
**Texas A&M International University
A. R. Sanchez, Jr. School of Business
Center for the Study of Western Hemispheric Trade**

In Partnership with

**Universidad Autónoma de Tamaulipas
Facultad de Comercio, Administración y Ciencias Sociales**

and

Universidad Tecnológica de Tamaulipas Norte



**29th Annual
Western Hemispheric Trade Conference
April 9 - 11, 2025**

Conference Proceedings



About the Center

The Center for the Study of Western Hemispheric Trade at Texas A&M International University (TAMIU) is a public service institute founded to study globalization with a special emphasis on the Western Hemisphere. The Center is a part of the A. R. Sanchez, Jr. School of Business (ARSSB), and it supports the college as well as the entire Texas A&M International University community by organizing conferences, seminars, lecture series, and other public events, in addition to promoting research.

Ongoing activities of the Center include the IBC Bank & Commerce Bank Keynote Speaker Series, TAMIU's Annual Western Hemispheric Trade Conference, the regular publication of *The International Trade Journal*, the flagship and highly successful academic journal now in its 38th year of publication, and its online *Working Paper Series* which provides a forum for disseminating works-in-progress reflecting the broad range of research activities of TAMIU's faculty and students.

Mission

The Center has as its mission to study and promote research on globalization with special emphasis on the Western Hemisphere. The Center aims to increase awareness and knowledge about Western Hemispheric countries and their economical, political, and social interactions. The Center spotlights Texas A&M International University and the City of Laredo as key resources of information, research, training, and conferences focusing on the Western Hemisphere. Consistent with the mission of the School of Business, the Center promotes education and teaching through its various programs.



The CSWHT was created in 1995, and
TAMIU's Western Hemispheric Trade Center opened its doors in September 2001.

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WELCOME

Dear Conference Participant,

Welcome to the 29th Annual Western Hemispheric Trade Conference, hosted by Texas A&M International University's (TAMU) A. R. Sanchez, Jr. School of Business (ARSSB), April 9-11, 2025. This year's Conference is co-sponsored by the Center for the Study of Western Hemispheric Trade (CSWHT), in collaboration with México's Universidad Autónoma de Tamaulipas (UAT) Facultad de Comercio, Administración y Ciencias Sociales and the Universidad Tecnológica de Tamaulipas Norte (UTTN).

We are grateful for the generous support of our corporate sponsors, **IBC Bank** and **Commerce Bank**, and the donors of **TAMU's Banking Academy**, **Texas Community Bank**, **Rio-South Texas Education and Community Development Foundation**, **PNC Bank**, the **Matias De Llano Charitable Trust**, and **Falcon Bank**.

The 2025 Conference program features a combination of on-site and virtual sessions:

- Sessions with an assigned room number (e.g., STC 230) will be held in person at TAMU and live-streamed via Microsoft Teams.
- Sessions labeled "MS Teams" will be conducted fully online.

We are honored to feature four distinguished guests:

Keynote Speakers

- **Hilary J. Allen** (April 9), *Crypto and Financial Crises*
Author and Law Professor, American University's Washington College of Law
- **Dr. William L. Megginson** (April 11), *The Financial Economics of Spaceflight*
Professor and Price Chair in Finance, University of Oklahoma's Michael F. Price College of Business.

Fireside Chat Panel (April 10), *Numbers, Engines, and Enterprise: Perspectives on Leadership from the Flight Deck to the Global Stage*

- **Roberto A. Tohme**
Co-owner, Pilot, and Chief Financial Officer, ATI Jet, Inc.
- **Dr. Len J. Treviño**
President, Iberoamerican Academy of Management, and SBA Communications Professor of International Business, Florida Atlantic University.

Nearly 100 papers will be presented across 25 academic sessions, including contributions to the Partial Least Squares (PLS) Applications Symposium, chaired by **Dr. Ned Kock**, Regents Professor and Chair of the ARSSB's Division of International Business and Technology Studies.

We hope you enjoy a stimulating and productive Conference experience—one that inspires meaningful scholarly exchange, builds lasting professional relationships, and encourages future collaboration.

Warm regards,



Luis Pérez-Batres, Ph.D.

Dean and Radcliffe Killam Distinguished Professor
A. R. Sanchez, Jr. School of Business
Texas A&M International University



George R. G. Clarke, Ph.D.

CSWHT Director and PNC Bank Chair
A. R. Sanchez, Jr. School of Business
Texas A&M International University

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CONFERENCE AGENDA

Wednesday, April 9, 2025

- 5:30 p.m. **Welcoming Reception** Student Center (STC) Ballroom
Sponsored by IBC Bank & Commerce Bank
- 6 p.m. **IBC Bank & Commerce Bank Keynote Speaker Series** STC Ballroom
MS Teams Location: <https://go.tamiau.edu/allen>
- Introduction: George R. G. Clarke, Ph.D., Director, CSWHT, ARSSB, TAMIU
- Crypto and Financial Crises***
Hilary J. Allen, Author and Law Professor, Washington College of Law,
American University

Thursday, April 10, 2025

- 9 a.m. **On-Site Check-In Begins** STC Rotunda, 2nd Floor
- Continental Breakfast** STC Ballroom
- 10 a.m. **Concurrent Academic Sessions**
- Session 1: International Business Issues I (Doctoral Student Presentations) STC 120
- Session 2: Issues in Finance, Firm Behavior, Innovation, and
Entrepreneurship STC 230
- Sesión 3: Inteligencia artificial, recursos humanos y educación STC 231
- Sesión 4: Productividad, competitividad y salud STC 236
- Session 5: Social Responsibility, the Blue Economy, and Production MS Teams
- 11:45 a.m. **Break**
- 12 p.m. **Lunch Begins** STC Ballroom
- 12:30 p.m. **Luncheon Fireside Chat Panel** STC Ballroom
MS Teams Location: <https://go.tamiau.edu/whtc-panel>
- Welcoming Remarks: Juan J. Castillo, Interim President, TAMIU
Introduction: Luis Pérez-Batres, Ph.D., Dean, ARSSB, TAMIU
- Numbers, Engines, and Enterprise: Perspectives on Leadership from the
Flight Deck to the Global Stage***
Roberto A. Tohme, Co-Owner, Pilot, and Chief Financial Officer, ATI Jet, Inc.
Len J. Treviño, Ph.D., President, Iberoamerican Academy of Management, and
SBA Communications Professor of International Business, Florida Atlantic University
Moderator: Luis Pérez-Batres, Ph.D., Dean, ARSSB, TAMIU

**All times listed are Central Daylight Time (CDT).
On-site presentations broadcast live via MS Teams for virtual participants.**

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CONFERENCE AGENDA

Thursday, April 10, 2025 (cont.)

1:45 p.m. Break

2 p.m. Concurrent Academic Sessions

Session 6: Issues in Finance and Investments	STC 120
Session 7: Leadership, Communication, and Knowledge Sharing	STC 230
Session 8: Treaties, Trade Openness, and Transportation.....	STC 231
Sesión 9: Educación, desarrollo y cultura	STC 236
Session 10: Global Business Issues.....	MS Teams

3:30 p.m. Break & Refreshments

3:45 p.m. Concurrent Academic Sessions

Session 11: PLSAS Innovative PLS-SEM Applications	STC 120
Session 12: Issues in Finance, Trade, and Technology (Undergraduate Student Presentations).....	STC 230
Session 13: Issues in Investments, Education, and Technology.....	STC 231
Sesión 14: Temas de producción, innovación y eficiencia.....	STC 236
Sesión 15: Temas de educación, empleo y consume	MS Teams

5:15 p.m. Break

5:30 p.m. Reception & Dinner Sue and Radcliffe Killam Library (KLM), Front Lawn

Welcoming Remarks: Luis Pérez-Batres, Ph.D., Dean, ARSSB, TAMIU

Friday, April 11, 2025

8:30 a.m. On-Site Check-In Continues.....STC Rotunda, 2nd Floor

Continental BreakfastSTC Ballroom

9 a.m. Concurrent Academic Sessions

Session 16: Evaluating Public Service Performance: Expectation and Experience in Public Organizations	MS Teams
Session 17: Issues in Policy, Production, and Trade	MS Teams
Session 18: Employment, Knowledge Management, and Security Interventions	MS Teams
Sesión 19: Temas de economía, comercio y sostenibilidad	MS Teams
Sesión 20: Temas de producción, eficiencia y desarrollo sostenible	MS Teams

Details for concurrent academic sessions available on pages 10 to 22.

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CONFERENCE AGENDA

Friday, April 11, 2025 (cont.)

10:30 a.m. Break

10:45 a.m. Concurrent Academic Sessions

Session 21: Corruption and Sustainable Development Goals MS Teams
Session 22: International Business Issues II (Doctoral Student
Presentations)STC 230
Session 23: Issues in Business and Science (Undergraduate Student
Presentations)STC 231
Sesión 24: Métodos para mejorar la gestión del inventarioSTC 236
Sesión 25: Temas de cultura organizacional, educación y consume MS Teams

12:15 p.m. Break

12:30 p.m. Lunch Begins..... STC Ballroom

1 p.m. Luncheon Keynote Address STC Ballroom

Sponsored by TAMIU's Banking Academy

MS Teams Location: <https://go.tamtu.edu/megginson>

Welcoming Remarks: Claudia E. San Miguel, Ph.D., Provost and Vice President
for Academic Affairs, TAMIU

Introduction: Luis Pérez-Batres, Ph.D., Dean, ARSSB, TAMIU

The Financial Economics of Spaceflight

William L. Megginson, Ph.D., Professor and Price Chair in Finance, Michael F. Price
College of Business, The University of Oklahoma

Announcement of Student Awards and Closing Remarks STC Ballroom

MS Teams Location: <https://go.tamtu.edu/megginson>

George R. G. Clarke, Ph.D., Director, CSWHT, ARSSB, TAMIU

End of Program

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ABOUT OUR SPEAKERS



Hilary J. Allen

Hilary J. Allen is a Professor of Law at the American University Washington College of Law. She teaches courses in Banking Law, Securities Regulation, Financial Regulation, and Business Associations.

Exclusively represented by BrightSight Speakers bureau, Professor Allen is a nationally recognized expert on financial stability regulation, having authored more than 15 law review articles on the subject (recent articles have appeared in the *Boston College Law Review*, the *George Washington Law Review*, and the *Harvard Business Law Review*). In her work, Professor Allen stresses the importance of financial stability by underlining the human consequences of financial crises, and considers a

variety of existing and evolving threats to financial stability. Her recent work has focused on threats arising from climate change and the increasing prevalence of fintech, as well as adapting the structure and scientific/technological capacity of financial regulatory agencies. She has testified before the House Financial Services Committee and the Senate Banking Committee, and is the author of the book *Driverless Finance: Fintech's Impact on Financial Stability* (2022, Oxford University Press). Professor Allen is also actively involved in presenting scholarly publications at roundtables and conferences, and regularly contributes blog posts and podcasts on the subject of financial regulation.

Professor Allen received her Bachelor of Laws from the University of Sydney, Australia, and her Master of Laws in Securities and Financial Regulation Law from Georgetown University Law Center (for which she received the Thomas Bradbury Chetwood, S. J. Plaque for graduating first in her class). Prior to entering the academy, Professor Allen spent seven years working in the financial services groups of prominent law firms in London, Sydney, and New York (most recently at Shearman & Sterling LLP in New York). In 2010, she worked with the Financial Crisis Inquiry Commission, which was appointed by Congress to study the causes of the financial crisis of 2007-2008.

Crypto and Financial Crises

Keynote Address | Wednesday, April 9, 2025 | 6 p.m. CDT

Student Center Ballroom | Live Broadcast available at <https://go.tamtu.edu/allen>

Sponsored by IBC Bank & Commerce Bank

Professor Allen will discuss the crypto ecosystem (with a particular emphasis on DeFi) and explain how its fragilities mirror the fragilities of financial innovations developed in the run up to the global financial crisis of 2008. She cautions that crypto innovation will not democratize finance, make finance more efficient, or promote financial inclusion, and argues that – given crypto's risks – it is therefore bad public policy to support this kind of innovation. In particular, she will emphasize that the integration of crypto into our traditional financial system is likely to make our system highly fragile, and so she argues for a firewall between crypto and traditional finance.



ABOUT OUR SPEAKERS



Roberto A. Tohme

Roberto Tohme is the co-owner and chief financial officer of ATI Jet, Inc. Mr. Tohme graduated as a certified public accountant from México's Instituto Tecnológico y de Estudios Superiores de Monterrey, Campus Laguna, in May 1990; then as a master sewing machine technician at the Union Special Technical Training Center in Huntley, Illinois, in November 1990. With ample experience in apparel manufacturing from 1990 to 2015 in Gomez Palacio, Durango, México, and concurrently running his US sales and private label contracting business, Sunshine Traders of El Paso, LLC, in El Paso, Texas, he developed his concepts of processes streamlining, cost evaluations and measures to reduce them, procuring

financing for the company in more favorable terms and conditions, management of cash flows, oversight on accounting, tax related matters on both sides of the border, financial planning, and international trade related matters.

Mr. Tohme's aviation career began in May 2006 when, as a freshly minted FAA private pilot, he acquired his stake at ATI Jet, Inc. in El Paso, a private charter, air ambulance, and critical cargo operator. This pushed him not only to learn an entirely new business line, adopting and adapting his concepts mentioned above, but to advance his license to commercial pilot in 2008 and then to airline transport pilot in 2012, as he met the minimum hours required for each category. Today, Mr. Tohme holds over 3,800 hours of experience, of which more than 3,200 hours are on turbine powered aircraft and have type ratings on Learjet LR-JET series, Learjet LR-60 series, and Citation CE500 series, including company Learjet instructor privileges.



Len J. Treviño, Ph.D.

Dr. Len J. Treviño is President of the Iberoamerican Academy of Management and Director of International Business Programs and SBA Communications Distinguished Professor of International Business at Florida Atlantic University. His research focuses on the antecedents and consequences of foreign direct investment, the internationalization strategies of multinational enterprises, gender and diversity, and cross-cultural management. Dr. Treviño has published in leading international business and management journals, including *Journal of International Business Studies*, *Journal of Management*, *Journal of World Business*, *Academy of Management Learning & Education*, *Asia Pacific Journal of*

Management, *Journal of International Business Policy*, *International Business Review*, *Journal of International Management*, and *Management International Review*. He has taught international management classes at all levels throughout Iberoamerica.

Dr. Treviño received his Ph.D. in international business and strategic management from Indiana University, Bloomington.

Numbers, Engines, and Enterprise: Perspectives on Leadership from the Flight Deck to the Global Stage

Panel Discussion | Thursday, April 10, 2025 | 12:30 p.m. CDT

Student Center Ballroom | Live Broadcast available at <https://go.tamtu.edu/whtc-panel>

ABOUT OUR SPEAKERS



William L. Megginson, Ph.D.

Dr. Bill Megginson is Professor and Price Chair in Finance at the University of Oklahoma's Michael F. Price College of Business. He is also Finance Area Editor for the *Journal of International Business Studies* and Visting Professor at University of International Business and Economics (Beijing). He was Editor of the *Journal of Corporate Finance* from 2018-2020, and from 2014-2019 was the Saudi Aramco Chair Professor in Finance at King Fahd University of Petroleum and Minerals in Dhahran, Saudi Arabia. From 2002 to 2007, he was a voting member of the Italian Ministry of Economics and Finance's Global Advisory Committee on Privatization. During spring 2008, he was the Fulbright Tocqueville Distinguished Chair

in American Studies and Visiting Professor at the Université-Paris Dauphine and received the University of Oklahoma's top research award, a George Lynn Cross Research Professorship, in April 2010.

In recent years, Professor Megginson's research interest has focused on the privatization of state-owned enterprises, sovereign wealth fund investments, venture capital and private equity fund-raising and investments, and investment banking principles and practices. He has published refereed articles in several top academic journals, including the *Journal of Economic Literature*, the *Journal of Finance*, the *Journal of Financial Economics*, the *Review of Financial Studies*, the *Journal of Financial and Quantitative Analysis*, the *Journal of International Business Studies*, and the *Journal of Law and Economics*. His co-authored study documenting significant performance improvements in recently privatized companies received one of two Smith Breeden Distinguished Paper Awards for outstanding research published in the *Journal of Finance* during 1994. He is author or co-author of nine textbooks.

Professor Megginson's research has been frequently cited in academic and professional publications. His articles have been downloaded over 80,000 times from the Social Sciences Research Network, and his books and articles have been cited almost 29,000 times (according to Google Scholar). His co-authored privatization survey article, published in the *Journal of Economic Literature* in 2001, is the eighth most widely cited finance article published since 2000, and the most widely cited article published in 2001. He has served as a privatization consultant for the New York Stock Exchange, the OECD, the IMF, the World Federation of Exchanges, the European Bank for Reconstruction and Development, and the World Bank. He has visited 85 countries during his lifetime, and has lived in Spain, Pakistan, France, and Saudi Arabia, in addition to the United States.

Dr. Megginson has a B.S. degree in chemistry from Mississippi College, an MBA from Louisiana State University, and a Ph.D. in finance from Florida State University. Prior to entering academia in 1986, he worked for five years as a petroleum chemist at the world's largest styrene monomer plant and at the largest independent petroleum refinery in the United States. He has been a visiting professor at Duke University, Vanderbilt University, the University of Zurich, the University of Amsterdam, Bocconi University, and Université-Paris Dauphine.

(continued on next page)

ABOUT OUR SPEAKERS

The Financial Economics of Spaceflight

Keynote Address | Friday, April 11, 2025 | 1 p.m. CDT

Student Center Ballroom | Live Broadcast available at <https://go.tamtu.edu/megginson>

Sponsored by TAMU's Banking Academy

Dr. Megginson will present a financial economics analysis of the global space economy, with annual revenues of around \$600 billion (0.6% of global GDP). Commercial products and services represent three-fourths of space economy revenues, while government orders account for one-fourth. He categorizes the space economy along an entrepreneurial spectrum, ranging from: (1) a Pure Science and Exploration sector, wherein projects are sponsored exclusively by national space agencies and financed solely with government contracts; through (2) a Military sector, also exclusively sponsored and funded (often secretly) by national military and intelligence organizations; to (3) a Human Space Exploration sector, with mixed government and commercial oversight and funding, currently focused on Earth-orbiting space stations but anticipating lunar and Martian visits; and (4) a Commercial sector, funded and operated by private companies that launch and operate satellites, provide communications and Earth-monitoring services, and collect and sell data thus produced. Since the Space Shuttle ended in 2011, national space agencies, especially NASA, have increasingly relied on private companies to provide space services under fixed price contracts. There has also been a massive decline in launch costs, from \$18,500/kg to \$1,400/kg, driven mostly by SpaceX's relentless pursuit of efficiency, scale, and rocket reusability. Far more than in most other capital-intensive industries, the space economy is dominated by private (unlisted) companies; relies far more than most industries on government contracts and venture capital for funding, rather than external debt and retained earnings; and faces very high bankruptcy costs due to extreme asset-specificity and rapid obsolescence.

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Political Risk and Corporate Culture: Evidence from Firm-Level Dynamics

Ayman Samak¹

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Abstract

This paper investigates the impact of firm-level political risk on corporate culture, emphasizing how firms strategically adapt their cultural frameworks to mitigate external uncertainties. The study utilizes a dataset of 27,807 U.S. firm-year observations from 2003 to 2021. Political risk and corporate culture are quantified using textual analysis and machine-learning methods applied to earnings call transcripts. Corporate culture is measured through five key traits: innovation, integrity, quality, respect, and teamwork. Robustness checks, including alternative proxies and instrumental variable analysis, ensure the validity and causal interpretation of the findings. The analysis reveals that increased political risk is positively associated with stronger corporate culture metrics, particularly traits like integrity and teamwork, which play pivotal roles in fostering organizational resilience and trust. Industry-specific analysis indicates that sectors such as Business Equipment, Healthcare, and Construction exhibit pronounced cultural responses to political risk. This study contributes to the literature on political economy and organizational behavior by demonstrating the strategic role of corporate culture in mitigating the challenges posed by political uncertainty. It underscores the value of cultivating cultural resilience as a mechanism for adaptability and long-term success.

Keywords: Political risk; political exposure; corporate culture; integrity culture; teamwork culture; textual disclosures

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The Mediating Effects of Human Resources Training on Leadership-Employee Workplace Commitment and Work Outcome

Tochukwu J. Emegwa¹

A.R. Sanchez, Jr. School of Business, Texas A&M International University, Laredo, Texas, USA

Abstract

Our paper investigates the mediating effects of human resources (HR) training on the leader-employee workplace commitment for optimal performance. The relationship between leaders and subordinates impacts their work output. The results support the argument that leader-employee relationships and work outcomes are mediated by HR's soft and hard skills training. Thus, demonstrating the enhancement roles of HR training in the leader—employee commitment—work outcome relationships. Consequently, employee commitment strengthens, culminating in higher employee work performance.

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Market Competition as a Disciplinary Mechanism: Does It Curb Managerial Myopia in Innovation Investments?

Nana Twum Owusu-Peprah¹

A.R. Sanchez, Jr. School of Business, Texas A&M International University, Laredo, Texas, USA

Abstract

This study explores the critical role of market competition in mitigating myopic management practices, particularly the tendency of corporate managers to cut research and development (R&D) expenditures to meet short-term financial targets, secure bonuses, and advance their careers. Addressing a key gap in the literature, this research examines how competitive market forces discipline managerial behavior and influence corporate innovation and efficiency.

Using a dataset of 26,694 firm-year observations from U.S. nonfinancial publicly traded firms spanning 2000 to 2021, I find a negative relationship between firm efficiency and innovation, primarily driven by managers' inward-looking behavior. This managerial focus on short-term financial performance exacerbates financial frictions, such as information asymmetry and free cash flow issues, hindering long-term innovation. However, when firm efficiency interacts with market competition—measured using the Herfindahl-Hirschman Index (HHI)—this negative effect is reversed. This suggests that competitive pressure acts as a disciplinary mechanism, curbing managerial short-termism and mitigating governance weaknesses.

The theoretical framework of the study is grounded in agency cost theory, which explains conflicts between firm owners and managers. This study addresses potential endogeneity and selection bias concerns through firm-level controls, firm and year-fixed effects, instrumental variables, and Tobit specifications. The findings contribute to the literature on corporate governance, innovation, and managerial incentives, offering valuable insights for policymakers and business leaders. By highlighting the role of competition in shaping internal corporate decisions, this research underscores the broader implications for fostering a more innovation-driven and competitive corporate landscape.

Keywords: Innovation, Firm efficiency and Market Competition (HHI), Information Asymmetry

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CEO Extraversion and Firms' Entrepreneurial Orientation (EO): The Role of CEO's Bridging Social Capital and Top Management Team (TMT) Support

Zahidul Karim¹

A.R. Sanchez, Jr. School of Business, Texas A&M International University, Laredo, Texas, USA

Abstract

CEO personality and its impact on entrepreneurial orientation (EO) is a sparking topic for scholars and practitioners. The influence of CEO extraverted personality on EO extensively studied but the mechanisms by which extraverted CEO influence entrepreneurial orientation of firms are not adequately studied. Integrating Upper Echelon and Social Capital theories, this study has established theoretical link between CEO extraversion and firm's EO and underlying mechanisms with contingent factors. The study proposes that the CEO's bridging social capital and top management team (TMT) support strengthen this relationship. Through rigorous review of literature, the present study provides important resolution for mixed findings in prior studies and important managerial insights for understanding the role of CEO extraversion on EO and the contingent effects of TMT support and CEO's bridging social capital. Finally, the study offers future research options.

Keywords: CEO extraversion; entrepreneurial orientation; TMT support; bridging social capital

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Geographic Diversification and Debt Costs in High-Interest Rate Environments

Kyle Kelly¹

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Nur Al Faisal

Division of International Banking and Finance Studies, A.R. Sanchez, Jr. School of Business, Texas A&M International University, Laredo, Texas, USA

Abstract

This study examines the impact of firms' geographic dispersion on their cost of debt, particularly in high-interest-rate environments. By analyzing state name mentions in SEC Form 10-K filings, we classify firms based on the breadth of their operational reach. Our findings suggest that firms with greater geographic dispersion benefit from lower borrowing costs, with the effect becoming more pronounced during periods of elevated interest rates. These results highlight the role of geographic diversification in mitigating credit risk and enhancing firms' financial flexibility.

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Ownership and Control in Family Business Groups: An Agency Costs Perspective

Hyeonjin Im¹

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Dongguen Kim

Center for Industrial Policy Research, Korea Institute for Industrial Economics & Trade, Sejong, South Korea

Abstract

This study explores the impact of ownership and control structures in family business groups on agency costs and firm behavior. Family-controlled firms are prevalent globally, and the agency cost framework offers valuable insights into the conflicts between owners and managers (vertical agency costs) and between majority family shareholders and minority shareholders (horizontal agency costs). Family-controlled firms often reduce vertical agency costs due to the overlap of ownership and control. However, horizontal agency costs emerge from misaligned interests between family shareholders and minority shareholders. This study examines the trade-off between these two types of agency costs within firms that belong to business groups.

First, in terms of firm performance, the study finds that family CEOs reduce vertical agency costs, and the presence of family members on the board strengthens the alignment between management and ownership, further mitigating vertical agency conflicts. However, as family ownership becomes more concentrated, horizontal agency costs increase, negatively affecting firm performance. This indicates that higher concentrations of family ownership amplify horizontal agency costs, which adversely impact firm outcomes.

Second, with respect to innovation, the study investigates the relationship between agency costs and innovation strategies. Family control promotes long-term investment in R&D, reducing vertical agency costs and encouraging innovation. However, as horizontal agency costs rise with concentrated ownership, diversification in innovation is hindered. Specifically, the study finds that family firms, often risk-averse, may underinvest in high-risk, transformative innovations. Additionally, the nonlinear relationship between family ownership and innovation suggests that while family control can foster innovation, excessive ownership concentration leads to diminishing returns in innovative activities.

Using firm-level data from South Korean family-owned business groups, this study provides empirical evidence on how agency costs influence both performance and innovation, with important governance implications. The results suggest that while family control can reduce vertical agency conflicts, it also increases risks related to the expropriation of minority shareholders, associated with higher horizontal agency costs.

JEL: L22; D22

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Spillover Effect of Marketing Alliance on Innovation

Nur Al Faisal¹

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Jintao Zhang

Marketing Department, Tippie College of Business, University of Iowa, Iowa City, Iowa, USA

Abstract

This study investigates the spillover effects of marketing alliances on firms' innovation capabilities, emphasizing the role of specialization. Drawing on resource-based and network theories, we argue that marketing alliances enable firms to focus on their core competencies while leveraging partners' knowledge. Using a panel dataset of firms engaged in marketing alliances, we empirically assess how these partnerships influence innovation outcomes, measured through patent filings and new product introductions. Our findings reveal that marketing alliances not only improve market performance but also stimulate innovation by facilitating access to cross-industry insights. However, we find stronger evidence for exploitation rather than exploration, suggesting that firms use alliances to refine existing capabilities rather than pursue radical innovation. This study contributes to the literature by demonstrating how marketing partnerships serve as catalysts for incremental innovation and offering managerial implications for optimizing alliance strategies.

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Does Central Bank Transparency Promote Entrepreneurship?

Amit Ghosh

Division of International Banking and Finance Studies, A.R. Sanchez, Jr. School of Business, Texas A&M International University, Laredo, Texas, USA

Constant L. Yayi¹

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Abstract

A burgeoning body of literature has examined the effects of central bank transparency (CBT), with a primary focus on financial market outcomes. While most studies focus on financial implications, we investigate the impact of CBT on the real sector, specifically the formation of new businesses. Our IV Poisson GMM estimation results indicate that higher overall CBT, as well as increased transparency in any of its five dimensions, fosters new business formation. Specifically, we find that a one-unit increase in the overall CBT index corresponds to a 5.49% rise in the business formation rate per 1,000 adults, underscoring the role of monetary policy transparency in stimulating entrepreneurship. These findings remain robust across alternative weighting schemes for CBT and various estimation techniques. Exploring transmission mechanisms, we find higher political stability and lower economic uncertainty to reduce interest rates, thereby spurring entrepreneurial activities. Additionally, CBT enhances financial stability and reduces bank insolvency risks.

Keywords: Central bank transparency; new business entry rate; Poisson model; lending interest rate channel

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La inteligencia artificial y su impacto en la contabilidad: ¿Evolución o revolución?

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Resumen

La inteligencia artificial ha transformado el campo de la contabilidad, convirtiéndose en una herramienta clave para optimizar la gestión de datos contables en las organizaciones. Su capacidad para automatizar tareas rutinarias, como la clasificación de transacciones, la conciliación de cuentas y la generación de informes, plantea interrogantes sobre si este cambio representa una simple evolución o una auténtica revolución en la profesión contable, ya que al liberar a los profesionales de actividades operativas les permite enfocarse en funciones estratégicas, como el análisis de datos y la planificación financiera, lo que contribuye al crecimiento de los ingresos empresariales.

Esta investigación analiza el impacto de la inteligencia artificial en la contabilidad moderna a través de la aplicación de encuestas a una muestra de contadores, en la cual se destacan sus beneficios y programas contables actuales, así como el posible desplazamiento de puestos de trabajo. Asimismo, se examina la transformación de los métodos contables tradicionales, evaluando sus ventajas como la optimización de procesos y la mejora en la toma de decisiones como sus desventajas, entre las que se incluyen preocupaciones sobre la seguridad, la fiabilidad de los sistemas y la creciente dependencia tecnológica.

Palabras clave: Inteligencia artificial; contabilidad moderna; automatización; ética profesional

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Mejora de la gestión de recursos humanos, mediante la inteligencia artificial

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Resumen

El siguiente estudio de investigación, presenta un análisis detallado sobre la aplicación de la inteligencia artificial (IA) en la administración de recursos humanos (RH) en el contexto organizacional y cómo, aunque algunas empresas multinacionales a nivel local han invertido en IA, no obtienen resultados favorables. Este análisis se desarrolla con el objetivo de identificar cómo la IA puede optimizar procesos clave como la selección de talento, el análisis del desempeño y la retención de empleados, enfrentando, al mismo tiempo, desafíos relacionados con la ética, la privacidad y la equidad en la toma de decisiones.

En la actualidad, la inteligencia artificial transforma distintas áreas administrativas, incluyendo la gestión de recursos humanos, pero muchas empresas no obtienen los resultados esperados por enfocarse solo en lo técnico (Aguinis et al., 2024). No se consideran aspectos humanos esenciales como el liderazgo, cultura organizacional e integración, esto puede limitar su impacto. Este estudio propone un marco de referencia para evaluar la preparación empresarial en la adopción efectiva de IA.

El planteamiento del problema gira en torno a la pregunta: ¿Cómo puede la inteligencia artificial optimizar la gestión de recursos humanos, mejorando procesos clave y abordando desafíos éticos? Con base en esta interrogante, la investigación propone como objetivos analizar, determinar e identificar los beneficios y el impacto de la IA en la transformación de los procesos de contratación, desarrollo de talento y retención del personal dentro de una empresa.

La IA optimiza la gestión de recursos humanos al automatizar tareas repetitivas, como revisión de currículums y entrevistas (Andrejczuk, 2018), permitiendo a RH enfocarse en estrategias clave. También mejora la toma de decisiones con análisis de datos para predecir rotación y evaluar desempeño (Pastor, 2021). Además, personaliza la capacitación según las necesidades de cada empleado.

No obstante, la implementación de IA en recursos humanos enfrenta diversos desafíos. En primer lugar, Existen limitaciones tecnológicas y económicas, como acceso restringido a datos, rápida obsolescencia de la IA y falta de presupuesto para herramientas avanzadas. En segundo lugar, Surgen preocupaciones éticas y legales sobre la imparcialidad de los algoritmos, la privacidad de los datos y la aceptación social de la automatización en decisiones. (Terán, 2023).

El estudio se desarrollará en el municipio de Nuevo Laredo, Tamaulipas, centrándose en cinco empresas transportistas y la Universidad Autónoma de Tamaulipas. La investigación adoptará un enfoque cualitativo, utilizando entrevistas y análisis de casos específicos con empleados de recursos humanos, estudiantes y docentes. Se analizarán tres dimensiones principales: la optimización de procesos, la toma de decisiones y el desarrollo del talento. La recopilación de datos se realizará mediante cuestionarios estructurados con preguntas relacionadas con la percepción sobre la IA en la gestión de recursos humanos.

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En conclusión, la IA puede transformar la gestión de recursos humanos en las organizaciones, optimizando procesos, decisiones y desarrollo de talento. Su implementación efectiva requiere una estrategia integral que considere aspectos tecnológicos, éticos y organizacionales. Esta investigación busca ofrecer un marco para evaluar su adopción y maximizar su impacto positivo en la administración del talento.

Palabras clave: Inteligencia artificial; gestión de recursos humanos; optimización de procesos; toma de decisiones; ética y privacidad

Factores sociolaborales para la captación de talento; estudio empírico

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Resumen

En un entorno laboral en constante cambio, las organizaciones buscan estrategias efectivas para atraer y retener talento. Este estudio tiene como objetivo identificar y analizar los factores clave que los próximos profesionistas consideran al evaluar una oferta laboral, con el propósito de comprender sus prioridades, percepciones y motivaciones. Asimismo, se busca explorar cómo estos factores varían según características demográficas, sector laboral y contexto socioeconómico.

El estudio se desarrollará bajo un enfoque cuantitativo, deductivo, exploratorio y de corte transversal, aplicando una encuesta con escala de Likert a estudiantes de licenciatura de la Universidad Autónoma de Tamaulipas. A partir del análisis de los datos, se pretende contribuir al campo de los recursos humanos, especialmente en las teorías de motivación laboral y toma de decisiones. Además, se busca identificar brechas en la literatura sobre factores emergentes, como el trabajo remoto, el balance vida-trabajo y la flexibilidad laboral.

Los resultados del estudio proporcionarán información basada en evidencia que permitirá a las empresas diseñar ofertas laborales más atractivas y alineadas con las expectativas y necesidades de los futuros profesionales. Esto contribuirá a mejorar las estrategias de reclutamiento y retención de talento, fortaleciendo la competitividad organizacional en el mercado laboral actual.

Palabras clave: Oferta laboral; retención de talent; motivación laboral

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El impacto transformativo de la inteligencia artificial generativa en la educación superior: Oportunidades y desafíos

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Abstract

Esta investigación aborda cómo la tecnología de la inteligencia artificial en chatbots IA y generadores de contenidos IA, pueden impactar en el área académica, concretamente en el sector de la educación superior. Se analizan las funciones de las herramientas de inteligencia artificial de chatbots AI como ChatGPT, Google Gemini, ChatPDF, Microsoft Copilot, así como también generadores de contenidos IA como Kaiber, Sora, Gen Runway, Microsoft Designer, Microsoft Bing Image Creator y Suno AI, que son herramientas existentes de acceso público desde dispositivos móviles y también desde computadoras personales. A través de una revisión de la literatura se abordan los progresos de esta tecnología en la actualidad, se explora cómo la IA ha evolucionado gracias a sus desarrolladores, y se destacan los beneficios y riesgos en el uso académico tanto de estudiantes como docentes. Se enfatizan los riesgos éticos del uso de estas tecnologías y se destacan las consecuencias del uso descuidado de las herramientas, las cuales podrían afectar las vidas profesionales de los usuarios. Se concluye que las herramientas de IA poseen los beneficios potenciales de personalizar el aprendizaje, automatizar tareas, crear contenidos innovadores, y apoyar la investigación. Sin embargo, se debe tener cuidado con la integridad académica, los sesgos algorítmicos, la dependencia tecnológica, la privacidad y seguridad de los datos, la desinformación y manipulación, así como la propiedad intelectual. La IA tiene el potencial de revolucionar la educación superior, pero su implementación debe abordarse cautelosa y responsablemente. De esta manera, resulta necesario establecer políticas y directrices claras para el uso ético de estas tecnologías, así como promover la alfabetización digital y el pensamiento crítico entre estudiantes y docentes.

Palabras clave: Inteligencia artificial; Chatbot; generador de contenidos; academia; docentes; estudiantes; ética; educación superior

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La importancia de los tiempos muertos en la productividad y el bienestar

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Resumen

En la sociedad actual, el concepto de productividad ha sido llevado al extremo, promoviendo la idea de que cada momento del día debe ser aprovechado para alcanzar un rendimiento óptimo. Sin embargo, este criterio puede generar efectos adversos tanto en la salud mental como en la calidad de trabajo realizado. La sobrecarga de tareas y la obsesión por la eficiencia pueden llevar a una pérdida de habilidades esenciales como la creatividad, el pensamiento lógico y la capacidad de resolución de problemas.

Alcanzar nuestro máximo potencial en el trabajo no es solo dependiente del tiempo que la dedicamos a cierta tarea y confeccionarla, sino también, de tener aquellos momentos de desconexión que podamos tener el suficiente tiempo de poder seguir creando nuevas ideas, y desarrollando un pensamiento lógico de innovación. Todos estos espacios de pausa permiten nuestra recuperación, reflexión y el origen de nuevas ideas, teniendo así un equilibrio entre la eficiencia y la calidad de vida. Ignorar la necesidad de descanso, momento de relajación y desconexión puede convertir a las personas en meras agendas vivientes, sacrificando su humanidad en favor de una productividad mecánica.

Muchos estudios nos han mostrado que la creatividad no surge únicamente en momentos de esfuerzo cognitivo intenso, sino también, en momentos de descanso. Clara evidencia de ello está en la teoría de incubación de Eysenck (1968), sostiene que cuando una persona deja de enfocarse en un problema específico y se distrae o descansa, la mente sigue procesando la información de forma inconsciente, logrando así soluciones innovadoras.

Del lado del pensamiento lógico y la capacidad de toma de decisiones tenemos estudios como el de Alvarado (2012), la cual confirma estas habilidades clave, se pueden deteriorar si no se permite que el cerebro tenga periodos de descanso. La fatiga mental disminuye la atención y la habilidad para procesar información, lo cual conlleva a una reducción de la calidad del trabajo como así lo confirma el médico internista peruano Venegas (2020). Es por esto los tiempos muertos no deben ser vistos como una pérdida de tiempo, sino como una estrategia clave para mejorar el desempeño laboral y el bienestar personal.

Palabras claves: Productividad; desconexión; bienestar; trabajo

Abstract

Today, the concept of productivity has been taken to the extreme, promoting the idea that every moment of the day should be used to achieve optimal performance. However, this criterion can generate adverse effects on both mental health and the quality of work performed. Task overload

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and obsession with efficiency can lead to a loss of essential skills such as creativity, logical thinking and problem-solving ability.

Reaching our maximum potential at work is not only dependent on the time we dedicate to a certain task and its completion, but also on having those moments of disconnection that we can have enough time to be able to continue creating new ideas and developing logical and innovative thinking. All these spaces of pause allow our recovery, reflection and the origin of new ideas, thus having a balance between efficiency and quality of life. Ignoring the need for rest, relaxation and disconnection can turn people into mere living agendas, sacrificing their humanity in favor of mechanical productivity.

Many studies have shown us that creativity does not only arise in moments of intense cognitive effort, but also in moments of rest. Clear evidence of this is in Hans Eysenck's (1968) incubation theory, which maintains that when a person stops focusing on a specific problem and becomes distracted or rests, the mind continues to process information unconsciously, thus achieving innovative solutions.

On the side of logical thinking and decision-making ability, we have studies such as Alvarado (2012) that confirm that these key skills can deteriorate if the brain is not allowed to have periods of rest. Mental fatigue decreases attention and the ability to process information, which leads to a reduction in the quality of work, as confirmed by the Peruvian internist Venegas (2020). This is why downtime should not be seen as a waste of time, but as a key strategy to improve job performance and personal well-being.

Keywords: Productivity; disconnection; welfare; job

Variables clave para la competitividad de las PyMES: Caso Nuevo Laredo Tamaulipas México

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Resumen

La presente tuvo como objetivo identificar las variables clave que afectan el nivel de productividad y competitividad de las Pymes en Nuevo Laredo Tamaulipas México.

Las variables clave que influyen en la competitividad de las pequeñas y medianas empresas incluyen uso tecnológico, la globalización, los requisitos actuales del mercado, acceso a la financiación, planificación empresarial, formación del personal, uso de herramientas de análisis competitivo y la financiación. Captación de capital, uso y gestión de tecnología e información, implementación de políticas públicas, gestión del capital humano, innovación, estrategias de marketing, uso de redes sociales, atracción y retención de clientes potenciales y resistencia al cambio.

En México, representan más del 99% de las empresas y más del 72% de las fuentes de empleo (OCDE, 2013). En México, estas empresas representan el 88% (Inegi, 2015). Sin embargo, las empresas representan sólo alrededor del 35% del producto interno bruto (PIB). El objetivo no debe ser convertir una empresa en una gran empresa, sino mejorar los niveles de productividad.

Estos problemas hacen que la esperanza media de vida de estas empresas sea de sólo 7,7 años (González, 2005), y más del 60% no sobrevive más de 3 años.

Palabras clave: Competitividad; pymes; variables clave

Abstract

The objective of this study was to identify the key variables that affect the level of productivity and competitiveness of SMEs in Nuevo Laredo Tamaulipas Mexico.

The key variables that influence the competitiveness of small and medium-sized businesses include technological use, globalization, current market requirements, access to financing, business planning, staff training, use of competitive analysis tools and financing. Capital raising, use and management of technology and information, implementation of public policies, human capital management, innovation, marketing strategies, use of social networks, attraction and retention of potential customers and resistance to change. In Mexico, they represent more than 99% of companies and more than 72% of employment sources (OECD, 2013). In Mexico, these companies represent 88% (Inegi, 2015). However, companies represent only about 35% of the gross domestic product (GDP). The goal should not be to turn a company into a large company, but to improve productivity levels.

These problems mean that the average life expectancy of these companies is only 7.7 years (González, 2005), and more than 60% do not survive more than 3 years.

Keywords: Competitiveness; SMEs; key variables

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Análisis bibliométrico sobre el impacto del sueño en el entorno y satisfacción laboral

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Resumen

El sueño, definido por la Real Academia Española como el estado de reposo caracterizado por la inacción o suspensión de los sentidos y el movimiento voluntario, es un componente esencial del bienestar humano que trasciende el ámbito personal para incidir significativamente en el entorno laboral. La calidad del sueño, a menudo subestimada por empleados y empleadores, es un factor determinante en la satisfacción y el rendimiento de los empleados en variadas áreas profesionales, incluyendo medicina, negocios, enfermería, psicología y educación. En estos contextos, se requiere de un óptimo desempeño cognitivo y motriz, por lo que una mala calidad del sueño puede comprometer la eficacia y la seguridad de los trabajadores. En este trabajo se realizó un análisis de la literatura internacional sobre la calidad del sueño en el entorno laboral. A través de un estudio bibliométrico de artículos indexados en la Web of Science (WoS), esta investigación caracteriza el interés académico global sobre esta temática, identificando tendencias en la literatura científica. Los resultados preliminares revelan un interés significativo en la influencia del sueño en el entorno laboral. Se identificó la insuficiencia de horas de sueño como un factor determinante en la percepción de satisfacción laboral, poniendo en relieve la necesidad de considerar la calidad del sueño como un elemento clave en las estrategias de bienestar laboral. Así, en este trabajo se destaca la relevancia de promover entornos laborales que fomenten el descanso adecuado y la higiene del sueño, reconociendo su incidencia en el rendimiento y la salud de los empleados.

Palabras clave: Sueño; satisfacción laboral; análisis bibliométrico; bienestar laboral; rendimiento laboral

Bibliometric Analysis of the Impact of Sleep on the Work Environment and Job Satisfaction

Abstract

Sleep, defined by the Royal Spanish Academy as a state of rest characterized by inaction or suspension of the senses and voluntary movement, is an essential component of human well-being that transcends the personal setting to have a significant impact on the work environment. Sleep quality, often underestimated by employees and employers, is a determining factor in employee satisfaction and performance in a variety of professional areas, including medicine, business, nursing, psychology, and education. In these contexts, optimal cognitive and motor performance is required, so poor sleep quality can compromise the efficiency and safety of

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workers. In this work, an analysis of the international literature on sleep quality in the work environment was conducted. Through a bibliometric study of articles indexed in the Web of Science (WoS), this research characterizes the global academic interest in this topic, identifying trends in scientific literature. Preliminary results reveal a significant interest in the influence of sleep in the work environment. Insufficient sleep hours were identified as a determinant factor in the perception of job satisfaction, highlighting the need to consider sleep quality as a key element in work wellness strategies. Thus, this work highlights the relevance of promoting work environments that encourage adequate rest and sleep hygiene, recognizing their incidence on the performance and health of employees.

Keywords: Sleep; job satisfaction; bibliometric analysis; occupational well-being; job performance

Impacto en la salud y productividad de estudiantes y trabajadores: Ergonomía en entornos de computo

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Resumen

El uso prolongado de computadoras ha mejorado la productividad y el aprendizaje, pero también ha generado problemas de salud asociados a la ergonomía. Este estudio aborda la importancia de la ergonomía en entornos académicos y laborales, destacando su impacto en la salud y el rendimiento de los usuarios.

Se presenta un análisis histórico de la ergonomía, desde sus inicios en el siglo XIX hasta su aplicación moderna en ingeniería y medicina. La ergonomía informática se centra en la optimización del diseño de hardware, software y espacios de trabajo para minimizar la fatiga y las lesiones musculoesqueléticas.

Se realizó un estudio de caso en la Facultad de Comercio, Administración y Ciencias Sociales de la Universidad Autónoma de Tamaulipas (UAT), encuestando a 101 estudiantes de la carrera de Tecnologías de la Información. Los resultados muestran que:

- El 41.6% de los estudiantes ha experimentado molestias físicas por el uso de computadoras.
- El 41.6% desconoce los principios básicos de ergonomía.
- El 58.4% considera que la ergonomía mejora la productividad.
- El 46.5% cree que la falta de ergonomía puede afectar su salud a largo plazo.

La investigación enfatiza la importancia de aplicar estrategias ergonómicas en ambientes educativos y de trabajo, como el empleo de mobiliario adecuado, la incorporación de descansos activos y la enseñanza sobre ergonomía. Se proponen recomendaciones clave para mejorar la alineación postural, la iluminación y la distribución del espacio laboral, favoreciendo así la salud y el confort de los usuarios.

Palabras clave: Ergonomía informática; salud ocupacional; productividad; trastornos musculoesqueléticos; entornos computacionales

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Determinants of Strategic Business Performance: Roles of Leadership Traits, Corporate Social Responsibility Dimensions, and the Usage of AI

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Abstract

Sustainability has become key to long-term success in today's ever-changing and uncertain global business environment. Organizations are progressively held responsible for their environmental, social, and economic impact, aligning with the Triple Bottom Line (TBL) approach, which underlines People, Planet, and Profit. While sustainable business strategies contribute to long-term resilience, their effectiveness is mainly shaped by leadership traits and the extent to which technology, primarily Artificial Intelligence (AI), is leveraged. This study will explore the interactions among leadership traits, sustainability, and business performance while exploring the moderating effect of leaders' AI usage within the TBL framework.

Effective leadership plays a key role in implementing sustainability within corporate strategy. Leaders with a specific vision, ethical responsibility, adaptability, and innovation tend to drive sustainable initiatives by nurturing a corporate social responsibility (CSR) culture and ethical governance. However, the degree to which these leadership traits translate into enhanced business performance remains dependent on various internal and external factors.

Adopting sustainability practices is increasingly linked to higher business performance when assessed through the TBL approach. Companies that prioritize People (social responsibility, employee well-being, community engagement), Planet (environmental stewardship, carbon footprint reduction, resource efficiency), and Profit (financial viability, innovation, stakeholder trust) tend to achieve long-term competitive advantages. However, while sustainability initiatives can enhance operational efficiency and brand loyalty, they often require substantial investments, regulatory compliance, and strategic realignment. This presents challenges in balancing short-term profitability with long-term sustainability goals, highlighting the complexities of implementing sustainability initiatives.

AI has emerged as a transformative tool in sustainability-driven decision-making. Leaders utilizing AI technologies—such as predictive analytics, machine learning, and real-time data monitoring—can improve sustainability outcomes while optimizing business performance. AI aids in supply chain optimization, energy efficiency, carbon footprint analysis, and stakeholder engagement, thus strengthening the positive impact of sustainability initiatives. However, it's important to note that the moderating effect of AI depends on the leaders' technological competence, ethical AI governance, and strategic foresight. If misapplied, AI could introduce biases, data privacy concerns, or misalign with sustainability goals, weakening its potential benefits. This underscores the need for caution and careful consideration when integrating AI into sustainability strategies.

Therefore, this study proposes a conceptual framework linking leadership traits, sustainability, and business performance through the lens of the TBL approach, with AI usage as a moderator. This research will contribute to leadership, sustainability, and business strategy by identifying how leadership characteristics and AI-driven decision-making interact. We propose that the findings offer practical insights for corporate leaders, emphasizing the need for AI literacy, ethical technology integration, and a holistic approach to sustainability that balances economic performance with environmental and social responsibility. This holistic approach is

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crucial for maintaining a balance between short-term profitability and long-term sustainability goals, ensuring the continued success of businesses in the future.

Keywords: Leadership traits; corporate social responsibility; Triple Bottom Line; Artificial Intelligence; corporate strategic performance

Why the ‘Blue Economy’ Continues to Stagnate: Lessons Learned from the Launch of Shell’s Marine Renewable Energy Group

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Abstract

The Blue Economy is ostensibly a transformative concept focused on sustainably unlocking the economic potential of the world's oceans and waterways to improve the health, prosperity, and social welfare of the global population. However, it remains relatively obscure to the masses and persistently commercially stagnant. Based on a multi-year, first-hand involvement with Shell's exploration of this emerging sector, this paper identifies two key paradoxes constraining progress, the key categories of players and incentives perpetuating these paradoxes, and offers specific, practical suggestions for breaking the impasse to revitalize and accelerate movement of this subset of the UN's 17 sustainable development goals.

Keywords: Blue Economy; You First Paradox; Strange Bedfellows Paradox; sustainable development goals; Silicon Valley of the Blue Economy

I. Introduction

Although well intentioned, the United Nations' "17 Sustainable Development Goals" (U.N., 2015) proclamation aggregates more politically controversial topics such as climate change, gender equality, and social justice policies with less controversial but vitally important topics such as developing clean water systems and pursuing more sustainable practices for land and marine resources. As a result, the packaging of these seventeen issues and agendas together resulted in an uneven and sometimes cynical reception by the general population across the entirety of the seventeen goals (i.e., wariness and sometimes animosity against the group of seventeen goals as a whole) which unfairly harmed topics that might otherwise engender more cooperation and be developed and advanced more quickly. One of the possible casualties of this guilt-by-association phenomenon is the Blue Economy, which is a subset of the "Affordable and Clean Energy" and "Life Below Water" U.N. goals. The U.N. describes the Blue Economy as "the next great economic frontier" and goes on to summarize it by saying, "although there is no consensus on the exact definition, ... the Blue Economy is an economic term linked to exploitation and conservation of the maritime environment and is sometimes used as a synonym for (a) sustainable ocean-based economy" (United Nations, 2022). Clearly, the U.N.'s vision for the Blue Economy (i.e., their vision for the economic potential of the essentially untapped opportunities of the world's oceans and waterways) is massive and transformational. So, why is the topic still relatively unknown to the world at large and lacking investment momentum and excitement? In other words, why is it persistently obscure and stagnant?

In 2021, Shell launched an effort within its research and development division to assess the status and viability of what they eventually learned was called the Blue Economy and to see if there were mutually beneficial ways to participate. The author of this paper was asked to serve as the global lead strategy and commercial advisor for what Shell named the Marine Renewable Energy ("MRE") group, and the following discussion highlights some of the first-hand, lessons learned from this experience.

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The Blue Economy is a large and amorphous construct that has enormous economic and social welfare potential, but there are very significant technological, political, and financing obstacles that are currently endemic to the system that must be overcome before any significant traction and momentum can be achieved. Specifically, this paper identifies and describes two key paradoxes currently at play in the market, one related to financing and one related to political intransigence, that are so substantial and impactful that the Blue Economy is likely to continue moving at glacial speed until both of these paradoxes are resolved. In other words, to catalyze non-trivial growth of the Blue Economy these two paradoxes must first be acknowledged and overcome. After identifying critical path obstacles, specific suggestions regarding how to overcome these challenges are then offered as a starting place for future research, policy, and/or alternative deal structuring ideas.

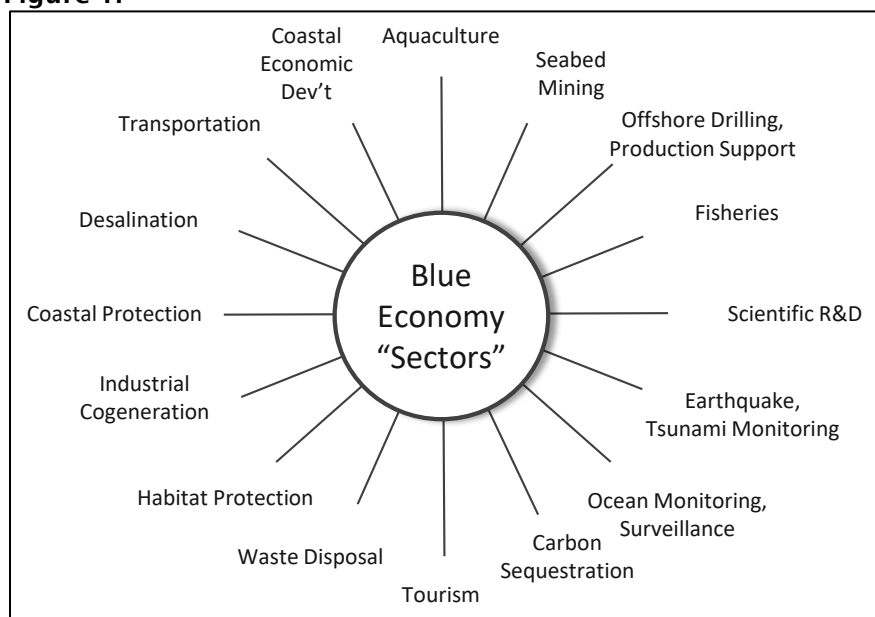
II. The Blue Economy

The concept of a Blue Economy is an important topic in international business, trade, and the environmental community that is gaining political momentum with support and advocacy from groups like the World Bank (World Bank, 2016, 2017a, 2022), the United Nations (U.N., 2015), the U.S. Department of Energy (DOE, 2019), and the U.S. National Oceanic and Atmospheric Administration (NOAA, 2021) among many others. There are many descriptions of this emerging construct but one of the broadest in scope comes from the Organisation for Economic Co-operation and Development (“OECD”). They describe it as including “all industries with a direct or indirect connection to the ocean, such as marine energy, ports, shipping, coastal protection, and seafood production, (that when combined) could outperform global economic growth by 2030” (OECD, 2016). One obvious concern with this description involves the ambiguity surrounding the scope and definition of “indirect connection” and the fact that much of the world’s energy (oil, LNG) and the global supply chain of physical products already travel on ships across oceans and waterways. The OECD’s definition is so broad that it essentially co-opts major parts of the traditional economy under its umbrella which undermines the credibility of the construct as being a new frontier. It is also unnecessary because even without adding transportation to the mix, the potential scope of the Blue Economy is massive and substantial enough to merit investment, technological research, and scholarly examination.

An alternative description that is still large in scope but more conceptually defensible can be formed by combining the definitions from the United Nations (UN, 2022) and World Bank (World Bank, 2017b) – *The Blue Economy involves the sustainable exploitation, stewardship, conservation, and improvement of marine and coastal environments to support economic growth, improved livelihoods, and advances in science and innovation for both developed and developing countries*. Although the illustration in Figure 1 below includes transportation, it generally captures most of the key (non-military) sectors that would typically be considered part of the Blue Economy construct.

A sample of statistics that hint at the potential enormity of the Blue Economy include the following. Two recent publications estimate the scale of the Blue Economy at USD\$2.5 Trillion annually (U.N., 2021) and at USD\$1.5 Trillion (as of 2024) growing to USD\$3 Trillion by 2030 (Grantham Research Institute, 2024). Approximately forty percent of the world’s population lives near (within 100 km) coastlines, not including those living along rivers or large lakes (U.N., 2007). It is estimated that nearly 3 billion people rely on the ocean for their livelihoods (OECD, 2020). The population of island nations, excluding Japan, UK, and Australia is estimated at 767 million (World Population Review, 2025). And the percentage of the earth that is covered by water is approximately 72% (USGS, 2019) with only 0.5% potable (U.S. Bureau of Reclamation, 2025). Whatever the final accepted definition of the Blue Economy, the scale is very large and should be generating substantial commercial interest.

Figure 1:



III. Shell's Marine Renewable Energy Group

Shell has recently undergone a global restructuring program which impacted most all aspects of the organizational design (Bouso, 2024), including the research and development division and the MRE program. Although the related management and employees remain at Shell as of the writing of this paper, their scope has been expanded or refined beyond what is described below.

Following a series of strategic planning meetings led by the author in the Q1 2023 through Q4 2023, MRE publicly described itself as being "in a unique position to bring leadership to the energy infrastructure foundation of the Blue Economy. (Shell) has the scale, the credibility, the knowledge of marine environments, and the visionary desire to be a pillar in the transition to a more sustainable energy future. The Blue Economy is a global construct, and the potential long-term demand is enormous. The Marine Renewable Energy group was formed primarily to solve the problems of shepherding marine renewable energy technologies through the commercialization process, determining the optimal ways to aggregate and synchronize those technologies to meet the needs of a given customer, and developing the larger organization needed to execute its business model on a global scale."

Although there was a confidential internal version of the mission and vision statements for MRE, the public facing mission statement was... *to provide turnkey, customized, and packaged marine renewable and zero emission power and essential services to island, coastal, and offshore customers globally*. The public facing vision statement was... *30 by 30 – By the end of 2030, MRE will be recognized by the global community as the leader in the marine renewable power industry by commissioning and managing 30 megawatts of renewable power, and by having the highest average capacity factor, profitability, and growth of new power stations in the world*. MRE focused on most all aspects of marine renewable energy except for offshore wind which was managed by a different organization within the larger corporation. MRE's scope included not just the power generation technologies (e.g., wave, current, tidal, salinity, ocean thermal) but also the collection, cleaning, synchronizing, delivery, and commercial contracting of power from these marine deployed power sources.

IV. What Shell MRE Discovered

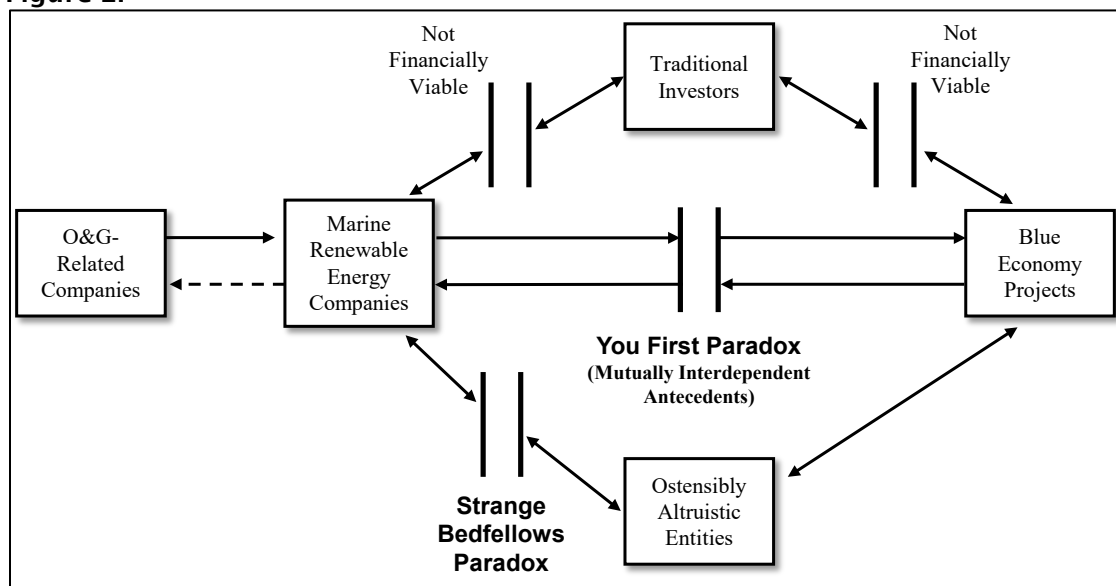
After making numerous investments in a diverse set of technology demonstration projects and engaging the vast majority of leading marine power, collection, distribution, and industry advocacy / research organizations across the world, it became clear that the Blue Economy was not as far along as MRE expected and the larger development, deployment, and operation business model could not be implemented at this time. This realization, plus the start of the larger reorganization by Shell Corporate, led the program manager of MRE to initiate an indefinite pause on further investments and a call for his team to conduct a forensic investigation to determine the main barriers and challenges that were inhibiting the advancement of the MRE business model and the Blue Economy at large. For legal reasons, it is important to note that the discussion below is the author's non-confidential perspective of issues related to that investigation and does not include any official approval or support of any part of the Shell organization nor is any aspect covered by any non-disclosure or similar type of contractual restriction.

At least two main categories of challenges were encountered repeatedly by MRE, both of which were substantial, persistent, widespread, and will require coordinated efforts to overcome. The first category involves a lack of external financing to support the more rapid development of marine renewable technologies and projects. This turned out to be a particularly difficult problem because it seems to be driven by what the author has defined herein as the "You First Paradox." This is basically a "Catch-22" type situation where the primary counterparties in a commercial marine project (i.e., a Blue Economy project) need the other counterparty to be operationally proven with a sound credit rating before each can get their own financing. Specifically, power users (such as an aquatic mining operation) need an existing, low cost, and reliable energy supply to get funding to build out their mining project, but marine energy providers need an existing, credit worthy counterparty (such as an aquatic mining operation) before they can secure financing to build out the capital-intensive energy infrastructure. Traditional profit-seeking investors are generally unwilling to invest in a project unless there is a reasonable expectation of receiving their risk-adjusted minimum return within a reasonable period of time and the project has the backing of companies with proven track records of engineering, construction, and operational success in marine environments – which at this point in the evolution of the market is almost always an oil and gas company or related service company with significant offshore experience.

The second major category of challenges is also persistently problematic because it involves a paradox within the political realm. The author has named this the "Strange Bedfellows Paradox." At the current stage of the development of marine renewable energy, traditional for-profit investors are not providing the capital needed to advance the Blue Economy market. This is due primarily to the unexpectedly early stage of development of marine energy technologies, the You First Paradox described above, and the fact that energy technologies and infrastructure are very capital intensive projects. Traditional investors usually have numerous alternative investment options with potentially higher returns and shorter payback periods in other industries. As a result, the vast majority of Marine Renewable Energy Companies ("MREC") are essentially dependent on sources of capital that are government-backed (grants, loan guarantees) or provided by similar types of organizations such as NGO's (non-governmental organizations), angel social investors, philanthropic foundations, etc. The author will refer to these types of organizations herein as OAEs (Ostensibly Altruistic Entities) because nearly all of them are nonprofit organizations deploying either tax dollars or their own personal fortunes. Unfortunately, OAEs are usually – by their very nature – bureaucratic, often slow to act, laden with numerous regulatory restrictions/rules, and have a strong desire to avoid political controversy at least within their political tribe. This last concern – avoiding political controversy – is particularly challenging because the only companies with significant experience engineering, deploying, and operating asset-intensive facilities offshore in marine environments are mostly oil and gas producers or oil and gas related service companies. Given the often vicious politics and media surrounding the climate change debate, many politicians or OAEs do not want to be castigated by their peers for working with what some view as the enemy. This is at the heart of the Strange Bedfellows Paradox.

Figure 2 is provided below as an attempt to visually depict some of the key participants in the investment, development, deployment, and operation of the Blue Economy, their interdependent relationships, and the areas which appear to be effectively blocked at the moment.

Figure 2:



Marine Renewable Energy Companies (MREC)

To receive sufficient funding to develop, test, deploy, and operate capital intensive renewable energy-related technologies, traditional investors typically want to see an economically viable contract with a credit-worthy counterparty (a Blue Economy project energy user) as well as a contract or relationship with an entity that has real-world experience engineering, constructing, deploying, and operating capital-intensive assets in marine environments. Unfortunately, most marine renewable energy technologies are still very early stage (TRL 2-5 – out of 9) so they are generally not ready to be deployed commercially at this point anyway. TRL stands for Technology Readiness Level, and it is a standard categorization of technology development used by many government organizations in North America, Europe, and throughout the world. There are variations across providers, but a typical example of a TRL scale can be found online at the US Department of Energy (DOE, 2022), the National Air and Space Administration (NASA, 2023), or the European Union (European Commission, 2014). TRL levels of 8 or 9 are usually needed before a technology is considered commercially operational.

Most of the focus of MRECs has been on power generation devices to accommodate different marine resources, e.g., waves, tides, thermal differences, but there is far less work done to date on the gathering, conditioning, and delivery of reliable power that is often associated with “substations” for onshore power facilities. Eventually, the gathering and condition technologies will be needed to aggregate across power generation and conditioning equipment including the use of relevant aggregation and optimization software. There are fewer companies developing these complementary technologies and they are generally earlier on the TRL development scale.

Oil & Gas Related Companies

Although there are certainly exceptions in various parts of the world, the only industry with substantial experience building, deploying, and operating capital-intensive assets offshore is the oil and gas and/or related services businesses (The solid line from O&G to MRECs in Figure 2).

However, while there is generally a curiosity about supporting marine renewable energy projects by many O&G companies (Shell being an example of this), the entire aggregated sector of marine renewable projects is so small that it is essentially inconsequential to the larger O&G industry (the dotted line on Figure 2). In addition, there is a larger trend in the O&G industry to pull back from much of the renewable sector because of the track record of poor economic returns and the distraction from the core oil and gas business.(Paraskova, 2024)

Blue Economy Projects

As shown in Figure 1, there are myriad possible sectors to the emerging Blue Economy, but they will nearly all require access to reliable, low cost, and preferably low or zero polluting sources of energy. Some will require large amounts of energy while some smaller monitoring and communications devices could be supported by a very small wave and/or solar array combination like what is currently used on some street signs in remote locations.

But the type and quantity of marine renewable energy that can be generated is highly dependent on the resource at that site, i.e., the energy potential is site-specific. Some locations have significant currents or tides, and some do not. Some locations have significant wave activity, and some do not. In some locations the ocean water may be very deep and in more tropical climates which might allow for ocean thermal energy conversion (OTEC) devices, and some do not. The point is that experts in marine energy will need to work with the developers and operators of a given Blue Economy project to determine the potential energy available to support the project. As noted above, marine projects are likely to become aggregation projects with generation equipment below, on, and above the waterline such as including solar arrays and wind turbines on platforms adjacent to or embedded with the wave, tidal, current, or OTEC equipment. The customized nature of building a marine energy support infrastructure for a Blue Economy project is another obstacle to both counterparties being able to secure needed up front capital from traditional investors.

Mutually Interdependent Antecedents

The “You First Paradox” is basically the result of both counterparties having mutually interdependent antecedents before they can secure financing. As with the emergence of most other sectors and products, this will likely be less of a problem in the future once, 1) the marine renewable energy technologies are more developed with more operating time proving their output and reliability projections, and 2) multiple Blue Economy projects are put into operation with appropriate and reliable energy infrastructure assets performing as predicted. The more such projects are operational, the more ‘learnings’ there will be about how to aggregate different types of energy assets, the less risk will be perceived by investors, and the greater the supply chain efficiencies which further drive down manufacturing and delivery costs. Blue Economy projects will likely always need customization due to the physics of location-specific energy resources, but the modularity of energy assets will be better known, lower priced, and easier to deploy and operate. This packaged solution of modular components was a key aspect of Shell’s MRE strategy and an area they were and are developing unique global competencies.

Ostensibly Altruistic Entities (OAE)

There are numerous entities that comprise the OAE universe, but the point of this categorization is to identify those organizations that might be able to deploy financing into the nascent Blue Economy world as a stopgap to get the industry participants far enough along that more traditional investors would be willing to step in and actualize a longer-term functional, self-sufficient marketplace. These groups typically represent large sums of money, and the criteria for determining deployment of this money is usually not directly tied to near or medium-term profitability.

Unfortunately, as mentioned earlier, these organizations typically suffer from numerous other problems that create enormous hurdles for typical startup MRECs. Government grants are

notoriously difficult and time consuming to apply for, often take many months to learn if any money has been awarded, sometimes come with a requirement of substantial “cost-sharing” which can be extremely challenging for startup companies to raise, e.g., many EU grants such as the PENG grant in Poland often require ~15%-25% of the total grant request to be supplied by the startup company upfront at the beginning of the project, often show preference to larger companies that already have established operations and balance sheets, typically require partnerships with large, experienced organizations that can provide the implementation side of a given project proposal, often require coordination and/or partnership with universities (which often slows the process further and complicates ownership of intellectual property), and/or are simply so very bureaucratic and complicated that it requires third-party companies that specialize in grant writing and management to put together the coalition of the dozen or more entities that are often sought by large grant providers. Complaints by actual MREC startups to MRE were constant and visceral, but there is essentially an ‘Industrial Complex’ (a self-sustaining bureaucracy) of gate keepers and protectors of most OAE grant procurement activities, and this bureaucracy is generally not well incentivized to make their processes more efficient, transparent, or accountable.

Furthermore, because OAEs are essentially government agencies, NGOs, or philanthropic organizations, there is often a strong political or ideological overtone to much of the grant procurement supply chain. This is particularly challenging to MREC startups because most of the implementation of offshore projects will likely need the support and assistance of companies that currently operate in or support the oil and gas industry.

V. Resolving the Impasse of the Paradoxes

The previous discussion focused on the significant and intransigent obstacles to advancing the Blue Economy. However, there is still reason to be optimistic that these obstacles can be successfully overcome in a relatively short period of time. The first step is to recognize the current problems with the Blue Economy’s development and commercialization system and the incentives of the participants in that system (which was the primary focus of the previous portion of this paper). Next, it is important to identify the critical path obstacles that need to be addressed to unlock the barriers across the network. And third, alternative approaches can then be proposed that might hasten and improve the larger development and commercialization process.

Critical Path Obstacles

Based on the experiences with Shell’s MRE group and direct interaction with a broad spectrum of participants in the development system, the author believes the OAEs currently hold the key to resolving the impasse constraining the Blue Economy’s advancement.

Traditional Investors

MRECs are too early stage, the capital requirements are too large, and the timeframe of repayment is too long to attract substantial direct investment from traditional for-profit investors.

Blue Energy Projects

Potential project users of sustainable marine energy are similarly restricted by the early-stage nature of MRECs which means for these projects to move forward they will rely on currently available energy such as diesel engines or be nearshore and tethered to an existing power grid.

Grant Recipient Attribute Requirements

MRECs are also typically very small and cannot easily prepare multiple, complicated grant applications, nor do they have many of the attributes or upfront funding that numerous OAEs require to be awarded substantial grant funding.

O&G Companies

Most O&G companies are generally pulling back from the larger universe of renewable energy investments primarily due to a history of poor economic performance and an increased political acceptance of the likely continued role of fossil fuels for the foreseeable future. In addition, many of the efforts pursued by O&G or related service companies were often preemptively labeled as “greenwashing” irrelevant of whether the program had sincere intentions or not. This further alienated the O&G industry from taking the lead on development of MREC technologies.

Specific Suggestions

To make more rapid progress in this sector, OAEs should consider making some significant changes. Specifically, the processes, decision criteria, amount of capital available, and universe of approvable projects/companies should be reevaluated and incentives put into place to provide funding where it can be most productive for the growth of the sector at this early stage of its life cycle. The following is a list of some of the suggested changes.

Grant Processes and Capital Expectations

Easier, Cheaper Application Processes. Grant applications need to be streamlined for more efficient completion by smaller-sized (i.e., entrepreneurial startup) grant applicants. This is especially true in the EU and for governmental grants. In addition, many new technologies are so unconventional, novel, and potentially impactful on existing industries or on more established research that OAEs should more aggressively avoid using reviewers from companies being threatened or challenged by the new innovation or from those who represent competing research theories that might be called into question. Finally, a single reviewer should not hold a veto on whether or not to fund a technology. *There is a significant difference in outcomes between a review panel trying to find a way for a new idea to succeed than a panel trying to find ways in which it will fail.*

Startup Friendly Selection Criteria. Criteria for grant selection should be refined to be more supportive of startup organizations that do not yet have extensive implementation partnerships or relationships with universities or research facilities. Although it tends to reduce the chances of a project not succeeding, the requirement to find and partner with large companies or universities to receive grant money is an enormous hurdle for small businesses. If such partnerships are important to the grant provider, then the OAE should consider pre-establishing a network of EPCs, test facilities (e.g., water tanks, wind tunnels), and research organizations that can be offered, but not forced upon, the small business if it is successfully progressing through the TRL process.

End “Cost Sharing” Requirements. Cost sharing within grants is ostensibly an incentive for skin-in-the-game on the part of MREC companies, but in practice, it is both illogical and a significant impediment to progress. Most MREC’s already have much, if not most, of their personal, family, and friends’ fortunes tied up in the development of a given technology so the added incentive of finding more investment capital as a motivation tool is essentially moot and counterproductive. Furthermore, if the MRECs could readily raise substantial investment capital on their own, the need for non-trivial grant investment would be substantially reduced. If the supposed concern relates to a grant recipient’s commitment to a project, there are various other governance and incentive tools and processes available to mitigate such concerns.

Increased Amount of Capital. Energy technologies are inherently capital-intensive and take longer to move through the TRL scale progression than other technologies such as more ubiquitous information or digital technologies. As a result, OAEs need to recognize that investment in the Blue Economy will require greater amounts of money invested in earlier stage projects supported by longer payout periods than might be typical for other sectors. A change in the timeframe and milestones for capital intensive grants will likely require reconsideration of the oversight and governance processes of grant management. However, this should be imminently achievable given that most OAEs have governance as a primary function of their mission statement.

Expansion to the Supply Chain

One challenge facing the growth of the Blue Economy that tends to be under recognized is the need for more attention to be given to the supply chains for MREC products and services. It is one thing to provide enough grant capital to get a technology through the TRL cycle, but it is another significant step to create a supply chain that can help drive down capital and operating costs thereafter. MRECs usually talk in vague ways about potential future cost reductions “based on scale efficiencies,” but few MRECs use that terminology correctly and even fewer have done much to begin developing lower cost manufacturing sources. This situation is logical at the moment because most MRECs are so early stage that there simply is not enough demand to be able to get factories to consider retooling for larger scale manufacturing. Furthermore, and this is particularly problematic longer-term, some grant money is provided by governmental organizations with stipulations that require manufacturing and supply to come from the same country who is providing the grant money. Scotland and parts of the EU are well known for having such restrictions. From the government’s perspective, there is a defensible logic to wanting grant money to aid in the economic development of their countries, but it is also myopic. The MRECs will very likely not be cost competitive on the world market if their component parts must be produced in very high cost, high regulation markets. However, once again there is reason to be optimistic. If willing to be creative, there are numerous potential deal structures that can be negotiated by a governmental or OAE host that still benefit the host country while not hamstringing the recipient MREC.

Willingness to Work with O&G Companies

This problem is at the heart of the Strange Bedfellows Paradox described in Figure 2. Shell ran into this problem multiple times with multiple governments and OAE grant providers in just the few years the MRE group was operational. It became an ‘inside joke’ that both OAEs and MRECs aggressively made contact with Shell’s MRE group once they knew that Shell was legitimately pursuing this sector, but the main request was nearly always for money. Shell was viewed first and foremost as a bank, and some of the requests were in the millions of dollars for topics such as naming rights to new research buildings, or to support projects that only needed a small portion of the money they were asking for to achieve the next step in the TRL progression, etc. OAEs seemed to be comfortable claiming publicly they got Shell to “give them money,” but it was much more difficult for OAEs to provide their public support for having Shell become an active participant or partner on a demonstration project or consortium.

Finally, OAEs should recognize that O&G companies will, necessarily, be a part of the buildout of the Blue Economy. MRECs will need their assistance with engineering, deployment, and financing. OAEs will need their assistance providing support to MRECs regarding construction, deployment, operations, and maintenance. OAEs would also benefit from the involvement of O&G companies regarding ongoing research and engineering at universities, research labs, etc. Eventually, for-profit investors will also demand involvement and support from O&G companies to reduce implementation risk for their investments. For the foreseeable future, O&G and related service companies are the only ones with the scale, experience, and expertise to make lofty Blue Economy aspirations an implemented reality. This is not meant as an overt advocacy of O&G

companies. Rather, it is the author's opinion based on working with the myriad parties over the last number of years and gaining a more detailed understanding of what implementation will require for the Blue Economy to make non-trivial advances.

VI. Alternative Approaches: Silicon Valley of the Blue Economy ("SVBE")

The suggestions above have not yet been put into practice to any significant degree, in part, because they are difficult, expensive, time consuming, and involve activities that OAEs are not strongly incentivized to pursue. Although it is possible for the suggestions above to be implemented if strong parties, such as the United Nations, one or more larger NGOs, or specific governments, step up to take a leading role in manifesting change, there are some more creative ideas that might still help the situation if these OAE entities remain entrenched in the current approach.

A concept called the Silicon Valley of the Blue Economy was brought to Shell's MRE group for consideration that looked at how the world of digital technologies was able to overcome obstacles similar to what the Blue Economy is currently facing without relying solely on OAEs for its success. The moniker of Silicon Valley represents both a physical location and a metaphor for the global epicenter for the innovation, financing, and commercialization of information and digital technologies. It evolved over many decades starting in the 1950s and 1960s in part due to the local talent and research at local universities (e.g., Stanford), a large nearby naval/military presence and funding, catalyst entrepreneurs such as Bill Hewlett, David Packard, William Shockley, a supportive regulatory environment, and the eventual establishment of "Stanford Research Park" by profit-seeking companies such as Hewlett Packard, Kodak, General Electric, and Lockheed. It went through continued evolution in the 1970s through 1990s with the growing interest and involvement of venture capitalists and the use of well-placed government contracts. Following the "dot.com crash" of the early 2000s, Silicon Valley has continued its success by further expanding its activities into the supply chain of digital equipment and into tangential technologies such as blockchain technologies, artificial intelligence, and quantum computing.

The author is not at liberty to provide much detail here because aspects of the proposal are still being evaluated by various commercial entities, but the point of mentioning it is to provide an example of how more creative approaches to resolving the impasse facing the Blue Economy are potentially available. In general terms, the SVBE is a business model that provides options for establishing a collaborative nexus of independent parties – similar to the ad hoc evolution of Silicon Valley – but without having to wait fifty to sixty years for it to develop organically. Unfortunately, the model is complicated and requires the involvement of one or more large companies that have credibility installing and operating capital intensive assets in marine environments (probably an O&G or related service company), a physical location with a supportive local government / regulator preferably close to a diverse set of marine resources, and an independent organization not directly owned or controlled by the local government or any single party that can manage the operation, administration, and governance activities of the nexus. The structures and processes (organizational design and contractual relationships) needed to align incentives and achieve the creation and maintenance of the nexus are feasible, but they require participants be somewhat sophisticated in deal structuring and corporate governance. Without elaboration, Shell brought a version of the concept to the appropriate representatives of a geographical jurisdiction and found the government to be initially interested, but they lacked the knowledge of sophisticated deal structuring concepts as well as being hesitant due to typical "strange bedfellows paradox" concerns about being seen working with an O&G company.

VII. Conclusion

The Blue Economy is a potentially transformative concept that could dramatically improve the health and welfare of the global economy while relying on sources of energy that are more sustainable to the planet. It is generally nested within the United Nations' "Life Below Water"

component of their 17 Sustainability Development Goals but is broader in scope with benefits across many of the other U.N. macro-objectives. The problem is that the Blue Economy is essentially stagnate and largely unknown to the masses. In other words, it is not making much progress even though the economic and global impact is potentially enormous – which begs the questions, why?

The author was very fortunate to have an unprecedented view of the marine renewable energy side of the Blue Economy via a lead consulting role within Shell's Marine Renewable Energy (MRE) group. Because of Shell's global footprint, brand, size, and experience with owning and operating offshore energy assets, most of the entire global network of participants in the marine renewable energy sector were willing and often eager to communicate with MRE which gave them a unique view into the drivers and obstacles to the sector's lack of progress. Although on indefinite pause at the moment due, in part, to a larger restructuring by Shell Corporate, the MRE experience is still germane to the current situation.

The paper is based on non-confidential lessons learned from the MRE experience, and it focused on three main objectives. First, it was important to identify the key players in the sector, their attributes and their primary incentives. Second, a model was proposed that described and illustrated two fundamental paradoxes currently obstructing the sector's progress. And third, a series of suggestions and recommendations were offered to help clarify who is best able to resolve the current impasse, how they can resolve it, and how more creative approaches (e.g., Silicon Valley of the Blue Economy) to overcoming these paradox obstacles are possible if OAEs, investors, and other sector participants are willing to consider new business models. It is hoped that this paper can be a catalyst to the OAE, academic, and business communities to reenergize their efforts regarding the advancement of the nascent but transformational Blue Economy objective.

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Trend and Prospects for the Garment Industry in Bangladesh-Some Preliminary Discussion

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Abstract

Occupying the prestigious second place globally, the readymade export garment industry is the most important manufacturing and export industry in Bangladesh. The industry took root in the 1980s and has subsequently grown very rapidly since the 1990s, now contributing significantly to employment, income, exports, foreign exchange earnings, national output, and the overall social and economic development of the country. This paper focuses on the growth and development of the industry over the years, along with a critical discussion of some major social sustainability challenges facing this industry, particularly those pertaining to child labor issues, worker income, the gender gap, and worker and workplace safety, among others. The paper uses a mixture of quantitative and non-quantitative analysis and utilizes data and information from secondary sources to analyze the issues. The authors fill a critical gap in the existing literature on social sustainability challenges facing the export garment industry and finds that the country has made significant progress; however, more needs to be done improve social sustainability. The authors argue that not addressing these challenges, particularly external ones, may threaten the long-term viability and sustainability of this industry on the global stage. The paper discusses the progress made in these fronts and the prospects for the future, so that the industry continue to play a pivotal role at the global stage and in the overall economic, social, and human development of the country.

Keywords: Readymade garments; garments industry; exports; growth; social sustainability; economic development; Bangladesh

JEL Classification: F14; L67; O10

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Indian Food Grain Demand Towards 2050: Growth Rates, Elasticities, Projections, and Policies

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Abstract

Economics plays a fundamental role in shaping the world, serving as an intellectual tool that drives policies, decisions, and future visions. Among the many economic concerns that dominate global discourse, one of the most pressing is the challenge of feeding a growing population. Despite its vast population, India has successfully managed to feed its people over the years. A comprehensive study of India's food sector aims to assess the demand and supply of key food commodities for the years 2025, 2030, 2040, and 2050. The present study examines the demand of food grains towards 2050 and finds out strategies and policies to achieve sustainability, food security and achieve SDG's. The period of study is from 2004-05 to 2023-24. This is basically a framework of estimation of growth rates, elasticities, forecasting of demand of cereals, pulses, millets towards 2050. The results show that the Consumption growth trends indicating a shift away from traditional coarse cereals toward rice and wheat. The elasticities of Rice, the most widely consumed staple, shows inelastic demand, wheat rural demand elasticity is elastic. Demand towards 2050 reveals a continued shift in dietary patterns, with rice and coarse cereals showing a decline while wheat consumption is projected to increase in rural areas. The consumption of pulses shows that Pigeon pea consumption showed an increase in both rural and urban areas. The compound annual growth rate of pulse consumption in India reveals a generally stable or slightly increasing trend across both rural and urban areas. Price elasticity of demand (PED) for various pulses in India highlights significant variations across different crops and locations. Among other pulses, pea consumption is highly elastic. The projected consumption of pulses in India towards 2050 highlights a significant shift in demand patterns. The agricultural sector remains the backbone of India's food supply, feeding over 1.2 billion people and employing a significant portion of the population. As India moves toward 2050, addressing food security challenges requires a multi-pronged approach that balances agricultural productivity, economic sustainability, and environmental conservation. Key strategies include investment in agricultural technology, climate-resilient farming practices, improved food distribution networks, and sustainable consumption policies.

Keywords: Food Grains Demand; Trends; Growth Rates; Elasticities; Projections; Policies

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I. Introduction

Economics plays a fundamental role in shaping the world, serving as an intellectual tool that drives policies, decisions, and future visions. Among the many economic concerns that dominate global discourse, one of the most pressing is the challenge of feeding a growing population while maintaining environmental sustainability. The concept of Neo-Malthusianism advocates for planned population control to ensure that resources and ecosystems remain intact for both present and future generations. As global population projections indicate an increase to nearly 10 billion by 2050, and as per capita incomes continue to rise, ensuring affordable access to a nutritious and safe diet amid climate change and resource depletion has become a formidable challenge.

Hunger has been steadily increasing since 2015, and food production per capita has shown signs of deceleration and instability. Despite its vast population, India has successfully managed to feed its people over the years. However, with a population currently at 1.36 billion and projected to rise to 1.51 billion by 2030 and 1.65 billion by 2050, the nation faces significant challenges in ensuring food security. The 2022 Global Hunger Index ranked India 107th out of 121 countries, highlighting the urgency of addressing food accessibility and nutrition. As a signatory to the United Nations' 2030 Agenda for Sustainable Development, India has committed to the international review of progress on Sustainable Development Goals (SDGs). Additionally, the G20 Summit declaration has emphasized the need to accelerate SDG growth, particularly in addressing hunger and malnutrition.

A comprehensive study of India's food sector aims to assess the demand and supply of key food commodities for the years 2025, 2030, 2040, and 2050, while also evaluating potential demand-supply gaps. Such insights are essential for developing medium- and long-term strategies to ensure self-sufficiency, food security, and alignment with the SDGs. Achieving these goals requires examining the potential growth rates in agricultural output to meet the rising domestic demand. The Food and Agriculture Organization (FAO) envisions a world free from hunger and malnutrition, where food and agriculture contribute to improving global living standards in a sustainable and equitable manner. The UNGA SDG summit held on September 18, 2023, reinforced this vision by urging accelerated actions towards implementing all 17 SDGs. By 2050, India is expected to be a global powerhouse, marked by advancements in technology, economic progress, and social transformation. A critical component of this transformation involves shifting agriculture from a subsistence-based model to a highly commercialized and efficient sector.

India's food consumption patterns have undergone a significant transformation in recent decades due to rapid urbanization, economic growth, and evolving consumer preferences. As the country moves toward greater urbanization and improved economic conditions, dietary habits are changing. Data from multiple rounds of the National Family Health Survey (NFHS) between 2005-06 and 2019-21 reveal that Indian adults are consuming food differently than before, with variations observed across states and demographic groups. This shift reflects broader lifestyle and cultural changes that influence food choices, nutritional intake, and overall health. Looking ahead to 2050, projections suggest that Indians will consume more vegetables, fruits, and dairy products, while the intake of cereals and pulses is expected to remain steady.

Economic conditions play a crucial role in shaping food consumption trends. The Household Consumption Expenditure Survey indicates that per capita spending in rural areas grew by 9.2 per cent, surpassing the 8.3 per cent growth in urban areas. This narrowing economic gap suggests that rural consumers are now spending more on diverse food items, reflecting improved income levels and changing lifestyles. However, high food inflation has impacted middle-class spending, causing a reduction in expenditure on non-essential items. This shift has implications for consumer goods companies and raises concerns about long-term economic growth, as urban consumption—previously a key driver of post-pandemic recovery—is now slowing down.

The agricultural sector remains the backbone of India's food supply, feeding over 1.2 billion people and employing a significant portion of the population. According to Khatkar et al. (2016), food grains dominate 65 per cent of the cropped area, with India being a leading producer of cereals, pulses, and millets. However, their study highlights a shift in dietary preferences,

projecting a decline in per capita food grain consumption due to urbanization and dietary diversification. Despite this, overall food grain demand is expected to rise from 201 million tonnes in 2000 to 377 million tonnes by 2050 due to population growth. These projections emphasize the need for sustainable agricultural policies that balance rising food demand with resource constraints and environmental sustainability.

Sustainable food consumption is becoming increasingly critical for achieving food security and environmental sustainability. Studies highlight the importance of policies that promote sustainable agriculture, support local food systems, and encourage multi-stakeholder collaboration. Effective initiatives aimed at environmental, social, and economic sustainability in India's food sector must be expanded to ensure long-term resilience.

Rice consumption trends indicate that while total rice consumption is increasing due to population growth, per capita rice consumption is declining due to dietary diversification. Significant variations exist between rural and urban consumption patterns, with urban populations shifting toward more protein-rich and diverse diets. Additionally, consumer preferences for specific rice varieties based on taste, quality, and aroma reaffirm the cultural significance of rice in Indian cuisine.

India's evolving food consumption patterns indicate a shift towards high-value agricultural products, promoting healthier and more nutritious diets. However, disparities remain, with lower-income groups consuming only 65% of the recommended calorie intake. While nutritionally superior diets align with global health standards, they must also balance affordability and environmental sustainability.

As India moves toward 2050, addressing food security challenges requires a multi-pronged approach that balances agricultural productivity, economic sustainability, and environmental conservation. Key strategies include investment in agricultural technology, climate-resilient farming practices, improved food distribution networks, and sustainable consumption policies. With proper planning, India has the potential to not only feed its growing population but also position itself as a global leader in sustainable food production and nutrition.

The present study examines the demand and supply of food grains towards 2050 and find out strategies and policies to achieve sustainability, food security and achieve SDG's.

The specific objectives are:

- To Estimate Demand, Per capita Consumption, Growth rates, Elasticities of cereals, pulses and millets.
- To make projections for India's demand of selected products towards 2050 under different scenarios.
- To suggest R&D strategies and policies to government to make Indian agriculture self-sufficient, food secure and to achieve SDGs.

II. Data and Methodology

This is basically framework of growth rates, elasticities, forecasting of demand of cereals, pulses, millets towards 2050. The period of study is from 2004-05 to 2023-24. Demand data: The demand study is based on the data compiled from the publication of NSSO (National Sample Survey Organization) on 'Consumption of Some Important Commodities in India' of NSSO, 68th round, 2011-12.

The main sources of secondary data are CMIE, Economic Survey 2021-21, Planning commission reports and World Bank. APEDA, DGCIS, NHB, FAO STAT, WORLD STATISTICS, CMIE Commodities, NABARD, EXIM, ICAR-IIOR, Foreign Trade Yearbook, Planning commission reports and India stat.

Demand Models

This is basically framework of growth rates, elasticities, forecasting of demand of cereals, pulses, millets towards 2050.

Compound Annual Growth Rate (CAGR)

The exponential Compound Annual Growth Rate (CAGR) is estimated by using log linear functions on the time series data of consumption. The semi log exponential is used to analyse the trend in growth rate, which is one of the appropriate functional forms to estimate the growth rate. Hence, the growth rate is estimated using the following form:

$$Y_t = Y_o(1 + r)^t$$

Transforming this into logarithmic form,

$$\ln Y_t = \ln Y_o + t \ln (1 + r)$$

Where,

Y_t = consumptions of food grains in year 't' in India and world.

t = time variable in the year

r = Compound Growth Rate

Y_o = consumption of food grains at the base year

Now, let $\ln Y_o = a$ and $\ln (1 + r) = b$

Then the above expression will become,

$$\ln Y_t = a + bt$$

a and b can be calculated using regression.

The annual compound growth rate (r) can be worked out using:

$$b = (\ln (1 + r))$$

$$\exp(b) = 1 + r$$

$$r = \exp(b - 1)$$

The percentage growth in consumption of food grains (CAGR %) can be calculated using the following expression

$$CAGR \% = r * 100$$

Price Elasticity

Price elasticity of demand measures how responsive the quantity demanded of a good or service is to changes in its price. In other words, it quantifies the percentage change in quantity demanded for a given percentage change in price.

The formula for price elasticity of demand using the midpoint method is:

$$PED = \frac{\frac{Q_2 - Q_1}{Q_1}}{\frac{P_2 - P_1}{P_1}}$$

Q_1 – Initial quantity demanded
 Q_2 – Final quantity demanded
 P_1 – Initial price
 P_2 – Final price

Demand Forecast Model:

Estimating Total Consumption Per Year

Total consumption of a commodity is derived by multiplying **per capita consumption** with the **total population** for a given year:

Total Consumption = Per Capita Consumption × Population

- **Per Capita Consumption:** Represents the average consumption per person in a given year.
- **Population:** The total number of individuals in a region or country for that year

Demand forecast using CAGR

To predict future demand, the **CAGR method** is applied, assuming a steady growth pattern over time. The formula used for forecasting supply is:

$$V_t = V_0 \times (1 + \text{CAGR})^t$$

where:

- V_t = Forecasted value at year t
- V_0 = Latest available value (base year)
- CAGR = Compound Annual Growth Rate
- t = Number of years from the base year to the forecast year

III. Results and Discussion

Cereals and Millets

a) Consumption of Major Cereals and Millets Crops

Table 1 shows the total consumption of major cereal crops in India. It has shown varying trends across rural and urban areas between 2004-05 and 2011-12. Rice remained the most consumed staple, with rural consumption increasing from 84.216 million tonnes (MT) in 2004-05 to 86.8296 MT in 2011-12, while urban consumption also grew slightly from 62.172 MT to 65.1948 MT. Wheat consumption exhibited an overall upward trend, with rural demand rising from 55.308 MT to 62.2908 MT, while urban consumption fluctuated, reaching 58.2252 MT in 2011-12. However, coarse cereals such as bajra, maize, and jowar witnessed a decline in consumption, especially in rural areas. Bajra consumption in rural areas dropped from 5.148 MT to 3.4848 MT, while urban consumption declined marginally. Maize saw a significant fall in both rural and urban areas, decreasing from 4.092 MT to 1.8876 MT in rural regions and from 0.33 MT to 0.20328 MT in urban regions. Similarly, jowar consumption in rural areas decreased from 5.676 MT in 2004-05 to 2.904 MT in 2011-12. These trends indicate a shift in dietary patterns, with a preference for rice and wheat over coarse cereals, especially in rural India. Previous studies have also highlighted this shift, attributing it to factors such as rising incomes, urbanization, and changing food preferences (Kumar et al., 2009; Chand et al., 2011; Mittal, 2007). The National Sample Survey

Office (NSSO, 2014) confirms this trend, showing a decline in coarse grain consumption and a sustained increase in rice and wheat consumption. Pingali (2007) further notes that the westernization of Asian diets has led to a transformation in food systems, reducing the demand for traditional coarse cereals. These findings suggest that economic development and policy-driven factors have played a significant role in shaping India's cereal consumption patterns.

Table 1: Total Consumption of Cereal and millets in India over the years.

Crop	Area	Total Consumption (MT)		
		2004-05	2009-10	2011-12
Rice	rural	84.216	86.4	86.8296
	urban	62.172	65.088	65.1948
Wheat	rural	55.308	61.2	62.2908
	urban	57.552	58.752	58.2252
Bajra (perl millet)	rural	5.148	3.744	3.4848
	urban	1.452	1.296	1.1616
Maize	rural	4.092	2.88	1.8876
	urban	0.33	0.3024	0.20328
Jowar (sorghum)	rural	5.676	4.176	2.904

b) Consumption Compound Annual Growth Rate (CAGR) of Major Cereal and Millets Crops

Table 2 presents the compound annual growth rate (CAGR) of major cereal crops in India. That reflects a declining trend in consumption, particularly for coarse cereals, between 2004-05 and 2011-12. Rice consumption remained relatively stable, with a slight decline of -0.01 per cent in both rural and urban areas. Wheat consumption showed no significant growth in rural areas (0.00% CAGR), while urban areas saw a minor decline of -0.01 per cent. In contrast, coarse cereals experienced a sharp decrease in consumption. Bajra consumption declined at a rate of -0.07 per cent in rural areas and -0.04 per cent in urban areas. Maize showed an even steeper decline, with a CAGR of -0.12 per cent in rural areas and -0.08 per cent in urban regions. Similarly, jowar consumption in rural areas fell by -0.10 per cent CAGR. These trends align with previous studies indicating a shift away from traditional coarse cereals toward rice and wheat, driven by changing dietary patterns, rising incomes, and urbanization (Kumar et al., 2009; Chand et al., 2011; Mittal, 2007). The National Sample Survey Office (NSSO, 2014) confirms this declining trend in coarse grain consumption.

Table 2. CAGR of Consumption of the Cereals, Millets, Over the Years

Crop	Area	CAGR
Rice	rural	-0.01
	urban	-0.01
Wheat	rural	0.00
	urban	-0.01
Bajra (perl millet)	rural	-0.07
	urban	-0.04
Maize	rural	-0.12
	urban	-0.08
Jowar (sorghum)	rural	-0.10

C) Consumption Elasticities of Major Cereal and Millet Crops

Table 3 shows the price elasticity of demand (PED) for major cereal crops in India indicates varying consumer responses to price changes across rural and urban areas. Rice, the most widely consumed staple, shows inelastic demand, with PED values of -0.15 in rural areas and -0.11 in

urban areas, meaning that price changes have a relatively small impact on consumption. Wheat demand is almost unitary in rural areas (0.03 PED) but slightly elastic in urban areas (-0.10), suggesting that urban consumers are somewhat sensitive to price fluctuations.

Coarse cereals exhibit higher price sensitivity, reflecting their declining consumption trends. Bajra has a PED of -0.43 in rural areas and -0.30 in urban areas, indicating that a price increase would significantly reduce its consumption. Maize shows even greater price sensitivity, with PED values of -0.48 in rural areas and -0.36 in urban areas, while jowar consumption in rural regions has a PED of -0.32. These trends suggest that coarse cereals are more price-elastic compared to rice and wheat, which aligns with previous research showing a shift in consumer preference toward fine cereals due to rising incomes, urbanization, and dietary diversification.

Table 3. Price elasticity of demand for the cereals and millet

Crop	Area	PED
Rice	rural	-0.15
	urban	-0.11
Wheat	rural	0.03
	urban	-0.1
Bajra (perl millet)	rural	-0.43
	urban	-0.3
Maize	rural	-0.48
	urban	-0.36
Jowar (sorghum)	rural	-0.32
	urban	-0.20

d) Forecasting Demand of Major Cereal Crops Towards 2050

The forecasted consumption of major cereal crops in India for 2030, 2040, and 2050 reveals a continued shift in dietary patterns, with rice and coarse cereals showing a decline while wheat consumption is projected to increase in rural areas. Rural rice consumption is expected to decrease from 71.2504 million tonnes (MT) in 2030 to 59.233 MT in 2050, while urban consumption is projected to fall from 55.3701 MT to 45.9118 MT over the same period. Similarly, urban wheat consumption is expected to decline from 48.4166 MT in 2030 to 37.8567 MT in 2050, though rural wheat consumption is forecasted to rise from 65.0141 MT to 69.6076 MT, indicating a growing rural reliance on wheat as a staple food.

The consumption of coarse cereals such as bajra, maize, and jowar is predicted to continue declining sharply. Bajra consumption in rural areas is forecasted to drop from 1.3662 MT in 2030 to just 0.3847 MT in 2050, with a similar downward trend in urban areas. Maize consumption is projected to see an even more dramatic decline, reaching near-negligible levels by 2050, from 0.353 MT in 2030 to only 0.0125 MT in rural areas and from 0.0543 MT to 0.0072 MT in urban regions. Jowar consumption in rural areas is also expected to decrease significantly, from 0.5374 MT in 2030 to 0.0262 MT in 2050.

These projections align with previous studies that have observed a long-term shift away from coarse cereals toward rice and wheat due to factors such as rising incomes, urbanization, and dietary diversification (Kumar et al., 2009; Chand et al., 2011; Mittal, 2007). The NSSO (2014) has also reported a persistent decline in coarse grain consumption. Pingali (2007) attributes this trend to the modernization of food systems and changing consumer preferences, which favor fine cereals over traditional grains. If these trends continue, policy interventions may be necessary to promote the consumption of coarse cereals due to their nutritional and environmental benefits.

Table 4. Forecasted values for the year 2030, 2040 and 2050

Crop	Area	Forecast (MT)		
		2030	2040	2050
Rice	rural	71.2504	64.9684	59.233
	urban	55.3701	50.4138	45.9118
Wheat	rural	65.0141	67.2654	69.6076
	urban	48.4166	42.8127	37.8567
Bajra (perl millet)	rural	1.3662	0.725	0.3847
	urban	0.5287	0.3343	0.2114
Maize	rural	0.353	0.0665	0.0125
	urban	0.0543	0.0198	0.0072
Jowar (sorghum)	rural	0.5374	0.1186	0.0262

Pulses

a. Consumption of major Pulses crops

The total consumption trends of pulses in India between 2004-05 and 2011-12 exhibit notable variations across different crops and regions, influenced by changing dietary preferences, price dynamics, and policy interventions. Pigeon pea consumption showed an increase in both rural and urban areas, rising from 2.75 million metric tons (MT) in 2004-05 to 3.08 MT in 2011-12 in rural regions and from 3.89 MT to 4.37 MT in urban areas. This upward trend aligns with findings from Reddy (2010) and Kumar et al. (2014), who attribute the rise to increased awareness of protein-rich diets and government support for pulse production.

Similarly, moong consumption increased slightly, from 1.21 MT to 1.32 MT in rural areas and from 1.50 MT to 1.70 MT in urban regions. The steady demand for moong aligns with observations by Joshi et al. (2016), who noted that its shorter cultivation cycle and adaptability to various climates contribute to its sustained consumption. Urd consumption also saw growth, from 1.06 MT to 1.22 MT in rural and 1.19 MT to 1.42 MT in urban areas, which supports findings by Chand et al. (2017) on pulse consumption stability in India.

In contrast, pea consumption exhibited fluctuations, increasing in rural areas from 0.49 MT in 2004-05 to 0.82 MT in 2009-10, before declining to 0.76 MT in 2011-12. Urban pea consumption followed a similar pattern, peaking at 0.36 MT in 2009-10 before falling to 0.33 MT in 2011-12. This trend is consistent with studies by Ramaswami and Sharma (2018), which highlight that pea consumption is highly price sensitive.

Gram, both split and whole, showed a continuous upward trend. Split gram consumption in rural areas rose from 0.77 MT in 2004-05 to 1.15 MT in 2011-12, while urban consumption increased from 0.96 MT to 1.23 MT. Whole gram followed a similar trajectory, rising from 0.34 MT to 0.58 MT in rural regions and from 0.44 MT to 0.65 MT in urban areas. These findings align with reports by Birthal et al. (2019), which suggest that gram's affordability and widespread use in Indian cuisine contribute to its rising consumption.

b. CAGR Consumption of Pulses

The compound annual growth rate (CAGR) of pulse consumption in India reveals a generally stable or slightly increasing trend across both rural and urban areas. Pigeon pea and moong have shown no significant growth, with a CAGR of 0.00 per cent in both regions, indicating stagnant consumption patterns. In contrast, urd has experienced a modest increase, with a CAGR of 0.01 per cent in both rural and urban areas.

Table 5. Total Consumption of pulses in India over the years

Crop	Area	Total Consumption (MT)		
		2004-05	2009-10	2011-12
Pigeon pea	rural	2.75	2.35	3.08
	urban	3.89	3.80	4.37
Moong	rural	1.21	1.05	1.32
	urban	1.50	1.50	1.70
Urd	rural	1.06	1.04	1.22
	urban	1.19	1.30	1.42
Pea	rural	0.49	0.82	0.76
	urban	0.20	0.36	0.33
Gram (split)	rural	0.77	1.11	1.15
	urban	0.96	1.14	1.23
Gram (whole)	rural	0.34	0.48	0.58
	urban	0.44	0.56	0.65

Pea consumption has grown at a relatively higher rate, with rural areas registering a CAGR of 0.05 per cent and urban areas slightly higher at 0.06 per cent. Similarly, gram (split) has recorded growth, with a CAGR of 0.05 per cent in rural areas and 0.02 per cent in urban areas, while gram (whole) has exhibited the strongest growth among pulses, at 0.06 per cent in rural areas and 0.05 per cent in urban regions. This trend suggests a gradual shift toward gram-based pulses, likely due to their affordability, versatility in Indian cuisine, and higher consumer acceptance.

Previous studies have documented these patterns, linking them to changing dietary preferences, protein awareness, and government policies aimed at promoting pulse production and consumption (Reddy, 2009; Shankar et al., 2012; BIRTHAL et al., 2015). The National Sample Survey Office (NSSO, 2014) has reported an increasing preference for gram consumption among urban consumers. Moreover, Gulati and Saini (2016) emphasize the role of minimum support prices (MSP) and procurement policies in influencing pulse production and availability. As pulses are crucial for addressing protein malnutrition and improving dietary diversity, continued policy interventions may be necessary to sustain their growth in consumption.

c. Price Elasticities of Pulses

The price elasticity of demand (PED) for various pulses in India highlights significant variations across different crops and locations, reflecting diverse consumer preferences and price sensitivity. Pigeon pea exhibits a low positive PED of 0.02 in both rural and urban areas, indicating that its demand remains relatively inelastic to price changes. Similarly, moong has a PED of -0.01 in rural areas, suggesting a slight inverse relationship between price and demand, while in urban areas, its PED is 0.02, signifying a small positive response to price changes. Urd shows a more pronounced price responsiveness, with PED values of 0.03 in rural and 0.05 in urban areas, indicating that urban consumers are more price-sensitive compared to their rural counterparts.

Among other pulses, pea consumption is highly elastic, with a PED of 1.62 in rural areas and 2.13 in urban areas, meaning that demand is significantly affected by price fluctuations. This suggests that peas are more of a discretionary item, with consumers reducing consumption when prices rise. Gram (split) shows moderate elasticity, with a PED of 0.29 in rural areas and 0.13 in urban areas, indicating that demand is somewhat responsive to price but not highly elastic. Gram (whole) has a PED of 0.56 in rural and 0.38 in urban areas, reflecting a stronger but still moderate sensitivity to price changes.

These findings align with earlier studies, which suggest that pulses generally exhibit low price elasticity due to their essential role in Indian diets, though certain varieties like peas show greater price sensitivity (Kumar & Joshi, 2013; Chand et al., 2015; Deb et al., 2017). The National Sample Survey Office (NSSO, 2021) has reported variations in pulse consumption patterns based on price changes, while Ramaswami et al. (2019) argue that price policies and income growth also influence demand elasticity. Given these trends, policies aimed at stabilizing pulse prices and

improving affordability could ensure sustained consumption, particularly for protein-rich varieties essential for nutritional security.

Table 6. CAGR of consumption of Pulses over the years

Crop	Area	CAGR
Pigeon pea	rural	0.00
	urban	0.00
Moong	rural	0.00
	urban	0.00
Urd	rural	0.01
	urban	0.01
Pea	rural	0.05
	urban	0.06
Gram (split)	rural	0.05
	urban	0.02
Gram (whole)	rural	0.06
	urban	0.05

d. Forecasting demand of Pulses towards 2050

The projected consumption of pulses in India by 2030, 2040, and 2050 highlights a significant shift in demand patterns, influenced by population growth, changing dietary habits, and policy interventions promoting pulse production and consumption. The forecast suggests that pigeon pea consumption will increase steadily, from 3.62 million metric tons (MT) in rural areas in 2030 to 4.42 MT in 2050, while urban consumption is expected to grow from 5.15 MT to 6.26 MT during the same period. These projections align with findings by Kumar et al. (2014) and Joshi et al. (2016), which indicate a rising preference for protein-rich pulses due to increasing health consciousness.

Similarly, urd consumption in rural areas is projected to grow from 1.45 MT in 2030 to 1.80 MT in 2050, while urban demand is expected to rise from 1.84 MT to 2.59 MT. The increasing trend supports studies by Chand et al. (2017), which emphasize the role of price stability and government procurement in ensuring steady demand for pulses. Moong consumption, however, is expected to decline slightly in rural areas from 1.28 MT in 2030 to 1.20 MT in 2050, while urban demand is anticipated to rise from 1.84 MT to 2.07 MT. This is consistent with Ramaswami and Sharma (2018), who argue that urban consumers are more likely to diversify their diets with high-value pulses.

Table 7. Price elasticity of demand of Pulses in India

Crop	Area	PED
Pigeon pea	rural	0.02
	urban	0.02
Moong	rural	-0.01
	urban	0.02
Urd	rural	0.03
	urban	0.05
Pea	rural	1.62
	urban	2.13
Gram (split)	rural	0.29
	urban	0.13
Gram (whole)	rural	0.56
	urban	0.38

Pea consumption is projected to grow significantly, especially in urban areas, where it is expected to increase from 0.96 MT in 2030 to 3.51 MT in 2050. The rural demand is forecasted to grow from 1.88 MT to 4.82 MT during the same period. This aligns with research by Birthal et al. (2019), which suggests a strong future demand for peas driven by their use in processed foods.

The consumption of gram (split and whole) is also expected to increase sharply. Rural split gram consumption is forecasted to rise from 2.33 MT in 2030 to 5.79 MT in 2050, while urban demand will grow from 1.85 MT to 2.81 MT. Whole gram follows a similar pattern, with rural demand increasing from 1.75 MT to 5.15 MT and urban demand from 1.60 MT to 4.15 MT. This surge aligns with Kumar et al. (2021), who predict that gram consumption will continue to expand due to its affordability and extensive use in Indian cuisine.

Table 8. Forecasted values for the year 2030, 2040 and 2050

Crop	Area	Forecast (MT)		
		2030	2040	2050
Pigeon pea	rural	3.62	4.00	4.42
	urban	5.15	5.68	6.26
Moong	rural	1.28	1.24	1.20
	urban	1.84	1.96	2.07
Urd	rural	1.45	1.61	1.80
	urban	1.84	2.18	2.59
Pea	rural	1.88	3.01	4.82
	urban	0.96	1.83	3.51
Gram (split)	rural	2.33	3.68	5.79
	urban	1.85	2.28	2.81
Gram (whole)	rural	1.75	3.00	5.15
	urban	1.60	2.58	4.15

IV. Conclusion

Economics plays a fundamental role in shaping the world, serving as an intellectual tool that drives policies, decisions, and future visions. Among the many economic concerns that dominate global discourse, one of the most pressing is the challenge of feeding a growing population while maintaining environmental sustainability. Despite its vast population, India has successfully managed to feed its people over the years. However, with a population currently at 1.36 billion and projected to rise to 1.51 billion by 2030 and 1.65 billion by 2050, the nation faces significant challenges in ensuring food security. A comprehensive study of India's food sector aims to assess the demand and supply of key food commodities for the years 2025, 2030, 2040, and 2050, while also evaluating potential demand. The present study examines the demand of food grains towards 2050 and finds strategies and policies to achieve sustainability, food security and achieve SDG's.

The Consumption trends indicate a shift in dietary patterns, with a preference for rice and wheat over coarse cereals, especially in rural India. These findings suggest that economic development and policy-driven factors have played a significant role in shaping India's cereal consumption patterns. The consumption growth trends indicate a shift away from traditional coarse cereals toward rice and wheat. The elasticities show that rice, the most widely consumed staple, shows inelastic demand. Wheat demand is almost unitary in rural areas (0.03 PED) but slightly elastic in urban areas. Coarse cereals exhibit higher price sensitivity, reflecting their declining consumption trends. The forecasted consumption of major cereal crops in India for 2030, 2040, and 2050 reveals a continued shift in dietary patterns, with rice and coarse cereals showing a decline while wheat consumption is projected to increase in rural areas.

The consumption of pulses shows that Pigeon pea consumption showed an increase in both rural and urban areas. Similarly, moong consumption increased slightly. In contrast, pea

consumption exhibited fluctuations, increasing in rural areas. Gram, both split and whole, showed a continuous upward trend. The compound annual growth rate (CAGR) of pulse consumption in India reveals a generally stable or slightly increasing trend across both rural and urban areas. The price elasticity of demand (PED) for various pulses in India highlights significant variations across different crops and locations, reflecting diverse consumer preferences and price sensitivity. Among other pulses, pea consumption is highly elastic, with a PED of 1.62 in rural areas and 2.13 in urban areas. The projected consumption of pulses in India by 2030, 2040, and 2050 highlights a significant shift in demand patterns, influenced by population growth, changing dietary habits, and policy interventions promoting pulse production and consumption.

To meet India's food grain demand by 2050, the country will need to increase agricultural production and diversify its food system. This can be achieved through policies that improve and increase investment in agriculture and provide access to a balanced diet. The study suggests policies to Increase agricultural production by Increase investment in agriculture to increase the productivity of rice and wheat and improve soil and water management practices to increase crop yields. Diversify food system by creating new opportunities for the food system to cater to changing consumer demand and ensure greater availability of food diversity within the local system. And improve the affordability of diets and social security policies by ensuring access to food for the poorest citizens through a social security policy.

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Informational Flow Between Credit Derivative and Equity Markets: Emerging Markets Evidence

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Abstract

We comprehensively examine the existence, strength and evolution of cross-market informational flow in the credit derivative and equity markets for emerging markets. We find empirical evidence with respect to the existence of such flow in both directions based on in-sample and out-of-sample results. Nonetheless, further analysis reveals that the flow is not stable over time. We explain this change in flow strength by providing evidence of instability, and attempt to identify the factors related to market structure, international trade, market sentiment and health policy which drive such change. Major emerging markets covered in this study include Mexico, Colombia, Brazil, Turkey, South Africa, Indonesia, Saudi Arabia and Chile.

Keywords: Emerging markets; market efficiency; volatility; structural break; CDS index

JEL Classification: C32; C58; G01; G14; G15; G17

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Taxable Income Comparability and Corporate Tax Behavior

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Abstract

We examine whether taxable income comparability or tax liability comparability affects a firm's tax behavior. We find that comparable taxable income deters corporate managers from engaging in aggressive tax planning. We also find that the deterrence effect of taxable income comparability on aggressive tax planning is more pronounced for firms with less IRS attention and a more uncertain information environment. A battery of sensitivity analyses, including alternative measures of comparability and tax planning and a difference-in-differences design around an exogenous comparability-increasing shock, confirm that the above findings are robust to both endogeneity and measurement error concerns. Our study implies that a more comparable tax return discourages firms' incentives for aggressive tax planning.

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Reverse Monday Effect on the Cryptocurrency Market

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Abstract

We examine the weak form of market efficiency in the cryptocurrency market. More precisely, we investigated the reverse Monday effect in three major cryptocurrencies the Bitcoin, the Ethereum, and the Litecoin. Following the traditional methodology, we find the calendar anomaly in the Bitcoin and Ethereum markets. In addition, we show that the positive Mondays returns are more prominent at the beginning and the end of the month. Finally, we also demonstrate the economic significance of our results by using the reverse Monday effect as an investment strategy and making sizeable profits even after considering the trading costs.

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Public Pension Funds' Asset Allocation, Performances, and Institutional Conditions

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Abstract

This study examines the factors contributing to variations in public pension fund (PPF) operations and investment portfolios across OECD countries. The goal of this paper is to explore how PPF investment and management decisions, conditional on fund sustainability and social objectives such as welfare. Specifically, the study investigates whether PPF management decisions are influenced not only by funding status and past performance but also by institutional conditions, using cultural values and redistribution.

From a financial perspective, the study finds that short-term performance persistence is negative, indicating that past success in fund management does not lead to improved future performance. This rejection of the performance persistence hypothesis aligns with the efficient market theory. Additionally, the paper investigates the risk transfer hypothesis related to underfunding, as fund deficits do not significantly affect riskier investments such as equities. However, underfunded PPFs tend to reduce investments in fixed-income assets and increase investments in alternative assets such as infrastructure. This supports the risk transfer hypothesis regarding asset portfolios.

In terms of the relationship between institutional conditions and PPF investments, the study finds that cultural values such as individualism and masculinity are significantly associated with PPF performance and asset portfolio behavior, particularly encouraging investment in riskier assets. Although the effect of other cultural values on asset allocation is undetermined, changes in the sign of coefficients suggest that financial risk considerations may play a role in PPF decision-making than specific cultural values.

Regarding the welfare aspect, the study employs a pre-post approach to measure government intervention in income redistribution, using the difference in inequality before and after taxes and transfers. It finds that welfare states are positively associated with PPF performance, but not with risk-taking investment behavior.

In summary, this paper concludes that while PPF performance is influenced by both financial and institutional conditions, asset allocation decisions are driven more by social and welfare conditions than financial factors.

JEL: G11; G23

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Unveiling the Interplay of Organizational Identity, Felt Obligation, Work Values, and Leadership Intention: A Longitudinal Study Integrating Social Identity Theory and Leadership Research

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Abstract

This study investigates the intricate relationships among organizational identity, felt obligation, work values, and leadership intention, integrating insights from social identity theory, organizational behavior, and leadership research. Employing a longitudinal design, the findings reveal a significant positive relationship between organizational identity and felt obligation, underscoring the role of identity in fostering employees' sense of duty. The felt obligation is positively associated with the six dimensions of work values—achievement, independence, recognition, relationships, support, and working conditions—highlighting its multifaceted influence on workplace priorities. Furthermore, work values significantly predict leadership intention, demonstrating that work values shape leadership potential. Theoretical and practical implications were discussed.

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Heifetz and Hofstede: Implementing the Adaptive Leadership Framework in Cross-Cultural Environments

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Abstract

Adaptive leadership, developed by Ronald Heifetz, consists in guiding groups to confront complex challenges that necessitate a shift in fundamental values, beliefs, loyalties, and identities. It moves beyond a managerial, hierarchical view of leadership, to conceptualize leadership as practice, rather than a position or role within an organization.

Adaptive leadership, by nature, challenges deeply held convictions and self-definitions, and provides productive spaces within ranges of tolerable disequilibrium. However, individual, collective, and institutional identities often originate in different, and at times, antagonistic environments, thus adding an additional layer of complexity to the practice of adaptive leadership. Within the framework of adaptive leadership, leadership becomes a function of a social system and a relational activity exercised by people within that system. As such, when different social systems collide, additional variables must be taken into account.

Geert Hofstede, the founder of comparative intercultural research, developed one of the first models of dimensions of culture. He established a new paradigm considering the importance of cultural elements in the context of international business and communications. Hofstede's cultural dimensions: Individualism vs. collectivism, power distance, gender egalitarianism, approaches to uncertainty, time orientation, and indulgence, provide the missing element needed when adaptive leadership is practiced within the context of discordant social systems.

This conceptual study proposes the integration of Heifetz's adaptive leadership and Hofstede's cultural dimensions frameworks to provide an increasingly culturally relevant application of adaptive leadership in international, cross-cultural, and potentially conflicting environments.

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Gaps in Professionalism, Leadership and Communication: Can Targeted Process Improvements Enhance Internal Audit Engagement?

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Abstract

This study examines the association between gaps surrounding two pillars of internal audit knowledge competencies on day-to-day internal audit engagement processes. These competencies, developed by the Institute of Internal Auditors, have been preserved over the years and constructed across different cultures based on the Committee of Sponsoring Organizations of the Treadway Commission (COSO) frameworks (1992, 2013, 2017), which provide guidance for conducting effective internal audits. As quasi-supervisors within organizations, internal auditors serve as moral agents, demonstrating integrity through enhanced managerial capabilities that foster self-inspection. Consequently, they encounter ethical complexities in their daily engagements. The findings of this study reveal that gaps in these competencies—particularly in relevance and resource alignment—significantly and negatively associated with internal audit engagement processes, including planning, fieldwork, outcomes, and agile auditing. Specifically, deficiencies in professionalism, leadership, and communication contribute to engagement process inefficiencies, highlighting an expectation gap in the internalization of regulations between auditors' quasi-supervisory and advisory roles. Additionally, the study indicates that targeted improvements, particularly through technological interventions such as digital transformation, help mitigate these competency gaps. While digitalization is often assumed to enhance decision-making through data and automation, this study underscores its role in reinforcing the necessity of human intervention—particularly through senior management support and, to a lesser extent, certifications. Ultimately, digitalization should be reframed not as an objective mechanism but as a tool for strengthening engagement within internal audit processes.

Keywords: Professionalism; leadership; communication; internal audit engagement processes; targeted process improvements

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Knowledge-Sharing: The Role of Cultural Orientations and Group Conflict

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Abstract

In this study, we seek a nuanced understanding of employees' motivation to share work-related knowledge by examining the influence of individual-based cultural orientations and their interactive effects with group conflict. We collected data from a sample of Chinese employees and tested our hypotheses with hierarchical regression analysis. The results largely support our predictions. Implications and limitations are also discussed.

Keywords: Cultural orientation; knowledge-sharing; group conflict

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Agricultural Transportation of Texas: An Overview of the Progreso-Nuevo Progreso International Bridge

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Abstract

Agricultural transportation is a topic not adequately included in the academic literature despite the essential role that it plays in regional, national and subnational economies around the world. International trade in grains, fruits and vegetables, fiber crops, and other farm products constitutes a significant portion of agricultural economies worldwide. Transportation is a crucial part of agricultural supply chains and is a key feature of agricultural marketing, distribution, and land-use decision making. Case studies are useful to understanding crop and livestock transportation and distribution, especially by highlighting regional differences. This approach includes examinations of agricultural transport hubs such as grain elevators and other storage and processing facilities, and their connections within agricultural trade networks. This paper, a work in progress, provides such a case study. Through qualitative methods that include web site content analysis and a small number of interviews of stakeholders in agricultural transportation, the paper focuses on two major themes: cross border movements of agricultural commodities between Texas and Mexico in general, and, more specifically, movements through the Progreso-Nuevo Progreso binational inland port. The Progreso-Nuevo Progreso International Bridge is included in the study because cross-border trade at that location is overwhelmingly agricultural compared to other categories of freight. Southbound grains and northbound fruits and vegetables dominate the locality's overall freight movements. The analysis provides descriptions of the connectivity of that crossing point with locations throughout Texas and Mexico, and the evolving freight and agricultural storage infrastructure that define the locality. In addition to the geographic analysis of agricultural transportation in the Lower Rio Grande Valley, the paper discusses policy implications in light of changing global patterns of agricultural trade resulting from shifts in geopolitics, agricultural markets, climate, and trade relations between the U.S. and Mexico. It concludes that the US-Mexico border crossing points for agriculture face uncertainty as protectionism and tariffs remain concerns for the industry and for local and regional economic development. Furthermore, efforts to market the Progreso-Nuevo Progreso International Bridge for trade and for infrastructure development could be enhanced.

Keywords: Agricultural transportation; US-Mexico trade; Progreso-Nuevo Progreso International Bridge; qualitative research

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Employment Effects of Trade Policy Shifts in North American Supply Chains: A Multi-State Analysis of Transportation and Manufacturing Integration

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Abstract

This study examines the potential employment impacts of proposed tariffs on North American trade integration across fifteen U.S. states. Using a two-stage analytical approach combining trade dependency analysis with scenario modeling, we assess workforce vulnerability in the manufacturing and agriculture/mining sectors. Our findings reveal that over 4.3 million jobs could face exposure to trade disruptions, with manufacturing bearing the largest potential impact (3.7 million jobs). The analysis demonstrates significant regional variations in trade dependency, from Texas's exposure of 805,000 jobs to Michigan's 671,800 jobs, reflecting decades of supply chain integration. Under moderate disruption scenarios (25% reduction in trade), over 1.08 million jobs could be affected across the analyzed states. These findings have important implications for transportation policy and infrastructure planning in an era of evolving regional trade patterns. The study contributes to understanding how trade policy changes can ripple through regional transportation networks and affect local labor markets.

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Exploring the Role of Trade Openness on International Tourism Development: Evidence from the CPTPP countries

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Abstract

The UK's accession to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in December 2024 positions the bloc as a pivotal global trade network. While empirical studies have demonstrated a bidirectional linkage between trade openness and international tourism development in specific contexts, the predictive role of trade openness in shaping tourism growth remains ambiguous, particularly within the CPTPP's unique composition of six developed and six developing economies. Furthermore, the interplay between economic development and trade openness in driving tourism dynamics—a critical consideration given the bloc's economic diversity—has yet to be systematically explored.

This study employs a Bayesian Global Vector Autoregression (BGVAR) model to analyze cross-country interdependencies among the 12 CPTPP member states, integrating unconditional forecasting to project international tourism trajectories. Utilizing annual time-series data spanning from 1990 to 2022 sourced from the World Bank, IMF, and World Tourism Organization, we quantify the dynamic connectedness between three core variables: (1) economic development (proxied by GDP per capita, total investment % of GDP, Service in GDP%, and Consumer price index), (2) trade openness (measured by Trade% of GDP, Price level ratio of PPP conversion factor (GDP) to market exchange rate), and (3) international tourism development (captured by inbound tourist arrivals). The two-way trade volume is used to produce the weights in the model for the global vector, and three Bayesian simulation strategies are tested for impulse shocks.

The BGVAR framework investigates latent synergies between trade policy adjustments and tourism demand shocks, enabling scenario-based forecasts under varying trade liberalization timelines. This novel methodology provides policymakers and investors with actionable insights for optimizing sectoral investments, aligning trade agreements with tourism infrastructure development, and mitigating risks from global economic volatility.

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Evaluación y acreditación de las instituciones públicas en México

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I. Introducción

La evaluación y acreditación en universidades públicas de México, es un proceso necesario mediante, se garantiza la calidad educativa, para mejorar los estándares académicos en instituciones de nivel superior. En un contexto actual, la competitividad y transformación del sistema educativo, induce en universidades adaptarse a nuevas exigencias, incluye el fortalecimiento de su calidad, mejora procesos internos y la formación de profesionales altamente calificados. Así, los sistemas de evaluación y acreditación contribuyen en la mejora continua de la educación superior.

Desde la implementación de la Ley para la Coordinación de Educación Superior en México, en los 27 artículos, 2 transitorios, abarca desde la educación normal, tecnológica y la universitaria, también rige las funciones de la docencia, establece la coordinación educativa en toda la República Mexicana. DOF (1978), indica criterios estructurales en evaluación institucional de calidad requerido por organismos nacionales e internacionales en universidades públicas. La evaluación mide resultados académicos, procesos administrativos, infraestructura, bienestar estudiantil y vinculación con la sociedad.

Sin embargo, el proceso de acreditación ha sido objeto de debate en los últimos años, debido a los criterios utilizados y como se aplica en universidades públicas. La evolución de política educativa en México fortalece cuerpos evaluadores, generado avances significativos y desafíos para implementación efectiva de estos mecanismos.

En este documento se abordarán principales aspectos relacionados con evaluación y acreditación en universidades públicas mexicanas, explora objetivos, impacto en la mejora institucional, retos y perspectivas para su consolidación al futuro cercano. A través análisis de fuentes académicas y documentos oficiales, pretende proporcionar una visión integral en proceso y su importancia al contexto en la educación superior del país.

II. Conceptualización

La educación pública en México es fundamental para la construcción de una sociedad más equitativa y desarrollada. A través de un sistema educativo gratuito y obligatorio, el Estado mexicano busca garantizar acceso a la educación a todos niños y jóvenes del país, desde la educación básica hasta la educación superior. Las instituciones educativas públicas representan un factor clave para el crecimiento económico y progreso social del país.

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El sistema educativo mexicano se conforma por los niveles: preescolar, educación básica (primaria y secundaria), media superior (preparatoria o bachillerato) y superior (universidades y tecnológicas). De acuerdo con el Artículo 3er. de la Constitución Mexicana, la educación es un derecho fundamental, el gobierno está obligado a ofrecerla sin costo alguno. Aun con este marco legal, la calidad formativa sigue siendo un desafío, debido por la disparidad entre las zonas urbanas y rurales, con dificultades económicas de muchas familias para acceder a recursos educativos complementarios.

Las instituciones educativas públicas tienen un impacto significativo en el desarrollo del país. Primero, contribuyen a crear capital humano calificado, capaz de enfrentar retos en el mercado laboral. Las universidades públicas en particular, deben ser centros de investigación y generación de conocimiento, actualizado para impulsar la innovación tecnológica y social. También, deben promover la cohesión social, se encargan de brindar oportunidades educativas a sectores históricamente marginados, contribuir a la movilidad social, reduciendo las brechas de desigualdad.

En términos económicos, fortalecer la educación pública, permite al país contar con una fuerza laboral más competente, favorece la competitividad y la capacidad de generar riqueza. Para ello es necesario que se sigan implementando políticas públicas, mejorando tanto la infraestructura como la calidad educativa en todas las regiones del país.

Palabras clave: Evaluación; acreditación; educación; mejora continua

Public education in Mexico is essential for building a more equitable and developed society. Through a free and mandatory educational system, the Mexican State seeks to guarantee access to education for all children and young people in the country, from basic education to higher education. Public educational institutions represent a key factor for the economic growth and social progress of the country.

The Mexican educational system is made up of levels: preschool, basic education (primary and secondary), upper secondary (preparatory or high school) and higher (universities and technological). In accordance with Article 3. of the Mexican Constitution, education is a fundamental right, the government is obliged to offer it at no cost. Even with this legal framework, training quality continues to be a challenge, due to the disparity between urban and rural areas, with economic difficulties for many families in accessing complementary educational resources.

Public educational institutions have a significant impact on the development of the country. First, they contribute to creating qualified human capital, capable of facing challenges in the labor market. Public universities must be centers of research and generation of knowledge, updated to promote technological and social innovation. Also, they must promote social cohesion, they are responsible for providing educational opportunities to historically marginalized sectors, contributing to social mobility, reducing inequality gaps.

In economic terms, strengthening public education allows the country to have a more competent workforce, favors competitiveness and the ability to generate wealth. To achieve this, it is necessary to continue implementing public policies, improving both infrastructure and educational quality in all regions of the country.

Keywords: Evaluation; accreditation; education; continuous improvement

Propuestas para la práctica de investigación científica y tecnológica en la educación medio superior

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Resumen

Se aborda la falta de motivación y conocimiento de los jóvenes bachilleres hacia la ciencia y la investigación, señalando que la estructura curricular de Bachillerato no ha logrado canalizar el interés de los estudiantes hacia la investigación, lo cual debe ser corregido desde la etapa de Bachillerato, no solo en la universidad.

El objetivo principal es generar un movimiento juvenil activo en el ámbito académico, científico y tecnológico, promoviendo el desarrollo de competencias en los estudiantes de Bachillerato. Se destaca la importancia de integrar la investigación científica y tecnológica en la educación media superior, proponiendo varias acciones como la creación de grupos de investigación, asistencia a congresos internacionales, misiones de investigación en comunidades vulnerables y la modificación de la estructura curricular para incluir materias dedicadas a la investigación.

Se busca también incentivar la participación de los jóvenes mediante concursos de investigación y la producción de contenidos audiovisuales que promuevan la investigación. Se afirma que la investigación es clave para el desarrollo y bienestar de las regiones, y que motivar a los jóvenes a investigar será fundamental para construir un futuro mejor.

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El rescate de espacios públicos como medio de desarrollo social en Nuevo Laredo

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Resumen

La educación como medio permite el desarrollo y el progreso social de las naciones. La educación como proceso, es dinámico y promueve la colaboración y la creatividad en la búsqueda de nuevas maneras de hacer las cosas. Esas actividades realizadas en conjunto, se vuelven experiencias que afianzan el aprendizaje y que al transmitirse se vuelven en parte de la cultura de una sociedad. En este trabajo se explora un caso de estudio en donde mediante el aprendizaje basado en proyectos se desarrolló una red de colaboración entre niños, jóvenes y adultos para rescatar espacios públicos de las colonias en donde viven para promover actividades culturales, sustentables y deportes. De tal manera que mediante la participación en estas actividades se promueva el bienestar y la sana convivencia además de estimular el sentido de pertenencia, el sentido de vida, la creatividad, el trabajo en equipo y la inspiración.

Palabras clave: Aprendizaje basado en proyectos; deporte; desarrollo sustentable; educación; sociedad

Rescuing public spaces as a means of social development in Nuevo Laredo

Abstract

Education as a means enables the development and social progress of nations. Education as a process is dynamic and promotes collaboration and creativity in the search for new ways of doing things. These activities, carried out together, become experiences that strengthen learning and, when transmitted, become part of the culture of society. This paper explores a case study where, through project-based learning, a collaborative network was developed among children, youth and adults to rescue public spaces in the neighborhoods where they live to promote cultural, sustainable and sports activities. In such a way that through participation in these activities, well-being and healthy coexistence are promoted, in addition to stimulating a sense of belonging, a sense of life, creativity, teamwork and inspiration.

Keywords: Project-based learning; sport; sustainable development; education; society

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Macoa: Confianza recíproca y oportunismo económico y social en la cultura mexicana

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Resumen

Mediante la práctica del “echarse la mano” (macoa en náhuatl) se privilegia la ayuda mutua y la reciprocidad en las relaciones sociales en México desde épocas precolombinas. Sin embargo, la práctica ha sido también usada con frecuencia para fines ilícitos e inmorales en algunos ámbitos de la vida social y económica de México.

Los objetivos del estudio son 1) examinar la raíz histórica del principio cultural “echarse la mano” y 2) explicar la aplicación de dicho principio para la obtención de beneficios moralmente aceptados versus los inmorales al usar macoa para implementar actos de corrupción en contextos económicos y políticos contemporáneos.

Entrevistas en profundidad revelan que la práctica de macoa sigue siendo fundamentalmente beneficiosa y recíproca a pesar de la evolución de la sociedad mexicana y los cambios en las formas de producción, distribución y organización en la economía y la política nacional. Sin embargo, las entrevistas revelan también el uso controversial de macoa para actos recíprocos pero que persiguen fines ilícitos e inmorales, mayormente en el ámbito urbano mucho más que en el rural.

I. Las Raíces Culturales de Macoa

Las costumbres de las comunidades en la sociedad mexicana reflejan valores donde destaca la importancia de la solidaridad, la cooperación y el apoyo mutuo, elementos clave en la formación de estructuras sociales. Un repaso rápido a las raíces económicas, sociales y laborales de macoa, en base a datos documentales y arqueológicos, nos hace ver una estructura de las relaciones sociales en la sociedad mexicana antigua con raíces en la producción de los bienes de consumo, la organización social, y la organización para el trabajo. Estas raíces privilegiaron la contribución individual y familiar, así como la reciprocidad, resultado de interacciones con fines de ayuda mutua y permanencia en una sociedad productiva.

Raíces en la producción y distribución de los bienes de consumo

Como estructura productiva de subsistencia, la economía mexicana prehispánica, dominada por la cultura Azteca en el periodo que antecedió a la conquista española (1428 - 1521), consistió en la explotación de los recursos naturales y las relaciones de producción que resultaron en tres tipos básicos de intercambio: reciprocidad, redistribución y canje comercial (Smith, 1983).

Comparado a otros modelos productivos agrícola de la misma época, como el holandés y el americano (Palerm, 2019), el modelo mexicano ha perdurado debido a su capacidad de adaptación a distintas situaciones locales, nacionales e incluso globales. Esta adaptación habría estado basada en la combinación de propiedad familiar y trabajo colectivo en las sociedades

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precolombinas, destacando la solidaridad como una medida de previsión social (Ramírez-Díaz, Herrera-Ospina y Londoño-Franco, 2016).

Raíces en la organización social y las formas tributarias

En la transición del campo a la ciudad, proceso lento e indefinido, coexistieron distintos niveles y formas de organización económica y social, en el que se desarrolló un sistema tributario. Carrasco y Broda (1978) describen la existencia de enormes almacenes reales, grandes obras públicas organizadas por el Estado, tierras públicas y propiedades del rey trabajadas bajo un sistema tributario. La economía del Imperio Azteca era dirigida y regulada por el organismo político, con una estructura jerárquica de nobles (píjiltín), quienes controlaban los medios de producción, y plebeyos (macehualtin), quienes trabajaban y dependían políticamente de la nobleza.

Smith (1983) explica que la distribución de tierras y la organización de la economía dependían de decisiones políticas, y que los plebeyos debían pagar tributo en especie y en trabajo. En este contexto, la confianza recíproca y la cooperación eran fundamentales para la cohesión familiar y social. La ayuda mutua (macoa) permitía a las familias trabajar juntas, asegurando su sustento y la contribución al sistema económico.

Raíces en el trabajo basado en la solidaridad y la ayuda recíproca

El trabajo colectivo en las sociedades precolombinas se basó en la solidaridad de los miembros de la comunidad (Ramírez-Díaz, Herrera-Ospina y Londoño-Franco, 2016). Los patrones de solidaridad y apoyo mutuo se manifestaron en relaciones de respeto y parentesco como el “compadrazgo” (relación de respeto y reciprocidad entre padrinos y ahijados) y el “tejido social” (red de relaciones y apoyo mutuo entre familiares, amigos y vecinos).

Carrasco y Broda (1978) documentan la existencia de criados y esclavos en el Estado de Morelos, así como parientes y allegados que recibían tierras de un labrador a cambio de ayudarlo a pagar tributo. En este contexto, la ayuda mutua o recíproca (macoa) era una obligación en la organización del trabajo agrícola.

II. La Práctica Contemporánea de Macoa: Objetivo Dual en el Contexto Urbano

La solidaridad en la sociedad mexicana actual, allí donde ella se manifiesta, parece reflejar la persistencia de la justicia y la equidad en el trabajo. Sin embargo, la transición del trabajo rural al urbano ha transformado la forma en que se practica la ayuda mutua. Ramírez-Díaz, Herrera-Ospina y Londoño-Franco (2016) explican que, en el contexto del capitalismo, la cooperación laboral adopta formas informales, donde varios trabajadores funcionan juntos para alcanzar un objetivo común sin una relación de subordinación formal. De allí que esta forma de cooperación laboral es considerada trabajo informal y no formal.

La mixtura entre trabajo formal (empleos y contratos con salarios, entre otras formas) y trabajo informal resulta en prácticas que a menudo escapan de los marcos legales de los sistemas de trabajo vigentes. Palerm (2019) destaca que el “macoa” o tequio actual sigue utilizando la parentela y la relación de compadres, y otros mecanismos de cooperación, pero también recurre a la necesidad de pagar salarios en las tareas que requieren de mayor fuerza de trabajo. Por tanto, la ayuda mutua, aunque persiste, también ha evolucionado para adaptarse a las nuevas formas de organización económica.

En esta adaptación, los fines u objetivos pueden ser diferentes entre familias, grupos, instituciones y comunidades. Debido al carácter dominante del sistema político-económico vigente, mayormente capitalista, las adaptaciones se asimilan a los patrones desarrollados en la sociedad, patrones predominantemente formales, es decir, en línea con los sistemas legales del país. Sin embargo, varias adaptaciones se han acomodado a objetivos al borde de la ley o fuera de la ley, incluyendo conductas ilegales e inmorales. Actos que reflejan estas conductas oportunistas incluyen la corrupción y los crímenes de distinta índole.

III. Estudio Empírico de la Vigencia de Macoa en Practicas Oportunistas

Este estudio exploratorio busca explicar el valor de la ayuda mutua y la reciprocidad en la cultura contemporánea mexicana aguzando nuestra observación en los comportamientos y las relaciones, las costumbres individuales y grupales, y la empatía en la obtención de beneficios, sea los moralmente logrados, sea los inmoralmemente obtenidos, como los que derivan de la corrupción y el crimen.

Métodos

La investigación incluye dos métodos, 1) un repaso selectivo de documentos históricos de la cultura prehispánica en que se enmarca el origen de *macoa*, y 2) entrevistas focalizadas a personas que no solo saben lo que es *macoa*, sino que también lo experimentaron en la vida comunitaria de sus pueblos de origen. Se entrevistó a dos participantes de áreas rurales del estado de México y el estado de Hidalgo, dos participantes del ámbito laboral del gobierno, uno de ellos jubilado, y un participante del área laboral financiera.

Para las entrevistas estructuradas se diseñó un instrumento de cinco items, con el objetivo de deducir hipótesis de orientación para identificar cómo se experimenta una manera de ayuda reciproca, definir cómo se conoce las formas de recibir ayuda, y describir cómo funciona algún tipo de ayuda que se recibe. También se indagó si el entrevistado considera que existen beneficios mutuos o también perjuicios, si estos acontecen.

La guía de entrevistas incluyó las siguientes preguntas en busca de retroalimentación:

1. ¿Conoce o ha experimentado alguna forma de ayuda reciproca, en su comunidad rural?
¿Como lo conoce?
2. ¿Podría decirme cómo funciona la ayuda reciproca?
3. ¿Puede este tipo de ayuda brindar beneficios mutuos?
4. ¿Qué se obtiene mediante este mecanismo de ayuda?
5. ¿Podría decir si la ayuda mutua puede perjudicar a alguien, en algún momento?

Resultados

El análisis cualitativo de las respuestas obtenidas refleja tanto el conocimiento de la cultura local y sus costumbres como también las vivencias que están vinculadas a la práctica de *macoa* en su interacción social dentro y fuera de su comunidad.

En las comunidades rurales, el *macoa* se vive como un sistema tradicional de organización y apoyo mutuo, apoyado regularmente por un mayordomo que facilita la operación legal y la gestión de recursos ante la autoridad federal o municipal. Los agricultores siguen el paradigma de la tradición de su pasado, se basan en el conocimiento para sembrar y cosechar, y practican la ayuda mutua no solo en las labores del campo, sino también en las tareas del hogar. Esta solidaridad comunitaria permite compartir recursos naturales, como el agua, y se refuerza con apoyos gubernamentales estacionales, aunque estos son limitados al temporal. Sin embargo, En las comunidades rurales, la ayuda mutua puede volverse desigual cuando el destino de los apoyos gubernamentales no beneficia a todos por igual. Aunque los comisariados ejidales representan a la comunidad ante las autoridades, las decisiones finales dependen del grupo en el poder, lo que a veces provoca que ciertos agricultores queden fuera de los beneficios.

En el contexto urbano, el *macoa* se percibe de manera orgánica administrativa. La entrevistada académica obtuvo ayuda a través del sindicato, el cual le permitió incrementar horas laborales por derecho, durante un periodo de la administración federal que gestionaba ese tipo de desarrollo. Por lo tanto, la ayuda se percibe como un estímulo por la militancia sindical. Sin embargo, la ayuda laboral y sindical, específicamente en el SNTE, cambió con las nuevas reglas del juego y esto ha afectado la dinámica de la ayuda mutua.

El entrevistado jubilado de la Suprema Corte de Justicia (SCJ) también experimentó el *macoa*, aunque en forma de preparación y entrenamiento otorgados para ascender a mejores cargos. Esta ayuda se materializa como un beneficio en especie, orientado al desarrollo profesional y la movilidad laboral. Sin embargo, el riesgo de la ayuda mutua surge cuando los empleados no se sienten favorecidos por el sistema de recompensas; el trabajador lo percibe como una injusticia. Esto puede traducirse en un desempeño laboral deficiente, actitudes negativas hacia los compañeros o incluso un trato déspota al público y a los litigantes.

Finalmente, en el ambiente del organismo financiero, el entrevistado ejecutivo de un banco describe el *macoa* como una red de apoyo para mejorar la eficiencia laboral. La ayuda se expresa mediante la promoción de empleados, la creación de oportunidades laborales y el establecimiento de conexiones que permitan favorecer a conocidos y cercanos en su búsqueda de empleo. Sin embargo en el ámbito financiero, la ayuda mutua puede convertirse en un riesgo en la relación. Las relaciones creadas en la base de formación profesional pueden ser usadas para perjudicar a otros, particularmente en la lucha de grupos políticos.

IV. Conclusiones

Todos estos resultados, reflejan cómo la ayuda puede adoptar distintos propósitos, desde una perspectiva de solidaridad, hasta un apoyo restringido por exigencia de un sistema burocrático.

La ayuda reciproca se presenta como un agente de vinculación, une a las personas mediante el intercambio de trabajo, desde sembrar una cosecha, obtener ayuda y acceso a horas adicionales, o bien construir equipos de trabajo. En cada contexto se persigue un propósito en común de beneficio mutuo, pero cabe destacar que la reciprocidad es un engranaje para el logro y alcance de objetivos comunes para mantener cohesión social o institucional.

El significado dual de la ayuda reciproca presenta el lado positivo y también el lado negativo de la práctica del *macoa*. Por un lado, esta práctica genera beneficios mutuos en diversos contextos, desde la solidaridad comunitaria en el campo, pasando por los intercambios sindicales y el crecimiento institucional, hasta la proyección profesional en el ámbito corporativo, la ayuda se convierte en un puente que conecta intereses individuales con logros colectivos, promoviendo un equilibrio entre dar y recibir.

Por otro lado, *macoa* puede dar origen a prácticas oportunistas, las cuales pueden aparecer como prácticas de ayuda mutua que busca generar beneficios compartidos, pero que en última instancia persiguen propósitos inmorales como perjudicar a otros en los resultados, manipular la distribución de tareas o beneficios en actos de deslealtad política, o perseguir beneficios no logrados como derechos no satisfechos.

Debido a que estas prácticas oportunistas a menudo son informales, existe un desafío y hasta impedimentos en las organizaciones dominadas por relaciones informales, incluyendo sectores del gobierno, para lograr transparencia, equidad y equilibrio en las dinámicas de ayuda reciproca, y así evitar que un principio tan valioso como el *macoa* se convierta en una fuente de conflicto y perjuicio.

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The Synergic Effects of Strategic Orientations on Firms' International Financial Performance

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Abstract

Strategic orientation (SO) of firms often comes to the fore of scholars and practitioners as it is considered one of the pivotal determinants of firms' sustainable competitive advantage and international financial performance (IFP). Although strategic orientation is one of the most pronounced topics in strategic management and marketing, existing literature on strategic orientation is narrowly focused on a few strategic aspects that fail to capture the complex and dynamic nature of the strategic orientation of firms and examine their pervasive impacts on firm performance. Synthesizing and integrating extant literature from strategic management and marketing, this study examines five SOs (entrepreneurial, brand, growth, operational, and market) using two decades of panel data. We emphasize the interactional effects of SOs on firms' IFP. Results indicate that SOs and their interactions significantly affect firms' IFP. We offer important theoretical and managerial implications along with future research directions.

Keywords: Synergies; entrepreneurial orientation; market orientation; brand orientation; operational efficiency orientation; growth orientation; international financial performance

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The Effect of “Hi-Tech” US FDI Outflows on Affecting the Labor Market Structure in Destination Countries¹

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Abstract

We investigate the effects of capital investment in a global value chain framework on labor at various skill levels. We provide evidence of the complementarity of capital and labor dependent on industry position, and by extension, production complexity along value chains. Most existing evidence on GVC participation relies on value added metrics to measure relative dependence on GVC networks, but neglects capital involvement in production, and the industry level effects of foreign capital as an input. Using data from 12 countries and 15 aggregate industries over the period of 2000 – 2011, we examine the heterogeneous effects of direct investment relative to the average industry distance from final goods. We find that foreign capital compliments labor in high-tech industries, with medium-skilled employment experiencing the largest effect, supportive of the maintenance of high-skilled domestic jobs, and the promotion of medium- and low-skilled employment in host country economies.

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Exotic Structured Products — The Case of Papillon Certificates

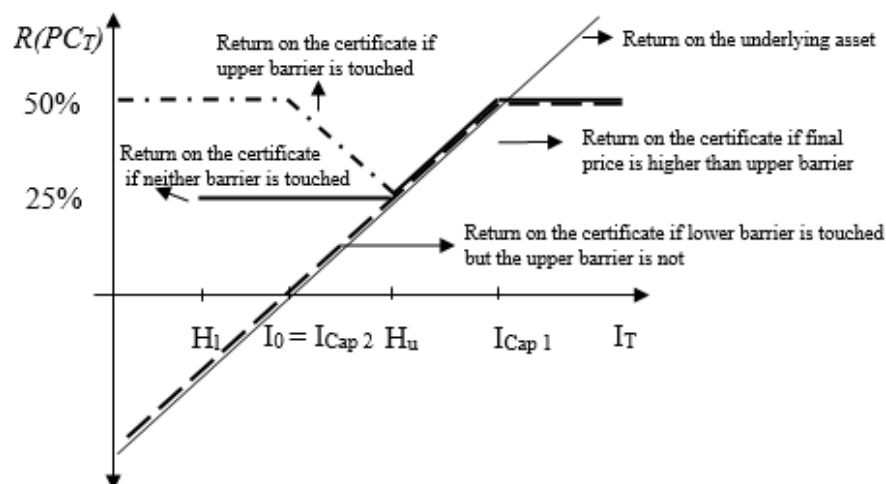
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Abstract

We introduce and describe a new financial product referred to as Papillon Certificates and show, based on option pricing theory, that the payoff of a Papillon Certificate can be duplicated by the combination of a long position in a zero coupon bond, a long position in call options on the underlying asset, a short position in call options on the underlying asset, a short position in down-and-in put options on the underlying asset, a long position in up-and-in put options on the underlying asset, and a short position in up-and-in put options on the underlying asset. We also empirically examine a Papillon Certificate issued by WestLB AG that was issued in September 2004 to investigate if the issuer made a profit in the primary market. Consistent with previous research on structured products, the issuer generates a considerable profit in the primary market, 14%. Finally, we simulate the sensitivities of Papillon Certificates to changes in different pricing input variables and parameters used in the design of Papillon Certificates.

Figure 1:



The rate of return of a Papillon Certificate, $R(PCT)$ as a function of the underlying asset value, IT , with a guaranteed minimum return of 25%, a lower barrier level of 75% of the initial fixing price, Hl , and a capped return of 50%. On the down side: a) the solid line represents the rate of return of a certificate on maturity when the neither barrier was ever broken over the term of maturity, b) the long dash line represents the rate of return of a certificate on maturity when the lower barrier was broken over the term of maturity but the upper barrier was not, and c) the dash dot line represents the rate of return of a certificate on maturity when the upper barrier was broken over the term of maturity.

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Reflections on the Vision for a New Era of National Ascent Envisioned by General Secretary Tô Lâm

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Abstract

The purpose of this article is to synthesize and compare the political and economic institutions of the Communist Party of Vietnam (CPV) with those historical political and economic institutions identified and explained by Nobel laureate economists to argue that the CPV's single-party, dictatorial, totalitarian regime has imposed extractive political and economic institutions. Two scholars, North (Nobel laureate in Economics, 1993) and Thomas, argue that such “institutions” do not provide “mechanisms” that encourage/motivate positive economic initiatives, thus hindering/preventing sustainable economic development, measured by a per capita long-run rise in income. Recently, three scholars awarded the Nobel Prize in Economics in 2024, Acemoglu, Johnson, and Robinson, identified that countries with a history of sustainable economic development have implemented and enforced inclusive political and economic institutions, whereas those that have imposed extractive political institutions and extractive economic institutions have failed.

Statistical data provided by Vietnam and archived by the International Monetary Fund show that Vietnam's economic performance is abysmal. The statistics support the conclusions of these Nobel Prize economic experts. The inevitable inference is that Vietnam must undertake a second renewal for sustainable economic development: changing polity to deploy and enforce inclusive political and economic institutions. However, if the goal of the polity is to protect the Party and the interests of its members, the political and economic institutions cannot be inclusive. Therefore, the vision of success for the new era of national ascent envisioned by General Secretary Tô Lâm is improbable unless he and the CPV change the polity.

I. Introduction

Depending on the nature of the “polity,” the causality/interference between economic development and the sustainability of a country’s polity can be mutually supportive/symbiotic or mutually antagonistic/hostile (positively/negatively bidirectional causality). The term polity here is “a concept in political science, used to refer to the form of organization and management of a country or a political organization.” The direction and time for the causality/interference processes (symbiotic or antagonistic) to be completed depends on the political and economic institutions the polity deploys and pursues. In this article, causality/interference includes Granger causality/interference.

It is indisputable that Vietnam is a country characterized by dictatorship, single-party rule, and totalitarianism. Therefore, with the power of the police and public security forces and the capability to criminalize any citizen’s actions, the Party and officials possess extensive power/ability to control/“mobilize” or suppress the masses compared to the governments of democratic countries.

One proof that the police serve as the protector/shield of the Party and government officials is the Ministry of Public Security budget allocation compared to the Ministries of Defense, Health, and Education and Training. The budget for 2024 was approved by the National Assembly on November 10, 2023, and published on the National Assembly website in early December 2023.

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According to this resolution, the budget allocations are as follows: VND 113.271 trillion for the Ministry of Public Security, and 270.024, 7.010, and 7.711 trillion VND, respectively, for the Ministries of Defense, Health, and Education and Training.

Furthermore, contemporary economic development theory presents two opposing schools: inward-looking (Prebisch-Singer Development Hypothesis) and outward-looking (Washington Consensus Development Hypothesis) theories to drive economic development. Vietnam's strategy for economic growth has been an outward-oriented development model since the reforms. Additionally, economic development is characterized as a "putty-clay process" (Singer, 1998). This theory explains that if economic development policies are improperly devised or executed incorrectly, the cost will be immense—in terms of not only capital, but human resources, and time. Furthermore, it may even be impossible to correct these errors post-implementation.

The Vietnam War, in which the Communist Party of Vietnam used the method of struggle along with a culture of "*Rather kill mistakenly than to miss an enemy*", ended fifty years ago, and the country has since been "unified". Moreover, the motto of the Socialist Republic of Vietnam is a government "of the people, by the people, and for the people," affirming that the goal of all government policies is the welfare of the people, encapsulated in the slogan/principle that "the people are the roots." However, the reality is entirely different.

Unfortunately, for humanity, there has never been an exception; after seizing political power the communist regime has always been more brutal than the regimes they struggled to overthrow, through violent actions to impose the principle that "minority rules and majority are exploited". This minority governed by the culture of Marxist-Leninist theory.

The method and goal of the power struggle, according to Marxist-Leninist theory on the armed seizure of power, involves fighting for social class, utilizing the strength of the oppressed majority to overthrow the repressive ruling minority. This is followed by tightly controlling every aspect of the life of the vast majority in a "tyrannical" manner. Furthermore, today, the CPV has shifted from its "self-proclaimed and self-appointed role as the leader of the oppressed class, or the proletariat," in the conquest of the South to "the leader of a single-party, dictatorial, and totalitarian regime oppressing nearly 100 million non-Party members."

More importantly, observers recognize the CPV as a source of protection and a shield both domestically and internationally. Notably, through the police force, it appears that nearly 50 years after its establishment, the Party's and the government's institutions in Vietnam have not only maintained their long-held power to tightly control all aspects of the people's lives without showing signs of weakening or facing serious threats but have also become increasingly stringent and oppressive over time.

Meanwhile, under the same regime, the bidirectional causality between Vietnam's economic development and polity can only be interpreted as a detrimental relationship. Evidence of this is the "Đổi Mới" (Renovation) policy introduced by the CPV, which required a shift from the traditional centrally planned economic model of Marxist-Leninist doctrine to a "market economy with socialist orientation" in the late 1980's to preserve the Party and the privileges of its members. This transformation dismantled several economic barriers, allowing the populace some limited economic freedom. Along with USD 2 billion in remittances from those labeled as "scum and thugs following the American empire," helped Vietnam escape a severe economic crisis.

However, the "market economy with a socialist orientation" strategy has established numerous new barriers to protect the Party and increase opportunities for party members to engage in corruption involving money and power. Consequently, more than 30 years later, Vietnam's economy is teetering on the brink of the middle-income trap, a situation the Party and government have been unable to resolve despite receiving over \$16 billion annually in remittances from a group that the Party now refers to as "*Khúc ruột ngàn dặm*" (can be translated into English as "A thousand-mile gut" literally, but its actual meaning is more figurative. It is a Vietnamese phrase often used to refer to Vietnamese people living far from their homeland, especially in overseas Vietnamese communities. A more natural translation would be "The distant homeland's heart" or "Expatriates from afar"). This economic institution has failed to maximize the welfare of the non-party members of the populace.

Beyond economic challenges, issues of “self-evolution” and “self-transformation” among party cadres and members, as well as the predominantly pro-American sentiment of the Vietnamese populace compared to other Southeast Asian nations (Shambaugh, 2021), necessitate that the Vietnamese Party and officials upgrade relations with the United States to a Comprehensive Strategic Partnership, urging the U.S. to recognize Vietnam's market economy status. Furthermore, the issuance of Decree No. 1334/QĐ-TTg, Directive 24-CT/TW, Resolution 39-NQ/TW on July 18, 2023, and more recently, Resolution 18-NQ/TW on September 27, 2024, concerning institutional streamlining, aims to make the government machinery and the Party more efficient. These measures are not merely administrative but strategically aim to attract intellectual and financial resources from overseas Vietnamese under the rapidly promoted slogan of entering “A New Era of National Rise”, championed by General Secretary Tô Lâm of the CPV. The Party and officials employ these tools to find solutions for the economic difficulties they have created, which they have been unable to resolve, to preserve the Party and the vested interests of its elite members.

For the reasons outlined above, the purpose of this article is:

- i. *To synthesize the political and economic institutions of the CPV and compare them with historical political and financial institutions that Nobel Prize-winning economists have identified and explained to argue that the CPV's single-party, dictatorial, and totalitarian regime has imposed extractive political institutions and extractive economic institutions in the country.*
- ii. *To compile explanations by two scholars, North (Nobel laureate in Economics, 1993) and Thomas, who argue that a “single-party,” dictatorial, and totalitarian “institution” does not provide “some kind of mechanisms” to encourage or incentivize positive economic initiatives, thereby hindering sustainable economic development.*
- iii. *To synthesize the findings of three Nobel laureates in Economics in 2024, Acemoglu, Johnson, and Robinson identified that historically, countries with sustainable economic development have implemented and enforced inclusive political and economic institutions, while those countries which have imposed extractive political and economic institutions have failed.*
- iv. *To summarize a selection of statistical data provided by the Vietnam government and archived by the International Monetary Fund, which indicates that Vietnam's economic performance is exceedingly poor, to argue that these statistics seemingly confirm or support the observations and conclusions of financial experts.*
- v. *Based on the analyses mentioned above, to propose that for sustainable economic development, Vietnam must undertake a second reform; this entails transforming institutions to enable the deployment and enforcement of inclusive political and financial institutions.*
- vi. *Finally, in conclusion, the author expresses concern that since the institution's goal is to protect the Party and the interests of its members, the political and economic institutions cannot be inclusive. Therefore, the vision of success for the “era of national ascent” under General Secretary Tô Lâm appears highly improbable unless he and the CPV undertake significant institutional changes.*

II. The Nature of Political and Economic Institutions and Issues in Education and Regional Geopolitics

2.1. Political Institutions

Following 1975, the single-party, communist regime adopted the rationale of “party nominates, people elect,” and a labor allocation process based on the principle of “hồng hơn chuyên better – rather red than professionalism” (hồng: adhering to Communist ideology; chuyên: expertise or specialization); within the traditional centrally planned economic system where communal

property, particularly land, was predominant. This arrangement resulted in concentrated political and consequently economic control in a small group within the Socialist Republic of Vietnam. This economic institution led the country into extreme hardship and a severe economic crisis. This crisis threatened the existence of the Communist Party and the institution in the early 1980s. Evidence of this is the Sixth Party Congress at the end of 1986, which concluded with the slogan "Reform or Die" (Kleinen, 2015).

2.2. Economic Institutions and Consequences

Vietnam introduced the *Đổi Mới* in 1986, which theoretically transitioned the economic activities from a "centrally planned" model to a "socialist-oriented market economy. This transition began when international financial institutions, such as the International Monetary Fund and the World Bank, the US Department of Finance, along with leaders from advanced countries advocating neoclassical economic theories, preached that the contemporary economic development strategy involved developing the manufacturing sector for export. This policy, known as the "Outward-oriented economic development Policy," posits that foreign trade and the industrial sector are central to or spearheading the national economic development strategy. Naturally, these international financial institutions encouraged and supported countries to pursue this outward-looking economic development strategy. Inevitably, the "market economy" segment of Vietnam's economic development plan relies on an export-driven or outward-oriented economic development strategy.

The nature of the "market economy, socialist orientation" model is essentially two conflicting, opposing economies. Vietnam does not have an actual market economy. In reality, the socialist economy guides the market economy. Consequently, the private sector, including foreign-owned enterprises, are unfairly treated. Moreover, although the political environment is "stable," it lacks democratic freedom, respect for human rights, and property rights. However, the domestic laws of international trade partner countries mandate these freedoms must be fulfilled and enforced in the agreements that Vietnam has committed to, such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the European Union-Vietnam Free Trade Agreement (EU-VFTA).

Regarding the implementation and execution of Vietnam's economic development strategy, two scholars with significant expertise and understanding of Vietnam, Professors Klingler-Vidra and Wade (2020), in their research titled "Science and Technology Policies and the Middle-Income Trap: Lessons from Vietnam," suggest that Vietnam has been considered by many in the economic development research community as a potential new Asian Tiger. They argue that since the early 2000s, Vietnam has rapidly advanced in income and technology. Evidence of this includes Intel's inauguration 2010 of its largest chip manufacturing center outside the United States, seemingly confirming Vietnam's status as an emerging information and communication technology nation. Other large Western, Japanese, and South Korean multinational corporations, such as Samsung, Fujitsu, and Toshiba, have also established manufacturing facilities in Vietnam.

During the same period, Vietnam progressed beyond the World Bank's classification from "low- income" to "low-middle income" in 2010. The government, donors, and aid organizations began to address the "middle-income trap" as an impending critical issue for Vietnam. To position "science and technology policy" as a strategic tool for sustaining economic growth and preventing the middle-income trap., authorities looked to China's science and technology policy as a model, citing Intel's \$1 billion investment in Vietnam as evidence of an emerging technology hub. However, in subsequent years, Vietnam's science and technology policy faltered, with efforts predominantly aimed at increasing the number of startups in the style of Silicon Valley rather than implementing and enforcing a comprehensive science and technology policy suited to the Vietnamese socio-economic environment to enhance productive capacity, or pursuing a strategy akin to "Made in China 2025".

Therefore, in assessing the potential "success" of Vietnam's science and technology policy, Klingler-Vidra and Wade (2020) lament that: "Rather than investing in technology and expertise, Vietnamese enterprises still predominantly rely on the advantages of cheap labor and raw material

exploitation. The so-called high-tech companies remain small and compete internationally almost entirely on cost, not innovation or quality."

Regarding the structure of the economy, Busch (2017) remarked, "Vietnam's cautious and orderly adoption of market institutions has yielded over two decades of impressive economic performance, while the fundamental political economy of the country remains largely intact." He further noted: "However, successful economic restructuring also contributes to Vietnam's central economic challenge today, explicitly addressing the 'missing intermediary', i.e., the absence of an effective domestic private sector."

Regarding the challenges in macroeconomic activities and the inevitable issues related to economic growth, it is not that the Communist Party and the leadership of Vietnam are unaware despite numerous economic development strategies proposed by experts and scholars. Both domestic and international (such as the World Bank and Vietnam's Ministry of Planning and Investment, 2016), the Party and Vietnamese officials continue to foster an economic culture that Professor Dr. Chu Nguyen (Nguyen, Hiệp, Lộc; 2021) describes as a development strategy that is "self-serving, meticulous, and selective in choosing partners for development", in his critical remark. The inevitable consequence of this strategy is transforming the nature of Vietnam's economy into what the media mockingly calls "The Project Economy". This term implies that the Party and Vietnamese leaders lack a genuine strategy for economic development; instead, they focus on devising projects that facilitate opportunities for corruption and patronage.

In other words, the project-based economy refers to an economy where projects executed by government officials are primarily aimed at personal gain rather than as functional components of the country's economic development strategy. This type of economy has maximized the opportunities and extent to which corrupt officials could exploit resources as they had anticipated. Consequently, the inevitable outcomes of this culture have been statistically documented in *Vietnam: the 2024 Article IV Consultation-Press Release* (part of Table 1 below), which has directly and indirectly exposed these issues (IMF, 2024). The practices of the Communist Party and Vietnamese leadership have significantly hindered economic development and brought Vietnam to the threshold of the middle-income trap. Therefore, this difficulty is self-inflicted and, as it appears now, beyond the current regime's ability to remedy.

Another significant issue is the importance of agricultural products in Vietnam's export portfolio, particularly rice and aquaculture, and the worsening salination, which is currently and will continue to cause severe damage to Vietnam's agriculture and aquaculture processes. It is difficult to dispute those flaws in the policy development for science and technology, along with issues in agricultural and aquacultural practices, will lead to numerous negative consequences for Vietnam's economic growth and foreign trade in the future.

2.3. Consequences of Political Institutions and Regional Geopolitical Issues

2.3.1. Education

Regarding education, the educational system in Vietnam is described by Truyết (2025) and Binh (2025) as significantly outdated, failing to keep pace with the country's economic development and deteriorating in all aspects over time. Despite the workforce being affordable, diligent, and valuing education, there is a notable lack of skills due to the national education curriculum not adapting to the employment market's needs. This situation is compounded by a rampant culture of diploma fraud, particularly prevalent among government officials. A notable example is Intel's inability to recruit sufficient local staff upon entering the Vietnamese market. Learning from Intel's experience, Samsung has sent Vietnamese employees abroad for training. In 2021, Apple had to employ staff from the U.S. for its operations in Vietnam as the local infrastructure began. The poor state of infrastructure is evident from the condition of significant ports, roads, bridges, utilities and widespread pollution.

In Vietnam, the single-party regime has delegated economic control to a small circle of loyalists and cronies. This is not due to a lack of awareness by the government but rather a deliberate strategy, as the leadership seems to prioritize implementing and enforcing projects

that offer their personal benefits. This approach has led to the rise of a "project-based economy". Klingler-Vidra and Wade (2020) point out that "...the Vietnam 2035 report, which was widely released in February 2016, recommends that the government 'strengthen' and 'coordinate' its science and technology system as a priority to 'avoid falling into the middle-income trap and falling behind' (World Bank & Vietnam Ministry of Planning and Investment, 2016). In November 2018, Dr. Chu Ngọc Anh, the Minister of Science and Technology of Vietnam, declared, "Vietnam needs to develop a national strategy" (Akhaya, 2018). Klingler-Vidra and Wade (2020) report that "Immediately after the release of the Vietnam 2035 report in May 2016, Government Resolution 35 sets further targets to support innovative startups. The targets include a plan to create 5,000 small and medium-sized enterprises focusing on science and technology and 30 high-tech enterprises and development centers between 2016 and 2020. Klingler-Vidra and Wade (2020) lament that, like many of the targets mentioned before; for example, in 2011, the announcement to train 80,000 engineers, technicians, and managers of small and medium-sized enterprises by 2020 gave these numbers without any basis or analysis."

2.3.2. Corruption Issues

The Party rules and degree supersede national law, adhering to the principle of "the Party nominates, the people elect", or more accurately, "the Party appoints". The "furnace burning" (Đốt lò) campaign initiated by the late General Secretary Nguyễn Phú Trọng and now intensified by the new General Secretary Tô Lâm, ostensibly continues to target political adversaries.

On a larger scale, the project to implement Resolution No. 18-NQ/TW of the 12th Party Central Committee (issued in 2018) currently, "Streamlining the administrative apparatus: The Second Renovation of the Country," by General Secretary Tô Lâm, is even more insidious than the goal of the furnace campaign of the late General Secretary Nguyễn Phú Trọng. It aims to eliminate political rivals, consolidate personal power, and seize lucrative economic assets for the Ministry of Public Security and the Hưng Yên interest group. The administrative machinery continues to perform poorly. The legal framework is cumbersome and often presents contradictions between Party and governmental laws, with some not meeting international standards. The bureaucracy still encompasses two vast and costly systems, even post-streamlining the state and the Party. The personnel of both the Party and the state lack professional competence, ethical integrity in administration, and transparency.

Corruption occurs everywhere and will continue to do so. Furthermore, the pervasive corruption in Vietnam is a product of the single-party system, essentially embedded in the DNA of the communist regime, its institutions, and the structure of public authority. Created and condoned by the **polity itself**, this severe corruption permeates all levels from top to bottom, acting as a super virus that spreads across various sectors in Vietnam to such an extent that even party-aligned leaders and media acknowledge its excessive severity. The investigations of the "furnace burning" campaign have revealed numerous corruption cases that have cost the country billions of dollars, involving high-ranking party members appointed by the Party through its personnel selection process for positions of power, some of whom have subsequently been prosecuted, removed and, in some cases, sentenced to death.

However, those who replace them will continue to operate within the same system of rewards, punishments, and incentives; therefore, they are likely to follow in their predecessors' footsteps, that is, they will engage in corruption. This indicates that anti-corruption efforts in the Vietnamese style will never be successful because the political structures that encourage corruption remain intact. Consequently, without institutional change, the behavior of those within the system will not change: the approach of "old vase, new wine" will not resolve the corruption issue in Vietnam.

Evidence that corruption remains a persistent issue in Vietnam is reflected in the following media reports. Despite a prolonged and extensive anti-corruption campaign proclaimed by the late General Secretary Nguyễn Phú Trọng, who made empty promises using slogans such as "no forbidden zones, no exceptions, regardless of who it might be". Regardless, mainstream media report in the first half of 2024, the police detected over 3,000 cases of corruption, economic crimes, and smuggling—an increase of 21.63% compared to the same period in 2023.

Prosecutorial authorities initiated 2,836 instances involving 5,975 suspects for corruption, economic, and official misconduct; the Government Inspectorate uncovered violations involving over 92.739 trillion Vietnamese dong and 299 hectares of land; and throughout 2024, authorities detected 956 corruption and official misconduct offenses and prosecuted 2,418 defendants for corruption-related crimes (<https://baochinhphu.vn/6-thang-dau-nam-phat-hien-hon-3000-vu-pham-toi-tham-nhung-kinh-te-buon-lau-102240708174427336.htm>).

2.3.3. Geopolitics

Regarding strategic geography, the Philippines has agreed to allow the United States access to all nine military bases (The Economist, February 21, 2023) around the Luzon archipelago, an area also contested between the Philippines and China. Japan has doubled its defense budget, and the emergence of the AUKUS and QUAD alliances and several other ongoing shifts in the region could negatively impact Vietnam's significance in the future Asian strategy of the U.S. and its allies.

In a world thrown into disarray, with the South China Sea at the heart of this turmoil, U.S. sanctions against China have disrupted supply chains, compelling the U.S. to seek alternative sources to address inflation driven by demand-pull and cost-push factors.

III. Requirements for a Strategy to Develop an Economy

An interesting point by Professor Lewis (1955) suggests that governments can slow economic growth by allocating too many societal resources to constructing monuments or town halls, as the profitability of these projects is very low. Nevertheless, the ongoing maintenance costs after completion are exceedingly high. Published in 1955, his critique was directed at such constructions in Russia and the Eastern Bloc. However, in the past two decades, Vietnamese domestic media has proudly reported on many large-scale monument constructions, village gates, and massive cultural establishments. Recently, opulent museums with astronomical annual operating and maintenance costs, while hospitals lack both facilities and medications, students, the nation's future, must cross rivers in styrofoam boxes due to the absence of bridges and share packets of instant noodles daily.

3.1. Elements Needed for a Contemporary Development Strategy over Time

For sustainable development, a nation's economy must continually grow and evolve, especially in developing countries, to avoid what Gill and Kharas (2008) describe as falling into a "middle-income trap". This trap hypothesizes that countries advancing from "higher low-income" to "low middle-income" status may experience a slowdown in growth that they had seen in previous decades. This slowdown occurs because the increase in production productivity does not keep pace with rising production costs; in other words, the productivity growth lags behind the increase in production costs.

Sustainable development means that the economy must continue to grow; it cannot just grow for a period, slow down, and then stagnate. Doner and Schneider (2016) noted, "Of the 101 middle-income economies in 1960, only 13 had achieved high-income status by 2008. Today's middle-income countries are caught in a developmental nutcracker: '... unable to compete with low-income, low-wage economies in export manufacturing and unable to compete with advanced economies in high-skill and high-technology areas'"

Rapid changes in the international marketplace over the past three decades have made governments' roles and responsibilities in correctly designing, implementing and enforcing policies more challenging and complex. Kang and Paus (2020) argue that these are challenges that successful technological adopters in East Asia, such as South Korea, Taiwan, and Singapore, have not faced previously. Therefore, the need for "government to get it right", as Professor Lewis advocated, becomes crucial if a country hopes to avoid falling into the middle-income trap.

Furthermore, Kang and Paus (2020) argue that an exclusive focus on domestic factors is insufficient to provide a comprehensive framework for understanding or escaping the middle-

income trap; a situation in which a country's growth slows after reaching middle-income levels. Such an approach fails to account for two critical challenges faced by middle-income countries:

- i. The complex internal difficulties involved in upgrading and strengthening domestic innovation capabilities require practical synergy and interaction among interrelated factors.*
- ii. The impact of external forces, which evolve and, when combined with domestic factors, create substantial obstacles to advancing innovation-driven economic activities.*

Given these challenges, Kang and Paus (2020) assert that any effective strategy to overcome the middle-income trap must be rooted in economists' and political scientists' research and theoretical insights.

Additionally, Kang and Paus (2020) believe that focusing solely on domestic factors does not provide a valuable framework for understanding or escaping the middle-income trap. Such an approach overlooks two critical challenges that middle-income countries face:

- (i) Promote the development of domestic productive capacities to upgrade and increase the growth rate of productivity development of production factors (capital and labor force);*
- (ii) Timely response to or exploitation of international interactions with domestic factors, as these interactions will change over time and may present challenges to domestic innovation or opportunities for plans to increase productivity growth; and*
- (iii) Understand the nature of government-private sector linkages and simultaneously leverage them to maximize productivity growth.*

Moreover, Raj-Reichst (2020) emphasizes that recommendations for escaping the middle-income trap and catching up with high-income economies require essential prerequisites. Chief among them is the presence of a high-quality higher education system, encompassing both natural and social sciences; substantial government investment in research and development; and the implementation of difficult structural reforms to phase out outdated companies and obsolete technologies that no longer align with the demands of the modern era.

At the same time, Raj-Reichst (2020) highlights that countries that have successfully transitioned beyond middle-income status, such as South Korea and Taiwan, have benefited from strong support from large domestic enterprises. These businesses have played a crucial role in enhancing education systems to meet the growing demand for a highly skilled and adaptable workforce, ensuring that national economies remain competitive in an ever-evolving global landscape.

3.2. Evolution of Development Strategies over Time

For nearly a century, following John Maynard Keynes's (1936) introduction of Keynesian Economics as a macroeconomic framework aimed at pulling the global economy out of the Great Depression that began in the late 1920s, two contrasting economic development strategies emerged. First is the inward-looking development strategy also known as the Prebisch-Singer Hypothesis or Prebisch-Singer Thesis, rooted in Keynesian economic theory (Singer, 1998). The second is the outward-looking development strategy, which is based on Neoclassical economic theory and later became known as the Washington Consensus economic development strategy.

The term "Washington Consensus" was first introduced in 1989 by British economist John Williamson. International financial institutions heavily promoted the outward-looking development strategy, such as the International Monetary Fund (IMF), the World Bank, and the U.S. Treasury Department. Developed nations strongly supported it during the 1980s and 1990s. This approach mandated policies emphasizing free-market principles, including trade liberalization, privatization, and financial liberalization, as well as fiscal and monetary policies aimed at reducing fiscal deficits and controlling inflation. These policies set the foundation for the modern era of globalization.

In contrast, the Prebisch-Singer Hypothesis argues that the long-term decline in the relative prices of primary commodities compared to manufactured goods leads to deteriorating terms of trade for economies dependent on primary product exports. Raúl Prebisch and Hans Singer developed the inward-looking development strategy in the late 1940s, and it has since been a cornerstone of Dependency Theory and policies such as import-substitution industrialization (ISI). This approach served as the foundation for Latin American governments to subsidize the import of machinery and equipment while fostering workforce development, ultimately aiming to strengthen domestic market purchasing power.

An interesting development in the transition between these two aforementioned competing economic paradigms was the work of Douglas C. North, recipient of the 1993 Nobel Prize in Economics and his co-author Robert P. Thomas. In their seminal study, *The Rise of the Western World* (1973), they concluded that **effective economic institutions** are the primary determinants of **long-term economic growth, as measured by a per capita long-run rise**. Their research emphasized that societal progress would stagnate without incentives for economic initiative.

North and Thomas (1973, p. 2) further argued that:

"First we must isolate the type of growth of income which results from increases in the inputs of productive factors (land, labor, capital). Such direct increments lead to overall (extensive) growth but not necessarily to increases in income per person. Two situations can precipitate the latter sort of per capita improvement which we designate as true economic growth. On the one hand, the actual quantities of the per capita factors of production may increase. On the other, an increase in efficiency on the part of one or more of the factors of production will result in growth. Such increase of productivity can come about through realization of economies of scale, because of improvements in the quality of the factors of production (better educated labor, capital embodying new technology) or because of a reduction in those market imperfections that result from uncertainty and information costs, or as a result of organizational changes that remove market imperfections."

Additionally, according to North and Thomas (1973), economic historians have long attributed technological change as the primary driver of Western economic growth, given that European economic history is deeply intertwined with the Industrial Revolutions. More recently, scholars and experts have argued that investment in human capital is the key factor behind economic expansion. Today, researchers are beginning to explore the growth-enhancing effects of reducing market information costs. Indeed, each of these factors—technological innovation, human capital investment, and improved market efficiency—has significantly contributed to increased economic output. Economies of scale have also played a crucial role, mainly through production for expanding markets. Since economic growth is measured by **a per capita long-run rise**, population growth is an additional variable in the determination of sustained economic growth.

North and Thomas (1973) lament that these widely cited explanations are innovation, economies of scale, education, and capital accumulation. Economic historians and economists have consistently referenced them as determinants of economic growth. However, they identify a critical flaw in this reasoning:

"If all that was necessary for economic growth were investment and innovation, why have some societies failed to achieve the desired outcomes?"

To address this fundamental question, North and Thomas (1973, p.2) argue that the factors listed above—technological progress, economies of scale, education, and capital accumulation—are not the causes of growth; **they are growth**. Long-term economic growth, they contend, will not occur unless the existing economic organization is efficient.

According to North and Thomas (1973, p. 2):

“Growth will simply not occur unless the existing economic organization is efficient. Individuals must be lured by incentives to undertake the socially desirable activities. Some mechanism must be devised to bring social and private rate of return into closer parity. Private benefits or costs are gains or losses to an individual participant in any economic transaction. Social costs or benefits are those affecting the whole society. A discrepancy between private and social benefits or costs means that some third party or parties, without their consent, will receive some of the benefits or incur some of the costs. Such difference occurs whenever property rights are poorly defined or not enforced, if the private costs exceed the private benefits, individuals ordinary will not be willing to undertake activity even though it is socially profitable.”

North and Thomas (1973) emphasize that long-term growth occurs only when total national income rises faster than the population. Conversely, a static or non-growth state does not generate a sustainable increase in per capita income, even though average income may fluctuate in short—or medium-term cycles. A state of stagnation is inevitable when individuals lack the motivation or incentives to engage in activities that drive economic growth.

As North and Thomas (1973) assert, an undeniable truth is that “while some individuals in society may choose to **disregard incentives** for positive economic behavior, both theory and historical experience—across East and West—have demonstrated that the vast majority of people prefer more goods to fewer and act rationally in pursuit of their interests.” For an economy to grow, a significant portion of the population must act rationally in pursuit of their welfare. However, economic progress under any political system remains unattainable if the institutional framework fails to provide the necessary incentives and motivations for positive economic initiatives.

Even the most resource-rich economies risk stagnation without a system encouraging innovation, entrepreneurship, and productive investment. It is not merely the actions of individuals that drive development; it is the structural policies and institutional environment that shape their choices and opportunities.

In concluding remarks, North and Thomas express their aspiration that they have “only just begun to explore the study of economic organization.” More than a mere reflection, their words serve as an invitation—an open challenge—to scholars and practitioners alike. If their research has “encouraged or provoked others to take up this challenge,” they believe it has fulfilled its purpose, transforming what might have been an ending into a new beginning.

A particularly noteworthy moment in economic thought occurred nearly 40 years later, when outward-looking development strategies had lost much of their appeal, and the global political landscape had shifted toward populist ideologies. Three future Nobel Laureates—Daron Acemoglu, Simon Johnson, and James Robinson (awarded the Nobel Prize in Economics in 2024)—alongside Thaicharoen (2003), appeared to have taken up the intellectual challenge set forth by North and Thomas.

Their groundbreaking study on the historical failures of nations led them to a conclusion that directly echoes North and Thomas’ insights:

The “*mechanism*” within an economy that encourages and incentivizes individuals to engage in socially beneficial economic activities while ensuring a closer alignment between private and social benefit is what North and Thomas had alluded to are inclusive political institutions and inclusive economic institutions.

In their seminal 2012 work, *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*, Acemoglu and Robinson conclude that prosperity and economic success are achieved through the establishment of inclusive political institutions, which allow broad-based participation in governance and inclusive economic institutions, which ensure equitable distribution of economic benefits across society. Conversely, nations that adopt extractive political institutions, designed to consolidate power within a small ruling elite, and **extractive economic institutions**, which enable that elite to monopolize national wealth, ultimately fail to achieve sustainable

development and long-term prosperity. These institutional structures perpetuate inequality, hinder innovation, and **suppress economic dynamism**, leaving such countries trapped in cycles of stagnation and instability.

Acemoglu and Robinson highlight the divergent perspectives among scholars, experts, economists, and commentators regarding the fundamental causes of national poverty. Some emphasize geography, arguing that unfavorable physical conditions are the primary determinants of a country's economic struggles. Others point to cultural factors, contending that deeply ingrained societal traits or a lack of employment opportunities have hindered prosperity.

Meanwhile, economists and policymakers argue that poverty stems not from immutable conditions but from governance failures. They assert that rulers, due to ignorance or misguided priorities, have historically implemented ineffective policies and strategies, thereby stifling national development. These competing explanations underscore the complexity of economic disparity and the critical role of institutions in shaping a nation's fate.

Acemoglu and Robinson's work reinforces the indispensable role of polity in shaping economic destiny, further cementing the argument that sustainable economic development is not merely a function of investment or technological progress but fundamentally a product of well-structured, inclusive institutions that create the right incentives for broad-based participation and innovation.

As history unfolds, the lessons drawn from these seminal economic thinkers remain ever relevant. They offer that poverty is simply due to rulers not knowing what is needed to make their countries prosperous and having pursued inappropriate/ineffective policies and strategies in the past.

Acemoglu and Robinson (2012) argue that political and economic institutions are shaped by the polity governing a nation. While inclusive institutions promote prosperity, ruling elites—such as dictators or the Communist Party—often prefer extractive institutions to entrench power and exploit resources. This divide determines whether a nation thrives through shared prosperity or remains trapped in authoritarian control and stagnation.

According to Acemoglu and Robinson (2012), the power balance between the majority and the ruling elite is the primary force shaping institutions and their political and economic outcomes. These institutions establish power dynamics rules, determining how governments are formed and which branches hold authority. Political institutions dictate who wields power and how it is exercised. When power is concentrated in a narrow, unchecked elite, political institutions become authoritarian, as seen in absolute monarchies that dominated much of history.

Acemoglu and Robinson (2012) assert that pluralism and inclusive economic institutions are strongly correlated. However, this is not a direct or absolute relationship, as evidenced by countries with pluralistic political structures like Somalia. The key to understanding why nations like South Korea and the United States have developed inclusive economic institutions lies in political pluralism and strong, centralized states capable of enforcing order and governance. In contrast, Somalia presents a case where political power has long been widely distributed—almost pluralistic—but lacks a centralized authority to regulate or enforce laws. Instead, Somali society remains fractured into deeply hostile clans, where power is dictated not by institutions but by the firepower of competing clans.

Acemoglu and Robinson (2012) argue that this power distribution does not lead to inclusive institutions but chaos. At its root, the Somali state lacks any form of political or state centralization and is incapable of enforcing even a minimal amount of law and order to support economic activity, commerce, or even basic security for its citizens. Max Weber (2002) coined a famous and widely accepted phrase to describe this state as “the monopoly of legitimate violence in society.”

In their work, Acemoglu and Robinson also show a strong synergy between economic and political institutions. Extractive political institutions concentrate power in the hands of small elites or the ruling class and place few constraints on exercising this power. This ruling class often structures economic institutions to extract resources from the rest of the society. Thus, extractive or bloodsucking economic institutions naturally accompany extractive political institutions. Bloodsucking economic institutions inherently depend on extractive political institutions for their existence. Political institutions that share and grant broad power will tend to uproot the extractive

economic institutions, erecting barriers to forming or operating markets so that only a minority can benefit.

On the inherent issues of political institutions, Acemoglu and Robinson (2012) highlight the reinforcing cycle between extractive political institutions and extractive economic institutions, creating a powerful feedback loop. Extractive political institutions enable the ruling elite to control political power and shape economic institutions with minimal constraints or opposition.

Moreover, extractive political institutions allow the elite to design the structure and evolution of future political institutions, ensuring their continued dominance. Extractive economic institutions, in turn, enrich the ruling class, and their financial wealth and power further entrench their political control, perpetuating a cycle of elite domination and institutional stagnation.

Nations differ in economic success due to variations in institutional structures, which establish the rules shaping economic activity and individual incentives. However, Acemoglu and Robinson (2012) argue that national poverty is a direct consequence of governance by a narrow elite. This minority structures society to serve its interests at the expense of the broader population. Political power is narrowly concentrated and strategically exercised to preserve elite wealth and dominance, entrenching systemic inequality and hindering broad-based economic progress.

From a different perspective, Acemoglu and Robinson (2012) argue that inclusive economic institutions foster a market economy that promotes broad participation. Such institutions not only allow individuals the freedom to pursue careers best suited to their talents but also ensure a level playing field where everyone can do so. Under inclusive economic institutions, innovators and entrepreneurs can launch businesses, workers are incentivized to engage in more productive activities, and inefficient firms are naturally replaced by more competitive enterprises. Furthermore, Acemoglu and Robinson argue that inclusive economic institutions enable and incentivize broad public participation in economic activities, allowing individuals to maximize their talents and skills while freely pursuing their aspirations.

For economic institutions to be truly inclusive, they must establish clearly defined property rights, uphold an impartial legal system, and provide public services that ensure a level playing field where individuals can trade, contract, and compete fairly. Additionally, inclusive institutions must facilitate the entry of new businesses and allow individuals the freedom to choose their professions, fostering a dynamic and competitive economic environment.

At the same time, inclusive economic institutions serve as a catalyst for two key drivers of prosperity: technology and education. Sustainable economic growth is almost always accompanied by technological advancements, which enhance the productivity of labor, land, and capital—optimizing existing resources such as infrastructure, machinery, and human capital to drive economic progress. In contrast, extractive economic institutions are designed not to foster broad-based growth but to concentrate wealth and resources. These institutions are deliberately structured to extract income and wealth from one segment of society to benefit another, perpetuating inequality and hindering long-term development.

Acemoglu and Robinson (2012) observe that extractive institutions have been historically prevalent due to their inherent logic and appeal to ruling elites. They can generate limited economic prosperity while simultaneously concentrating wealth and power in the hands of a small ruling class. For this model of growth to function, political centralization is essential. Once established, the state—or the ruling elite controlling it—has an incentive to invest, create wealth, and encourage others to do the same, not for the broader benefit of society but to extract resources from productive individuals and enterprises. In some cases, these elites may even mimic elements of inclusive economic institutions and market mechanisms, not to foster genuine prosperity but to enhance their capacity for extraction and control.

Growth generated by extractive institutions fundamentally differs from that fostered by inclusive institutions—most critically, it is unsustainable. By design, extractive institutions fail to promote creative destruction (Schumpeter, 1947) and, at best, can only produce limited technological progress. The absence of creative destruction and innovation is not the only reason why growth under extractive institutions is inherently constrained. When these institutions concentrate wealth and power within a ruling elite or minority leadership, they create strong incentives for rival factions within the system—whether political allies, cronies, or internal

challengers—to compete for control. As a result, internal power struggles and instability become defining features of extractive regimes. This internal conflict exacerbates inefficiency and frequently undermines political centralization, sometimes leading to the complete collapse of law, order, and governance—plunging societies into chaos and disorder.

Acemoglu and Robinson (2012) also argue that the growth generated by extractive institutions is inherently short-lived, even if it appears spectacular during its peak. A striking example is the rapid development of the Soviet Union, which astonished the Western world throughout the 1920s, 1930s, 1940s, 1950s, and 1960s, with lingering admiration even into the 1970s. The two scholars also conjecture that China, under Communist Party rule, represents another case of a society experiencing growth under extractive political institutions. However, like the Soviet Union, China is unlikely to achieve sustainable long-term growth unless it undergoes a fundamental polity transformation toward inclusive political institutions.

IV. Macroeconomic Performance of Vietnam

4.1. Vietnam's Economy

From empirical evidence and economic theory, renowned scholars and experts have identified significant challenges and structural obstacles for an emerging economy like Vietnam. Having recently transitioned from a **low-income** economy to a **low-middle-income** economy, Vietnam now faces the imperative of sustained economic growth to escape the middle-income trap and advance to **high-income** status, with the long-term goal of becoming a **high-income**, advanced economy.

However, despite these well-documented challenges and the economic strategies proposed by experts, Vietnamese officials often engage in contradictory policymaking—saying one thing and doing another. This inconsistency is not accidental; instead, it **creates and maximizes opportunities for corruption and vested interests, further complicating the nation's path toward sustainable and inclusive development as the Vietnamese officials often say one thing but do another.**

At the outset of Đổi Mới, Vietnam was a poor and underdeveloped nation. As it pursued an outward-looking development strategy, it benefited from financial subsidies and preferential loan programs from international financial institutions such as the International Monetary Fund (IMF) and the World Bank and foreign aid from developed economies. These global financial inflows, combined with state-controlled national resources, provided party members and officials with ample opportunities for corruption.

By the 2010s, as Vietnam transitioned into a low-middle-income country, it no longer received the same level of financial support from international institutions through preferential loans and aid. Moreover, as a low-middle-income nation, Vietnam was expected to contribute financially to poorer countries rather than rely on external assistance. However, by this time, state-controlled national resources had been severely depleted—primarily due to corruption, further limiting the country's economic prospects.

During this decade, many leading economic development experts and institutions predicted that Vietnam had the potential to rapidly ascend in both income and technology, emerging as a new East Asian tiger—but only if the Communist Party leadership and government officials implemented and executed development strategies as advised by Professor Lewis.

However, proper policy implementation requires substantial capital investment and limits opportunities for corruption and personal gain. As a result, party leaders and government officials deliberately mismanaged policies to maximize opportunities for corruption and power consolidation, prioritizing their interests over national progress.

The high-profile corruption investigations launched under General Secretary Nguyễn Phú Trọng's "blazing furnace" anti-graft campaign—including cases involving Việt Á Company, the Rescue Flight Scandal, Vạn Thịnh Phát Group, FLC Group, and irregular corporate bond

issuances—have exposed widespread misconduct, inflated project costs, delays, and substandard results, all of which have inflicted enormous damage on the national economy.

Ironically, these corrupt officials were once touted by the Communist Party as exemplary party members, praised for their sense of duty, moral integrity, and strict adherence to party discipline. They were promoted into key leadership positions through the Party's personnel appointment process under the pretense of being "public servants" dedicated to the people—a stark contradiction to the reality of systemic corruption and mismanagement.

Regarding the government apparatus, the Communist Party rules stand above national law, operating under the principle of "the Party nominates, the people elect"—or, more accurately, "the Party appoints." Meanwhile, the "blazing furnace" anti-corruption campaign serves as a tool to eliminate political rivals, while the public administration system remains deeply inefficient and dysfunctional.

Regulatory complexities arise from contradictions between Party and government laws, some of which do not align with international standards. The system operates with two massive and costly bureaucracies—the *state apparatus* and the *Communist Party*. Personnel within both lack professional competence, administrative integrity, and transparency. Corruption, social injustice, and systemic inefficiencies are rampant, posing significant challenges for foreign investors.

4.2. Selected Statistical Data from the International Monetary Fund (IMF)

Table 1 below presents *Vietnam's* foreign trade values with the *United States, China, the European Union, the global market*, and other key macroeconomic indicators. These figures are sourced from the IMF's 2024 Article IV Consultation Report on Vietnam and statistical data from the IMF's Direction of Trade Statistics (DOTS) database.

Notably, the import value, export value, and trade balance figures (sections 1-a, 1-b, 1-c; 2-a, 2-b, 2-c; 3-a, 3-b, 3-c; and 4-a, 4-b, 4-c in the left column of **Table 1**) exclusively report transactions based on trade values measured in millions of U.S. dollars, unless otherwise specified. These figures strictly represent the values recorded under export and import accounts and their net difference (trade surplus or deficit) in the current account transactions. In other words, the reported data in sections 1, 2, 3, and 4 of **Table 1** do not include net unilateral financial transfers within the current account framework.

Turning to macroeconomic indicators and statistical data, a fundamental principle in both *Statistics* and *Econometrics* is that statistical data alone cannot prove any argument, theory, or hypothesis; instead, they serve as supporting evidence or a basis for interpretation, recommendations and trend analysis. ***Under this principle, the selected economic indicators in Table 1 highlight several key points and warn about upcoming economic challenges and the potential hardships facing the economy and the Vietnamese people.***

- i. One key indicator used in economic theory to assess an economy's openness and degree of integration is the sum of total export and import values as a percentage of GDP—or the sum of export value as a percentage of GDP and import value as a percentage of GDP. According to IMF statistical data, cited in **line 6-c of Table 1**, Vietnam's trade openness ratio has fluctuated between 144.40% and 178.10% of GDP in recent years—a remarkably high level. This underscores Vietnam's extreme dependence on and deep entanglement with global economic conditions.
- ii. Vietnam's trade surplus with the United States 2023 was **\$83,205.42 million**, as indicated in **line 1-c of Table 1**.
- iii. Vietnam's trade deficit with China in 2023 amounted to **-\$48,903.06 million**, as shown in **line 2-c of Table 1**.
- iv. According to **line 3-c of Table 1**, Vietnam's trade surplus with the European Union in 2023 was only **\$9,499.67 million**.
- v. The capital and financial account balance is particularly concerning, as reflected in **line 5-d of Table 1**; the IMF projected figures indicate deficits of **-\$2.80 billion** and **-22.40 billion** in 2023 and 2024, respectively.

Table 1: Vietnam – Selected Economic Indicators (*measured in millions of U.S. dollars, unless otherwise noted*)

Foreign trade sector	Period					
1. Vietnam to/from USA	2010	2015	2020	2021	2022	2023*
1-a. Export product value	14.238,13	33.475,03	77.151,20	96.390,16	109.111,56	97.019,66
1-b. Import product value	3.766,91	7.792,51	13.758,47	15.020,63	14.438,83	13.814,24
1-c. Export (+)/import (-) super value	10.471,22	25.682,52	63.392,73	81.369,52	94.672,73	83.205,42
2. Vietnam to/from China	2010	2015	2020	2021	2022	2023*
2-a. Export product value	7.308,80	16.567,69	49.094,89	56.200,56	58.464,69	61.283,59
2-b. Import product value	20.018,83	49.441,12	84.374,28	109.825,13	117.700,34	111.186,65
2-c. Export (+)/import (-) super value	12.710,03	-32.873,44	-35.279,38	-53.624,57	-59.235,65	-48.903,06
3. Vietnam to/from Europe Union	2010	2015	2020	2021	2022	2023*
3-a. Export product value	8.746,21	24.123,31	30.332,87	35.067,90	40.935,11	23.313,91
3-b. Import product value	5.053,73	8.674,85	13.121,79	14.833,67	13.458,46	13.814,24
3-c. Export (+)/import (-) super value	3.692,48	15.448,46	17.211,07	20.234,23	27.476,65	9.499,67
4. Vietnam to /from entire world	2010	2015	2020	2021	2022	2023*
4-a. Export product value	70.249,10	160.261,88	277.270,84	330.432,00	364.262,42	345.093,23
4-b. Import product value	83.364,78	174.965,99	258.784,44	324.832,95	350.869,49	318.466,94
4-c. Export (+)/import (-) super value	13.115,68	-14.704,12	18.486,39	5.599,05	13.392,93	26.626,29
5. Foreign trade (billion USD)	2010	2020	2021	2022	2023*	2024**
5-a. Current account	-4,30	15,10	-8,10	-1,40	25,10	14,10
5-b. Capital & Financial Accounts	6,90	8,50	30,80	9,50	-2,80	-22,40
5-c. Value of Errors & Omissions	-3,70	-6,90	-8,40	-33,60	-16,60	0,00
5-d. Trade Balance	-1,10	16,60	14,30	-22,70	5,60	-8,30
6. Openness of the Economy	2010	2020	2021	2022	2023*	2024**
6-a. Export value as % of GDP	69,70	81,60	91,40	81,60	80,90	81,10
6-b. Import value as % of GDP	74,70	72,70	86,70	85,00	75,80	73,10
6-c. Openness of the economy	144,40	154,30	178,10	166,60	166,70	154,20
7. GDP (billion USD)	103,60	346,30	370,10	408,00	433,70	467,90
8. Economic growth rate (%GDP)	6,80	2,90	2,60	8,10	5,00	6,10
9. FX reserves (billion USD)	12,40	95,20	109,40	86,7	98,70	84,00

Source: Report of the IMF's 2024 Article IV Consultation with Vietnam, and Direction of Trade Statistics (DOTS, database);

* Preliminary data; **Projected by IMF

Another critical figure to consider is Vietnam's total *global trade surplus*, which includes trade with the U.S., China, and the EU. According to **line 4-c of Table 1**, Vietnam's total trade surplus 2023 amounted to only \$26,626.29 million. Meanwhile, despite Communist Party leaders and government officials touting Vietnam's economic growth as the strongest in Southeast Asia, **line 5-d of Table 1** reveals Vietnam's trade balances in 2020, 2021, 2022 were 16.6 billion, 14.30 billion, -22.70 billion, respectively. And, the IMF projected corresponding figures for 2023 and 2024 are 5.60 billion and -8.39 billion, respectively. These figures highlight **Vietnam's fluctuating trade performance** and underscore the **challenges in sustaining a stable trade surplus as well as economic growth amid shifting global economic conditions**.

Besides, returning to the selected statistical data in **Table 1**, the **officially reported** trade deficit between Vietnam and China in 2024 stands at -\$48,903.06 million in 2023. However, given Vietnam's shared long border with China and the severe levels of corruption within the country, it is reasonable to speculate that a significant volume of Chinese goods enters Vietnam through **illicit channels**. As a result, Vietnam's actual trade deficit with China is likely to be **far greater than the reported \$48,903.06 million**. Additionally, if we exclude the \$16 billion in remittances and account for the unregistered value of smuggled Chinese imports, Vietnam's trade balance in 2024 and recent years would likely hover around zero or even dip into further deficit territory.

V. Reflections as a Conclusion

Although it may be on a minimal scale that "**Western culture does not convey Eastern teachings**," the fundamental contradiction within Vietnam's "socialist-oriented market economy" remains evident—it attempts to merge two inherently opposing economic systems. Within this model:

- i. The state-owned sector is positioned as the spearhead of the economy.
- ii. The "Đổi Mới" reforms primarily involve dismantling some of the barriers imposed by the state itself, leading to systemic national economic challenges. These adjustments are framed as a transition toward a "socialist-oriented market economy," allowing limited private-sector participation.
- iii. Economic activity and wealth are concentrated within a small elite, which includes Party members, vested interest groups, and politically connected businesses (crony enterprises).
- iv. Corruption is institutionalized and entrenched at every level of governance, enabled and tolerated by the system.
- v. Violence and coercion are used to maintain the Party's rule under the doctrine of "minority rules and majority are exploited". This governance model is steering Vietnam into the middle-income trap, a predicament the leadership appears incapable of escaping—unless they acknowledge and address these fundamental structural flaws.
- vi. Vietnam's long-term economic trajectory hinges on whether its leadership can recognize these systemic contradictions and implement genuine institutional reforms rather than continuing to reinforce a system prioritizing political control over economic efficiency.

The statistical data in **Table 1** presents a stark assessment of Vietnam's macroeconomic performance, indicating economic distress. One particularly alarming indicator—perhaps a painful reality for the nation—is in **line 5-b of Table 1** (Capital & Financial Account), which records a deficit of -\$22.40 billion. This negative value suggests that a substantial amount of Vietnam's capital has exited the country. Moreover, it is undeniable that the labor force lacks the financial capacity to engage in such capital outflows. Instead, these transactions are primarily carried out by wealthy individuals and elites through mechanisms such as: (i) EB-3 and EB-5 investor visa programs; (ii) funding for overseas education; (iii) foreign citizenship purchases; (iv) acquiring properties and business assets abroad; (v) outward Foreign Direct Investments; and (vi) overseas Portfolio Investments.

In terms of propaganda, Vietnam's official media, directed by the Central Propaganda Department, always preach progress in all aspects of society, surpassing its Southeast Asian neighbors thanks to the leadership of the Party and the government. This is contrary to the comment of the current General Secretary To Lam at a group discussion session, within the framework of the 9th extraordinary session of the National Assembly on February 13, 2025: "Looking at Singapore, in the past, they said that going to Chợ Rẫy Hospital for medical treatment was a dream. Looking back 50 years, now we dream of going there for medical treatment."

While it is often argued that "Eastern governance models do not necessarily align with Western principles", a more fundamental consideration is required. Rather than persisting with the "blazing furnace" anti-corruption campaign and merely streamlining the administrative apparatus, the Communist Party of Vietnam and government officials should change the government structure; in other words, by changing the polity, Vietnam can establish and implement inclusive political and economic institutions, laying the foundation for *a new era of national rise*. This approach aligns with historically proven sustainable economic development models, as recognized by Nobel Prize-winning economists, who have demonstrated that nations achieving long-term prosperity have consistently pursued similar institutional transformations.

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On the Application of Closure of the Gestalt to Reinforcement Learning

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Abstract

The target audience of this paper is not behavioral psychologists. Our audience is one that seeks utility by the application of broad principles of behaviorism in areas such as business: students and practitioners of finance, marketing, operations, and similar domains. That said, we explore the idea by Killen (2014) citing Premack that “it is not stimuli that reinforce actions, but rather actions that reinforce actions.” We offer that some kind of stimulus is necessary, that perception is essential, and, furthermore, that closure of a gestalt is often necessary. We offer the idea that “closure of the gestalt,” in addition to the Premackian idea of actions serving as reinforcers for other actions, can serve as a reinforcer. Furthermore, the perception of closure of a gestalt, provides a reinforcer than serves well in termination of a sequence or chain of behaviors. Finally, for students of business as well as practitioners, this idea has immediate application in diverse business areas, including finance, marketing, and operations. We provide examples from peer-reviewed literature.

I. Introduction

In all fairness, the concept offered here is but a codification of the obvious. Thomas Kuhn (1997) might refer to it as a “mopping up” operation rather than a breakthrough that results in a “paradigm shift.”

However, Isaac Newton, (Smith, 1997) arguably, “codified the obvious” when he derived the concept of “gravity” from observing an apple fall from a tree, or so legend would have it. Keeping that in mind, we offer that the idea presented here may have application and utility beyond abstract notions and provide examples.

II. Reinforcement as Action

“A reinforcing stimulus is defined as such by its power to produce the resulting change.” (Adams, M (2000) citing (Skinner, 1938)) Considerable discussion has emerged regarding this general definition.

Killeen (2014) offers in the title of his article that “Pavlov + Skinner = Premack,” that “all conditioning is Premackian,” and that Premack **“noted that it is not stimuli that reinforce actions, but rather actions that reinforce actions.”** [emphasis added]

III. Reinforcement and Perception of Stimuli

While this approach is intriguing, we offer that some kind of stimulus is necessary. In most cases, perception cannot be entirely eliminated as part of the process. Exceptions may exist in some “chains” of behaviors, but in many cases perception is essential. As such, theories of perception become relevant, particularly the well established concept of “closure of the gestalt.”

With “closure of the gestalt,” many observers see a circle and a square in Figure 1.

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Figure 1: Public Domain Example of Closure of Gestalts



Source: https://en.wikipedia.org/wiki/Gestalt_psychology

However, neither a circle nor a square are present. A series of unconnected lines are grouped in a pattern that resembles a square, and a series of unconnected arcs are grouped together in a pattern that resembles a circle. The German word for “pattern” is “gestalt.” And, the research in this area was initially conducted by German psychologists. The process of “connecting” these unconnected lines and arcs into square and circle is called **closure of the gestalt** in Gestalt psychology. Said differently, “closure of the gestalt” is completing the pattern. Somehow, without conscious intervention, the brains of many observers perform this task of completing the pattern, or closing the gestalt, with stimuli such as the example in Figure 1.

But, can this process serve as a “reinforcer,” increasing the frequency of a target behavior?

Similar ideas have been offered before, and our approach may not be entirely novel. For example, White (1936) wrote of the “completion hypothesis,” stating “completion of a fractional anticipatory reaction tends to reinforce,” possibly a somewhat similar concept given the question of “what is a ‘fractional anticipatory reaction.’”? Is it closure of a gestalt?

Given that White published in 1936, he may not have had the benefit of the insights of Gestalt psychologists. While their work was in progress by 1936, “closure” was a later concept. The initial work in the field of Gestalt psychology addressed the discovery of Phi motion.

Wagemans (2015) states, regarding the discovery of Phi motion in 1912, “What Max Wertheimer discovered was not the phenomenon of apparent motion—that is, the perception of motion between two stationary light sources flashing on and off at given intervals, but a special case. It concerned perceived motion without seeing an object moving” (citing Wertheimer (1912)). Motion pictures work this way, many stills are presented in rapid succession, and the viewer perceives motion rather than stills. Dobrez (2013) But, Dobrez asked (and we do too), “[H]ow it is that we perceive motion in pictures”? (Id.)

Better answers, beyond Phi motion alone, did not emerge until the 1940s. Wagemans (2015) AFTER White’s “fractional anticipatory reaction,” the Gestalt psychologists began to offer answers regarding the gestalt and the concept of closure. And, while neuropsychology has identified more granular models of perception, for purposes of identifying a class of reinforcers based on perception, stretching beyond the genius of Premack’s idea that one activity serves as a reinforcer for another, the concepts of Gestalt psychology and closure may be significantly more convenient.

We cannot act on a condition in the environment until we perceive it. And, in many cases, such perception requires “closure of the gestalt.” Lines and circles may be meaningless until they “close” into an image of an automobile bearing down upon us with the associated risk of injury due to an accident at an intersection. Headlights are not “headlights” as long as they are “circles” disconnected from the greater whole. The same remains for the outline of the automobile. In a real and practical sense, when we are in the crosswalk we must perceive the automobile in time to respond, and that perception is predicated on “closure of the gestalt.”

In evolutionary terms, this process has “survival value.”

IV. Target Audience: Business Students and Practitioners

The target audience of this paper is not behavioral psychologists. They may, or may not, perceive utility from the ideas presented. They may, or may not, respond with Premackian actions. Regardless, we are not addressing fine distinctions in behaviorism here.

Our audience is one that seeks utility by the application of broad principles of behaviorism in areas such as business: students and practitioners of finance, marketing, operations, and similar domains.

V. The Central Premise of This Paper

Stated simply, we offer the idea that “closure of the gestalt,” in addition to the Premackian idea of actions serving as reinforcers for other actions, can serve as a reinforcer. Furthermore, this stimulus, the perception of closure of a gestalt, provides a reinforcer than serves well in termination of a sequence or chain of behaviors. Finally, for students of business as well as practitioners, this idea has immediate application in diverse business areas, including finance, marketing, and operations.

VI. The 99 Cent Principle: Incomplete Gestalts and Dissonance

Marketing students and practitioners are familiar with the concept. The classic concept of pricing a penny short of some price has been axiomatic for roughly a century or more. In the United States, gasoline prices may be \$2.999, with a tenth of a penny missing. This creates a form of dissonance for the prospective customer, arguably a form of Festinger’s “Cognitive Dissonance,” with the result that attention is heightened, possibly improving the marketing communications ability to convert to sales.

As an aside, Morvan & O’Connor’s book (2017) “An analysis of Leon Festinger’s a theory of cognitive dissonance” has a citation count of 65,097 as of February 28th of 2025. (Hopefully, soon to be 65,098. Are you wondering who will publish the next two papers citing Morvan & O’Connor, pushing the number to 65,100?)

We offer the idea that what might be called the “99 Principle” is a combination of a perceptual mechanism resulting from closure of a gestalt, or attempted closure of a gestalt, with a form of Festinger’s Cognitive Dissonance. In this case, the dissonance is not from a contradiction as is typical but is from a static image that, when perceived, prevents or alternately stimulates the closure of a gestalt.

Although now bankrupt, the name and trademarks of a chain of discount stores was built on this: “The 99 Cent Store.” We note that the bankruptcy did not occur until after they began raising prices.

We offer the idea that, as essential as the concept of closure of the gestalt is in marketing and other areas, it does not stand alone in a vacuum. Again, closure of the gestalt may function as a reinforcer, perceptions of incomplete gestalts stimulating the initiation of a sequence of behaviors that ultimately lead to closure of the gestalt and termination of a particular iteration of the sequence.

In this sense, the incomplete gestalt may be viewed as a stimulus that initiates approach behavior. And, that has practical applications in diverse fields, ranging from the use of Kanban in operations management to the “99 Principle” in consumer behavior.

VII. Codification of the Obvious

More abstract variations exist. Financiers distribute risk in portfolios, but they invariably seek some form of optimality. Jorion (1992) Closure, in some form, terminates the search for optimality, at least for some period of time or so long as market conditions justify the structure

of the portfolio. To be sure, market conditions do change and Ren et al (2017) discussed this in their development of a “new dynamic portfolio strategy based on the time-varying structures of MST networks in Chinese stock markets, where the market condition is further considered when using the optimal portfolios for investment.” All of this sounds quite impressive, but almost certainly the binding constraint in their model is almost certainly what they call the “investment horizon.” But, how to choose the “investment horizon”? What window of time is “the right one?”

Is the answer perceptual in nature rather than rational? Does an analyst review market data, possibly with graphics, and closure of a gestalt occurs, the pieces falling together in an “Aha!” moment as a best guess regarding the optimal choice of “investment horizon” emerges?

This same issue presents in a variety of areas of business operations. Calculation of batch size in assembly lines and inventory control has the same characteristics. Optimal batch size is calculated and, once “closure” occurs the search for optimal batch size is terminated and application of the results begins production. And, sometimes, batch size is a “best guess,” much the same as “investment horizon” is likely to be.

This problem has been with us for decades, if not centuries, possibly reaching back to the advent of the problems associated with developing the infrastructure necessary for rail and telegraph.

We merely seek to codify the obvious here, though not with the import of Newton observing the apple falling.

But, think about it: what would your reaction be if you could not quite see the apple hitting the ground?

VIII. Terminating the Search

Killeen (2000) touches on this idea of a stimulus terminating a sequence of behavior, or “actions”: “In none of those cases is the termination of the activity the goal of the activity. Were I to tell you that the butler did it, I would not concentrate your pleasure, but rather devastate it.” However, termination of a particular iteration of a sequence, an instance within a class, is often precisely the result sought.

Peter Diamond, Dale Mortensen, and Christopher Pissarides (2010) were awarded the “Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2010” for their work on “search frictions.” A fundamental aspect of their research addressed this question: “when does a search end?” Whatever the precise answer to that question may be, it almost certainly requires a perception that involves the closure of a gestalt, the perception of reaching the completion of some target.

Does not the end of the search at least superficially resemble the calculation of optimal batch size or determination of the “investment horizon”?

What is “proofreading,” if not the search for the “perfect” paper? When does it terminate?

IX. Application of Closure of Gestalt as a Reinforcement

Again, all of this is obvious. What may not be obvious, except to experts with the “99 Cent” concept, is that an incomplete gestalt, and the actions or processes necessary to close that gestalt, may be used in reinforcement learning. More specifically, in addition to any other variants, visual stimuli that involve closure may be used in behavior programming and training paradigms.

The actions of chains of behaviors likely operate as Killeen describes, one action being the reinforcement of the previous action in the sequence. This fact does not preclude the use of visual stimuli to facilitate a sequence.

Macchiavello et al (2024) showed improvements by “increas[ing] direct rehabilitation time in a Stroke Rehabilitation Centre.” This meant that providers spent more time helping patients rather than on paperwork. A Kanban system, providing visual feedback, was the backbone of the approach used by Macchiavello et al. What about other aspects of direct patient care? For a given

“morning routine” of an individual, termed “ADLs” or “activities of daily living” by the nursing profession, the final actions of the sequence may result in a type of “closure” of a “gestalt.” Could a visual method such as Kanban result in improvements in the target behaviors of patients in a rehabilitation or memory care facility? Could this improve quality of life for both patients and caregivers?

What about personal application? Would the same apply to students or independent practitioners such as solo professionals in streamlining their workflow? Could it be applied to researchers for whom “closure of the gestalt” would be the completion of a sequence that results in a peer-reviewed publication?

Assembly lines in production and operations management are amenable to these chains of behavior and the application of Premack to such chains. For example, in one approach, complex assembly lines cluster operations (i.e. “behaviors”) into groups (i.e. “chains of behavior”). Lead times for this method are NOT for individual operations but for completion of the cluster (closure of the gestalt):

To manage the complex assembly process of the modules, operations are clustered into so-called milestones. The total processing time of a milestone is 2–20 days. The notion of milestones is mainly used for planning purposes. The leadtimes are planned not for the individual operations but only for the milestones. (Atan et al, 2016)

However, adding a perceptual tool that visually presents an incomplete gestalt that is ultimately completed is helpful. Kanban (Hiranabe, 2007, Dalton, J., & Dalton, 2019) depends on visual feedback, incomplete until a sequence has been completed. An example of the benefits in the use of Kanban, and its visual feedback, is the application of the method in software development, resulting in “improved lead time to deliver software, improved quality of software, improved communication and coordination, increased consistency of delivery, and decreased customer reported defects.” (Ahmad et al, 2013)

Keeping in mind that much software development is now guided by project management methods, Kanban has been applied to project management with similar results. (Damij, N., & Damij, 2021)

X. Conclusion

Reaching a “milestone” in the visual methodology of Kanban is both closure of a gestalt and a reinforcer. Completion of the project would also be closure of the gestalt.

The same is true of completion of reading an article such as this one.



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Employing WarpPLS in a Doctoral Course on International Business and Information Systems Research: First Student Project

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Abstract

This presentation will discuss the first of two student projects conducted as part of a course on international business and information systems research. The project employed the software WarpPLS to test a model with several hypothesized relationships among variables. The student team independently collected data to test their model, which addressed a topic on the intersection of international business and information systems research. Theoretical reviews and analyses or previously published empirical studies informed the development of the model with hypothesized relationships. Additional tests were conducted to ensure confidence on the results of the analyses, including multicollinearity tests.

Keywords: WarpPLS; Multiple Regression; Partial Least Squares; Structural Equation Modeling; Multicollinearity

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Abstract

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Governance and Political Impact in Developing Economies Performance: A Path Analysis Using WarpPLS

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Abstract

This study explores the pivotal roles of education policies and research and development (R&D) investments in fostering governance and economic growth in developing economies. Anchored in Endogenous Growth Theory and Institutional Theory, it employs Structural Equation Modeling (SEM) using WarpPLS 8.0 to analyze BTI Transformation Index data from 137 countries between 2008 and 2024. Findings reveal that education and R&D positively influence economic performance, fiscal stability, and political participation, while mitigating societal challenges. "Stateness," reflecting state capacity and administrative efficiency, emerges as a key factor in reducing the adverse effects of structural difficulties on governance. Despite its contributions, the study acknowledges limitations, including the exclusion of cultural variables and a broad dataset scope. Policymakers are advised to prioritize investments in human capital and institutional quality to achieve sustainable development and economic resilience in developing nations.

Keywords: Education policies; research and development; economic performance; political participation; stateness; endogenous growth theory; institutional theory; structural equation modeling; developing economies

I. Introduction

Achieving sustainable economic growth and maintaining political stability are critical goals for developing nations, which face significant obstacles such as structural challenges, ineffective governance, and limited resources. This paper explores how educational policies and R&D investments can shape political participation and foster economic performance.

This research contributes to governance and economic theory by integrating education policies, political participation, and fiscal stability into a sophisticated Structural Equation Modeling (SEM) framework, utilizing the powerful WarpPLS 8.0 software. Drawing from Endogenous Growth Theory and Institutional Theory, it highlights the transformative role of human capital development and institutional quality in promoting economic and social progress. Additionally, this study investigates the moderating role of "stateness," defined as the state's capacity to enforce authority, foster national identity, and ensure administrative efficiency in mitigating structural constraints and enhancing governance effectiveness.

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The paper is structured as follows: first, it encompasses the theoretical foundations of the study, integrating insights from economic and governance theories to formulate hypotheses about the relationships between education, governance, and economic outcomes. The subsequent sections outline the methodology applying the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach and validating the measurement model. The results section presents the empirical findings, emphasizing education and governance's direct and moderating effects on economic and political outcomes. Finally, the discussion and conclusion elaborate on the implications of these findings for policy and theory, underscoring the importance of education and R&D investments in fostering resilience and stability in developing economies.

This paper aims to bridge the gap between theory and practice by offering strategies for developing countries to improve policy coordination, strengthen anti-corruption efforts, and build resilience through a comprehensive understanding of governance and development dynamics.

II. Research Background and Hypotheses

The pursuit of economic growth has remained a key focus in development studies, with various theories emerging to clarify the drivers of sustained progress. Endogenous Growth Theory offers valuable insights into how long-term economic growth is fueled by investments in human capital, innovation, and knowledge (Romer, 1986; 1990). Unlike neoclassical models, which attribute growth primarily to external technological advancements, this theory highlights the influence of internal factors shaped by policy decisions and institutional frameworks (Lucas, 1988). By emphasizing the pivotal roles of education, research, and development, Endogenous Growth Theory illustrates how these elements can transform economies and ensure sustained performance over time.

A fundamental principle of Endogenous Growth Theory is the significance of positive externalities and the increasing returns arising from human capital and knowledge investments. Romer (1986), for example, highlights how knowledge, as a nonrival and partially excludable resource, produces spillover effects that extend beyond individual users, fostering self-perpetuating economic growth. Similarly, Lucas (1988) underscores that human capital boosts individual productivity and generates societal benefits through disseminating knowledge. These perspectives are supported by empirical findings that emphasize the critical role of education and research in enhancing economic outcomes and addressing structural challenges in developing nations (North, 1990).

Institutional Theory complements Endogenous Growth Theory by offering a perspective on the structural and governance factors that influence economic development (North, 1990; Williamson, 1981). Institutions, encompassing formal and informal rules that regulate human interactions, act as the "rules of the game" by shaping incentives, minimizing uncertainties, and facilitating efficient resource use (North, 1990). Well-functioning institutions improve adaptive efficiency, enabling economies to navigate evolving challenges while fostering conditions that support innovation and economic resilience.

Institutional Theory emphasizes the importance of governance in lowering transaction costs and encouraging collaboration (Williamson, 1981). Legal solid frameworks, effective regulatory systems, and accountability mechanisms are critical in ensuring resources are used efficiently while reducing the risks of opportunistic behavior (Meyer & Rowan, 1977). This perspective is especially pertinent to developing nations, where inadequate governance and persistent structural challenges frequently hinder economic advancement (North, 1990).

By integrating these theoretical frameworks, this study examines the relationship between human capital, institutional structures, and economic outcomes. It focuses on the idea that education and research policies and governance and institutional stability shape critical aspects of national development, including economic performance, political engagement, and fiscal stability in developing economies. The hypotheses are rooted in these theoretical foundations, highlighting the combined impact of knowledge-driven growth and institutional effectiveness on developmental progress.

Economic growth in developing nations is a complex process shaped by targeted investments in education and research and development (R&D). These investments are critical in developing human capital, driving innovation, and advancing technological progress. Endogenous Growth Theory asserts that internal factors influence economic performance, such as policies prioritizing knowledge and skill enhancement rather than relying solely on external forces (Romer, 1986; Lucas, 1988). Through a focus on education and R&D, countries can accelerate human capital development, stimulate innovation, and boost productivity.

Rodrigues and Souza (2024) emphasize the transformative impact of education quality on GDP growth, citing the critical importance of skilled educators and resource allocation in cultivating human capital. Similarly, Hanushek (2013) highlights the link between cognitive skills derived from high-quality education and economic growth, showing that even modest improvements in test scores can significantly increase GDP growth rates. These findings illustrate that policies focusing on both education access and quality are essential for fostering economic development.

Barro (2013) underscores the importance of secondary and tertiary education for advancing technological adoption and innovation. Investments in these levels of education enhance labor productivity and equip the workforce with the skills needed to drive technological progress. Supporting this, Benos and Zotou (2014) demonstrate through a meta-regression analysis that both the quantity and quality of education substantially influence economic performance.

In addition to its role in fostering innovation, education also supports entrepreneurship and economic diversification. Van der Sluis, Van Praag, and Vijverberg (2005) reveal that education significantly enhances entrepreneurial performance, particularly in developing economies, by building cognitive and managerial skills crucial for economic progress.

R&D policies complement education by driving technological innovation and enhancing productivity. Maroto, Gallego, and Rubalcaba (2016) emphasize the role of publicly funded R&D in improving public sector efficiency and generating economic spillovers, thereby encouraging collaboration between public and private sectors. Wang (2007) further highlights that nations with higher R&D efficiency achieve superior economic outcomes, reinforcing the importance of optimizing resource allocation in R&D activities.

The integration of education and R&D policies is supported by Institutional Theory, which highlights the role of governance structures in enabling effective policy implementation (North, 1990). Robust institutions reduce uncertainties, foster cooperation, and create environments conducive to innovation and knowledge dissemination. This synergy between education, R&D, and institutional quality establishes a strong foundation for sustained economic growth. Based on this, we propose the following hypothesis:

H1: Education and resource and development policies positively influence the country's economic performance.

The challenges a nation faces, including structural constraints, weakened civil society traditions, and conflict intensity, are significantly shaped by the quality and focus of its education and resource and development policies. Structural barriers, such as poverty, geographic limitations, and inadequate infrastructure, hinder governance effectiveness, while diminished civic engagement and high levels of conflict compound national difficulties. Endogenous Growth and Institutional Theory provide valuable frameworks for understanding how investments in education and R&D address these issues by fostering human capital development and enhancing institutional capacity (Romer, 1986; North, 1990).

Education serves as a powerful tool for alleviating structural challenges. Hofmarcher (2021) demonstrates that higher educational attainment reduces income poverty, unemployment, and social exclusion. Similarly, Barbier (2010) highlights education's role in breaking the "poverty-environment trap," enabling communities to transition from resource-depleting subsistence activities to sustainable practices. Muysken and Nour (2006) emphasize the importance of addressing deficiencies in technical education to build a skilled labor force capable of overcoming geographic and infrastructural challenges. Furthermore, Callegari and Feder (2022) illustrate how

education fosters resilience, helping communities recover from systemic shocks such as pandemics and natural disasters.

Active civic engagement and social trust, fundamental elements of civil society, are bolstered by education and R&D policies. Østby, Urdal, and Dupuy (2019) argue that education promotes social cohesion and reduces intergroup conflict by fostering tolerance and cooperation. Moywaywa (2018) underscores the role of education in building trust and reducing polarization, particularly in contexts of ethnic and religious diversity. Barbier (2010) adds that inclusive education policies empower marginalized communities, fostering equitable participation in governance and strengthening civic traditions.

By addressing structural constraints, fostering social trust, and reducing conflict intensity, education and R&D policies act as critical drivers for reducing national difficulties. Building on these insights, we put forward the following hypothesis:

H2: Education and resource and development policies negatively influence the nation's level of difficulty.

Stateness, defined by the state's monopoly on the use of force, cohesive national identity, independence from religious dogmas, and functional administrative structures, is essential for stable governance and national development. Education and R&D policies are critical in enhancing these dimensions by fostering institutional capacity, unifying populations, and ensuring effective governance.

These policies bolster the state's capacity to maintain authority and territorial control. Green (1990, 1997) highlights the historical role of education systems as tools for centralizing power and promoting order, instilling shared values and norms that align societal behavior with state objectives. This alignment reinforces the state's monopoly on force. Similarly, Guimón and Agapitova (2013) argue that R&D investments enhance the state's ability to address systemic challenges, such as social instability and resource management, consolidating state control and authority.

Education is pivotal for fostering a cohesive national identity. Green (1997) demonstrates how European and Asian education systems integrated diverse populations through standardized curricula emphasizing shared languages, values, and histories. These efforts promoted loyalty to the state and reduced societal fragmentation. Lim (2016) underscores the role of education in fostering cultural cohesion through policies like Singapore's "Shared Values" initiative. Moreover, Guimón and Agapitova (2013) highlight how local innovation systems reduce dependence on foreign technologies, enhancing national pride and reinforcing state legitimacy.

Secular education policies minimize the influence of religious dogmas on governance, ensuring the state operates independently of non-state ideologies. Green (1990) illustrates how public education systems historically served as secular institutions, separating governance from religious control. Lim (2016) exemplifies that states like Singapore aligned their governance with secular, evidence-based frameworks through education, reducing ideological interference and promoting modernity. Education and R&D policies are instrumental in developing efficient administrative structures. Education systems produce skilled personnel essential for public administration, enabling states to deliver services effectively (Green, 1997; Argyres & Silverman, 2004). Also, Guimón and Agapitova (2013) argue that R&D investments drive innovations such as e-governance, improving public service delivery and administrative efficiency.

From an Institutional Theory perspective, investments in education and R&D reduce transaction costs, foster cooperation, and align institutions with development goals (North, 1990). Endogenous Growth Theory highlights how human capital and innovation drive societal progress and institutional stability (Romer, 1986). Together, these frameworks demonstrate how education and R&D policies strengthen the pillars of stateness, enabling states to maintain authority, unify populations, and govern effectively. In light of this understanding, we formulate the following hypothesis:

H3: Education and resource and development policies positively influence the nation's stateness.

Monetary and fiscal stability are vital for sustainable economic growth and development, reflecting a country's ability to sustainably manage inflation, exchange rates, fiscal policies, and debt. Education and R&D policies play a crucial role in strengthening these dimensions by fostering human capital development, promoting innovation, and enhancing institutional frameworks.

Dinh et al. (2024) highlight how education equips monetary institutions with skilled professionals capable of managing inflation and ensuring exchange rate stability. Similarly, R&D investments contribute by advancing financial tools and models, enabling policymakers to forecast and address economic shocks more effectively. Barro (2013) underscores that higher educational attainment equips nations with the ability to adopt and leverage advanced economic governance systems, thereby reducing monetary volatility. Educated professionals enhance the credibility and independence of monetary authorities, ensuring sound economic principles drive policy decisions rather than political influence. Yabré and Semedo (2021) further argue that political stability, supported by education, strengthens the institutional frameworks necessary for effective monetary policy implementation.

Fiscal stability relies on the government's ability to manage budgets, debt, and revenues sustainably. Education and R&D investments foster fiscal stability by promoting economic growth, expanding the tax base, and improving public expenditure management. Barro (2013) demonstrates that education-driven economic growth increases government revenues, reduces fiscal deficits, and supports sustainable debt management. Yabré and Semedo (2021) emphasize that education enhances institutional capacity, enabling governments to align fiscal policies with long-term developmental goals. By promoting accountability and efficiency in public spending, education reduces deficit bias. Dinh et al. (2024) also argue that R&D investments foster innovation, optimizing resource allocation and addressing systemic fiscal challenges. Institutional Theory complements this by emphasizing the importance of robust institutions, supported by human capital development, in maintaining stable macroeconomic policies (North, 1990). From this perspective, we derive the following hypothesis:

H4: Education and resource and development policies positively influence the nation's monetary and fiscal stability.

The level of difficulty a nation faces acts as a significant barrier to economic performance and political participation. Structural challenges, such as poverty, inequality, resource scarcity, and weak institutions, hinder growth and reduce citizens' capacity and motivation to engage in civic processes. Strobl (2012) illustrates how natural disasters like hurricanes devastate GDP growth in developing countries by damaging infrastructure, disrupting supply chains, and diverting resources from productive investments. Similarly, Adhvaryu et al. (2021) emphasize that resource-based conflicts destabilize economies by deterring investment and reducing productivity, effects compounded by weak institutions unable to mitigate these challenges effectively. Inequality further exacerbates structural inefficiencies, limiting the capacity of economic growth to reduce poverty. Fosu (2017) demonstrates that inequality and structural inefficiencies perpetuate stagnation and underdevelopment. Guiga and Rejeb (2012) argue that income inequality restricts access to opportunities and reduces overall productivity, inhibiting nations from realizing their economic potential. Additionally, Murdoch and Sandler (2002) highlight the spillover effects of civil conflicts, which disrupt trade and reduce regional economic activity, amplifying the broader consequences of structural difficulties.

Poverty, inequality, and lack of access to education also diminish citizens' capacity for political participation. Finkel (2002) notes that these constraints limit individuals' ability to engage in civic and democratic processes, even when implementing programs designed to enhance civic education. Similarly, Kern et al. (2015) reveal that economic crises and resource scarcity erode institutionalized political participation, such as voting, by undermining trust in governance and depleting resources necessary for engagement. Conflict intensity further compounds these challenges by creating insecurity and fostering distrust in governance systems. Murdoch and Sandler (2002) show how civil wars weaken institutional frameworks and social cohesion, deterring citizens from engaging in political activities. Moywaywa (2018) adds that

ethnic and religious conflicts polarize societies, reducing opportunities for inclusive participation. Weak civil society traditions and low social trust amplify these effects as marginalized groups disengage from political processes, further weakening governance accountability (Guiga & Rejeb, 2012). Strong institutions are essential to mitigating these challenges by fostering trust, reducing inequality, and promoting inclusivity (North, 1990). By addressing structural constraints, institutions can support economic growth and encourage civic engagement. With this foundation, we suggest the following hypothesis:

H5a: The nation's level of difficulty negatively influences economic performance.

H5b: The nation's level of difficulty negatively influences political participation.

Economic stability creates a predictable environment that allows citizens to engage politically without being burdened by immediate survival concerns. Feng (1997) highlights that political stability, supported by sound fiscal and monetary policies, reduces regime interruptions and enhances system adaptability. When governments effectively manage economic crises, they build trust in governance systems, encouraging political participation and fostering a stronger relationship between citizens and the state. Weller and Singleton (2004) demonstrate that financial stability increases public confidence in institutions, a key driver of civic engagement. Citizens perceive stable economic systems as indicators of responsive and accountable governance, which motivates their involvement in political processes. Fiscal discipline and transparent policies further enhance government legitimacy, incentivizing democratic participation.

Yabré and Semedo (2021) provide evidence from sub-Saharan Africa, where fiscal consolidation and economic stability have improved the relationship between governments and their citizens. These policies address grievances, reduce inequality, and create opportunities for inclusive political participation, fostering a sense of trust and commitment to governance structures. Political participation, in turn, enhances economic performance by creating more inclusive and representative governance frameworks. Feng (1997) argues that democracy, supported by active citizen involvement, fosters political stability and economic growth. When citizens engage in governance, policies become more effective, reducing inefficiencies and corruption. Weller and Singleton (2004) underscore that political freedoms, exercised through participation, ensure the equitable distribution of resources and more efficient public spending, both of which drive economic development. Political engagement also builds social trust and cohesion, critical components of stable economic growth. Actively involved citizens are more likely to support policies that promote sustainable growth and economic resilience, further enhancing performance.

Institutional Theory emphasizes the bidirectional relationship between monetary and fiscal stability, political participation, and economic performance. At the same time, the Endogenous Growth Theory complements this by stressing that sustained growth relies on innovation and effective governance. Based on this, we propose the following hypotheses:

H6a: The nation's monetary and fiscal stability positively influences political participation.

H6b: The country's political participation positively influences economic performance.

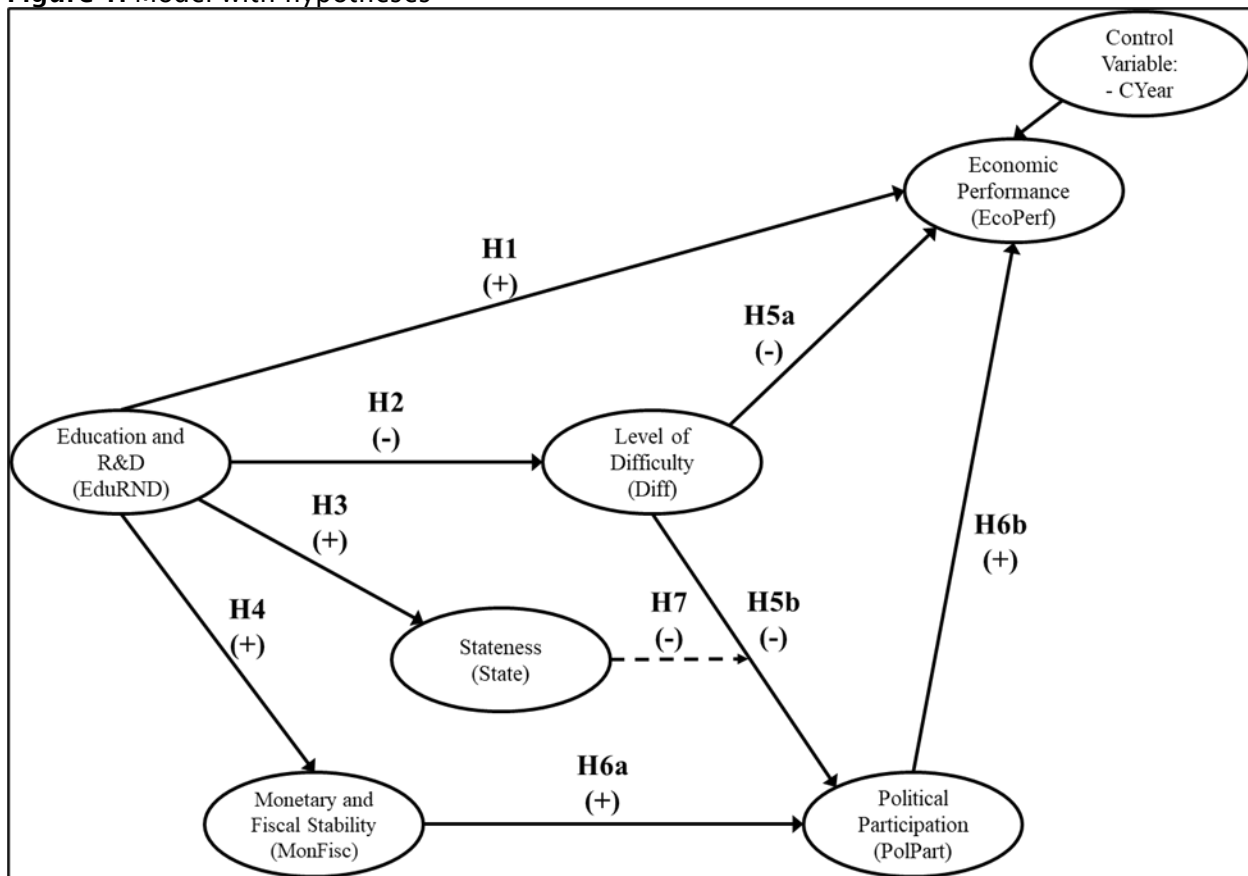
Stateness plays a critical role in moderating the relationship between the nation's level of difficulty and political participation. Craft and Howlett (2012) highlight the importance of governance shifts and policy advisory systems in enhancing administrative capabilities and policy coherence. Robust institutions facilitate formulating and implementing policies necessary to address crises and reduce societal conflict. Andersen and Doucette (2022) emphasize the significance of strong state institutions in mediating challenges and enforcing policies. Their findings indicate that robust governance mechanisms are critical for maintaining social order and fostering political stability, particularly in structural constraints and fragmented governance contexts. Karim (2020) provides experimental evidence from areas of limited statehood, showing

that relational state-building efforts, such as strengthening local law enforcement and governance structures, positively influence citizen attitudes toward governance. This evidence underscores the moderating effect of stateness, where administrative solid and enforcement mechanisms mitigate the adverse effects of structural challenges on political participation.

As a moderating factor, stateness shapes the extent to which structural constraints and societal challenges impact political participation. In contexts where governance is weak or fragmented, there is an amplification of the adverse effects of structural difficulties. Conversely, strong governance mitigates these effects by enabling efficient policy implementation, fostering public trust, and creating conditions conducive to civic engagement. Guided by this reasoning, we propose the following hypothesis:

H7: The nation's stateness negatively moderates the relationship between the level of difficulty and political participation.

Figure 1: Model with hypotheses



III. Research Method

We gathered data from the BTI (Transformation Index) across a sample of 137 developing countries. To determine adequate sample size, we performed a prospective statistical power analysis using the inverse square root and gamma-exponential methods, setting the minimum absolute significant path coefficient at 0.14, with a significance level of 0.05 and a power level of 0.8 (Kock & Hadaya, 2018). This analysis produced minimum required sample sizes of 365 and 352, respectively. Our study collected 1233 rows of data, exceeding the more conservative sample size estimate of 365.

Our model comprised four latent variables (LVs), each measured indirectly through two to four indicators and three additional variables measured via single indicators. The LVs focused on various dimensions of governance and economic performance, including Diff (Level of Difficulty), PolPart (Political Participation), MonFisc (Monetary and Fiscal Stability), and State (Stateness), with EduRND (Education policy/R&D), EcoPerf (Economic Performance), and CYear through single indicators. To assess data distribution, we employed the Jarque-Bera test (Jarque & Bera, 1980; Bera & Jarque, 1981) and Gel & Gastwirth's (2008) robust modification of this test. These tests' results indicated non-normality across the LVs and the single-indicator variables.

Due to generating estimates of both composites and factors in two stages, fully accounting for measurement error and measuring factors employing variation sharing, we employed the Factor-Based PLS Type REG2 as our outer model algorithms via PLS Regression (Kock, 2015b; 2017; Kock & Sexton, 2017). Additionally, a resampling method, Stable3, was utilized to enhance the reliability of the model's estimates.

The latent variables in our model captured complex aspects of governance, economic structure, and policy implementation within developing countries. Each row in the dataset represented a unique country observation, allowing for a broad analysis across varied socio-political and economic contexts.

This methodological framework provided a robust foundation to explore the dynamics of political, economic, and educational policies and their influence on governance efficiency and economic outcomes in developing nations.

IV. Validation of the Measurement Model

In this section, we evaluate our measurement model by examining convergent validity, discriminant validity, and reliability. Table 1 presents the loadings and cross-loadings for our LVs. All loadings exceed 0.5, indicating convergent solid validity (Amora, 2021; Kock, 2014). This result implies that respondents consistently interpreted the question statements tied to each LV with the intent of the questionnaire designer.

Table 1: Loading and cross-loadings for LVs

	Diff	PolPart	MonFisc	State
Diff1	(0.771)	0.156	0.145	0.024
Diff2	(0.656)	-0.408	-0.377	0.549
Diff3	(0.741)	0.259	0.003	-0.576
PolPart1	0.030	(0.946)	-0.036	-0.032
PolPart2	0.036	(0.923)	-0.108	0.133
PolPart3	0.029	(0.946)	0.052	-0.053
PolPart4	-0.144	(0.931)	0.098	-0.056
MonFisc1	-0.004	0.006	(0.897)	-0.022
MonFisc2	0.037	-0.002	(0.898)	0.038
State1	-0.193	-0.227	-0.228	(0.811)
State2	0.068	0.203	-0.300	(0.783)
State3	0.047	-0.043	0.408	(0.682)
State4	0.051	0.066	0.050	(0.800)

Notes: Loadings are unrotated and cross-loadings are oblique-rotated. Loadings shown within parentheses. Loadings equal to or lower than 0.5 suggest good convergent validity. Diff = Level of difficulty; PolPart = Political participation; MonFisc = Monetary and fiscal stability; and State = Stateness.

Table 2 displays the correlations and square roots of the Average Variance Extracted (AVEs) for the latent variables (LVs) in our model. Each square root of the AVEs exceeds the corresponding correlations within the same columns, indicating strong discriminant validity (Kock, 2014; Rasoolimanesh, 2022). In other words, respondents understood question statements as belonging to incorrect latent variables. The HTMT and HTMT2 ratios calculation yielded maximum values of 0.808 and 0.811, both below the 0.85 threshold. This finding further supports strong discriminant validity (Kock, 2022a; Rasoolimanesh, 2022).

Table 2: Correlations and square roots for LVs

	Diff	PolPart	MonFisc	State
Diff	(0.725)	-0.466	-0.554	-0.646
PolPart	-0.466	(0.937)	0.590	0.492
MonFisc	-0.554	0.590	(0.897)	0.602
State	-0.646	0.492	0.602	(0.771)

Notes: Square roots of AVEs show along diagonal within parentheses. Square roots of AVEs greater than the correlations the same column suggest good discriminant validity. Diff = Level of difficulty; PolPart = Political participation; MonFisc = Monetary and fiscal stability; and State = Stateness.

Table 3 presents various coefficients for the LVs in our model. The Composite reliabilities and Cronbach's alphas are above 0.7, indicating strong reliability (Kock, 2014). In other words, the respondents consistently interpreted the question statements used to measure each latent variable similarly. All full collinearity variance inflation factors (VIFs) were below 3.3, indicating an absence of common method bias (Kock, 2015; Kock & Lynn, 2012).

Table 3: LV coefficients for first order LVs that make up ACAP

	Diff	PolPart	MonFisc	State
Composite reliability	0.768	0.966	0.892	0.853
Cronbach's alpha	0.760	0.966	0.891	0.822
Full collinearity VIF	2.354	1.757	3.051	2.642
Jarque-Bera test of normality	No	No	No	No
Robust Jarque-Bera test of normality	No	No	No	No

Notes: Composite reliabilities and Cronbach's alphas equal to or greater than 0.7 suggest good reliability. FCVIFs equal to or lower than 3.3 suggest no common method bias. Multivariate non-normality, indicated by the Jarque-Bera test and its robust variation provide support for the use of the non-parametric PLS-SEM method. Diff = Level of difficulty; PolPart = Political participation; MonFisc = Monetary and fiscal stability; and State = Stateness.

This study also was further validated by Harman's single factor test, which yielded a single factor with an AVE (a.k.a. total variance explained) of 0.489, lower than the 0.5 thresholds, suggesting no common method bias (Kock, 2021b). The last two rows of the table show that multivariate non-normality is present in all latent variables (LVs), as previously noted, based on the Jarque-Bera test and its robust variant. This result supports our choice of PLS-SEM, a non-parametric SEM method that does not require the assumption of multivariate normality (Kock, 2016; Ma & Zhang, 2023).

V. Data Analyses and Results

As mentioned earlier, we applied the PLS-SEM approach (Kock & Gaskins, 2014; Kock & Lynn, 2012) for our analyses, utilizing the WarpPLS software (Kock, 2022a). This approach enabled us

to evaluate model quality through multiple indices. We managed missing data using the multiple regression imputation method to prevent deletion bias (Kock, 2018).

Table 4 presents the quality indices computed for our model. The average path coefficient (APC), average R-squared (ARS), and average adjusted R-squared (AARS) indicate relatively high levels of variance explained for the model's endogenous variables.

The VIF indices, specifically the average block VIF (AVIF) and the average full collinearity VIF (AFVIF), were below 3.3, respectively, indicating ideal levels of both vertical and lateral collinearity (Kock, 2014; Kock & Lynn, 2012). These ideal levels indicate that the model's variables capture distinct underlying constructs. Also, these indices imply that the model is mainly free from common method bias (Kock, 2015; Kock & Lynn, 2012).

The Tenenhaus GoF (GoF) indicates a high level of goodness-of-fit between the model and the data (Kock, 2014; 2022a). The last four rows display values for causality assessment indices (Kock, 2022b): Simpson's paradox ratio (SPR), R-squared contribution ratio (RSCR), statistical suppression ratio (SSR), and nonlinear bivariate causality direction ratio (NLBCDR). These values suggest that the model is generally robust concerning its causality assumptions, specifically regarding the directions of causality implied by the variable linkages.

Table 4: Model quality indices

Index	Value	Interpretation
Average path coefficient (APC)	0.389	$P < 0.001$
Average R-squared (ARS)	0.452	$P < 0.001$
Average adjusted R-squared (AARS)	0.452	$P < 0.001$
Average block VIF (AVIF)	1.474	acceptable if ≤ 5 , ideally ≤ 3.3
Average full collinearity VIF (AFVIF)	2.273	acceptable if ≤ 5 , ideally ≤ 3.3
Tenenhaus GoF (GoF)	0.620	small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36
Simpson's paradox ratio (SPR)	1.000	acceptable if ≥ 0.7 , ideally = 1
R-squared contribution ratio (RSCR)	1.000	acceptable if ≥ 0.9 , ideally = 1
Statistical suppression ratio (SSR)	0.900	acceptable if ≥ 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	1.000	acceptable if ≥ 0.7 , ideally = 1

We analyzed our latent variable (LV) moderator, stateness, to understand its moderating effect. Figure 2 presents a 2D graph highlighting the best-fitting lines or curves for high and low values of the moderator. This visualization assesses statistically and visually how stateness impacts the strength and direction of the relationship between a developing nation's level of difficulty and its political participation. The graph uses standardized scales to ensure consistent interpretation and computational efficiency, emphasizing the relational dynamics rather than raw values. As Kock (2016b) suggested, the 2D graphs effectively captured the moderated direct links by focusing on the moderating variable's low and high values, providing a practical tool for analyzing interaction effects.

In addition, Figure 3 shows the main results of our analyses of direct effects. In our research, we utilized categorical-numeric-categorical conversion to facilitate multi-group analysis, converting the year numeric variables into categorical labels to distinguish groups more effectively (Kock, 2014a). This approach allowed us to create a new data label variable for grouping, enhancing our ability to conduct multi-group analyses.

The path coefficients for the respectively causal links were: EduRND > EcoPerf ($\beta = 0.49$, $P < 0.01$), EduRND > Diff ($\beta = -0.68$, $P < 0.01$), EduRND > State ($\beta = 0.67$, $P < 0.01$), EduRND > MonFisc ($\beta = 0.64$, $P < 0.01$), Diff > EcoPerf ($\beta = -0.15$, $P < 0.01$), Diff > PolPart ($\beta = -0.21$, $P < 0.01$), MonFisc > PolPart ($\beta = 0.49$, $P < 0.01$), PolPart > EcoPerf ($\beta = 0.13$, $P < 0.01$), and State > (Diff > PolPart) ($\beta = -0.13$, $P < 0.01$). Despite the model consisting of only four LVs, the explained variances in the

endogenous LVs were high: EcoPerf ($R^2=0.550$), Diff ($R^2=0.460$), State ($R^2=0.450$), MonFisc ($R^2=0.410$), and PolPart ($R^2=0.390$).

Figure 2: Moderation Analysis

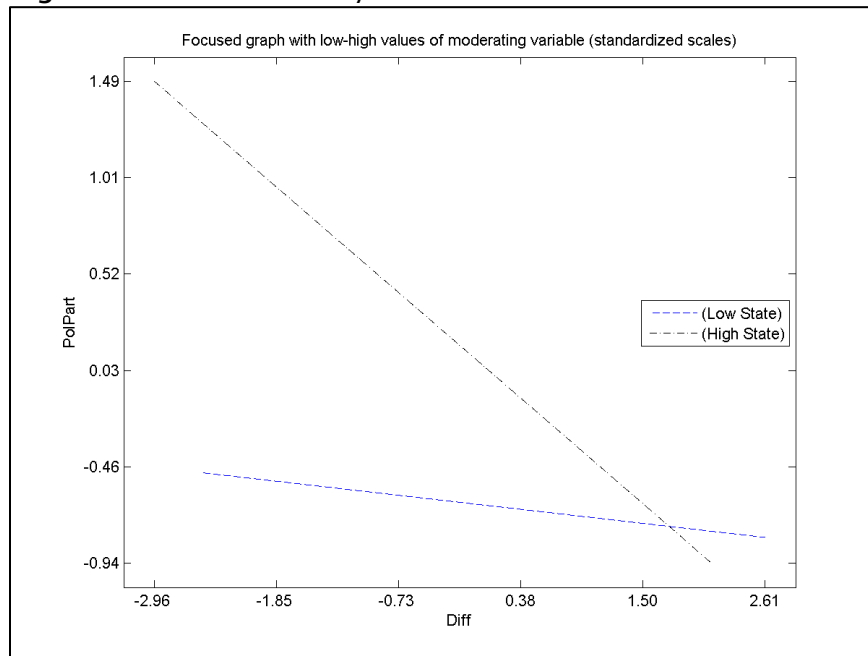
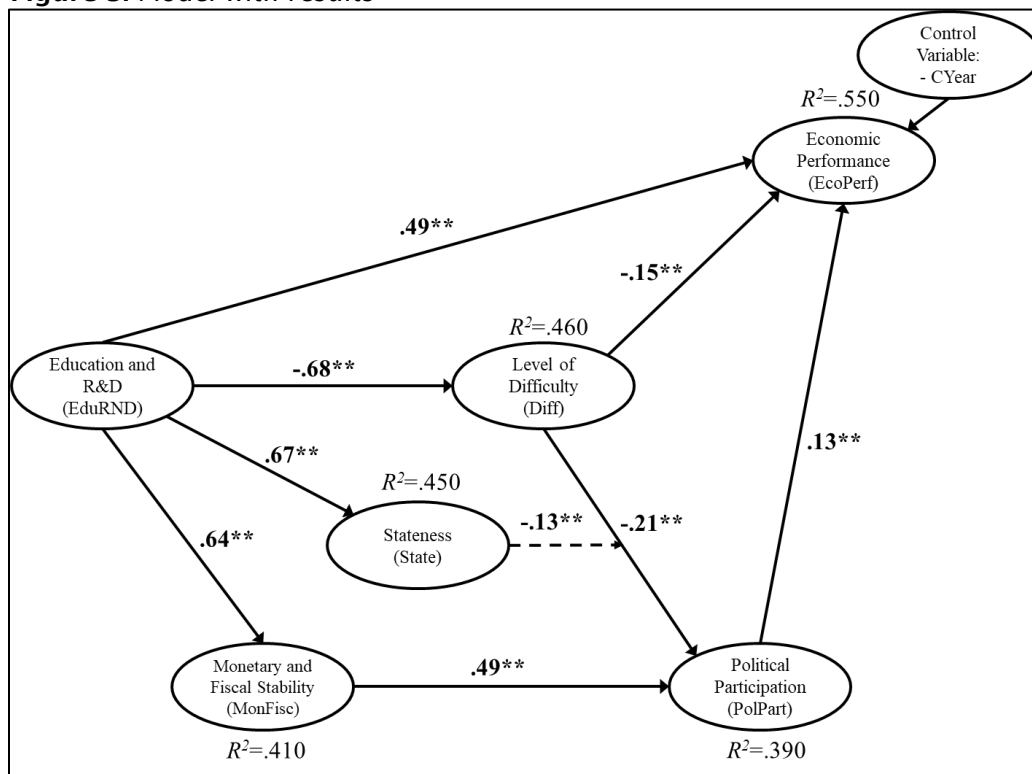


Figure 3: Model with results



Notes: ** = significant at the $P < 0.01$ level

We assessed all causal relationships for nonlinearity using the segmentation delta method (Kock, 2021a). The analysis shows that none of the relationships are nonlinear, indicating that all association coefficients rely on fixed effects without any underlying heterogeneity.

Moreover, we evaluated all causal links for reciprocity using the reciprocal stochastic instrumental variables technique (Kock, 2022a; 2023; Morrow & Conger, 2021). The results showed no reciprocity, indicating that all links are unidirectional and the selected directions are appropriate.

VI. Discussion

Education, R&D, and National Development

The results underscore the transformative potential of education policies and R&D investments in driving national development across multiple dimensions in developing economies. The significant positive relationship between education and R&D and economic performance supports Hypothesis 1, demonstrating that strategic investments in education and R&D bolster economic performance. This finding aligns with the Endogenous Growth Theory, which highlights the critical role of internal policy decisions in fostering human capital and innovation to drive productivity and GDP growth (Romer, 1986; Lucas, 1988). Supporting literature, such as Rodrigues and Souza (2024), further validates the impact of education quality on GDP growth, emphasizing the importance of resource allocation and skilled educators in cultivating human capital.

In addition to improving economic outcomes, education and R&D investments reduce societal challenges, confirming Hypothesis 2. In other words, these policies alleviate structural constraints, foster civic engagement, and reduce conflict intensity. By addressing challenges like poverty, inadequate infrastructure, and social exclusion, education equips communities with the skills and resilience needed to overcome systemic barriers (Hofmarcher, 2021; Barbier, 2010). Moreover, promoting social trust and cohesion through inclusive education policies further mitigates conflict and strengthens civil society (Østby et al., 2019; Moywaywa, 2018).

The relationship between education and R&D investments and a nation's stateness supports Hypothesis 3. Robust education systems and R&D frameworks strengthen state institutions by fostering cohesive national identities, consolidating governance capacity, and reducing reliance on religious dogmas in policymaking (Green, 1990; Lim, 2016). These results echo Institutional Theory's emphasis on the importance of governance structures in reducing uncertainties and fostering cooperation to enable effective policy implementation (North, 1990).

Finally, the significant positive relationship between education and R&D policies and the monetary and fiscal stability supports Hypothesis 4. By equipping institutions with skilled professionals and fostering innovation, these policies contribute to effective inflation control, debt sustainability, and fiscal discipline (Dinh et al., 2024; Barro, 2013). Institutional Theory further reinforces this finding, emphasizing the role of robust institutions in maintaining stable macroeconomic policies and ensuring effective resource allocation (North, 1990).

These findings highlight the multifaceted contributions of education and R&D policies in driving economic performance, reducing societal challenges, enhancing institutional capacity, and fostering macroeconomic stability in developing economies.

Challenges to Economic and Political Outcomes

The findings highlight the significant negative influence of a nation's difficulty level on economic performance and political participation. These results confirm Hypotheses 5a and 5b, emphasizing the barriers that structural challenges impose on national development, such as poverty, inequality, resource scarcity, and weak institutions.

The negative relationship between the country's difficulty level and economic performance underscores the detrimental impact of structural challenges on economic growth. These findings align with prior studies illustrating how natural disasters (Strobl, 2012) and resource-based

conflicts (Adhvaryu et al., 2021) disrupt economic activities, deter investment, and hinder productivity. For instance, natural disasters often devastate infrastructure, disrupt supply chains, and divert public resources from productive investments to recovery efforts. Similarly, Adhvaryu et al. (2021) show how conflicts over scarce resources destabilize economies, amplifying the effects of weak governance. Furthermore, Fosu (2017) demonstrates that inequality perpetuates structural inefficiencies, limiting economic growth's ability to reduce poverty and generate sustainable development.

In addition to economic consequences, the nation's level of difficulty exerts a substantial adverse effect on political participation, reflecting how structural and societal challenges undermine political engagement. Poverty, inequality, and lack of access to education diminish individuals' capacity to participate in democratic processes (Finkel, 2002). As Kern et al. (2015) note, economic crises erode political trust and reduce institutionalized participation, such as voting. Conflict intensity further exacerbates these challenges, creating insecurity and fostering distrust in governance systems (Murdoch & Sandler, 2002). Ethnic and religious conflicts, as discussed by Moywaywa (2018), polarize societies and reduce opportunities for inclusive civic engagement, particularly among marginalized groups.

These findings also highlight the compounding role of weak civil society traditions and low social trust, which amplify the adverse effects of structural difficulties on political participation. Marginalized groups often disengage from political processes, weakening accountability and governance effectiveness (Guiga & Rejeb, 2012). This disengagement underscores the importance of strong institutions in mitigating structural constraints, fostering inclusivity, and promoting civic engagement (North, 1990). By addressing these challenges, governments can support economic growth and strengthen democratic participation.

The Interplay of Economic Stability, Political Engagement, and Economic Performance

The significant positive relationship between monetary and fiscal stability and political participation supports hypothesis 6a. This indicates that monetary and fiscal stability creates an environment conducive to civic engagement, where citizens feel less constrained by economic insecurity and are more motivated to participate in democratic processes. Feng (1997) highlights that political stability, underpinned by sound fiscal and monetary policies, reduces regime interruptions and enhances system adaptability, strengthening the relationship between citizens and the state. Economic stability builds public confidence in governance systems. As Weller and Singleton (2004) demonstrate, financial stability is a crucial driver of civic engagement, and it increases trust in institutions. Citizens in stable economic environments perceive governments as more responsive and accountable, further incentivizing political participation. These dynamics reinforce the notion that economic stability is not only a prerequisite for democratic engagement but also a catalyst for inclusive governance.

The positive relationship between political participation and economic performance supports hypothesis 6b. This finding highlights the critical role of political participation in driving economic outcomes. Active citizen involvement ensures that governance frameworks are more inclusive, representative, and responsive, reducing inefficiencies and corruption (Feng, 1997). As emphasized by Weller and Singleton (2004), political freedoms and civic engagement promote equitable resource distribution and efficient public spending, both of which are crucial for sustainable economic growth. Institutional Theory complements this perspective by emphasizing the interconnectedness of political and economic stability. At the same time, Endogenous Growth Theory underscores the importance of effective governance and innovation as drivers of sustained economic development. These results underscore the importance of sound macroeconomic policies and democratic engagement in promoting sustainable development in developing countries.

The Moderating Role of Stateness

Lastly, the findings confirm Hypothesis 7, demonstrating that stateness negatively moderates the relationship between the nation's level of difficulty and political participation. This indicates that

higher levels of stateness mitigate the adverse effects of structural constraints and societal challenges on political engagement. Stateness, characterized by a monopoly on the use of force, strong national identity, secular governance, and robust administrative structures, play a crucial role in enabling governance systems to address crises effectively and foster civic participation. This result aligns with Craft and Howlett's (2012) emphasis on the importance of robust governance mechanisms in addressing societal challenges. Solid capabilities and coherent policy advisory systems enable governments to navigate structural constraints like poverty and inequality and reduce societal conflicts.

Moreover, Karim (2020) provides experimental evidence supporting the moderating role of stateness, showing that relational state-building efforts, such as strengthening local governance structures and law enforcement, positively influence citizen attitudes toward governance. These efforts foster trust in the government and reduce the adverse effects of structural challenges on political participation. In contrast, in contexts where governance is weak or fragmented, the lack of administrative capacity and enforcement mechanisms amplifies the adverse effects of societal challenges, deterring citizens from engaging in democratic processes. The negative moderating effect of stateness also reflects the importance of governance in shaping the political landscape. In nations with solid governance systems, administrative structures reduce the direct impact of structural constraints on political engagement and foster public trust and inclusivity. Robust governance enables efficient policy implementation and provides the institutional framework for promoting civic engagement despite significant societal challenges.

This study highlights the transformative role of education and R&D in driving economic performance, reducing societal challenges, and fostering political participation and institutional stability in developing countries. It emphasizes the interplay between economic stability, governance, and civic engagement, with stateness as a critical moderating factor in mitigating structural constraints. These findings underscore the importance of robust governance systems and strategic investments in human capital and innovation. For a summary of all hypotheses and their outcomes, refer to Table 5, which indicates whether each hypothesis was supported.

Table 5: Support for the hypotheses based on the results

Hypothesis	Supported?
H1: Education and resource and development policies positively influence the country's economic performance.	Yes
H2: Education and resource and development policies negatively influence the nation's level of difficulty.	Yes
H3: Education and resource and development policies positively influence the nation's stateness.	Yes
H4: Education and resource and development policies positively influence the nation's monetary and fiscal stability.	Yes
H5a: The nation's level of difficulty negatively influences economic performance.	Yes
H5b: The nation's level of difficulty negatively influences political participation.	Yes
H6a: The nation's monetary and fiscal stability positively influences political participation.	Yes
H6b: The country's political participation positively influences economic performance.	Yes
H7: The nation's stateness negatively moderates the relationship between the level of difficulty and political participation.	Yes

VII. Conclusion

This study highlights the essential influence of education policies and R&D investments in driving governance improvements and fostering economic progress in developing nations. Utilizing

Structural Equation Modeling (SEM) framework powered by WarpPLS 8.0, this research integrates key elements of Endogenous Growth Theory and Institutional Theory to highlight the interconnectedness of education, governance, and economic performance. The findings underscore several implications for both researchers and practitioners.

For researchers, this study enhances the theoretical understanding of the ways human capital development and institutional strength contribute to economic growth and political stability. The positive relationships between education and R&D investments and key indicators, such as economic performance, fiscal stability, and political participation, emphasize the need for further exploration of these dynamics. Additionally, the moderating role of stateness offers a new dimension to governance studies, providing insights into how robust state structures can mitigate the adverse effects of societal and institutional challenges.

For practitioners, the findings offer practical strategies to strengthen governance systems and build economic resilience. Education and R&D policies emerge as critical tools for addressing structural challenges, such as poverty, inequality, and weak institutions. Policymakers can use these insights to focus on investments in education systems and innovation initiatives, promoting societal trust, encouraging economic diversification, and enhancing civic participation.

Although this study offers valuable contributions, it also has certain limitations. The model, while comprehensive, does not account for other influential factors such as cultural differences, which may play critical roles in shaping development outcomes. Additionally, the dataset's broad scope provides a generalized perspective but may overlook region-specific dynamics. Future research should expand the model by including additional contextual factors and concentrating on specific regions or country groups, enabling a deeper understanding of localized dynamics and their impacts.

In conclusion, this research aims to bridge theory and practice, offering a comprehensive framework for understanding the interplay between education, governance, and economic performance. By tackling governance deficiencies and utilizing education and R&D as transformative instruments, developing nations can address structural challenges, strengthen institutional frameworks, and promote inclusive growth. These findings serve as a foundation for future research and policy innovation aimed at creating resilient and prosperous societies.

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Appendix: Measurement Model

The following indicators were used to measure the constructs in this study, which assess various aspects of governance, economic performance, and policy within the context of developing countries. Data for these constructs were collected from the BTI Transformation Index, a comprehensive resource that evaluates political and economic transformation in developing countries. We would like to thank the BTI Transformation Index project for making their data publicly available, which greatly supported this study. For more details on the BTI Transformation Index, visit their official website at <https://bti-project.org/en>.

Latent Variables (LVs)

1. Level of Difficulty (Diff)

- a. **Structural Constraints:** To what extent do structural difficulties constrain the government's governance capacity? Assessed based on factors such as poverty levels, educational availability, geographic challenges, infrastructural deficiencies, natural disasters, and pandemics.
- b. **Civil Society Traditions:** To what extent do traditions of public or civic engagement exist, including active civic associations and social trust?
- c. **Conflict Intensity:** How serious are political, social, ethnic, and religious conflicts, as measured by indicators of polarization, mobilization, and violence levels within the country?

2. Political Participation (PolPart)

- a. **Free and Fair Elections:** Evaluates if elections are regularly held, free, and fair, with transparent and impartial electoral processes.
- b. **Effective Power to Govern:** Assesses the extent to which democratically elected representatives hold effective power, free from interference by veto groups.
- c. **Association and Assembly Rights:** Measures the degree of freedom individuals have to form and join political or civic groups and assemble freely.
- d. **Freedom of Expression:** Examines whether citizens, organizations, and the media can express opinions freely, without state interference or censorship.

3. Monetary and Fiscal Stability (MonFisc)

- a. **Monetary Stability:** Assesses the monetary authority's ability to pursue and communicate a consistent stabilization policy, focusing on inflation control, exchange-rate policies, and independence from political influence.
- b. **Fiscal Stability:** Evaluates the government's commitment to maintaining fiscal stability through sound budgetary policies, debt management, and institutional safeguards.

4. Stateness (State) (*Moderator*)

- a. **Monopoly on the Use of Force:** Assesses whether the state maintains a monopoly on the use of force across its entire territory.
- b. **State Identity:** Measures the level of agreement among societal groups on citizenship and the legitimacy of the nation-state.
- c. **No Interference of Religious Dogmas:** Evaluates the extent to which political and legal institutions operate independently of religious influence.
- d. **Basic Administration:** Determines the existence and functionality of administrative structures that provide public services, including access to water, sanitation, and electricity.

Individual Indicator Variables

5. Education Policy / R&D (EduRND)

- a. Evaluates the existence and quality of institutions for basic, secondary, and tertiary education, as well as research and development. Considers government support,

funding structures, and educational outputs, such as enrollment rates, literacy rates, and patents.

6. Economic Performance (EcoPerf)

- a. Measures the economic performance of a country using quantitative indicators such as GDP, GDP per capita growth, inflation, unemployment, foreign direct investment, current account balance, public debt, and tax revenue.

7. CYear

- a. Data were collected biennially from 2008 to 2024, providing insights into trends and changes across the time periods studied.

Understanding Factors in Internal Control Weaknesses

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Abstract

We research the differences in CEO and CFO characteristics such as salary, age, and gender and their possible association with material internal control weaknesses. We hypothesize a potential link between upper-level management characteristics and their willingness to disclose weaknesses within their organization. Following the implementation of the Sarbanes-Oxley Act of 2002, proper internal controls have become crucial in ensuring transparency and accuracy within financial reports. Our research covers the general roles and responsibilities of CEOs and CFOs as well as their regulation obligations, more specifically their SOX requirements. We cover the importance of internal controls and the role they play, as well as a few of the most common internal controls found within businesses. The research utilizes financial data from the years 2014-2021 to further examine various factors that we presume to be associated with an increased number of surprise disclosures. Through this research we seek to gain insights and spotlight the characteristics of Chief Executive Officers and Chief Financial Officers that are associated with the fewest number of material internal control weaknesses in the hope of highlighting for the business community factors that may aid in the continuing improvement of organizational compliance with regulatory standards such as the Sarbanes-Oxley Act.

I. Introduction

The goal of this study is to identify associations between internal control issues leading to surprise disclosures and a wide range of Chief Executive Officer (CEO) and Chief Financial Officer (CFO) characteristics that perhaps have an influence on their organization's audit reports or lack of information regarding their audit reports. The topic of internal control issues has become of increasing interest in the years following the implementation of the Sarbanes-Oxley Act (SOX)² and similar regulations in order to maintain transparency and accuracy within business financial reports.

The CEO and CFO are two of the top executive roles within an organization, yet they vary greatly in their responsibilities. CEOs are often the top decision maker of an organization and oversee the organizations general direction of functions. "The roles the CEO plays would enable him/her to discern the results of corporate philanthropy, improved firm reputation, legitimacy, and employee loyalty" (Xu, 2022). The CEO of a company is much like the head spokesperson of the organization in that they do their best to keep shareholders satisfied while maintaining a strong company image. The responsibilities of a CEO consist of a broad range of activities such as presenting strong leadership skills and providing direction towards achieving the organization's overall strategic vision. A CEO must maintain strong communication skills as they are often seen as the 'face of the company' to the general public. CEOs should monitor day to day operations in order to ensure policies and proper workplace culture are being followed as efficiently and effectively as possible within the organization. The CFO, on the other hand is the executive officer of the financial part of the organization and focuses on maximizing financial returns and avoiding any unnecessary financial losses. CEO and CFO responsibilities can

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² The Sarbanes-Oxley Act (SOX), enacted July 30, 2002, imposed the requirement that both the Chief Executive and Chief Financial Officers certify the accuracy of financial statements (SOX, Section 302) and provide information on the adequacy of their internal controls (SOX, Section 404) (Hillier, 2022).

sometimes conflict if a CFO's priorities do not align with those of the CEO, "his/her roles are focused on the potential immediate financial returns from investment" (Xu, 2022). Managing financial returns consists of a wide range of responsibilities similar to that of a CEO but are more targeted toward finance. For example, a CFO would cover the financial strategies and planning as well as ensure capital resources are being used as efficiently and effectively as possible. Rather than interact with the general public, a CFO must engage and maintain investor relations. In order for CFOs to track their work they rely on financial reports and analyses that comply with regulations, and focus on variables such as revenues, assets, liabilities, and cash flows.

The financial oversight of an organization is important to protect against fraudulent activities. Fraudulent activities involve activities that go against an organization's values and ethics, "Broadly, fraud is part of deviant workplace behavior" (Agnihotri, 2020). Frauds that do begin within an organization can, however, be mitigated through the use of proper internal controls. A Finance department's internal controls involve keeping track of assets and liabilities as well as many other elements of financial data. Auditors have the job of reviewing the company's financial reports and in ensuring that they are in compliance with laws and regulations. Mistakes can, however, be overlooked, or perhaps even perpetrated within the financial department. "Auditors' jobs are to uncover these deceitful acts to help shareholders make decisions. Auditors do not want to be held liable for any type of missed fraud" (Boylan 2022). Therefore, auditors continuously monitor and adjust reports in order to ensure accuracy. "The auditor must consider certain adjustments and impairments such as fixed assets depreciation, inventories adjustment, provisions for employee retirement benefits" (Hategan, 2022). Missed fraud not only reflects negatively on the auditors involved but on the organization as a whole with consequences that can include jail time, hefty fines, and public backlash.

In reference to internal controls, surprise disclosures are late unexpected disclosures of information or rather the lack of informational disclosures throughout the fiscal year. According to "Early Warnings of Internal Control Problems", the number of organizations with surprise disclosures has been a continuous issue. "A majority of accelerated filers with material weaknesses (MWs) continue to have "surprise" adverse internal control reports; that is, the Section 302 certifications by such firms in the previous quarters of the same fiscal year were clean (with no mention of any MWs)" (Vishal, 2013). Disclosures when reported in a timely fashion can provide new information to shareholders of the organization, "information disclosure by management is an essential way to alleviate the problem of asymmetric information between inside managers and outside information users" (Wang, 2015). Surprise disclosures are often made in the last reporting period of the year and the term "surprise" implies that there was no prior indications that there were issues with the listed internal controls within the recent relevant reports. Often times, surprise disclosures can be unintentional, as in the organization or more specifically, management truly did their part to follow internal control procedures and unfortunately struggled with issues during the final quarter. Surprise disclosures can, however, also be a result of fraudulent activities in which one or multiple members of the organization are knowingly hiding information that may be viewed negatively and therefore taint the company's image and cause share prices to decline. "While warnings are typically limited to the forthcoming earnings announcement, they may raise investor concerns about long-term competitiveness and economic viability, contributing to large price declines" (Kasznik, 1995). "Occurrence and Consequences of Surprise Internal Control Disclosures" covers the many consequences that upper management faces when it comes to MW disclosures. "The results show that companies with MW disclosures are more likely to dismiss their auditors and CFOs, and experience more shareholders voting against auditor ratification, compared to companies that issue clean reports" (Hambisa, 2018). The results suggest that shareholders do care about internal control disclosures and therefore upper management should be more inclined to avoid any surprise disclosures.

In response to a number of fraudulent report scandals³ from large organizations, regulations such as the Sarbanes Oxley Act of 2002 have been implemented to enhance the quality and

³ "Enron, WorldCom, HealthSouth, Adelphia, Parmalat, Elan, Andersen... the world economic system has witnessed in monetary terms the largest dollar level of fraud, accounting manipulations and unethical behavior in corporate history and certainly the most economic scandals and failures since the 1920s" (Rockness, 2005).

reliability of audit reports. The Sarbanes Oxley Act covers a variety of issues, but our focus is on sections 302 and 404. Section 302 requires the CEO and CFO to certify that the financial reports published on behalf of the company are accurate and complete. The requirement of CEO and CFO validation is intended to ensure that top executives are held accountable if any fraudulent activities come to light later on. Failure to follow section 302 can lead to a hefty fine or even result in jail time for any of the members involved. Section 404 deals with the implementation of internal controls and their effectiveness which, similarly, increases transparency and reduces the risk of fraudulent activities. Rather than focusing on the individuals representing the organization as does section 302, section 404 highlights the strategic use of internal controls throughout the organization as a whole.

There are a number of factors that affect internal control weaknesses (ICWs) such as the overall quality of enterprise governance. Effective governance practices, such as clear delineation of roles and responsibilities, transparent decision-making processes, and strong ethical standards, are positively associated with the strength of a company's internal control system. Another critical factor is the degree of fulfillment of management objectives. Any issues between management and the overall strategic objectives of an organization increase the probability of internal control weaknesses. A number of internal control weaknesses are also tax related, increasing the severity of such issues. "Equally important and under-studied are the implications of these frequent tax-related ICWs..., in the year prior to disclosing a tax-related ICW, firms are more likely to reduce their ETR (effective tax rate) from the third to fourth quarter to meet or beat earnings benchmarks relative to firms without such ICWs" (Bauer, 2016). In addition, advancements in technology can have a significant impact on internal control systems as they are constantly changing the way tasks, such as tax reports, are completed. Although new technologies can definitely enhance efficiency and effectiveness, they also come with their own risks that must be properly managed.

When it comes to CEO and CFO compensation, there are many different ways to be compensated aside from a base salary. Compensation is the organizations way of reimbursing employees for their work done and it can be made up of monetary awards, benefits, and/or perks. Benefits could include a range of insurance plans as well as vacation and sick days depending on the company. Perks could include things like tuition assistance, employee discounts, and free memberships. Monetary forms of compensation may include company stock, sales commissions, and annual bonuses. "U.S. CEOs' base salaries on average account for just 21% of their total compensation, whereas incentive pay consisting of bonuses, stock option awards, and restricted stock represents more than 73%" (Pan, 2018). The various forms of compensation apply to CFOs the same way, therefore, both CEO and CFO compensation is dependent on individual and organizational performance. Upper managements compensation is often linked to the organizations performance in order to motivate employees to behave in ways that best benefit the organization. A CFOs performance is more related to that the accounting and financial activities than is that of the CEO, therefore the presence or absence of a surprise disclosure is more dependent on the performance of the CFO. In regards to the CEO, we test the base salary for our hypothesis of an association internal control weaknesses as well as whether CEO gender has relevance.

II. Hypotheses

The focus of this study is to explore management compensation and overall management expertise in all areas and apply our findings to a connecting hypothesis involving any and all relationships between salary and incidents of surprises when it comes to disclosing material weaknesses. We hypothesize that there is a connection between CEO and CFO characteristics and internal control material weaknesses, more specifically a connection between CEO and CFO compensation and surprise disclosures. Our hypotheses imply that the better a CEO/CFO is compensated, the more willing they are to fulfill the duties within their role to the best of their capabilities as well as look out for the best interests of their company. Contrarily, the less that a CEO/CFO is compensated, the less effort they will place in fulfilling their duties, overall sharing

less interest in the organizations wellbeing. A higher compensated individual is more likely to see themselves as having more to lose compared to a lower compensated employee who perhaps sees themselves as underappreciated and undervalued within their organization. Lack of effort especially from a CEO or CFO leads to an increase in internal control weaknesses as there is less emphasis placed on the importance of internal controls therefore leading to an increase in the possibility of material weaknesses. We assume in our hypothesis that the lower compensated executives choose not to disclose the presence of material weaknesses within the company for as long as possible in hopes of maintaining their image and buying more time perhaps in hopes of meanwhile working towards resolving the material weaknesses, failure leads to an increase in surprise disclosures. We present our hypotheses in the null form:

H1: There is no significant association between a CEOs compensation and internal control weaknesses

H2: There is no significant association between a CFOs compensation and internal control weaknesses

III. Model

To test our hypotheses, we use the following logistic regression

$$NNSurp = \alpha + \beta_1 LNTAASSETS + \beta_2 ROA + \beta_3 CURR\ RATIO + \beta_4 LEV + \beta_5 BIG4 \\ + \beta_6 LOSS + \beta_7 OANCF + \beta_8 CEOa + \beta_9 CEOb + \beta_{10} CEOs + \beta_{11} CEOg \\ + Year\ and\ Industry\ Fixed\ Effects + \varepsilon$$

Variable definitions are provided in the appendix.

IV. Research Design

Our primary analysis is conducted over the years 2018-202. We retrieved data on managers internal control reports for each year using the database *Audit Analytics*. Beginning with a total sample of 22,691 firm-year observations, filtering out any duplicates or firms that did not meet the criteria to evaluate. We again used *Audit Analytics* to retrieve disclosure control reports (the SOX section 302 and 404 reports) to identify which firms had surprise disclosures and which did not. Our resulting sample is comprised of 907 unique firms. Taking note of each firms reports, or in some cases, lack of reports in each quarter and comparing the results to those of the ending period reports as well as the previous year's ending period reports we merged our auditor data with financial reporting data from *Compustat* and with CEO and CFO specific data from *Execucomp*. Table 1 presents the sample selection process.

Table 1: Sample Selection

Data	Observations
Total Sample from <i>Audit Analytics</i>	22691
Less Missing information	21782
Sample from <i>Audit Analytics</i>	909
Less Missing Financial Data	15
<i>Compustat</i> Total	894
Less missing <i>Execucomp</i> CFO data	335
Less missing <i>Execucomp</i> CEO data	2
Total	557

Table 2 below presents the distribution of our sample observations by year. The year 2016 constitutes the largest portion of the sample with 90 observations whereas the year 2021 makes up the smallest portion of the sample with 29 observations.

Table 2: Distribution by Years

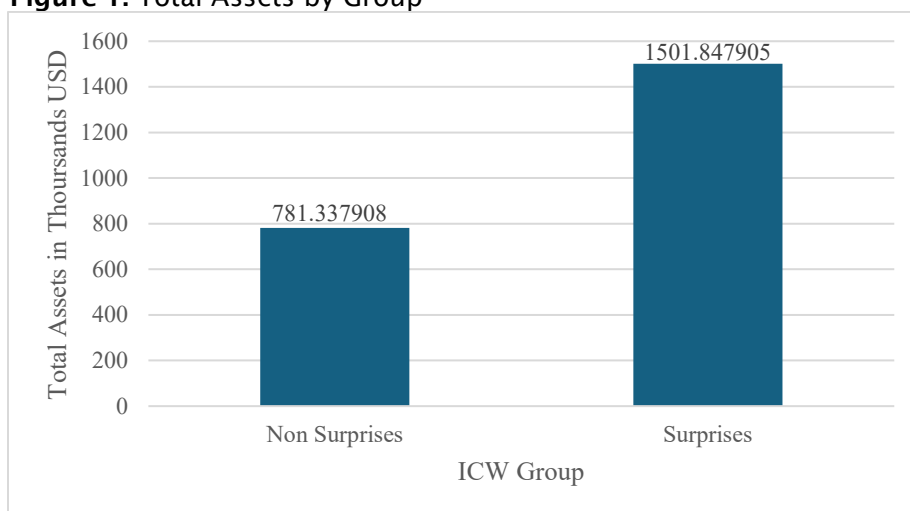
Years	Observations
2022	56
2021	29
2020	41
2019	63
2018	78
2017	56
2016	90
2015	79
2014	65
Total	557

Table 3 presents the sample by industry distribution. The majority of the sample observations are from the manufacturing industry making up over half of the observations at 53% or 296 observations. Services comprise the second largest portion of our sample with 124 observations (22%). Transportation and Utilities and Wholesale and Retail both have 55 observations (10%), While Agriculture, Mining and Construction had 27 observations (5% of the sample).

Table 3: Distribution by Years

Industry	Observations	%
(0000–1999)--Agriculture Mining and Construction	27	5%
(2000–3999)--Manufacturing	296	53%
(4000–4999)--Transportation and Utilities	55	10%
(5000–5999)--Wholesale and Retail	55	10%
(7000–9999)--Services	124	22%
Total	557	100%

Figure 1: Total Assets by Group



We calculated Return on Assets (ROA) by dividing net income by total assets on an annual basis. We calculated Leverage (LEV) by dividing total liabilities by total assets per year. The Current Ratio (CURR RATIO) was derived from dividing current assets by current liabilities. Lastly, Cash from Operations (CASHOP) was computed by dividing cash from operations by total assets. Total assets for the sample equals \$2,283,186 (in millions) with surprise companies totalling \$1,501,848 and non-surprise companies \$781,338. Figure 1 presents total assets for the non-surprise and surprise companies graphically.

Table 4 presents descriptive statistics for the sample as a whole. We find that the mean *Surp*, where 0 represents a surprise disclosure and 1 represents no surprise disclosure is .41, indicating that 41% of our sample are non-surprise disclosures while 59% of our sample disclosed surprises. The mean of *BIG4* is .78 signifying that 78% percent of the sample firms were audited by one of the big 4 auditing firms. The mean of *LOSS* is 0.35 signifying that 35% of the sample companies reported a loss. The *CEOa* and *CFOa* have means of 56.58 and 52.49 respectively, while *CEOg* and *CFOg* have means of 0.05 and 0.09.

Table 4: Sample Descriptive Statistics

Variable	Mean	S.D	0.25	Mdn	0.75
<i>Surp</i>	0.41	0.49	0.00	0.00	1.00
<i>AT</i>	4100000000.00	9400000000.00	640000000.00	1400000000.00	3300000000.00
<i>LNTAASSETS</i>	21.11	1.12	20.28	21.06	21.92
<i>ROA</i>	0.00	0.07	-0.03	0.02	0.05
<i>CURR_RATIO</i>	2.16	0.98	1.40	1.99	2.82
<i>LEV</i>	0.58	0.22	0.40	0.57	0.73
<i>BIG4</i>	0.78	0.41	1.00	1.00	1.00
<i>LOSS</i>	0.35	0.48	0.00	0.00	1.00
<i>OANCF</i>	0.58	0.22	0.40	0.57	0.73
<i>CEOa</i>	56.58	5.46	52.00	57.00	61.00
<i>CEOb</i>	42.08	106.93	0.00	0.00	0.00
<i>TDC1CEO</i>	4500.00	2900.00	2100.00	3700.00	6600.00
<i>CEOs</i>	0.74	0.68	0.23	0.52	0.97
<i>CEOg</i>	0.05	0.21	0.00	0.00	1.00
<i>CFOa</i>	52.49	6.04	48.00	53.00	58.00
<i>CFOb</i>	31.96	64.56	0.00	0.00	0.65
<i>TDC1CFO</i>	1800.00	1000.00	913.36	1500.00	2400.00
<i>CFOs</i>	0.40	0.34	0.12	0.28	0.58
<i>CFOg</i>	0.0916	0.2887	0	0	1

Untabulated results for CEO age in our sample ranged from the youngest at 37 years of age to the oldest at 78 years of age. CFO age ranged from the youngest at 30 years of age to the oldest at 75 years of age. The combined average age of the two groups of executives is 54.

Table 5 presents test of the equality of means for our variables: surprises versus the non-surprises. our results indicate that when separating the non-surprise and surprise samples from each another, the results in the categories *BIG4*, *LOSS*, *CEOg*, and *CFOg* vary. Of the 228 non-surprise observations, 175 were audited by the *BIG4*, 85 companies reported a *LOSS*, 10 CEOs were female, and 16 CFOs were female. Whereas for the surprise observations, 262 firms were audited by the *BIG4*, 111 reported a *LOSS*, 16 CEOs were female, and 35 CFOs were female.

To further evaluate the statistical significance of these differences, we conduct *t*-tests of the two-samples assuming unequal variances between the surprise and non-surprise. Our analysis of the resulting *p*-values provides insight into several of the factors we tested. We find that *LNTAASSETS*, *CURR_RATIO*, *CEOa*, *CEOs*, and *CFOs* have *p*-values greater than .10 indicating that the differences between the samples are not statistically significant. On the other hand, *ROA*, *LEV*, *OANCF*, *CEOb*, *TDC1CEO*, *CFOa*, *CFOb*, and *TDC1CFO* yield *p*-values less than .05 or .10 suggesting that the differences between the samples are statistically significant. *ROA* has a *p*-value of 0.02, *LEV* 0.062, *OANCF* 0.062, *CEOb* 0.037, *TDC1CEO* 0.026, *CFOa* 0.006, *CFOb* 0.028, and *TDC1CFO* 0.098.

Table 5: Differences Between Groups

Variable	Mean		diff	Ha: diff != 0
	Non-Surprise (n=228)	Surprise (n=329)		Pr(T > t)
<i>LNTAASSETS</i>	20.993	21.168	0.176	0.176
<i>ROA</i>	-0.005	0.009	0.015	0.020
<i>CURR_RATIO</i>	2.096	2.197	0.100	0.238
<i>LEV</i>	0.600	0.565	-0.035	0.062
<i>OANCF</i>	0.600	0.565	-0.035	0.062
<i>CEOa</i>	56.658	56.532	-0.126	0.789
<i>CEOb</i>	53.450	34.195	-19.255	0.037
<i>TDC1CEO</i>	4534.518	5435.882	901.364	0.026
<i>CEOs</i>	0.781	0.711	-0.070	0.233
<i>CFOa</i>	53.329	51.909	-1.420	0.006
<i>CFOb</i>	39.193	26.953	-12.239	0.028
<i>TDC1CFO</i>	1664.953	1812.970	1752.382	0.098
<i>CFOs</i>	0.403	0.391	-0.011	0.696

Variable Categorical	Non Surprise (n=228)	Surprise (n=329)	Chi-Square Test
<i>BIG4</i>	173	262	0.292
<i>LOSS</i>	85	111	0.389
<i>CEOfg</i>	10	16	0.793
<i>CFOfg</i>	16	35	0.145

The logistic regression results for the our variables of interest are presented in Tables 6 and 7. In the results for the CFO Model, *LNTAASSETS*, *ROA* and *CFOs* are negative and significant. The *LNTAASSETS* coefficient indicates that size is associated with a reduced probability of internal control weakness surprises. *CFOs* is also negatively associated with the probability of non-surprises. This suggests that internal control surprises are more likely to occur in companies that are larger and pay their CFO via a base salary. However, *CFOb* is positive and significant, indicating that firms that pay their CFO via bonuses are less likely to have surprises.

Table 7 reports the results for our logistic regression for CEO. Contrary to the results presented in Table 6, *CEOs* is not significant. The coefficient of *CEOb* is, however, positive and significant, which indicates that companies that pay their CEO via bonuses are less likely to have surprises.

In conclusion, our results for CEOs show no differences between the average salary of a CEO for a non-surprise versus surprise disclosure company, while there is a notable difference in the bonuses received by CEOs in surprise versus non-surprise disclosure companies. Our results for CFOs on the other hand are lower for non-surprise disclosure companies when they were paid more in bonuses. These results show that the bonus for CEOs is much higher and significant for surprise versus non-surprise companies. These results indicate that compensation made up of salary alone has a higher probability of leading to surprise disclosures, therefore increased salaries are associated with a greater likelihood of surprise disclosures. When looking at the bonus factor alone there is a higher probability of non-surprise disclosures for CEOs. We can also note that our results indicate that older executives are associated with a greater probability of non-surprise disclosures. This should be investigated in future research.

All in all, our results indicate that non-surprise companies pay more compensation via bonuses, while surprise companies pay more compensation via salaries. Bonuses are often based on performance whereas salaries are fixed. Therefore, while non-surprise companies are paid less via salaries, the overall compensation enhanced through bonuses. Higher bonuses for non-surprise disclosure companies supports our conjecture that higher overall compensation and benefits would be associated with higher levels of performance.

Table 6: Logit Regression Results CFO

Variable	(1) NNSurp	
<i>LNTAASSETS</i>	-0.553	***
	(-2.69)	
<i>ROA</i>	-6.469	***
	(-2.59)	
<i>CURR_RATIO</i>	-0.188	
	(-1.34)	
<i>LEV</i>	0.475	
	(0.78)	
<i>BIG4</i>	0.175	
	(0.64)	
<i>LOSS</i>	-0.757	*
	(-1.94)	
<i>OANCF</i>	0.000	
	(.)	
<i>CFOa</i>	0.054	***
	(3.21)	
<i>CFOb</i>	0.003	**
	(2.16)	
<i>CFOs</i>	-1.333	**
	(-2.21)	
<i>CFOg</i>	-0.423	
	(-1.11)	
<i>Intercept</i>	7.478	
	(1.64)	
<i>Industry and year</i>	Yes	
<i>N</i>	557	

*, **, *** indicate 0.10, 0.05, and 0.01 significance levels, respectively, for a two-tailed test (one-tailed for predicted directions)

Table 7: Logit Regression Results CEO

Variable	(1) NNSurp
<i>LNTAASSETS</i>	-0.281 (-1.57)
<i>ROA</i>	-6.323 ** (-2.57)
<i>CURR_RATIO</i>	-0.161 (-1.17)
<i>LEV</i>	0.528 (0.88)
<i>BIG4</i>	0.181 (0.67)
<i>LOSS</i>	-0.752 * (-1.96)
<i>OANCF</i>	0.000 (.)
<i>CEOa</i>	0.011 (0.59)
<i>CEOb</i>	0.002 ** (2.14)
<i>CEOs</i>	-0.141 (-0.56)
<i>CEOg</i>	-0.233 (-0.50)
<i>Intercept</i>	7.478 (1.64)
<i>Industry and year Fixed Effect</i>	Yes
<i>N</i>	557

*, **, *** indicate 0.10, 0.05, and 0.01 significance levels, respectively, for a two-tailed test (one-tailed for predicted directions)

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Appendix

SURP = 1 if there is not a year-end SOX Section 404 MW disclosure without SOX Section 302 MW disclosures during the first three quarters of the same year, 0 otherwise

Assets = monetary measurement of the resources owned by the organization that will provide future benefits

LNTAASSETS = the natural log of client's total assets (in millions of \$) at the end of the fiscal year

BIG4 = 1 if the firm is audited by one of the Big 4 auditors, otherwise 0.

LOSS = 1 if the firm reports negative net income, otherwise 0

CEO = the age of the CEO at the time of the reports

CEOg = the gender of the CEO, 1 if female, otherwise 0

CEOs = the amount in \$ of salary of the CEO

CEOb = the bonus the CEO was given in compensation during the fiscal year

CFO = the age of the CFO at the time of the reports

CFOg The gender of the CFO, 1 if female, otherwise 0

CFOs = the amount in \$ of the CFO's salary

CFOb = the amount of bonus the CFO was granted during the fiscal year

ROA = net income/total assets in year t.

LEV = total liabilities/total assets in year t.

CURR_RATIO = current assets/current liabilities in year t.

OANCF = cash from operations/total assets in year t

The Role of Green Loans in Promoting Corporate Sustainability: A Comparative Analysis between the Countries of the United States of America and the Republic of Azerbaijan

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Abstract

Green loans have been termed as a specific category of financial instrument that permits borrowers to allocate the funds exclusively towards initiatives that significantly advance environmental goals. They particularly specify social, environmental, and government concerns. Green loans facilitate the articulation of the environmental enhancements undertaken by borrowers within their operational frameworks and supply chain dynamics. Sustainable development lays emphasis on the present needs without compromising about the future requirements. The author aims to focus on analyzing the role of green loans in promoting corporate sustainability in two given countries. The author also aims to assess the importance of green financing in promoting sustainable development. To support the paper, the author relied on the secondary data including peer-reviewed journals and published reports that contained statistical primary data. The databases that have been used in research include ABI/INFORM Collection databases; the author restricted publication dates to 2020-2025. A systematic database research contained of the following keywords: “green loans”, “green financing”, “sustainability”, “corporate sustainability”, “sustainable development”, “inclusive economic development”, “financial instruments”, “environment” and “environmental concern”. The inclusion criteria involve the countries of the United States of America and the Republic of Azerbaijan, while the exclusion criteria involve other countries.

I. Introduction

The world economy’s general tendencies and issues, particularly with regard to its financial system, are linked to the research topic’s relevance in terms of the role of green loans in promoting corporate sustainability. A disastrous loss of natural capital is occurring against the backdrop of the world’s population and gross domestic product growing at an accelerated rate. United Nations (UN) forecasts indicate that all of this could result in a global economic restructuring that takes into account significant social, economic, and environmental shifts (Mamedov & Qurbanov, 2022). Therefore, it is imperative to ensure global sustainable development and the shift to a so called green economy in order to prevent such adverse effects. These transformations under these circumstances can be ensured by the financial sector (Mamedov & Qurbanov, 2022). Moreover, speaking about the greening of the modern economy, scientists around the world use several terms, such as “circular economy”, “green economy” and “bioeconomy” (Mamedov & Qurbanov, 2022). The author will adhere to the utilization of the “green economy” term for the rest of the paper.

The initiative of green projects can play a crucial role in ensuring the economic security of the country (Mamedov & Qurbanov, 2022). According to the UN Environmental Programme, green finance is a subset of sustainable finance. The latter includes social and governance aspects (of “ESG” priorities, closely related to corporate social responsibility), but green finance focuses specifically on environmental goals (Forstater & Zhang, 2016; Benjamin, 2022). Appropriate green finance can reduce harmful environmental footprints and improve environmental quality because

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its main objective is the trade-off between the growing versus the greening economy (Brandi et al., 2020).

Whilst sustainability debts can be studied at six different forms, such as green bonds, green loans, sustainability-linked bonds, sustainability-linked loans, sustainability bonds, and social bonds (Redfield, 2022). The author is focused on researching especially green loans that exist within the private market. As recent studies have focused mainly on the role of green loans in promoting sustainable development, very few have compared and analyzed the application of green loans in the countries of the United States of America and the Republic of Azerbaijan.

Climate change, pollution control, over-exploitation of fisheries, preservation of biodiversity, and water resource management constitute important public preoccupations at the local, state, and even world scales (Ahmadov et al., 2020). Therefore, the author narrows down the research to the role of green loans in promoting corporate sustainability in the countries of the United States of America and the Republic of Azerbaijan. The research purpose is to analyze the role of green loans in two countries, compare the financial instruments used, and compare green loan products in the market. The author is aimed at achieving the research goal without drawing attention to the country that practices green loans one step ahead, but rather to help the reader to recognize the relevance of the topic in two countries. The author constructed the paper in the qualitative research design using the secondary data and focusing on the green loans.

II. Literature Review

This section outlines some key ideas that have dominated the literature and consists of green loan definitions, the significance of green loans, green loan products and instruments, green loan promoters, the concept of inclusive economic development, strategies for increasing green loans and investments, the role of green loans in promoting corporate sustainability, and concludes with challenges of green loans in selected countries.

Definitions of Green Loans

There are several definitions of green loans in both countries. A green loan is defined by the Loan Market Association's "Green and Sustainable Lending Glossary of Terms" as any type of loan instrument made available exclusively to finance or refinance, in whole or in part, new and/or existing eligible "green projects" (Addleshaw Goddard, 2020). While the previous is the definition provided in the American context, the following is the definition in the Azerbaijani context. A green loan is defined by the Entrepreneurship Development Fund as business initiatives that aim to reduce greenhouse gas emissions in the production of products and develop technologies or support the use of clean energy (Entrepreneurship Development Fund, 2024).

Why Green Loans are Important?

According to the McKinsey Sustainability report, green bank financing could mobilize hundreds of billions in investment toward net-zero Greenhouse gas (GHG) emissions by 2050 as well as advance environmental justice in the United States of America (Buehler et al., 2023). According to the same source, to reach net zero by 2050, the United States of America could need an estimated \$27 trillion in climate investment (Buehler et al., 2023). Green bank financing could play a significant role in catalyzing this investment over the next decade.

In the Republic of Azerbaijan, the financial sector is primarily developed by the banking sector, which holds about 95% of the financial sector's total assets (International Trade Administration, 2023). The country is aimed at increasing its green project investments by 2030, and the banking sector may play a crucial role in fulfilling this aim (International Trade Administration, 2023). A question arises: How may it? According to the article that is available at the International Monetary Fund's (IMF) eLibrary, a well-developed banking sector already has the infrastructure in place to manage loans, assess creditworthiness, and reach potential borrowers, which can be leveraged to offer green loans (Radzewicz-Bak et al., 2024).

The American Chamber of Commerce's (AMCHAM) Azerbaijan branch recently established the Sustainable Development and Corporate Impact Committee with a purpose to support businesses that are incorporating sustainable practices in their operations and encouraging more businesses to adopt sustainable practices (AMCHAM, 2024). The Republic of Azerbaijan has signed and ratified both UN Climate Agreements, which are the Kyoto Protocol and the Paris Agreement (Department of State, 2023). On one hand, to fulfill the Kyoto Protocol's requirements by the year of 2020 was a challenging task for many countries, and the Republic of Azerbaijan is not an exception. On the other hand, there is a time for the deadline of the Paris Agreement, which is by the year of 2030. The Republic of Azerbaijan, with the help of green finance and its instruments, can get closer to the achievement of the requirements of the Paris Agreement.

Green Loan Products and Instruments

In the context of the United States of America, the predominant financial instruments in green finance are debt and equity (Green Finance Platform, 2021). To meet the growing demand, new financial instruments, such as green bonds and carbon market instruments, have been established, along with new financial institutions, such as green banks and green funds (Green Finance Platform, 2021).

The Clean Energy Fund of Texas (CEFT) offers low-cost loans for green energy projects. The CEFT, which is considered a public-private entity, and established in 2021, operates as a non-profit organization that mobilizes funding from a mix of public and private sources to provide low-cost financing for clean energy projects in Texas, essentially acting as a "green bank" within the state (CEFT, 2022). This green bank offers loans of \$3,000 to \$50,000 in long terms with low fixed interest rates to increase energy efficiency within homes, loans to increase energy efficiency and water conservation within businesses, and loans for developers to build environmentally focused energy projects (CEFT, 2024). CEFT draws funding from both public entities, such as government grants, and private investors.

Who the CEFT finances:

- a) Community-based organizations – including non-profit organizations that are also energy users that can save money and energy by making clean energy upgrades and efficiency improvements.
- b) Residents – homeowners can save money and save energy by accessing affordable financing to add solar panels, retrofit their homes, and make other upgrades.
- c) Suppliers – suppliers of solar panels, high-efficiency insulation, water-saving appliances, smart grid technology, heating, ventilation, and air conditioning units, and other materials have the opportunity to expand their reach and help more Texans.
- d) Small and large businesses – money-saving upgrades for small businesses and large businesses, including shopping centers and commercial centers, can access affordable financing for green projects.
- e) Buildings – investing in affordable upgrades that make buildings more efficient in saving money over time and making buildings more attractive to tenants.

Added benefits of green loans:

Advocacy – financing as many projects as possible.

Contractor Platform – an easy-use online workflow platform designed to streamline and create transparency during the application process. At the CEFT, the red tape is removed, and trusted and competitive financing is provided so that every Texan can become a borrower.

Energy and Water Audits – free energy and water conservation audits for low and moderate-income families and small businesses to identify opportunities for sustainable improvements.

Green Workforce Development – facilitating opportunities for families in under-resourced communities to access workforce development programs in the green economy. From solar panel installers to water and other technicians, there are thousands of jobs coming open in this new economy.

Environmental and Energy Literacy – coordinating education programs to assist low and moderate-income families with selecting the right contractor and retail electric provider.

Credit Enhancements – providing a loan loss reserve to reduce the risk for banking partners of green lending in disadvantaged communities.

Bank Respublika, one of the leading commercial banks of the Republic of Azerbaijan, which was founded in 1992 and is headquartered in Baku, the capital city of the Republic of Azerbaijan, offers a new credit product for the transition to a green economy. This product is offered under the European Bank for Reconstruction and Development (EBRD) credit line, providing an opportunity to invest in technologies that meet the highest standards and ensure efficient resource use. These loans are aimed at acquiring equipment and technologies that comply with the European Union's (EU) Green Technology Selector platform. The EBRD is extending a loan of up to US\$7.5 million (€6.9 million) in local currency to Bank Respublika (Bitsadze, 2024). The bank will on-lend the proceeds to small and medium-sized enterprises (SMEs). SMEs play a vital role in the green transition, and having them access sustainable finance opportunities has emerged as an important policy issue (EU Strategy for Financing the Transition to a Sustainable Economy, 2021). The loan aims to boost the competitiveness and green transition of local SMEs, with half of the proceeds, which is the equivalent of €3,000,000 (*loans are issued in Azerbaijani manat), expected to be directed to green investments. This initiative will support businesses in adopting energy-efficient technologies, utilizing renewable energy, and minimizing their environmental impact (Bitsadze, 2024). If activities fall under one of the following areas, beneficiaries can participate in the program:

- a) *Agriculture* – Livestock farming, poultry farming, horticulture, crop farming
- b) *Food Production* – Food/beverage production, processing/storage of fruits and vegetables; production of dairy products, tea, coffee, beer, wine, and bread
- c) *Various types of businesses* – Production of cotton, fabric, rubber, plastic, glass, furniture, and other types of products

To mention, there is an opportunity for borrowers to earn reimbursement – up to 15% (Bank Respublika, 2023).

There is a restriction in the loan application as follows. Only Azerbaijani companies that meet the following criteria can apply for the green loan:

- 1) At least 51% privately owned and under private management (Bank Respublika, 2023)
- 2) Operating in a sector potentially open to exports
- 3) Registered and operating in Azerbaijan in compliance with Azerbaijani legislation
- 4) Classified as individual entrepreneurs or sole proprietors
- 5) Meeting the standard financial evaluation criteria of the Partner Bank or Partner Financial Institution
- 6) Complying with the Environmental and Social Policy of the EBRD

Added benefits of green loans:

Affordable – The 10%-15% reimbursement incentive reduces financing costs for borrowers' investments (Bank Respublika, 2023).

Flexible – Suitable for any investment that helps borrowers' company comply with EU directives, increasing market potential and profitability.

Predictable – Financing is available in AZN for a term of 3 to 5 years (Bank Respublika, 2023).

Simple – Lacks strict compliance criteria (e.g., no minimum Internal Rate of Return (IRR) requirement).

Focus on Quality – All eligible investments improve product quality while expanding borrowers' market access locally and internationally.

Reduced Base Costs – Most eligible investments reduce energy and resource consumption, lowering costs and increasing competitive advantage.

Green Image – Many eligible investments reduce greenhouse gas emissions and other pollutants.

Free Expert Support – Simple procedures and free technical advice from a team of experts to help borrowers to enter new markets.

Promoters of Green Loans

The Coalition for Green Capital (CGC), an American-based, non-profit organization founded in 2009 and headquartered in Washington, D.C., developed a theory of change to address the climate crisis by using public and private partnerships to increase investments and accelerate the development of clean energy through a national green bank (Coalition for Green Capital, 2025). When federal efforts to establish a national green bank fell short, CGC pivoted to supporting the development of state and local green banks across the country. Over the years, CGC has supported/created over 40 green banks, providing the effectiveness of public-private partnerships in driving clean energy development (Coalition for Green Capital, 2025). To continue advocacy for a national green bank, CGC created the American Green Bank Consortium (AGBC), a network of green banks and other lending partners who have demonstrated the need for capital, technical expertise, and support at the local level to finance and deploy clean energy investments. Since 2011, the AGBC has collectively deployed \$25.4 billion in clean energy investments (Coalition for Green Capital, 2025).

The Azerbaijan Renewable Energy Agency, established in 2020 and functioning under the Ministry of Energy of the Republic of Azerbaijan, plays a pivotal role in advancing the country's renewable energy objectives. The Agency is tasked with shaping and implementing state policies related to renewable energy and its efficient use. The Agency's efforts reflect the country's commitment to transitioning towards a sustainable and diversified energy future (Askerov et al., 2025).

How Green Loans Foster Inclusive Economic Development?

Both countries that are the primary focus of this research are aimed at fostering inclusive economic growth, which, as stated in the IMF publication, is about seeking to boost national wealth and well-being while reducing poverty, ensuring equity across generations, and preserving economic freedoms (Agarwal, 2024). Countries prosper when they harness the power of all of their citizens (Department of State, 2025). To mention, the concept of inclusive economic development emerges from inclusive economic growth (Zhu, 2022). It is important to define the following two categories: economic growth and inclusive growth. The former focuses exclusively on ex-post redistribution, relying on the neo-liberalistic and capitalistic framework, instead of active ex-ante participation and planning in resolving inequality issues, which is, on the contrary, the focus of the latter (Zhu, 2022). These perspectives are economically favorable, but from an ecological and social viewpoints, are destructive (Zhu, 2022).

It is a common practice for scholars to regard inclusive economic growth as interchangeable with inclusive growth and to thus equalize these two concepts. This welfare approach to development recognizes economic growth as the pathway toward job creation, which can improve the living conditions of marginalized people (Zhu, 2022). Increases in income per capita or rationalization of income distribution may not be sufficient to benefit citizens and reduce inequality. Zhu (2022) further emphasizes that, for instance, education inequalities may not change or may even be intensified as the economy grows. Thus, inclusiveness should not be confined to the narrow concept of growth but instead should go beyond income concerns to embrace other dimensions of wellbeing. Continuing with the expansion of the scope of development and inclusiveness, this transition is aimed at ensuring development benefits the well-being of citizens and to acknowledge the interdependency between development initiatives and environmental sustainability. Experience demonstrates that the transition to the concept of inclusive development is a long-term and multifaceted process. At the same time, the duration and effectiveness of the transition to inclusive development depend critically on the countries' level of economic development and potential, the nature of the chosen economic development model, as well as national and global problems that determine the economic situation as a whole and the degree to which economic and political conditions are favorable (Ahmadov, 2020). Thus, inclusive development, being an integral part of the sustainable development model, requires the interactive and interdependent solution of economic, social, demographic, and environmental problems simultaneously.

Strategies for Increasing Green Loans and Investments

Recent studies, notably "The Global Stocktake" at the 28th United Nations Climate Change Conference of the Parties (COP), have underlined the gap in financial resources currently being mobilized for climate mitigation and adaptation, particularly in developing countries (First Global Stocktake, 2023). The author comes to a conclusion that as the core goal of green financing is to channel funds towards projects that actively reduce GHG emissions, which aligns with the concept of mitigation, followingly, green financing may be considered as a part of mitigation. To support this statement, the author also adds that green financing is generally considered to be a part of mitigation in the context of climate change, as it primarily focuses on funding projects that reduce GHG emissions and prevent further climate change, like renewable energy investments, rather than adapting to existing climate impacts. Implementing green technologies has become a critical global concern as nations strive to address environmental challenges and pursue sustainable development. The Republic of Azerbaijan, a developing country with a growing economy, is no exception to this need (Musmar, 2024).

Within this critical context, attention has turned towards the potential of Sovereign Wealth Funds (SWF) as viable candidates for championing climate and sustainable finance. In addition to their sheer scale, SWFs' commonly stated objectives of achieving stability and long-term economic benefits align seamlessly with the overall goals of sustainable development (Madrigal, 2024). The State Oil Fund of the Republic of Azerbaijan (SOFAZ), which is the country's sovereign wealth fund, has a mission to transform hydrocarbon reserves into financial assets generating perpetual income for current and future generations and to finance strategically important infrastructure and social projects of national scale (Department of State, 2023). SOFAZ has been actively integrating Environmental, Social, and Governance (ESG) principles into its investment strategy, focusing on green projects by investing in renewable energy, sustainable infrastructure, and climate-conscious companies, aligning its portfolio with the UN Sustainable Development Goals, and actively monitoring ESG performance across its asset classes like fixed income, equities, and real estate; essentially aiming to contribute to a more sustainable future through its investments (SOFAZ, 2023). The author provides an example of SWF to demonstrate that SWFs can be assessed as key climate and sustainable finance providers/catalysts.

BlackRock (BLK), an American multinational investment company and the world's largest asset manager, headquartered in New York, USA, offers green loans and funds, including green home improvement loans, green bonds, and funds that invest in green materials, such as the BlackRock BFM Brown to Green Materials Fund (BlackRock, 2025). The Fund will invest a minimum of 70% of

its total assets in the equity securities (i.e. shares) of companies globally that contribute to the transition towards a low-carbon global economy (BlackRock, 2025). Moreover, BLK is also involved in climate infrastructure projects. The company also possesses a separate Green Finance Strategy. BLK has extensive experience in renewable power and sustainable investing and is committed to factoring climate – and other environmental-related risks into their investment and risk management processes, including developing new approaches to measuring physical climate risks and stress testing portfolios for future carbon price scenarios. Climate Finance Partnership (CFP) is a part of BlackRock’s ongoing efforts to provide investors with more and more ways to invest their capital in strategies that accelerate the global low-carbon transition (BlackRock Impact Report, 2024). CFP is dedicated to accelerating the flow of capital into renewable energy across emerging markets and thereby supporting the transition to a low-carbon world (BlackRock Impact Report, 2024). Their global team of investment professionals is focused on driving financial returns through renewable energy generation, storage, and transmission in developing economies. CFP is further characterized by its attention to the management of ESG risks. CFP’s investment strategy directly supports the low carbon energy transition in emerging markets, and CFP believes that a robust, integrated approach to sustainable investing is essential in preserving and enhancing the value of its assets throughout their investment lifecycle (BlackRock Impact Report, 2024).

Noteworthy, BlackRock and the State Oil Fund of the Republic of Azerbaijan have partnered to invest in infrastructure assets.

The Role of Green Loans in Promoting Corporate Sustainability

Bank of America, through its Environmental Business Initiative, has committed \$1 trillion over the decade from 2020 to 2030 to advancing goals like renewable energy, sustainable transportation, water and agriculture, and improved forestry management (Benjamin, 2022). To emphasize, Bank of America is aimed at net-zero GHG emissions in all its activities before 2050 (Bank of America, 2025).

COP29, a leading climate conference, was hosted by the Republic of Azerbaijan on November 11-21, 2024, in Baku, the capital city of the Republic of Azerbaijan. A plethora of crucial environmental topics were discussed by the more than 200 parties, with a particular focus on climate finance, including green loans. At COP29, the Central Bank of the Republic of Azerbaijan (CBA) declared it would green 10% of its loan portfolios over the next six years (Costa, 2024). Moreover, the CBA is also considering greening its monetary policy and introducing a mandatory green insurance project (Costa, 2024).

Importance of Green Finance Taxonomies in Green Loans

The increasing effort to mitigate climate change has caused more and more individuals, governments, and companies to shift away from traditional financial investments and activities, and towards more environmentally-friendly alternatives. However, there has been a lack of consensus on what green finance and its environmental impact are. Thus, green finance taxonomies are needed to provide classification systems that identify how environmentally-friendly and sustainable economic and financial activities are.

Green finance taxonomies provide investors, governments, and loan-issuers with guidelines for identifying environmentally-sustainable economic assets and activities, as well as guidance on integrating sustainability into investment decisions. Thus, they help protect investors from greenwashing, put pressure on companies to become environmentally-friendly, and steer investment towards more sustainable initiatives. Seja et al. (2022) indicate that taxonomies also create a common reference for comparing the social and environmental impacts of different investments.

According to the World Bank’s 2020 Guide to Developing a National Green Taxonomy by Hussain (2020), green finance taxonomies have become increasingly important for the development of sustainable development strategies across many sectors:

- Central banks and regulators use them to support their green refinancing and lending programs.
- Governments refer to them when designing national sustainable development strategies and developing green fiscal policy.
- Private banks align their activity reports with them to communicate with investors about their green engagement.
- Financial authorities can use green taxonomies as a prerequisite for developing their green markets (Hussain, 2020).

Proceeding to practices of green finance taxonomies in the context of the United States of America and the Republic of Azerbaijan. To confirm the integrity of the \$1.5 trillion sustainable finance by 2030 goal mentioned in section VII), the Bank of America has worked with a third-party sustainability advisory firm to create an internal taxonomy document, the Sustainable Finance Taxonomy, that aligns with the 17 United Nations Sustainable Development Goals (Bank of America, 2025). In the context of the Republic of Azerbaijan, another notable achievement of the Central Bank of the Republic of Azerbaijan is that it released its global green taxonomy roadmap when the country was the host of the 29th Conference of Parties in an attempt to align taxonomies around the world and help increase financial capital for the transition in alignment with the Paris Agreement. The roadmap was released in partnership with several UN and global development groups, including the International Finance Corporation (IFC) and the Sustainable Banking and Finance Network (Costa, 2024).

Challenges of Green Loans

In the framework of the United States of America, even though private financial firms in emerging markets and developing economies (EMDEs) have started taking initiatives in the area of green and sustainable finance, the firms face a number of challenges, such as firms that would like to adopt more ambitious green and sustainable finance goals are hampered by the fear of losing market share to those that continue business-as-usual (Demekas, 2023). This “first mover disadvantage” risks holding back the wider adoption of sustainable finance practices (Demekas, 2023).

According to Musmar (2024), the realization of green projects via green loans in the Republic of Azerbaijan is not without obstacles, too. Limited awareness and understanding of sustainable practices among the population and inadequate regulatory frameworks pose significant challenges (Musmar, 2024). In section II), the author mentions that a well-developed banking sector may manage the provision of green loans, hereby, a challenge is that even with a well-developed banking sector, if there is not significant demand from businesses and individuals for green loans, the capacity to provide them might not be fully utilized.

III. Discussion

Delving into the importance and relevance of the findings, this green loan study demonstrated the accelerating demand for green loans by focusing on the specific examples and applications in two given countries. As a first stage of comparative analysis, the author mentioned the definitions of green loans, slightly moving to the importance of green loans in the context of both countries. As a third focus, the author researches the green loan products and instruments by providing specific examples. Continuing with green loan promoters and then fostering inclusive economic development with the help of green loans, the author analyzes the situation in focus countries. In this green loan study, the author proposed the concept of inclusive economic development as a sub-concept of inclusive economic development, which can better guide the policy and practice of green loans in promoting corporate sustainability. After analyzing the advantages of green loans, the author researched the strategies for increasing green loans and investments and came to the conclusion that green financing is generally considered to be a part of mitigation rather than adaptation. In the strategies section, the author discusses the

importance of investment companies and sovereign wealth funds in combatting climate change. Moving forward with the section focused on the role of green loans in promoting corporate sustainability, some important statistics is provided to support the section. For all parties to have a common reference in understanding classification systems of green finance, there was an importance of demonstrating the concept of green finance taxonomies in green loans, which was the sub-topic of the VIII) section. It was inevitable to provide a separate section mentioning the challenges of green loans, which was the section IX). Comparing the findings of the countries of the United States of America and the Republic of Azerbaijan, the conclusion might be stated as both countries are adapting new policies in green finance by advancing its instruments. This green loan study has its own limitations as well. The author would like to provide an accurate picture of some of the limitations that might need to be addressed in future research.

Limitations in design/execution. This paper demonstrated qualitative research with less focus on quantitative data. Some of the sources were utilized as readily available data. To continue, the author restricted the date of sources to 2020-2025 for presenting the most recent findings; however, utilizing data from the previous decades might present other new perspectives on the topic and lead to the necessity of including new sub-topics.

Limitations in generalizability. The author restricted the research to two specific countries, which makes generalizability of findings limited, considering them as an inclusion criteria for the sources, while considering all other countries as an exclusion criteria. Undoubtedly, the more countries' green finance tools were demonstrated, in contingency, some unmentioned applications would have appeared. As there was almost no research previously comparing these two countries, some difficulties were encountered in finding supportive papers for the stated claims. To explain, the results may not be externally valid if considering other countries. The results might not be replicable in or applicable to other settings or in other situations. It is beyond the scope of this green loan study to consider all of the limitations. However, as for the suggestions of avenues for future research, the author recommends taking into account some of the mentioned limitations.

IV. Conclusion

Thus, green loans are a fundamental tool in combating the environmental crisis and stimulating the development of green finance. This green loan study demonstrated the way the United States of America and the Republic of Azerbaijan are in a full-speed development of a green type of lending that enables them not only to improve the climatological situation but also to stimulate the economy in a greener way. The lending banks, by guaranteeing lower interest rates and additional benefits, may incentivize borrowers for green loans. A green type of economy is the one that makes the environmental and economic interests of society in equilibrium in favor of sustainable development. In general, the topic of green loans is relevant and important for the sustainable development of society and the economy.

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Appendix I

List of Abbreviations

The following table describes the significance of various abbreviations and acronyms used throughout the paper. The page on which each one is defined or first used is also provided.

Abbreviation	Meaning	Page
AGBC	American Green Bank Consortium	12
AMCHAM	American Chamber of Commerce	7
BLK	BlackRock	15
CBA	Central Bank of the Republic of Azerbaijan	17
CEFT	Clean Energy Fund of Texas	7
CFP	Climate Finance Partnership	16
CGC	Coalition for Green Capital	11
COP	Conference of Parties	14
EBRD	European Bank for Reconstruction and Development	9
ESG	Environmental, Social and Governance	15
EU	European Union	9
GHG	Greenhouse gas	6
IMF	International Monetary Fund	6
SME	Small and Medium-sized Enterprises	9
SOFAZ	State Oil Fund of the Republic of Azerbaijan	15
SWF	Sovereign Wealth Fund	15
UN	United Nations	4

The Economic Landscape of U.S.-Mexico Border Cities Before, During and After the COVID-19 Pandemic

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Abstract

The economies of U.S.-Mexico border cities are deeply connected, with trade agreements like NAFTA and the USMCA fostering growth in manufacturing and logistics across the region. Recent geopolitical shifts have strengthened Mexico's role in American supply chains, fueling nearshoring trends. This report examines the economic evolution of these border cities through the COVID-19 pandemic, highlighting trade resilience, infrastructure investments, and increased foreign direct investment.

I. Introduction

Cities along the U.S.-Mexico border have long depended on the strong flow of trade between the two nations, driven largely by a highly integrated manufacturing sector. Historically, cross-border trade has been promoted by trade agreements such as the North American Free Trade Agreement (NAFTA), enacted in 1994, and its successor, the United States-Mexico-Canada Agreement (USMCA), which took effect in July 2020. NAFTA played a crucial role in establishing duty-free access to goods across North America, spurring growth in export-oriented manufacturing zones, particularly in northern Mexico, where maquiladoras produce goods largely for U.S. markets. The USMCA maintained this trade-friendly framework while updating provisions related to labor, digital trade, and intellectual property, further reinforcing cross-border economic integration.²

Another factor that has influenced trade between the two countries is the U.S.-China trade war initiated in 2018 under the Trump administration which had a considerable impact on trade flows, tariffs, and supply chains. By imposing tariffs on a range of Chinese imports, the U.S. incentivized manufacturers to relocate production from China to other countries to avoid tariffs, with Mexico becoming a prime relocation destination due to its geographical proximity to the U.S. and trade-friendly environment.³ This shift encouraged multinational corporations to reconsider their supply chains, increasing demand for manufacturing facilities and infrastructure in northern Mexico, which has further strengthened its trade linkages with the U.S.

To capitalize on this opportunity, The Mexican government has invested heavily in the industrial sector of northern states, particularly in the automotive and electronics sectors, which has attracted considerable foreign direct investment (FDI). For instance, the state of Nuevo León has emerged as a key hub for these industries, benefiting from its proximity to the U.S. border and a well-developed infrastructure that supports international trade. Global corporations, such as Tesla, which announced plans for a new production facility near Monterrey in 2023, underscore investor confidence in the region's manufacturing capacity. This strategic investment by the Mexican government aligns with its broader objectives to promote economic development in northern regions and increase export capacity.

Consequently, the U.S.-Mexico border economy is experiencing a transformation toward high-value manufacturing, logistics, and supply chain management sectors. Border cities such as Laredo, El Paso, and San Diego, along with their Mexican counterparts Nuevo Laredo, Ciudad

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² USTR. (2020). *The United States-Mexico-Canada Agreement Fact Sheet*. Office of the United States Trade Representative.

³ Bown, C. P. (2019). *The 2018 US-China Trade Conflict After Forty Years of Special Protection*. The Peterson Institute for International Economics.

Juárez, and Tijuana, have seen substantial growth in infrastructure investment, including expanded ports of entry, enhanced rail connectivity, and upgraded highways to handle increasing trade volumes.⁴ This development has fostered a more integrated and resilient cross-border economy, where U.S. and Mexican manufacturers collaborate closely to maximize efficiency. However, this interdependent economic landscape remains sensitive to fluctuations in global trade policy, supply chain disruptions, and economic shifts in key trading partners. To address this, the U.S. and Mexico must better align their objectives and establish long-term conditions that remain independent of the political agendas of either country's executive leadership.

II. Trade Growth

Trade between the U.S. and Mexico saw consistent growth during the 2018-2020 period, reaching record levels in 2019 when Mexico briefly surpassed China to become the U.S.'s largest trading partner. This increase was largely driven by heightened demand for automotive, electronics, and machinery goods, which together constituted a substantial portion of the trade value.⁵

Figure 1.1 highlights the resilience of U.S.-Mexico trade in the face of the COVID-19 pandemic. Showing that, while the trade value sharply declined due to the initial disruptions in early 2020, it quickly rebounded to pre-pandemic levels in less than 4 months, underscoring the critical interdependence and adaptability of cross-border supply chains between the two countries.

The post-pandemic resurgence in trade has continued in the following years, reaching a notable level at the start of 2022 that aligns with broader economic recovery and possibly growing trends toward nearshoring. The trade between the two countries accounted for 798 billion dollars in 2023. Roughly a 300 percent increase in value from 2004.

Figure 1.1: Value of Goods Traded between the U.S. and Mexico During the Last 20 years (USD)

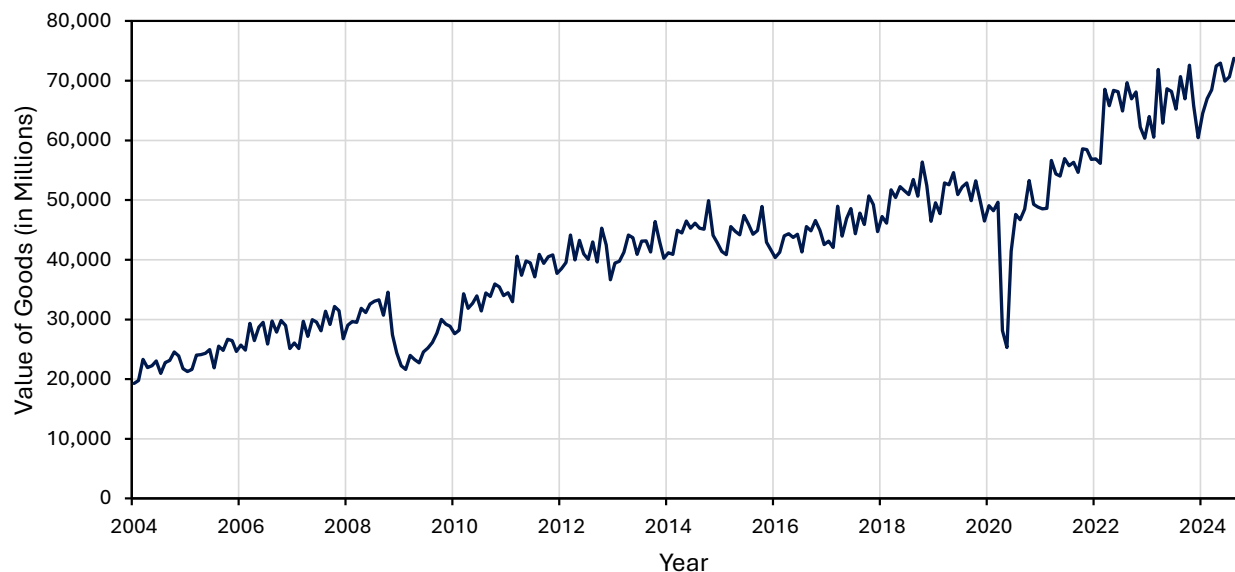


Figure 1.1 displays the times series of trade value (unadjusted for inflation) between the USA and Mexico from 2004 to 2024, with shaded areas indicating economic recessions.

Source: U.S. Census Bureau, 2004 to 2024 Trade in Goods with Mexico

⁴ See page 5 for more detailed information.

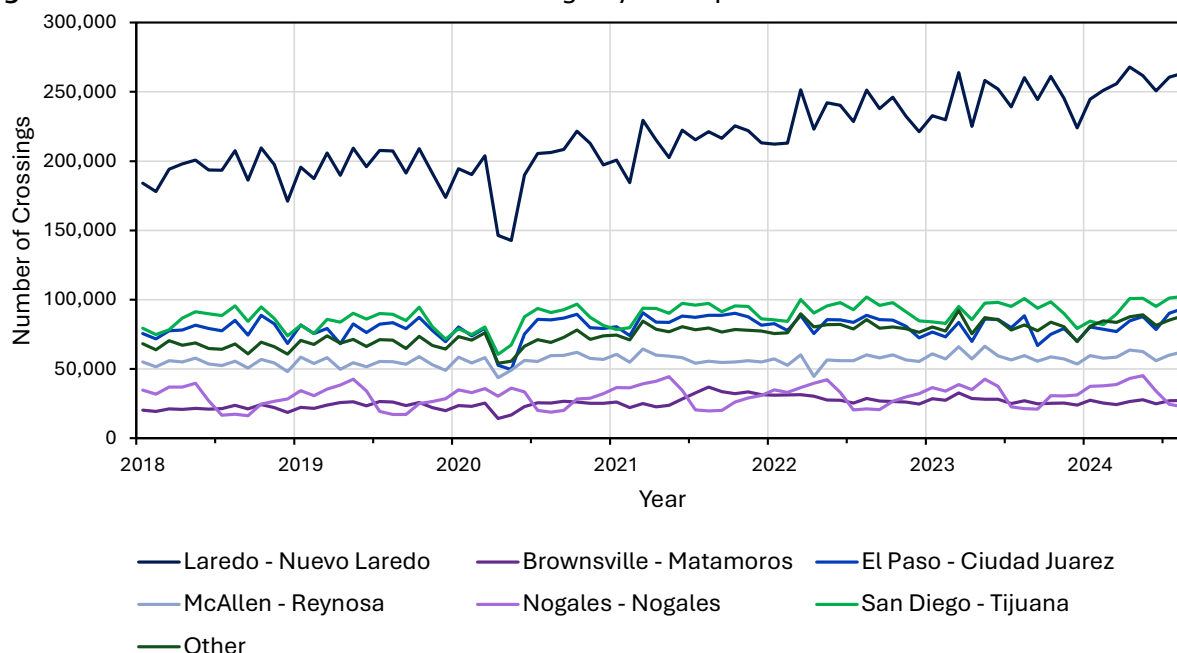
⁵ U.S. Bureau of Industry and Security, *2019 Statistical Analysis of U.S. Trade with Mexico* (Bureau of Industry and Security, U.S. Department of Commerce, 2019), <[https://www.bis.doc.gov/index.php/documents/technology-evaluation/ote-data-portal/country-analysis/2651-2019-statistical-analysis-of-u-s-trade-with-mexico/file#:~:text=In%202019%2C%20of%20the%20%24256.4,%2C%20and%20Minerals%20\(14.1%25\)>](https://www.bis.doc.gov/index.php/documents/technology-evaluation/ote-data-portal/country-analysis/2651-2019-statistical-analysis-of-u-s-trade-with-mexico/file#:~:text=In%202019%2C%20of%20the%20%24256.4,%2C%20and%20Minerals%20(14.1%25)>)>.

About 71 percent of the total trade between the U.S. and Mexico passes through the land ports along the border, making the transportation industry a significant part of the economy of border cities.⁶

In the years leading up to and following the pandemic, most land ports experienced a slow yet steady increase in border crossing volumes. However, Laredo, TX stands out as the only metropolitan area to see a dramatic rise in truck crossings since the pandemic's onset, with an increase of 38 percent (Figure 1.2).

The land ports on the 6 cities in Figure 1.2 make up 87 percent of the truck border crossings volume, with Laredo alone accounting for 38 percent of the total.

Figure 1.2: U.S.-Mexico Border Truck Crossings by Metropolitan Area



Key Events

In March 2018, the U.S. imposed tariffs of 25 percent on steel and 10 percent on aluminum imports from various countries, including Mexico. This move was framed as a national security measure, but it sparked retaliation from Mexico, which imposed tariffs on U.S. goods, including agricultural products and steel. This approach heightened tensions and led to fears of a trade war that could disrupt the integrated supply chains developed under NAFTA.

At the same time, Mexico signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) aiming to foster economic ties with several Asia-Pacific countries. Mitigating risks associated with U.S. trade policies and strengthening its position in the global trade network.

⁶ U.S. Department of Transportation, Bureau of Transportation Statistics, "Modal Profiles of U.S. Freight Transportation: Canada, Mexico, and China," last modified February 24, 2022.

III. Investment

Foreign direct investment (FDI) inflows in Mexico surged in 2022, reaching \$35.29 billion—a notable 11.6 percent increase from 2021.⁷ This growth aligns with the post-pandemic rise in trade between the U.S. and Mexico.

While much of this investment targets Mexico's northern border states, it is also heavily concentrated in major urban centers, including Mexico City, Monterrey, and Guadalajara.⁸ This distribution contributes to increased border crossings at Laredo–Nuevo Laredo, as Mexico's highway network links several major interior manufacturing hubs to the U.S. through this crossing.

On the cities along the border, much of the public investment in recent years has gone into expanding port and highway capacity to adapt to the increasing trade volumes. Examples include the construction of the new Otay Mesa II Port of Entry, the expansion of the Federal Highway 85 in Mexico, and upgrades to several ports along the border.¹⁰

Turning to the private sector, in addition to Tesla's planned Gigafactory, other major investments have been announced in Mexico by companies like Mexico Pacific Limited and Amazon. Mexico Pacific Limited has committed to constructing a \$15 billion liquefied natural gas (LNG) export facility in Puerto Libertad, Sonora, aimed at supplying LNG to global markets, particularly in Asia. While Amazon has also announced a \$6 billion investment to establish a new Amazon Web Services infrastructure region in Mexico, expected to enhance cloud capabilities across the country by 2025.¹¹

The governments of border states like Texas in the U.S. and Nuevo León in Mexico have implemented business-friendly policies, including tax breaks, subsidies, infrastructure upgrades, and minimal regulation, to attract investment in during the last decade. While these measures have boosted economic output and job creation, they have faced criticism from residents who argue that the benefits largely favor corporations and the wealthy, offering limited advantages to the working class. This perceived prioritization of corporate interests over social investment has created tension in these communities.

Although these policies successfully attract investment and increase regional GDP, they risk deepening inequality and social discontent if not balanced with initiatives that directly support the local population. Especially in areas that do not have potable water, electricity, or adequate medical services.

IV. Covid Policy Response

In mid-January 2020, the first COVID-19 cases were reported in both the United States and Mexico. At that time, initial regulations were implemented to limit contact with travelers from high-risk areas in an effort to curb early transmission. However, as COVID-19 continued to spread globally, the World Health Organization (WHO) declared it a pandemic on March 11, 2020.¹² In response, both the U.S. and Mexican governments introduced stricter measures to contain the virus, though these measures entailed substantial economic repercussions.

⁷ Gobierno de México, *Segundo Informe de Gobierno 2024, Segundo Trimestre*, Secretaría de Hacienda y Crédito Público, September 5, 2024, <https://www.gob.mx/cms/uploads/attachment/file/945218/20240905_Informe_Congreso_2024_2T.pdf>.

⁸ Secretaría de Economía, "United States Profile," *Data México* <<https://www.economia.gob.mx/datamexico/en/profile/country/estados-unidos#foreign-direct-investment>>.

⁹ U.S. Department of State, *2024 Investment Climate Statements: Mexico* <<https://www.state.gov/reports/2024-investment-climate-statements/mexico/>>.

¹⁰ Noël Perry, "U.S.-Mexico Border Infrastructure Upgrades on the Way," *FreightWaves*, May 8, 2023, <<https://www.freightwaves.com/news/us-mexico-border-infrastructure-upgrades-on-the-way>>.

¹¹ Reuters, "Mexican Officials Shake Off Investor Concern at Bilateral Business Summit," *Reuters*, October 15, 2024, <<https://www.reuters.com/world/americas/mexican-officials-shake-off-investor-concern-bilateral-business-summit-2024-10-15/>>.

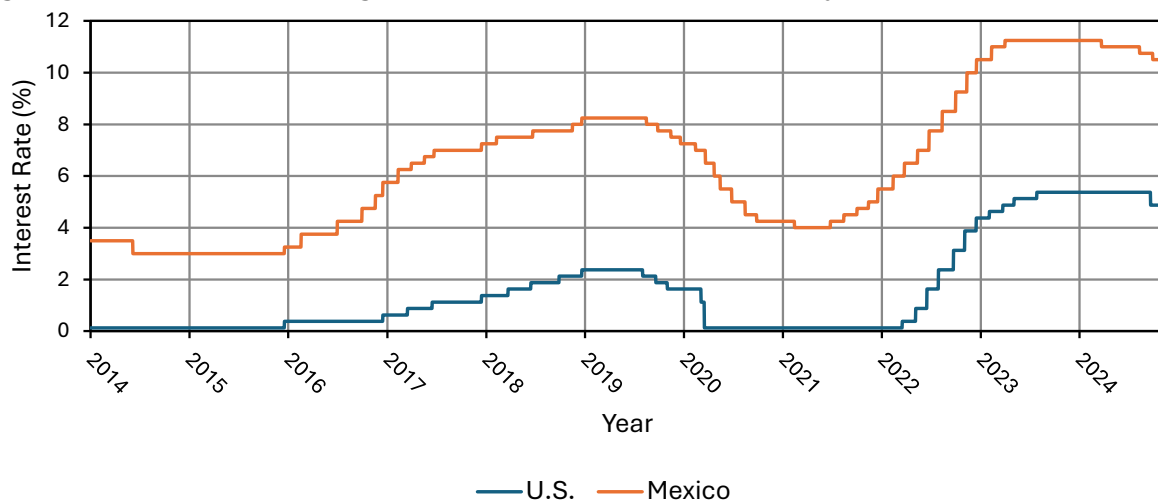
¹² Centers for Disease Control and Prevention, "COVID-19 Timeline," *CDC Museum*, <<https://www.cdc.gov/museum/timeline/covid19.html>>.

On March 21, 2020, the U.S.-Mexico border was closed to non-essential travel. This restriction significantly disrupted economic activity in the border regions, as cross-border traffic is a critical driver of commerce, particularly in sectors such as retail, hospitality, and tourism. This, combined with the stay-at-home policies, created a challenging environment for businesses.

To mitigate the economic impact of the pandemic, both the U.S. and Mexico enacted legislation to provide relief to small businesses, low-income households, unemployed individuals, and other vulnerable groups, while also funding essential healthcare services and vaccine distribution efforts.

In addition to these relief measures, the central banks of both countries—the Federal Reserve in the U.S. and Banco de México in Mexico—initially lowered interest rates to reduce borrowing costs and stimulate economic activity. This move was intended to support households and businesses during the height of the crisis. However, as the economy began to recover and demand for consumer and industrial goods surged, supply chains faced ongoing disruptions, leading to rising inflation. To control this inflation, both central banks gradually raised interest rates, seeking to stabilize prices and manage the economic rebound (Figure 1.3).

Figure 1.3: Federal Funds Target Rate (U.S.) vs Tasa de Interés Objetivo (Mexico)



V. Conclusion

The U.S.-Mexico border economy has benefited immensely from integrated supply chains, nearshoring trends, and sustained infrastructure investment, creating a resilient yet interdependent economic relationship. However, potential renegotiations of the USMCA in the near future could bring significant shifts. If adjustments to labor standards, environmental regulations, or tariff structures are made, these could lead to higher production costs for manufacturers on both sides of the border. This might also affect the cost and flow of goods, impacting key sectors like automotive and electronics that heavily rely on cross-border supply chains.

Moreover, potential policy changes could alter foreign direct investment patterns in Mexico, especially if U.S. incentives for reshoring become more attractive. Such changes could slow or redirect the current influx of investment into northern Mexico, where major players like Tesla have set up new operations. As companies adjust to potential new terms, border cities may see fluctuations in employment and demand for logistics and transportation services, affecting local economies reliant on cross-border trade.

Border cities will need to adapt proactively to maintain their roles as trade hubs. Strategic investment in port infrastructure, highways, and customs facilities will be essential to managing

any regulatory shifts efficiently. Ultimately, the evolving U.S.-Mexico trade landscape could redefine economic opportunities and challenges for border cities, impacting local employment, business growth, and cross-border economic integration.

Declaration of AI Use

In preparing this report, AI tools were utilized to assist with language refinement. The AI-supported contributions aimed to enhance clarity, coherence, and conciseness while preserving the author's original analysis and findings. All AI-generated text was reviewed and revised by the author to ensure accuracy and relevance to the report's objectives.

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The Future of Transportation - Emerging Self-driving Taxis

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Abstract

The emergence of self-driving vehicles (SDVs), speculate autonomous taxis or “robotaxis”, make a significant shift in transportation technology. Companies like Waymo and Tesla are pioneering advancements, leveraging artificial intelligence (AI) and sophisticated sensors to achieve near-complete autonomy in vehicles. SDVs promise a range of benefits from reducing traffic accidents and pollution to enhancing urban mobility and accessibility. However, the journey toward full integration of SDVs faces multiple challenges, including regulatory, ethical, and cybersecurity issues, along with public skepticism regarding safety and data privacy. This paper explores the technological mechanisms behind SDVs, examines the benefits and limitations of current systems, and addresses the legal and ethical implications of widespread adoption. Furthermore, the contrasting market strategies of keep players like Waymo and Tesla reflect differing visions for the future of autonomous transportation. As these companies advance their technologies, the potential for SDVs to reshape societal transportation habits become clearer, yet consumer trust and regulatory adaptation remain essential for the successful integration of SDVs into daily life.

Keywords: Self driving vehicles (SDVs); autonomous vehicles (AV); artificial intelligence (AI)

I. Introduction

Fifteen years ago, we all envisioned a future where technology had made remarkable leaps. Some even imagined that by 2024, flying cars would be part of everyday life. While that has not quite materialized, we are now witnessing the dawn of cutting-edge advancements in transportation. Autonomous vehicles, or self-driving vehicles (SDVs), are ushering in the era of futuristic mobility.

A car that can navigate by itself without being dependent on humans for inputs is known as a self-driving car (Shreyas, Bharadwaj, Srinidhi, Ankith, & Rajendra, 2020). It uses a combination of sensors, cameras, radar and artificial intelligence (AI) to travel between destinations without a human operator (Gillis & Leutkevich, 2024). Self-driving cars have the potential to bring many changes to future roadways and transportation industries, including reducing traffic congestion, lowering the number of accidents, and enabling new self-driving, ride-hailing and trucking services (Gillis & Leutkevich, 2024). It is predicted that every aspect of transportation would be much easier and would pollute the environment less (Pisarov & Mester, 2021).

In today's world, SDVs are becoming a more common sight with many of them being Tesla models. However, as technology continues to advance, other players in the SDV field are preparing to offer public SDV services as well. For example, Waymo has already launched its autonomous ride-hailing services in major cities like Phoenix, Arizona, and San Francisco, California. Imagine you are walking through the city and decide to hail a ride from Waymo. Here is what happens: a sleek Waymo AV pulls up, equipped with active sensors emitting a low hum. A green and blue 'W' glows on the windscreen as the car navigates to the curb and parks, sending an arrival notification to your phone (Cusack, 2021). When you open the door, you are greeted

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by the gentle, vehicle sound system, "Good evening, this car is all yours – with no one upfront" (Cusack, 2021).

SDVs drive autonomously relying on vast amounts of data from image recognition systems, along with machine learning and neural networks (Gillis & Leutkevich, 2024). They see what is going on around them using three main electronic "eyes"—radar, cameras, and laser-based light detection and ranging (LiDar). All three feed data into on-board processors, using sophisticated software, algorithms, and machine learning to send signals to the vehicle's actuators to trigger appropriate actions such as braking, steering and acceleration. The array of sensors can detect a wide variety of road features and obstacles such as lane markings, curbs, pedestrians, cyclists, or other vehicles. This is done either visually through cameras, or by bouncing light impulses or radar signals off of surrounding objects. While technologies adopted in SDVs help improve safety, they are not 100% infallible. Their effectiveness can be diminished when sensors or lane markings are covered by snow or other heavy precipitation (Garsten, 2024).

SDVs offer several compelling benefits, including reduced driving for the passenger, integration of modern technology, enhanced fuel efficiency, and lower emissions - all of which contribute to reducing pollution. Additionally, SDVs have the potential to democratize mobility by enabling autonomous travel for those who lack it, such as the blind, the disabled, the young, the elderly, and the economically disadvantaged individuals. As parking demands decrease, forecasters also anticipate a rise in green space and decreases in pollution, traffic, crashes, and transportation costs (Magazine, 2018). In a future dominated by SDVs, commutes could become more comfortable, productive, and environmentally friendly.

An important aspect shaping SDVs' future is Artificial Intelligence (AI), which is one of the primary drivers behind the development of level 4 and level 5 SDVs. AI leverages deep learning to enable SDVs to continuously learn and improve, enhancing their ability to make informed, experienced-based decisions. This technology contributes to safer, smoother, and more efficient rides (TaskUs, 2023). AI can either assist human drivers or in fully SDVs replace them entirely (TaskUs, 2023).

These developments promise to change how we commute, travel, reduce carbon emission, and shape the future of transportation. The potential benefits of SDVs are vast, ranging from safer roads through reduced human error to lower emissions and improved fuel efficiency. Moreover, SDVs promise to revolutionize urban mobility, and make transportation more accessible and efficient. However, the road to full adoption is not without challenges. Technical, regulatory, and social hurdles must be addressed to ensure the smooth integration of SDVs into society. Questions surrounding safety, public trust, and legal frameworks are just a few of the obstacles. This paper will explore the current state of SDVs, their potential impacts, and the challenges that lie ahead in realizing the full transformative potential of self-driving technology.

II. Key Players of SDVs

The SDV industry is rapidly expanding with several major players leading the way. Three notable companies making significant strides in this space are Waymo, Tesla, and BMW. While Waymo and Tesla have established a solid presence in the market, BMW is making strides with a futuristic model currently in development for release in 2025.

A leading player in the field of SDVs is Waymo, launched as Waymo One Service in Phoenix, Arizona. Its service allows users to hail fully autonomous vehicles using smartphone apps, similar to Uber except you are the only person in the car. Due to its advanced technology, the company alongside others such as Tesla and AutoX have been conducting real-world tests and launching services that use advanced sensors and AI to operate vehicles without human drivers.



Source: <https://www.waymo.com/>

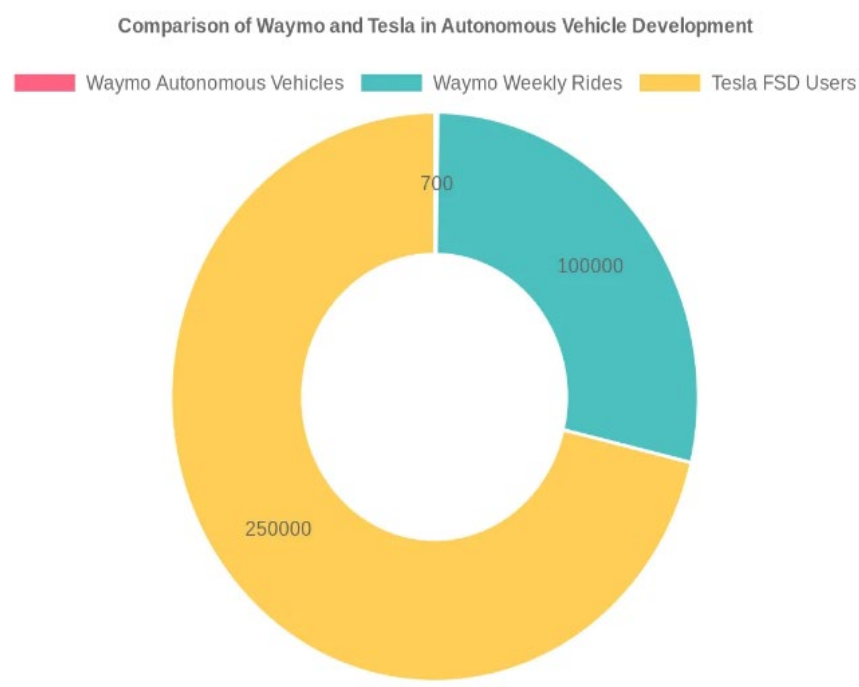
Waymo, the SDV technology arm of Alphabet (Google's parent company), is a pioneer in this field. The company has partnered with Chinese automaker Geely to build an all-electric, self-driving ride-hailing vehicle (Bellan, 2021). Waymo's vision goes beyond current autonomous technology, envisioning a future where cars no longer require steering wheels. However, while this idea is innovative, the technology required to implement it safely is not yet advanced enough. As a result, Waymo prioritizes safety over "flashy" features. For example, the parent website with Zeeker, announced in December 2021, aims to deliver vehicles that are 30% more efficient than anything currently on the road (Bassett, 2022).

Waymo's strategy is based on a sensor fusion system that combines cameras, radar, and lidar to produce an all-encompassing environmental model. Waymo vehicles can precisely navigate intricate urban surroundings because of this multi-layered approach, which also contributes to the growth of confidence in autonomous driving technology (Quanta Intelligence, 2024).

Tesla, another key player in the SDV market, employs a different approach with its Autopilot system. Tesla's system functions similarly to an airplane autopilot, but the driver is still ultimately responsible for controlling the vehicle (Ingle & Phute, 2016). Unlike Waymo, Tesla relied heavily on advanced camera technology and neural networks, aiming to develop AI that can interpret visual data with human-like precision. Tesla's approach eliminated the need for lidar, but this has raised concerns about the system's performance under challenging visibility conditions (Quanta Intelligence, 2024).



Source: <https://www.tesla.com/>



Source: <https://quantaintelligence.ai>

The graph above provides a comparison between Waymo and Tesla's SDV usage. The shaded blue portion represents Waymo's weekly rides, especially those taken by ride-hailing users, while

the yellow-shades section reflects Tesla's individual consumer usage. It is clear from the data that Tesla holds a competitive advantage, as its vehicles are purchased by consumers for personal use, allowing them to accumulate rides on a consistent basis without requiring ride-hailing services like Waymo. In contrast, Waymo's services are limited to ride-hailing, which means their weekly ride numbers are restricted to the demand for shared, commercial trips rather than individual vehicle ownership. The distinction underscores Tesla's broader reach in the market and its ability to generate higher ride volumes through its personal vehicles sales.

BMW is learning to create an AV named BMW i Vision Dee. It is a minimalist electric performance sedan that leans hard into digital features like augmented reality and voice-driven virtual assistants. Think of the metaverse or Amazon Alexa but in the form of a sports sedan. The concept also offers the ability to create a driver avatar profile, which can even be projected onto the side window (George, 2023).



Source: <https://www.theverge.com>

The headlights and the closed BMW kidney grille also form a common phygital (fusion of physical and digital) icon on a uniform surface, allowing the vehicle to produce different facial expressions,” the automaker said in a news release. “This means the BMW i Vision Dee can talk to people and, at the same time, express moods such as joy, astonishment or approval visually (George, 2023). BMW’s design direction for this concept car pushes the boundaries of futuristic aesthetics, embracing a nearly fictional style that merges technology with sleek, innovative design.

III. Challenges

Economic Impact

Waymo faces significant economic hurdles in scaling its robotaxi service. The costs associated with developing and maintaining a fleet of specialized autonomous vehicles, coupled with the expenses of creating detailed mapping systems, pose challenges to achieving profitable operations at scale (Quanta Intelligence, 2024). However, insights into current transportation trends suggest how these challenges can be navigated but require time and investment to address effectively (Quanta Intelligence, 2024).

Tesla's approach, on the other hand, integrates autonomous capabilities into mass-market vehicles, potentially offering a more sustainable economic model. By selling autonomous-capable cars directly to consumers, Tesla minimizes the operational costs associated with running a taxi service while capitalizing on its existing manufacturing infrastructure. This strategy allows Tesla to leverage economies of scale, making autonomous technology more accessible to a broader audience (Quanta Intelligence, 2024).

Safety

While SDVs are often hailed as a solution to making roads safer, the practicality of that promise remains questionable. While these vehicles can follow traffic laws and make calculated decisions, they cannot control the actions of other drivers who may be violating those laws, potentially putting themselves and others in danger. Moreover, although SDVs are expected to reduce traffic congestion, they may still be faced with complex, high-stake decisions in certain scenarios. For example, an SDV might be forced to swerve to avoid hitting a cyclist, potentially risking a head-on collision with another vehicle (Magazine, 2018). In fact, according to a 2016 poll series published in the journal *Science*, respondents stated that, while they personally would not purchase or ride in an autonomous car, they do feel that, in theory, the welfare of its occupants should be sacrificed for the greater good (Magazine, 2018). These limitations - ranging from legal, ethical, social, economic, and cyber security dilemmas - are key factors in the broader public's lack of trust in SDVs.

Regulatory

The evolving regulatory framework surrounding autonomous vehicles presents unique challenges for both Waymo and Tesla. Waymo's methodical approach, which includes extensive testing of autonomous robots in controlled environments, aligns well with current safety-focused regulations. This strategy fosters greater trust among regulators and the public, as evidenced by Waymo CEO John Krafcik's emphasis on safety in discussions about SDVs (Quanta Intelligence, 2024).

In contrast, Tesla's aggressive rollout of its Full SDV features has attracted regulatory scrutiny. The National Highway Traffic Safety Administration (NHTSA) has launched investigations into incidents involving Tesla vehicles, underscoring the challenges of deploying partially autonomous technology to consumers, this regulatory attention could impact Tesla's ability to rapidly iterate and deploy new features, emphasizing a crucial difference in their approach to market entry (Quanta Intelligence, 2024).

With the rapid advancements of SDVs technology, governments are increasingly prioritizing the creation and implementation of comprehensive safety regulations to protect both vehicle occupants and pedestrians. This proactive approach aims to address the unique risks associated with autonomous driving and ensure that SDVs operate within strict safety parameters. Automotive manufacturers must adhere to a range of specific regulations and standards, meeting stringent safety requirements and obtaining certification from prominent organizations. These include the New Car Assessment Program (NCAP) which assesses crashworthiness and overall safety, the Institute for Highway Safety Insurance (IIHS), known for its rigorous safety ratings, and the International Automobile Technology Center (ICAT), which specializes in testing and certifying advanced vehicle technologies (TaskUs, 2023).

In addition to manufacturing regulations, laws, and policies must also evolve to accommodate the complexities of autonomous driving. This includes updating traffic laws, insurance requirements, and liability frameworks to address the nuances of driverless technology. According to the National Conference of State Legislators, as of March 2017, 32 states had either issued executive orders or passed legislation addressing autonomous vehicles, highlighting the

growing recognition of the need for legal adjustments to safely integrate SDVs into public roads (Magazine, 2018). While regulatory frameworks continue to develop, these efforts are crucial in ensuring that SDVs are not only technologically advanced but also aligned with public safety standards and legislative requirements, providing a foundation for their responsible deployment on roads worldwide.

Social Impact

As SDVs eliminate the need for drivers, companies like Uber are aware of the potential job losses for many of their drivers. In response, they have invested in creating opportunities for upskilling, offering programs in computer science, engineering, and coding for individuals looking to transition into new professions (Englbert, 2017). Simultaneously, as more large corporations create SDVs, competition has increased. The change places pressure on smaller automakers like traditional taxi services, and lowers their profit margins (Ryan, 2012).

Additionally, SDVs are designed to interpret human signals, rather than relying solely on digital cues. This capability has sparked public demand for government investment in SDV-specific infrastructure to enhance safety and functionality on the roads. Many advocates believe that this infrastructure development should be partially funded by automotive companies, who stand to benefit from its implementation (Ryan, 2019).

Lastly, SDVs will affect how much money law enforcement makes. Speeding and unlawful parking have decreased somewhat and slowly as there are more law-abiding cars on the road. More law-abiding cars are undoubtedly beneficial, but they also imply that the police will no longer be able to generate as much money (Marshall & Davis, 2018).

Data Privacy

Long-term success in the autonomous vehicle market hinges on consumer trust and adoption. Waymo's fully driverless rides in urban environments provide tangible proof of the technology's reliability, potentially accelerating public acceptance (Quanta Intelligence, 2024). Each successful ride reinforces confidence in autonomous systems, making Waymo's approach particularly appealing to those cautious about embracing new technology (Quanta Intelligence, 2024).

Tesla, however, leverages its loyal customer base, many of whom actively participate in the development of self-driving features through real-world usage. This approach allows Tesla to gather vast amounts of data, potentially accelerating the refinement of its autonomous driving capabilities (Quanta Intelligence, 2024). However, publicized incidents involving SDVs have raised concerns about the system's readiness for widespread deployment, illustrating the delicate balance Tesla must maintain between innovation and safety (Quanta Intelligence, 2024).

SDVs' data and privacy feature stores amount of data and requires large processing capabilities. There has also been debate over whether data acquired from SDVs can be used as legal evidence. For example, if the driver was in control of the car at the time of an accident, could that evidence be used in court to determine liability (Johnsen et al. 2017)? In fact, there have already been court cases in places such as the United States of America, Australia, and China. Due to the in-car cameras and steering-wheel sensors have demonstrated that the driver was at fault. However, in California there were cases that demonstrated that it was a manufacturing flaw that caused the accidents (Ryan, 2019).

The world faces concerns regarding the following questions: How long should data be stored? Where should it be stored? On the car's hard drive, the manufacturer's cloud platform, or an independent cloud platform? Who should have access to this information, under what circumstances? What happens to the owner's data when they sell the vehicle? How will the information be secured against hacked? And who is the owner of this information (Ryan, 2019)?

Because modern cars have sophisticated computer systems, there are many potentials for hackers and automakers to commit crimes (Gelles, Tabuchi, & Dolan, 2015). It may be argued that as autonomous systems grow more prevalent, product liability plans will become more significant because it will be less probable that the driver will be to blame for harm (Bruyne & Werbrouck, 2018). Many individuals are worried about SDV cybersecurity because they worry that they could be readily compromised due to the fact that self-driving cars depend on a vast amount of digital infrastructure to function (Ryan, 2019). In today's world, we often hear about data breaches, scams, and hackers. When cybercriminals take over a car, they can do small things like open and close windows, or they can do more serious things like disable the car's ability to read stop signs, intentionally cause cars to crash and injure their occupants, or use SDVs for terrorist activities like carrying and setting off remote-controlled bombs (Ryan, 2019).

Unfortunately, there have already been incidents related to SDVs cyber-security. For example, before giving up control of the car, attackers in London used crypto malware to take advantage of weaknesses in SDVs and extort money from the occupants. However, they were isolated events, and gray-hat hackers had already discovered the majority of cybersecurity vulnerabilities prior to harmful incidents (Ryan, 2019).

Technical solutions for hardening these communication channels involve encryption, access controls, and proactive network monitoring (George, Baskar, Srikanth, 2023). Proactive collaboration between automobile and technology companies, government agencies, academic researchers, and infrastructure providers is required to assure the cybersecurity of autonomous transportation systems (George, Baskar, Srikanth, 2023). SDV companies have been making their best efforts to better secure the required technological infrastructure. Companies such as Tesla have hired a new security chief from Google, who previously oversaw security for the Chrome web browser (Gelles, Tabuchi, & Dolan, 2015). SDV companies are not just focusing on driver safety from potential hackers. Lawmakers are also working diligently to ensure robust security measures are in place. In July of 2015 Senator Edward J. Markey, Democrat of Massachusetts and Richard Blumenthal, Democrat of Connecticut, introduced new legislation that would require cars sold in the United States to meet tough standards of protection against computer attacks (Gelles, Tabuchi, & Dolan, 2015).

IV. Discussion

The SDVs market is accelerating at breakneck speed. It's projected to reach \$5 trillion in 2031, with a Compound Annual Growth Rate (CAGR) of 36.3% (TaskUs, 2023). Major players like Tesla, Toyota, and Ford are maneuvering to capture larger market shares, shaping the future of SDVs and positioning themselves at the forefront of this transportation (TaskUs, 2023). Key trends in this industry include the increasing integration of AI and rising government support for SDVs technology.

Some questions about SDVs remain: Would people trust an AV to transport their young children to parties or their disabled/elderly relatives to medical or social appointments? Are they filled with dread about an 18-wheeler truck with chemical cargo barreling down the highway at high speeds? (Rangwala, 2024). Additionally, concerns linger about the potential loss of jobs due to automation and the risks posed by hackers, with a new avenue for assault, potentially transforming automobiles into deadly weapons (Magazines, 2018)? These concerns highlight the inherent hesitation many feel about surrendering full control to autonomous systems.

Studies like The Mobility Confidence Index Study, conducted in collaboration with the MIT Advanced Vehicle Technology (AVT) Consortium, provide valuable insights into consumer attitudes toward AVs (Rangwala, 2024). A survey of 3,000 U.S. vehicle owners aged 18 and older reveals a decline in confidence regarding AV technology between 2021 and 2023 (Rangwala, 2024). Respondents expressed concerns over data breaches, AV system hacks, and confusion

about the varying levels of autonomy, such as the distinction between conditional and fully autonomous driving, as well as the unclear definitions of Operational Design Domains (ODD) (Rangwala, 2024).

Interestingly, confidence is significantly higher among those who have had firsthand experiences with fully autonomous ride-hailing services, such as Waymo in San Francisco or Phoenix (Rangwala, 2024). Direct exposure to AV technology appears to dissolve much fear and uncertainty.

As Waymo and Tesla continue to refine their technologies, the autonomous vehicle landscape is poised for significant evolution. Waymo's sensor-rich approach provides robust environmental awareness but at a higher cost, while Tesla's vision-based system offers a potentially more scalable solution if it can overcome current limitations (Quanta Intelligence, 2024). The coming years will be critical in determining which approach resonates more strongly with consumers, regulators, and industry stakeholders (Quanta Intelligence, 2024). Factors such as safety records, ease of deployment, and adaptability to diverse driving conditions will play crucial roles in shaping the future of autonomous transportation (Quanta Intelligence, 2024).

The debate surrounding SDVs presents two contrasting views. On the one hand, these vehicles promise a cleaner, safer, and efficient world. On the other hand, serious concerns about trust, safety, ethics, and technology persist. While some are excited about the possibilities, many remain cautious, pointing to the challenges that lie ahead.

SDVs brings the futuristic cars we once imagined to our society, offering a glimpse of advanced transpiration. These SDVs leverage cutting-edge sensors and AI to navigate without human drivers, which could be a welcome change for introverts and others seeking a more independent travel experience. For introverts, this might be great news. However, SDVs are still a work in progress, with ongoing developments in entering, design, cybersecurity, safety, and privacy. Major companies are deeply invested in this market, channeling significant resources into research and development (R&D) to address these challenges and enhance vehicle reliability.

While these advancements are promising, societal concerns surrounding safety and privacy will require time and continued improvements to address fully. To help ease these concerns, governments are stepping in with programs like the New Car Assessment Program (NCAP), the Institute for Highway Safety Insurance (IIHS), and the International Center for Automotive Technology (ICAT).

Like any pioneering innovation, SDVs are still in their early stages. Instead of rushing to form conclusions, it is important to give these vehicles time to demonstrate their true safety and potential. Through careful observation and ongoing development, we can gain a clearer understanding of how SDVs will contribute to a safer, more advanced transportation future.

V. Conclusion

The divergent strategies employed by Waymo and Tesla are reshaping the automotive industry's approach to autonomous technology. Traditional automakers and new entrants alike are closely watching these leaders, adapting their own research and development efforts in response (Quanta Intelligence, 2024). As autonomous vehicle technology matures, we may see a convergence of approaches, with companies adopting hybrid systems that combine the strengths of various sensor technologies with advanced AI. This evolution could lead to more robust and versatile autonomous systems capable of operating in a wide range of environments and conditions (Quanta Intelligence, 2024).

The development of self-driving vehicles represents a transformative innovation with the potential to alter urban transportation, reduce environmental impact, and improve traffic safety. Companies like Waymo, Tesla, and BMW are at the forefront of this shift, each with unique strategies and technologies that address different aspects of the SDV ecosystem. However,

challenges related to public trust, data privacy, legal accountability, and cybersecurity are perishing and highlight the need for cautious and responsible development. Although SDVs offer exciting possibilities, the public remains divided due to concerns about relinquishing control to autonomous systems, particularly in complex or high stakes driving scenarios. Addressing these concerns will require continued collaboration among industry leaders, regulators, and consumers to ensure these vehicles can operate safely and ethically. The path forward involves not only technological progress but also thoughtful, transparent engagement with societal concerns. With responsible advancements, SDVs may one day fulfill their potential to create safer, more efficient, and environmentally friendly transportation networks.

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Origination of RMBS: Escape from Crisis or Maintain Reputation?

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Abstract

In this paper, we investigate the optimized decisions made by the originators of residential mortgage-backed security (RMBS). Conditional on default and prepayment risks, originators choose (i) the asset pool to be securitized from their entire mortgage obligations, (ii) coupon interest rates of the senior tranche, and (iii) disclosure of the condition and risks of the asset pool to achieve highest benefits from reinvestment opportunity and reputation. We find that myopic originators conceal true risks or even exaggeratedly disclose high risks to attract investors and to ensure the current issuance. We also discover that repeated originators are concerned about the dispersion of risks and disclose true risks because reputation enlarges their total profits from facilitating their future originations.

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MS Excel Models T for Inventory Management Concepts

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Abstract

As is well known, MS Excel models and charts are used to demonstrate and teach many business concepts in almost all business programs both undergraduate and graduate alike. However, for most part these Excel models present static examples with limited or no interactive features. Whereas research suggests that student learn at a much deeper level when they learn using interactive models and learning techniques which includes computer simulations. In this study we present a couple of interactive Excel models that will help students to grasp the underlying logic in Inventory Management concepts, more specifically how the variation in consumption of raw material affects the reorder point and reorder quantity using statistical probability estimates. These interactive models we hope will help users to develop useful insights into managing inventory in real world situations.

Keywords: Interactive MS Excel; active Learning; inventory management; simulation; inventory policies

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Tech vs. Theft: Can Smart Traffic Signals Reduce Opportunistic Street Crimes?

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Abstract

This working paper investigates the causal impact of smart traffic lights on cell phone thefts and robberies in São Paulo, Brazil. As part of an infrastructure improvement program in 2023 and 2024, the city replaced traditional traffic lights with smart ones in select areas. Leveraging geolocation data on both crimes and traffic lights, I identify the number of incidents occurring near each traffic signal. By exploiting the staggered implementation of smart traffic lights across different locations, I assess their effect on crime rates. To estimate this impact, I employ a staggered difference-in-differences approach following the methodology of Callaway and Sant'Anna (2021).

Keywords: Smart Traffic Lights; Cell Phone Thefts; Brazil; Crime; Urban Areas.

JEL Classification: O10, O18, K42.

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Does it Matter How Natural are Computer Mediated Communications? Developing a Measurement Scale for Media Naturalness and Testing its Moderating Effect on Motivating Language

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Abstract

For decades, the research in communication in organizational behavior has focused on the reduction of uncertainty and consequently so has the research of leadership and computer mediated communication (CMC) (Salancik & Pfeffer, 1977; Sullivan, 1988). Because of this, many of the controversial issues and competing theories of CMC have in good part centered around the topic of media choice in the context of task performance, which is a reflection of this narrow focus of CMC on uncertainty reduction. Therefore, to study the more whole form of communication in, a CMC theory is needed that is not constrained by this narrow focus of media choice as a function of uncertainty reduction.

This paper attempts to fill this need by proposing a measurement scale for the media naturalness theory proposed by Kock (2004), which is validated through personal interviews in a manner similar to those conducted by Russ, Daft, and Lengel (1990) and Trevino (1990). A research model and hypotheses were developed based on literature in order to analyze the predicted moderating effect of media naturalness on motivating language. In order to strengthen the study, several confirmatory relationships whose expected path coefficients are well documented in the literature are examined and the research was conducted using WarpPLS to implement a Partial Least Squares Structural Equation Model.

The moderating effect is supported, and a detailed analysis of the results as well as structural and measurement models revealed that the confirmatory relationships were consistent with the literature in the pilot and main studies. It also reveals that the proposed measurement scale for media naturalness is valid.

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Análisis de clima organizacional y propuestas de mejora continua dentro de una empresa maquiladora de giro alimenticio

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Resumen

El capital humano en la actualidad representa junto con los recursos financieros y materiales las bases de cualquier empresa, por ello se le debe dar importancia a los factores que influyen en su productividad y motivación. El clima organizacional, por ejemplo, es uno de los más importantes y complicados de entender, pues este es diferente dependiendo de la percepción y motivación que tiene cada persona, así como la variación que puede verse influenciada por elementos internos y externos a la compañía.

En la siguiente investigación se llevó a cabo un diagnóstico del clima organizacional dentro de una empresa maquiladora de giro alimenticio en la ciudad de Reynosa, Tamaulipas donde se consideró un total de 188 empleados del área de producción, turno matutino. Dado que la perspectiva de los colaboradores es fundamental para comprender el ambiente laboral se aplicó un cuestionario de 19 preguntas de forma anónima para evitar influenciar los resultados y por ende detectar los principales factores que podrían provocar desmotivación y una futura renuncia del personal.

La encuesta incluyó aspectos como las relaciones con los compañeros de trabajo, sus superiores, la comunicación, el trabajo en equipo y algunos eventos que la empresa realiza para recolectar opiniones y sugerencias que mejoren o detecten áreas de oportunidad. Los resultados se graficaron para observar las tendencias e identificar los aspectos más importantes para la mayoría de la muestra.

Al detectar el origen de los mayores índices de insatisfacción se realizaron estrategias con el fin de priorizar dichas áreas de oportunidad; esto también se llevó a cabo con la expectativa de que la planificación pueda implementarse y estandarizarse antes de la temporada de más alta rotación de personal basados en los registros de 2024.

También se planteó la posibilidad de realizar una encuesta de satisfacción para el personal temporal de la planta durante los meses de junio - agosto para identificar sus similitudes con los resultados de la primera encuesta que se realizó a principios de año.

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Gestión de registro de información a sistema de cálculo para determinar el valor en aduanas de mercancías de importación

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Resumen

El proyecto titulado "Gestión de registro de información a sistema de cálculo para determinar el valor en aduanas de mercancías de importación" tiene como objetivo implementar un registro eficiente y estructurado para calcular el valor aduanal de las mercancías importadas. Esta iniciativa busca garantizar el cumplimiento normativo, minimizar los riesgos legales y reducir costos asociados a posibles multas por incumplimientos. Anteriormente, este registro era gestionado por una agencia aduanal externa, pero dejó de realizarse debido a consideraciones de costo y operatividad. Como resultado, la empresa enfrentó un rezago en la información fiscal y la falta de un archivo físico o digital completo. Además, el incumplimiento de estas obligaciones podría haber generado sanciones significativas en caso de auditorías. Mediante este proyecto, se pretende habilitar un registro interno en hojas de cálculo para optimizar la gestión de información y asegurar que los datos sean confiables, accesibles y cumplan con los requerimientos del SAT.

Se realizarán observaciones y técnicas muestrales para el levantamiento y análisis de datos, mediante las teorías de productividad y cultura organizacional se pretende en esta propuesta incluir la implementación de procedimientos claros, la capacitación del personal involucrado y la integración de áreas clave, como Import Export y la Gerencia de Planta. Se espera que este proyecto contribuya a: garantizar la legalidad y el cumplimiento aduanero, reducir costos asociados a la contratación externa., fortalecer la gestión interna de información fiscal y aduanera.

Palabras clave: Import/export; innovación; cultura organizacional; gestión y productividad

Abstract

The purpose of the project entitled "Management of information registry and calculation system for determining the customs value of imported goods" is to implement an efficient and structured registry for calculating the customs value of imported goods. This initiative seeks to ensure regulatory compliance, minimize legal risks and reduce costs associated with possible fines for non-compliance. Previously, this registry was managed by an external customs agency, but was discontinued due to cost and operational considerations. As a result, the company faced a backlog of tax information and the lack of a complete physical or digital file. In addition, non-compliance with these obligations could have generated significant penalties in case of audits. Through this project, we intend to enable an internal registry in spreadsheets to optimize information management and ensure that the data is reliable, accessible and complies with SAT requirements.

Observations and sampling techniques will be used for data collection and analysis, using the theories of productivity and organizational culture. This proposal is intended to include the implementation of clear procedures, training of the personnel involved and the integration of key areas, such as Import Export and Plant Management. This project is expected to contribute to: ensuring legality and customs compliance, reducing costs associated with outsourcing, and strengthening internal management of tax and customs information.

Keywords: Import/export; innovation; organizational culture; management and productivity

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Optimización en la gestión del proceso de cuentas por pagar

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Resumen

La realización de los pagos en tiempo y forma es un indicador de solvencia y compromiso de una empresa. Por este motivo, el departamento de cuentas a pagar debe buscar el balance entre financiarse con sus proveedores y cumplir puntualmente con los compromisos de pago adquiridos. Una empresa en la ciudad de Reynosa, Tamaulipas especializada en la creación de equipamiento médico domiciliario presenta un área de oportunidad dentro del departamento de cuentas por pagar, ya que casi toda la documentación que manejan es de forma física, lo cual puede presentar una gran carga de trabajo para su equipo de trabajo y un pequeño descuido puede presentar demoras en los pagos y traer problemas más adelante, ya que las demoras, sobre todo si son reiteradas, puede suponer: proyección de imagen negativa a proveedores que han confiado en ella y la pérdida de proveedores clave para la empresa.

Por eso, con este proyecto se busca simplificar y mejorar la gestión del proceso de cuentas por pagar, para evitar multas, tiempo de trabajo, riesgos de retrasos o extravió de información importante. Para resolver esta situación se tiene contemplada la reestructuración de su proceso de cuentas por pagar, teniendo como base la digitalización de documentos para reformular y acelerar el proceso de cuentas por pagar a través del apoyo de los antecedentes de información de diversos autores que han estudiado este tipo de casos.

Términos clave: Optimización, digitalización y cuentas por pagar.

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Propuesta para el desarrollo de un software en MSS Metrology Solutions Specialist S.A. de C.V.

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Abstract

The project consisted of a proposal for the implementation of a custom software solution for MSS Metrology Solutions Specialist S.A. de C.V., with the goal of optimizing and automating internal processes related to the generation of technical reports and the issuance of certificates. The company, specialized in the calibration and certification of measurement equipment, faced significant challenges due to its reliance on manual methods, such as the use of spreadsheets, to manage and organize data obtained during calibration procedures.

This traditional approach was inefficient, as it involved a considerable investment of time in data collection, analysis, and organization, while also being prone to human errors. These issues directly impacted the quality of the services provided, extending report delivery times and complicating the traceability of results. Errors generated during the manual process also increased the risk of inconsistencies in the reports and certificates, potentially damaging customer trust and the overall quality of the results.

The proposed automation not only aims to reduce human errors but also streamline the process of generating reports and certificates. The technical and operational reports are intended to be generated automatically, tailored to the specifications required by each client, thus significantly reducing delivery times and improving the accuracy and consistency of the reports.

With this software proposal, MSS Metrology Solutions Specialist S.A. de C.V. will be able to significantly improve its operational efficiency. The time spent on manual tasks will be drastically reduced, allowing employees to focus on higher value-added activities such as interpreting results or providing personalized customer support.

The proposal not only optimizes internal efficiency but will also have a positive impact on customer satisfaction. Reports and certificates generated more quickly and with greater accuracy contribute to strengthening customer trust in the services provided.

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Falta de oportunidades laborales para los estudiantes

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Resumen

En la actualidad uno de los más grandes desafíos que enfrentan los jóvenes por terminar su carrera universitaria o que están en proceso de culminarla, son escasas las oportunidades laborales que se les permitan desarrollarse profesionalmente, aun con el conocimiento adquirido durante su formación universitaria. El cambio de la vida académica a la vida laboral se convierte en un proceso más complicado por escasez de empleo, desconfianza, falta de experiencia y poca experiencia laboral. Esta situación afecta a los jóvenes, incluso llega a desanimarlos y al no tener oportunidades esto puede ocasionar que se dediquen a otras actividades laborales. Y ponen en riesgo su vida profesional y laboral.

A pesar de programas de gobierno dedicados a evitar que los jóvenes desistan al no encontrar oportunidades para mejorar la empleabilidad, los estudiantes continúan enfrentando obstáculos, limitan su capacidad para obtener empleos de acuerdo con su preparación. Este problema ha escalado debido a la crisis económica, la automatización de trabajos y falta de emprendedores. El desempleo entre jóvenes recién egresados es generado por escases de empleo y falta de oportunidades para los nuevos profesionistas, lo cual provoca el abandono de su preparación y pérdida del interés a continuar empleándose como profesionistas.

Esta tesis tiene como objetivo, analizar las causas de la falta de oportunidades laborales para los estudiantes universitarios, indagando los factores económicos, sociales y educativos que tienen ocasionan este problema el cual ha escalado demasiado. A través de un análisis profundo se tiene como objetivo ofrecer soluciones para colaborar, ha mejorar la introducción laboral de los jóvenes estudiantes, y reducir aceptar empleos diferentes de la formación académica.

Palabras clave: Oportunidades; nuevos empleos; jóvenes emprendedores

Abstract

Currently, one of the greatest challenges that young people face when finishing their university degree or who are in the process of completing it, there are few job opportunities that allow them to develop professionally, even with the knowledge acquired during their university education. The change from academic life to working life becomes a more complicated process due to lack of employment, mistrust, lack of experience and little work experience. This situation affects young people, it even discourages them and by not having opportunities this can cause them to

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dedicate themselves to other work activities. And they put their professional and work lives at risk.

Despite government programs dedicated to preventing young people from giving up when they do not find opportunities to improve employability, students continue to face obstacles that limit their ability to obtain jobs in accordance with their preparation. This problem has escalated due to the economic crisis, the automation of jobs and lack of entrepreneurs. Unemployment among recently graduated young people is generated by job shortages and lack of opportunities for new professionals, which causes them to abandon their preparation and lose interest in continuing to work as professionals.

This thesis aims to analyze the causes of the lack of job opportunities for university students, investigating the economic, social and educational factors that cause this problem, which has escalated too much. This thesis aims to analyze the causes of the lack of job opportunities for university students, investigating the economic, social and educational factors that cause this problem, which has escalated too much.

Keywords: Opportunities; new jobs; young entrepreneurs

Un análisis de la adicción a los teléfonos inteligentes entre estudiantes universitarios de tecnologías

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Resumen

El marcado incremento en el uso de los teléfonos inteligentes en la vida cotidiana ha generado preocupación por el desarrollo de conductas adictivas, especialmente entre la juventud. Este trabajo exploró la prevalencia y los factores asociados a la adicción al smartphone en una muestra de 146 estudiantes de licenciatura en tecnología informática de una universidad pública mexicana. Se empleó un diseño transversal y cuantitativo. Los datos se recolectaron a través del cuestionario SASSV (Smartphone Adiction Scale - Short Version) el cual fue sometido a un análisis factorial para confirmar su estructura. Además, se realizaron preguntas sobre el miedo a estar sin el teléfono inteligente, el nivel de dependencia a él y las horas de uso diario. Se realizaron análisis descriptivos y se calcularon correlaciones de Spearman para explorar las relaciones entre las variables. Los resultados revelaron correlaciones positivas y significativas entre la puntuación total del SSASV y variables como el miedo a estar sin el teléfono, el nivel de dependencia y las horas de uso diario. Asimismo, se encontraron correlaciones positivas entre el miedo y la dependencia, así como entre el miedo y las horas de uso, y también entre la dependencia y las horas de uso. Estos hallazgos sugieren que los estudiantes de tecnología presentan niveles significativos de adicción al smartphone y que esta adicción se relaciona con un mayor miedo a la desconexión, una mayor percepción de dependencia al celular y un uso más intensivo del dispositivo. Los resultados de este estudio corroboran la creciente preocupación por el desarrollo de conductas adictivas relacionadas con el uso de smartphones, especialmente en poblaciones jóvenes y altamente tecnológicas como los estudiantes de la licenciatura en tecnologías de la información. Se destaca la necesidad de implementar programas de prevención y tratamiento dirigidos a reducir el uso problemático del smartphone y sus consecuencias negativas en la salud mental y el bienestar de los estudiantes universitarios.

Palabras clave: Adicción al smartphone; estudiantes universitarios; tecnología informática

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An Analysis of Smartphone Addiction among Undergraduate Technology Students

Abstract

The remarkable increase in the use of smartphones in everyday life has raised concerns about the development of addictive behaviors, especially among adolescents. This paper studied the prevalence and factors associated with smartphone addiction in a sample of 146 undergraduate computer science students at a Mexican public university. A cross-sectional quantitative design was used. Data were collected using the SASSV (Smartphone Addiction Scale - Short Version) questionnaire, which was subjected to factor analysis to confirm its structure. In addition, questions were asked about the fear of being without the smartphone, the degree of dependence on the smartphone, and the hours of daily use. Descriptive analyses were performed, and Spearman correlations were calculated to explore the relationships between variables. The results showed positive and significant correlations between the SSASV total score and variables such as fear of being without the phone, level of dependence, and hours of daily use. Similarly, positive correlations were found between fear and dependence, between fear and hours of use, and between dependence and hours of use. These findings suggest that Information Technology students have significant levels of smartphone addiction, and that this addiction is associated with greater fear of disconnection, greater perceived dependence on the cell phone, and more intensive use of the device. The results of this study confirm the growing concern about the development of addictive behaviors related to smartphone use, especially among younger and highly technological populations such as IT students. It highlights the need to implement prevention and treatment programs aimed at reducing problematic smartphone use and its negative consequences on the mental health and well-being of college students.

Keywords: Smartphone addiction; college students; information technology

Análisis del consumo de tabaco en los hogares de México durante y después del Covid-19

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Resumen

El objetivo de esta investigación es analizar el cambio en el consumo de tabaco en los hogares mexicanos durante y después del Covid-19, así como identificar los factores sociodemográficos y económicos que influyen en la probabilidad de dicho consumo. Se utilizaron microdatos de la Encuesta Nacional de Ingreso y Gasto de los Hogares (ENIGH) para los años de 2020 y 2022, y se estimaron estadísticos descriptivos y modelos econométricos Logit. Los resultados descriptivos muestran que aumentó el consumo de tabaco en forma de cigarrillo en los estratos de ingreso bajo y alto, mientras que en los estratos de ingreso medio se redujo. Las estimaciones econométricas muestran que, si el hogar se encuentra en la zona urbana, el jefe de hogar es hombre, hay un aumento en el número de perceptores ocupados y el quintil de ingreso, incrementa la probabilidad del consumo de tabaco; en cambio, los incrementos en la edad y el nivel escolar del jefe de hogar, aumento del tamaño de hogar, así como la presencia de adultos mayores de 65 años y niños menores de edad, reducen la probabilidad del consumo de tabaco.

Palabras clave: Consumo del hogar; tabaco; México

Analysis of Tobacco Consumption in Mexican Households During and After Covid-19

Abstract

The objective of this paper is to analyze the change in tobacco consumption in Mexican households during and after Covid-19, as well as to identify the sociodemographic and economic factors that influence the probability of such consumption. Microdata of the National Survey of Mexican Household Income and Expenditure for the years 2020 and 2022 were used, and descriptive statistics and Logit econometric models were estimated. The descriptive results show that the low and high income strata increased tobacco consumption in the form of cigarettes, while in middle income strata it decreased. Likewise, the econometric estimations show that the variables that more positively impact the probability of tobacco consumption are: employment income recipient, monetary income, the household head's male, and household urban site. On the other hand, the probability of tobacco consumption tends to decrease when the household head's age increases and his education level, as well as the presence of numbers above 65 years old and the number of children in the home.

Keywords: Consumption; household; tobacco; Mexico

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Evaluating Public Service Performance: Expectation and Experience in Public Organizations

Peter Haruna (panel moderator)¹

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Abstract

This panel addresses the question of how to evaluate public service performance in the face of the ongoing technological revolution, continuing demographic shifts, and intensifying climatic changes, highlighting expectations and experiences in public service organizations. While evaluating public service performance is not new in the field, the continuing decline of public trust in all levels of U.S. Governments reflect the need to understand the conditions for effective public governance in a very complex and interconnected world. In *Can Governments Earn Our Trust*, Donald Kettl (2017) argues that distrust is the biggest governmental crisis of our time. A recent survey by the Partnership for Public Service (2024) confirms that the crisis of public trust is growing. In fact, only 23 percent of Americans trust the federal government, down from 35 percent in 2022. The consequences are well-known: distrust undermines confidence in public institutions, reduces social capital, and raises questions for democratic governance. In this panel, panelists use primary and secondary data to gauge the performance of public organizations and examine the strategies that they can follow to improve performance and earn back public trust.

The panel is organized as follows:

- (1) Department of Homeland Security's Strategy Against the South Texas Migrant Crisis by Aaron Gonzalez
MPA Student, Department of Social Sciences, College of Arts and Sciences, Texas A&M International University
- (2) The Youth Aware of Mental Health Program by Kiara Sanchez
MPA Student, Department of Social Sciences, College of Arts and Sciences, Texas A&M International University
- (3) Educators' Experiences with Teaching During COVID-19 by Kristin Pedersen
MPA Student, Department of Social Sciences, College of Arts and Sciences, Texas A&M International University
- (4) County Government on the Border: A Framework of Exploratory Research by Victoria E. Alfaro
Graduate Student, Department of Social Sciences, College of Arts and Sciences, Texas A&M International University

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Department of Homeland Security's Strategy Against the South Texas Migrant Crisis

Aaron A. Gonzalez¹

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Abstract

The field of public administration is one of many components that are constantly evolving and adapting to new environments within an evolving society. But what truly is public administration? Public administration is a line of work typically involving the enacting of policies and principles that are meant to benefit the public being served. That said, the following research topic closely examines the public opinion and perspective on the public administration, the government organization known as the Department of Homeland Security and two of its agencies, US Customs and Border Protection and US Border Patrol. Essentially, this examination attempts to depict the importance on how citizens view the quality of service being given to them by government agencies (Boyd-Swan et al., 2018) To further explain, this research provides a closer look at the handling of the migrant crisis along the South Texas on behalf of the Department of Homeland Security but more so understand how individuals residing in border communities such as Laredo, Texas believe DHS is containing this ongoing issue.

As previously mentioned, the realm of public administration is embedded with hefty decision-making and implementation of laws, more so when it comes to government agencies. When discussing agencies such as the US Customs and Border Protection, it's important to note that they are the first line of defense when guarding the ports of entry. That alone requires CBP personnel to act swiftly in an efficient and effective manner. By that same token, earlier this year Texas Governor, Gregg Abbott signed a new policy into action that granted authority to more than two thousand law enforcement agencies to detain and arrest any migrant that arrived in the US unlawfully (Vega, 2024). In doing so, this gave court judges the authority to extradite or remove these individuals back to their country of origin or sentence them to prison without any regard to the federal immigration court system (Vega, 2024). Ultimately, this new law has since then begun raising concerns about the public's safety. And so, border cities such as Laredo, Texas have constantly been faced with challenges stemming from migrant situations resulting in neighborhoods feeling unsafe. As a result of feeling unsafe due in part of the enforcement actions and migrant encounters with increased law enforcement agencies such as US Customs and Border Protection and US Border Patrol, a survey questionnaire was conducted in order to grasp a more in-depth comprehension of how the community believes government agencies such as these have gone onto to handle the migrant crisis.

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County Government on the Border: A Framework of Exploratory Research

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Abstract

The significance of county government beyond maintaining law and order and infrastructure outside city limits is acknowledged but very little research that thoroughly examines the impact of county government on the lives of residents has been undertaken. Pertinent issues of political authority, accountability, and funding vary nationwide that seldom attracts intellectual analysis. Given the scarcity of research on county government and the impacts of climate, technology, and demographic changes, we were interested in exploring how Webb County government, as a political and administrative unit of the State of Texas has positioned itself to lead the effort toward building resilient communities in the post-COVID-19 world. Our goal was to collect and analyze data to reflect on significant developments over the past two decades that have impacted the lives of county employees and residents.

Webb County, the 6th largest county in Texas, is quite unique because of its geographic location, its economic significance, and its political stature. We posed two questions that every researcher would consider: (1) What is the most appropriate approach to help us answer the research question? How will this approach assist us in achieving our stated goal? This approach must meet the following criteria: (1) it should help us convey the county's story in all its complexity and nuance; (2) it should assist us in linking the structural and administrative elements in a manner that is understandable to county government employees, residents, and readers; and (3) it should serve as a model for MPA students interested in developing applied projects around public management and local governance issues as they prepare for public service careers. For this presentation, we want to describe our primary data collection process, containing interviews and focus groups, and reflect on the obstacles and challenges of our arduous journey.

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Climate Policy Uncertainty Shocks and Energy Exploration: An Analysis of U.S. Oil and Natural Gas Producing Regions

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Abstract

In light of the capital-intensive nature of oil and natural gas exploration and production (E&P) companies, uncertainty is a major concern in their investment decisions. A key operational component for E&P companies in managing market-related uncertainties are drilled but uncompleted wells (DUCs). An inventory of DUCs provides an E&P company with the ability to contain costs while retaining the flexibility to respond to changes in the market environment. We explore the response of drilled wells and the ratio of DUCs to completed wells to positive shocks in climate policy uncertainty, oil prices and oil price uncertainty across the seven major oil and natural gas producing regions in the U.S. In general, our results confirm and extend existing evidence on the response of DUCs to oil price shocks and oil price uncertainty shocks. A positive oil price shock increases drilled wells and reduces the ratio of DUCs to completed wells across each region. A positive oil price uncertainty shocks reduces drilled wells and increases the ratio of DUCs to completed wells across each region. Our primary new results relate to climate policy uncertainty. Unlike previous studies on the relationship between climate policy uncertainty and non-renewable energy consumption, our results, in general, find that a positive shock to climate policy uncertainty has had little impact on either drilled wells or the DUCs to completed wells ratio, after controlling for the oil market variables. The implications of our findings are also discussed.

JEL Codes: Q30 Q40; R00

Keywords: DUCs; oil price uncertainty; climate policy uncertainty; U.S. oil producing regions; impulse response functions

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US-China Trade War: Modeling Tariff Efficiency on Trade Revenue

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Abstract

This paper presents a theory and a specific model to illuminate the effect and efficiency of tariff policy on trade revenue. Escalating protectionisms and trade wars between the US and China over the years provide insights for this research paper. The main goal of the paper is to use an elasticity approach to determine the effect of tariff policy.

In recent decades, the function and viability of the World Trade Organization (WTO) has been threatened by economic skirmishes and the resulting trade war between the US and China. This results in ripple effects across the global trading system. Consequently, the WTO has not been able to control market distortions as was intended. China's continued application of its export subsidies and the US tariff responses to protect its domestic industries from the cheap Chinese exports have caused global hot debates over decades. Based on this fact, the paper examines these two large trading partners' ongoing tit-for-tat trade wars and evaluates the effect and efficiency of the US tariff policy. Wide application of US tariffs created backlash both from general consumers and fiscal policy makers.

The method of the research is to use the partial differential of trade revenue with respect to changes of these two country's commercial policies in the forms of export subsidies and protective tariffs as retaliatory tools to examine the ongoing US-China tit-for-tat trade wars. The theory encompasses a method of comparative static analysis and Cobb-Douglas type multiplicative exponential forms to construct a general model. The theory nests a combined theory of neoclassical and political economy to analyze commercial policies from both importing and exporting countries.

The first finding of the paper is the "lambada" function, a term emerging from the constructed model, which is a crucial factor for estimating the effect and efficiency of the tariff on the trade revenue. As such, the "function can also be called a "tariff policy efficiency indicator". The "lambada" function is a multivariable functional relationship of market forces from both countries represent price elasticity of demand from the importing country and the price elasticity of supply from the exporting country, respectively. Consequently, the model singles out the pure effect of tariff on trade revenue and evaluates its efficiency. The conclusion is that the effect of tariff on trade revenue depends on price elasticity of demand of the pertinent product.

A key finding is that for inelastic products the tariff elasticity of trade revenue is positive indicating that an increase in tariff will result in an increase in trade revenue. Conversely, if the price elasticity of demand is elastic, the tariff elasticity of trade revenue is negative. The "lambada" function also sheds light on who gains and who loses from the tit-for-tat trade war by creating a step-by-step analysis for the free and fair market scenarios, respectively. Equally important, the model also has fiscal policy implications from the government tax policy efficiency perspective.

Keywords: US-China trade war; WTO; tariff policy; efficiency

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Economic and Regulatory Factors Impacting the Creation of Medical Device Exporting Enterprises in Mexico

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Abstract

The medical device (MD) industry plays a crucial role in global healthcare, driven by increasing demand, technological advancements, and evolving regulatory frameworks. Despite its rapid growth, the creation of new MD manufacturing companies faces significant economic and regulatory challenges. This study provides an exploratory and descriptive analysis of the key factors influencing MD business creation, focusing on market demand, investment costs, patent development, quality certification, and regulatory compliance. Through a review of statistical data, trade reports, and academic literature, the study examines the global MD market landscape and highlights the strategic role of North America, particularly Mexico and Canada, in supplying the U.S. market. Findings indicate that while the U.S. dominates the MD industry, Mexico and Canada remain underutilized markets, presenting opportunities for new businesses to enter the MD exportation sector. The study concludes that fostering innovation, regulatory compliance, and leveraging nearshoring strategies could enhance MD business creation in emerging markets. Future research should incorporate empirical studies to validate these findings and assess policy interventions that facilitate industry growth.

Keywords: Medical devices; business creation; enterprise creation; economic factors; regulatory compliance; export industry

Factores económicos y regulatorios que impactan en la creación de empresas exportadoras de dispositivos médicos en México

Resumen

La industria de dispositivos médicos (DM) desempeña un papel crucial en la atención médica global, impulsada por la creciente demanda, los avances tecnológicos y los marcos regulatorios en evolución. A pesar de su rápido crecimiento, la creación de nuevas empresas manufactureras de DM enfrenta desafíos económicos y regulatorios significativos. Este estudio proporciona un análisis exploratorio y descriptivo de los factores clave que influyen en la creación de negocios de DM, con un enfoque en la demanda del mercado, los costos de inversión, el desarrollo de

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patentes, la certificación de calidad y el cumplimiento normativo. A través de una revisión de datos estadísticos, informes comerciales y literatura académica, el estudio examina el panorama global del mercado de DM y resalta el papel estratégico de América del Norte, particularmente México y Canadá, en el suministro del mercado estadounidense. Los hallazgos indican que, si bien Estados Unidos domina la industria de DM, México y Canadá siguen siendo mercados infrautilizados, lo que presenta oportunidades para que nuevas empresas ingresen al sector de exportación de DM. El estudio concluye que fomentar la innovación, el cumplimiento normativo y aprovechar las estrategias de nearshoring podría mejorar la creación de negocios de DM en mercados emergentes. Las investigaciones futuras deberían incorporar estudios empíricos para validar estos hallazgos y evaluar intervenciones políticas que faciliten el crecimiento de la industria.

Palabras Clave: Dispositivos medicos; creación de negocios; creación de empresas; factores económicos; cumplimiento regulatorio; industria de exportación

I. Introduction

The MD industry plays a crucial role in improving healthcare and quality of life worldwide. A MD is defined as an instrument, apparatus, machine, implant, or in vitro reagent that includes components, parts, accessories, which diagnoses, cures, treats, or prevents disease or condition. Unlike pharmaceutical products, MD acts on the structure or function of the body without chemical intervention (Food and Drug Administration [FDA], 2022). Given their importance in medical care, the global MD market was valued at approximately \$500 billion USD in 2023, with an estimated compound annual growth rate (CAGR) of 3% (Market.U.S., 2023). The Americas region leads this industry, with the United States as the world's largest exporter (Pan American Health Organization [PAHO], 2024).

Mexico has established itself as a key player in the MD industry, particularly in manufacturing. Since the implementation of North American Free Trade Agreement (NAFTA) in 1994, the Mexican MD market has shown remarkable growth, positioning the country as an important global manufacturing hub. Between 2003 and 2020, Mexican MD exports grew at an average annual rate of 8.6%, reaching a total export value of approximately \$10.668 billion USD, with the United States as the primary destination (Pineda, 2022). However, despite the sector's expansion, the national industry remains highly dependent on imports, with only one-fifth of the total production coming from domestic manufacturers (González, 2022).

The creation of MD manufacturing companies in Mexico faces multiple challenges influenced by economic and regulatory factors. Key determinants such as market demand, initial investment costs, patent development, quality certifications, and compliance with health regulations impact the feasibility and sustainability of these enterprises (Marešová et al., 2020). Additionally, Mexico's reliance on imported MDs, primarily from the United States and China, underscores the need to strengthen domestic production to enhance economic growth and reduce external dependence (INEGI, 2022).

This article analyzes the economic and regulatory factors influencing the creation of MD exporting companies in Mexico. By examining these elements, this research seeks to provide insights into the opportunities and barriers faced by entrepreneurs in this sector. Understanding these dynamics is essential for developing strategies that promote business growth, enhance Mexico's role in the global MD industry, and support the expansion of national manufacturing companies.

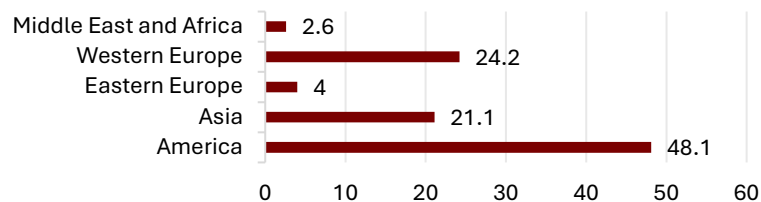
II. Literature Review

The creation of new businesses in the MD industry is influenced by a variety of factors, many of which are directly influenced by economic and regulatory elements. These factors not only play a critical role in promoting the establishment of new MD manufacturing companies worldwide but also in determining market entry feasibility and long-term sustainability. This section reviews key theoretical perspectives and empirical studies that provide insight into the factors shaping the development of MD manufacturing firms.

2.1 Market Overview of the Medical Devices Industry

The global market for MD was valued at \$404.5 billion in 2019, with the Americas representing the largest share at 48.1%, followed by Western Europe at 24.2%, Asia at 21.1%, Eastern Europe at 4%, and the Middle East and Africa at 2.6% (Fitch Solutions, 2019). This distribution is illustrated in Figure 1.

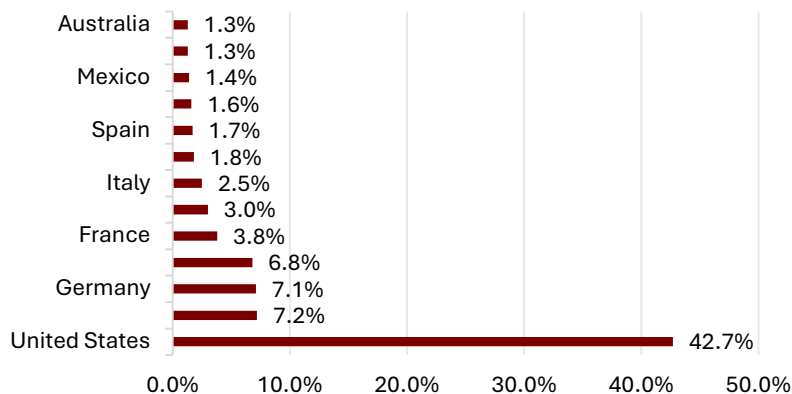
Figure 1. Percentage by Region of the Global Medical Device Market Value in 2019



Source: Prepared by author using data from Fitch Solutions (2019).

Looking at the market share by countries, the United States holds the largest portion at 42.7%, followed by Japan (7.2%), Germany (7.1%), and China (6.8%). Other notable markets include France (3.8%), the United Kingdom (3%), and Italy (2.5%). Mexico, with a 1.4% share, ranks among the emerging markets in the global MD landscape, as shown in Figure 2.

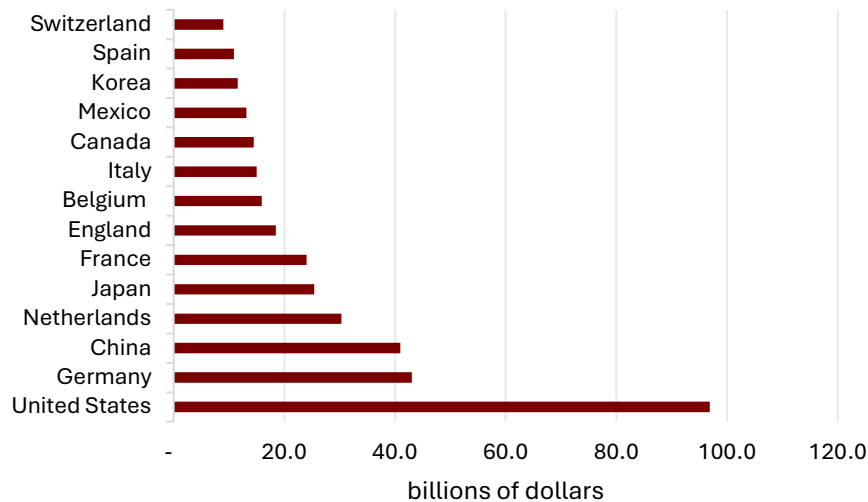
Figure 2. Percentage by Country of the Global Medical Device Market Value in 2019



Source: Prepared by author using data from Fitch Solutions (2019)

The MD import market in 2019 was primarily dominated by the United States, Germany, China, the Netherlands, and Japan (Drevinkas et al., 2023), as seen in Figure 3. This underscores the significant role of these countries in global trade in MD.

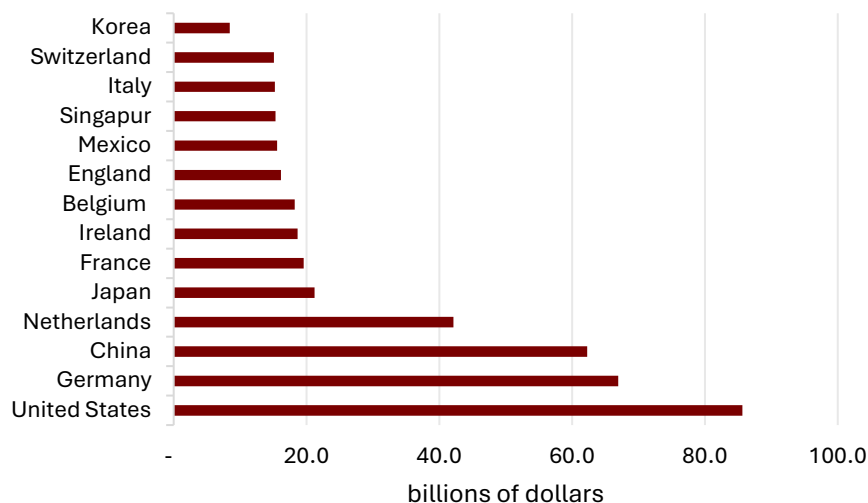
Figure 3. Value of Medical Device Imports by Country in 2019



Source: Prepared by author using data from Drevinkas (2023)

Simultaneously, the export market for MD mirrors this distribution, highlighting the influence of the same leading countries in driving global exports, as shown in Figure 4.

Figure 4: Value of Medical Device Exports by Country in 2019

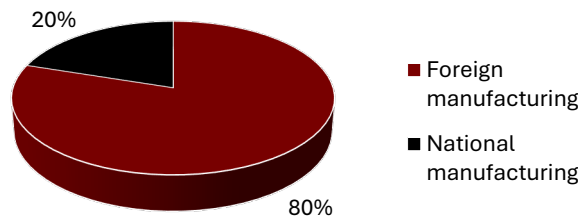


Source: Prepared by author using data from Drevinkas (2023).

In Mexico, the MD market reached approximately \$5.86 billion in 2019. The country’s export volume significantly outpaces domestic production, with exports reaching \$10.67 billion in 2020, compared to \$5.42 billion in imports (INEGI, 2022).

A relevant fact is that the Mexican market is covered with more than 80% of imports, which indicates that the national supply is less than 20% as shown in Figure 5, while the volume of exports is almost double the size of the national market, which means that international companies, a large part of which are American, decided to strategically move their industrial and manufacturing operations to the Mexican territory with the aim of reducing production costs, taking advantage of geographical proximity, high quality standards and staff training in science and technology (BasqueTrade, 2023).

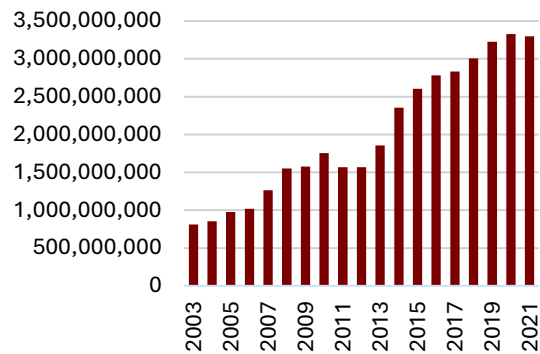
Figure 5. Percentage of Domestic vs. Foreign Manufacturing of Medical Devices in Mexico



Source: Prepared by author using data from BasqueTrade (2023).

Notably, the growth trend in Mexico’s MD export market, particularly within the tariff fraction 9018.90.99 (other medical instruments), shows a positive trajectory, as shown in Figure 6 (SIAVI, 2024).

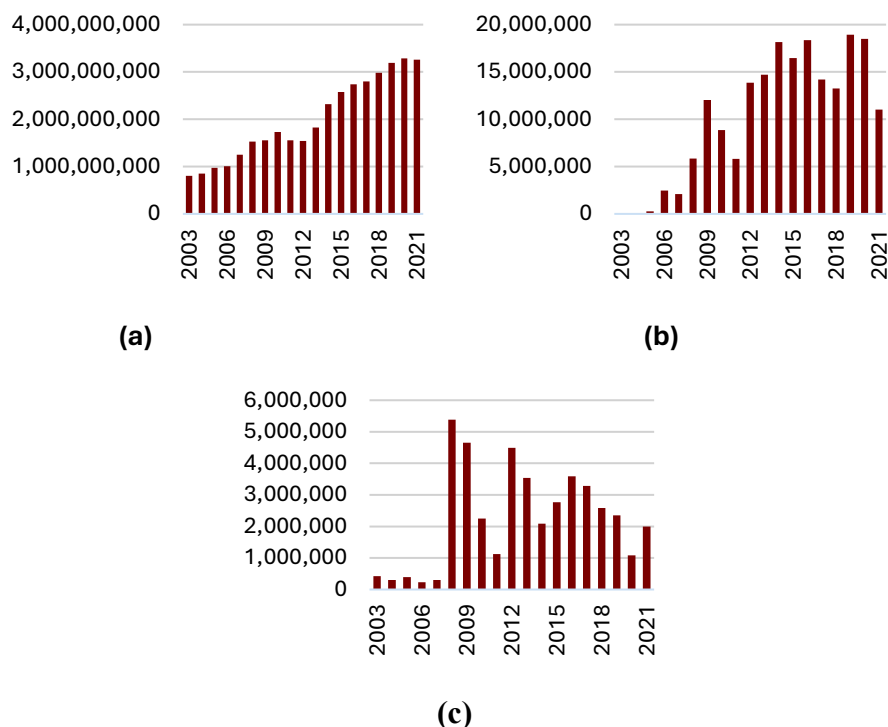
Figure 6. Evolution of Exports of the Tariff Fraction 9018.90.99



Source: Prepared by author using data from SIAVI (2024).

The United States remains the primary destination for Mexican exports in this category, followed by the Netherlands and Germany. These trends are visually represented in Figure 7, which indicates a growth trend for exports to the U.S. and the Netherlands, while exports to Germany have seen a slight decline.

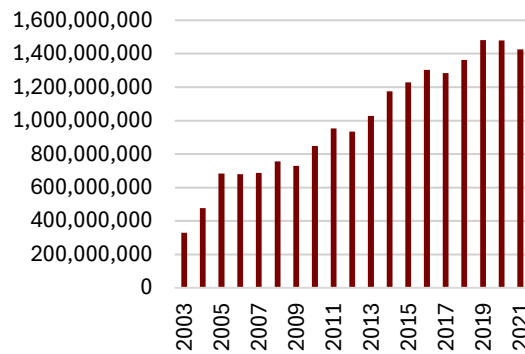
Figure 7. (a) United States, (b) Netherlands, and (c) Germany as the Main Export Destinations for Tariff Fraction 9018.90.99 from Mexico



Source: Prepared by author using data from SIAVI (2024).

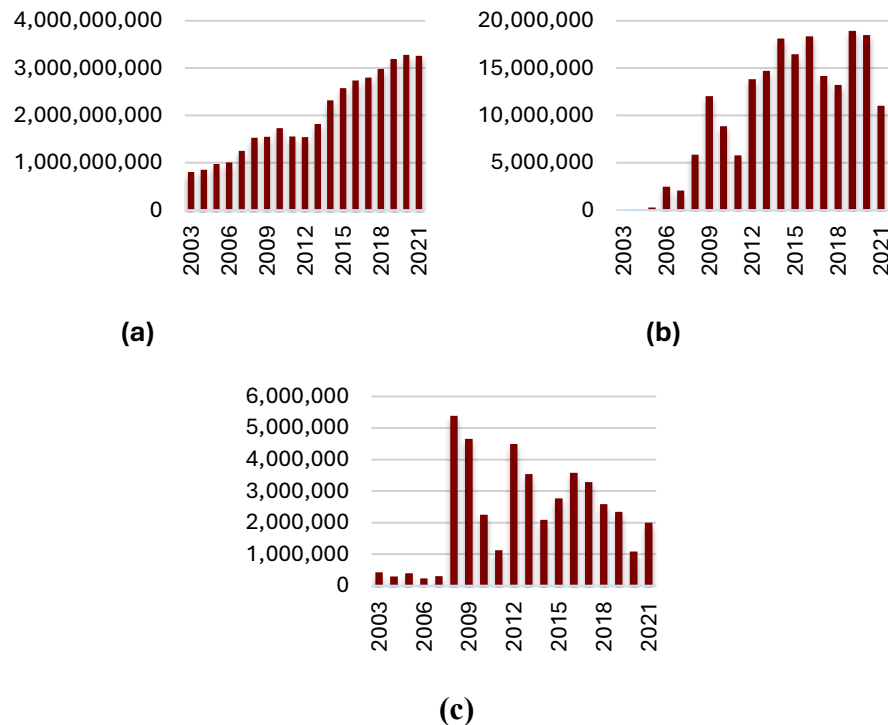
On the import side, the same tariff fraction also exhibits growth, as shown in Figure 8. Countries such as United States, China, and Germany contribute the leading suppliers to Mexico's MD imports, as detailed in Figure 9.

Figure 8. Evolution of Imports of the Tariff Fraction 9018.90.99



Source: Prepared by author using data from SIAVI (2024).

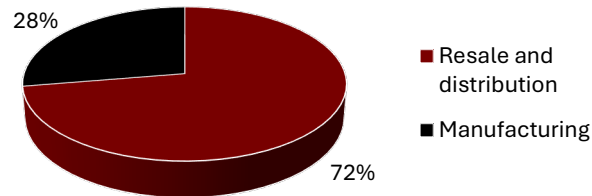
Figure 9. (a) United States, (b) China, and (c) Germany as the Main Import Sources for Tariff Fraction 9018.90.99 to Mexico



Source: Prepared by author using data from SIAVI (2024).

In Mexico, there are 368 companies dedicated to the commercialization of MD, and 140 companies engaged in the manufacturing of these devices, as shown in Figure 10 (SIEM, 2024). However, only 20% of these manufacturers are national producers, a crucial factor when considering the challenges and opportunities in the domestic market.

Figure 10. Percentage of Medical Device Commercializing vs. Manufacturing Companies in Mexico



Source: Prepared by author using data from SIEM (2024).

The global MD market, post-COVID-19, has shown a promising growth trajectory, with a market value of \$518.46 billion in 2023 and an estimated projection to reach \$886.8 billion by 2032 (Fortune Business Insights, 2024). In Mexico, the compound annual growth rate (CAGR) is estimated at 6.2%, while the United States is seeing a similar growth trend of 6.1% (BasqueTrade, 2023; Fortune Business Insights, 2024).

The trade dynamics, including the growing reliance on nearshoring due to the shifting economic and political landscape, underscore Mexico's strategic position as a hub for manufacturing MD for the U.S. market (Barry et al., 2023). This shift is largely driven by the proximity, favorable labor costs, and robust regulatory standards that make Mexico an attractive destination for U.S. companies.

The MD industry has seen remarkable growth driven by key factors which have played a significant role in the establishment of new businesses in this sector. The increasing demand for MD worldwide has created a robust market for companies to capitalize on. As the global healthcare sector expands, there is a rising need for innovative solutions and high-quality products, encouraging new players to enter the market and meet these needs (Arango, 2017).

One of the key factors behind the growth of the MD industry is the lower production costs and attractive infrastructure in some regions. As highlighted by Gómez (2018), the possibility of reducing initial investments and operating more efficiently in countries with favorable economic conditions incentivizes the establishment of new companies. This is especially relevant in markets where production costs are a key consideration for companies seeking to remain competitive in a rapidly evolving industry.

Technological advancements and the continuous development of patents are also essential for fostering new enterprises. Löfsten (2015) emphasizes how research and development in medical technologies have allowed companies to stay competitive by creating cutting-edge solutions. As a result, startups and new companies are encouraged to innovate and bring fresh ideas to the market, increasing the overall value of the sector.

Furthermore, international certifications and compliance with quality standards have opened doors for companies to expand their market reach globally. Wu and Wu (2019) explain that businesses meeting international quality standards have better opportunities for exporting their products. The ability to access foreign markets significantly boosts the potential for new businesses, especially those looking to expand beyond domestic boundaries.

The regulatory environment, including the requirement for sanitary registration, also plays a critical role in facilitating the creation of companies. As noted by Huusko et al. (2023), the clarity and accessibility of the regulatory process help new businesses enter the market and participate

in global trade. By ensuring that MD meets necessary standards, companies can increase their credibility and attract more investment.

In summary, factors such as market demand, investment costs, patents development, quality compliance and the ability to meet regulatory requirements all contribute to the growth of the MD industry. As these factors continue to evolve, they present further opportunities for the creation of new businesses in this sector, ultimately shaping the future of global healthcare.

2.2 Theoretical Framework for Business Creation

The history of business creation dates to ancient civilizations like Greece, China, and Rome, where entrepreneurial activities through trade and usury began to lay the foundations for today's business landscape (Góral et al., 2022; Kolesnik et al., 2013). Today, business creation is considered a vital driver of economic growth, and it involves various stages, from identifying opportunities to securing financial resources and successfully entering the market (Sánchez, 2015). Drucker's Business Theory (2017) offers a framework to understand how entrepreneurs define their mission, adapt to environmental changes, and create organizations that can thrive in a competitive market. According to Villar et al. (2014), business creation encompasses the entire journey, from the conception of an idea to its realization. Key motivations for entrepreneurial ventures are varied, ranging from continuing a family legacy to creating wealth (BBVA, 2023).

Factors influencing business creation are complex, and previous studies highlight both external and internal obstacles that entrepreneurs face. For instance, Genesca and Veciana (1984) identified barriers such as lack of capital and political instability, which can hinder new ventures. Meanwhile, Gómez et al. (2018) emphasized the importance of market demand as a key driver for business creation. The empirical analysis conducted by these authors underscores the significance of understanding market dynamics to validate business opportunities.

2.3 Theoretical Framework for Economic and Regulatory Factors

a. Market Demand as a Reason for Business Creation

Market demand is a foundational concept in economics and directly affects the establishment of new businesses. It is influenced by consumer preferences, purchasing power, and overall market conditions (Aruka, 2015). The theory of supply and demand, developed by economists like Werner Hildenbrand (1994), explains how market demand is shaped by the interactions between consumers' needs and producers' supply. According to Peiro (2024), market demand represents the willingness of consumers to acquire products at various price points, while Moya (2015) highlights its direct relationship to market size and potential sales volume. However, high demand does not automatically translate into business growth. Barriers such as industry consolidation, intellectual property restrictions, and supply chain dependencies can limit new entrants despite strong market opportunities.

In Mexico, for example, over 80% of the domestic MD market is supplied by imports (BasqueTrade, 2023), which suggests that local companies struggle to compete with established international manufacturers. This heavy reliance on foreign suppliers presents both a challenge and an opportunity, while it reflects barriers to local business creation, it also indicates a market gap that could be filled by domestic firms if investment and regulatory conditions improve.

Several empirical studies demonstrate the critical role of market demand in the creation of businesses. For instance, Arango (2017) found through a study in Colombia that market demand is a primary driver for entrepreneurs, as it signals opportunities for business growth. Additionally, Kirkley (2016) explored how customer demand and market opportunities influence entrepreneurial decisions. His research, conducted with entrepreneurs in New Zealand, reveals that understanding customer needs and market conditions is essential for business success.

b. Investment Costs and Competitive Advantages

Investment costs are another crucial determinant in the process of business creation. The historical development of economic theories, such as the "supply function" and "adjustment costs," provide valuable insights into how investment decisions are made (Mussa, 1977). These theories indicate that investment decisions are influenced by the expected returns and the costs associated with entering a new market (Casson & Casson, 2014).

The costs associated with setting up a new business include expenses related to machinery, technology, product development, and labor (Kuri, 2021). Investment in these areas is essential for the business's ability to function and compete in the marketplace. According to MytripleA (2024), initial capital investments can be substantial, requiring financial resources for technology, licenses, and administrative expenses.

Research highlights the direct relationship between investment costs and business creation. Blazenko and Pavlov (2009) argue that businesses are established when expected returns exceed financial opportunity costs. Furthermore, studies by Eka and Rahman (2022) and Saraiva et al. (2020) emphasize the importance of continuous investment and financial management in sustaining and expanding new ventures.

Countries with favorable production and investment costs, skilled labor, and well-developed industrial infrastructure tend to attract more MD companies. Mexico and Canada, for example, have become key manufacturing hubs for U.S. firms looking to reduce production costs through nearshoring strategies (Barry et al., 2023). Despite Mexico's 1.4% market share, compared to the U.S. at 42.7%, its strategic advantages such as lower labor costs, geographic proximity, and trade agreements like the United States-Mexico-Canada Agreement (USMCA) position it as a viable alternative to Asia for MD production. However, the fact that most MD companies operating in Mexico are foreign-owned means that profits often leave the country rather than fueling local industry expansion.

c. The Role of Innovation and Patent Development

Patent development is a key component in fostering innovation and encouraging new business creation. The U.S. patent system, which grants inventors exclusive rights to their creations, has long been recognized to stimulate technological advancements and enable entrepreneurs to commercialize their inventions (Lamoreaux & Kenneth, 2001). The protection provided by patents serves as an incentive for innovation, granting a competitive edge to businesses by preventing imitation (Wadhvani & Lubinski, 2018).

Fisher (2001) suggests that intellectual property protections, such as patents, play a significant role in business creation by safeguarding valuable assets and encouraging new ideas. Löfsten (2015) further explores this by examining 131 startups in Sweden, showing that a robust patent strategy contributes to business success. Similarly, Giudici et al. (2017) found that patent development is an essential factor influencing the creation of tech startups, highlighting its positive impact on business growth.

In Mexico, patent development remains limited compared to major MD exporters like the U.S. and Germany, highlighting the need for policies that encourage local R&D investment and technology transfer initiatives.

d. The Strategic Importance of Certification and Market Access

Beyond regulatory approvals, international quality certifications play a crucial role in determining market entry success. The importance of quality certifications has grown as consumer demands for high-quality products and services have increased. Certifications, which ensure compliance

with recognized standards, serve as a signal of reliability and safety for consumers and businesses alike (Viadiu et al., 2002; Wimmer & Chezum, 2007). The theory of Total Quality Management (TQM) underscores the significance of customer satisfaction, continuous improvement, and employee involvement in ensuring product quality (Aichouni et al., 2023).

Companies that obtain certifications such as ISO 13485 or FDA 510(k) clearance gain a significant competitive advantage in global trade (Wu & Wu, 2019). Without these certifications, even companies with high-quality products may struggle to secure distribution agreements and access foreign markets, also, their study, involving 878 manufacturing firms in China, found that obtaining certifications boosts product performance and market competitiveness. Utami et al. (2021) also found that TQM practices significantly improve startup performance, providing new companies with a competitive edge.

In Mexico, where many MD companies are foreign-owned, local manufacturers must compete at an international level to remain viable. This requires not only compliance with domestic regulations but also alignment with global quality standards, reinforcing the need for stronger support mechanisms for certification processes.

e. Regulatory Compliance as a Market Barrier

Health regulations are fundamental to ensuring the safety and efficacy of MD, especially in sectors like medical technology. The concept of regulatory compliance is rooted in the U.S. market economy of the 19th century and has evolved into a global necessity to protect public health while enabling the smooth flow of trade (Jacobson, 2001). Health regulations, such as the International Health Regulations, aim to minimize risks associated with public health threats and ensure that products meet established standards (Nuttall, 2014).

Maci and Marešová (2022) highlight the importance of compliance with health regulations, noting that adherence to these regulations not only ensures consumer safety but also fosters fair competition and innovation. Compliance with standards such as ISO 13485, FDA approvals, and CE marking is often a time-consuming and costly process, requiring companies to invest heavily in quality assurance and regulatory expertise. Studies, such as those by Huusko et al. (2023), demonstrate the critical role that compliance with health regulations plays in the success of MD companies. Their study in Finland found that health regulatory compliance directly influences the establishment and success of new companies in the MD sector.

III. Methodology

This article adopts an exploratory and descriptive approach to examine the economic and regulatory factors influencing the creation of MD manufacturing companies in Mexico. The study synthesizes historical trends, statistical data, and theoretical frameworks to provide a structured understanding of industry dynamics. By relying on secondary data, this research serves as a foundation for future empirical studies, offering insights into market conditions, investment trends, and regulatory environments.

3.1 Research Design

A documentary research design was adopted to analyze quantitative and qualitative secondary sources. This approach allows for a systematic review of statistical trends and theoretical information, ensuring a comprehensive assessment of the MD industry. The study integrates market intelligence reports, trade databases, and academic literature to contextualize how economic and regulatory variables influence business creation.

3.2 Data Collection

The study relies on secondary data from official sources, including:

a. Market and Trade Data

SIAMI (2024), BasqueTrade (2023), and INEGI (2022), provide insights into Mexico's MD trade flows, import dependency, and export growth.

Fitch Solutions (2019) and Fortune Business Insights (2024), offer global market valuations and regional growth trends, contextualizing Mexico's role in the global MD landscape.

b. Regulatory and Business Environment Data

Huusko et al. (2023) and Wu & Wu (2019), discuss how regulatory compliance affects business entry and international market access.

SIEM (2024) and SCIAN databases, identify the number and type of MD manufacturers in Mexico, highlighting gaps in domestic production capacity.

c. Academic Literature

Arango (2017), Gómez (2020), and Löfsten (2015), explore economic factors influencing MD business creation, including market demand, investment costs, and patent development.

Barry et al. (2023), Provide insights on nearshoring trends, a key factor shaping investment decisions in North America's MD sector.

3.3. Data Analysis

A comparative and interpretative approach was used to analyze how Mexico's MD industry aligns with global market conditions. The study identifies:

1. Key economic and regulatory trends shaping MD business creation.
2. Comparative insights on Mexico's position relative to leading MD markets (U.S., Germany, China, etc.).
3. Strategic implications for business creation, emphasizing Mexico's potential for nearshoring and domestic industry expansion.

3.4 Scope and Limitations

This study does not involve primary data collection, instead, it offers a theoretical and statistical foundation for future research. Given their reliance on secondary sources, real-time market dynamics and recent regulatory developments may not be fully captured. Future studies should incorporate surveys, case studies, or firm-level analyses to validate and expand upon these findings.

IV. Conclusions

The MD industry plays a vital role in global healthcare, with market expansion driven by economic and regulatory factors that influence business creation. This study highlights how market demand, investment costs, patent development, quality certification, and regulatory compliance shape the emergence of MD manufacturing companies. These factors not only determine entry conditions for new firms but also define their long-term competitiveness in an increasingly regulated and technology-intensive industry.

A key finding is that market demand alone is not sufficient to drive business creation, the ability to overcome regulatory barriers, manage investment costs, and obtain international certifications is equally critical. Despite a growing global market, high entry costs and complex regulatory environments remain major obstacles for new companies, particularly in emerging economies.

The study identifies a major gap in North America's MD industry structure. While the United States dominates the global market with a 42.7% share, Mexico and Canada account for only 1.4% and 1.8%, respectively. This discrepancy presents an opportunity for new companies to enter the sector with a focus on exporting to the U.S., where demand continues to grow.

Furthermore, Mexico's 80% import dependency indicates a significant reliance on foreign manufacturers, meaning that most profits generated in the country are redirected to overseas companies. While foreign firms benefit from Mexico's skilled workforce, competitive labor costs, and trade advantages, the lack of domestic players limits local industry development.

To strengthen domestic MD manufacturing and reduce import dependency, the following strategic actions could be considered:

1. Enhancing local innovation and patent development. Policies that promote research funding, technology transfer programs, and industry-academia collaborations can help increase Mexico's intellectual property output and reduce reliance on foreign technologies.
2. Facilitating market entry for new manufacturers. Streamlining regulatory processes, reducing approval delays, and expanding support for ISO 13485 and FDA certification would enable local companies to access international markets more efficiently.
3. Leveraging nearshoring for industry expansion. Given U.S.-China trade tensions, Mexico is strategically positioned to attract investment from American MD firms. Developing industrial clusters, improving supply chain resilience, and strengthening cross-border logistics could further enhance its role in the North American market.
4. Strengthening incentives for domestic production. Government incentives such as tax benefits, export financing, and investment in high-tech manufacturing infrastructure could help increase local business participation in the MD sector.

This study serves as a theoretical and statistical foundation for future empirical research. Future studies could:

1. Conduct surveys and case studies with MD manufacturers to validate the economic and regulatory factors identified.
2. Perform comparative analyses between Mexico and other emerging MD markets (e.g., Brazil, India) to assess competitive positioning.
3. Investigate the long-term impact of nearshoring on MD industry growth in North America.

By studying these gaps, future research can provide data-driven recommendations for policymakers, industry leaders, and investors seeking to strengthen the global MD manufacturing landscape.

V. Conflict of Interest Statement

By submitting this paper, I acknowledge that I am the author of the submission and that I have the permission of all co-authors to include this paper/summary note/abstract in the 29th Annual Western Hemispheric Trade Conference Proceedings. I also acknowledge that I have the rights to include any third-party materials in the submission.

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A Subnational Region Model of International Trade: The Influence of Multi-level Institutions

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Abstract

With persistent global shocks and a heightened focus on geographic regional integration, the nature of true globalization may be more aptly characterized as partial globalization. Institutions have strategic components which intend to support and/or constrain international business conduct within their spheres of influence, and foreign companies will likely benefit from evaluating institutional characteristics in an area when deciding whether to localize business there. The institutions which govern an area may also significantly benefit from inward foreign investment and other international business activities, and as such, may actively prompt, manage, and grow associated location-specific international business relationships and processes. While the influence of national institutions on international business is well researched and understood, this study narrows its approach to examine the more nuanced features of subnational institutional competitiveness for international business in a subnational geographic region. Synthesizing tenets from regional science and economic geography into more contemporary views of international business paradigms, we theorize the mechanisms of subnational institutional influence on international business, in consideration of the broader national and supranational institutions where situated. Our resulting interdisciplinary model is extended into a four-dimensional space to highlight multi-level effects of region institutional competitiveness for subnational international business. Our study clarifies the subnational region as most geographically and contextually proximate to foreign inward investment and localization of foreign business practices. As such, we highlight the importance of subnational institutions to the ultimate success of international business in a subnational regional area and finalize with a discussion of study implications for research and practice.

Keywords: Regions; region-based institutions; subnational regions; subnational institutions; multinationals; international trade

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The Effects of POS, LMX and Mindfulness on Work Behaviors: A Comparative Study between India & USA

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Abstract

Scholars are often tempted to understand employees' psychological and behavioral traits that drive their work-related behaviors and job performance. Although there is ample literature on perceived organizational support (POS), leader-member exchange (LMX) and mindfulness (MND) and its effects on employee job satisfaction and performance, there is substantial research gap in examining direct effects of POS and LMX on mindfulness and indirect effects on entrepreneurial orientation (EO), sustainable behavior (SB), organizational citizenship behavior (OCB, and well-being (WLB) through mindfulness in cross-country analysis. Thus, the aim of this study is to examine the direct effects of POS and LMX on crucial work behaviors of employees and indirect effects through mindfulness. A two-country sample analysis (India and USA) has been conducted with PLS-SEM to explore differential effects of POS, LMX, and MND on employee work behaviors. The study reveals significant direct effect of POS, LMX, and MND on work behaviors and differences between countries. Furthermore, mindfulness mediates the relationship between LMX and work behaviors, not between POS and work behaviors. The study provides important theoretical and managerial implications and future research directions.

Keywords: Mindfulness; EO; SB; OCB, WLB; POS; LMX; India; USA

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Identifying Gender-Based *Microaggressions* and *Micro-Machismos* in the Workplace

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Abstract

This paper presents an extensive collection of microaggressions and “micro-machismos”, providing a series of characterizations that are frequent in everyday life but that in some social spheres have not been named. Various tables are presented, showing typologies, taxonomies, and explanations of the most common terms.

Keywords: Microaggressions; micro insults; micro assaults; micro-inequities; micro-machismo; gender gap

I. Introduction

Although microaggressions and micro-machismos (Spanish for everyday instances of male chauvinism) have grown in use and are publicly presented in social media and media outlets, sometimes their meaning is not clear. Micromachismo and most microaggressions are directed toward women and can take place in any type of setting, including the workplace.

This paper aims to make microaggressions against women visible by identifying and contextualizing the subtle but profound ways in which they manifest in everyday situations, from home life to the workplace. While overt discrimination and explicit bias against women tend to be more visible, microaggressions, including actions that reinforce negative stereotypes and diminish women, can be continuously overlooked.

The term microaggressions was developed by Harvard psychiatrist Chester Pierce in 1970 to explain regular insults and dismissals used by non-black individuals against black people, which had a significant impact on their physical and psychological well-being. The term was originally grounded in race and applied to insults and dismissals towards people of color (Dalton & Villagran, 2018). In 1973, MIT economist Mary Rowe extended the meaning to include aggressions against women. In 2015, the term was declared word of the year by the Global Language Monitor (Brown, 2015), and in 2017, the word was formally added to the Merriam-Webster Dictionary, becoming part of the lexicon (The Washington Post, 2017).

Microaggressions may occur in conversations and different types of interactions and have sometimes been called thinly veiled instances of aggression (Limpong, 2020). They are non-verbal exchanges, which are “put-downs” (Pierce et al., 1976, p. 66) and subtle insults (Solórzano et al., 2000), although they represent major indignities. However, since they happen daily, it is difficult for a lot of people to recognize them, and people who commit them might not be aware of what they are doing, yet they result in victims feeling uncomfortable and even insulted. Microaggressions occur in all types of contexts, including families, friends, neighborhoods, and workplaces (Wheeler, 2016).

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Although the name includes the prefix "micro", it does not mean that the aggressions are small or innocuous, but that they underscore the interpersonal micro-level context of the act. It also means they are barely visible and challenging to detect (Lilienfeld, 2017). Microaggressions overlap with other similar concepts, such as racism, majority rule, and everyday discrimination. Uncivil behaviors, if left to continue, may result in bullying and even violence (University of Colorado Denver, 2024).

These aggressions are often engrained in family dynamics taught to children while growing up and are influenced by friends later in life. They also result from exclusion and discriminatory practices by structures of power. Microaggressions convey despairing messages to people just because they are perceived to belong to a certain group.

People who engage in these behaviors are ordinary people who consider themselves to be good, moral, and decent individuals (Desmond-Harris, 2015). The microaggressions can be presented in a considerate or helping manner and present attitudes that reflect "benevolent sexism" (Cabay et al., 2018).

Different studies have suggested that microaggressions have large impacts. In fact, neuroscience research revealed that the brain is impacted by violations of dignity (University of Denver Colorado, 2024). Microaggressions have important effects on women at work, and it is not a micro-impact but a macro one (Gynn, 2023).

One of the problems with microaggressions is that sometimes they can be disguised as a compliment or advice, but they can take on many forms. They often involve situations in which a woman feels offended because of insensitive statements, questions or assumptions (Washington, 2022).

Microaggressions are directed to all types of groups and individuals and in all settings. For instance, in sports, women are assumed to be inferior athletes and, therefore, receive less media coverage or no coverage at all. And if they do, the content is dismissive of their abilities, which has strong negative effects on their self-image (Kaskan & Ho, 2016). In academia, hierarchical microaggressions are frequent; some slights communicate systemic valuing or devaluing of a person because of the institutional role that is held, which can result in people being ignored, excluded, and interrupted, as well as being the subject of insensitive comments (Young et al., 2015). In STEM, women are considered as "too pretty to code" because of a perceived role of incongruity, and therefore, technical competencies are devalued (Kim & Meister, 2023). Even in therapy, frequent microaggressions have been reported, which can interfere with the therapeutic process based on racial and ethnic status (Owen et al., 2014).

Microaggressions can be experimented in three different ways, as can be observed in Table 1.

Table 1: Ways in which Microaggressions can be Experimented

Type	Description
Verbal	Comments or questions that are hurtful or stigmatizing to a marginalized group.
Behavioral	Behaving in a way that is discriminatory or hurtful to marginalized persons or groups, including ignoring someone.
Environmental	Subtle discrimination occurs within society, and it is packed with symbols that are demeaning, hostile, and abusive toward certain groups, their culture, and lifestyles.

Source: Sue & Spanierman, 2020.

II. Roles Involved in Microaggressions

Normally, in microaggressions, there is a perpetrator and a target (Hinton, 2004). Ako-Brew (2020) has added two more roles: the ally and the bystander. The actions of all of these roles are presented in Table 2.

Table 2: Roles and Actions in Microaggressions

Role	Actions
The perpetrator	The instigator of the micro-aggressive act
The target	Recipient of the micro-aggressive act
The ally	The person who speaks up about discrimination
The bystander	The person who simply observes and allows things to unfold

Source: Ako-Brew, 2020.

Among the different roles, the ally is positive, as it is the whistleblower of the wrongful behavior. The importance of allies and allyship is presented in the last section of the paper as a way out of the vicious cycle of microaggressions and micromachismos.

Taxonomy of Microaggressions

Originally, there were three types of microaggressions: micro-assaults, micro-insults, and microinvalidations. From the perspective of business, micro-inequities were added. Microaggressions theory has become integrated into a variety of professional fields, such as psychology, education, law, medicine, and public policy (Sue & Spanierman, 2020, p.xi). Table 3 presents the descriptions of the different types of microaggressions along with the actions carried out by perpetrators.

Table 3: Taxonomy of Microaggressions

Type	Description	Perpetrator actions	Authors
Micro-assaults	Often conscious and explicit displays of verbal and non-verbal attacks and intentional discriminatory behavior meant to hurt the target. Common deliberate and intentional insults or remarks, including name-calling, avoidant behavior, and front-up discriminatory actions, which include inappropriate jokes and mocks.	The perpetrator is well aware of what he/ she is doing and feels safe while committing the act. Often, they pretend to be joking. There is an intention to hurt.	Sue, 2020; Ako-Brew, 2020; Capodilupo, 2010; Cleveland Clinic, 2022; Smith-Hahighi, 2023
Micro-insults	Often unconscious and subtle verbal and behavioral snubs that are rude or insensitive. Comments or actions can be unintentionally discriminatory. There are also rude comments suggesting people do not belong to a certain group because they do not act according to stereotypes. It can involve demeaning the victim's heritage, identity, or other characteristics.	The perpetrator is mostly unaware that this behavior has provoked ill feelings in the target.	Sue, 2020; Ako-Brew, 2020; Capodilupo, 2010; Cleveland Clinic, 2022; Smith-Hahighi, 2023; Georgia State University, 2023; Iswari et al., 2023
Micro-invalidations	Unconscious verbal or non-verbal remarks that debunk the experiential realities of the target. It includes comments that deny a person's experience and attempts to discredit or minimize the experiences of a person who is from an underrepresented group. It is the most prominent type of microaggression. Communications that exclude, negate, or nullify the psychological thoughts, feelings, or experiential reality of the victim.	The perpetrator denies the experiential realities of the target.	Sue, 2020; Ako-Brew, 2020; Capodilupo, 2010; Cleveland Clinic, 2022; Berk, 2017; Iswari et al., 2023
Micro-inequities	The pattern of being overlooked, disrespected, and devalued because of race or gender. It is particularly prevalent in the workplace.	The perpetrator believes it is just part of the culture.	Hinton, 2004

Gender microaggressions can include all of the above and can be indirect, social, or relational. Additional classifications of microaggression types are included in Table 4.

Table 4: Additional Types of Microaggressions

Type of microaggression	Description	Examples
Racial	Exchanges that send denigrating messages to people of racial minority groups.	Denying that a message or action is racial in nature Servicing others first Not speaking up when witnessing a microaggression against someone from a minority group. For instance, Latinos are assumed to be foreign-born, although they can be third-generation Americans
Sexist	stereotyping, prejudice, and discrimination because of gender	Assumption of traditional gender roles Improper language Gender inferiority Pay gap Limited promotions Using degrading images
Misogynistic	aggressive behavior and comments from males toward females	Dislike or contempt for females Sexist humor Objectification Inferiority Refusal to take certain roles, for instance, caregiving
Heterosexist	Used to be called homophobia, sexuality-based biases. They target people with various sexual orientations and are often carried out by cisgender people	Use of derogatory terms Assumptions of others' sexual orientation Exclusions

Source: Smith-Hahighi, 2023.

Explicit racism is frowned upon, yet because of implicit bias, micro-racial aggressions are growing, and people are using them more than before, with the justification that they are just jokes. Comments are insensitive. There are certain remarks, questions, looks, and actions that might even be worse than explicit comments. Social media has become an important platform for these daily insults. Racial microaggressions can be divided into different types, as presented in Table 5.

Table 5: Racial Microaggressions

Type	Description
Exclusion or isolation	Questioning authority Being treated as second-class citizens
Exoticization and objectification	Putting race on display Sexual objectification
Assumption of monoracial identity or mistaken identity	Multiracials mistaken to be monoracial Multiracials being considered a different race
Denial of multiracial experiences	Denying the possibility to choose their own identity Invalidation by others
Pathologizing of identity or experience	Considered to be bizarre or abnormal Pathological assumptions about present relationships
Racial stereotypes	Stereotypes based on racial stereotypes and not racial groups

Source: Nadal et al., 2011

Table 6: Specific Gender-Related Microaggressions

Type of gender-related microaggressions	Authors
Sexual objectification	Capodilupo et al., 2010; Ako-Brew, 2020
Second-class citizenship/assumption of inferiority	Capodilupo et al., 2010; Ako-Brew, 2020
Assumption of traditional gender roles	Capodilupo et al., 2010; ko-Brew, 2020
Use of sexist language	Capodilupo et al., 2010; Ako-Brew, 2020
Environmental invalidations	Ako-Brew, 2020

Source: Developed by the authors based on the cited sources, 2025.

Due to their impact on a person's overall health, microaggressions have been considered in the same vein as how Maya Angelou described indignities -as little murders and "death by a thousand little cuts"- (Cleveland Clinic, 2022; Hinton, 2004), in the sense that constant slights can be devastating to a person's mental and physical health.

Table 7 shows health problems associated with gender-related microaggressions in the workplace.

Table 7: Health Problems based on Gender-Related Microaggressions

Health problems	Authors
Increase in stress hormones glucocorticoid	Ako-Brew, 2020
Heightened stress response	Periyakoil et al., 2020
Increase in heart rate	Ako-Brew, 2020
Increase in blood pressure/hypertension	Sapolsky, 2004; Cleveland Clinic 2022
Stress-induced diseases	Periyakoil et al., 2020
Heart disease	Kaskan & Ho, 2016
Sleeping problems/poor sleep	Cleveland Clinic, 2022; Hunt, 2011
Post-traumatic stress disorders	Cleveland Clinic, 2022
Anxiety	Periyakoil et al., 2020
Depression	Sue, 2010
Low self-esteem	Sue, 2010
Cognitive problems	Ako-Brew, 2020
Emotional, problems	Ako-Brew, 2020
Behavioral problems	Ako-Brew, 2020
Assumption of inferiority	Sue, 2010
Loss of self-confidence	Periyakoil et al., 2020
Confusion on whether the microaggression occurred	Ako-Brew, 2020
Loss of energy	Kumar & Soni, 2022
Feeling devalued or put down	Periyakoil et al., 2020
Suicidal thoughts	Velazquez et al., 2022
Health and safety issues	Velazquez et al., 2022
Inflammation	Hunt, 2011
Increased body weight	Hunt, 2011
Nicotine and substance dependence	Hunt, 2011
Anger	Desmond Harris, 2015

Microaggressions have an important toll on the mental health of the recipients. As can be observed, they lead to anger, depression, and even suicidal thoughts and substance abuse.

Since many women suffer microaggressions throughout their working life, continuous exposure to them might lead to additional problems (Sue, 2010) and long-term health deficits (Periyakoil et al., 2020). Besides causing personal harm, microaggressions in the workplace can also result in a variety of negative outcomes for organizations.

Table 8: Results of Microaggressions in the Workplace

Main results	Authors
Inhospitable/toxic working conditions	Kim & Meister, 2023
Unwelcoming atmosphere	Velazquez et al., 2022
Low morale	Ako-Brew, 2020; Sue, 2010
Increased absenteeism	Ako-Brew, 2020; Sue, 2010
Problems with work-life balance	Ako-Brew, 2020
Lowered trust	Kim & Butto, 2022; Sue, 2010
Decreased information sharing	Kim & Butto, 2022
Job delays	Kim & Butto, 2022
Intent to leave	Kim & Butto, 2022; Sue, 2010
Toxic environment	Kim & Butto, 2022
Brain-drain of high-potential talent	Kim & Butto, 2022
Poor/reduced performance	Sue, 2010; Hunt, 2011
Reduced helpfulness	Kim & Butto, 2022
Reduced creativity	Kim & Butto, 2022

Source: Developed by the authors from the selected sources, 2025

In terms of the working environment, microinsults result in lower work productivity and problem-solving abilities. It makes a toxic working environment in which constant streams of insults flow regularly.

The normalization of microaggressions towards women at work is also an essential part of gender blindness. These are seemingly innocent transgressions that may or may not be intentional. Microaggressions include all those comments or actions that disparage a person just because of their gender, race, age, disability or other attributes, and that also have a long-term impact. The negative effect is not only on their work and performance but also influences their self-concept.

Simple issues such as the fact that women are interrupted more frequently than men when they are speaking, that others take credit for their work, direct insults, and comments about their physical appearance, among others, are considered microaggressions.

Microaggressions include micro-assaults, which are conscious activities and attitudes or beliefs communicated to marginalize groups through certain verbalizations or behaviors that can be subtle or explicit. Also highlighted are micro-insults, which are usually unintentional actions but which denote stereotypes, insensitivity, and even rudeness, and micro-invalidations, which are messages that invalidate the experience of a marginalized group (Sue et al., 2007).

III. Micromachismos or Toxic Masculinities

Just as it happens with microaggressions in general, micromachismos are challenging to make visible and evident, especially since it has become common practice. Sometimes, these actions are not done with the intention to harm anyone because they are part of how specific cultures tend to connect and socialize, especially in various Latin American countries. Micromachismos are microaggressions grounded on the culture, which supports the idea that men are superior to women (Castañeda, 2019), and are part of symbolic violence, imposing domestic responsibilities on women, psychologically abusing them, and discouraging them from pursuing their dreams (Ocaña, n.d.).

There are four main types of micromachismos, as can be observed in Table 9.

Table 9: Types of Micromachismos

Types of micromachismos	Description
Utilitarian	Related to the domestic environment and based on characterizations of female abilities
Hidden	The type of "machism" that renders women invisible. It is the men who have a voice. As a result, women follow the paths chosen for them.
Crisis related	When women become conscious of the unequal position they are in and become empowered
Coercive	Male dominance in terms of finances, morals, and emotions that reduces female freedom and decision-making

Source: Bonino, 2004

Most common micromachismos place women in an infantile position, taking away their power while giving more power to men, increasing the gender gap (Demirdjian, 2022). Although the concepts are recent, the practices are not.

When these behaviors happen in the workplace, and large groups of people get together in meetings, many women find it difficult to get their point across, especially in places where women are a minority (Nair, 2016).

Mansplaining has an important effect on women's self-esteem because their ideas and proposals are considered worthless and, as a result, they will stop bringing ideas to the table losing their sense of security (Demirdjian, 2022).

Mansplaining can also take additional forms, such as **whitesplaining**, when white men try to tell people of color that they have misunderstood a racist comment, or white makes shaming others by ignoring socioeconomic factors associated with entitlement such as race, class or aesthetic value (Cookman, 2015); **straighsplaining**, when extreme explaining is one with people who are not heterosexual to offer their opinion, and **cisplaining**, when invalidating cis person identities through multiple explanations (Nithya, 2014).

Table 10: Most Common Micromachismos

Most common micromachismos	Brief description
Mansplaining	Male colleagues or bosses feel the need to explain things to women without them asking. "Condescending explanation by members of a socially, culturally, or legally privileged group in their interaction with those who don't hold the same privileges" (Nithya, 2014). It is based on an ingrained assumption that women are too ignorant to understand (Cookman, 2015).
Manspreading	Men spreading themselves while using public space, taking up more space, and limiting the space of women (Alonso, 2023).
Maninterrupting	Male colleagues or bosses unnecessarily interrupt women when talking in meetings (Reeves, 2015). Men interrupt women just because they are women (Minor, 2021).
Maninterpretation	A man's interpretation of things a woman said, giving it a different meaning, and the woman needs to defend what she meant (Reeves, 2015).
Manimization	A man minimizing a woman's thoughts or ideas to receive validation. (Reeves, 2015)
Manslamming	Pedestrian collisions are caused by the refusal of some men to make space for other people, especially women who are using the same sidewalk or hallway (Cookman, 2015). The unwillingness of a man to make way for a woman coming from the opposite direction (Nair, 2016).
Manderstanding	Exchanges of jokes or banters in social or work settings that only men will understand or agree with, and as a response, women are left confused (Nair, 2016).
Manologues	A man giving words of advice when not being asked to do so, assuming that the female should be interested in what he has to say (Minor, 2021).
Bropropriating	A man takes credit for the ideas and the work of a woman (reeves, 2015).
Heapeating	When a woman sets forward an idea she has been preparing and no one listens and then a man takes on the same idea and repeats it and ends up being praised for it (BBC, 2017).
Gaslighting	Subtle emotional violence in which the victim doubts herself in terms of her judgment and even her memory. It includes questioning the person's sanity, and discrediting their ideas and thoughts (Alonso, 2023).

Sources: Developed by the authors with information from the cited sources, 2025.

IV. The Need to Move to the Opposite Side: Micro-Affirmations and Allyship

Micro affirmations are "small acts which are often ephemeral and hard to see public and private events, usually conscious but effective, occur when people wish to help others to succeed (Rowe, 2008 p. 46).

It is about affirming others, and altering the mindset to focus on searching for effective ways to dignify people, adding value to the life of all employees (Berk, 2017), and creating allyship (Cleveland Clinic, 2022). Micro-affirmations are small acts that foster inclusion, listening, comfort, and support for people who may feel isolated or invisible in an environment (Rowe, 2008). Micro-affirmations will likely occur through appreciative inquiry, recognizing and validating even small experiences, affirming feelings, and reinforcing and rewarding positive behaviors (Rowe, 2008). Small acts of kindness can increase a sense of inclusion (University of Colorado Denver, 2024).

Table 11: Tangible Actions in Micro-Affirmations

Active listening	Focusing on the other, paying attention to what is being said and shared, establishing eye contact, using an open body posture, asking questions, and establishing rapport.
Recognizing and validating experiences	Delving deeper into identifying and validating constructive behaviors, expressing care, and demonstrating a willingness to find a path forward.
Affirming emotional reactions	Acknowledge that others have experienced something that might have been positive or negative so that the conversation can focus on turning the feelings into empowering and healing actions from which everyone can learn.

Source: Powell, Demetriou, & Fisher (2013)

Micro-affirmations can include welcoming facial expressions, using the members' names with the correct pronunciation, using the right pronouns, and giving affirmative messages (UC Davis, 2018).

Microaffirmations include a variety of actions, such as leading instead of trying to push people to do something, opening the doors for new opportunities for others, fostering inclusion and caring, building a sense of community, giving credit to those who earn it, helping those in distress, and building on strengths (Rowe, 2008, p. 46).

Promoting Allyship

Allyship is an important part of eradicating microaggressions. It is a lifelong process of building and nurturing supportive relationships with underrepresented, marginalized or discriminated individuals or groups. Becoming an ally is a challenge to the status quo by helping support vulnerable or marginalized communities (Clarke, n.d.). There are different ways in which allyship can be promoted and also ways in which it can be impeded.

For instance, performative allyship erodes trust and leads to further exclusion because it is done as a show, such as positing apparent good deeds in social media but not acting on them, sponsoring a group but not including them in the decision-making process (Luthra, 2022).

On the other hand, confident allyship creates a safe space for people to express themselves, believing their individual experiences and making them feel supported. It is about becoming an upstander instead of just a bystander by acting on things.

Intersectionality allyship means acknowledging that everyone has their unique experiences of discrimination and oppression while recognizing and honoring identities.

V. Conclusions

The different tables here presented illustrate the variety of microaggressions and micromachisms that can be found in mainstream media. The collection of taxonomies and typologies were established as a glossary for notions that have increased in use but for which meanings are not always clear. Understanding and making visible these types of aggressions can help create policies to eradicate them in the workplace.

Eradicating microaggressions and micromachismos is essential to reduce the gender gap. One way to do it is to name such behaviors so that they can be clearly identified and understood, instead of falling into the traps of gender blindness.

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Knowledge Management and Innovation in North Macedonian Financial Institutions: A Knowledge Graph Analysis

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Abstract

This paper examines the relationship between knowledge management practices and innovation outcomes in banking institutions (coded as 1) versus non-banking institutions (coded as 2) in North Macedonia. Using knowledge graph methodology to analyze structural relationships, we identify distinct patterns in how knowledge acquisition, sharing, utilization, and retention contribute to product, service, process, and organizational innovation across these institutional types. Based on research conducted in February 2022 with 12 banking and 15 non-banking institutions, our findings reveal that while both sectors leverage similar knowledge management components, regulatory environments, organizational cultures, and institutional constraints create divergent innovation pathways. Banking institutions demonstrate stronger regulated knowledge acquisition but more conservative utilization practices, while non-banking institutions exhibit more open knowledge sharing systems and flexible retention mechanisms. These structural differences significantly impact the nature and pace of innovation across institutional contexts in the North Macedonian financial sector.

Keywords: Knowledge management; innovation; banking sector; non-banking institutions; knowledge graph; North Macedonia

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A Public Intervention Framework for Sustainable Citizen Security for Cities in Emerging Countries: Conceptual Model

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Abstract

This paper presents a sustainable public intervention tool to improve security in an emblematic and representative urban area. The main goal is to develop public intervention strategies that reduce gaps in public security and mitigate the economic burden on residents in a specific territory, such as a municipality or district in a large city, fostering a more equitable urban environment.

The study focuses on assessing the impact of insecurity on neighborhood residents and its social, economic, and environmental consequences. It also seeks to create a neighborhood-scale public intervention tool to enhance safety and minimize economic impacts.

Additionally, a management and diffusion plan is proposed to support the implementation of public security initiatives. The approach is exemplified through a case study of a typical neighborhood in Santiago, Chile, known as "Matta Sur."

This theoretical-practical research aims to improve the quality of life for the residents of Matta Sur by strengthening security measures and empowering community leaders to implement coordinated actions against crime. From an urban perspective, it identifies gaps in access to public goods and services, proposing targeted actions to address these inequalities and expand access to rights.

The study lays a foundation for establishing priorities through the development of a multi-criteria decision-making model, guiding the implementation of sustainable public security interventions.

Key words: public intervention tool; security; strategy; priorities

I. Introduction

Security in a commune is an essential pillar for social and economic development, as it directly influences the quality of life of its inhabitants. According to the United Nations (UN), citizen

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security is “a fundamental right that allows people to live free from violence and fear” (UN, 2019). This concept encompasses different areas, such as citizen, road, environmental and digital safety. To achieve a safe commune, coordination between local authorities, security forces and the community is essential. According to studies by the Inter-American Development Bank (IDB), crime prevention and citizen participation are key to reducing crime rates in urban and rural areas (IDB, 2021). Among the most effective strategies to improve security in a community are the implementation of video surveillance systems, the strengthening of public lighting, preventive patrols and awareness campaigns on self-protection measures (Garcia & Lopez, 2020). Likewise, the development of social inclusion and values education programs has proven to be a determining factor in the reduction of violence and crime (UNDP, 2022). As a final point, security in a community requires a comprehensive approach that combines prevention, control and citizen participation. Collaboration between the government, security institutions and society is essential to build safe spaces and improve community coexistence.

Is in the same way as a district of the Chilean capital city has been exposed to urban renewal processes which include the explosion of multiple real estate projects since the 1990s, in which vertical growth has eradicated lifestyles in the historic neighborhoods of the capital. Today, their inhabitants demand that these lifestyles and customs do not disappear as a result of modernization. In other words, the neighborhoods demand better access to public goods and services, moving towards a “Just City”. Insecurity in the territory emerges as a constraint to the access of these goods and services and that is the objective of this research. The initiative seeks to estimate the impact of insecurity conditions on access to public goods and services in the neighborhood, as well as to estimate its impact on the family budget.

This research study offers a methodological framework for sustainable citizen security to generate a set initiative in social, economic and environmental areas. The study suggests the intervention of a neighborhood, applying a set of instruments such as focus groups, interviews and surveys. The expected results are: to estimate the impact of insecurity and its respective access to associated services, as well as the implications on the family budget.

II. The System Description

Knowing that security is a broad concept that encompasses various dimensions, from the physical protection of people and their property to the social and economic stability of communities. In general terms, it is possible to distinguish aspects from different point of view such as personal security refers to the protection of the physical integrity of individuals, including the prevention of crimes such as robberies, assaults and homicides. It is essential for people to feel safe in their daily environments.

Public security implies the responsibility of the state and local authorities to ensure the safety of the population. This includes the implementation of policies and strategies to prevent crime, as well as the effective response to emergency situations. On the other hand, citizen security focuses on the relationship between the community and law enforcement, fostering collaboration between citizens and the police to create a safer environment. Community participation is key to identifying security problems and developing effective solutions.

Economic security refers to the financial stability of individuals and communities. Economic insecurity can lead to increased crime, as people may be driven to commit crimes out of necessity. Therefore, job creation and access to resources are critical to improving economic security. In a broader context, social security involves protecting the rights and well-being of individuals within a society, ensuring access to basic services such as health, education and housing, which are essential for a dignified and safe life. In the digital era, cybersecurity has become highly relevant, as the protection of personal information and data has become crucial. This area is concerned with preventing cyber-attacks and protecting the privacy of online users. Security is a fundamental right and its absence can have serious consequences for the well-being of individuals and the development of communities. It is therefore essential that both governments and citizens work together to create safer and more resilient environments. Education, prevention and collaboration are key tools to address security challenges in any society.

Under this context, there it become interesting to obtain evidence on the effect of having adequate strategies to reduce insecurity from the perspective of stakeholders.

The following set of factors makes a commune from a district of the Chilean capital city a representative and relevant case to study how insecurity is transforming households' financial decisions and priorities in a context of growing violence.

It has been detected a high crime rate since it has recorded the highest number of homicides in the neighborhood during 2024, standing out as one of the most affected areas by violence in Santiago. Also a Growth of organized crime because the neighborhood has experienced the proliferation of organized crime groups (car theft and drug trafficking), which has increased insecurity and created an atmosphere of fear among residents. Widespread perception of insecurity: The residents show growing distrust in local authorities and public security, leading to a constant sense of vulnerability. It is the neighbors themselves who organize to report crimes or protect themselves. Impact on the local economy: This is a historic neighborhood with businesses such as restaurants, coffee roasters, local stores, tourism, among others, which, being viewed as a high-risk area, leads visitors from other neighborhoods to avoid it. Relevance as a representative case: the district named "Matta Sur" reflects the social and economic dynamics of other areas of Santiago facing similar challenges, making it a key area to analyze the consequences of insecurity on family budgets. Context of socio-economic vulnerability: The neighborhood is mainly inhabited by lower and lower-middle-class families, which exacerbates the difficulties residents face in dealing with both insecurity and economic hardship.

III. Concept Model

A proposed conceptual model and methodology is presented to evaluate the impact of insecurity on neighborhood residents and its social, economic, and environmental consequences. On the first stage, the efforts are oriented to identify the main factors and its derivations that are essential according to the stakeholders. The attributes indispensable to meet the requirement in concordance to their expectation. Then strategies could be defined and analyzed to check the performance on an application.

The conceptual model is based in a first stage on the conformation of a multidisciplinary team of academic and governmental character, which will allow coordinating, planning, directing, organizing the different stages and processes of the project for the development of a sustainable tool of public intervention oriented towards civil security. Since this is a tool built from the base of citizenship, it is most likely that the actors to be determined for the leading role in the development of the project will be those who are universally present in a high percentage of communities where governance is democratic and there are universal freedoms. Also, the factors that predominate in the security of the civilian population of any society with greater or lesser presence of some. When considering an initial state of the art, it is necessary to update the bibliographic searches, whether of advances, developments, cases, among others, that serve as a reference for the mastery of the issue. It is of vital importance to search for recent or analogous experiences developed in other latitudes, best practices.

In addition to the identification of the main stakeholders involved in developing the project, efforts are oriented to identify the main factors and their derivations that are essential according to the interested actors. The indispensable attributes to satisfy the requirement in accordance with their expectations. Thus, for the implementation of public interventions, especially in the field of security, it is a complex challenge, since there are no unique or optimal solutions to address public problems. It is common that public policies do not respond to an optimal model, but are defined as a set of feasible alternatives, the selection of which depends on the authority in charge, considering the available resources and existing restrictions (Lahera, 2004). This decision making is framed in a context where rationality is limited, and where the actors must face multiple restrictions (Ostrom, 1990). Once the actors have been identified, the instruments to be applied to them will be designed to identify, confirm and prioritize the factors that a priori the bibliography and the cases have already been pre-determined and are universally known.

These instruments are quantitative and qualitative in nature. From the above, three relevant actors can be identified: The political actors or decision makers, the technical actors and the social actors, which must converge in their pretensions to solve the identified security problem, considering the context in which they are coexisting.

Therefore, the inclusion of these actors in the selection of criteria to give way to a multi-criteria model will be fundamental for the viability and legitimacy of the policies adopted.

Regarding the potential factors and their derivatives (sub-factors) for tools to be built, there are social, technical, economic and environmental aspects for public interventions in Matta Sur. Among the possible factors to consider are:

Social factors: Level of community participation, perception of security, social cohesion and level of victimization.

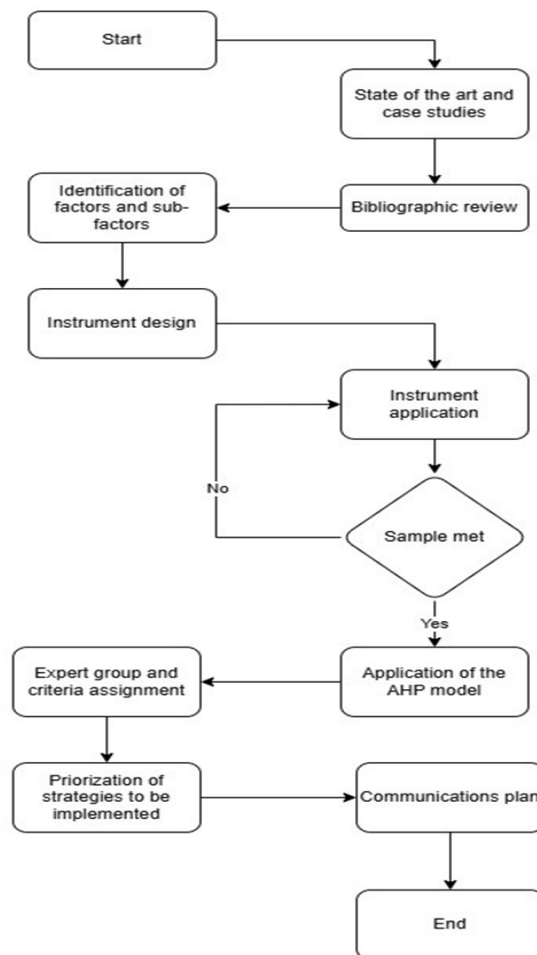
Technical factors: Available infrastructure, technological surveillance coverage, access to basic services and neighborhood organizational capacity.

Economic factors: Cost of implementation, availability of financing, impact on local economic activity and financial sustainability.

Once the instruments have been applied recursively until the factors and sub-factors are definitively confirmed, the dynamics of the hierarchical prioritization and refinement of the fundamental factors will be established to give way to a modeling. For this purpose, a qualitative AHP model will be applied.

Figure 1 presents a model scheme showing the different stages involved in the evaluation.

Figure 1. Proposed conceptual model for evaluation.



As a logical consequence of our scientific approach to social problems, sustainability and civil security, the following methodology is proposed.

IV. Proposed Methodology

The proposed methodology is based on multi-criteria analysis, which allows us to consider multiple factors and relevant criteria to evaluate the sustainable model of citizen security. The key steps of the methodology include:

- A. Identification of criteria and sub-criteria: Selection of the most relevant factors that influence the sustainable citizen security model.
- B. Data collection: Obtaining quantitative and qualitative data through surveys, interviews and analysis of data emerging from the instruments applied.
- C. Multi-criteria modeling: Based on the structuring of the data obtained, a model is formulated from the perspective of the organizations and actors identified.
- D. Application of multi-criteria analysis techniques, such as the Analytical Hierarchical Process (AHP) or the Criteria Weighting Method, to evaluate and weight the importance of each criterion.
- E. Impact assessment: Use of statistical models and simulation techniques to assess the impact of digital merchandising on the direct profitability of digital outlets.
- F. Generation of strategic maps to optimize the resources allocated to security, identified in the applied instruments.
- G. Validation of results: Comparison of the results obtained with previous studies and validation through empirical tests and socialization with the various stakeholders.
- 8.- Once a multi-criteria model has been constructed, the perspective of all stakeholders involved in the problem or affected by its solution must be considered. The participation of diverse actors allows information to be gathered on the different dimensions of the problem, which favors the legitimacy and sustainability of public interventions.

We must now consider that the process of formulating public policies, or in this case a public intervention, requires the convergence of three fundamental elements. In the presence of a public problem, such as neighborhood safety, the existence of an empowered political actor with the capacity to make decisions, the presence of technicians with the necessary knowledge to propose viable solutions and an appropriate political situation that facilitates the implementation of the proposed measures are required (Olavarria, 2011). This analysis is based on the window of opportunity theory developed by Kingdon (1984), who argues that for an opportunity for change to occur, three flows must coincide: the flow of problems, the flow of policies and the political flow.

The flow of problems refers to the existence of a public problem that demands a solution. In the case of public safety, the perception of insecurity, the increase in crime and the effects that these generate on the quality of life of the population constitute a high priority problem for the community. Insecurity has a direct impact on people's habits, social relations and economic activities, which reinforces its importance as a public problem.

The flow of policies, on the other hand, refers to the existence of solutions or technical proposals to address the problem or mitigate its effects. In the area of security, proposals may range from strengthening neighborhood organization to the implementation of surveillance infrastructure, the provision of technological equipment or increased police presence.

Finally, the political flow is linked to the context or juncture in which the policy is implemented, which includes the disposition of decision-makers, social demands and external events that may facilitate or hinder the adoption of measures. The convergence of these three flows generates the opening of a window of opportunity that allows the implementation of public policies.

From this perspective, three relevant actors can be identified: Political actors or decision makers, technical actors and social actors, which must converge in their pretensions to solve the identified security problem, considering the context in which they are coexisting. Therefore, the

inclusion of these actors in the selection of criteria for a multi-criteria model is fundamental for the viability and legitimacy of the policies adopted.

V. Conclusion and Observations

The study provides a foundation for prioritization through the formulation of a multi-criteria decision-making model that enables the design of a management and dissemination framework for implementing public safety interventions in a commune. This research is an ongoing effort that builds on previous initiatives and highlights the importance of security within a typical area (the Matta Sur Tourist and Heritage Territory). Developed as part of a project submitted by the research team to the Ministry of Housing and Urbanism of Chile, this initiative was recognized as the best national security project for its focus on territorial security and sustainability.

The study follows a structured approach that includes a literature review, bibliographic modelling, and the development of an initial framework that integrates the perspectives of both residents from the typical area and experts to define alternative criteria and strategies. The identification of key objectives leads to the formulation of a multi-criteria methodology that guides the overall process and supports decision-making in public safety planning.

The study provides a foundation for prioritization through the formulation of a multi-criteria decision-making model that enables the design of a management and dissemination framework for implementing public safety interventions in the commune.

VI. Future Work

The approach will be exemplified through a case study of a typical neighbourhood in Santiago, Chile, known as Matta Sur. The next steps in the research involve both qualitative and quantitative methodologies. The qualitative approach includes conducting focus groups and interviews with key stakeholders identified through a stakeholder mapping process. This phase requires developing a variable matrix, designing semi-structured interview guidelines, identifying relevant participants, reaching out to stakeholders, and executing the survey process. Simultaneously, the quantitative approach focuses on administering structured surveys to neighbourhood residents. This involves designing and validating the survey instrument, training surveyors to ensure methodological consistency, carrying out fieldwork, and managing data entry, standardization, and processing to guarantee accuracy and reliability.

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EcoRed Miquihuana: Redes comunitarias para la conservación biocultural y el ecoturismo sostenible

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Resumen

EcoRed Miquihuana es un modelo de desarrollo sostenible que integra la conservación del patrimonio biocultural con el ecoturismo responsable, generando beneficios económicos y sociales para las comunidades locales. Su objetivo es proteger la riqueza natural y cultural de Miquihuana, Tamaulipas, mientras fortalece el bienestar comunitario.

A través de redes comunitarias, el modelo articula la participación de ejidos, organizaciones civiles, instituciones académicas y dependencias gubernamentales para gestionar de manera sostenible los recursos naturales y desarrollar productos turísticos responsables.

Se promueve la valoración del conocimiento tradicional, como el uso de plantas medicinales, la agricultura de conservación y las prácticas ancestrales de manejo del territorio. Además, se fomenta la participación activa de la comunidad en la protección de su biodiversidad.

EcoRed Miquihuana impulsa una oferta turística diversificada y sostenible, respetuosa de los ecosistemas y la cultura local. Para ello, se capacita a los habitantes en guianza turística, alojamiento rural, producción artesanal y experiencias vivenciales. También se han diseñado rutas turísticas innovadoras y estrategias de promoción para consolidar a Miquihuana como un destino de ecoturismo.

El fortalecimiento de redes de colaboración es clave para coordinar acciones, intercambiar conocimientos y garantizar que las comunidades locales lideren la gestión de su territorio. Se han creado plataformas de comunicación, talleres y encuentros que fomentan la toma de decisiones participativa y el empoderamiento comunitario. Se ha demostrado que la conservación y el desarrollo económico pueden coexistir, generando un modelo replicable que impulsa la resiliencia y el bienestar de las comunidades.

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Estimación econométrica de la disposición a pagar por los servicios recreativos del Cañón de San Lorenzo, Saltillo, Coahuila

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Resumen

El Cañón de San Lorenzo es un espacio natural ubicado en el municipio de Saltillo, Coahuila, México, con gran importancia ambiental, cultural y recreativa. El objetivo de esta investigación es estimar la disposición a pagar (DAP) por los servicios recreativos del Cañón de San Lorenzo. Los datos utilizados se obtuvieron mediante una encuesta aplicada a una muestra representativa de visitantes al espacio natural. Los resultados descriptivos son los siguientes: el 52% de los visitantes son mujeres y el resto son hombres, con una edad promedio de 30 años; el 64% vive en la zona sur de la Ciudad de Saltillo; más de la mitad (54%) tiene estudios universitarios; el 86% de los encuestados está dispuesto a pagar para la conservación y mantenimiento del Cañón; la mayoría (66%) realiza la vista en familia o con amigos; los principales motivos de visita son para realizar actividades recreativas como senderismo (23%), explorar y descansar (23%), así como apreciar el paisaje natural (16%). Igualmente, las estimaciones del modelo econométrico Probit muestran que las variables que influyen de forma positiva a la probabilidad de la DAP son el nivel de ingreso monetario, cuando el visitante usa automóvil propio y vive en la zona sur de la Ciudad de Saltillo; en contraste, la probabilidad de la DAP tiende a disminuir cuando el visitante aumenta su edad y viaja solo al Cañón de San Lorenzo.

Palabras clave: Servicios recreativos; disposición a pagar; modelo Probit

Econometric Estimation of Willingness to Pay for the Recreational Services in the Cañón de San Lorenzo, Saltillo, Coahuila

Abstract

The Cañón de San Lorenzo is a natural area located in the municipality of Saltillo, Coahuila, Mexico, with great environmental, cultural and recreational importance. The objective of this research is to estimate the willingness to pay (WTP) for recreational services in the Cañón de San Lorenzo. The data used were obtained through a survey applied to a representative sample of visitors to the natural area. The descriptive results are as follows: 52% of the visitors are women and the rest are men, with an average age of 30 years; 64% live in the south of the City of Saltillo;

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more than half (54%) have university education; 86% of the respondents are willing to pay for the conservation and maintenance of the Cañón de San Lorenzo; the majority (66%) attend the visit with family or friends; the main reasons for visiting are to do recreational activities such as hiking (23%), explore and rest (23%), as well as appreciate the natural landscape (16%). Likewise, the estimates of the Probit econometric model show that the variables that positively influence the probability of the WTP are the level of monetary income, when the visitor uses his own car and lives in the south of the City of Saltillo; in contrast, the probability of the WTP tends to decrease when the visitor increases in age and travels alone to the Cañón de San Lorenzo.

Keywords: Recreational services; willingness to pay; Probit model

U.S. Protectionism and its Origin in Labor and Non-Financial Factors

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Abstract

Protectionism refers to the practices and policies that a country implements to protect its domestic industry and economy from foreign competition. In the history of the United States, protectionism has played a crucial role in shaping its economy and politics over the centuries. The objective of this research is to demonstrate that the origin of the protectionist measures that will be imposed in the United States has its origin in the loss of jobs, especially in the manufacturing sector, starting in 1973. Using a descriptive methodology through the compilation of documentary bibliographic material, the results show that 300 thousand jobs leave the United States annually to other countries, mainly in the manufacturing sector. The outlook is not easy for American trading partners. Threats do not work in a globalized commercial environment and the mercantilist vision of the current US Trump administration will only make global commercial activity uncertain. The decrease in the trade deficit of the United States will not be enough to cause an improvement in the standard of living of its population until employment figures in the manufacturing sector recover.

Keywords: Tariffs, jobs; net exports; manufacturing sector; trade agreements

I. Introduction

The history of the development of foreign trade shows how the increase in trade defense measures has been a normal response of the world to the serious financial crises that have occurred, as in the case of the Great Depression of the 1930s (Vesga Benavides, 2021). Protectionism is an economic policy that promotes state intervention to protect the domestic market against foreign competition. In other words, the State protects national products against foreign products. This policy has been applied by several countries, mainly the United States (US). For Roncal Vattuone, & Calderón Collazos (2018), the northern country has been the main promoter of the globalization of the world economy, favoring large North American transnational corporations.

For Dabrowski (2024, P. 374), “the growing wave of protectionism in various corners of the world, with the use of apparently attractive, but economically misleading slogans (shortening of supply chains, onshoring, reshoring, nearshoring, friend-shoring, reindustrialization etc.), creates a serious challenge to the global trade system and global economic development”. In the specific case of the U.S., protectionism has brought recurring trade deficits over time at two points in its history: from 1800 to 1872 and 1973 to 2024, a clear loss of manufacturing jobs from the 1970s onwards, the trade deficit has been growing to exceed 900 billion dollars in 2022 (Department of Commerce, 2024).

Establishing protection or openness policies for industries has been a constant debate in mainstream economic thought, however, free trade liberalization has been positioned as the architect of global economic development despite economic studies that present contrary

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evidence. Therefore, the objective of this research is to demonstrate that the origin of the protectionist measures that will be imposed in the United States has its origin in the loss of jobs, especially in the manufacturing sector, starting in 1973.

To achieve this objective, a series of questions are posed: What is the origin of American protectionism? What is the current situation of American protectionism? and how does this protectionism affect labor and non-financial factors? This research becomes highly relevant because of Donald Trump's return to power and his "Make America Great Again" policy that will surely have a significant impact on the revision of the Mexico Canada United States Free Trade Agreement. In addition, this research is relevant because it addresses the issue of U.S. jobs.

In the first section after the introduction, aspects of the literature review such as The History of Trade Protectionism in the United States, Protectionism in the Postwar Era, Postwar and Globalization, and The Modern Era of Protectionism are addressed. Section two details the methodology used for this research. Section three presents the results. Finally, the conclusions conclude this research.

II. Literature Review

The following aspects of the literature review are addressed: The History of Trade Protectionism in the United States, Protectionism in the Post-War Era, The Post-War Era and Globalization, and The Modern Era of Protectionism.

The History of Trade Protectionism in the United States

Trade protectionism refers to the practices and policies that a country implements to protect its domestic industry and economy from foreign competition. In the history of the United States, protectionism has played a crucial role in shaping its economy and politics over the centuries. This article explores the key stages of U.S. protectionism, its justifications, and its effects on the economy and trade policy.

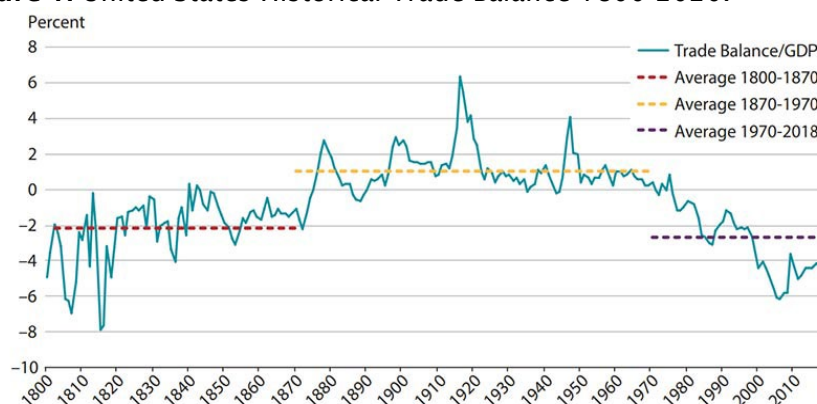
The beginnings of protectionism in the United States date back to the late 18th and early 19th centuries. The Constitution of 1787 gave Congress the authority to regulate trade, which led to the establishment of tariffs to protect local industries. The Tariff of 1789 was one of the first such efforts, designed to raise revenue and protect fledgling American industries (Irwin 2009).

It would be Hamilton who would provide the theoretical basis for protectionism so that the nascent United States could compete against the European powers of the time, mainly the United Kingdom, in the development of its industries. In this justification, the Secretary of the Treasury between 1785 and 1795 justified U.S. protectionism under the following criteria: Infant industry, national security, economic independence and the equality of the field in matters of economic competition.

Throughout the 19th century, a series of tariffs, such as the Tariff of 1828, known as the "Abominable Tariff," were implemented to protect industrial interests in the North, causing tensions with the import-dependent agricultural South. This situation culminated in debates that eventually contributed to the Civil War (Oatley, 2018).

As can be seen in Figure 1, the collection of tariffs in the United States made it possible to reverse the trade deficit that the country recorded from its early years, up to -8% of GDP, as an independent nation and until 1840 when the trade balance is positive for the first time. However, the U.S. foreign trade balance will fall again into negative territory in the period prior to the Civil War, between 1861 and 1865, and until 1870.

Figure 1: United States Historical Trade Balance 1800-2020.



Source: Bureau of Economic Analysis, World Trade Historical Database, Measuring Worth, and author's calculations.

Protectionism in the Post-War Era

After the Civil War, the U.S. economy industrialized rapidly. The decade from 1870 to 1900 was characterized by strong protectionism, with tariffs exceeding 50%. This approach advocated the idea that protecting local industries would promote job creation and domestic economic development (Baldwin & Krugman 2004).

The commercial and economic development of the United States is the result of the combination of advantages that the country had simultaneously in contrast to its European competitors. Something that can be considered as the verification of the Heckscher Ohlin Model since the country had greater reserves of capital and labor that allowed it to create and consolidate productive activities in the agricultural, industrial and commercial sectors.

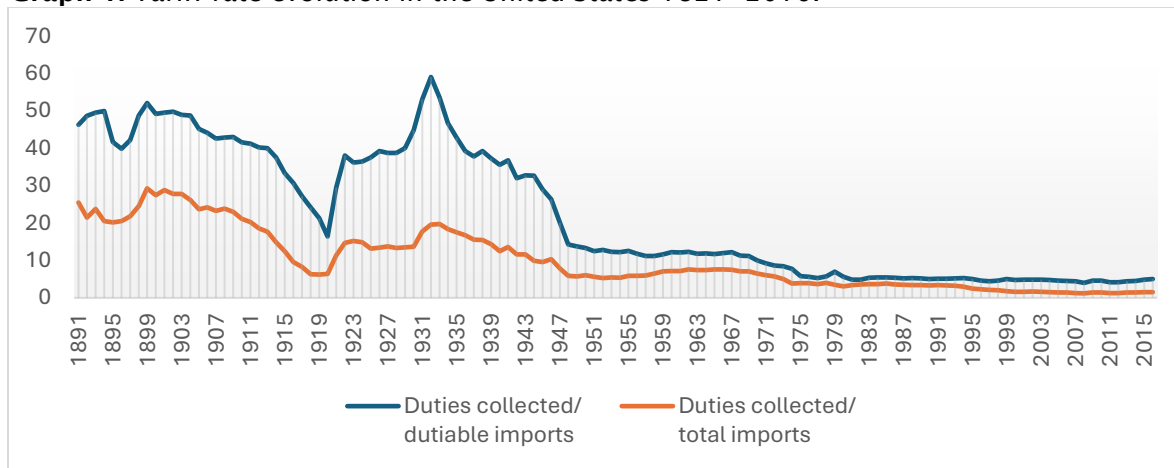
The territorial expansion of the United States and the growth of its population provided the country with the conditions that allowed it to develop its comparative advantage without the need to colonize distant territories as in the case of the British or French Empires. In fact, it will be Leontief who will demonstrate through the paradox that bears his name that the United States, unlike European countries, had an advantage in the production and export of both labor-intensive and capital-intensive goods. In other words, the country was exporting mainly goods to be sold, mainly to poor countries, and yet it had already become one of the most developed economies.

It is worth noting that the collection of tariffs in the U.S. economy has a lot to do with which party wins the presidency in the country. If the president is a Republican, there is a greater likelihood that tariffs will be levied and increased. Conversely, it is assumed that Democrats believe that trade should operate with fewer barriers and, therefore, foreign trade taxes tend to be reduced. However, one thing that is a constant in the United States is that tariff rates have been declining relative to the historical evolution of the country.

As can be seen in Graph 1, U.S. imports are divided into two groups of goods: dutiable goods and other imports. Examples of the first type of goods are alcoholic beverages and cigarettes, regardless of the CIF value of the goods in customs. On the other hand, imports valued at less than US\$800 are exempt from duties, together with those imported under the free trade agreements signed by the country.

Graph 1 shows that the trend in the collection of tariffs has tended to decrease over time in the United States. Tariff behavior in the two groups of goods or imports that are made in the country have reduced the average tariff collection from 50% for imports subject to duties and 25% in the average total imports. As the country's industrial and economic development consolidated, in 1918, at the end of World War I, the rates were 24% and 6% respectively.

Graph 1: Tariff rate evolution in the United States 1821- 2016.



Source: https://www.usitc.gov/documents/dataweb/ave_table_1891_2016.pdf,
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Starting in 1918, tariffs rose again as a result of the US government's need to increase its tax revenue by any means possible, including imports. To this end, the Smoot Hawley or Tariff Act was created, which was implemented in 1930 and contributed to raising tariffs to the highest point in U.S. history when in 1932 tariffs on taxable goods reached 59% and the total average was 19%. One effect of the Act was to deepen the effects of the Great Depression as imported goods became more expensive and the protection of local producers of food and industrial goods was transformed into higher prices for consumers whose incomes declined (Irwin 1998).

The effect of the increase in tariffs had the opposite effect to that originally intended: to protect national interests and, on the contrary, the initial benefit, which later disappeared due to the effects of the Great Depression, ended up on the side of local producers at the cost of higher prices of imported goods and the local consumer will have to choose between paying more for imported goods or less for goods produced locally but which may be less competitive than imported goods.

The effect of the above was a 67% reduction in U.S. trade flows as a result of the Great Depression (Eckes, 1995). The aforementioned reduction caused the country to fall back to the figure recorded in 1913. In an attempt to counteract this, the U.S. government decided to gradually reduce tariffs to 11% for dutiable goods and 7% on average for other imports in 1959.

However, the Great Depression of 1929 marked a turning point. In an attempt to protect the U.S. economy, Congress passed the Smoot-Hawley Tariff Act in 1930, which dramatically increased tariffs on imports. Although this law was expected to protect local industry, it resulted in retaliatory trade by other countries, which deepened the global economic crisis and led to a reduction in international trade.

After World War II, the United States played a key role in creating a more open international trading system, leading initiatives such as the General Agreement on Tariffs and Trade (GATT). However, in the following decades, concerns about foreign competition and the offshoring of jobs began to generate a new wave of protectionism.

GATT was created in 1947 to convince its member countries to reduce their tariffs and non-tariff barriers, permits, quality standards and import quotas on foreign trade. As can be seen in Graph 1, the tariff rates charged by the U.S. government were reduced as follows. Between 1944 and 1954, the rate for goods subject to tariffs fell from 32% to 10% and the average tariff fell from 10% to 5%. This trend coincided with the consolidation of the growth of the U.S. economy through the expansion of U.S. corporations and the consolidation of the U.S. dollar as an effective

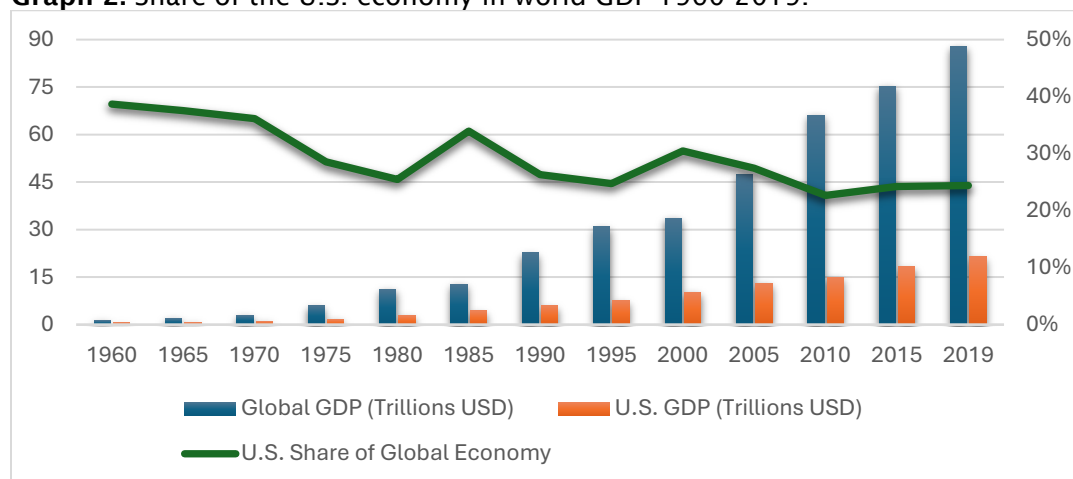
reserve alternative for the central banks of North America, Europe and some Asian countries (Jones, 2005).

1973 and the Beginning of the Modern Trade Balance Deficit Trend

As mentioned above (Figure 1), in the first years of the independent life of the United States, significant trade deficits were recorded, reaching up to 8% of its GDP in 1815. That proportion would represent today, 2024, an amount that at current value equals 2.24 trillion dollars and is almost three times the current deficit. The U.S. trade balance at that time, according to mercantilism, condemned the United States to be an impoverished economy that would run out of gold or reserves to pay for its imports. As time went by, however, the reality was very different.

Subsequently, between 1870 and 1970, the United States recorded constant trade surpluses due to the country's advantages in the availability of production factors such as natural resources, an abundant and young population compared to Europe and, of course, the consolidation of capital markets which, among other things, allowed the dollar to become a reserve instrument that allowed corporations and consumers in the country to access capital, both for production and consumption, under more than favorable conditions.

Graph 2: Share of the U.S. economy in world GDP 1960-2019.



Source: Bhutanda Govind, "The U.S. Share of the Global Economy Over Time". Available at: <https://www.visualcapitalist.com/u-s-share-of-global-economy-over-time/>

Precisely to support the expansion of corporations, mostly of U.S. origin, President Nixon's administration decided to continue with the tariff reduction agreed upon in the Tokyo Round in 1973. The downward trend in tariffs caused, among other factors, multinational companies, mainly American, to intensify their internationalization processes, mainly through the installation of factories for various products in countries that paid lower wages compared to those paid in the United States.

As can be seen in Graph 2, the share of the U.S. economy reached its highest level, 40%, in the 1960s, but from the 1970s onwards there was a decline in this indicator, reaching 24% at present. This decline does not mean that U.S. multinationals have lost part of their value; on the contrary. As can be seen in Annex 1, the value of the 20 most important companies in the world between 1970-1980, many of them of U.S. origin, only increased in terms of revenues and profits.

The reality described in the previous paragraph would lead us to ask the following question: who were affected by the departure of companies, mostly of U.S. origin, to produce in countries with low labor costs? It seems that there are no other than manufacturing jobs. The transformation of the U.S. economy, previously balanced between manufacturing and service

activity, has now tilted toward the latter is a clear result of the country's decision to reduce its tariffs.

In 1929, the ratio of manufacturing to service activity was 45-55%. In 1977, the ratio was 32-68%. In terms of their contribution to GDP, or value generation, in 1948, the ratio was 46-54%. Thirty years later this indicator was 34-66% (Ginzberg & Vojta, 1981). It is worth noting that the modernization of production techniques contributed to a decrease in the labor force destined to agriculture and mining by 6 of the 12 percent points recorded in the period.

In the 1980s, there was an increase in protectionist measures aimed mainly at industries such as steel and textiles, driven by the lack of competitiveness in the face of imported products. During this period, trade policies began to include not only tariffs, but also quotas and non-tariff barriers. It is also worth noting that the main cause of the U.S. trade deficit in the 1980s was the trade imbalance with Japan. Between 1980 and 1985, the deficit increased from 100 billion to 125 billion dollars (Federal Reserve, 1986).

A growing trade deficit resulting from a loss of competitiveness of U.S. companies against their European and Japanese counterparts demanded action by the U.S. government. The U.S. government's response can be identified in two ways: technical and financial promotion of exports and the signing of free trade agreements.

In the first case, the operation of the Webb Pomerene Associations (WPA) and the Export Management Corporations (EMC), public-private entities, together with a depreciation of the dollar, were a failed attempt to increase the country's exports by making them cheaper than those of Europe and Japan. However, the result was not as expected as the deficit continued to grow throughout the decade and the structural and operational problems of the companies. The WPAs and EMCs could have been more successful had they had more financial and operational support as was the case of the Sogo Shosha in Japan and the European export trading companies that had more support from their governments (Cao, 2015).

As for free trade agreements, the United States signed one with Canada in 1987, allowing companies from both developed countries to have free access, or without paying tariffs, to the neighboring country's market, which was expected to increase U.S. exports to Canada and thus, a reduction of the trade deficit could be expected. Whether or not this was achieved will be answered in 1994 with the extension of this bilateral treaty to a regional one within the framework of the North American Free Trade Agreement.

The Modern Era of Protectionism

The trade evolution of the United States since the 1990s, during the disintegration of the socialist bloc and the consolidation of China as an economic and commercial power, testifies to the constant deterioration of its trade balance and the country's attempts to reduce its deficit with its main trading partners within the framework of NAFTA. The above proves unsuccessful and now, the U.S. deficit China, European Union, Mexico and Vietnam reached, in 2024, 295 billion, 235, billion, 171 billion and 123 billion dollars respectively. (Trading Economies, 2024)

The election of Donald Trump in 2016 marked a resurgence of protectionism under the banner of "America First." His administration-imposed tariffs on a number of products, especially from countries such as China, arguing that these measures were necessary to protect U.S. industry and reduce the trade deficit. However, these actions were met with criticism and generated tensions in international diplomatic and trade relations.

The U.S. government of President Trump seeks to reduce the trade deficit under two perspectives: a clear and open one that points out that the country's trade deficit is a product of the subsidies that its inhabitants, consumers, give to producers in other countries. Therefore, if those "subsidies" are reduced, U.S. exports will rise, and imports will fall. On the other hand, the Trump administration does not mention it as much as the previous point; however, the real intention is to seek the attraction of manufacturing companies that will contribute to raise the numbers in terms of job generation in the manufacturing sector.

State of the Art of Trade Protectionism

World trade has made great strides with the introduction of technology, the development of innovative processes and the proliferation of a diversity of products and services. International trade flows continue to increase but face a number of difficulties. In this regard, Vesga Benavides (2021) mentions that the history of the development of foreign trade shows how the increase in trade defense measures by countries has been a normal response of the world to the serious financial crises that have arisen, as in the case of the COVID-19 pandemic.

During the period mentioned above, there has been a generalized increase in protectionist measures through trade defense mechanisms and tariff and non-tariff barriers. This has been in response to the economic recovery policies implemented by countries. One example has been the Sino-US trade war and also the threats of tariffs imposed by the US on Mexico.

According to Ma and Ning (2024) the Sino-US trade war has resulted in significant welfare losses for both countries, with surprisingly little impact on employment in the manufacturing sector. Tariffs have not achieved the result intended by policymakers. This is because investments in plants and their operation will not move so easily from one destination to another just because of tariffs, a measure that may be temporary and reversed as soon as it proves to be ineffective.

In the same vein, López-Rodríguez; Flórez-Santacruz; Rincón-Castiblanco and Moreno-Gutiérrez (2022) argue that the regional liquidity variation rates, the stock of non-financial corporate sector debt in the Latin American international bond market and the indicators of capital flows to the region are elements that support that the trade war between China and the United States has negatively impacted the Latin American capital market.

Huerta González. (2017, P.118) Given the results of low economic growth, unemployment and foreign trade deficit in many countries as pointed out, it is necessary to question about trade agreements in the face of protectionist measures of the U.S. government. Huerta González (2017, P.118) points out that the Mexican economy will be seriously affected, given its great dependence on the U.S. economy, so he recommends the need to change the development strategy; insisting that Mexico would benefit from leaving NAFTA (now T-MEC), since it would have the possibility of having an economic policy to grow towards the domestic market and replace imports.

Finally, Portales Rodríguez (2024) also makes a series of recommendations to Latin American countries in the face of the protectionist measures imposed by the U.S.: Expand and diversify the destination countries of their exports, the participation of emerging countries represents an opportunity to strengthen and update the expansion and diversification system, Latin American countries should evaluate policies at the country level to address the instability of U.S. trade policy manifested in recent years (2016-2019). Finally, the countries of the region, by uniting as a bloc can have greater influence in this kind of organizations, giving a second chance to multilateralism, in the face of U.S. protectionist tendencies.

III. Methodology

This research work is descriptive in nature since through the compilation of documentary bibliographic material, firstly, an analysis of the historical economic context of commercial protectionism in the United States is presented in order to understand how at certain times protectionism favored the creation and position of multinational and transnational American companies that dominated the world; secondly, this research is analytical because it analyzes the evolution of Protectionism in the Post-War Era, Post-War and Globalization and the Modern Era of Protectionism.

Additionally, the deductive method will be used since it starts from the general premises about protectionist measures in order to consider the specific case of the U.S. and its effects on employment. Finally, the materials used are electronic documents, books, scientific articles, virtual magazines, documentation and data from institutional organizations.

IV. Results

In this section we can record the trend in U.S. foreign trade and analyze the advisability of adopting the protectionist measures that, so far, have not been applied, proposed by the Trump administration in the sense of increasing tariffs across the board, or in some cases specific to certain industrial sectors, against the exports of the main U.S. trading partners.

Initially we will say that U.S. trade tends to be in deficit due to the following factors:

- The unilateral decision to reduce tariffs, a trend that begins at the start of the GATT operation in 1947 and that deepens as of 1973.
- The exchange rate of the U.S. dollar in relation to its trading partners.
- The income level of U.S. consumers compared to their suppliers of goods.
- The United States pays for its imports with its local currency and not with foreign exchange as in the case of most countries in the world.
- The loss of manufacturing jobs, a trend that is only increasing over time.

Graph 3 shows what the result of lower tariffs in the United States has been: the country increases its imports because it is cheaper to produce goods in countries with lower wages, more efficient means of communication and transportation, and the purchasing power of the U.S. dollar. The average wage in the manufacturing sector in the United States was 29.75 dollars per hour (US Department of Commerce, 2012); while in Mexico it was 2.10 dollars per hour (Talent.com, 2025). In other words, the hourly wage paid to a US worker could pay up to 14 salaries in Mexico.

A relevant fact to consider from the same graph 3 is that the proportion of the deficit over the country's GDP reached its highest level in 2006 when the indicator represented 5.69%. Currently, the indicator is equivalent to half at 2.8%. The above would represent, under the mercantilist vision, a transfer of wealth from the country to the exterior; however, it should be remembered that Smith and, mainly Bastiat, explained how inconvenient, from the point of view of wealth production, it is to privilege obtaining trade surpluses, almost at any cost (Humphries, 2012).

The traditional or mercantilist view of seeing the trade balance as an indicator of the economic or commercial health of a country is incorrect. In fact, any attempt to reverse a deficit by imposing tariffs and non-tariff barriers is futile and counterproductive. Furthermore, the imposition of barriers to reduce imports in a country reduces the freedom of choice of the country's consumers since they can discourage the consumption of imported products that may be cheaper or of better quality than those available in the local market (McGee, 1996).

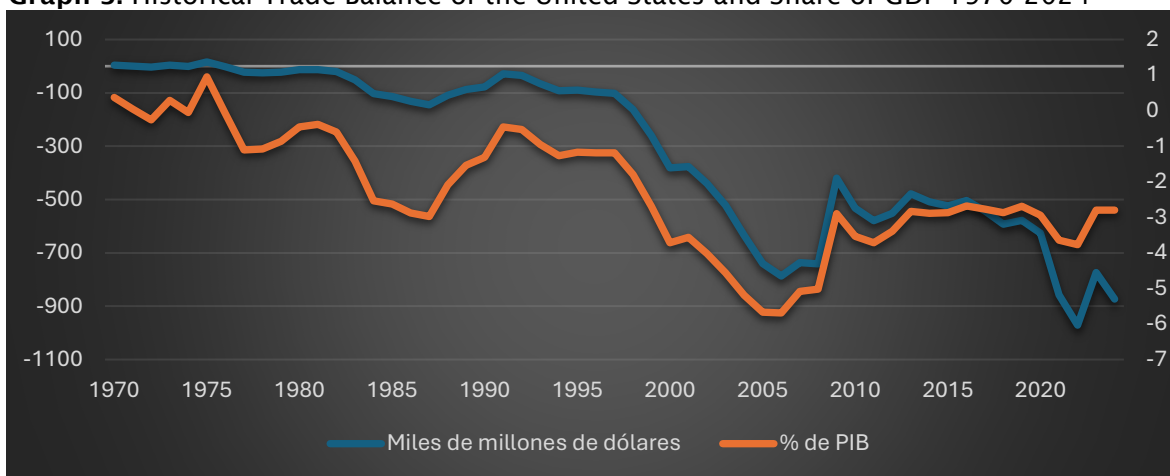
Regarding the exchange rate and its relationship to the country's trade deficit, there is no conclusive data, at least in the case of the United States. The above can be stated because the country has trade deficits both with countries or regions with parities higher than the dollar, euro, and with those lower, such as Mexico, Canada and China. However, when the dollar appreciates, the consumer's purchasing power increases and there may be an increase in imports, and the opposite if the dollar depreciates.

However, the internationalization of companies means that they tend to establish themselves, to manufacture their products, in those places where exchange rate parity can reduce production costs. The above allows us to assume that there may be multiple cases where it is more attractive to produce goods outside the United States compared to doing so in the country. This attractiveness can be greater if geographic proximity is added to the lower production cost, as demonstrated by the Gravitational Trade Model.

In terms of purchasing power, the purchasing power of the American consumer has been consistently high compared to its main trading partners (Mexico, Canada and China). Using a very simple indicator, the BigMac index, calculating the average hourly wage and dividing it by the cost of that hamburger in each country, we can illustrate, in this product, the purchasing power of each one: Mexico $2.1/5.1 = 0.41$, Canada $22/5.52 = 3.98$, China $3.56/3.53 = 1.02$. In the

American case we have the following relationship: $29.7/5.69 = 5.21$ hamburgers per hour worked.²

Graph 3: Historical Trade Balance of the United States and Share of GDP 1970-2024



Source: Own elaboration with data from the United States Department of Commerce 1970-2024.

If the United States wants to reverse the trade deficit, it will be necessary to depreciate the dollar so that imports become more expensive, but the above would imply lowering the purchasing power or standard of living of the American consumer with the social protests that this would require. That is, the trade problem of the United States should not be approached from the perspective of the trade balance. It is very likely that a very large part of the US population would not be interested in sacrificing part of their purchasing power in order to make their exports more competitive against the current offer of their trading partners.

Another point to consider in the case of the US deficit, and which was pointed out as an issue to be developed, is that the country pays for its imports with its local currency and not with foreign currencies that it should obtain in the financial markets. The above occurs only in a few cases: the euro in imports from the European Union whose sellers accept that currency, as well as in the case of the BRICS (Brazil, Russia, India, China and South Africa) that seek to develop international payment schemes among themselves without the need to use dollars between exports and imports made between them.

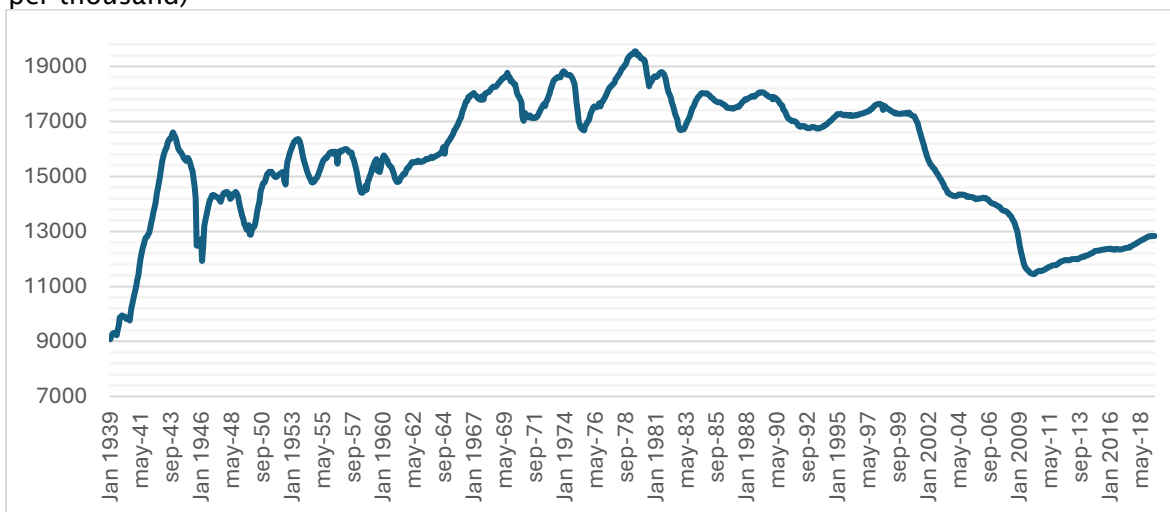
Returning to the point of the comparative advantage that the use of its local currency to pay for its imports represents for the United States, this gives it the advantage of accessing the payment instrument that allows it to settle the amount of its imports without importing their amount. That is, if the US economy had to pay 1 or 2 trillion dollars to its suppliers abroad, it could do so without needing to exchange a single dollar into another currency. This advantage remains considerable despite the efforts made by several countries to de-dollarize their foreign trade operations, especially in raw materials markets (JP Morgan, 2024).

Regarding the loss of jobs in the manufacturing sector, we can see what happened in the United States in the period 1939-2019. Chart 4 shows us that the country has lost manufacturing jobs since its highest point in the reference period, August 1979, in which it had 19.4 million jobs. Since then, the indicator has registered a decreasing trend that was accentuated in the period of the 2008-2009 financial crisis, when the figure fell to 11.4 million. That figure was equivalent to the number of jobs in US factories in March 1941. The latest data considered in the graph indicates that, in June 2019, in the last part of the first Trump administration, there were

² Para obtener el precio de la BigMac en varios países, se puede consultar: <https://worldpopulationreview.com/country-rankings/big-mac-index-by-country>.

12.8 million jobs. That amount was equivalent to the figure recorded in November 1941, during the Second World War.

Graph 4: Evolution of employment in the manufacturing sector 1939-2019 (Quantities per thousand)



Source: U.S. Bureau of Labor Statistics

We maintain that the true intention of applying protectionist measures by the Trump administration is to cause manufacturing companies to return to producing goods in the United States. The increase in tariffs is just a pretext to pursue the above. Factory employment represents, in 2023, 9.8% of the country's workforce (Benzow & O'Brien, 2024). On the other hand, the services segment has compensated, both in proportion of wealth production and employment figures, for what the manufacturing sector has lost.

Here the following question is worth asking: why the Trump administration's interest in increasing employment numbers in the manufacturing sector? The answer is simple: jobs in the manufacturing sector in the United States pay higher wages than those in the service sector. how big is that difference? Batra (1996) points out that at least 30% higher, for the same occupational level, in factories compared to stores and offices in the service sector.

In a document published in 2000 by the Department of Labor, it was illustrated that, compared to a plastics production plant as base 0, wages paid were 32% higher in car and auto parts factories, 29% in the oil sector, 25% in the electrical sector and 23% in the manufacture of airplanes and their parts. In contrast, wages were 35% lower in beauty salons, 36% in food and beverage establishments, 38% lower in clothing and child care stores; Finally, wages paid in a shoe store were up to 72% lower (U.S. Bureau of Labor Statistics, 2000).

Despite the figures provided above, there is evidence to show that salaries in the manufacturing sector are losing ground compared to the services sector. The above causes a decline in the living standards of the working population of the United States. A report from the Economic Policy Institute demonstrates how the decline in employment in the industrial sector has generated downward pressure on wages at all occupation levels (Mishel, 2018). Below is a table to demonstrate it:

Period	College or					Ages 25–34	Ages 35–44	Ages 45–54
	All	Men	Women	Non-college	more			
1980s	14.70%	13.30%	14.80%	13.10%	22.80%	12.30%	12.60%	13.60%
1990s	11.90%	11.30%	11.30%	10.30%	18.10%	9.70%	10.00%	11.90%
2000s	9.40%	8.20%	10.40%	7.10%	16.30%	8.20%	7.60%	8.70%
2010s	10.40%	9.30%	11.50%	7.80%	16.70%	10.30%	7.70%	9.00%
Percentage-point change								
1980s–	-4.30%	-4.00%	-3.40%	-5.30%	-6.10%	-2.00%	-4.90%	-4.60%
2010s								

Source: Analysis of Current Population Survey Outgoing Rotation Group data

The above information allows us to affirm that the industrial base of the United States has been reducing its size and importance in the country's economy. The above illustrates that fewer better-paying jobs affect the standard of living of American citizens, and voters, and it is likely that this has influenced the current President Trump's victory in the elections twice. Much of his speech on economic matters promises to recover factory jobs that have gone to countries with lower salaries.

It is estimated that 300,000 jobs leave the United States annually to other countries. In the period 1998-2021, the number of jobs, in total, reached 5 million (Scott, et al, 2022). To try to reverse the previous trend, the US government is willing to break the trade agreements that they have signed and convinced other countries to do so. They are also willing to increase tariffs and practice trade discrimination against countries that are their main trading partners.

The collection of tariffs will have diverse effects, but it is difficult for this measure, by itself, to cause the departure of factories located in countries with lower labor and production costs, to return to the United States. Especially if the next US administrations do not continue the measures that President Trump plans to implement. Some of the effects that increased tariffs may have on the US and world economy are:

- A. Increase in the cost of imported goods in the country of destination of the exports subject to them. The above, as long as importers do not convince exporters to grant a discount similar to the tariff charged.

For example, if a 20% tariff is imposed and the importer negotiates with the seller or exporter a discount of the same 20% on the export price, the following may occur:

Table 2: Effect of tariff collection on the export price and import cost if there is a discount on the former

	No Tariff	With (20%)	Tariff	With (25%)	Tariff
Exporting Price	\$ 100.00	\$ 80.00	\$ 80.00		
Tariff amount	Exento	\$ 16.00	\$ 20.00		
Local Tax	4%	4%	4%		
Import Cost	\$ 104.00	\$ 99.84	\$ 104.00		

Source: Own elaboration.

As can be seen, the tariff, unlike what is believed, can be paid by the exporter by forcing him, depending on the case or the operation in question, to grant discounts on the export price similar to the tariff that could be charged if the United States decides to apply it with the risk that the exporter could be replaced by another from a country that is not charged the same tariff or would have to pay a lower one. A tariff of up to 25% can be charged and the export price reduced by up to 20% without any change in the import cost. This is known as quota rent.³

- B. Protection of local producers at the expense of market competitiveness. Charging tariffs takes care of the interest of local producers at the expense of the freedom of choice of American consumers.

This point is valid as long as there are both local and foreign alternatives in the production of goods subject to the payment of tariffs. However, globalization has made it difficult to charge tariffs that do not end up affecting the interest of American consumers. An example to demonstrate the above: If tariffs are charged, an additional 10% to what they already pay, on Chinese imports of toys, importers in the US will have to look to see if there are local manufacturers of those toys: if so, what price are they? If it is higher, consumers will be affected. If there are no local manufacturers, are there others that are not Chinese? What tariffs do those countries other than China have?

- C. In the event that there are multinationals that have their headquarters in the USA and factories in countries subject to tariff sanctions imposed by President Trump, what could they do?

For this assumption, let's think that General Motors can meet the requirements in this case. Its headquarters are in Detroit and it has plants in Argentina, Canada, Brazil, China, South Korea, Egypt, the United States, Indonesia and Mexico. Assuming that the 25% tariffs affect its plants in Canada and Mexico, what can the company do if it does not want to be affected by those tariffs?

1. Pay millions of dollars to close their plants in those countries and relocate them to countries that are not subject to paying tariffs. The cost of the above could raise the price of each car by at least \$1,000 to \$1,500. The above without counting the expenses associated with building plants in the USA. Those costs could be at least \$2 billion.⁴
2. That the company convinces the United States government and unions to reduce the wages they will pay in that new factory that was relocated from Canada or Mexico to the United States.
3. Look for other countries with low labor costs and that are not subject to tariffs on the vehicles they export. The automotive sector will see that it is not safe to invest in any country since the decisions of the US government are hasty and desperate and affect all participants in the sector.

As can be seen, the outlook is not simple for US trading partners. Threats do not work in a globalized commercial environment and the mercantilist vision of the current US administration will only make global commercial activity more uncertain. The decrease in the trade deficit of the

³ Quota rent refers to the economic benefit that producers receive when a quota limits the supply of a good, allowing them to sell their products at a higher price than they would in a competitive market. This situation arises in the context of trade protectionism, where government-imposed quotas restrict the amount of imported goods, creating a scarcity that benefits domestic producers by increasing their profits. The additional revenue that producers earn due to these restrictions is considered quota rent.

⁴ Una planta de Hyundai en EUA que produce autos eléctricos costó 7.9 mil millones de dólares. [https://www.autonews.com/automakers-suppliers/hyundais-us-ev-factory-cost-grows-759b/#:~:text=Hyundai%20Motor%20Group%20and%20battery%20partner%20LG,complex%20near%20Savannah%2C%20Ga.%2C%20to%20\\$7.59%20billion.](https://www.autonews.com/automakers-suppliers/hyundais-us-ev-factory-cost-grows-759b/#:~:text=Hyundai%20Motor%20Group%20and%20battery%20partner%20LG,complex%20near%20Savannah%2C%20Ga.%2C%20to%20$7.59%20billion.)

United States will not be enough to cause an improvement in the standard of living of its population until employment figures in the manufacturing sector recover.

V. Conclusions

A country's trade policy should seek to increase its trade flows with the rest of the world. In the case of the United States, this objective has been achieved since its independence, as the United States has become the largest economy in the world. This has been done due to the use of the commercial advantages that the country had in comparison with the main European commercial powers that were affected by the two world wars of the 20th century.

The United States has a trade policy in the style of Stevenson's character Dr. Jekyll and Mr. Hyde. That is, on the one hand, it asks countries to practice open trade in which world markets are open for investment and the production of goods wherever it is most convenient to produce and sell them. However, when statistics or indicators do not favor their commercial interests, the solution they propose is the application of protectionist measures, mainly the charging of tariffs in a discriminatory manner against selected countries and industries.

U.S. trade history has been characterized by an initial period, from 1776-1870, as an independent country with a deficit trade balance. Another period, 1875-1973, shows that the United States recorded a surplus that consolidated the country's progress to become the trade and economic superpower that has dominated the rest of the world's countries. However, the same U.S. authorities made decisions in the early 1970s that changed the trade balance situation.

The consequences of the lowering of tariffs in the United States, the country's exit from the gold standard and the consolidation of the use of the dollar allowed the United States to adopt measures that liberalized trade worldwide and caused the production of goods to move to countries with low labor costs, which has led to a trend that continues to this day: the outflow of better-paid factory jobs to countries that pay low wages. This paper considers that this is the reason why the current Trump administration seeks to implement a protectionist trade regime.

The mercantilist vision of the Trump administration considers that the trade deficits that the country has with several nations, its main partners, are subsidies given by the US to those countries that only want to take advantage of the generosity and goodwill of the United States. This is false because foreign trade operations are not gifts, they are products of supply and demand. The decision to outsource production activities to low-cost countries was made by shareholders of companies that have benefited in terms of revenues and profits by producing abroad with lower production costs compared to staying in the US.

The United States has been the main promoter of trade agreements that sought to maximize the profits of its corporations. However, having realized that the country has lost millions of manufacturing jobs, the U.S. government now intends to reverse this trend by implementing protectionist measures. This generates uncertainty in economic and commercial activity, as such measures put pressure not only on consumers but also on manufacturers and exporters of goods destined for the U.S. market.

In practice, trade agreements such as the USMCA are a dead letter. The United States, the country that apparently provided certainty to the global economic and trade course, has become the main threat due to the adoption of measures that defy the most elementary logic. The application of tariffs to the extent proposed by President Trump will return the country to the rates charged by the government in 1942. In other words, the U.S. president seeks to go back 80 years in time. However, to the administration's misfortune, the world has changed irreversibly, and it is not feasible to change, with tariffs alone, the commercial reality experienced by what is still the leading economic power.

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Territorios vivos: Innovación social y desarrollo sostenible

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Resumen

Territorios Vivos surge como una respuesta innovadora y sostenible para impulsar el desarrollo económico y social en cinco municipios de Tamaulipas: Jaumave, Palmillas, Miquihuana, Bustamante y Tula. Este proyecto, resultado de la colaboración entre los presidentes municipales, PRONATURA Noreste AC y la Universidad Autónoma de Tamaulipas, busca aprovechar los recursos endémicos de la región para crear productos comerciales que, a su vez, fomenten la conservación de estos ecosistemas únicos.

El enfoque principal de *Territorios Vivos* radica en la valorización de especies comestibles poco aprovechadas, con el objetivo de impulsar una economía local sostenible. Al promover el consumo y la comercialización de estos productos endémicos, se busca reducir la presión sobre los terrenos forestales y evitar el cambio de uso de suelo, contribuyendo así a la preservación de la biodiversidad y los ecosistemas locales.

Uno de los mayores desafíos que enfrenta la gestión de recursos endémicos es su falta de viabilidad económica y la dependencia de las comunidades locales de recursos públicos. *Territorios Vivos* busca superar estos obstáculos mediante la creación de modelos de negocio sostenibles que generen ingresos y empleo, reduciendo así la dependencia de subsidios y fomentando la autonomía de las comunidades.

La iniciativa también abre nuevas oportunidades de negocio para jóvenes profesionistas de diversas disciplinas. Se busca fomentar la creación de asociaciones y cooperativas que se dediquen a la práctica, producción, manejo y comercialización de estos nuevos productos, impulsando así el emprendimiento juvenil y la innovación en la región.

Territorios Vivos se presenta como un modelo de desarrollo sostenible y participativo que involucra a diversos actores clave: gobiernos locales, organizaciones de la sociedad civil, instituciones académicas y comunidades locales. Esta colaboración multisectorial garantiza un enfoque integral y efectivo para la gestión de los recursos naturales y el impulso del desarrollo económico y social en la región.

Territorios Vivos representa una apuesta por un futuro sostenible para Tamaulipas, donde la conservación de la biodiversidad y el desarrollo económico y social van de la mano. Al aprovechar los recursos endémicos de la región y fomentar la innovación y el emprendimiento, se busca crear un modelo de desarrollo que beneficie tanto a las comunidades locales como al medio ambiente.

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Implementación del Programa 6S en las líneas de producción de empresa manufacturera en Reynosa

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Antecedentes

La falta de un programa 6S y auditorías semanales provoca paros en manufactura, afectando entregas y clientes. Implementarlo garantizará herramientas adecuadas, mejorará la eficiencia operativa y reducirá interrupciones en producción.

Problema Identificado

La falta de documentación y estandarización causa paros, aumenta costos y reduce productividad, afectando la competitividad en un mercado exigente.

Definición del proyecto

La implementación de 6S mejorará la eficiencia operativa, reduciendo paros no programados y asegurando herramientas y documentación. Con clasificación, orden, limpieza, estandarización, disciplina y seguridad, optimizará recursos, minimizará tiempos muertos y mejorará el ambiente de trabajo en producción.

Justificación

La implementación de 6S mejora productividad, optimiza recursos, reduce costos, aumenta seguridad y refuerza la imagen corporativa, demostrando compromiso con la calidad.

Objetivo General

Definir e implementar la metodología "6 S", en las áreas de la empresa, para garantizar una buena práctica de la metodología y obtener una cultura de mejora continua dentro de la organización.

Objetivos Específicos

1. Analizar las necesidades de la organización para crear los procesos de la metodología, en un plazo de 1 Semana.
2. Implementar un sistema de auditorías semanales para asegurar que las líneas de producción cuenten con las herramientas necesarias y que los procesos sean consistentes y estandarizados, en un plazo de 3 Semanas.
3. Establecer procedimientos operativos estandarizados para garantizar que todos los empleados sigan un proceso claro y coherente en cada tarea, en un plazo de 2 Semanas.
4. Reducir el tiempo de inactividad y los paros no programados mediante la correcta organización de herramientas y materiales, en un plazo de 2 Semanas.

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5. Crear un sistema de monitoreo de los procesos de la metodología de 6'S, en un plazo de 3 Semanas.

Límites y delimitaciones (alcances)

Limitaciones:

1. Uno de los principales desafíos podría ser el presupuesto asignado al proyecto. Puede implicar costos asociados con:
 - Capacitación del personal
 - Compra de materiales
 - Herramientas y equipos adicionales para mejorar la organización en las estaciones de trabajo.
2. El éxito de 6S depende de su sostenibilidad. Sin recursos ni seguimiento, los avances de la implementación inicial pueden perderse.

Delimitaciones:

1. El proyecto aplica para todas las áreas de la organización, tanto operativas como administrativas.

Planeación y descripción de las etapas

El proyecto 6S abarca cinco etapas clave: análisis de necesidades, auditorías semanales, estandarización de procesos, reducción de inactividad y monitoreo continuo. Se aplican herramientas como el análisis de 5 Porqués, auditorías estructuradas, capacitaciones operativas y reorganización de herramientas para optimizar productividad. Además, se definen indicadores clave de desempeño (KPIs) para evaluar la implementación. La metodología busca minimizar paros, reducir costos y mejorar la eficiencia operativa. Se realizan ajustes constantes basados en los resultados obtenidos, promoviendo una cultura de mejora continua. La estandarización y el seguimiento garantizan procesos sostenibles, alineados con los objetivos de calidad y competitividad de la empresa.

Implementación de la metodología 5S's en el laboratorio de pruebas del departamento de medición de una empresa enfocada a la generación de energía eléctrica

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Resumen

El correcto funcionamiento de los sistemas eléctricos es fundamental para el desarrollo de las sociedades modernas, siendo la medición del consumo energético un factor clave para la eficiencia operativa y la satisfacción del usuario. Este proyecto se enfoca en optimizar el espacio de trabajo del laboratorio de pruebas de medidores en el Departamento de Medición de una empresa federal de generación de electricidad ubicada en la zona de Tampico. La desorganización actual de equipos y herramientas interrumpe los flujos de trabajo, aumenta el tiempo de inactividad y crea riesgos de seguridad, lo que afecta negativamente la calidad del servicio.

La solución propuesta implica implementar la metodología 5S, un enfoque globalmente probado para la optimización del espacio de trabajo, centrándose en la organización, la estandarización y la disciplina. Al mejorar el diseño de las herramientas, optimizar los flujos de trabajo y promover la limpieza, el laboratorio tiene como objetivo mejorar la eficiencia operativa y garantizar un entorno de trabajo más seguro. Los indicadores clave de rendimiento (KPI por sus

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siglas en inglés), como el tiempo de recuperación de herramientas, las tasas de error y los informes de incidentes, medirán el éxito de estas mejoras.

Este proyecto aspira a mejorar el rendimiento del laboratorio y al mismo tiempo contribuir a un servicio eléctrico más confiable y eficiente para la comunidad de Tampico. Al abordar las ineficiencias organizativas y promover la seguridad de los trabajadores, el proyecto respalda beneficios sostenibles a largo plazo tanto para los empleados como para los usuarios finales.

Palabras clave: Optimización de espacio de trabajo; 5s; estandarización de procesos

Abstract

The proper functioning of electrical systems is fundamental to the development of modern societies, with energy consumption measurement being a key factor for operational efficiency and user satisfaction. This project focuses on optimizing the workspace of the meter testing laboratory in the Metering Department of a federal electricity generation company located in the Tampico area. The current disorganization of equipment and tools disrupts workflows, increases downtime, and creates safety risks, negatively affecting service quality.

The proposed solution involves implementing the 5S methodology, a globally proven approach to workspace optimization, focusing on organization, standardization, and discipline. By improving tool layout, optimizing workflows, and promoting cleanliness, the laboratory aims to improve operational efficiency and ensure a safer work environment. Key performance indicators (KPIs), such as tool recovery time, error rates, and incident reports, will measure the success of these improvements.

This project aims to improve laboratory performance while contributing to a more reliable and efficient electrical service for the Tampico community. By addressing organizational inefficiencies and promoting worker safety, the project supports long-term, sustainable benefits for both employees and end users.

Keywords: Workspace optimization; 5s; process standardization

I. Introducción

La Comisión Federal de Electricidad (CFE) es una empresa estatal mexicana responsable de generar, transmitir, distribuir y comercializar electricidad en todo el país. Fundada el 14 de agosto de 1937, su misión es proporcionar energía eléctrica a precios competitivos, promoviendo el desarrollo económico y social de México [1]. La CFE juega un papel clave en el sector energético, siendo una de las principales empresas de su tipo en América Latina, y ha evolucionado para incluir energías renovables como parte de su compromiso con la sostenibilidad [2]. Su operación está regulada por la Ley de la Industria Eléctrica y otros marcos legales nacionales.

El correcto funcionamiento de los sistemas eléctricos es esencial para el desarrollo de cualquier sociedad moderna. La eficiencia y la seguridad en la medición del consumo de energía son factores cruciales que impactan no solo en la operación de las empresas, sino también en la calidad de vida de los usuarios. En este contexto, la organización adecuada de los laboratorios de medidores y pruebas es vital para garantizar la precisión en la calibración y verificación de los equipos [3].

El presente proyecto se centra en la optimización del espacio de trabajo en el laboratorio de medidores y pruebas del departamento de medición de la zona Tampico, perteneciente a una empresa federal generadora de energía eléctrica. Este laboratorio desempeña un papel crítico en la garantía del correcto funcionamiento de los medidores de energía eléctrica, y su eficiencia operativa se ve afectada por la desorganización actual en la disposición de equipos e instrumentos. Los problemas de acceso a herramientas, flujos de trabajo interrumpidos y tiempos

improductivos han generado una percepción de ineficiencia que repercute negativamente en el servicio que se ofrece a la comunidad.

Además, la falta de una distribución adecuada del espacio ha contribuido a problemas de seguridad, resultando en accidentes menores y en un incremento de la carga física para los trabajadores. La incorporación de un patín hidráulico para movilizar las tarimas con medidores es solo un ejemplo de cómo una organización adecuada puede mejorar la seguridad y la ergonomía en el laboratorio.

Para abordar estos problemas, se propone la implementación de la metodología 5S, un enfoque que ha demostrado su eficacia a nivel global en la optimización de espacios de trabajo en sectores técnicos y de laboratorio [4]. Esta metodología se basa en cinco principios fundamentales: clasificación, orden, limpieza, estandarización y disciplina, los cuales permitirán no solo mejorar la organización y la accesibilidad a los instrumentos esenciales, sino también fomentar un ambiente de trabajo más seguro y eficiente [5] [6].

Este proyecto no solo busca reorganizar el laboratorio de medidores y pruebas de la empresa, sino también contribuir a un servicio eléctrico más confiable y eficiente para los usuarios de la zona Tampico. Al establecer indicadores clave de desempeño (KPIs) para medir el impacto de estas mejoras, se garantizará que las optimizaciones se mantengan a largo plazo, beneficiando tanto a los trabajadores como a la comunidad en general.

1.1 Planteamiento del problema

El laboratorio de medidores y pruebas del departamento de medición de la zona Tampico de la empresa previamente mencionada enfrenta dificultades operativas que afectan tanto su eficiencia como la seguridad de sus trabajadores. La desorganización en la disposición de los equipos e instrumentos ha llevado a un aumento en los tiempos improductivos y a la ocurrencia de errores en los procesos, generando un impacto negativo en la calidad del servicio proporcionado a los usuarios. Estos problemas han sido evidentes en las demoras en el acceso a las herramientas necesarias y en un flujo de trabajo interrumpido, lo que resulta en una disminución de la efectividad del equipo técnico.

Además, la falta de una distribución adecuada del espacio ha contribuido a problemas de seguridad, incluyendo accidentes menores que han ocasionado lesiones como cortadas y golpes. Esta situación no solo representa un riesgo para la salud de los empleados, sino que también aumenta los costos operativos asociados a la ineficiencia y los tiempos de inactividad. En este contexto, la implementación de la metodología 5S se presenta como una solución viable, pero es fundamental identificar primero la causa raíz de los problemas actuales para garantizar que se aborden de manera efectiva.

La relevancia de este planteamiento radica en la necesidad de optimizar el laboratorio para asegurar que los medidores y transformadores de energía eléctrica funcionen correctamente, contribuyendo así a un servicio eléctrico más confiable. Por lo tanto, se requiere un análisis profundo de los procesos actuales y una estrategia clara para rediseñar el espacio de trabajo, reorganizar los flujos de trabajo y mejorar la accesibilidad a las herramientas, lo que no solo aumentará la eficiencia operativa, sino que también promoverá un entorno laboral más seguro y productivo.

1.2 Justificación

El laboratorio de medidores y pruebas del departamento de medición de la zona Tampico de la Comisión Federal de Electricidad (CFE) es una pieza clave para garantizar el correcto funcionamiento de los sistemas eléctricos, asegurando que los medidores y transformadores operen con precisión. Sin embargo, las actuales dificultades operativas y problemas de seguridad en el laboratorio no solo comprometen la eficiencia del equipo técnico, sino que también aumentan el riesgo de accidentes laborales y los costos asociados a la ineficiencia.

La implementación de la metodología 5S en este entorno se justifica por la necesidad urgente de mejorar la organización del espacio de trabajo, reducir tiempos improductivos y evitar errores que afectan la calidad del servicio ofrecido a los usuarios.

La reorganización adecuada del laboratorio permitirá un flujo de trabajo más eficiente, incrementando la efectividad del equipo técnico y mejorando la seguridad laboral al reducir la probabilidad de accidentes.

Este proyecto no solo mejorará el rendimiento operativo, sino que también contribuirá a la creación de un entorno de trabajo más seguro y organizado. A través de la implementación de mejoras en seguridad y eficiencia, se promoverá un ambiente laboral más productivo y sostenible a largo plazo. Esto permitirá alcanzar los objetivos operativos, al mismo tiempo que se garantiza el bienestar de los empleados y un uso responsable de los recursos.

1.3 FODA

En la tabla mostrada se describen los diferentes aspectos encontrados en el análisis FODA encontrados dentro de la empresa.

Tabla 1: Análisis FODA del laboratorio de medidores y pruebas

<p>Fortalezas: + interno</p> <ul style="list-style-type: none"> ● Posición estratégica en la cadena de servicio. ● Equipo técnico capacitado y procedimientos establecidos. ● Infraestructura técnica disponible. 	<p>Oportunidades: + externo</p> <ul style="list-style-type: none"> ● Mayor demanda de energía confiable. ● Avances tecnológicos aplicables. ● Programas de capacitación y colaboración interna en la CFE.
<p>Debilidades: - interno</p> <ul style="list-style-type: none"> ● Espacio limitado y desorganización. ● Falta de herramientas de movimiento y KPIs. ● Incidentes de seguridad frecuentes. 	<p>Amenazas: - externo</p> <ul style="list-style-type: none"> ● Normativas de seguridad estrictas. ● Presiones presupuestales y cambios en la demanda. ● Riesgos de desastres naturales.

1.4 Objetivo del Proyecto

Objetivo General

Implementar la metodología 5S para optimizar la organización y eficiencia del laboratorio de medidores y pruebas del departamento de medición de la empresa proveedora de energía eléctrica en la zona Tampico

Objetivos Específicos

- Mejorar la disposición física de los equipos e instrumentos en el laboratorio mediante la aplicación de la metodología 5S, asegurando un acceso rápido y eficiente a las herramientas necesarias para las pruebas y calibraciones.
- Optimizar los flujos de trabajo dentro del laboratorio estableciendo procedimientos estandarizados y claros, minimizando los tiempos de espera y los desplazamientos innecesarios del personal.
- Disminuir los riesgos de accidentes laborales mediante la reorganización del espacio y la implementación de prácticas de limpieza y orden.

II. Marco teórico

En esta sección se explican de manera muy general los conceptos generales que enmarcan el desarrollo del proyecto que se está documentando.

2.1 *Conceptos clave*

2.1.1 5S- Son una forma sistemática de organizar los lugares de trabajo eliminando los residuos, mejorando el flujo y reduciendo el número de procesos siempre que sea posible.

2.1.2 Seiri (Clasificación)- Separar lo necesario de lo innecesario, manteniendo sólo lo que es útil en el espacio de trabajo.

2.1.3 Seiton (Orden)- Organizar los elementos de manera lógica y accesible para facilitar su uso.

2.1.4 Seiso (Limpieza)- Mantener el área de trabajo limpia y libre de suciedad, identificando y eliminando fuentes de contaminación.

2.1.5 Seiketsu (Estandarización)- Establecer normas y procedimientos claros para mantener la clasificación, el orden y la limpieza de manera constante.

2.1.6 Shitsuke (Disciplina)- Fomentar hábitos y compromisos para seguir las normas y prácticas establecidas, asegurando su sostenibilidad en el tiempo.

2.1.7 PHVA (Planificar Hacer Verificar Actuar)- Es una estrategia iterativa de resolución de problemas para mejorar la gestión procesos e implementar cambios. El ciclo PHVA es un método de ciclo de mejora continua.

2.1.8 KPI (Key Performance Indicator o Indicadores Clave de Desempeño)- Métrica cuantitativa que muestra cómo tu equipo o empresa progresa hacia tus objetivos empresariales más importantes. Las empresas usan KPI en varios niveles.

2.1.9 Optimización de laboratorios: Es el proceso de mejorar la disposición del espacio, los flujos de trabajo, y la eficiencia de los procesos en los laboratorios para aumentar la productividad y reducir costos.

2.1.10 Mejora continua- Es un enfoque sistemático que busca optimizar los procesos y los resultados de una organización de manera constante, implementando pequeñas mejoras progresivas a lo largo del tiempo.

2.1.11 Lean manufacturing o Manufactura esbelta- Es una filosofía de gestión que se centra en la eliminación de desperdicios y la mejora continua para maximizar el valor para el cliente y reducir los costos operativos.

2.1.12 Seguridad laboral- Son las medidas y prácticas implementadas para prevenir accidentes y proteger la salud de los empleados en el lugar de trabajo.

2.2 *Antecedentes*

Numerosas empresas han implementado metodologías similares a las 5S y la mejora continua con el objetivo de optimizar sus procesos operativos, mejorar la calidad de sus productos y reducir costos. A continuación, se presentan algunos ejemplos relevantes de empresas que han tenido éxito con la aplicación de estas metodologías:

1. Implementación de la metodología 5S en el laboratorio de la empresa de calidad y servicios LTDA[7].

Este proyecto técnico tomó a una empresa como centro de investigación que está dedicada a la fabricación de pegantes y morteros ubicada en la ciudad de Guayaquil. La empresa en cuestión consta de varias áreas que desempeñan funciones específicas; el corazón de esta empresa, el área de producción seguía los lineamientos de seguridad, pero no tenía un sistema de orden y limpieza implementado. Debido a este motivo se tenía una producción diaria baja. En base a esto, se implementó la metodología 5S en la planta de producción.

2. Implementación de la metodología 5S en los laboratorios de una escuela universitaria de ingeniería [5].

El proyecto de investigación desarrollado creó una cultura organizacional de todos los recursos en los laboratorios de prácticas. En la implementación de la metodología 5S para optimizar el trabajo y la seguridad de los laboratorios universitarios de ingeniería se definió un modelo de trabajo para crear una estructura 5S y se estableció un proceso de implementación. Con la implementación de la metodología 5S, los laboratorios escolares se han convertido en laboratorios industriales; se han adaptado a las condiciones de seguridad y organización que generalmente se encuentran en la industria metalmecánica.

3. Aplicación del Lean Manufacturing (5s y Kaizen) para el incremento de la productividad en el área de producción de adhesivos acuosos de una empresa manufacturera [8].

En el presente estudio se consideró necesario aplicar una estrategia de mejora basada en la metodología de Lean Manufacturing, por lo que se seleccionó la metodología Kaizen y las 5S. La aplicación se llevó a cabo en etapas que consistieron, primero, en un diagnóstico situacional, seguido del diseño, la implementación y la evaluación de los resultados. La presente investigación se desarrolló en una empresa manufacturera que en los últimos cuatro años ha estado presentando un problema de baja productividad en el área de producción de adhesivos acuosos.

4. Plan de Proyecto para la Implementación de la Transformación de las 5S en una Fábrica de Snacks [9]

El proyecto consistió en la elaboración de un Plan de Proyecto para la implementación de las 5S en una Fábrica de Snacks de una empresa dedicada a la fabricación de patatas fritas y snacks. Surge ante los numerosos despilfarros existentes en la fábrica (desorden, stocks excesivos, transportes internos innecesarios, etc.) y la necesidad de corregirlos.

2.3 KPI

Dentro de la empresa en la actualidad no se cuenta con KPIs (Indicadores Clave de Desempeño) en un laboratorio de medición, los KPI's se utilizan para evaluar y optimizar los procesos dentro del laboratorio, garantizando que las mediciones sean precisas, oportunas y eficientes. En un entorno de laboratorio de medición, estos KPIs ayudan a garantizar la calidad de los datos y la efectividad de las operaciones, lo que es crucial para la toma de decisiones informadas y el cumplimiento de normativas.

A continuación se mencionan los KPIs propuestos para aplicar en el área con un enfoque en los tiempos de medición.

Tiempo de Respuesta (Turnaround Time - TAT)

- **Definición:** Mide el tiempo total que toma procesar una muestra o realizar una medición desde que llega al laboratorio hasta que se obtiene el resultado final.

- **Importancia:** En la empresa generadora de energía, este KPI es crucial para asegurar que las mediciones sean entregadas en un plazo oportuno, lo cual es fundamental para la gestión de la red eléctrica y la toma de decisiones operativas.

$$TAT = \frac{\text{Hora de entrega de resultados} - \text{Hora de recepción de la muestra}}{\text{Número total de mediciones}}$$

Tiempo de Calibración

- **Definición:** Es el tiempo necesario para calibrar un equipo de medición para que proporcione resultados precisos y confiables. Este KPI es esencial para garantizar la precisión en las mediciones que se realizan dentro del laboratorio.
- **Importancia:** Un tiempo de calibración más corto permite que el laboratorio esté disponible para más mediciones, mejorando la eficiencia operativa.

$$\text{Tiempo de calibración} = \frac{\text{Número total invertido en calibración}}{\text{Número de equipos calibrados}}$$

Disponibilidad de Equipos

- **Definición:** Mide el porcentaje de tiempo que los equipos están operativos y listos para ser utilizados en mediciones.
- **Importancia:** Este KPI refleja la eficiencia de los recursos y es vital para evitar cuellos de botella debido a equipos fuera de servicio.

$$\text{Disp. de equipos} = \frac{\text{Tiempo de funcionamiento efectivo}}{\text{tiempo total de operacion}} \times 100$$

Tiempo Promedio por Mediciones

- **Definición:** Es el tiempo promedio necesario para realizar una medición específica. Este indicador es útil para conocer la eficiencia en la ejecución de mediciones y poder identificar posibles mejoras.
- **Importancia:** Un tiempo promedio muy largo podría indicar ineficiencias en el proceso de medición.

$$\text{Tiempo promedio} = \frac{\text{Tiempo total empleado en todas las mediciones}}{\text{Número total de mediciones}}$$

Eficiencia del Laboratorio

- **Definición:** Evalúa la relación entre el tiempo total disponible para realizar mediciones y el tiempo que realmente se dedica a la actividad productiva (medición).
- **Importancia:** Permite identificar cuellos de botella o tiempos muertos que afectan la eficiencia operativa.

$$\text{Eficiencia laboratorio} = \frac{\text{Tiempo de medición efectivo}}{\text{Tiempo total disponible}} \times 100$$

2.4 Marco legal

A continuación, se enmarcan las normas nacionales definidas que impactan directamente al desarrollo del proyecto.

Seguridad e Higiene en el Trabajo

1. **NOM-001-STPS-2021:**
Garantiza que las instalaciones del laboratorio cumplan con las condiciones mínimas de seguridad para prevenir accidentes.
2. **NOM-019-STPS-2011:**
Obliga a contar con una comisión de seguridad e higiene para evaluar regularmente las condiciones del laboratorio y proponer mejoras.
3. **NOM-030-STPS-2009:**
Establece actividades preventivas para evitar accidentes y enfermedades laborales mediante inspecciones y medidas correctivas.

Ergonomía y Movilización de Cargas

4. **NOM-036-1-STPS-2018:**
Ayuda a prevenir riesgos ergonómicos asociados al uso del patín hidráulico y manejo de herramientas, optimizando posturas y movimientos.
5. **NOM-006-STPS-2014:**
Regula la manipulación y transporte de medidores, transformadores y herramientas, reduciendo riesgos relacionados con el manejo manual de cargas.

Gestión de Riesgos

6. **NOM-017-STPS-2008:**
Garantiza que el personal utilice equipo de protección personal (EPP) como guantes, gafas y calzado adecuado para calibraciones y manipulación de equipos.
7. **NOM-010-STPS-2014:**
Aplica al uso de pintura en aerosol para marcar chatarra, estableciendo medidas para prevenir la exposición a vapores químicos, como buena ventilación y EPP.

Orden y Limpieza

8. **NOM-025-STPS-2008:**
Asegura niveles óptimos de iluminación para trabajos técnicos y de precisión en el laboratorio.
9. **NOM-005-STPS-1998:**
Regula el almacenamiento y manejo seguro de sustancias químicas como solventes utilizados en la limpieza de equipos.
10. **NOM-026-STPS-2008:**
Establece el uso de colores y señales para identificar áreas específicas, zonas de peligro y rutas de evacuación en el laboratorio.

III. Metodología experimental

3.1 Metodología

En este capítulo se describe la metodología propuesta para la implementación de las 5S.

3.1.1. Mejorar la Disposición Física de los Equipos e Instrumentos

Objetivo: Facilitar un acceso rápido y eficiente a las herramientas necesarias para pruebas y calibraciones.

Pasos a seguir:

- ❖ Clasificación (Seiri):
 - Realizar un inventario de los equipos e instrumentos en el laboratorio.
 - Identificar cuáles herramientas son esenciales para el uso diario, cuáles se usan ocasionalmente y cuáles ya no se utilizan o están obsoletas.
 - Retirar o disponer adecuadamente los equipos no esenciales o en mal estado.
- ❖ Orden (Seiton):
 - Asignar lugares específicos y accesibles para cada equipo e instrumento, teniendo en cuenta la frecuencia de uso y el tipo de pruebas que se realizan.
 - Etiquetar cada espacio y herramienta para evitar la pérdida o mal uso y facilitar el acceso.
 - Crear un mapa de ubicación de los equipos, que esté visible para todos los operadores.

3.1.2. Optimización de los Flujos de Trabajo

Objetivo: Minimizar tiempos de espera y desplazamientos innecesarios del personal mediante la estandarización de procedimientos.

Pasos a seguir:

- ❖ Limpieza (Seiso):
 - Identificar las áreas que generan mayor acumulación de desechos o desorden y limpiarlas.
 - Asignar responsabilidades específicas de limpieza y asegurarse de que todos conozcan sus tareas y los procedimientos de limpieza.
- ❖ Estandarización (Seiketsu):
 - Documentar los procedimientos de calibración y pruebas, creando guías visuales y diagramas para cada proceso.
 - Estandarizar la ubicación de las herramientas y equipos dentro de las estaciones de trabajo para reducir desplazamientos innecesarios.
 - Entrenar al personal en los nuevos procedimientos y verificar su comprensión y cumplimiento.
- ❖ Disciplina (Shitsuke):
 - Establecer un sistema de auditorías y revisiones periódicas para asegurar el cumplimiento de las nuevas disposiciones y procedimientos.
 - Fomentar el compromiso del personal con el orden y la limpieza mediante recordatorios visuales o incentivos.

3.1.3 Reducción de riesgos de accidentes/incidents

Objetivo: Reducir riesgos de accidentes mediante la reorganización del espacio y el orden en el área de trabajo.

Pasos a seguir:

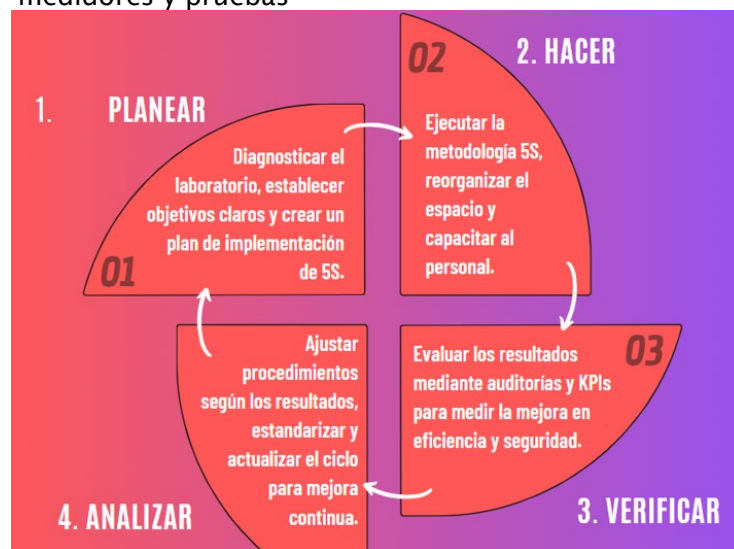
- ❖ Clasificación (Seiri):
 - Eliminar objetos innecesarios del área de trabajo que puedan obstruir el paso o representar un riesgo.
 - Separar los equipos en buen estado de aquellos que requieren mantenimiento o reparación para evitar riesgos.

- ❖ Orden y Limpieza (Seiton y Seiso):
 - Asegurar que los cables, herramientas y equipos estén correctamente almacenados y fuera de las áreas de paso.
 - Implementar protocolos para limpiar cualquier derrame o desecho que pueda ser peligroso y revisar periódicamente las áreas de riesgo.
- ❖ Estandarización (Seiketsu):
 - Colocar señalizaciones y recordatorios de seguridad visibles en áreas de riesgo (p. ej., pisos resbaladizos, equipo caliente).
 - Definir zonas de seguridad, como áreas de paso y zonas de almacenamiento, y marcar las áreas de riesgo de manera clara.
 - Proporcionar y revisar periódicamente el equipo de protección personal (EPP) necesario y capacitar al personal en su uso correcto.

3.2 Metodología Planear Hacer Verificar Actuar (PHVA)

En la figura 1 se muestra los aspectos básicos y las actividades dentro de la empresa implementadas usando la metodología PHVA.

Figura 3.1: Metodología PHVA aplicada al laboratorio de medidores y pruebas



3.3 Diagrama de flujos de proceso a analizar

El proceso analizado consta en evaluar todos los pasos llevados para revisar 2 lotes de 40 medidores cada uno y proponer una mejora de dicho proceso. Dicho proceso se muestra gráficamente en la figura 3.2(a), en la figura 3.2(b) se muestra el proceso propuesto.

Diferencias clave entre la situación actual y nuestra propuesta

Operaciones únicas (no repetitivas):

1. **Transporte de 2 lotes a la zona de pruebas:**
 - Actual: 275 segundos.
 - Propuesta con Patín Hidráulico: 69 segundos.
 - Mejora: Reducción significativa de 206 segundos al optimizar el transporte.

2. **Buscar herramientas para abrir cajas:**

- Actual: 448 segundos.
- Propuesta con 5s: 6 segundos.
- Mejora: Reducción drástica de 442 segundos, probablemente por una mejor disposición o acceso a las herramientas.

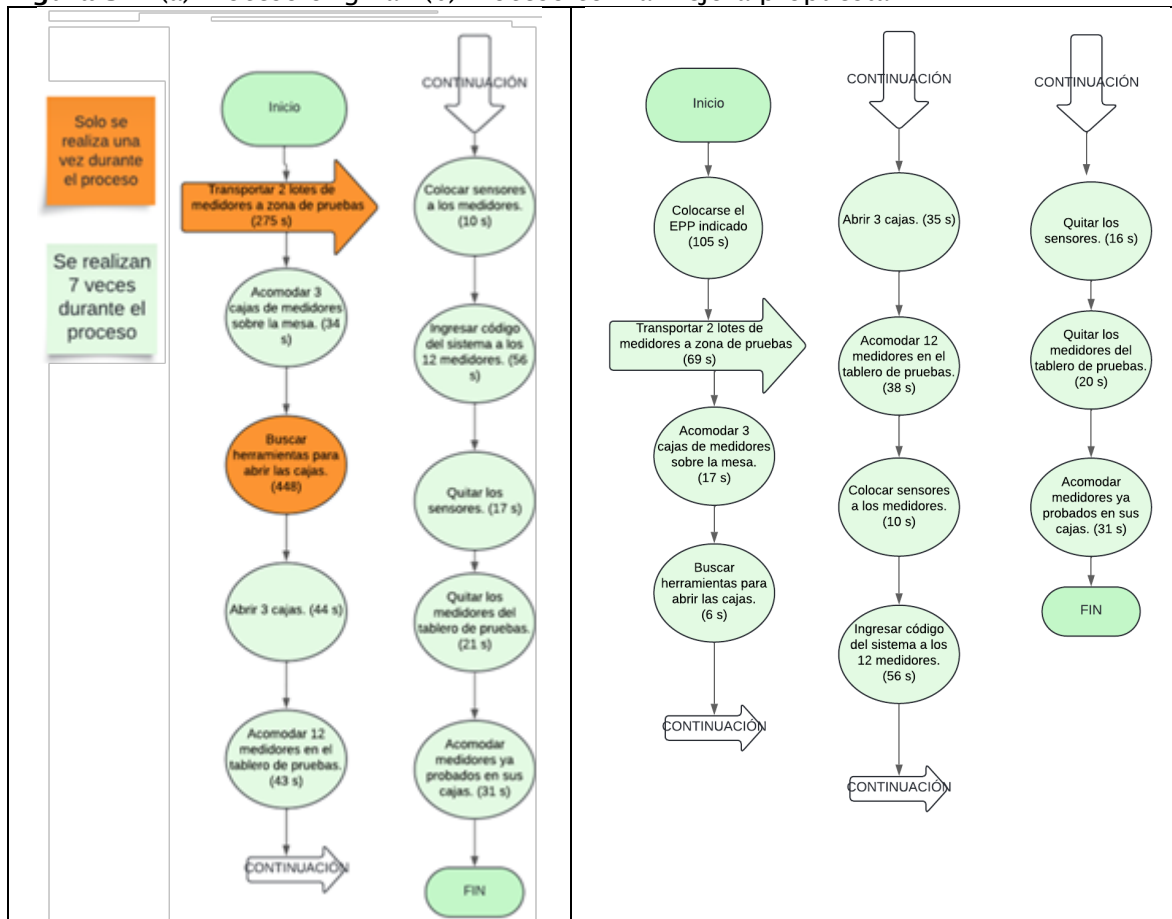
3. **Colocarse EPP (solo en Propuesta):**

- Propuesta: Se incluye un nuevo paso de 105 segundos que no existía en el proceso actual.

Tiempos totales:

- Actual: 2513 segundos (41 minutos y 53 segundos).
- Propuesta: 1741 segundos (29 minutos y 1 segundo).
- Reducción total: 772 segundos (12 minutos y 52 segundos), equivalente a un 30.7% de mejora en tiempo.

Figura 3.2: (a) Proceso original (b) Proceso con la mejora propuesta



3.4 Planteamiento matemático del problema

En el laboratorio de pruebas y medidores de la empresa, la implementación de las 5S permitió reorganizar y optimizar el uso de los tableros de pruebas. Antes de la mejora, solo se contaba con una estación de servicio, donde una computadora controlaba dos tableros para procesar dos lotes de 40 medidores en 41 minutos. Tras la mejora, se establecieron dos estaciones

independientes, asignando una computadora a cada tablero, lo que redujo el tiempo de proceso en un 30%.

Para evaluar esta mejora, se aplicó la **teoría de colas**, analizando indicadores clave como la longitud promedio de la cola y el tiempo promedio en el sistema, destacando el impacto positivo de la reorganización en la eficiencia operativa del laboratorio.

Situación antes de la mejora:

Proceso:

- Una computadora controlaba dos tableros de prueba.
- Se procesaban dos lotes de 40 medidores cada uno (80 medidores en total).
- Tiempo total del proceso: 41 minutos por los dos lotes.

Tasa de servicio promedio (μ):

La tasa de servicio indica cuántos medidores se procesan por hora:

$$\mu = \frac{\text{Número de medidores procesados}}{\text{Tiempo total en horas}} = \frac{80}{\frac{41}{60}} = \frac{80 \times 60}{41} \approx 117.07 \text{ medidores/hora.}$$

Tasa de llegada promedio (λ):

80 medidores por hora.

Cálculos matemáticos:

1. Antes de la mejora: (M/M/1)

- Longitud promedio de la cola (L_q): **1.47 medidores**

$$L_q = \frac{\lambda^2}{\mu(\mu - \lambda)} = \frac{80^2}{117.07 \times (117.07 - 80)}$$

- Tiempo promedio en el sistema (W): **1.62 minutos**

$$W = \frac{1}{\mu - \lambda} = \frac{1}{117.07 - 80}$$

- Tiempo promedio en cola (W_q): **1.11 minutos**

$$W_q = \frac{L_q}{\lambda}$$

2. Después de la mejora: 2 estaciones de (M/M/1)

Situación después de la mejora:

- Se asignaron dos computadoras, cada una con un tablero de prueba.
- Una computadora procesa los medidores nuevos y la otra los medidores de reuso.
- El tiempo total del proceso se reduce en 30%.

Nuevo tiempo promedio por lote:

- 29 minutos

Nueva tasa de servicio por computadora (μ mejorado):

Ahora cada computadora procesa un lote de 40 medidores en 28.7 minutos

$$\mu_{\text{mejorado}} = \frac{\text{Número de medidores procesados}}{\text{Tiempo total en horas}} = \frac{40}{\frac{28.7}{60}} = \frac{40 \times 60}{28.7} \approx 83.62 \text{ medidores/hora.}$$

Tasa de llegada promedio (λ)=40

Tasa de servicio promedio mejorada (μ mejorado)=83.62

- Longitud promedio de la cola (L_q)= **0.44 medidores**

$$L_q = \frac{\lambda^2}{\mu_{\text{mejorado}}(\mu_{\text{mejorado}} - \lambda)} = \frac{40^2}{83.62 \times (83.62 - 40)}$$

- Tiempo promedio en el sistema (W): **1.38 minutos**

$$W = \frac{1}{\mu_{\text{mejorado}} - \lambda} = \frac{1}{83.62 - 40}$$

- Tiempo promedio en cola (W_q): **0.66 minutos**

$$W_q = \frac{L_q}{\lambda}$$

Interpretación:

- La longitud promedio de la cola, el tiempo promedio en el sistema se redujo y el tiempo promedio en cola mejoraron significativamente como lo muestra la figura 3.3.

Figura 3.3: Resultados de planteamiento matemático



3.5 Análisis financiero

En este análisis económico, se realiza una evaluación detallada del impacto financiero asociado a la optimización del laboratorio de medidores y pruebas de la Comisión Federal de Electricidad (CFE), con un enfoque particular en los costos laborales. Es importante destacar que los cálculos incluyen únicamente las horas extra trabajadas por los empleados, ya que su jornada laboral regular de 8 horas diarias no se ve alterada en este análisis.

1.- ANÁLISIS DE LA SITUACIÓN ACTUAL

DATOS CLAVE:

- SALARIO DIARIO: \$430
- HORAS LABORADAS: 8 hrs./día
- SALARIO POR HORA: \$53.75
- SALARIO POR HORA EXTRA TRABAJADA: \$107.50
- TIEMPO DE LA ACTIVIDAD: 0:41:53 (aproximadamente 0.6921 horas)
- COSTO POR ACTIVIDAD: \$74.40

- COSTO ANUAL POR EMPLEADO: \$18,823.39 (Considerando 253 días laborados anualmente)
- COSTO ANUAL DE LOS TRES EMPLEADOS DEL ÁREA: \$56,470.17

Tabla 2: Análisis económico antes de la mejora

salario \$	horas laboradas	salario x hra extra	actividad	tiempo (69,21 porcentaje de hora)	costo actividad	costo de la actividad anualmente por empleado	costo de la plantilla encargada(3 empleados)
\$430.00	8	\$107.50	proveer de medidores el area correspondiente	0:41:53	\$74.40	\$18,823.39	\$56,470.17

2.- ANÁLISIS DE LA SITUACIÓN MEJORADA (con reducción del 30% del tiempo)


- DATOS CLAVE
- NUEVO TIEMPO POR ACTIVIDAD 0:29:07 (aproximadamente 0.48447 horas)
- COSTO POR ACTIVIDAD: \$ 52.08
- COSTO ANUAL POR EMPLEADO: \$13,176.37
- COSTO ANUAL DE LOS TRES EMPLEADOS DEL ÁREA: \$39,529.12

Tabla 3: Análisis económico después de la mejora

salario	horas laboradas	salario x hra extra	actividad	reducción de tiempo 30%(48,447 porcentaje de hora)	costo actividad	Costo de la actividad anualmente por empleado	costo de la plantilla encargada(3 empleados)
\$430.00	8	\$107.50	proveer de medidores el area correspondiente	0:29:07	\$52.08	\$13,176.37	\$39,529.12

Para llevar a cabo la mejora económica se necesita una inversión de \$ 11088 para un patín hidráulico donde su función será mover las cajas de medidores ayudando en la reducción de tiempo -ver figura 3.4-.

Figura 3.4: Equipo a adquirir por parte de la empresa

Objeto	Precio	Imagen
Uline patin hidráulico	\$11,088	

Beneficios de la mejora

1. REDUCCIÓN DE COSTOS

- La reducción del tiempo por actividad genera un ahorro anual por empleado de \$5,647.02
- Para un equipo de tres empleados, el ahorro total es de \$ 16,941.05
- Para esta mejora hay que hacer la inversión del patín hidráulico que es de \$11,088

2. RECUPERACIÓN DE LA INVERSIÓN

- La inversión de \$11,088 se recupera en 7.85 meses.
- Dando un ahorro de \$5853.05 en el primer año.

IV. Resultados

Los resultados que se han logrado al implementar la metodología 5S en la empresa en cuestión se pueden resumir en:

- **Mejora en la disposición física y organización:** Reducción del desorden en el laboratorio, acceso rápido y eficiente a equipos e instrumentos, optimización del espacio de trabajo.
- **Optimización de flujos de trabajo:** Documentación y estandarización de procedimientos operativos, reducción de tiempos en las actividades diarias, incremento en la productividad del equipo.
- **Incremento en la seguridad laboral:** Reducción de riesgos de accidentes al eliminar objetos innecesarios, correcta disposición de herramientas y equipos, implementación de señalización y protocolos de seguridad mejorados.
- **Impacto económico positivo:** Ahorro significativo en costos laborales por reducción de tiempos en un 30%, mayor capacidad de respuesta del laboratorio sin incremento en costos.
- **Satisfacción del personal:** mayor orden y claridad en las tareas diarias, incremento en la seguridad y comodidad en el entorno laboral.
- **Beneficios tangibles para la organización:** Mejoras inmediatas en eficiencia operativa, implementación de indicadores clave de rendimiento (KPI).

Las figuras 4.1 a 4.3 muestran las distribuciones anteriores y posteriores a la implementación de la propuesta implementada dentro del área de la empresa. Las mediciones y toda la información descrita en la sección de metodología fueron realizadas en dichas zonas.

Figura 4.1: Disposición física del laboratorio

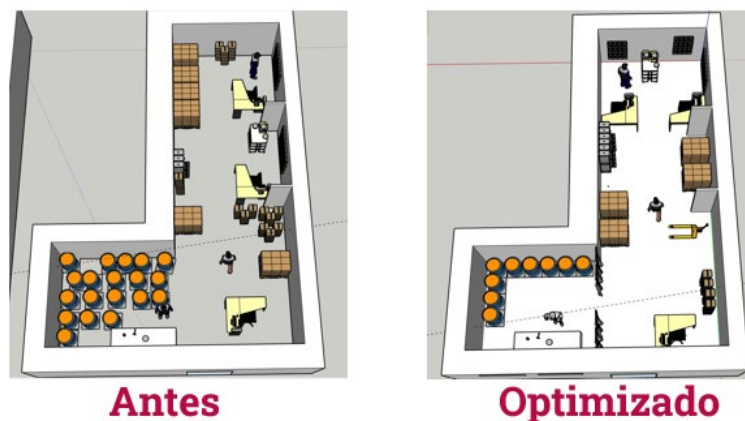
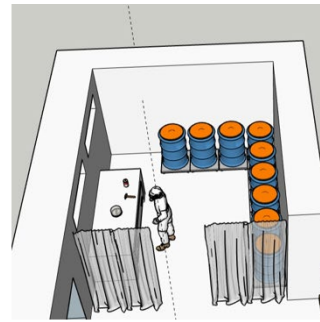


Figura 4.2: Zona de “chatarra”



Antes



Optimizado

Figura 4.3: Zona de acceso al laboratorio



Antes



Optimizado

Se ha limitado el número de fotografías al interior de la empresa antes y después de la implementación para asegurar la privacidad y la seguridad de esta.

V. Conclusiones

La implementación de la metodología 5S en el laboratorio de medidores y pruebas de la empresa generadora de energía eléctrica permitió corregir problemas de desorden, seguridad y flujos de trabajo, logrando:

- Reducción del 30% en tiempos de actividades, generando ahorros significativos y mayor productividad.
- Mejora en la organización y seguridad laboral, con señalización adecuada y eliminación de obstáculos.
- Uso de KPI para monitorear tiempos, seguridad y cumplimiento de estándares, impulsando la mejora continua.

Estos cambios optimizan la eficiencia y seguridad en el laboratorio.

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¿Cómo las Empresas Pueden Mejorar su Gestión Empresarial con ISO 14000 en México?

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Resumen

Hablando desde el punto de vista empresarial, donde cada vez son más necesarias las regulaciones en las empresas se crea lo que se conoce como las normas ISO o normas de estandarización, las cuales son un marco de regulación para las empresas, con ellas se busca que todas las organizaciones de manera internacional tengan los mismos parámetros para asegurar la calidad de los productos y/o servicios dirigidos a los consumidores.

Esta norma si bien no es obligatoria, sino de carácter opcional, tiene como beneficio que los consumidores y proveedores de la empresa conozcan que ellos se rigen bajo las regulaciones del medio ambiente y buscan optimizar los recursos de la empresa al máximo.

En el cual a las empresas se les ofrece la opción de certificación a nivel internacional con alguien externo, en este caso un auditor los evalúa para que se corrobore que cumplen con esos estándares y/o requisitos que se mencionarán posteriormente.

Este trabajo se enfocará sobre ¿En qué consiste la norma ISO 1400?, ¿Cuáles son sus beneficios?, La relación de ISO 14000 y las empresas, casos de éxito que han tenido las empresas aplicando ISO 14000, ¿Cuáles serán los procedimientos para certificarte en ISO 14000? y diversos puntos claves que se explicarán más a detalle.

La finalidad de este análisis es dar a conocer a las personas que revisen el documento, puedan interpretar y adentrarse más a detalle al tema acerca de la aplicación de la norma de estandarización ISO 14000 y su importancia que tiene para las empresas, la cual les será de gran utilidad.

Palabras Clave: Optimizar; estandarización; certificación

Abstract

Speaking from a business perspective, where regulations are increasingly necessary in companies, what are known as ISO standards or standardization standards are created, which are a regulatory framework for companies, with them it is sought that all organizations internationally have the same parameters to ensure the quality of products and/or services directed to consumers.

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Although this standard is not mandatory but optional, it has the benefit of ensuring that the company's consumers and suppliers know that they are governed by environmental regulations and seek to optimize the company's resources to the maximum.

In which companies are offered the option of international certification with an external party, in this case an auditor evaluates them to verify that they comply with those standards and/or requirements that will be mentioned later.

This work will focus on What is the ISO 1400 standard. What are its benefits? The relationship between ISO 14000 and companies, success stories that companies have had by applying ISO 14000, What will be the procedures to certify yourself in ISO 14000? and various key points that will be explained in more detail.

The purpose of this analysis is to inform people who review the document, so they can interpret and delve into more detail into the topic regarding the application of the ISO 14000 standardization standard and its importance for companies, which will be very useful to them.

Keywords: Optimize; standardization; certification

Fortalecimiento de competencias locales para la conservación y el desarrollo sostenible

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Resumen

Cuidar la naturaleza y mejorar la calidad de vida de las comunidades no tiene por qué ser una elección entre una u otra. Ambos pueden ir de la mano, y eso es precisamente lo que busca esta iniciativa. En la ANP Paisaje Natural de la Mariposa Monarca, las personas no solo habitan el territorio, sino que lo conocen, valoran, cuidan y viven de él. Por eso, este proyecto brinda lo necesario para que sean protagonistas en su protección, mientras generan oportunidades de desarrollo para sus familias y comunidades.

Cada comunidad posee conocimientos bioculturales que han pasado de generación en generación: el uso de flora y fauna con fines medicinales, la elaboración de artesanías, técnicas tradicionales de construcción y otras prácticas ligadas a su identidad. Sin embargo, muchas de estas tradiciones corren el riesgo de desaparecer. Para evitarlo, se imparten talleres y capacitaciones que fortalecen estas habilidades, promoviendo su conservación y adaptación a los desafíos actuales.

El trabajo en equipo es clave. Se crean redes de colaboración entre comunidades, expertos e instituciones, promoviendo el diálogo y la toma de decisiones compartidas. Cuando las comunidades son parte activa del cambio, la conservación se convierte en una oportunidad para transformar vidas y territorios.

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Corruption and SDG 13: Climate Action*

Take Urgent Action to Combat Climate Change and its Impacts

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Abstract²

In this chapter, we set out the links between corruption and the capacity to take actions to combat climate change and mitigate its impacts. After noting that corruption is linked with increased greenhouse gas emissions and reduced stringency of environmental regulation, we focus on three themes based on the other goals and indicators of SDG 13. We begin by discussing the links between corruption and the damage from natural disasters. Corruption increases death and destruction from natural disasters and can also increase the likelihood of the occurrence of certain types of disasters. We also explore the ways in which corruption undermines planning for and responses to natural disasters, noting the dangers that arise when corrupt officials are tasked with preventing disasters and disbursing resources that are intended to aid in relief and reconstruction. We then discuss the effects that corruption has on the extent and effectiveness of climate financing, noting that while current targets have been met, the dramatic increase projected to be needed speaks to an urgent need to fight corruption in donor and recipient countries. Finally, we provide preliminary evidence on how corruption undermines a fundamental requirement for climate action – citizen understanding of climate change.

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Corruption and Gender Equality: Impediments and Pathways towards Achieving Sustainable Development Goal 5*

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Abstract

This chapter examines the complex relationship between corruption and gender equality, focusing on its implications for achieving Sustainable Development Goal 5 (SDG 5). By synthesizing existing literature, this study highlights how corruption exacerbates gender disparities, facilitates violence against women, restricts their access to public services and resources, and hinders women's political and economic empowerment. Additionally, it identifies significant gaps in current research, particularly the need for understanding the adoption of gender equality frameworks, cross-country studies, and specific worldwide data on gender and corruption. The chapter concludes with recommendations for policy, practice, and future research.

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Corruption and Decent Work and Economic Growth (Social Development Goal 8)

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Abstract

Although Sustainable Development Goal 8 does not deal directly with corruption, corruption has the potential to undermine progress towards achieving goals related to economic growth, productivity, innovation, and the creation of good jobs. First, although several economists and political scientists have suggested that corruption might help economic growth by allowing firms to bypass overly restrictive rules and regulation, empirical studies do not strongly support this idea. In fact, although the empirical evidence is not unambiguous, most evidence at the country and firm-level suggests that corruption reduces growth, productivity and innovation. Corruption might also undermine progress towards achieving good jobs, improving wages, and protecting worker rights. Although bribes can, in some cases, allow firms to avoid over-restrictive regulations, corruption can also allow firms to avoid labor regulations aimed at ensuring equal pay and non-discrimination, eliminating child labor, and providing safe and secure working environments. Moreover, corruption can encourage firms to operate in the informal sector, where wages and productivity are lower. Reducing corruption—and carefully assessing the costs and benefits of regulations—could, therefore, help countries provide full and productive employment to their entire population.

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Trade Openness, Technology Transfer, ICT Dynamics and the Paradoxical Effects of National Cultures

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Abstract

This paper investigates the effects of Internet Communication Technology (ICT), national cultures, and trade openness on technology transfer. The study is grounded in trade expectations theory. Since literature posits that developing nations which are mostly autocracies enter trading relations with the motivation to leverage “transfer of technology” or “technological know-how” from developed nations, we employ data for this study from 11 developing countries across the world from 2013 to 2020 and specified an econometric model for our analysis. A paradoxical effect was found, such that trade openness and ICT are positively associated with technology transfer, but national cultures (power distance and uncertainty avoidance) are inversely related to technology transfer. Moreover, alternative measures for technology transfer in our study were quite robust with consistent results. The contributions in this study are novel within the context of trade openness—technology transfer literature. Lastly, we offer policy suggestions and possible avenues for future studies.

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Impacts of Leverage and Return on Investment (ROI) on Dividends: A Comparative Study Between North American and Global Non-Financial Business Firms

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Abstract

This comparative study focuses on the effects of leverage and return on investment on North American and Global business firms. Drawing on shareholder theory, the study argued that firms often strive to optimize value for shareholders through increased share prices or dividends. This study has included more than 70,000 and 1,00,000 observations from North American and Global firms respectively to measure the impacts of financial leverage and return on investment (ROI) on firms' dividends. Previous literature did not examine these relationships together and did not compare North American and Global business firms. The results are robust when including control variables and different models (Linear Probability, Logit, Probit, and Tobit). The study reveals that North American firms use higher leverage than Global business firms. In contrast, North American firms have lower returns on investment (ROI) than Global firms. As a result, Global firms pay higher dividends than North American firms. Regression analysis shows that leverage has negative impacts on dividends for North American firms while it is positive for Global firms. However, ROI positively affects the dividends of North American and Global business firms. The results remain significant when control variables are included in different regression models. This study suggests further study to measure the relationships between developed and developing countries, regional trading blocks, and currency unions.

Keywords: Leverage; return on investment (ROI); dividends; business firms; North America; Global

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Climate Policy Uncertainty and Corporate Working Capital Empirical Evidence from U.S.-Listed Firms

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Abstract

This study investigates the impact of climate policy uncertainty (CPU) on corporate working capital management using a sample of U.S. listed firms from 1988 to 2023. Specifically, we examine how CPU influences the cash conversion cycle (CCC) and its key components—days inventory outstanding, days receivables outstanding, and days payables outstanding. Our findings reveal that higher CPU prompts firms to shorten their CCC, primarily by reducing inventory levels and accelerating receivables collection. Furthermore, we find that firms with greater liquidity reserves adjust their CCC less aggressively, whereas high-cost firms adopt more conservative inventory management strategies. Our industry-level analysis further reveals notable differences, with manufacturing firms responding more cautiously than energy firms due to varying regulatory exposures. Finally, our robustness checks using alternative CPU measures reinforce our main results, underscoring the significance of regulatory uncertainty in shaping corporate liquidity strategies. These findings highlight the necessity for firms to incorporate climate policy considerations into financial planning. Our study offers important insights for corporate managers, investors, and policymakers in managing regulatory risks and ensuring financial stability in an evolving policy landscape.

Keywords: Climate policy uncertainty; working capital management; cash conversion cycle; corporate liquidity; regulatory risk

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Electricity Distribution and Revenue Collection Efficiency in Emerging Markets: A Regional Optimization Model of Electricity Distribution and Revenue Collection by Nigerian Electricity Distribution Companies

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Abstract

Electricity demand far exceeds its supply in many developing nations, leading to market failure and revenue uncertainty. Our study specifies a revenue distribution and collection optimization model to determine the most efficient electricity distribution companies (Discos) in the Nigerian electricity market. This study employs quarterly data from the Nigerian Bureau of Statistics and the general algebraic modeling system (GAMS) was used to run the specified optimization model. We found the most efficient Discos and offered suggestions to aid policy and strategy implementation that can improve market electricity supply to the Nigerian electricity consumers. By extension, affected emerging economies can glean some strategy from this study.

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Exploring Antecedent and Outcomes of Firm's AI Usage: A Case Study of Amazon's Twitter Posts

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Abstract

Artificial Intelligence (AI) is continuously transforming customer-firm interactions. Peltier, Dahl, and Schibrowsky (2024) extensively reviewed 300 AI and technology-related articles from 16 marketing journals, identifying four groups of antecedents and two outcomes associated with the firm's AI usage. Four antecedent groups include individual psycho-social factors (e.g., psychological factors, cognitive factors, social factors, hedonic and utilitarian motives), firm-level factors (e.g., strategic orientations, capabilities, and resources, structural issues), AI design factors (e.g., Anthropomorphic characteristics, hidden AI design characteristics), and industry and market factors (e.g., political, legal, regulatory environment; industry factors, globalization, purchase situational factors). The two outcome categories are customer outcomes (e.g., engagement and experiences, purchase/usage, satisfaction, evaluation of and attitudes towards AI performance, individual performance outcomes, and reactions to recommendations) and firm outcomes (e.g., customer-brand relationships; operational & strategic performance, employee-employer relationships, financial performance). Empirical research is needed to test this conceptual framework and validate its applicability.

E-commerce companies like Amazon frequently integrate AI-driven innovations to enhance consumer experiences. Amazon's AI-driven advancements include AI-powered product recommendations, voice assistants (Alexa), automated fulfillment systems, and more. In this research, I use Amazon as a case study, collecting data from its Twitter platform to analyze its marketing communications regarding AI innovation advancements. This approach is particularly insightful as it captures AI-related discussions from Amazon's official accounts and consumers' Twitter reactions.

Using a qualitative content analysis approach, I coded Twitter posts based on Peltier, Dahl, and Schabowski's theoretical framework. The findings from Amazon's Twitter digital communications strongly support the significance of firm-level factors and customer outcomes, particularly in shaping customer-brand relationships & strategic performance within the conceptual framework.

These findings also offer valuable insights into the acceptance and concerns surrounding AI adoption in online retailing, enabling businesses to optimize AI strategies to better align with customer expectations. Furthermore, analyzing social media discourse enhances understanding interactive marketing relationships between firms and customers. Finally, negative customer feedback highlights the need for future marketing and research efforts to address emotional and cost-related frustration and concerns about job displacement and privacy issues arising from AI-empowered innovations.

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Mapping the Intellectual Landscape of The International Trade Journal: A Bibliometric and Topic Modeling Analysis

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Abstract

Since the advent of globalization, the global economy has undergone a profound transformation characterized by increasing interdependence among nations. International economic integration has become a defining feature of the contemporary world order, driven by advancements in technology, trade liberalization, and policy reforms (Tian et al., 2018). As national boundaries become less restrictive, barriers to trade—such as tariffs, quotas, and regulatory constraints—are gradually diminishing, facilitating the seamless movement of goods, services, capital, and labor across borders (Sundaram and von Arnim, 2009). This shift has significantly contributed to the expansion of international trade, fostering economic growth, enhancing market efficiency, and promoting cross-border investments. The interconnected nature of economies today underscores the importance of trade as a catalyst for development, innovation, and global prosperity (Siddiqui, 2015). In 2023, the total value of global trade in goods and services reached approximately US\$30.5 trillion, underscoring its vast scale and impact (World Trade Organization [WTO], 2023). Historically, trade has been a powerful engine for economic expansion; over the past four decades, while world GDP has quadrupled, international trade has experienced a sevenfold increase, highlighting its role in driving global prosperity. Moreover, trade liberalization efforts have yielded substantial benefits; for instance, it is estimated that American real incomes are 9% higher than they would have been without such initiatives, equating to an additional \$1.5 trillion in income for the U.S. economy in 2013. However, recent challenges, including geopolitical tensions and protectionist policies, have introduced volatility into global markets. In 2023, world trade in goods experienced a 5% decline, while trade in services grew by 8%, reflecting a complex and shifting landscape (Cato, 2024; UNCTAD, 2023). These dynamics underscore the critical importance of international trade in shaping economic outcomes and the need for policies that promote open and fair-trade practices.

In the dynamic and ever-evolving domain of international trade, research related to international trade is burgeoning and promising. Scholarly journals play a pivotal role in the dissemination of knowledge, the advancement of academic discourse, and the formulation of trade policies. The International Trade Journal (ITJ) has established itself as a key platform for researchers, policymakers, and industry practitioners, facilitating rigorous discussions on trade theory, policy analysis, and empirical studies. Given its substantial and long-standing contributions to the field, a systematic examination of its publication trends, influential contributions, and evolving research themes is essential for understanding its intellectual trajectory and broader impact on global trade scholarship.

This study employs bibliometric analysis and topic modeling to explore the development and thematic evolution of research published in The International Trade Journal (Liu, Mai and MacDonald, 2019; Mustak et al., 2021; Venugopal et al., 2023). Bibliometric analysis provides a quantitative framework for assessing publication patterns, citation networks, and research collaborations, offering valuable insights into the journal's academic influence and knowledge dissemination. In conjunction with this, topic modeling, a machine learning technique designed to uncover latent themes within extensive textual datasets, enables a deeper exploration of both dominant and emerging research areas within ITJ over time. The primary objectives of this study are to:

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1. Identify key scholars, institutions, and collaborative networks that have shaped ITJ's research landscape.
2. Examine citation patterns to determine the journal's most influential works and thematic priorities.
3. Analyze the evolution of international trade research by detecting shifting trends through topic modeling.

The findings of this study will contribute to the broader meta-analysis of trade-related research by mapping the journal's intellectual structure, identifying existing knowledge gaps, and highlighting emerging areas of inquiry. This research is particularly relevant in the context of globalization, technological advancements, and shifting trade policies, all of which continuously reshape the priorities and direction of international trade scholarship.

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MXene Composite Hydrogel for Anti-Cancer Applications

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Abstract

According to global cancer statistics, skin cancer is the most common cancer worldwide, with rapidly increasing incidence, necessitating innovative treatment methods. Current cancer treatments often face limitations such as low bioavailability, low selectivity, and significant side effects due to high dosage requirements. These drawbacks have prompted the development of advanced drug delivery systems to enhance therapeutic outcomes while minimizing side effects. This study introduces a composite hydrogel matrix for transdermal cancer treatment, incorporating chitosan (CS), polyethyleneimine (PEI), MXene (Ti₃C₂T_x), genipin, and triethyl citrate (TEC). Chitosan provides biocompatibility, biodegradability, and pH responsiveness, while PEI enhances drug encapsulation efficiency and mechanical strength. MXene, known for its high surface area, conductivity, and photothermal properties, enables targeted cancer therapy and imaging applications. Genipin serves as a natural crosslinker, improving the hydrogel's mechanical properties and stability, while TEC acts as a plasticizer to enhance elasticity and flexibility. Fourier-transform infrared spectroscopy (FT-IR) confirmed the successful integration of MXene and cross-linking interactions, while scanning electron microscopy (SEM) revealed a uniform surface and good dispersion of MXene within the hydrogel. The inclusion of MXenes influenced the material properties of the hydrogel, increasing its hydrophilicity, as indicated by a rise in the contact angle with increasing MXene content. The developed MXene-enhanced hydrogel offers a targeted and efficient drug delivery system, potentially reducing the required dosage and associated toxic effects, while also serving as a platform for advanced drug delivery technologies. This adaptable and biocompatible system shows great promise for future transdermal cancer therapies.

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Microfluidic Fabrication of Dexamethasone-Loaded Hydrogel Microparticles

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Abstract

Hydrogel-based drug delivery systems have the potential to improve therapeutic outcomes by enabling sustained drug release, prolonging residence time at the target site, minimizing administration frequency, and promoting tissue or organ recovery. Microparticles, known for their structural and functional advantages, are effective drug carriers that can be delivered through minimally invasive injections. In this study, we develop micron-sized spherical hydrogel microparticles using a coaxial microfluidic device, incorporating thermosensitive surface modifications to optimize drug delivery. Dexamethasone (Dex), a corticosteroid, is encapsulated within self-assembling microparticles synthesized from polyvinyl alcohol with phenol moieties (PVA-Ph) and fabricated via a coaxial double-orifice microfluidic spinneret. The outer surface of these microparticles is functionalized with thermo-responsive Pluronic F127 (Plu-Ph) to facilitate targeted aggregation and localization within tissues. Embedded within a Plu-Ph hydrogel matrix, these microparticles enhance the mechanical stability, structural integrity, and controlled release of Dex, thereby reducing dosing frequency. This approach presents a versatile and efficient platform for targeted therapeutic delivery, contributing to advancements in drug delivery and regenerative medicine, particularly in applications that restore hearing function.

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Implementation of External Warehouses (3PL) within Companies

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Abstract

Currently, many companies employ the cross-docking model for receiving materials, especially when working with international suppliers. This system allows materials to pass through a transit point with a limited retention time before being processed. Once received, these materials must comply with established import procedures and be registered in the company's warehouses for further distribution or use in production processes.

However, a common challenge companies face arises when implementing new projects or expanding product lines, as these changes often lead to an increased demand for raw materials. In many cases, this growth results in material accumulation within the facilities, potentially causing storage issues and impacting operational efficiency. With the constant arrival of new material shipments, it is crucial to implement strategies that optimize space utilization, as limited storage capacity can become a barrier to business growth.

To address this issue, one of the most effective solutions is to partner with a Third-Party Logistics (3PL) provider. This model enables companies to outsource material storage, whether for incoming supplier shipments or excess inventory that exceeds optimal levels within the company's facilities. Utilizing a 3PL provider not only facilitates material management but also helps optimize internal space, improve logistical flow, and ensure that operational processes are not disrupted by physical limitations.

The theoretical framework is based on key studies on third-party logistics (3PL) warehouses. Bowersox, Closs, and Cooper (2013) highlight the role of 3PL in optimizing supply chains. Christopher (2016) emphasizes how outsourcing logistics improves efficiency and cost management. Langley and Capgemini (2022) provide insights into current 3PL trends and challenges. Razzaque and Sheng (1998) analyze the impact of logistics outsourcing on business performance. These studies demonstrate that 3PL warehouses enhance flexibility, scalability, and operational efficiency, making them essential for companies seeking competitive advantages in dynamic markets.

Additionally, information will be collected within maquiladora companies that work with or use this type of storage services, using a mixed methodology to obtain measurable data based on the experiences of individuals involved in the processes.

By implementing this type of solution, companies can achieve multiple benefits. Not only will they gain better control over inventory levels and optimize the available space within their facilities, but they will also have access to key industry certifications, including corporate compliance, customs regulations, and supply chain security programs. These certifications may include international standards such as Authorized Economic Operator (AEO) programs or the Customs Trade Partnership Against Terrorism (CTPAT), among others, enhancing the company's competitiveness and reliability in the global market.

Ultimately, adopting an approach based on external storage solutions and internal logistics optimization allows companies to improve operational efficiency, reduce costs, and ensure sustainable long-term growth.

Keywords: Third-Party Logistics (3PL); Warehousing; Supply Chain Management; Inventory Management; Outsourcing; Distribution; Cost Efficiency; Logistics Optimization; Scalability; Operational Flexibility

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Metodología agile para la reducción de errores en inventarios

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Resumen

El control de inventarios es un elemento fundamental para la eficiencia operativa de cualquier empresa dedicada a la producción y venta de productos perecederos. Sin embargo, muchas organizaciones enfrentan dificultades en la gestión de sus inventarios debido a la falta de integración de sistemas, procesos manuales poco eficientes y capacitación insuficiente del personal. Estas problemáticas pueden generar discrepancias entre los registros y las existencias reales, afectando la toma de decisiones, la disponibilidad de productos y la rentabilidad del negocio.

Este proyecto se implementará en una pastelería que ha experimentado un crecimiento significativo en sus operaciones. A medida que la empresa ha ampliado su alcance y demanda, se han identificado inconsistencias en la administración de su inventario. Aunque la pastelería cuenta con un sistema de gestión diseñado para el control de sus productos, este presenta áreas de oportunidad que requieren ajustes y optimización. La falta de coordinación entre los departamentos de inventarios, finanzas y operaciones ha generado errores en el registro de productos, ocasionando pérdidas, excesos de stock o problemas en el abastecimiento de insumos esenciales para la producción. Además, el uso deficiente del sistema, junto con la ausencia de protocolos claros para la actualización de registros y comunicación entre áreas, ha dificultado la identificación y solución de estos errores. Para abordar esta problemática, se propone un enfoque basado en la optimización del sistema actual, la capacitación del personal y la implementación de protocolos de comunicación efectivos entre los departamentos involucrados en la gestión de inventarios.

La metodología Agile será utilizada como el marco de trabajo para el desarrollo del proyecto, permitiendo la implementación de mejoras de manera progresiva y adaptable. Agile se basa en ciclos iterativos de evaluación y mejora continua, lo que facilita la rápida identificación de errores y la optimización de procesos. A través de esta metodología, se realizarán ajustes y actualizaciones en el sistema de gestión de inventarios, asegurando que las mejoras implementadas respondan a las necesidades específicas del negocio.

Se realizarán observaciones directas para analizar las problemáticas existentes, así como evaluaciones periódicas para medir la efectividad de las mejoras implementadas. Además, la capacitación del personal garantizará que los empleados comprendan y apliquen correctamente los procedimientos establecidos, reduciendo errores en los registros y fortaleciendo la coordinación interna.

El resultado esperado de este proyecto es lograr una gestión de inventarios más eficiente, con registros más precisos y una reducción significativa de errores. A través de la actualización del sistema y la capacitación del personal, se mejorará la trazabilidad de los productos y se minimizarán pérdidas innecesarias. La implementación de protocolos de comunicación permitirá una mejor coordinación entre los departamentos, evitando discrepancias en los reportes de inventario y optimizando la toma de decisiones. De esta manera, la empresa podrá operar con mayor eficiencia, asegurando la disponibilidad de sus productos sin incurrir en costos innecesarios por desajustes en el inventario.

Palabras clave: Gestión de inventarios; optimización; procesos; metodología agile; eficiencia operativa

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Abstract

Inventory control is a fundamental element for the operational efficiency of any company dedicated to the production and sale of perishable goods. However, many organizations face difficulties in inventory management due to a lack of system integration, inefficient manual processes, and insufficient staff training. These issues can create discrepancies between recorded and actual stock levels, affecting decision-making, product availability, and business profitability.

This project will be implemented in a bakery that has experienced significant growth in its operations. As the company has expanded its reach and demand, inconsistencies in inventory management have been identified. Although the bakery has a management system designed for inventory control, it presents areas for improvement that require adjustments and optimization. The lack of coordination between inventory, finance, and operations departments has led to errors in product registration, resulting in losses, overstocking, or supply shortages of essential production materials. Additionally, poor system usage, along with the absence of clear protocols for record updates and interdepartmental communication, has made it difficult to identify and resolve these issues. To address this problem, an approach based on system optimization, staff training, and effective communication protocols between the departments involved in inventory management is proposed.

The Agile methodology will be used as the framework for project development, allowing for the progressive and adaptable implementation of improvements. Agile is based on iterative cycles of evaluation and continuous improvement, facilitating the rapid identification of errors and process optimization. Through this methodology, adjustments and updates will be made to the inventory management system, ensuring that the implemented improvements meet the specific needs of the business.

Direct observations will be conducted to analyze existing issues, as well as periodic evaluations to measure the effectiveness of the implemented improvements. Additionally, staff training will ensure that employees understand and correctly apply the established procedures, reducing errors in records and strengthening internal coordination.

The expected outcome of this project is to achieve more efficient inventory management, with more accurate records and a significant reduction in errors. Through system updates and staff training, product traceability will be improved, and unnecessary losses will be minimized. The implementation of communication protocols will enhance coordination between departments, preventing discrepancies in inventory reports and optimizing decision-making. In this way, the company will operate more efficiently, ensuring product availability while avoiding financial losses due to inventory mismatches.

Keywords: Inventory management; optimization; processes; agile methodology; operational efficiency

Optimización de la metodología PEPS en empresas comercializadoras de productos perecederos para reducir el nivel de merma

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Resumen

El presente trabajo trata de analizar el método PEPS en empresas que se dedican a la comercialización de productos perecederos, ya que el uso de esta metodología en este tipo de empresas requiere de acciones adicionales para que el producto no pase desapercibido al momento de ubicar la mercancía.

Mediante esta investigación se pretende implementar señalización visual que permita al empleado de almacén identificar los productos más fácilmente por fechas de caducidad, esta acción podría mitigar el error humano. Al implementar la mejora en la metodología PEPS para este tipo de empresas no sólo se beneficiará por reducir pérdidas económicas, sino que también se beneficiará positivamente en la calidad y relación con sus intermediarios para garantizar el tiempo de vida correcto para su comercialización.

Palabras clave: Método PEPS; productos perecederos; merma

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Modificación, mejora y digitalización de los procedimientos para el acomodo correcto de nóminas

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Antecedentes

En enero de 1977 se fundó el DIF, cuando comienza la unión del Instituto Mexicano para la Infancia y la Familia (IMPI) y el Instituto Mexicano de Asistencia a la Niñez (IMAN).

Con la fusión del IMPI y del IMAN, se crea un sólo organismo con la responsabilidad de coordinar los Programas gubernamentales de asistencia social y las medidas a favor del bienestar de las familias mexicanas, el cual fomentaba y otorgaba servicios de salud, orientación familiar, rehabilitación, paternidad responsable, actividades cívicas, culturales y deportivas, Desarrollo de la comunidad y alimentación.

El Sistema DIF se integró por un organismo central, el DIF Nacional, que de acuerdo con la Ley sobre el Sistema Nacional de Asistencia Social debe coordinar las actividades en forma y transparencia, así como por 32 Sistemas estatales DIF y los Sistemas municipales DIF Desarrollo Integral de la Familia. ("Gaceta Parlamentaria")

El Sistema DIF Reynosa Central, comenzó sus operaciones en el año 2005. Siendo parte de su infraestructura el Albergue de la Mujer y actualmente en 2024 se construyó el Banco Bienestar.

Contando con Direcciones y Coordinaciones de diferentes instituciones: CRI, CASAS CLUB, GUARDERIAS, CASA DEL ADULTO MAYOR, CASA HOGAR, PANNARTI, CAMEF y CEDIF. (DIF Reynosa, 2021)

Actualmente el sistema DIF cuenta con alrededor de 37 centros que lo componen, de tal manera que no cuentan con el área de Recursos Humanos, únicamente con sus coordinadores.

La ausencia del área en cada centro dificulta varios procesos realmente importantes, tales como el llenado adecuado de las nóminas, su acomodo y su retorno.

Definición del proyecto

El presente proyecto tiene como objetivo principal la optimización y digitalización de los procedimientos operativos con el propósito de minimizar la repetición de tareas, reducir la pérdida de recursos y mejorar la eficiencia en el uso del tiempo, los recursos financieros y los materiales disponibles.

Como parte fundamental de esta iniciativa, se llevará a cabo un análisis exhaustivo de los procesos actuales relacionados con la gestión y entrega de las nóminas. Se evaluarán las mejores prácticas para la distribución de estos documentos, asegurando una organización precisa y eficiente tanto en su entrega como en su posterior retorno. En este sentido, se establecerán mecanismos que garanticen que el papeleo se mantenga en el orden correcto, facilitando su acceso, revisión y archivo, lo que contribuirá a una administración más estructurada y libre de errores.

La implementación de herramientas digitales permitirá automatizar y estandarizar estos procedimientos, agilizando los flujos de trabajo y promoviendo una gestión documental más eficiente y transparente. Esto, a su vez, fomentará un mejor control interno, reducirá la probabilidad de errores administrativos y optimizará la asignación de recursos dentro de la organización.

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Justificación

La modificación, mejora y digitalización de los procedimientos para el acomodo correcto de nóminas es un proyecto necesario y estratégico para el Sistema DIF Reynosa debido a las limitaciones actuales en la gestión administrativa de los 50 centros que lo conforman. La ausencia de un área de Recursos Humanos en cada centro ha derivado en complicaciones como errores en el llenado, desorganización en el acomodo de las nóminas y pérdidas de tiempo en los procesos de envío hacia el sistema central y, posteriormente, hacia Ciudad Victoria.

El proyecto de mejora tiene como propósito principal optimizar los procesos administrativos relacionados con las nóminas mediante la implementación de herramientas digitales y procedimientos estandarizados. De esta forma, se busca reducir retrabajos, errores y la pérdida de recursos financieros y materiales, al tiempo que se mejoran la eficiencia y la transparencia en el manejo de la información.

La singularidad de este proyecto radica en que no solo aborda problemas operativos inmediatos, sino que también fomenta una transformación estructural en los métodos de trabajo. Al digitalizar los procesos, se facilitará la comunicación entre los centros y el sistema central, permitiendo una entrega y retorno de nóminas más ágil y en el orden adecuado.

Esta iniciativa es clave para garantizar la correcta administración del personal, lo cual repercute directamente en la calidad de los servicios que el DIF ofrece a las familias y comunidades de Reynosa. Además, la implementación del proyecto se alinea con las políticas actuales de transparencia y modernización administrativa, promoviendo una mayor rendición de cuentas y eficiencia operativa.

Objetivos

Objetivo general

Fomentar en cada centro la realización correcta de el acomodo, llenado y retorno de las nóminas, disminuyendo así el 30% de recursos humanos y materiales, dentro del período Enero-Abril 2025.

Objetivos específicos

- Optimizar y digitalizar el proceso de acomodo y envío de nóminas mediante la estandarización y documentación de procedimientos en un plazo de 3 meses, asegurando una reducción en errores detectados durante las auditorías internas.
- Capacitar a los coordinadores de los centros del Sistema DIF en el uso de herramientas digitales y en los nuevos procedimientos de gestión de nóminas, en un período no mayor a 1 mes, para garantizar la adopción y correcta aplicación del proceso.
- Reducir los errores en el acomodo y envío de nóminas hacia el sistema central a Ciudad Victoria, durante el primer trimestre mediante un monitoreo continuo y evaluaciones periódicas del proceso.
- Retroalimentar el proceso y llevar su seguimiento continuo dentro del DIF Reynosa.

Límites y delimitaciones

Limitaciones:

Las limitaciones de un proyecto se tratan de factores que condicionan la forma en la que se ejecutan las tareas y se alcanzan los objetivos generales y que debes tener en cuenta durante todo el ciclo de vida de este.

Entre las limitaciones más significativas que podrían impactar la implementación del proyecto destacan las siguientes

La resistencia al cambio representa un desafío importante, ya que el personal de los centros podría tener dificultades para adaptarse a los nuevos procedimientos y herramientas digitales. Esta situación podría generar retrasos en la implementación completa del proyecto, especialmente si no se manejan adecuadamente las inquietudes o dudas de los colaboradores.

Asimismo, existe el riesgo de que la capacitación insuficiente afecte la homogeneidad del aprendizaje y la adopción de los nuevos procesos. Debido a la cantidad de centros involucrados y a las diferencias en los niveles de experiencia del personal, algunos colaboradores podrían no adquirir las competencias necesarias para garantizar el éxito del proyecto.

Finalmente, las restricciones de tiempo también representan una limitante importante. La necesidad de cumplir con un plazo establecido para completar el proyecto podría generar presión sobre el equipo encargado de su ejecución, lo que, a su vez, podría impactar negativamente en la calidad de los resultados y en la atención a los detalles durante las diferentes fases del plan.

Delimitaciones:

Las delimitaciones de un proyecto establecen los límites y alcances del estudio, definiendo qué aspectos se incluyen y cuáles se excluyen. Ayudan a enfocar el trabajo, evitando desviaciones y optimizando recursos. Pueden ser temporales, espaciales, temáticas o metodológicas. Estas precisan el contexto en el que se desarrollará el proyecto para lograr objetivos claros.

El presente proyecto tendrá como ámbito de aplicación los 37 centros que integran el Sistema DIF Reynosa Central, excluyendo cualquier otro sistema DIF municipal o estatal. De esta manera, se concentrará exclusivamente en optimizar los procesos administrativos relacionados con esta área específica.

En cuanto al área de intervención, el alcance del proyecto estará delimitado al acomodo, llenado, envío y retorno de las nóminas. No se incluirán otros procedimientos administrativos ni actividades fuera del objetivo principal de este plan.

El plazo de ejecución se ha definido en un periodo de cuatro meses, durante el cual se desarrollarán fases concretas para garantizar el éxito del proyecto. Estas fases incluyen el análisis inicial, la creación de soluciones, la implementación progresiva y una evaluación final para medir los resultados obtenidos.

Por último, las actividades relacionadas con la capacitación y adaptación del personal se llevarán a cabo dentro del horario laboral habitual, con el objetivo de evitar interrupciones en las operaciones diarias de los centros. Esto asegura que el desarrollo del proyecto no impacte negativamente en el funcionamiento normal de los servicios ofrecidos por el Sistema DIF Reynosa.

Planeación y descripción de las etapas

Mes 1: Diagnóstico y Análisis de Procesos Actuales

Duración: 4 semanas

Objetivo: Evaluar el estado actual de los procesos de acomodo y gestión de nóminas en los centros del DIF Reynosa Central.

Actividades:

- Reunión inicial con los coordinadores de cada centro para discutir los procedimientos actuales.
- Observación directa de los procesos de llenado y acomodo de nóminas.
- Identificación de áreas de mejora y problemas recurrentes.
- Recopilación de documentos e información de nóminas para analizar su manejo y organización.
- Entrevistas con el personal encargado para entender sus retos y dificultades.

Mes 2: Diseño de Procedimientos Mejorados y Manuales de Proceso

Duración: 4 semanas

Objetivo: Crear procedimientos claros y detallados para el acomodo, llenado y envío de nóminas que se alineen con las necesidades del Sistema DIF Reynosa Central.

Actividades:

- Diseño de un formato estandarizado para el acomodo de las nóminas, asegurando la claridad y la organización.
- Redacción de un manual de procedimientos para el llenado y revisión de nóminas.
- Establecimiento de un protocolo para el envío de nóminas a la sede central.
- Desarrollo de un cronograma con plazos específicos para cada actividad dentro del proceso de nóminas.
- Revisión y validación de los procedimientos con los coordinadores y el personal clave de los centros.

Mes 3: Implementación de Procedimientos Mejorados y Capacitación del Personal

Duración: 4 semanas

Objetivo: Poner en práctica los nuevos procedimientos y capacitar al personal involucrado para garantizar su correcta ejecución.

Actividades:

- Realización de sesiones de capacitación para los coordinadores y el personal administrativo sobre los nuevos procedimientos y formatos.
- Implementación gradual de los nuevos procedimientos en todos los centros.
- Supervisión y seguimiento durante la primera aplicación de los procedimientos mejorados para asegurar el cumplimiento.
- Recopilación de retroalimentación del personal sobre las nuevas prácticas y resolución de dudas o problemas.

Mes 4: Evaluación de Resultados y Ajustes Finales

Duración: 4 semanas

Objetivo: Evaluar la efectividad de los nuevos procedimientos y realizar ajustes para optimizar su funcionamiento.

Actividades:

- Revisión de las nóminas procesadas durante el mes para verificar la correcta aplicación de los nuevos procedimientos.
- Entrevistas con los coordinadores y personal para identificar áreas de mejora o dificultades persistentes.
- Ajustes a los procedimientos según las observaciones y resultados obtenidos.
- Elaboración de un informe final con recomendaciones y un plan para la continuación de las mejoras en el futuro.

ACTIVIDADES	TIEMPO EN SEMANAS															
	ENERO				FEBRERO				MARZO				ABRIL			
	S2	S3	S4	S5	S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
Análisis de la problemática dentro del DIF central. Observación directa de los procesos de llenado y acomodo de nóminas.																
Identificación de áreas de mejora y problemas recurrentes.																
Recopilación de documentos e información de nóminas para analizar su manejo y organización.																
Entrevista con el personal encargado para entender sus retos y dificultades.																
Diseño de un formato estandarizado para el acomodo de las nóminas, asegurando la claridad y la organización.																
Establecimiento de un protocolo para el envío de nóminas a la sede central.																
Desarrollo de un cronograma con plazos específicos para cada actividad dentro del proceso de nóminas.																
Revisión y validación de los procedimientos con los coordinadores y el personal clave de los centros.																
Realización de sesiones de capacitación para los coordinadores y el personal administrativo sobre los nuevos procedimientos y formatos.																
Implementación gradual de los nuevos procedimientos en todos los centros.																
Supervisión y seguimiento durante la primera aplicación de los procedimientos mejorados para asegurar el cumplimiento.																
Recopilación de retroalimentación del personal sobre las nuevas prácticas y resolución de dudas o problemas.																
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Entrevistas con los coordinadores y personal para identificar áreas de mejora o dificultades persistentes.																
Ajustes a los procedimientos según las observaciones y resultados obtenidos.																
Elaboración de un informe final con recomendaciones y un plan para la continuación de las mejoras en el futuro.																

Responsabilidad Social y Capital Humano: Ética y Cultura en la Gestión Empresarial

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Resumen

Este artículo examina la interrelación entre la responsabilidad social empresarial (RSE), la ética empresarial y la gestión del capital humano, y cómo estos elementos contribuyen al desarrollo sostenible y competitivo de las organizaciones. Se argumenta que la RSE, más allá de ser una obligación corporativa, es una herramienta estratégica que fortalece la cultura organizacional, promueve la ética en la toma de decisiones y mejora el bienestar de los empleados. A través de la implementación de prácticas socialmente responsables, las empresas pueden no solo mejorar su reputación y posición en el mercado, sino también atraer y retener talento, aumentar la productividad y fomentar un ambiente de trabajo positivo y colaborativo. Además, se destaca la importancia de la ética empresarial como base de la RSE, influyendo en la conducta y decisiones de todos los miembros de la organización. El artículo también explora cómo la cultura organizacional, al estar alineada con los principios de la RSE, puede potenciar el impacto positivo de estas prácticas, promoviendo un entorno laboral que favorezca el desarrollo integral del capital humano. En conclusión, se enfatiza que la integración de la RSE en la gestión empresarial no solo es esencial para el éxito organizacional a largo plazo, sino también para cumplir con las expectativas éticas y sociales del entorno actual.

Palabras Claves: Responsabilidad Social Empresarial (RSE); Ética Empresarial; Capital Humano; Cultura Organizacional; Desarrollo Sostenible; Gestión Empresarial; Productividad

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Ceilings are Everywhere, and They are No Longer Just Made of Glass: Metaphors Around the Most Prevalent Gender Barrier in the Workplace

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Abstract

This paper analyzes a variety of barriers that women face in the workforce, which emerged from the glass ceiling metaphor. An extensive yet not exhaustive list of ceiling metaphors has been provided, collected from different sources to create an integrative perspective of gender barriers in the workplace. The metaphors help explain the invisible obstacles that limit women's possibility of achieving leadership positions. Thirty-two metaphors are briefly described, showing the prevalence of the glass ceiling metaphor.

Keywords: Metaphors; gender; barriers; workplace glass ceilings

I. Introduction

Historically, women have faced numerous barriers in the workplace, most invisible, leading to the idea that these barriers might not exist. These roadblocks have been brought to people's attention through the use of metaphors, especially the glass ceiling.

This paper aims to bring more visibility to the different variants of a metaphor developed almost fifty years ago to help explain that, although great strides have been made towards gender equality, many barriers remain.

The metaphors described in this paper have been collected from various sources. Most of them come from mainstream media and business literature, and the rest from "women talks" with faculty members worldwide and international higher education institution meetings.

Some metaphors have general application, while others depict the barriers of more specific groups. The metaphors provide a general perspective of gender stereotypes, gender bias, penalizations, and obstacles that women face at work.

II. Starting at the Beginning: The Glass Ceiling

The glass ceiling has been the most prevalent gender-related metaphor in the workplace, which helps explain obstacles, barriers, and problems that women encounter when striving to move upward in the workplace. It has become the most influential metaphor that symbolizes the struggle of women to reach top levels of power. It aims to reflect and make visible a limiting approach that considered specific industries and job positions were better suited for men than women, in a world in which women were considered second to men.

Developed nearly 50 years ago, the metaphor is still in use with numerous constant variations. The first time it was used was in 1978, when Marilyn Loden, a management consultant, used it

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in a panel discussion about women's aspirations, recognizing women as a marginalized group (BBC, 2017). The idea of the glass ceiling gained prominence in the 1980s, as more women started entering the workforce with aspirations to obtain leadership positions. As time progressed, this metaphor extended to include the barriers of special groups of women and underrepresented demographics. The glass ceiling has been considered a very rich metaphor, powerful yet problematic, which is the main reason why it is still around (Times Record, 2016).

The original term, glass ceiling, was used to explain an invisible barrier that was positioned over the heads of women working in middle management positions to express the idea that higher-level positions were difficult to achieve. The disadvantages are stronger at the top of the hierarchy and worsen as a woman's career progresses (Purcell et al., 2010).

In 1984, Gay Bryant, the then editor of the Working Woman Magazine, used the metaphor as a quote in *Adweek* and the book *The Working Woman Report: Succeeding in Business in the 80s*. In 1986, a report called *The Glass Ceiling*, written by Carol Hymowitz and Timothy Schellhardt, was published in the *Wall Street Journal*. The report became critical in making the metaphor popular (Times Record, 2016), explaining why women could not rise any higher than middle management regardless of what they did in terms of training, education, self-image, personal appearance, and connections.

In 1991, a request to establish the Glass Ceiling Commission was filed in the US to study how businesses filled management and decision-making positions (National Archives, 1991). In 2004, Carol Hymowitz, again in the *Wall Street Journal*, published an article titled "Through the Glass Ceiling: How These 50 Women Got Where They Are" and why they bear watching.

The idea of portraying the barrier as see-through was because it is so subtle that it can be imperceptible, but it is there creating a structural block. The glass ceiling is said to be more suited to represent educated white women (Times Record, 2016), although its reach has expanded substantially. It has taken different forms by including cultural challenges of various groups of women who have seen their careers stagnate in middle management roles. The metaphor has spawned a wide raft of related executive hurdles made of glass (Williams, 2016), as well as other types of ceilings which are presented in this paper. This metaphor is not official policy but part of the organizational culture based on stereotypes regarding gender roles, gender bias, and unconscious bias.

III. Novel Ceiling Metaphors

Around the world, the glass ceiling metaphor had an impact, and it started to be used with cultural nuance, as well as sector or industry-specific characteristics. Different barriers expressed through the ceiling metaphor have been collected from around the world to increase awareness of the prevalence of this barrier even today.

In Europe, it was only in 2000 that the lack of women in management positions began to be analyzed as a public problem, and the number of gender metaphors developed to talk about this issue grew (Marry et al., 2017).

Because the glass ceiling metaphor has been one of the most used to explain gender issues in employment, new metaphors under the idea of "ceiling" have been developed to describe particular issues of certain groups of women or minorities, and specific employment sectors. It is important to highlight that these ceilings are neither homogeneous nor unalterable (Marry et al., 2017).

The metaphors of the novel ceilings can be classified in multiple ways: based on physical characteristics such as height, resistance, and thickness; the material they depict, such as lead, brass, cement, grass, bread, and others; or used to express the difficulties in crossing them, which can be soft, hard, or impenetrable. They can also be separated based on the specific sector they belong to and the ethnic groups they represent.

The metaphors that were collected are presented in alphabetical order in Table 1.

Table 1: Gender Related Metaphors in the Workplace and their Use

Metaphor	Group depicted/ barrier characteristics
Bamboo ceiling or rice bowl ceilings	Asian women
Bread ceiling	Women in philanthropy
Black glass ceiling	African-American women
Brass ceiling	Women in the military
Brown glass ceiling	Indigenous women of the South Pacific
Canvas ceiling	Migrant and refugee women
Celluloid ceiling	Women in the film industry
Cement ceiling	Women in the Arab world
Concrete ceiling	African-American women, especially in law
Culinary glass ceiling	Women in the hospitality and food industries
Disability ceiling	Women with disabilities
Ethnic ceiling	Barriers to specific ethnic groups
Expatriate glass ceiling	Women who accompany their partners in long-term international assignments
Grass ceiling	Women in agriculture and female sports
Gossamer ceiling	Soft, flexible barrier that can be seen and crossed
High ceiling	Unreachable barriers
Iron/steel ceilings	Latin women in the workplace
Ivory ceiling	Women in academia
Lead ceiling	Accumulation of discriminations
Mirrored ceiling	Female university students
Mosaic ceiling	Women's experiences as building blocks
Perspex ceiling	Women in industry
Pink, lavender, and rainbow ceilings	LGBTQ+ groups in the workplace
Plexiglass ceilings	Unbreakable racist barriers
Saran wrap ceiling	Stretchable barriers
Second glass ceiling	Women entrepreneurs, women forced out before retiring
Silver ceiling	Aging women in the workplace
Sound ceiling	Women in the music industry
Stained glass ceiling	Women in religious organizations
Thick, wide ceiling	Harder and almost unbreakable barriers
Triple glass ceiling	Women in Fintech
Veil ceiling	Women in fashion

Source: Developed by the authors, 2025

The metaphors are briefly described to explain their use and application. As can be observed, certain metaphors can be used in more than one way.

Bamboo Ceilings or Rice Bowl Ceilings

Bamboo is a plant that grows very quickly and becomes very thick, and its leaves are very sharp and almost impenetrable. Bamboo ceilings represent anti-Asian racism. This metaphor is used to explain that Asian women in international companies or women of Asian origin in companies in a country of residence other than their country of origin are the least likely to be promoted. Traditionally, Asian values of respect for authority, collectivism, control, and modesty are also

considered a disadvantage (Hyun, 2005). Thus, people from East Asian countries or Asian Americans who constitute a minority are placed in roles that make them invisible.

Bread Ceiling

The bread ceiling is a positive metaphor for the philanthropy sector. It refers to a soft ceiling that women can easily cross, and in doing so, they generate a spillover of benefits for other employees, organizations as a whole, and even society. It was developed by the Observatory for Competitiveness and New Ways of Working at UPAEP University (2025).

Women are starting to play a significant role in philanthropy. More women are holding leadership roles in non-profit organizations, breaking numerous barriers, making important decisions, and becoming stronger than men in this particular field, especially in fundraising for charities. The previous male leadership is not mirrored; women are creating their personal brand in philanthropy.

Black Glass Ceiling

The experiences of African American women who are ignored in organizations are expressed through this metaphor (Sepand, 2015). It is about the barriers to career progression due to double discrimination. African American women in employment have a constant need to prove themselves without support from management due to organizational culture, policies, and practices (Khosroshahi, 2021). Women in these conditions work twice as hard to succeed, which leads to burnout. Due to certain stereotypes that include communication patterns, women are categorized as being overly emotional and loud. The metaphor is explained as the feeling of being inside a bunker without the possibility of feeling the sun.

Brass Ceiling

Historically, military leadership is associated with a male figure, and the higher the rank, the more brass ornaments are seen on their uniforms. Even great leaders have been called “top brass”. The brass ceiling is a term used in the military and represents the obstacles to the progression of women’s careers in the armed forces, based on both cultural and structural barriers where certain groups cannot achieve upward mobility (Iskra, 2008).

Even though there has been significant progress in inclusion policies in the highest ranks of the American military, there are still certain barriers in the way of selecting leaders, such as their previous participation in combat leadership positions, whether in the infantry, cavalry, or in positions such as Sergeant Major or Commander. Many women, by their own decision, prefer to work in areas other than combat, which immediately eliminates them from possible promotions (Grossman, 2013). Knowing that they will not be promoted or that their opportunities are limited causes many women to leave the armed forces before retirement, affecting not only the number of women in positions of authority but also their general participation (Dicther & True, 2015). In addition, there is dissatisfaction due to other experiences of the gender condition in the armed forces, such as interpersonal violence and harassment, that also affect the decision to leave jobs abruptly. Of the women who remain, almost all reach retirement age before a major promotion.

Brown Glass Ceilings

This metaphor reflects the experiences of Pacific Islands women who are minimized by their cultural identity and limited in advancing their aspirations (Mesui, 2019), which constitutes systemic discrimination. The metaphor was developed to help understand the challenges and struggles of women with brown skin, including Maori and women of Asian descent, who have experienced pay gaps, discrimination, and a slower or limited career progression. In many cases, these are migrant women; therefore, in this metaphor, gender, race, and ethnicity intersect. These traits are not the same for all women in this group because of social identities (Monolagi, 2021).

Canvas Ceiling

The canvas ceiling is used to describe temporary refugee and migrant tent camps in precarious conditions and extreme marginalization, reflecting the obstacles migrants face in obtaining meaningful jobs in host countries. This also reflects the systematic and multi-level barriers refugees face as a workforce in achieving career advancement, particularly for women (Lee et al., 2020). This metaphor is a wake-up call to recognize the value of refugee and migrant women's talents, especially their determination, grit, and ability to rebuild their lives.

Celluloid Ceiling

This metaphor is called the celluloid ceiling because this material, derived from cellulose, is used in the photography and film industry and refers to the conditions of women filmmakers, especially in Hollywood, although similar situations are reported in countries such as India. This barrier serves to explain the limited number of women hired in the industry in various positions, as well as hostile conditions, discrimination, and continuous harassment (ABC News, 2018), and the peripheral roles in which they were placed for years, as an ornament or as victims who had to be saved and not in positions of influence. The nominations for the various Film Academy Awards show the absence of women in multiple fields. It is not exclusively an employability problem; it is a cultural issue (Lauzen, 2020). The directors of most Hollywood films are white men; therefore, this is the vision or perspective from which the films are presented. Women have begun to make their way, especially in independent cinema, and various studies have shown that a greater participation of women as directors affects the number of women employed as creatives, lighting technicians, and writers, among others. Recent cases, such as the success of the director of the film *Barbie*, Greta Gerwig, show that it is possible to break through the celluloid ceiling.

Cement Ceiling

Women in the Arab world have been considered the "third billion" in the sense that they are a very large population who will be claiming their place as employees, producers, and entrepreneurs in the global economy by 2030. Although they are scattered around different countries, they are searching for opportunities (Sabbagh, 2012). However, since many of them have not been prepared in terms of education, worldview, and especially freedom, they have been kept away from possible top jobs.

Concrete Ceilings

This impenetrable barrier is an example of the limitations faced by women who belong to other minorities. It refers to a visible and impossible-to-overcome barrier faced, in particular, by African-American women and women of different ethnic backgrounds. In a strict sense, it is a double discrimination: by gender and by race or ethnicity. Unlike the glass ceiling, where what is above can be seen, with the concrete ceiling, you cannot see what is above or even know that there is something above, which prevents many women from even seeing the opportunities. African-American women, for example, are underrepresented in high-level positions (Khosroshahi, 2021).

Culinary Glass Ceiling

Hospitality and catering services are spaces with a large female population, and women are widely represented in the workforce, although this does not happen at management levels. In high-level positions such as executive chefs, there is still great discrimination in haute cuisine (Albors-Garrigos, 2021). The Michelin guide is an example of this. Due to the military origins of professional cooking, male chefs have predominated even though cooking at home is predominantly a female task. When women want to set up their own restaurants, they often face financial restrictions.

Disability Glass Ceiling

Workers with disabilities are less likely to hold managerial positions than their non-disabled counterparts. People with mental health problems are the least likely disabled group to hold managerial positions across all sectors because of low productivity expectations, perceptions of people with disabilities as occupational hazards or dependent and needy (Lengnick-Hall, 2008), and their presence in the workplace being considered as a cause of “existential anxiety” in others.

Ethnic Ceilings

They are used for ethnic minorities and serve to contextualize the gaps that exist when women of certain ethnicities try to advance in their professional careers and are stigmatized. There are very different ethnic categorizations, such as visible minorities, indigenous, and aboriginal, among others, and in different regions, ethnicities are used to explain social categories of the population linked by race, language, nationality, food, and cultures that distinguish them from others through significant patterns. Within these ceilings, those that refer to skin color, Indigenous, and Aboriginal people stand out, with some of the most specific cases being that of Aboriginal women in Australia. Gender biases within ethnic groups do not allow women to develop their full potential at work (Diehl et al., 2023).

Expatriate Glass Ceiling

In couples where the man is the main breadwinner, and the woman also works, if the former has opportunities for growth through an assignment abroad, as an expatriate, the woman will simply become a “companion” and will have a secondary and passive role (Braithwaite, 2020). The professional career of the partner is prioritized and the other (usually the woman) is subordinated so that the man can advance professionally (Barnes, 2024). Women are the most negatively affected because they will not have a support network. Men are guaranteed a work structure. In most cases, in international movements and depending on the destination country, they will not have a work permit.

Gossamer Ceiling

Biology is incorporated into this metaphor to describe a barrier that is different from glass ceilings, which are rigid and have a certain thickness. Thus, the membrane ceiling is used to explain an obstacle that is not really a barrier but an abstraction, like a spider web or a thin and delicate fabric, made of a permeable material that can be moved in the search for professional growth (Browne, 2002). Apparently, women perceive it, but it is not so rigid as to prevent women who wish to cross it.

Grass Ceiling

The grass ceiling is a metaphor developed to explain the difficulties faced by women in accessing leadership positions in the agricultural sector. The metaphor was developed in the EU Horizon Europe program and refers to the conditions that prevent women from developing innovations in agriculture and participating in the development of the industry (Dabkiene et al., 2025). This metaphor has also been used to describe the inequalities in coverage of women's achievements in sport in Australia, as well as the low presence of women as leaders of teams and organizations linked to sport (Broderick, 2010).

High Ceilings

High ceilings help express the idea that there might be an opportunity for women in the workplace, but that it has been placed too high for them to access, and that without help or the proper tools, such as a ladder, reaching the goal might be impossible, although it can be seen

constantly. Having a goal that is a constant reminder of something a woman cannot reach alone can lead to frustration or burnout. On the other hand, it can also help create a network that can help women get there.

Iron/Steel Ceilings

This metaphor describes the barriers Latinas face when accessing high-level positions. It has also been used to uncover opaque and impassable ceilings in some organizations (Brumley, 2014). The barriers are more dense and more difficult to cross. The majority of large Latin American companies do not have even one woman on their board of directors. The gender gap in terms of wages and job quality is substantial. There is a lack of respect and dignified treatment for Latin women leaders due to cultural beliefs (Fuentes, 2014).

Ivory Ceiling

The ivory tower, coupled with gender, is the origin of this metaphor, which is represented as the glass ceiling of the ivory tower. The ivory tower is related to the intellectual function of the academy, and it was criticized for being in a state of privileged isolation from the aspects of real life or disconnected in some way. The academic community was considered the ivory tower, and the metaphor is still associated with it, even though universities are now more closely linked to the context. It also serves to explain the imbalance between the number of male directors, vice-chancellors, and rectors in the councils and governing boards of academic institutions. This metaphor is most frequently used in populations of African-American and Asian female employees in the academic world.

Lead Ceiling, Lead Sky, Lead Layer

The lead ceiling is used particularly in France to describe the accumulation of discriminations and small differences that occur from the beginning of a woman's professional career and which, over time, become significant gaps with respect to men in the workplace (Marry & Jonas, 2005; Schweitzer, 2009; Rabier, 2016). The metaphor has also been used to explain that the glass ceiling is becoming heavier. Women are not even able to enter the C suite, let alone progress into leadership. It has also been used to refer to the weight that aging women carry when they are unable to effect change with their existing employers and as a mid-life barrier in employment leading to mandatory early retirement (Owen Hussey et al., 2016)

Mirrored Ceiling

The mirrored ceiling is a representation of the reflection of young female students' expectations regarding the gender issue (Bates & Holt, 2021). This metaphor serves to conceptualize the way in which perceptions of gender inequality in the labor market are reflected and influence the professional aspirations of young women at the critical moment in which they choose their future. This reflection has led them to avoid certain sectors when choosing a job. These ideas are shared among women and significantly affect their professional career planning, and they are aware of the barriers they will face even before entering the labor market.

Mosaic Ceiling

The mosaic ceiling is a recent metaphor that explains what can be achieved when several women break the glass ceiling. Breaking glass ceilings is seen in a positive way, indicating that glass can take many forms and that each person chooses how they see it. It can be made visible to bring about changes, it can be broken or destroyed, and it can also be built. Every time a woman breaks a glass ceiling, many pieces of glass remain that, if recovered from different experiences, can create a work of art of what women could expect from their future work. Their own experiences

and actions. The metaphor also reflects a more colorful ceiling for Arab women to break (Feiner & Golley, 2012).

Perspex Ceiling

This barrier is said to be made of an acrylic resin that can be substituted for glass in industrial processes and is therefore used to exemplify the barriers faced by women in the industrial sector. It has been estimated that three-quarters of women in the manufacturing industry have never been promoted or offered better pay. They have also been denied the possibility of returning to work part-time after becoming mothers (Burke, 2011). The most important report on the subject was developed in 2023 and it analyzes the illusion of inclusion through this metaphor in the Australian market (The F 5 Collective, 2023).

Pink Ceiling, Lavender Ceiling, and Rainbow Ceilings

A variety of metaphors are used to explain the barrier based on a system of prejudices that causes inequalities in the LGBTQ+ community in terms of employment (Federo, 2024; Czyzselska, 2002). These metaphors aim to make visible LGBTQ+ members who are rejected from jobs because of their sexual orientation, and, as a result, many of them end up hiding it, which can lead to imposter syndrome. This ceiling is stubborn and hard to bear and has held back LGBTQ+ people at work. Although a lot of progress has been made, they are surprisingly underrepresented in most senior positions (McCay, 2024).

Plexiglass Ceilings

This metaphor refers to transparent (invisible) ceilings that cannot be easily broken, like glass, which can be broken with a single blow. Plexiglass can be scratched, but its condition remains intact despite being hit, however, with the necessary amount of constant pressure - which requires great effort - it can break (Yamagata-Noji, 2005). This metaphor has been used to describe the barriers of institutions with policies and behaviors that reinforce racism and sexism (Oliver, 2021). In the case of racist barriers, it is stated that glass barriers reflect the lived experience of white women, and plexiglass barriers are used to exemplify the obstacles faced by African-American women.

Saran Wrap Ceilings

In casinos and the gambling sector, male groups persist in management, such as the old boys networks. In this industry, there is no such thing as a glass ceiling, where when a woman breaks it, the barrier is removed for others. In this case, when a woman wants to cross it, the plastic is stretched but does not break, nor does a space open through which she can pass (Costen et al., 2003). The ceiling cannot be shattered, and therefore, few women gain access to the highest positions. Most of them end up in traditional female jobs, making less money than their male counterparts.

Second Glass Ceiling

There is evidence of a second barrier which forces women out of the workforce before they are able to retire (Hayes, 2023). This metaphor has been used in different ways, including evaluating potential women leaders for a position, and re-evaluating them even though they had passed with flying colors the first time and they have all the required skills, but new requirements are added to keep them away from promotions (Gabaldon et al., 2023).

This sometimes occurs with women entrepreneurs, those who own small businesses and are in need of capital and cannot grow and achieve their full potential because the entrepreneurial ecosystem is determined by men; an example of this is the startups (Bosee & Taylor, 2012).

Silver Ceilings

Silver ceilings combine two barriers, ageism, and beauty, and refer to the implicit limits on those over 50 who are "entering" old age, even when it is very early. It started in the entertainment industry, where the metaphor was developed, although its use has extended to any profession where women face discrimination based on age. In particular, in the cinema, the high unemployment of older women is analyzed, while a considerably higher proportion of men remain employed, mainly due to beauty standards. This situation has forced numerous actresses and women in different fields to undergo cosmetic surgery to adhere to social norms regarding appearance (Tolkoff, 2001). In other sectors, this metaphor also explains the exodus of women from the workplace at a time in their lives when they would be ready to take on positions of greater authority, having fought against sexism, learned to assert their opinions and negotiate better salaries, but their vision of the future does not align with the desired future in companies. When older women resign, they do so in an environment of silence.

Sound Ceiling

The music industry is reflected in this barrier because women are more likely than men to experience financial challenges and risks. In many cases, female artists are sexualized and suffer scrutiny for their performance, style, and body, and are criticized for the content of their songs. The visibility of women in the industry is considerably reduced with age, and there is a double standard for evaluating men and women in the industry. There are very few women producers and because they have to work much harder to obtain a position, many women in the industry are never heard of (Arellano, 2019).

Stained Glass Ceilings

Stained glass ceilings are used to illustrate the barriers women face in professional careers in religious organizations (de Gasquet, 2010). They still don't have a lot of presence in leadership positions. Women are more involved than men in terms of participation in religious congregations; however, they occupy few positions of importance. Women tend to be relegated to lower-ranking clerical positions than men. The fact that the ceiling is made of colored glass and not clear glass makes it more visible, indicating that the barrier is not kept hidden (Adams, 2007). Additionally, stained glass is generally associated with religious issues. This barrier has also been linked to glass cliffs through the so-called stained glass cliffs, as in times of crisis or conflict some women have been appointed to leadership positions with the idea that there is nothing to lose (Carrington, 2019).

Thicker Ceiling

Thicker ceiling is a metaphor that helps explain barriers that become harder, if not impossible to cross. During her presidential campaign, Hilary Clinton alluded to "thicker ceilings" to explain what lay ahead for her (Hyong-Ki, 2018). Also, this metaphor is used to explain that the glass ceiling is not the same for everyone and that certain groups, such as Latin Americans and African Americans, have fewer possibilities to access the C suite and that they will normally get stuck earlier in their careers, in the first layer of management (Harts, 2019)

Triple Glass Ceiling

This glass ceiling refers to the intersection of gender inequalities in the financial, technological and entrepreneurial sectors in Fintech. This is due to the male dominance in these fields, which has a multiplying effect on the systematic exclusion of women in Fintech that begins in primary education (Fox-Robertson and Wojcik, 2024).

Veiled Ceilings

There are invisible barriers in the fashion industry, and even when fashion is feminine, it is a male-dominated world (Palumbo, n.d.), and women are not represented in major brands as often as men. There is an undeniable lack of inclusivity in the fashion world, as even when fashion is greatly focused on women, and women are a great proportion of the models, this industry has unrealistic work expectations for women, especially those with family responsibilities.

IV. Conclusion and Further Research

The metaphors presented here depict only those related to ceilings. The number of ceiling-related metaphors is quite likely to increase as the glass ceiling has been the most used gender-related metaphor in history.

Many more different metaphors have been identified based on the glass component instead of the ceiling component, and others have been created to depict specific gender conditions in certain countries, industries, and sectors. So far, the study has been based on a literature review; further analysis will include surveys of women in different sectors in Latin America to determine which are the most prevalent metaphors in the region.

Hopefully, as gender equality gains traction, novel metaphors for referring to diversity and equality in positive ways will be created.

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La percepción de la responsabilidad social de alumnos de Instituciones de Educación Superior (IES) de Nuevo Laredo Tamaulipas en relación a promover acciones para prevenir el cambio climático

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Resumen

El cambio climático es un desafío global apremiante que exige la participación activa de todos los sectores de la sociedad, incluyendo las Instituciones de Educación Superior (IES). Estas instituciones tienen la responsabilidad de formar ciudadanos conscientes y comprometidos con la sostenibilidad, capaces de liderar acciones para mitigar los efectos del cambio climático. Esta investigación se enfoca en explorar la percepción de la responsabilidad social (RS) que tienen los alumnos de las IES de Nuevo Laredo, Tamaulipas, en relación con la promoción de acciones para prevenir el cambio climático.

El estudio busca comprender cómo los estudiantes de las IES de Nuevo Laredo conciben su papel en la lucha contra el cambio climático. Se analizará si los alumnos se sienten responsables de tomar medidas para reducir su huella de carbono, promover prácticas sostenibles en su vida diaria y participar en iniciativas a favor del medio ambiente. Además, se explorará si existen diferencias en la percepción de la RS entre estudiantes de diferentes IES, carreras o semestres.

La investigación se basa en una metodología mixta que combina enfoques cuantitativos y cualitativos. Se aplicará una encuesta a una muestra representativa de alumnos de las IES de Nuevo Laredo para medir su nivel de conciencia sobre el cambio climático, su percepción de la RS y su disposición a participar en acciones de prevención. También se realizarán entrevistas en profundidad con estudiantes para explorar sus opiniones, experiencias y motivaciones en relación con la prevención del cambio climático.

Los resultados de esta investigación permitirán identificar las fortalezas y debilidades en la percepción de la RS de los alumnos de las IES de Nuevo Laredo en relación con el cambio climático. Esta información será valiosa para diseñar e implementar estrategias educativas que fomenten la participación activa de los estudiantes en acciones de prevención y mitigación del cambio climático.

Se espera que este estudio contribuya a generar conciencia sobre la importancia de la RS en la lucha contra el cambio climático y a promover la participación activa de los estudiantes en la construcción de un futuro más sostenible en Nuevo Laredo y más allá.

Palabras clave: Cambio climático; responsabilidad social; estudiantes universitarios

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Abstract

Climate change is a pressing global challenge that demands the active participation of all sectors of society, including Higher Education Institutions (HEIs). These institutions have the responsibility to train conscious and committed citizens with sustainability, capable of leading actions to mitigate the effects of climate change. This research focuses on exploring the perception of social responsibility (SR) that students of HEIs in Nuevo Laredo, Tamaulipas, have in relation to promoting actions to prevent climate change.

The study seeks to understand how students of HEIs in Nuevo Laredo conceive their role in the fight against climate change. It will be analyzed if students feel responsible for taking measures to reduce their carbon footprint, promote sustainable practices in their daily lives and participate in initiatives in favor of the environment. In addition, it will be explored if there are differences in the perception of SR among students from different HEIs, careers or semesters.

The research is based on a mixed methodology that combines quantitative and qualitative approaches. A survey will be applied to a representative sample of students from HEIs in Nuevo Laredo to measure their level of awareness about climate change, their perception of SR and their willingness to participate in prevention actions. In-depth interviews will also be conducted with students to explore their opinions, experiences and motivations in relation to climate change prevention.

The results of this research will allow identifying the strengths and weaknesses in the perception of SR of students from HEIs in Nuevo Laredo in relation to climate change. This information will be valuable to design and implement educational strategies that promote the active participation of students in actions of prevention and mitigation of climate change.

It is expected that this study contributes to raise awareness about the importance of SR in the fight against climate change and to promote the active participation of students in the construction of a more sustainable future in Nuevo Laredo and beyond.

Keywords: Climate change; social responsibility; university students

Análisis del consumo de sustancias nocivas en estudiantes de una universidad en el noreste de México

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Resumen

El objetivo de esta investigación es determinar qué variables sociodemográficas, económicas y emocionales influyen en la probabilidad de consumo de sustancias nocivas en estudiantes de una universidad en el noreste de México. Se usaron datos a partir de una encuesta aplicada a una muestra aleatoria de 240 estudiantes, y se estimó un modelo econométrico Logit binario. Los resultados indican que los estudiantes consumen con mayor frecuencia bebidas alcohólicas y tabaco, y en menor medida la marihuana. Las estimaciones del modelo Logit muestran que los factores que aumentan la probabilidad de consumir sustancias nocivas fueron: el ingreso del estudiante, el entorno social bueno con amigos y compañeros, y cuando existen consumidores frecuentes de sustancias nocivas dentro del hogar; en cambio, se reduce la probabilidad de consumir sustancias nocivas cuando el estudiante es del sexo hombre y vive en un entorno familiar bueno. Asimismo, se identificó que la edad, el promedio académico, el estrés y ansiedad, así como practicar actividades deportivas y culturales no influyen estadísticamente en el consumo de sustancias nocivas.

Palabras clave: Sustancias nocivas; estudiantes universitarios; alcohol

Analysis of Toxic Substance Consumption in Students of a University in the Northeast of Mexico

Abstract

The objective of this research is to determine which sociodemographic, economic and emotional variables influence the probability of toxic substance consumption in students of a university in the northeastern Mexico. Data from a survey applied to a random sample of 240 students were used, and a binary Logit econometric model was estimated. The results indicate that students consume alcoholic beverages and tobacco more frequently, and marijuana to a lesser extent. The Logit model estimates show that the factors that increase the probability of toxic substance consumption were: the student's income, a good social environment with friends and peers, and when there are frequent consumers of toxic substances within the home; on the other hand, the probability of toxic substance consumption is reduced when the student is male and lives in a good family environment. Likewise, it was identified that age, academic average, stress and anxiety, as well as practicing sports and cultural activities do not statistically influence the consumption of toxic substances.

Keywords: Toxic substance; university students; alcohol

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