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**Journal of Accounting, Finance,
Economics, and Social Sciences**

Publisher

CamEd Business School
Phnom Penh, Cambodia

Printer

CamEd Business School
Phnom Penh, Cambodia

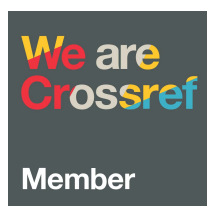
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Printed at

CamEd Business School
64 Street 108, Phnom Penh, Cambodia
Phone: (855)-23 986 522

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Contents

1	Strengthening National Competitiveness: The Evolution of Economic Clusters in Egypt <i>Karim Hamza</i>	1
2	Exploring ESG Dimensions in Cambodia: Findings from Various Industries <i>Huseyin Güngör</i>	15
3	The Rise in Food Prices and the Export of Milled Rice in the Greater Mekong Subregion <i>Rido Thath</i>	29
4	Positive Effects of Perceived Quality of Parent-Adolescent Communication on Academic Motivation and Achievement of Adolescents <i>Ron James D. Ortiz, Melissa P. Ferido, Rufo Gil Z. Albor, Inero V. Ancho, Abriel S. Bulasag, Phrygian P. Almeda, Kylie Embree F. Celzo</i>	39

Strengthening National Competitiveness: The Evolution of Economic Clusters in Egypt

Karim Hamza  *

ABSTRACT

Purpose: This paper examines the evolution of clusters and economic zone policies in Egypt and assesses their role in improving national competitiveness. Further, it provides insights to developing countries like Egypt on how to strengthen their national competitiveness by effectively leveraging clusters and economic agglomeration policies, such as economic zones.

Methodology: The paper critically analyzes existing literature on modern cluster policies and economic zones, illustrating the evolution of economic cluster policies in Egypt. It also evaluates the contribution and impact of economic zones on improving national competitiveness.

Findings: Despite recent policy reforms in implementing an economic cluster-based strategy, particularly economic zones, several constraints prevent these economic zones from fully reaching their potential to attract foreign investment and address the national trade deficit in Egypt. While these economic zones increased exports, they didn't sufficiently reduce the national trade deficit. Moreover, the Egyptian Government faces an increasing challenge in maintaining Egypt's position as a leading investment destination in North Africa and the wider region, mainly in front of the face of the increased competition from other emerging economies.

Implications: Egypt's recent attempts to implement an economic cluster-based strategy for enhancing national competitiveness highlight the need for closer alignment between the country's economic national strategies, including Egypt's Vision 2030, National Investment Plan, Trade and Industry Development Strategy 2016-2020, and National SME and Export Development Strategies, with the objectives of the economic zone.

Originality: This study contributes to understanding how to strengthen national competitiveness in developing countries by examining the evolution of clusters and economic zones in Egypt. It provides valuable insights for academic researchers and policymakers seeking to enhance national competitiveness through strategic economic policies.

Limitations and directions for future research: Further research on the impact of economic clusters on leveraging national competitiveness in Egypt could significantly improve related policymaking. Comparative analyses of other countries' experiences could also provide valuable lessons for policy formulation.

Keywords: National competitiveness; Clusters; Economic agglomeration; Economic zones; Egypt; Economic reform; Developing countries; Emerging economies

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Publisher: CamEd Business School
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INTRODUCTION

Different nations use clusters and economic zones as pivotal policy instruments for enhancing national and regional competitiveness, particularly in developing countries. Regional economic clusters play a vital role in formulating collective strategies to address shared economic and social challenges, thereby bolstering both national and regional competitiveness. Moreover, countries often find mutual benefit in pooling resources to cultivate robust clusters or facilitate cross-border cluster cooperation, exemplified by initiatives like the Arab League or Central Europe (Izsak & Meier zuKöcker, 2016).

Egypt has a rich history of implementing the concept of economic clusters, dating back to the era of Mohamed Ali during the first industrial revolution. Notably, Egypt emerged as a prominent global producer of cotton, to the extent that a dedicated stock market for the cotton sector was established (Karakoç *et al.*, 2017). Egypt currently hosts various economic agglomeration areas, including organic clusters, free zones, qualified industrial zones, and investment and technology zones. The country has recently developed a series of mega special economic zones such as the Suez Canal Economic Zone, Golden Triangle Zone, and Land Reclamation of 1.5 million Acres.

This study aims to assess Egypt's cluster and economic zone strategies and illustrate how these policies can strengthen national competitiveness (Mori, 2017; Egyptian Industrial Development Authority, 2022). Through a critical analysis of Egypt's modern cluster policies and economic zones, the study seeks to identify the potential role of these policies as strategies for enhancing national competitiveness in Egypt. It endeavors to assist developing countries like Egypt in understanding the drivers of improving national competitiveness and effectively leverage clusters and economic agglomeration policies, such as economic zones (UNIDO, 2016; Fleig, 2000; Farole, 2011).

Consequently, these policies can serve as strategic economic development tools to enhance national competitiveness at various levels, including industry, country, or region. They have the potential to stimulate economic growth, address the escalating global competition for attracting foreign investment, augment the country's market share in global trade,

and align with international competitiveness standards (Ketels *et al.*, 2012; Berger, 2008; Garelli, 2005).

This paper comprises four sections, including an identification of the main concepts, definitions, and types of clusters and economic agglomeration, reviewing the evolution of clusters and economic zones in Egypt, assessing Egypt's modern economic zones, and providing recommendations for policymakers on how to effectively utilize clusters and economic zones to improve the development of national competitiveness.

CLUSTERS AND ECONOMIC ZONES

The introduction of clusters and economic zones dates back to the 18th century, undergoing frequent evolution as comprehensive strategies for fostering economic growth. Successful implementations in countries/regions like China, South Korea, the European Union, and the Asian Tigers underscore their importance. They represent a comprehensive approach to directing government policies toward creating the foundations for economic growth (Marshall, 1961; Porter, 1990; Korhonen & Snäkin, 2005).

Economic clusters and zones generally represent geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field. Based on their specific characteristics and focus, these clusters are categorized into different types of economic zones (Andersson *et al.*, 2004; Benner, 2012). Table 1 presents the main types of economic clusters.

- 1. Industrial Park (IP):** The IPs are designated areas tailored for industrial development, providing infrastructure and support services to attract manufacturing and industrial businesses (World Bank, 2017; Falcke, 1999).
- 2. Special Economic Zone (SEZ):** The SEZs are geographically delineated areas offering incentives and regulations to attract foreign investment and foster economic development (Mugano, 2021; Ishida, 2009).
- 3. Eco-Industrial Park (EIP):** EIPs promote sustainable industrial development by integrating environmental considerations into industrial processes (UNIDO, 2017).

4. Technology Park (TP): TPs are specialized zones that foster innovation and technology-driven industries, facilitating collaboration and commercialization of R&D outcomes (Wessner, 2009).

5. Innovation District (ID): IDs are urban areas that promote innovation, entrepreneurship, and knowledge-based economic activities (UNIDO, 2015).

Table 1: Main Types of Economic Clusters

	Industrial Park (IP)	Special Economic Zone (SEZ)	Eco-Industrial Park (EIP)	Technology Park (TP)
Definition	An area developed to provide common facilities for the use of a group of industries	Designated estate where special regulations apply for trade laws, such as tariffs, quotas, or duties differ from the rest of the country	Seeking to enhance environmental and economic performance by collaborating in the management of environmental and reuse issues	Promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions
Defined by	Alfred Marshall's (1893) and UNIDO (1997)	Farole & Akinci, 2011	United States Environmental Protection Agency (USEPA)	The International Association of Science Parks (IASP)
Concept emerged	1890	1960	1970	1990
Objectives	Industrial development	Export and trade	Sustainability and environment	Market lead
Stage	Factor driven	Efficiency driven	Efficiency driven	Innovation-driven
Approach	Top-down	Top-down	Top-down and/or Bottom-up	Top-down or Bottom-up
Aim	Basic	Development	Efficiency	Improvement
Markets	Domestic and export	Mainly export	Domestic and export	Domestic and export
Location	Non-urban areas	Port of entry	Nation-wide	Around cities
Developing countries	Basic mechanism for economic development	Main mechanism for attracting investment and FDI	Secondary importance for economic development	Few trials with fewer results
Examples	Industrial zones	Shenzhen, Singapore, Dubai	Kalundborg in Denmark	Silicon Valley
Need	Low stage of economic development	Looking for global trade	Stronger environmental regulations	Compete in the knowledge economy

Source: Author's interpretation

Each economic cluster serves a specific purpose and targets different industries or economic activities. By providing specialized infrastructure, incentives, and

support services, these zones aim to attract investment, foster innovation, and drive economic development in their respective areas (Wolman & Hincapie, 2015; Brenner & Gildner, 2006).

Clusters and economic agglomeration policies, including economic zones, are recognized as important drivers for economic development, enhancing national competitiveness and economic performance (Marshall, 1961; Porter, 1990; Porter, 1996). These policies aim to develop specialized expertise, services, and resources within concentrated economic activities, creating competitive advantages for specific regions (Marshall, 1961; Porter, 1990; OECD, 2020; OECD, 2020). Countries and regions globally compete to provide the best clusters and economic zones to attract foreign investment and facilitate business growth (Innova & Inno, 2008; Porter, 1996; OECD, 2007).

Despite their potential benefits, many countries have faced challenges in realizing the full potential of cluster and economic zone policies. Rapid and continuous changes in the global economic environment, coupled with rising global economic and social challenges, have made it difficult for developing countries to increase their share in global trade using traditional economic strategies (Amado, 1989; Akinci & Crittle, 2008; Farole, 2011; Koyama, 2011).

EGYPT'S ECONOMIC POLICY TRANSFORMATION: A HISTORICAL OVERVIEW

Egypt's economic policy evolution reflects a dynamic process influenced by changing political landscapes and global economic dynamics. While recent reforms hold promise for sustainable growth, ongoing commitment to structural reforms and institutional strengthening is essential for long-term economic stability and prosperity (OECD, 2021).

Evolution of Egypt's Economic Policy

Since the establishment of the republic in 1952, Egypt has witnessed significant shifts in its economic policies under different political regimes. From the nationalist and socialist policies introduced by Gamal Abdel Nasser (1954-1970) to Anwar Sadat's (1970-1981) adoption of Western liberalization measures, and later Hosni Mubarak's (1981-2011) emphasis on

open trade with state control and privatization, Egypt's economic landscape has undergone notable (Waterbury, 2014; Galal, 2011).

The most recent phase of economic reforms began with the election of former army chief Abdel Fattah el-Sisi in 2014, following the political unrest of 2011-2013. President El-Sisi's economic agenda has prioritized reform and restructuring efforts, including reducing social subsidies, devaluing the Egyptian pound, and promoting investment (Dahshan, 2015; Shokr, 2017).

Additionally, the armed forces and their various affiliates played an important role in the economy during President El-Sisi's rule, particularly in infrastructure projects, roads, and railway systems. Therefore, the country's economy became the second largest in Africa after Nigeria in terms of nominal GDP, which is ranked 31st worldwide as of 2021 (Dahshan, 2015; Hanafy, 2015).

Egypt's Political System and Economic Authorities

Egypt's political system comprises three main branches of government: The Executive, Legislative, and Judicial authorities. The Executive authority, led by the President and the Egyptian Cabinet of Ministers, oversees economic policy formulation and implementation. The Cabinet of Ministers is responsible for various sectors, including finance, planning, infrastructure, and social development (Egyptian Cabinet, 2020).

Table 2: Egyptian Cabinet of Ministers 2020

Head of Cabinet	Economic Development	Social Development	Infrastructure & National Resources	National Security and International Affairs
Prime Minister	1. Finance 2. Planning and economic development 3. Central Bank of Egypt 4. Trade and industry 5. Public enterprise 6. Labor	7. Education 8. Higher education 9. Health & population 10. Social solidarity 11. Justice 12. Local development 13. Housing	14. Communications & Information Technology 15. Electricity and renewable energy 16. Transport 17. Civil aviation 18. Irrigation & water resources 19. Agriculture 20. Petroleum and mineral resources 21. Tourism and antiquities	22. Defense 23. Interior 24. Foreign affairs 25. Information affairs 26. International co-operation

Source: Author's interpretation

Egypt's Government has started to address long-standing market distortions, creating a significant potential for strong real economic growth in the long term. However, success will also depend on a commitment to structural reform and significant improvements to institutional effectiveness. These reforms and policies have strengthened Egypt's annual growth since the country now benefits from political stability, proximity to Europe, and increased exports (IMF, 2018).

INITIAL DEVELOPMENT OF ECONOMIC CLUSTERS IN EGYPT (1805 -1981)

Egypt's path toward economic industrialization can be traced back to Mohamed Ali's rule from 1805 to 1845. During this period, Egypt emerged as a global cotton producer, with Ali's government establishing factories for clothing, food, and other manufacturing sectors. However, this initial attempt at industrialization faltered due to overreliance on a single industry, mounting debt from foreign governments, and conflicts with major powers such as Britain, France, and the Ottoman Empire (Karakoç *et al.*, 2017; Panza, 2014).

The second wave of industrialization, spearheaded by President Gamal Abdel Nasser in the 1950s, was characterized by increased state intervention following the nationalization of the Suez Canal in 1956. Nasser's administration brought key sectors of the economy under state control, with public enterprises assuming responsibility for essential goods production, including steel, aluminum, and chemicals. However, the industrial complexes developed during this period struggled with inefficiency and low productivity, prompting the Mubarak regime to implement privatization programs in the 1990s to alleviate the burden (Waterbury, 2014).

President Sadat's tenure in the 1970s witnessed the emergence of economic zones as a pivotal strategy for driving foreign investment, exports, and employment. The establishment of Egypt's first free zone in Port Said in 1974 marked the initial step toward economic zone development. Subsequently, a variety of economic zones with diverse regulatory frameworks and incentives were introduced, resulting in a complex governance and management landscape. However, this complexity has also created competition

and rivalry between government institutions over expanding and managing new economic zones (OECD, 2020; Waterbury, 2014). Table 3 provides a comprehensive

overview of the evolution of clusters and economic zones in Egypt, detailing key elements such as their types, creation years, sizes, and associated presidents.

Table 3: Evolvement Timeline of Clusters and Economic Zones in Egypt (1805-2020)

Zone type/ Element	Industrial Complex	Industrial Clusters	Public & private Free Zone	Special Economic Zone	Qualified Industrial Zone	Investment Zone	Suez Canal Economic Zone	Golden Triangle Zone	Land Reclamation (1.5 million Acres)
President	Mohamed Ali	Naser	Sadat	Mubarak			Sisi		
Year of creation	1805	1956	1971	2002	2004	2008	2015	2017	2017
Size	NA	NA	48.6 km ²	9 km ²	NA	12.7 km ²	461 km ²	2.2 million acres	1.5 million acres to extend to 4 million

Source: Author and OECD based on Central Bank of Egypt, QIZ Unit Bulletin, GAFI, and WTO (2018)

CLUSTER AND ECONOMIC ZONES UNDER PRESIDENT MUBARAK (1981-2011)

President Mubarak's administration focused on the development of different types of economic zones, including Special Economic Zones, Qualified Industrial Zones, and Investment Zones. However, despite these efforts, Egypt's economic zones did not reach their maximum potential in terms of generating value-added, fostering innovation, and supporting diversification and sustainable development in the overall economy. Challenges such as limited competition between firms inside and outside economic zones and reliance on government incentives that reduced the economic zones' returns hindered their effectiveness (IMF, 2018). Additionally, foreign investors often limited their reliance on local providers of goods and services, which could narrow ties between economic zones and the local economy, particularly in sectors such as textiles and clothing. Policymakers could enhance economic zone returns by relying on higher-skilled labor or joint R&D agreements (Azmeah, 2014; Galal, 2011; Sakr, Baas, El-Haggar & Huisingh, 2011).

Free Zones

Egypt introduced the free zones system in 1997 during President Mubarak's administration. The

system comprises 10 public free zones primarily situated in and around Cairo and Alexandria. Supervised primarily by the General Authority for Investment and Free Zones (GAFI), these zones operate under the regulations outlined in Investment Law No. 72 of 2017 and its Executive Regulations (General Authority for Investment and Free Zones, 2022; Abdelaziz *et al.*, 2018).

These zones are strategically located in specific areas to leverage advantages such as proximity to raw material sources, export markets, and necessary labor. Among them are the Public Free Zones, numbering nine across Egypt, equipped with essential infrastructure like roads, electricity, sewerage stations, water networks, and telecommunications facilities. The selection of these locations considers their prominence within major cities, ensuring access to labor and supporting facilities while also complementing nearby maritime ports and airports (General Authority for Investment and Free Zones, 2022; Abdelaziz *et al.*, 2018).

The primary objective of free zones is to facilitate imports and exports, thereby stimulating trade and bolstering foreign currency reserves. This has been achieved through the exemption of customs duties, corporate income tax, and VAT, coupled with the provision of warehousing, storage, and related

services. Notably, recent amendments to investment laws have refined the scope of industries eligible for free zone status, excluding sectors such as petroleum refining, steel production, and high-energy-consuming industries (General Authority for Investment and Free Zones, 2022; Abdelaziz *et al.*, 2018; OECD, 2020).

Qualified Industrial Zones

President Mubarak signed a protocol between Egypt, the United States, and Israel to establish Qualified Industrial Zones (QIZs) in 2004. These zones are designed to boost exports of processed manufacturing goods, particularly textiles and clothing, to the United States. By combining the privileges associated with QIZ status and those offered by special investment regimes, these zones aimed to contribute to bilateral cooperation and stability in the region (Minister of Trade and Industry, 2022; OECD, 2020).

The QIZ Unit, operating under the supervision of the Ministry of Trade and Industry, plays a pivotal role in overseeing and supporting activities within these zones. Serving as both an executive and technical support unit and an information center for local and foreign businesses interested in investing under the terms of the QIZ protocol, it facilitates the implementation and management of QIZ-related initiatives (Minister of Trade and Industry, 2022; OECD, 2020).

Investment Zones and Technology Zones

Investment Zones and Technology Zones were introduced in 2008 and 2017, respectively, under the regulations of the 2017 Investment Law and Prime Minister decree No. 2310/2017. These zones are designed to foster the development of sector-specific clusters and promote activities in technology-related fields (General Authority for Investment and Free Zones, 2022).

Investment Zones encompass service clusters that Free Zones, such as Education, scientific research, and tourism infrastructure, do not prioritize. Examples include Cairo University and Cairo Airport, which operate under this regime. Technology Zones offer additional incentives, such as tax exemptions and waivers on customs duties for imported machinery

and tools necessary for project establishment. The Ministry of Communications, Information, and Technology oversees the establishment of Technology Zones to promote technological activities, including electronics manufacturing, programming, and technological Education (Abdelaziz *et al.*, 2018; General Authority for Investment and Free Zones, 2022).

Informal Clusters

Informal clusters have long been a part of Egypt's economic landscape, with their prominence growing notably during President Mubarak's tenure. These clusters, characterized by minimal government intervention, have become significant contributors to the economy. Examples include the El-Mahalla El-Kubra textile cluster, the Damietta furniture cluster, and the Fayoum and Beni Suef medicinal and aromatic plant cluster (Krafft *et al.*, 2024; Social Fund for Development, 2015).

The continued expansion of informal clusters in Egypt can be attributed to various factors, including government focus on large enterprises at the expense of small and medium-sized enterprises (SMEs), a complex tax system, and a high proportion of unproductive firms (Abdelaziz *et al.*, 2018). In 2018, the informal economy accounted for approximately 31.6 percent of GDP and 63.4 percent of total employment, highlighting its significant presence (Elgin *et al.*, 2021; Abdelaziz *et al.*, 2018).

Greater attention and support from the Egyptian Government are needed to address the challenges faced by informal clusters, such as governmental neglect and tax complexity. Integrating these informal clusters into the formal economy could unlock their potential and enhance their value propositions, contributing to overall economic development (Abdelaziz *et al.*, 2018; Social Fund for Development, 2015).

SPECIAL ECONOMIC ZONES UNDER PRESIDENT SISI (SINCE 2015)

President Sisi, who assumed office in 2014, has prioritized political and economic stability, seeking to address social unrest following the political upheavals of 2011-2013. In pursuit of this goal, his administration has initiated a comprehensive effort to

revitalize the Egyptian economy. This endeavor includes the establishment of specialized economic zones such as the Suez Canal Economic Zone, Golden Triangle Zone, and Land Reclamation of 1.5 million Acres, forming a key component of a broader structural economic reform agenda (Miehe & Roll, 2019; Dahshan, 2015; Shokr, 2017).

Furthermore, in support of these economic revitalization efforts, the International Monetary Fund (IMF) approved a US\$12 billion Extended Fund Facility for Egypt in 2016. This financial assistance is aimed at promoting macroeconomic stability and fostering inclusive growth. To address various economic challenges, measures such as currency devaluation, enhanced monetary policy, and fiscal consolidation have been implemented (IMF, 2018; European Commission, 2022).

President Sisi's government has endeavored to restore political and economic stability in Egypt, particularly following the unrest between 2011 and 2013. Through the development of specialized economic zones, the administration seeks to stimulate economic growth and enact structural reforms aimed at fostering long-term prosperity (Miehe & Roll, 2019; Dahshan, 2015; Shokr, 2017).

Suez Canal Economic Zone (SCZONE)

Established in 2015 under President Sisi's leadership, the Suez Canal Economic Zone (SCZONE) is Egypt's newest and most expansive cluster-based economic zone. Governed by Law No. 83/2002 and subsequently amended by Law No. 27/2015, SCZONE represents a significant component of the government's multi-billion-dollar investment into the Suez Canal and its surrounding areas. Covering a vast expanse of 461 sq km across both sides of the expanded Suez Canal, SCZONE distinguishes itself through its scale, level of investment, and incentives offered to investors (Oxford Business Group, 2017; SCZone, 2022).

Governed by the General Authority for the Suez Canal Economic Zone, reporting directly to the Prime Minister, SCZONE operates as a centralized hub for investors. This authority oversees licensing, tax collection, dispute resolution, and utilities provision, aiming to create a framework that provides investors with enhanced protections against political and

legislative instability. The primary objective of SCZONE is to act as a pivotal catalyst for economic advancement in Egypt, promoting diversified economic growth and enhancing national competitiveness (Oxford Business Group, 2017; SCZone, 2022).

With a vision to harness the vast potential of the Suez Canal Gulf and its surrounding areas, SCZONE aims to develop an efficient, competitive, and eco-friendly business environment. This includes generating employment opportunities, establishing a global center for maritime transport and logistics services, and positioning Egypt as a pivotal gateway for trade between East and West (SCZone, 2022). SCZONE endeavors to attract businesses from across the region by offering value-added supply chain services, world-class industrial parks, and improved access to regional markets and talent pools (Oxford Business Group, 2017; SCZone, 2022).

The SCZONE adopts a cluster-based approach, comprising four main industrial zones strategically distributed across Port Said, Qantara, Ismailia, and Ain Sokhna. These zones cater to a diverse range of sectors, including logistics, agri-business, textiles, ICT, heavy industry, and renewable energy manufacturing. Additionally, SCZONE features six ports and two airports to facilitate efficient operations within these industrial zones (SCZone, 2022).

Furthermore, SCZONE provides a host of incentives under various international trade agreements and financial schemes, including simplified labor cost options, VAT exemptions, and tailored customs regimes. Already, SCZONE has attracted substantial foreign investment, with notable commitments from entities such as China's Tianjin Economic-Technical Development Area (TEDA) Corporation and the Russian government-led initiatives near East Port Said. These investments span a wide array of sectors, including engineering, machinery, shipbuilding, and food (General Authority for Investment and Free Zones, 2021; 2022).

Golden Triangle Zone (GTZONE)

The Golden Triangle Zone (GTZONE), situated between Qena, Safaga, and Al Qusair, is another specialized economic zone that attracts foreign direct investment (FDI). Rich in natural resources and mining, the region is expected to host various

industries, including cement, glass, silicon, chemicals, and computer chips. Additionally, the GTZONE will serve as a trade route linking Upper Egypt with the Safaga seaport, benefiting from the Safaga solar energy project, a key component of Egypt's Vision 2030 (General Authority for Investment and Free Zones, 2022).

Land Reclamation of 1.5 Million Acres Agricultural Project

The Land Reclamation of 1.5 million Acres project primarily targets the agricultural sector, aiming to increase arable land by 20 percent, enhance Egypt's food security, and accelerate economic development in rural communities. In addition to strengthening Egypt's food exports, it currently accounts for nearly 18 percent of the total exports. The project is in Tosheka and West Minyah in Upper Egypt, Farafrah in the New Valley governorate, and El Magraa in the West Delta. This project is the first stage of a plan to reclaim 4 million acres, providing raw materials for industries such as textile manufacturing, leather production, and food processing while strengthening Egypt's food exports (General Authority for Investment and Free Zones, 2022).

CONCLUSION AND POLICY RECOMMENDATIONS

This study presents the evolution of clusters and economic zones in Egypt and emphasizes the significant role economic clusters play in enhancing a country's national competitiveness. Egypt's historical efforts in implementing economic clusters, which began with Mohamed Ali in the 18th century, underscore the country's longstanding commitment to industrialization and economic development. Despite these historical precedents, challenges persist in fully harnessing the potential of economic zones, as evidenced by limitations encountered during President Mubarak's administration, including inefficiencies and regulatory constraints.

Under President Sisi's administration, cluster-based development and the establishment of mega special economic zones demonstrate a renewed commitment to fostering economic growth, attracting investments, and creating employment opportunities. However, realizing the full potential of these initiatives requires alignment with national objectives, such as Egypt Vision 2030 and the National Investment Plan.

Strategic alignment will ensure coherence and maximize the impact of Economic Clusters on overall development goals.

Establishing strong partnerships and connections between foreign companies in economic zones and local businesses is essential for facilitating the exchange of knowledge, technology, and skills. This integration of local industries into global value chains will significantly enhance national competitiveness. Moreover, addressing challenges such as unfair competition and regulatory constraints demands the implementation of robust regulatory frameworks and measures to promote transparency and accountability. Additionally, by improving data collection methods and analysis, policymakers can design targeted interventions to steer economic zone development toward sustainable and inclusive growth (Christensen et al., 2012; Farole, 2011).

Therefore, effectively leveraging clusters and economic agglomeration policies to strengthen national competitiveness will require integrating strategic alignment with national objectives, fostering collaboration and linkages, and addressing challenges through robust regulatory frameworks and data-driven policymaking. Through concerted efforts and strategic interventions, Egypt can unlock the full potential of its Economic Clusters to improve national competitiveness and position itself as a leading player in the global economy (Christensen et al., 2012; Farole, 2011).

Based on the findings of this study, a few economic policy recommendations can be suggested to effectively utilize economic clusters to enhance national competitiveness in developing countries like Egypt. These policy recommendations include:

- **Alignment of Economic Strategies:** The government should ensure closer alignment between economic national strategies, mainly Egypt's Vision 2030 and National Investment Plan, and the objectives of economic clusters. In addition, policy formulation and implementation should be better coordinated to maximize the impact of economic clusters and enhance national competitiveness (Cho et al., 2006).
- **Enhanced Regulatory Frameworks:** Improving regulatory frameworks and enhancing

transparency in licensing, tax collection, and dispute resolution processes within economic zones can improve the investment climate and attract foreign investors (Farole & Kweka, 2011).

- **Stakeholder Engagement:** Effectively addressing the complexity of stakeholder relationships within economic zones necessitates fostering trust, transparency, and active engagement of the private sector, local governorates, and other relevant stakeholders (Freeman & McVea, 2001; Cho & Moon, 2005).
- **Implementation of Strategic Monitoring and Evaluation Systems:** Establishing robust monitoring and evaluation mechanisms is crucial for tracking the performance and impact of economic clusters over time. By regularly assessing key performance indicators within these clusters, policymakers can identify areas for improvement (Pellegrin et al., 2020; United Nations Development Group, 2011).
- **Emphasis on Data-Driven Monitoring:** It is essential to prioritize collecting, analyzing, and utilizing relevant data in monitoring the performance of economic clusters. By leveraging advanced analytics and data visualization techniques, policymakers can gain valuable insights into each cluster's strengths and weaknesses, enabling targeted interventions and resource allocation to maximize their contribution to national competitiveness (Pellegrin et al., 2020; United Nations Development Group, 2011).
- **Investment in Infrastructure:** Continued investment in infrastructure, including transportation, logistics, and utilities, is crucial for the success of economic zones (Christensen et al., 2012; Farole & Akinci, 2011).
- **Promotion of Technology-Driven Industries:** Promoting innovation through technology-driven industries within economic zones can contribute to sustainable economic development and enhance national competitiveness (Gerasymchuk & Sakalosh, 2007; Castells & Hall, 1994).

- **Sustainability and Social Responsibility:** Adopting environmentally friendly practices, promoting social inclusion, and investing in workforce development programs can create shared value for all stakeholders involved (Balkyte & Tvaronavičiene, 2010).

Hence, by implementing these policy recommendations, Egypt can leverage its economic clusters as a strategic tool for improving national competitiveness. By successfully implementing these policies, Egypt will have a better opportunity to position itself as a leading investment destination and a hub for innovation and economic growth in the region and its peers.

Further research on the impact of economic clusters on leveraging national competitiveness in Egypt could significantly improve related policymaking in developing countries. Additionally, Comparative analyses of other countries' experiences could provide valuable lessons for policy formulation, while exploring the role of technology and innovation in cluster development within economic zones would offer valuable insights into the competitiveness of industries and their potential for driving economic growth. Finally, evaluating the effectiveness of existing economic policies and regulatory frameworks governing economic clusters would contribute to evidence-based policymaking in Egypt.

Acknowledgments: This research paper/s includes contributions from artificial intelligence tools, specifically ChatGPT, for proofreading and editing purposes. While AI tools were utilized to enhance the language quality of the paper, all underlying ideas, data analysis, and conclusions presented herein are the result of the author's independent research efforts. The use of AI is disclosed transparently, and appropriate acknowledgments are provided. The author adheres to ethical principles and academic integrity standards when using AI in research.

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Exploring ESG Dimensions in Cambodia: Findings from Various Industries

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ABSTRACT

Purpose: This study explores the integration of Environmental, Social, and Governance (ESG) principles across various industries in Cambodia, aiming to assess current adoption levels, key challenges, and professional perceptions.

Methodology: The study used a mixed-methods approach, combining industry assessments, surveys with business professionals, and expert interviews to gather quantitative and qualitative insights.

Findings: The results show that while corporate ESG disclosures are generally above average, significant governance transparency and environmental accountability gaps exist. The survey responses indicate skepticism among professionals about the authenticity of ESG commitments, suggesting a potential risk of greenwashing. Expert interviews confirm that ESG awareness is growing, but practical implementation remains limited due to regulatory shortcomings and resource constraints.

Implications: The findings emphasize stronger ESG regulations, transparent reporting standards, and enhanced stakeholder engagement to support meaningful corporate sustainability in Cambodia.

Originality: This study addresses a notable gap in ESG literature focused on emerging markets, offering industry-specific insights and actionable policy and corporate strategy recommendations.

Limitations and directions for future research: Using self-reported data and qualitative assessments may introduce bias. Future research should consider longitudinal designs and cross-country comparisons to monitor ESG progress.

Keywords: ESG; Cambodia; Corporate sustainability; Greenwashing; Emerging markets

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Publisher: CamEd Business School
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Recommended Citation

Güngör, H. (2025). Exploring ESG dimensions in Cambodia: Findings from various industries. *Journal of Accounting, Finance, Economics, and Social Sciences*, 10(1), 15 – 28. <https://doi.org/10.62458/jafess1012xyz>

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INTRODUCTION

Global awareness regarding climate change, poverty, and inequality has grown significantly. Consequently, society increasingly expects businesses to minimize their negative impacts and contribute positively to the environment and communities. Organizations are, therefore, integrating environmental, social, and governance (ESG) dimensions into their strategies to generate long-term value (HBR, 2024; PwC, 2024). Various studies have highlighted ESG's potential to drive financial and societal value (Friede *et al.*, 2015; Ioannou *et al.*, 2022; Boffo & Patalano, 2020; Li, 2022; Wagner & Boyle, 2022). However, challenges such as inconsistent metrics, underdeveloped governance dimensions, and fragmented reporting standards persist, underscoring the need for further research into ESG integration, particularly in emerging markets, and its alignment with global sustainability objectives (Li *et al.*, 2021; Abhayawansa & Mooneeapen, 2022; Ahmed *et al.*, 2023).

As global attention increasingly focuses on sustainability, ESG has evolved from a peripheral consideration to a core strategic focus for organizations worldwide, including Cambodia. In a rapidly developing economy, Cambodia's business sector faces unique challenges and opportunities in integrating ESG practices (Cambodia Investment Review, 2023). While businesses are expected to mitigate negative impacts and contribute meaningfully to environmental preservation, social equity, ethical governance, and sustainable development remain a work in progress for many Cambodian organizations (LOCL Cambodia, 2024).

This study investigates the current state of ESG adoption and reporting practices among Cambodian businesses, addressing a significant gap in the existing literature on ESG implementation in developing nations (Ma'aji *et al.*, 2022; Flores, 2023). The study comprehensively analyzes ESG practices and challenges across diverse sectors by analyzing multiple industries. The significance of this research lies in its potential to advance both academic understanding and practical implementation of ESG in Cambodia. Therefore, this study aims to examine the current ESG practices of Cambodian companies, understand the perceptions of business professionals and industry experts, and offer insights that may inform future ESG policies and practices in the region.

The remainder of this paper is structured as follows. The next section reviews the existing academic literature on ESG, including conceptual definitions, empirical evidence, and emerging issues. This is followed by an overview of ESG practices in Cambodia, including recent national developments and regulatory efforts. The methodology section outlines the mixed-methods approach employed in this study, while the results section presents findings from industry assessments, survey data, and expert interviews. The discussion and conclusion offer key insights, practical implications, and recommendations for future research.

LITERATURE REVIEW

The prominence of ESG grew with the United Nations' Principles for Responsible Investment (PRI) report in 2006, which emphasized the inclusion of ESG criteria in financial evaluations (Atkins, 2020). The European Union's 2019 European Green Deal marked a pivotal moment by committing to climate neutrality by 2050 (The Economist, 2021). Subsequently, the Corporate Sustainability Reporting Directive (CSRD) mandated ESG reporting starting in 2024 (EU, 2019; 2021; 2022). This evolution reflects ESG's increasing importance in academic and corporate discourse, prompting extensive research into its multifaceted impacts.

Companies prioritizing ESG often report benefits such as improved financial performance, enhanced brand reputation, access to capital, better risk management, and increased customer loyalty. ESG fosters innovation, regulatory compliance, long-term sustainability, and positive societal impact (Friede *et al.*, 2015; Boffo & Patalano, 2020; Li, 2022; Wagner & Boyle, 2022). Consequently, many organizations focus on and publish reports to communicate their long-term commitments to ESG. These reports outline initiatives and goals for reducing environmental impact, developing human capital, and practicing responsible business (Ioannou *et al.*, 2022; Signori *et al.*, 2021).

Conceptual Review of ESG

ESG factors represent distinct but interconnected dimensions of corporate sustainability and ethical impact.

Environmental factors pertain to a company's impact on the natural environment, including carbon emissions,

resource efficiency, waste management, and climate change mitigation. The research underscores the critical role of environmental stewardship in long-term success. For instance, Senadheera *et al.* (2022) emphasized green investing and circular economy principles, while Li *et al.* (2021) highlighted the theoretical and economic impacts of environmental initiatives.

The environmental pillar has also driven innovation in green technologies and renewable energy adoption. Studies like Wagner and Boyle (2022) discuss how companies leveraging environmental sustainability often gain competitive advantages, particularly in emerging markets, such as Cambodia, where resource constraints are prevalent.

The social factors dimension focuses on relationships with employees, customers, suppliers, and communities, addressing labor practices, diversity, product safety, and community engagement. Studies like Clément *et al.* (2023) emphasize corporate responsibility's role in addressing social challenges, while Abhayawansa and Mooneeapen (2022) explore investor behavior aligned with social values.

Social factors also encompass ethical supply chain management, ensuring fair wages and safe working conditions. Cambodian industries, for example, face scrutiny over labor practices, particularly in the construction and garment sectors, highlighting the importance of aligning social practices with global standards (ILO, 2024).

Governance factors concern internal systems and processes ensuring accountability and ethical decision-making. Despite its importance, governance often lags behind environmental and social components (Senadheera *et al.*, 2022). Kumar *et al.* (2024) and Tsang *et al.* (2023) highlight the critical role of governance frameworks in enhancing overall ESG performance.

In Cambodia, governance reforms in corporate structures and regulatory compliance are essential to fostering investor confidence and aligning with international expectations (Royal Government of Cambodia, 2019; Vorng, 2023).

Empirical Review of ESG Research

Meta-analyses like that of Friede *et al.* (2015) consolidate evidence supporting the positive

correlation between ESG and corporate financial performance. Approximately 90 percent of studies report non-negative correlations, with many indicating positive impacts. Building on this, bibliometric studies by Senadheera *et al.* (2022) trace exponential growth in ESG-related publications driven by interest in sustainability trends like green investing. Research has also highlighted gaps in ESG practices, including inconsistent methodologies and fragmented reporting standards. Clément *et al.* (2023) critique ESG scores for their inconsistent definitions, while Tsang *et al.* (2023) identify the need for more relevant and stakeholder-focused disclosures. Further, governance metrics' underdevelopment calls for deeper exploration, according to Li *et al.* (2021), as also discussed by Kaplan and Spitzer (2024).

International case studies, such as those on Swedish corporations (Arvidsson & Dumay, 2022) and Polish ESG trends (Dmuchowski *et al.*, 2023), illustrate regional variations and common challenges. Looking at Italian organizations, Clementino and Perkins's (2021) research showed that corporate responses depend on managers' beliefs regarding the material benefits of adjusting to and scoring well on ESG ratings and their alignment with corporate strategy. Zhang *et al.* (2012) research showed that Chinese iron and steel companies have struggled to implement practices to reduce their energy consumption and emissions. Alda (2021) discussed the challenges and impact of ESG inclusion in pension funds' investments. Similarly challenging, research on Cambodia's ESG practices (Ma'aji *et al.*, 2022; Flores, 2023) reveals deficiencies in reporting standards and corporate awareness. These insights reinforce the need for comprehensive, context-specific research and strategies to advance ESG integration.

Emerging Terminology: Greenwashing, Greenhushing, and Carewashing

The rise of terms like "greenwashing," "greenhushing," and "carewashing" reflects growing scrutiny of corporate sustainability claims. Greenwashing involves overstating sustainability efforts, eroding consumer trust, and creating confusion (Lyon & Montgomery, 2015; Fella & Bausa, 2024). Bladt *et al.* (2024) showed that greenwashing can significantly damage brand attitudes. Conversely, greenhushing, as noted by FactSet data, involves downplaying ESG efforts to avoid scrutiny and public criticism (Financial

Times, 2024). Carewashing highlights superficial responses to social issues (Mussell, 2024). Carewashing occurs when companies with unsustainable "work hard, play hard" cultures offer superficial solutions, such as mindfulness training or yoga classes, as a substitute for creating genuinely safe and supportive work environments (Gube *et al.*, 2024). Consequently, these phenomena underscore the importance of transparency and accountability in ESG communications.

Challenges in ESG Reporting and Implementation

ESG reporting guidelines serve as institutional rules that enhance the credibility of publicly disclosed ESG information (Darnall *et al.*, 2022). Reporting is typically voluntary, and global ESG reporting guidelines often rely on third-party verification focused on processes (Howard-Grenville, 2021). The Big Four accounting firms, Deloitte, PwC, KPMG, and EY, are actively driving the ESG transformation by establishing a set of standardized measurements comprising specific metrics. This framework, known as the Stakeholder Capitalism Metrics, categorizes ESG reporting and disclosure into four pillars: Principles of Governance, Planet, People, and Prosperity (World Economic Forum, 2020).

Environmental	Social	Governance
Climate change and carbon emissions	Labor practices and standards	Board structure and diversity
Resource efficiency (energy, water, materials)	Health and safety	Executive compensation
Waste management and circular economy	Diversity and inclusion	Business ethics and anti-corruption
Pollution control and biodiversity	Training and development	Shareholder rights
Renewable energy and clean technologies	Community engagement and social investment	Transparency and disclosure
Climate risk and adaptation strategies	Human rights and supply chain responsibility	Risk management and internal controls

Figure 1: Conceptual model of the three ESG pillars (adapted from PwC, 2023)

Numerous ESG reporting agencies worldwide offer different ESG tracking metrics (Huber & Comstock,

2017; Billio *et al.*, 2021; Liang & Chan, 2022; Pérez *et al.*, 2022). Among these, the five most common frameworks are the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), Carbon Disclosure Project (CDP), Carbon Disclosure Standards Board (CDSB), and International Integrated Reporting Council (IIRC). Similarly, the International Financial Reporting Standards Organization (IFRS.org) is also trying to align with the International Sustainability Standards Board (ISSB), building on the work of existing investor-focused reporting initiatives. The board's standards are IFRS S1, which tells companies what information they need to disclose to investors about the sustainability-related risks and opportunities they face over the short, medium, and long term, and IFRS S2, which sets out specific climate-related disclosures. Building on these developments, the International Organization for Standardization (ISO) has also established a framework to implement principles that could serve as a foundation for related reporting and auditing frameworks (ISO, 2024).

Despite the momentum for ESG adoption globally, many organizations face various barriers (Davies, 2020). Resource limitations and a lack of technical expertise hinder the full-scale integration of ESG principles (Goddard, 2022). Studies by Zhang *et al.* (2012) emphasize that these issues are compounded by inadequate data management systems and cultural resistance to change within organizations. Moreover, small and medium-sized enterprises (SMEs) encounter difficulties due to the perceived complexity and cost of implementing ESG initiatives (Consultancy.uk, 2023; Farri *et al.*, 2022).

ESG in Cambodia

Like many other countries, Cambodia has recently started focusing on ESG practices. The country has been undergoing rapid economic development, and there is growing recognition that sustainability is essential for long-term growth and to attract green investments (Royal Government of Cambodia, 2019; SBFN & IFC, 2022; USAID, 2023). In line with these ambitions, several government and non-governmental initiatives have been organized to promote sustainability in Cambodia, such as the Cambodia Climate Change Summit since 2021, supported by the Ministry of Environment. The EuroCham Business Survey revealed that ESG

programs are gaining traction in Cambodia as "businesses are beginning to understand their roles extend beyond profitability to contributing to societal and environmental wellness" (Cambodia Investment Review, 2023).

Subsequently, Cambodia has established itself as a leader in Southeast Asia's fight against climate change by becoming the first member country in the region to endorse the Global Green Growth Institute's (GGGI) 'Blue Skies & Net Zero 2050' campaign. This pivotal endorsement was announced by the minister of the environment, demonstrating Cambodia's commitment to a sustainable and environmentally conscious future (Cambodia Investment Review, 2023). Finally, the Cambodia Outlook Conference 2023 marked a significant stride towards aligning Cambodia's private sector investment strategies with its 2030 vision for sustainable development, as advocated by the Cambodian Government (Cambodia Investment Review, 2023). Cambodia's growing focus on sustainability is also evident in initiatives such as the Cambodia Climate Change Summits and the 2024-28 Decent Work Country Program, which is signed by representatives of the Ministry of Labor and Vocational Training, the Cambodian Federation of Employers and Business Associations, Cambodian Trade Unions and the ILO (2024).

These initiatives reflect a broader commitment to integrating environmental priorities into national policies. However, the absence of mandatory ESG disclosure requirements poses significant challenges. Consequently, potential greenwashing remains relevant in Cambodia, where limited regulatory oversight can enable companies to exaggerate sustainability claims, especially in the construction and garment industries.

Studies by Ma'aji *et al.* (2022) and Edman (2023) highlight significant gaps in ESG reporting in Cambodia, including limited awareness and the absence of standardized guidelines. Despite these challenges, progress by organizations like Acleda Bank (2024) reflects Cambodia's potential to become a regional leader in ESG practices. Developing stringent reporting standards and promoting third-party audits are thus crucial steps toward addressing these challenges.

STUDY METHODOLOGY

A mixed-methods approach is employed to comprehensively examine ESG dynamics and practices in Cambodia, incorporating quantitative and qualitative data collection from multiple sources. This methodology ensures robust triangulation of findings and enhances the validity of the research (Creswell & Creswell, 2018).

Participants and Sampling

The study engaged three distinct groups of participants. First, student-assisted industry assessments: Undergraduate students from CamEd Business School conducted an industry-wide ESG assessment over two consecutive years. The study encompassed 12 industries: Finance and Banking, Construction, Tourism and hospitality, Retail and Supermarket, Garment, Footwear and Textiles (GFT), Energy, Agriculture, Logistics and Transportation, Retail, Education, Healthcare, and Telecommunications. These industries were evaluated based on publicly available corporate disclosures of ten companies from each industry, selected by their market size and information availability, such as websites, annual reports, and media coverage.

The assessment utilized a subjective heatmap methodology, scoring three key criteria under each ESG category. Environmental: Resource efficiency, carbon emissions, and waste management. Social: Labor law and conditions, diversity and equality, and community engagement. Governance: Business ethics, regulatory compliance, and transparency. To ensure relevance across industries, assessment components were tailored to specific sectors. For example, packaging and material waste were emphasized in the supermarket industry, while data security was incorporated into the telecommunications sector. Scores ranged from 1 (Poor) to 5 (Excellent), with student teams assigning ratings based on publicly available information, direct observations, and qualitative evaluations. For instance, a company was rated poorly in waste management if no policy existed or on-site observations indicated inadequate waste disposal practices, e.g., in schools, hotels, or construction sites. The collected data were then transformed into industry heatmaps (see Figure 2) while ensuring company anonymity.

Secondly, a survey of business professionals. Over 100 Cambodian business professionals were administered a structured online survey questionnaire to gauge their understanding and perceptions of ESG practices. The survey included closed-ended questions, allowing for the collection of descriptive statistics. Participants were selected through convenience sampling, mainly via LinkedIn and professional networks.

Thirdly, expert interviews. To supplement the industry assessment, 11 semi-structured interviews were conducted with academics, industry experts, corporate managers, and governmental and non-governmental organizations. Interviewees were selected through convenience sampling, mainly via LinkedIn and professional networks, for their knowledge of ESG policy, industry practices, and sustainability challenges in Cambodia. The interviews aimed to contextualize the ESG landscape, validate industry assessments, and identify challenges in policy implementation and corporate commitment.

Data Analysis

A multi-layered analysis was conducted to ensure comprehensive insights into ESG adoption in Cambodia. First, Heatmap Scoring Method: Each assessed company was assigned ESG scores based on a heatmap framework, evaluating three criteria under each ESG dimension. This scoring system enables a comparative industry-wide assessment (Eccles *et al.*, 2014). Secondly, Descriptive Statistics: Survey responses were analyzed using frequency distributions and means to assess the general perception of ESG adoption. Thirdly, the qualitative input evaluating the overall findings is incorporated from expert interviews.

Ethical Considerations

Participants in interviews and surveys provided informed consent, ensuring voluntary participation and data confidentiality. Furthermore, anonymity was maintained for industry assessments, surveyed professionals, and interviewees following established research ethics guidelines (Bell & Bryman, 2007).

RESULTS AND DISCUSSION

Industry Assessment Heatmaps

The overall results from the 2023 and 2024 industry assessments were remarkably similar, with average

ESG scores of 3.50 and 3.54, respectively, on a 1 to 5 scale. These findings suggest that the publicly available ESG disclosures of organizations in Cambodia are generally above average, with a slightly positive outlook. However, year-on-year comparisons indicate that while companies have become more diligent in reporting environmental consciousness and corporate social responsibility (CSR) initiatives, governance-related disclosures have shown minimal improvement.

When examining ESG performance across different industries, "service-based industries" such as finance, education, retail and supermarkets, telecommunications, and hospitality consistently exhibited higher ESG scores than "production-based industries" such as logistics, textiles, construction, and agriculture. More specifically, service industries such as finance, energy, and tourism notably improved resource efficiency and climate change awareness. Construction, textiles, and agriculture continued to lag behind, reflecting inconsistent sustainability efforts. Education and healthcare showed steady progress, likely driven by regulatory pressures and corporate responsibility initiatives.

The assessments also revealed significant variations in ESG performance between different organizations. Larger corporations generally outperformed smaller firms across all ESG dimensions, particularly in disclosure and reporting, most likely due to international requirements and budget availability. Smaller companies consistently received lower scores, especially those without formal ESG policies. For example, larger hotel chains performed significantly better than smaller hotels. Major construction firms provided more comprehensive ESG reports, whereas smaller construction sites in urban centers demonstrated weaker ESG practices. Supermarket and retail chains showed stronger ESG commitments than local shops and independent retail outlets.

Thus, the heatmap analyses suggest a relatively positive ESG outlook in Cambodia when considering corporate ESG disclosures. However, on-the-ground observations indicate a less optimistic reality, as many industries exhibit significant ESG gaps in actual practice.

CAMBODIA ESG ASSESSMENT 2023			Supermarkets	H. Education	Banking	Healthcare	Telecom	Hospitality	Construction	Logistics	OVERALL
MULTIPLE INDUSTRIES	ENVIRONMENT	Resource efficiency	3,4	2,8	3,6	3,5	3,3	3,3	2,5	3,0	3,17
		Carbon emissions	4,0	3,2	3,3	3,4	2,3	2,9	3,5	2,3	3,11
		Waste management	3,7	3,1	3,4	3,1	2,5	3,0	3,6	2,2	3,07
	SOCIAL	Labor law & Conditions	4,1	4,3	4,0	3,8	3,6	3,7	3,4	3,3	3,77
		Diversity & Equality	4,5	4,3	4,8	3,5	4,6	3,7	2,6	2,9	3,87
		Communities / CSR	4,6	5,0	4,2	3,9	3,5	4,1	3,3	2,5	3,89
	GOVERNANCE	Business ethics	4,4	4,7	4,2	3,8	4,2	3,4	3,1	2,2	3,74
		Regulatory compliance	4,3	4,8	3,8	3,5	3,9	3,0	3,0	2,5	3,59
		Transparency	4,2	4,1	4,1	3,6	4,1	3,4	2,9	3,1	3,68
		OVERALL	4,13	4,02	3,92	3,57	3,56	3,39	3,10	2,67	3,54

* Assessment scale: (1) Very poor (2) Poor (3) Fair / Neutral / Average (4) Good (5) Excellent // Assessment components can differ across industries.

Cambodia ESG ASSESSMENT 2024			Finance	Education	Tourism	Retail	Energy	Textile GFT	Agriculture	Construction	AVERAGE
MULTIPLE INDUSTRIES	ENVIRONMENT	Resources efficiency	3,8	3,4	3,2	3,0	3,8	3,1	3,3	3,0	3,33
		Climate change	3,9	3,3	3,6	3,4	4,3	3,1	2,5	3,3	3,40
		Waste management	3,6	3,3	3,9	3,0	3,6	2,9	3,3	2,9	3,31
	SOCIAL	Diversity & Equality	3,9	3,7	4,3	3,6	4,3	3,1	3,0	3,8	3,70
		Stakeholders & Community	4,7	3,9	4,7	4,0	4,4	3,1	3,0	3,8	3,94
		Labor law & Conditions	4,1	4,1	3,1	3,8	3,9	2,9	3,2	3,3	3,53
	GOVERNANCE	Business ethics	4,6	4,0	4,0	3,4	3,4	2,7	3,1	3,1	3,52
		Regulatory compliance	4,6	4,1	3,4	3,4	3,4	2,7	2,9	2,9	3,42
		Transparency	4,6	3,8	4,1	3,3	3,5	2,3	2,2	2,6	3,31
		OVERALL	4,2	3,7	3,8	3,4	3,9	2,9	2,9	3,2	3,50

* Assessment scale: (1) Very poor (2) Poor (3) Fair / Neutral / Average (4) Good (5) Excellent // Assessment components can differ across industries.

Figure 2: Industry Assessment Heatmaps

Quantitative Survey Findings

A quantitative survey was designed to validate the industry observations and assessments via the heatmaps, inviting Cambodian business professionals to assess ESG performance across industries. The

survey provides an additional layer of verification for the industry assessment findings. Results indicate that companies in different industries tend to overstate their ESG activities moderately, while general perceptions among business professionals are less positive than company information and publications.

In other words, the findings indicate a notable discrepancy between publicly disclosed ESG commitments and the perceptions of industry professionals, reinforcing concerns regarding the authenticity and depth of ESG integration within corporate strategies (Delmas & Burbano, 2011).

The survey results highlight a significant variance across ESG dimensions. Environmental concerns received the lowest ratings, suggesting that corporate environmental responsibility remains a significant area of concern. By contrast, social and governance factors were rated within the fair or neutral zone, indicating a more moderate perception of corporate adherence to social and ethical business practices. The survey further revealed that companies across different industries tend to overstate their ESG activities moderately, with business professionals expressing skepticism regarding the extent to which these commitments translate into tangible sustainability actions.

These findings align with previous studies highlighting the issue of greenwashing, wherein firms embellish their ESG performance in public disclosures to enhance their reputations without substantial operational changes (Eccles *et al.*, 2014). The perception of ESG overstatement in Cambodia is particularly relevant in light of broader global concerns about corporate sustainability transparency.

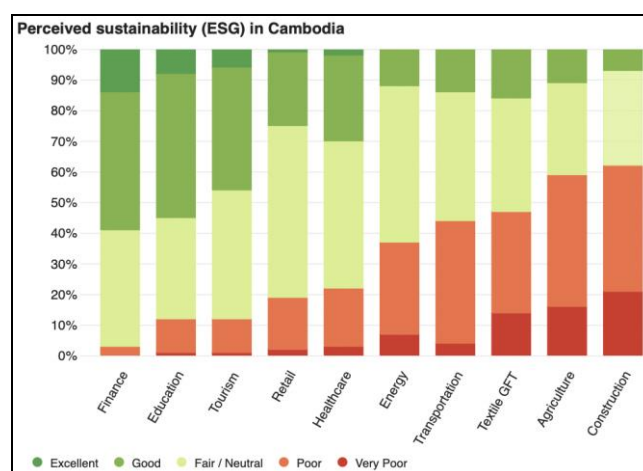
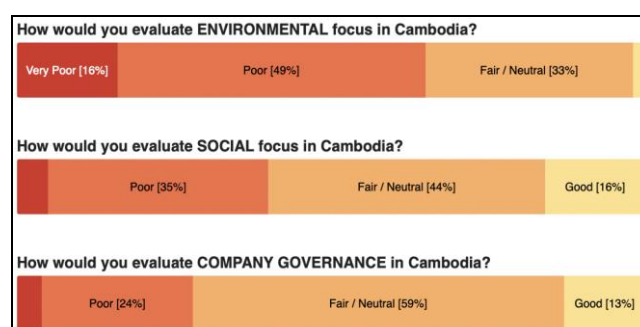
Comparison with Heatmap Findings and Implications

The survey results complement the industry-wide ESG assessments derived from heatmap scoring. The heatmaps indicated that most industries exhibit above-average ESG scores, with service-based sectors such as finance, retail, education, telecommunications, and tourism demonstrating relatively stronger ESG integration. In contrast, resource-intensive industries such as agriculture, construction, and textile manufacturing continued to lag behind in sustainability efforts. Notably, larger corporations consistently outperformed smaller firms across all ESG dimensions, particularly regarding disclosure and reporting quality.

The most concerning aspect of the findings relates to environmental responsibility. While some industries have made progress in resource efficiency and climate change awareness, the low ratings in the survey

indicate that corporate sustainability efforts may be more symbolic than substantive. This suggests that firms focus on compliance-based ESG (reporting) practices rather than genuinely proactive environmental stewardship.

The divergence between reported ESG performance and overall perceptions highlights key challenges in Cambodia's ESG landscape. The skepticism among business professionals regarding the accuracy of ESG disclosures underscores a fundamental trust gap. While the heatmaps indicate progress in ESG adoption, the perception that companies exaggerate their commitments signals a need for enhanced transparency and accountability. These results reinforce concerns about governance-related weaknesses, suggesting that while corporate awareness of ESG principles is increasing, genuine actions and implementation remain limited. This aligns with global research indicating that ESG policies often prioritize external reputation management over substantive changes in corporate behavior (Delmas & Burbano, 2011).



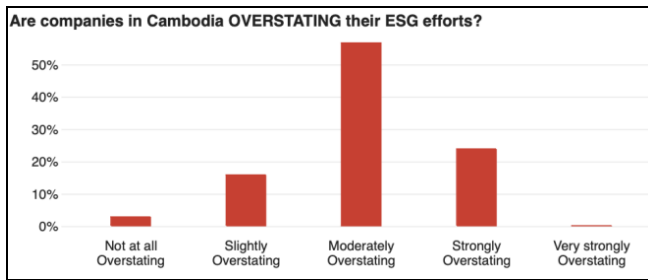


Figure 3: ESG Survey Results (N = 100)

Expert Interviews

To further investigate the perception-reality gap in corporate ESG strategies and reporting, 11 expert interviews were conducted. These semi-structured interviews encompassed various stakeholders, including five representatives from academia, government, and non-governmental organizations and six industry professionals from retail, finance, hospitality, construction, manufacturing, and agriculture. The main goal of these interviews was to discuss the initial findings from both industry assessments and survey results and gauge general sentiment about ESG in Cambodia.

The main findings from academia, government, and non-governmental interviews were twofold: First, experts acknowledged that company-disclosed ESG information, as presented in heatmaps, often moderately overstates daily practices in various industries, indicating a degree of greenwashing. Secondly, quantitative survey results provide a less positive but more accurate reflection of ESG practices in Cambodia, offering a more grounded perspective on sustainability efforts.

About the specific industries, expert interviews revealed that the finance industry is among the most advanced sectors in terms of ESG. This industry operates under stringent regulations, and its reporting obligations are more rigorous than most other industries. The student team analysis and expert interviews confirmed that the finance sector demonstrates the highest level of ESG integration. In the tourism and hospitality industry, ESG practices vary significantly. Large international hotel chains tend to prioritize ESG activities and reporting. However, numerous small-scale hotels, restaurants, and cafes lack awareness or concern regarding ESG practices. The retail and supermarket sector is similarly fragmented, consisting of several large chain

operations and thousands of small establishments. While major retail outlets and supermarket chains report ESG intentions, their daily operations implementation remains inconsistent.

Expert interviews acknowledged significant challenges in effectively implementing ESG activities in the construction industry. These shortcomings were also identified through the heatmap analysis. Cambodia's economic and social growth has led to a rapid expansion of construction activities. However, sustainability considerations have not been a primary focus within the sector. The textiles industry, including garment, footwear, and travel goods manufacturing, exhibits trends similar to those of the construction sector, where larger firms demonstrate greater commitment to ESG practices and reporting. In contrast, numerous small textile manufacturing enterprises do not visibly engage in ESG practices. Finally, the agriculture sector, which employs approximately one-third of Cambodia's workforce and contributes one-fifth of the nation's GDP, remains below the desired ESG standards. Although the government has expressed strong intentions to transform the industry towards sustainability, challenges persist, particularly in fragmented agricultural activities in rural areas. While large organizations, such as major rice exporters, include ESG commitments, e.g., in their websites, these practices are not widespread among small-scale producers.

CONCLUSION

This study aimed to evaluate the current ESG practices of Cambodian companies, assess the perceptions of industry experts and business professionals, and provide actionable insights to inform future ESG policies and practices in Cambodia. The findings indicate a growing awareness of ESG principles among Cambodian businesses, as evidenced by survey responses and heatmap analyses. However, expert interviews revealed persistent challenges in achieving meaningful ESG integration. Overcoming these obstacles requires a comprehensive approach that combines regulatory oversight, corporate transparency, and stakeholder engagement to ensure that ESG commitments translate into tangible sustainability outcomes.

Despite the challenges identified, Cambodia's efforts to advance ESG practices reflect a growing commitment to sustainable development and corporate responsibility. Organizations can adopt a systems-thinking approach to accelerate progress, integrating ESG considerations across all levels of their operations. This requires targeted interventions, including capacity-building programs, regulatory incentives, and stronger collaboration between the public and private sectors. Addressing governance gaps and ensuring greater transparency in ESG disclosures will foster trust and accountability within the business ecosystem. Developing stringent reporting standards and promoting third-party audits are thus crucial steps toward addressing these challenges.

ESG considerations are essential for businesses seeking long-term value while addressing global sustainability challenges. Companies, therefore, should move beyond compliance-based ESG adoption and develop a deeper understanding of the broader impacts of their practices. Effective ESG integration requires insight-driven decision-making, continuous learning, and a commitment to ethical governance. Therefore, boards and executive leadership should embed ESG principles into corporate strategies, recognizing that sustainability initiatives enhance stakeholder trust and contribute to overall organizational performance. While ESG indices provide useful benchmarks, they are insufficient as sole indicators of value creation. Businesses should, therefore, shift from a metrics-driven approach to a more impact-oriented ESG strategy, ensuring that reported commitments align with substantive sustainability practices. By fostering a culture of accountability and innovation, companies can align their sustainability efforts with local development priorities and global ESG standards, ultimately contributing to long-term economic and environmental resilience for the country and the region.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This study has several limitations. First, the availability of ESG-related information remains inconsistent, as many companies do not report their sustainability activities in a structured or standardized manner.

Second, the findings may have limited generalizability due to the purposive and convenience sampling used in the study. Third, the reliance on subjective evaluations of company information, rather than industry self-reports and expert audits, presents potential biases in assessing ESG performance.

To enhance the robustness of future research, it is recommended that studies incorporate survey-based self-reported data from companies, enabling more rigorous quantitative analyses of ESG adoption. Future research can focus on longitudinal studies to assess the long-term impacts of ESG integration on Cambodia's economic and environmental sustainability. Additionally, conducting in-depth expert interviews and industry-specific audits will provide richer insights into sectoral variations and the practical implementation of ESG frameworks. Finally, future research can explore comparative analyses with regional and international ESG practices to understand better Cambodia's positioning within the regional and global sustainability landscape.

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The Rise in Food Prices and the Export of Milled Rice in the Greater Mekong Subregion

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ABSTRACT

Purpose: This study examines how responsive the exports of milled rice are to rising food prices in the Greater Mekong Subregion.

Methodology: The research employed panel data regression models, including Fixed Effects and Random Effects, and the Pooled Ordinary Least Squares to examine data spanning from 1996 to 2020 for three countries in the subregion: Cambodia, Vietnam, and Thailand.

Findings: The results show that milled rice exports from the subregion were responsive to the food price surge of 2008-2009, i.e., exports increased following the price surge. In addition, the production of rice was found to be positively associated with exports.

Implications: The findings emphasize the importance of milled rice exports in the Greater Mekong Subregion. The responsiveness of rice exports to the price surge implies that exporters are ready to increase exports constantly. This provides policymakers with inputs to formulate policies and strategies to increase exports for stabilizing food prices and increasing rice farmers' income.

Originality: The study contributes to the existing body of literature, providing new evidence of the milled rice exports responding to the food price surge by looking into the major rice-exporting countries in the Greater Mekong Subregion.

Limitations and directions for future research: The study is not free from limitation due to the unavailability of data, leading to the exclusion of two countries in the Greater Mekong Subregion. The generalizability of the findings may be limited within this region, therefore, setting directions for future empirical studies to incorporate major rice-exporting countries in other regions.

Keywords: Rice export; Food price crisis; Greater Mekong Subregion

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Publisher: CamEd Business School
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Recommended Citation

Thath, R. (2025). The rise in food prices and the export of milled rice in the Greater Mekong Subregion. *Journal of Accounting, Finance, Economics, and Social Sciences*, 10(1), 29 – 38. <https://doi.org/10.62458/jafess1013xyz>

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INTRODUCTION

In the last quarter of 2007, global food prices, including rice, wheat, and maize, started to surge rapidly, causing panic in developing and developed countries as well as in importing and exporting countries. Food-importing countries such as the Philippines rushed to buy rice to store. In contrast, exporting countries like India, Vietnam, and Cambodia implemented various restrictions on the export of rice to ensure a stable and affordable supply for domestic consumption. Although it is still a subject of debate, the root causes of the surging prices are attributable to rising fuel prices, which are one of the primary inputs of fertilizer production, thus pushing the production cost and the price of fertilizers. Another root cause is the rising purchasing power of Asian middle-income countries such as China and India; the rising income in these two large countries causes an abrupt increase in the demand for food, especially rice, the staple food for Asian consumers. In addition, drought in several major food-producing countries such as India and Australia further depressed the supply of food; the increasing demand for biofuel, the depreciation of the US dollar against other key currencies such as the Euro and Japanese Yen, and other specific-crop-related causes are also the causes of food price increase (Timmer, 2008; Headey & Fan, 2008).

Rice, one of the most important staple foods in the Greater Mekong Subregion, is the source of protein, income, and employment for local people. It plays a vital role in local culture and tradition; in short, it is fundamentally the lifeline of the subregion. Rice is such an important crop that in Cambodia, for instance, it accounts for more than 70 percent of the land area allocated for agricultural production, and its output accounts for about 50 percent of the farm output (Asian Development Bank, n.d.). During the food price surge, exporting countries such as India, Cambodia, and Vietnam restricted their exports for some time to ensure a stable supply for the domestic market (for low-income net food buyers), causing its price to increase by 117 percent to 149 percent in the first quarter of 2008 (Wailes *et al.*, 2012). The timeline of the restriction taken by major rice exporting countries is as follows: in November 2007, India banned exports, followed by Vietnam and Egypt in January, and Cambodia in March 2008; from January to April 2008, the Philippines imported

normal annual quota in just four months (Headey & Fan, 2008).

In the Greater Mekong Subregion, which is comprised of Yunnan Province and Guangxi Zhuang Autonomous Region of the People's Republic of China, Cambodia, Lao PDR, Myanmar, Thailand, and Vietnam, rice plays a vital role in the livelihood of the majority of the people. These countries actively engage in international rice markets through exports, i.e., net exporters (Vietnam Plus, 2022). In 2022, Thailand was the second largest rice exporter after India, and Vietnam is the third largest. Although Cambodia is not the leading exporter of milled rice vis a vis Thailand and Vietnam, the country regularly supplies rough rice to be exported via Vietnam (USDA, 2022; Dawe & Slayton, 2010). In the first two months of 2023, for example, it was reported that Cambodia exported 871,319 tons of un-milled rice to the two neighboring counties, i.e., Thailand and Vietnam (Van, 2023). In addition, seeing the crop's potential, the Cambodian government formulated a policy in 2010 to promote rice export specifically (Royal Government of Cambodia, 2010). The surge of rice prices to the level that caused panic and distress to the world market had not just occurred in 2007-2008, but it once happened in the early 1970s, and it is uncertain whether or not the prices will surge again. Therefore, it is necessary to examine the responsiveness and behavior of the exports from the Greater Mekong Subregion during the recent rice price increase in 2007-2008, as this subregion is one of the primary sources of rice production and export. The knowledge from the study could be utilized to curb the surge in rice prices, which negatively affects the livelihood of low-income net food consumers.

This study holds significant importance as it aims to examine the responsiveness of the export of milled rice from three key countries in the Greater Mekong Subregion, namely Cambodia, Thailand, and Vietnam, to the increase in price. The Greater Mekong Subregion, in addition to two autonomous regions of mainland China, comprises five rice-exporting countries (alphabetically): Cambodia, Lao PDR, Myanmar, Thailand, and Vietnam. Due to data availability, the study covers only three countries for analysis. Myanmar and Lao PDR are rice-exporting countries, but their exports are relatively small. Specifically, the study explores how the global surge in rice prices affected the export of milled rice from these three countries, that is, how the export of rice

from the three countries responded to the price surge. This research is crucial in understanding the dynamics of rice export and its impact on the global market.

Following this introduction, the subsequent section reviews the literature on rice exports from the subregion and the causes and consequences of the rice price surge. Then, the study presents the results of the analysis, and finally, the study concludes with policy implications.

LITERATURE REVIEW

Rice Export from the Greater Mekong Subregion

Various heterogeneities exist among the three rice exporting countries, Cambodia, Thailand, and Vietnam, analyzed in this study. Regarding the volume of exports, Thailand has been the top rice exporter since the early 1980s and is well-known for its high-quality aromatic rice. Vietnam started to export rice in 1989, and it is better known for its low- and medium-quality rice, which has been exported to middle-income countries in Southeast Asia, such as Indonesia and the Philippines (Lan, 2018; Ear *et al.*, 2017). Cambodia is a relatively new player in the international markets. The country achieved self-sufficiency in rice production during the harvesting season of 1995-1996, and since then, it has started to export rice to international markets. The volume of exports has gradually increased. Historically, Cambodia exported rice since the French colonial period (1863 to 1953), and in the 1960s, it was once one of the leading rice exporting countries. After the coup d'état in the early 1970s, rice production was insufficient for local consumption due to the ongoing fighting that disrupted farming activities. In the early 1980s, Cambodia depended on a large amount of food aid to supplement the shortage of domestic rice for local consumption. Cambodian rice has also been well-known for its good taste and high quality and competed with Thai rice for the World's Best Rice award. In 2022, for instance, Cambodia's variety of Jasmine rice (Phka Rumduol) was crowned the World's Best Rice, while the Thai variety of Jasmine rice (Hom Mali) fell to second place (The Nation, 2022). As aforementioned, Cambodia has been exporting rough rice to neighboring Thailand and Vietnam, and it is not uncommon to observe Thai and Vietnamese traders cross the border to buy paddy

rice (un-milled rice) directly from Cambodian farmers during harvesting seasons to be processed and exported (Dao & Thai, 2020; Ear *et al.*, 2017).

Among the three countries, Cambodia is somewhat less developed. Its rice export had enjoyed preferential trade policies from Europe, allowing the country to export tariff-free until January 2019, when the European Commission decided to remove tariff preferences on the imports of rice from Cambodia for three years on the ground that rice imports caused economic damage to the EU producers (Hin, 2022). The tariffs ended in January 2022, and since then, the export of Cambodian rice to the EU market started to rise (Ou & Vantha, 2022; Hin, 2022).

Figure 1 presents the trajectory of the export volume of milled rice from Cambodia, Thailand, and Vietnam from 1996 to 2020. Rice export from Cambodia, although increasing, is negligible vis a vis those of Thailand and Vietnam, whose exports have continued to dominate the global rice markets. The Cambodian government has been making efforts to penetrate the export market, as evidenced by their policies on the promotion of paddy production and rice export since 2010 (Royal Government of Cambodia, 2010) and the Cambodian Rice Federation, an association of rice exporters, has set an ambition to export one million tons of milled rice by 2025 (Chea, 2023); however, there is still plenty of room to improve the competitiveness of Cambodian rice, which must involve different stakeholders from the downstream to upstream industries including farmers, millers, bankers, traders, and policymakers.

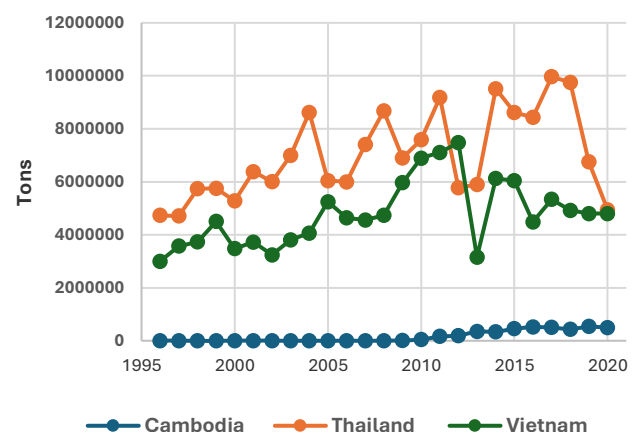


Figure 1: The Volume of Milled Rice Export from Cambodia, Thailand, and Vietnam from 1996 to 2020

Source: FAO database, online.

Figure 2 presents milled rice prices exported from Cambodia, Thailand, and Vietnam. Export prices are computed by dividing the quantity of exports (in tons) by the value of exports (in USD). Rice is exported in various forms and grades; therefore, prices vary by categories of exports. However, only the aggregate data for milled rice is available in the FOA online database, and so is the price. The average prices in 2020 were USD 504, USD 449, and USD 364 for Cambodian, Thai, and Vietnamese rice, respectively. As mentioned in the previous section, while the exports from Cambodia and Thailand are concentrated in high-quality aromatic jasmine rice, Vietnam exports more low- and medium-quality rice. Therefore, the average price of rice from Vietnam is lower. The ANOVA results to compare the average rice prices from the three countries demonstrated that at least one of the prices is significantly different at a five percent significant level ($p\text{-value} = 0.014$). Furthermore, the analysis using Tukey's HSD test to find which mean is different showed that the significant difference in mean prices occurs between the price of Cambodian rice and that of Vietnamese rice at a one percent significance level (Tukey critical value = 3.40, the absolute value of $q = 4.24$). The ANOVA and Turkey's HSD test results are not presented in the paper but are available upon request.

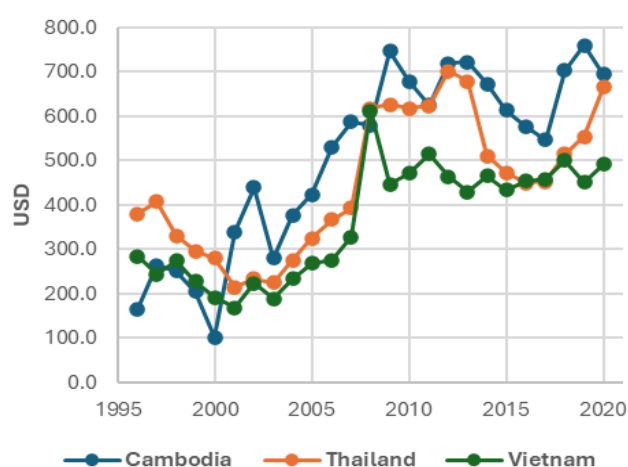


Figure 2: Export Prices of Milled Rice from Cambodia, Thailand, and Vietnam from 1996 to 2020

Source: FAO database, online.

Causes and Consequences of Rice Price Surge

The reasons behind the surge in rice prices are similar to those affecting other food crops. These factors include rising oil prices, the weakening US dollar (since most commodity prices are denominated in USD, a dollar depreciation leads to higher prices), increased demand for biofuels, and other specific factors related to rice (Headey & Fan, 2008). For some commodities, such as maize, stock speculation can cause a price surge and the market to panic; however, as rice is not traded in the forward/future market, speculation did not affect rice prices. While Timmer (2008) stated that the rising income of China and India was one of the main factors that caused the upsurge in demand for food crops, Heady and Fan (2008) downplayed this hypothesis; they argued that the rising income in the two countries had started well before the price surge. In addition, increasing demand for biofuel has a less direct effect on rice prices since rice is not used for biofuel production, and the land used for planting rice cannot be straightforwardly used for planting other crops for biofuel production. However, rice is a close substitute for wheat, and when wheat production is reduced due to the allocation of land for planting biofuel crops, the demand for rice increases, thus causing its prices to surge (Brahmbhatt & Christiaensen, 2008). Given different analyses of the causes of the rice price surge, Dawe and Slayton (2010) argued that the world rice crisis in 2007-2008 was not attributable to market failure but to the policy decision of the government, such as the panic buying by importing countries such as the Philippines and the restrictions of export by exporting countries such as Cambodia, Vietnam, and India. They further explained that rice is thinly traded internationally, with most transactions occurring through government-to-government contracts. Asian governments, recognizing rice's significance as a staple crop, closely manage its trade to maintain stability, as uncontrolled price fluctuations could impact social and economic stability in these countries.

The fact that rice-importing governments panic-bought rice is not irrational. Many governments fear that rising rice prices will cause social unrest. Various reports had warned about the possibility of turmoil and unrest as rice prices continued to rise (The StraitsTimes, 2022; NBC, 2008; Bradsher, 2008; The Guardian, 2008).

In addition to the decision of governments in importing countries to panic-buy rice to stock for fear of food shortage, amid the food price crisis, exporting countries in Southeast Asia, led by Thailand, considered founding a rice exporter cartel, namely the Organization of Rice Exporting Countries (OREC) to control rice export similarly to that of the Organization for Petroleum Exporting Countries (OPEC) 's control of the production and export of oil. However, just one week after the initiative, the proposal to found OREC was dropped due to pressure from public opinion (Dawe & Slayton, 2010), which believed that creating OREC would increase rice prices and hurt the poor urban rice consumers. Thus, it is unhumanitarian. The proposal to create OREC was not the only consequence of the rice price surge on public policy but also the formulation of the ASEAN Integrated Food Security Framework to avoid a repeat of the price crisis (Asian Development Bank, 2012).

The Current Rice Trade Policies beyond the Greater Mekong Sub-region

Outside the Greater Mekong Subregion, India, the largest rice exporter, significantly influences the global rice trade and its price. In July 2023, India banned the export of non-basmati rice to stabilize the local price in response to the reduced production due to unfavorable weather events such as the impact of El Nino (Shimoda, 2023), prompting concern about global food insecurity. It was estimated that after the ban, rice prices increased to the level seen in 2007 and 2008 (Montesclaros, 2023). According to the International Food Policy Research Institute (IFPRI), India has often imposed export restrictions during global food price surges; the restriction is on rice and wheat exports (Glauber & Mamun, 2023). There is a fear that the ban would lead to an international price crisis due to trade speculation from other countries that depend on revenue from rice imports, exports, and consumption; thus, it is critical to seek a multilateral solution to solve this problem (Montesclaros, 2023). The negative consequence may be beyond Asia and may be severe for food-importing countries in Africa and the Middle East (Baum & Klimek, 2023).

The recent rice price surge prompted policy responses from governments in Southeast Asian regions, especially the rice-importing countries. In

late September 2023, the Philippines and Myanmar introduced a rice ceiling for farmers, followed soon by Malaysia (Donnelly, 2024). Vietnam, the Philippines' major rice supplier, has signed a bilateral agreement to ensure a stable rice supply (Donnelly, 2024). Indonesia, one of the largest rice importers in Southeast Asia, also responded to the price surge by securing a commitment to supply rice from India and reaching out to Cambodia for additional supply (Nitta & Inoue, 2024). From the position of exporting countries, the ban on Indian rice exports saw a surge in prices and exports from major exporters such as Thailand and Vietnam (Nitta & Inoue, 2024). In conclusion, the recent surge in price, although less severe than in 2007-2008, saw similar responses from the governments; both importing and exporting countries seek to stabilize local prices and consumptions. While importing countries seek to increase the volume of imports, exporting countries may ban exports or set price ceilings to ensure affordable prices for domestic consumption.

METHODOLOGY

According to the law of supply, when prices increase, the quantity supplied will increase as incumbent suppliers increase their quantity supplied to maximize profits, and increasing prices will attract new suppliers to enter the industry. The supply for export follows the same law. In addition, how responsive a particular commodity is to the price surge depends on its supply elasticity. Agricultural commodities such as rice are relatively less supply elastic since it is time-consuming for producers to increase the productivity and capacity to produce rice output (it takes time to enlarge and prepare land, transplant, and at the earliest, it takes several months for rice from planting to be ready for harvest). Various methodologies, including the Gravity Model and the Computable General Equilibrium Model (CGE), were used to examine the behavior of the export of agricultural commodities, including rice, such as the study by Pham *et al.* (2014), Yu and Bandara (2017), and Kea, *et al.* (2019).

As stated in the objective, this study tested the hypothesis that the export of milled rice would increase after the price surge in 2007-2008 by estimating export function as in Abolagba *et al.* (2010), whose study applied a time series data model to investigate factors that influence the export of

cocoa and rubber in Nigeria. This study is different as the panel data model was employed to analyze the data that is publicly accessible in the online database of the Food and Agriculture Organization of the United Nations (FAO), spanning from 1996 to 2020. Three countries in the Greater Mekong Subregion, namely Cambodia, Thailand, and Vietnam, were included in the analysis, thanks to the consistent availability of the data from the three countries. In addition to the FAO database, the study utilized data from the World Bank's World Development Indicator (WDI).

The panel data regression was employed to regress the export supply of milled rice, the dependent variable, on explanatory variables, including rice production, producer's prices, exchange rate, year dummy, and the interaction between price and year. Specifically, the regression equation was adapted from the study of Abolagba *et al.* (2010) and expressed in the following econometric forms.

$$X_{it} = \beta_0 + \beta_1 PRO_{it} + \beta_2 PP_{it} + \beta_3 EX_{it} + \beta_4 YEAR_{it} + \beta_5 PP \times YEAR_{it} + \varepsilon_{it} \quad (1)$$

Where:

i is the country ($i = 1, 2, 3$ for Cambodia, Thailand, and Vietnam)

t is the year ($t = 1, 2, \dots, 25$ is for the years from 1996 to 2020)

X_{it} is the export of milled rice

PRO_{it} is the production of rice

PP_{it} is the producer price of rice

EX_{it} is the exchange rate

$YEAR$ is the dummy variable representing the year immediately after the world food price increase ($Y = 1$ if the year is 2009, 2010, 2011, and 2012, and is zero otherwise; the export of milled rice is assumed to increase several years after the price surge in 2007-2008).

$PP \times YEAR$ is the interaction between time and producer price

ε_{it} is the disturbance terms

Table 1 presents the descriptive statistics of variables used to estimate the regression model. These include the value of milled rice in thousand USD, the producer

price in USD, the exchange rate expressed as the value of USD per unit of local currency, and the volume of production in 1000 tons. The data spans from 1996 to 2020, so, generally, the minimum value represents the initial year.

Table 1: Descriptive Statistics for the Model Variables

Variable	Obs	Mean	SD	Min	Max
Milled rice (in 1000 USD)	75	1715006	1608867	150	5732154
Producer prices (in USD)	63	214.56030	76.86337	96.30000	345.50000
Exchange rate (USD per LUC)	75	0.00975	0.01383	0.00004	0.03946
Production (in 1000 tons)	75	25100	13900	3404	45100

Source: Author's calculation based on FAOSTAT.

The Hausman test results indicate that the random effect model is preferable (Table 2). For comparison, the results of three models, the Random Effects, Fixed Effects, and Pooled OLS, were analyzed and presented in Table 3. However, only the Random Effects result is used to analyze the determinants of rice exports and their responsiveness to the price surge.

Table 2: The Results of the Hausman Test

Variables	Fixed Effects Model (1)	Random Effects Model (2)	Differences (1)-(2)	SE
PP	-2.426	2.166	-4.592	4.177
EX	-15.949	48.292	-64.241	40.277
PRO	2.260	3.267	-1.008	0.638
$YEAR$	0.756	0.568	0.188	0.136
$PP \times YEAR$	0.002	-0.001	0.002	0.002

Note: chi-squared = 3.99; probability > chi-squared = 0.4073

Source: Author's calculation.

According to Table 3, the export of milled rice was significantly positive after the global food price rise (p-value = 0.021). This indicates that exporters responded to the increase in prices by increasing exports. For the controlled variables, the coefficient of producer prices (PP) is positive but not significant (p-value = 0.790). The production of rice (PRO) is positively correlated with export and is significant at a

one percent significance level (P -value < 0.001). This finding implies that the larger the production, the more significant the export. It also means that a larger rice surplus is available for export after domestic consumption is fulfilled. In addition, the exchange rate (EX) positively correlates with exports; thus, when the local currency appreciates, a larger volume of milled rice is exported. The interaction between time and price ($PP \times Y$), which could be used to assess the impact of price on export, was found to be negative but not significant (p -value = 0.816).

Table 3: Factors Affecting the Export of Milled Rice

Variables	Random Effects	Fixed Effects	Pooled OLS
PP	2.166 (8.130)	-2.426 (9.140)	2.166 (8.130)
EX	48.292*** (6.494)	-15.949 (40.798)	48.292*** (6.494)
PRO	3.267*** (0.121)	2.260*** (0.649)	3.267*** (0.121)
$YEAR$	0.568** (0.247)	0.756** (0.282)	0.568** (0.247)
$PP \times YEAR$	-0.001 (0.004)	0.002 (0.004)	-0.0001 (0.004)
Constant	-44.697*** (2.649)	-28.553** (10.977)	-44.697*** (2.649)
Number of obs.	63	63	63
R-sq	Within = 0.648 Between = 1.000 Overall = 0.962	Within = 0.669 Between = 0.916 Overall = 0.855	R-sq = 0.962 Adj R-sq = 0.958

Note: Standard errors in the parentheses. ** and *** indicate significant at 5% and 1%, respectively.

Source: Author's calculation.

Discussions

The rise in rice prices benefits exporting countries such as those in the Greater Mekong Subregion, which are the net exporters of rice. When the prices of rice increase in the global market, farmers who can produce a surplus of rice for export would increase profit. They would supply a larger volume for export rather than selling in the local market. However, the increasing exports would also put upward pressure on domestic prices, which hurt the farmers whose capacity to produce is low. So, their production volume is insufficient for household consumption, let

alone for selling at the market. In addition, the urban poor who depend on non-farm activities to generate income and spend most of their income on food would see their expenditure rise. Even in rice-exporting countries like Cambodia, Thailand, and Vietnam, only some farming households can produce a surplus for export. Therefore, given the increase in rice prices, there are losers and winners. A study in Vietnam indicates that although rising rice prices and other grains raise the overall Vietnamese household's welfare, some households have worse welfare (Vu & Glewwe, 2011). In Indonesia, one of the largest rice-importing countries, for example, the majority of people, including those in the rural areas, consume more rice than they produce and thus are hurt by the increase in price (McCulloch, 2008). Given that not everyone, even in the exporting countries, benefits from price upsurges, stable food or rice prices are preferable. As the world economy grows more interconnected, a crisis in one country or region can have ripple effects on other regions or countries. For instance, while a rice price surge may benefit Cambodia, Thailand, and Vietnam, it could adversely affect importing nations like the Philippines, Indonesia, or Europe, which also purchase other products such as garments and electronics from these three exporting countries.

The finding that when the exchange rate appreciates, the exports will increase contrasts with the conventional economic theory, which suggests that when a currency appreciates, exports should decrease due to higher prices in international markets. Conversely, a depreciating currency is expected to boost exports by lowering product prices. However, rice exports behave differently. Because rice is necessary, a price increase due to the currency's appreciation does not necessarily negatively impact exports as its demand is relatively inelastic. That means that although rice prices increase, consumers continue to consume rice even as prices rise, and any demand reduction is insignificant. For instance, a study on general agricultural exports in Turkey found that exchange rate volatility, particularly depreciation, did not significantly impact agricultural exports (Buguk *et al.*, 2003).

CONCLUSION AND IMPLICATIONS

The export of milled rice is found to be responsive to rises in world food prices. This responsiveness allows

exporting countries in the Greater Mekong Subregion to generate more foreign exchange, which can then be invested in other sectors. Additionally, rice farmers stand to benefit from rising prices, as they can retain larger profits. When exports are responsive—meaning there are no restrictions during price surges—importing countries also gain advantages. They can source food from various suppliers, and prices are less likely to spike rapidly. Consequently, responsive exports contribute to price stability, benefiting consumers in importing and exporting nations.

However, deciding to create a rice cartel or restrict exports to stabilize local prices and consumption may seem rational and reflect a somewhat selfish policy akin to "beggar thy neighbor." Such an approach could backfire because when prices rise in importing countries, it may trigger a crisis that spreads to other sectors, causing problems for the exporting nations. As the world becomes increasingly globalized, crises in one country or region can quickly spread to others.

While exporting countries may gain more during food price increases, not everyone benefits. Rising food prices negatively affect net food buyers within these exporting nations. To mitigate this impact, redistribution policies should be considered. Additionally, research should be conducted to understand the food industry's characteristics, allowing governments to identify which population groups might suffer during a food crisis. Mismanaged food prices can lead to severe consequences, including riots or social unrest.

Acknowledgments: The author presented an earlier version of this paper at the 11th Asian Society of Agricultural Economists (ASAE) at Aoyama Gakuin University, Tokyo, Japan, from March 17 to 20, 2023. The author would like to sincerely thank CamEd Business School for providing financial support for attending the conference and undertaking this research project.

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Positive Effects of Perceived Quality of Parent-Adolescent Communication on Academic Motivation and Achievement of Adolescents

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ABSTRACT

Purpose: This study investigates how the perceived quality of parent-adolescent communication influences academic motivation and achievement among students in a high-stakes academic setting.

Methodology: A quantitative, cross-sectional design was employed, involving 278 students from Grades 7 to 10 at a competitive public secondary school in the Philippines. Data were collected using the Parent-Adolescent Communication Scale and the Deo-Mohan Academic Achievement Motivation Scale. The study assessed academic achievement using students' general weighted averages. Stratified random sampling ensured proportional representation across year levels, and multi-category logistic regression was used to examine the effects of communication quality on academic outcomes.

Findings: High-quality parent-adolescent communication had a statistically significant positive effect on academic motivation and achievement. Conversely, low-quality communication had a more negative impact on motivation than on achievement. The findings support the Self-Determination Theory, suggesting that supportive communication satisfies adolescents' psychological needs for autonomy, competence, and relatedness, thereby enhancing intrinsic motivation and performance.

Implications: The study highlights the importance of parenting programs that promote open, empathetic, and autonomy-supportive communication. Educators and policymakers should consider integrating family communication initiatives into academic support systems to enhance student outcomes, particularly in high-pressure school environments.

Originality: This study contributes to the literature by isolating communication quality as a specific dimension of parental involvement and examining its role within a highly competitive academic context.

Limitations and directions for future research: The findings are limited to a single school and do not distinguish between maternal and paternal communication. Future research should employ longitudinal designs and explore the effects of specific communication styles.

Keywords: Parent-Adolescent communication; Academic motivation; Academic achievement; Self-Determination theory; Supportive parenting; High-Stakes education

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Publisher: CamEd Business School
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Recommended Citation

Ortiz, R. J. D., Ferido, M. P., Albor, R. G. Z., Ancho, I. V., Bulasag, A. S., Almeda, P. P., & Celzo, K. E. F. (2025). Positive effects of perceived quality of parent-adolescent communication on academic motivation and achievement of adolescents. *Journal of Accounting, Finance, Economics, and Social Sciences*, 10(1), 39-54. <https://doi.org/10.62458/jafess1014ortizetal>

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INTRODUCTION

Parental involvement has been widely documented as a crucial factor in adolescents' academic development, influencing their academic motivation, achievement, and emotional and social well-being (Jeynes, 2022; Li *et al.*, 2022). However, parental involvement is a complex, multi-dimensional construct that includes behaviors such as academic monitoring, emotional support, and communication (Garbacz *et al.*, 2019; Clark *et al.*, 2020). Within this spectrum, the quality of parent-adolescent communication stands out as a particularly influential factor, serving as a medium through which parents can directly impact adolescents' academic attitudes and outcomes (Hsieh, 2023; Silinskas *et al.*, 2015).

Although numerous studies have explored the benefits of positive communication, few have specifically examined how the perceived quality of parent-adolescent communication affects academic motivation and achievement in high-stakes academic environments. Adolescence, a developmental period characterized by a growing need for autonomy, often brings shifts in family communication patterns, which can either enhance or undermine students' academic resilience (Sun *et al.*, 2025; Smetana, 2017). In competitive educational settings, where students already face heightened academic expectations, understanding the role of parental communication becomes even more critical (Bi & Wang, 2023; Diseth *et al.*, 2020).

This study addresses a critical gap by investigating the effects of perceived parent-adolescent communication quality on academic motivation and achievement among students in a highly competitive public secondary school in the Philippines. It also contributes to the existing literature by framing communication as a specific, measurable dimension of parental involvement. Specifically, it aims to (1) assess the quality of parent-adolescent communication as perceived by adolescents; (2) determine the levels of academic motivation associated with different perceived qualities of parent-adolescent communication; (3) measure the academic achievement of adolescents across varying levels of perceived communication quality; (4) investigate the overall effects of perceived communication quality on academic motivation and achievement; and (5) provide evidence-based recommendations on how parents can enhance

communication practices to support their adolescents' academic success.

This study is grounded in the Self-Determination Theory (Deci & Ryan, 2000), which emphasizes the basic psychological needs for autonomy, competence, and relatedness. In educational contexts, Self-Determination Theory suggests that environmental factors such as parental communication styles can either support or hinder these needs, influencing academic motivation and achievement. Autonomy-supportive communication can foster intrinsic motivation by reinforcing adolescents' sense of agency, while controlling communication may undermine it (Celik, 2024; Froiland & Worrell, 2017; Soenens & Vansteenkiste, 2005).

By focusing specifically on the quality of parent-adolescent communication, this research seeks to extend the application of the Self-Determination Theory to adolescents' academic development in competitive environments. It also aims to offer practical insights for parents, educators, and counselors by highlighting communication strategies that promote academic motivation and achievement (Wilder, 2023; Bi & Wang, 2023). Understanding how high-quality communication supports adolescents' success can guide stakeholders in creating supportive environments, even under conditions of elevated academic pressure (Silinskas *et al.*, 2015; Jeynes, 2022).

LITERATURE REVIEW

The Multidimensional Nature of Parental Involvement with Communication at its Core

Parental involvement has long been recognized as a robust predictor of adolescents' academic, emotional, and social outcomes (Jeynes, 2022; Li *et al.*, 2022). Foundational research (Acharya & Joshi, 2011; Ghazi *et al.*, 2010; Xiong *et al.*, 2021; Derrick *et al.*, 2022) has established a link between active parental engagement through guidance, monitoring, and emotional support and students' academic success. Over time, scholarly consensus has moved toward a more nuanced understanding that parental involvement is not a singular behavior but a multidimensional construct encompassing various domains, including academic oversight, emotional support, and communication practices (Garbacz *et al.*, 2019; Clark *et al.*, 2020; Schmuck, 2011; Chan *et al.*, 2022).

Communication has emerged as a central and measurable element among these domains rather than a supplementary one. Communication acts as the critical channel through which emotional warmth, academic expectations, encouragement, and feedback are conveyed (Silinskas *et al.*, 2015; Sengonul, 2022; Xie & Derakhshan, 2021). It serves as the mechanism that either amplifies or undermines other forms of parental involvement. Positive communication strengthens adolescents' internalization of parental values, while poor communication can negate the benefits of even well-intentioned parental monitoring (Wong, 2008; Kapetanovic & Skoog, 2021). Thus, understanding parental involvement requires a deep exploration of the quality and nature of communication between parents and adolescents.

Given the centrality of communication within the broader construct of parental involvement, it is essential to examine how variations in communication quality specifically impact adolescents' educational outcomes. Building on the idea that communication serves as the main vehicle for transmitting support, expectations, and emotional connection, the following section explores how the quality of parent-adolescent communication predicts academic motivation and achievement.

Communication Quality as a Predictor of Academic Motivation and Achievement

The quality of parent-adolescent communication has consistently been found to predict key academic outcomes such as motivation, self-regulation, persistence, and achievement (Hsieh, 2023; Shao & Kang, 2022; Silinskas *et al.*, 2015). High-quality communication—marked by openness, responsiveness, mutual respect, and autonomy support—fosters adolescents' academic self-efficacy, goal-setting behaviors, and intrinsic motivation (Wong, 2008; Murphy & Kelp, 2023; Shin & Bolkan, 2021). Through encouraging conversations, adolescents develop greater confidence in their academic abilities and a stronger internal drive to succeed.

Conversely, communication that is characterized by criticism, excessive control, or emotional coldness has been linked to decreased academic engagement, lower intrinsic motivation, and even emotional withdrawal from learning (Chen *et al.*, 2023; Wang & Sheikh-Khalil, 2013; Smogorzewska *et al.*, 2022). Adolescents

exposed to unsupportive communication may experience feelings of helplessness, diminished self-worth, and fear of failure, ultimately impairing their academic performance (Mata *et al.*, 2018; Lavrijsen *et al.*, 2023; Qian, 2024).

Importantly, these effects hold even in high-pressure, highly competitive academic environments. Recent studies (Neville *et al.*, 2025; Bi & Wang, 2023) have shown that in schools with rigorous academic standards, supportive parent-adolescent communication remains a key protective factor against the adverse effects of academic stress, reinforcing its crucial role across various educational settings.

While the direct relationship between communication quality and academic outcomes is well-documented, it is equally important to situate this relationship within the emotional and developmental context of adolescence. As adolescents undergo significant changes in their social, emotional, and cognitive development, the nature and effectiveness of parent-adolescent communication can also evolve substantially. The following section examines how these developmental dynamics influence and mediate the impact of communication on academic success.

Emotional and Developmental Dynamics Shaping Communication Effects

The impact of communication on academic outcomes cannot be disentangled from the broader emotional and developmental context of adolescence. Adolescence is a period of rapid physical, cognitive, and emotional growth, often accompanied by a heightened desire for autonomy and increased sensitivity to relational dynamics (Sun *et al.*, 2025; Bi & Wang, 2021; Smetana, 2017). These developmental shifts can challenge traditional patterns of parent-child interaction and demand adjustments in communication styles.

Supportive, autonomy-affirming communication becomes especially critical during this period. Adolescents who experience open, empathetic, and autonomy-supportive dialogue with their parents demonstrate greater emotional resilience, reduced academic stress, and stronger engagement with school (Wilder, 2023). They are more likely to internalize academic goals and view challenges as opportunities for growth rather than threats to self-esteem (Le Poire, 2005). However, if parental communication remains authoritarian,

overly critical, or dismissive during adolescence, it may exacerbate conflict, erode trust, and hinder the development of academic persistence and emotional regulation (Aufseeser *et al.*, 2006). Thus, the dynamic interplay between developmental needs for autonomy and the quality of parental communication becomes a decisive factor in adolescents' academic trajectories.

Understanding the emotional and developmental backdrop of adolescence deepens the appreciation of why communication quality matters; however, a theoretical framework is necessary to explain the underlying psychological mechanisms. Self-determination theory (SDT) provides a framework that offers insight into how specific features of communication fulfill adolescents' basic psychological needs and drive academic motivation. The following section outlines how SDT can be applied to understand and enhance the impact of parent-adolescent communication on academic achievement.

Self-Determination Theory as a Framework for Understanding Communication Outcomes

Self-Determination Theory (Ryan & Deci, 2000) offers a compelling theoretical framework for understanding how parent-adolescent communication influences academic motivation and achievement. According to SDT, individuals are most motivated and perform optimally when three basic psychological needs are satisfied: autonomy (feeling in control of one's actions), competence (feeling effective in one's activities), and relatedness (feeling connected to others).

Communication that supports these needs—by respecting adolescents' emerging autonomy, offering constructive and encouraging feedback to build competence, and fostering emotional closeness—promotes intrinsic motivation and engagement (Celik, 2024; Froiland & Worrell, 2017). In contrast, controlling, dismissive, or overly critical communication undermines these needs, leading to decreased academic interest, lower persistence, and even academic disengagement (Lerner *et al.*, 2022; Soenens & Vansteenkiste, 2005).

Recent advances in SDT (Ryan & Deci, 2020) have emphasized the quality of family communication as a measurable environmental factor influencing adolescents' motivation and well-being. These updates further validate that parental communication

is supportive and foundational to academic success. As a result, framing communication quality within the SDT framework strengthens the argument that parent-adolescent communication is not a peripheral aspect of parental involvement but a central predictor of academic and emotional development.

Building on these insights, the present study contributes to the literature by framing parent-adolescent communication not simply as an aspect of parental involvement but as a specific, measurable dimension that directly influences academic motivation and achievement. Focusing on adolescents' perceptions of communication quality, this research captures the emotional, motivational, and developmental complexities that shape school outcomes. Grounded in Self-Determination Theory, the study also responds to calls for operationalizing communication behaviors in ways that can inform practical interventions. Ultimately, it aims to provide evidence-based recommendations that parents can use to foster autonomy-supportive, emotionally responsive communication, thereby enhancing their adolescents' academic success in increasingly competitive educational environments.

METHODOLOGY

The study employs a quantitative research design to examine the effects of perceived parent-adolescent communication quality on adolescents' academic motivation and achievement. Quantitative methods were selected because they enable the objective measurement and analysis of variables essential for establishing relationships between communication quality, motivation, and academic performance (Rana *et al.*, 2023; Creswell & Creswell, 2017). This approach enables the use of standardized instruments and inferential statistical techniques to identify patterns, correlations, and potential causal links, making it particularly suitable for studies focusing on measurable constructs in educational and developmental psychology (Muijs, 2022).

Research Design

This research utilizes a cross-sectional survey design, gathering data from a highly competitive public secondary school in the Philippines at a single point in time. A cross-sectional approach is appropriate here because it provides a snapshot of the current communication quality, motivation, and academic achievement levels within the selected population,

enabling a straightforward analysis of their relationships without the need for longitudinal data (Bryman, 2016; Adhikari & Sharma, 2021; Creswell & Creswell, 2017). The study employs multi-category logistic regression to examine the impact of communication quality on academic motivation and achievement, categorizing communication levels and academic outcomes into high, moderate, and low categories. This design enables comparisons across categories, thereby clarifying whether higher communication quality is associated with increased motivation and achievement (Xia, 2021; Hosmer *et al.*, 2013).

Population and Sampling

The population of interest consists of adolescents in Grades 7 to 10 at a highly competitive public secondary school in the Philippines. This school was chosen due to its academically competitive environment, which provides a unique setting to examine whether communication quality influences academic outcomes, even in high-stakes educational contexts. The school administration granted access to the student master list, enabling stratified random sampling to ensure proportional representation across all year levels. Stratified sampling enhances the representativeness of the sample, making the findings more generalizable to the entire student population within this school (Bryman, 2016; Fowler, 2013).

The sample size was calculated using a confidence level of 99% and a 10% margin of error, resulting in a total of 278 students, distributed among students from Grade 7 to 10. This sample size is adequate for generating statistically significant results, given the study's design and scope (Pate *et al.*, 2023; Taherdoost, 2022; Krejcie & Morgan, 1970). A high confidence level was selected to minimize the likelihood of sampling error and enhance the reliability of the findings.

Variables and Measures

The primary variables in this study are perceived parent-adolescent communication quality, academic motivation, and academic achievement. Perceived communication quality is assessed through the Parent-Adolescent Communication Scale (PACS), developed by Barnes and Olson (1985). This instrument, widely used in family communication

research, measures both positive and negative aspects of parent-adolescent communication through a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Positive scores on PACS indicate a high quality of communication, characterized by open dialogue and supportive interactions, while negative scores reflect lower quality, associated with criticism or a lack of empathy (Zhang *et al.*, 2021; Bi & Wang, 2023). For this study, communication scores are categorized as high, moderate, or low based on the average scores of the responses.

Academic motivation is measured using the Deo-Mohan Academic Achievement Motivation Scale (Deo & Mohan, 1985), a 37-item instrument tailored to the academic setting, with responses recorded on a five-point Likert scale (0 = Never to 4 = Always). The items are designed to assess students' intrinsic and extrinsic motivation toward academic tasks. Total scores are then categorized into high, moderate, or low motivation levels to facilitate comparative analysis across communication quality categories. This scale has been validated in various studies as a reliable measure of academic motivation in adolescent populations, making it appropriate for the present study (Singh & Chaudhary, 2024; Liang *et al.*).

Academic achievement is assessed using the students' general weighted average (GWA) for the three quarters leading up to the study. GWAs are categorized into high, moderate, and low achievement based on the mean score of the sample population. This measure, though not exhaustive of all aspects of academic success, provides a standardized indicator of academic performance that aligns well with the study's objectives (Ates, 2021).

Data Collection Procedure

Prior to data collection, the study obtained ethical clearance from the school administration and secured informed consent from both the student participants and their legal guardians. Participants were thoroughly informed about the study's objectives, the confidentiality and anonymity of their responses, and their right to withdraw from the study at any stage without penalty. These procedures ensured adherence to ethical standards for research involving minors (Resnik, 2018).

Data collection was scheduled during the school's Monday homeroom period to ensure maximum student availability and consistency in administration. Survey packets, including the Parent-Adolescent Communication Scale (PACS) and the Deo-Mohan Academic Achievement Motivation Scale, were distributed to the stratified random sample of students. Each participant was allotted 30 minutes to complete the survey instruments in a supervised, distraction-minimized setting, ensuring data quality and comparability across participants (Taherdoost, 2022; Bryman, 2016; Dillman *et al.*, 2014).

The study requested written authorization from the school principal to obtain students' academic achievement data. Upon approval, General Weighted Averages (GWAs) for the first three academic quarters were collected confidentially by a designated researcher. This approach safeguarded student privacy and ensured data accuracy.

Data Analysis

The study analyzes the data using multi-category logistic regression to examine the relationship between perceived communication quality (high, moderate, or low) and the outcome variables of academic motivation and academic achievement. Logistic regression is suitable for this study because it enables a comparative analysis between categories, providing a clear assessment of how variations in communication quality impact academic outcomes (Williams & Hosmer, 2019; Agresti, 2018).

Scores on the PACS and motivation scale were summed, and categories were defined based on the mean and standard deviation of the responses. Communication quality was coded as the predictor variable, with academic motivation and achievement as the response variables. The baseline category for all analyses was set to "moderate," allowing for comparisons with the high and low categories.

For the logistic regression model, the p-value threshold was set at 0.05 to determine the statistical significance of the relationships between communication quality and academic outcomes. A p-value below 0.05 would indicate a statistically significant relationship, rejecting the null hypothesis that communication quality does not affect motivation or achievement. All analyses were

conducted using SPSS, ensuring computational accuracy and minimizing the risk of human error in model estimation and interpretation.

Scope and Limitations

This study is limited to students at a highly competitive public secondary school in the Philippines in Grades 7 to 10, which may restrict the generalizability of the findings to other academic settings. The focus on a high-stakes academic environment, where intrinsic motivation may already be elevated, might also influence the study's results, as academic pressure in such contexts could overshadow the effects of parental communication (Bi & Wang, 2023). Additionally, the study does not distinguish between maternal and paternal communication, potentially overlooking differences in communication dynamics within two-parent households (Zhang *et al.*, 2021; Deacon & Firebaugh, 1988).

Moreover, while grades measure academic achievement, they may not capture all dimensions of student learning or performance. Future studies might include additional indicators of academic success, such as test scores or qualitative assessments of student engagement, to provide a more holistic understanding of academic outcomes (Ates, 2021). Finally, the self-reported nature of the PACS and motivation scale may introduce response biases, though assurances of confidentiality were made to mitigate these effects (Bryman, 2016; Babbie, 2021).

Ethical Considerations

This study strictly adhered to ethical standards for conducting research involving minors. Prior to data collection, informed consent was obtained from both the adolescent participants and their legal guardians, ensuring that participation was voluntary. Participants were fully informed of the study's objectives, procedures, and their rights, including the right to withdraw at any point without penalty (Resnik, 2018).

To maintain confidentiality, all survey responses were anonymized using participant codes, and academic records were handled exclusively by the designated researcher and stored securely. No personally identifiable information was disclosed at any stage of the research process.

Participants were also assured that their participation or responses would not affect their academic standing or relationships within the school. The research team provided clear instructions, debriefing, and contact information for follow-up inquiries or ethical concerns. These procedures ensured compliance with institutional and international ethical standards for educational research involving vulnerable populations (Facer, 2021).

RESULTS AND DISCUSSION

This section presents an extensive analysis of the study's results, detailing the relationship between the perceived quality of parent-adolescent communication, academic motivation, and academic achievement among high school students. Using tables and statistical analyses, we explore the distribution of communication quality, assess motivation and academic achievement levels, and examine the effects of communication quality on these academic outcomes. These findings are discussed in the context of relevant literature, providing insights into family communication dynamics and adolescent academic success.

Distribution of Perceived Quality of Parent-Adolescent Communication

Table 1 provides an overview of the distribution of perceived parent-adolescent communication quality among the respondents, categorizing communication as high, moderate, or low. This classification allows us to understand the overall communication environment perceived by adolescents within their families.

Table 1: Perceived quality of parent-adolescent communication

Communication Quality	Frequency	Percentage
Low	11	4%
Moderate	137	49%
High	130	47%
Total	278	100%

The data in Table 1 indicate that nearly half of the respondents (49 percent) rated their parent-

adolescent communication as moderate, while a close 47 percent reported high-quality communication. Only a small fraction (4 percent) perceived their communication with parents as of low quality. This distribution highlights that, for most students, the communication with parents meets a moderate or supportive level, aligning with findings from prior studies that emphasize the importance of open, supportive family communication in fostering adolescent development (Wilder, 2023; Bi & Wang, 2023; Schmuck, 2011). High-quality communication is often characterized by open dialogue, empathy, and encouragement, which are linked to adolescents' emotional and psychological well-being (Zhang *et al.*, 2021; Acharya & Joshi, 2011).

This distribution of communication quality suggests that most students experience some degree of supportive interaction with their parents. Adolescents who report high communication quality are likely to benefit from discussing concerns, receiving guidance, and feeling understood within their family environment. Studies show that such supportive communication fosters autonomy and relatedness, two components essential for fostering intrinsic motivation according to Self-Determination Theory (SDT) (Ryan & Deci, 2000).

Academic Motivation Levels Among Adolescents

The next stage of the analysis assesses academic motivation among adolescents and its association with perceived communication quality. Table 2 displays the distribution of academic motivation levels across different levels of communication quality, indicating how variations in parental communication may correlate with motivation.

Table 2: Frequency distribution of perceived quality of parent-adolescent communication and academic motivation level

Academic Motivation Level	Communication Quality			
	Low	Moderate	High	Total
Low	0	6	5	11
Moderate	4	67	66	137
High	7	64	59	130
Total	11	137	130	278

Table 2 reveals that students with high-quality communication are most likely to report high academic motivation, with 59 out of 130 students in this category reporting high levels of motivation. This reflects a substantial proportion of highly motivated students among those who perceive communication with their parents as supportive and open. In contrast, among students who reported low-quality communication, only 7 out of 11 students were highly motivated, while four students reported moderate levels of motivation. Notably, no students in the low-communication group reported low academic motivation, which may suggest that even minimal parental engagement, when present, might still contribute to buffering the most extreme cases of demotivation. These patterns are consistent with prior studies, which indicate that high-quality parent-adolescent communication supports intrinsic motivation and resilience in academically demanding environments (Zhang *et al.*, 2021; Bi & Wang, 2023).

These findings are consistent with Self-Determination Theory (SDT), which posits that environments supportive of autonomy, competence, and relatedness foster intrinsic motivation (Ryan & Deci, 2000). In this study, high-quality parent-adolescent communication may serve as an environmental factor that fulfills these basic needs, thereby enhancing students' intrinsic motivation to engage in academic tasks. Prior studies have shown that parents' supportive and open communication styles are positively associated with adolescents' motivation and engagement in academic settings (Liang *et al.*, 2024; Wilder, 2023; Caro, 2011). When adolescents perceive communication with their parents as supportive, they are more likely to feel motivated to perform well academically, which could reflect a direct encouragement of autonomy and personal goals within the home environment.

Conversely, students who perceive their communication with parents as low-quality or characterized by criticism and a lack of empathy may experience a decrease in motivation. This finding is consistent with research indicating that controlling or authoritarian communication can stifle intrinsic motivation by creating a high-pressure environment that undermines adolescents' autonomy and confidence (Silinskas *et al.*, 2015; Mata *et al.*, 2018). Thus, the results highlight the significance of communication quality in influencing students'

attitudes toward academic tasks and their willingness to engage in them.

Academic Achievement of Adolescents

The third component of the analysis examines academic achievement, using students' general weighted average (GWA) as a measure of academic performance over three quarters. Table 3 displays the relationship between perceived communication quality and academic achievement, classified as high, moderate, or low.

Table 3. Frequency distribution of perceived quality of parent-adolescent communication and academic achievement

Academic Achievement	Communication Quality			
	Low	Moderate	High	Total
Low	0	15	17	32
Moderate	4	67	64	135
High	7	55	49	111
Total	11	137	130	278

The data in Table 3 show that students with high perceived communication quality tend to have higher academic achievement levels, with 113 out of 130 students in this category achieving moderate or high academic results. Students who perceive moderate communication quality also show balanced academic achievement, but those with low communication quality show a lower trend in achieving high academic scores.

This trend suggests that students who experience supportive and high-quality communication with their parents may benefit from increased academic engagement, which in turn contributes to higher academic success. Parental communication quality can influence academic performance by providing students with the emotional and practical support needed to overcome academic challenges, set goals, and pursue success (Liang *et al.*, 2024; Bi & Wang, 2023; Ghazi *et al.*, 2010). High-quality communication also fosters a growth-oriented mindset, where students feel more capable of tackling academic obstacles due to encouragement and positive

reinforcement from parents (Ates, 2021). Supportive parental communication plays a crucial role in academic achievement by fostering resilience and confidence.

The link between high communication quality and academic achievement further aligns with research demonstrating that positive family environments contribute to adolescents' cognitive and academic development (Neville *et al.*, 2025; Wilder, 2023). When parents foster an atmosphere of trust and open dialogue, adolescents are more likely to experience academic success, as they have access to guidance and are more willing to seek help when facing academic challenges. Conversely, students who report low-quality communication may lack the emotional support necessary to excel academically, leading to lower achievement outcomes.

Effects of Communication Quality on Academic Motivation and Achievement

To analyze the effects of perceived communication quality on academic motivation and achievement, we used multi-category logistic regression, with "moderate" communication quality as the baseline. Table 4 summarizes the logistic regression coefficients, standard errors, and p-values for the effects of communication quality on academic motivation and achievement.

Table 4: Logistic regression results for the effects of perceived communication quality on academic motivation and academic achievement

Predictor	Outcome Variable	Coefficient (B)	Standard Error (SE)	p-value
High Communication Quality	Academic Motivation	1.23	0.45	0.023
Low Communication Quality	Academic Motivation	-0.67	0.32	0.049
High Communication Quality	Academic Achievement	1.15	0.38	0.015
Low Communication Quality	Academic Achievement	-0.54	0.29	0.082

The results in Table 4 reveal that high perceived communication quality has a statistically significant positive effect on both academic motivation ($B = 1.23$, $p = 0.023$) and academic achievement ($B = 1.15$, $p = 0.015$). These findings suggest that students who experience high-quality communication with their parents are more likely to report higher motivation and achieve better academic results. Conversely, low communication quality was associated with decreased motivation ($B = -0.67$, $p = 0.049$) and had a marginally significant negative effect on academic achievement ($B = -0.54$, $p = 0.082$).

The strong positive association between high-quality communication and academic motivation is consistent with SDT's framework, which emphasizes the importance of autonomy-supportive environments for fostering intrinsic motivation (Ryan & Deci, 2000). High communication quality meets students' psychological needs for relatedness, competence, and autonomy, thereby promoting engagement and persistence in academic tasks. Prior studies corroborate these findings, suggesting that open and positive communication helps students internalize academic goals and pursue them with greater intrinsic interest and resilience (Wilder, 2023; Zhang *et al.*, 2021; Froiland & Worrell, 2017).

The results of this study emphasize the crucial role of parent-adolescent communication quality in promoting academic motivation and achievement. Students who perceive their communication with parents as high-quality report higher motivation levels and tend to achieve better academically. This highlights the significance of communication quality in influencing adolescents' attitudes and academic performance, especially in competitive academic settings.

A key insight from this study is the positive impact of high-quality communication on academic motivation. Supportive parental communication fosters an environment that encourages autonomy, open dialogue, and empathy, which are essential for sustaining motivation. This aligns with past research suggesting that positive parental interactions play a protective role against academic disengagement and foster the resilience needed to handle academic pressures (Bi & Wang, 2023; Acharya & Joshi, 2011; Caro, 2011).

The findings also suggest that while high-quality communication benefits motivation and achievement, low communication quality has a more pronounced negative effect on motivation than on achievement. This may indicate that motivation is more sensitive to parental support, as adolescents who feel unsupported may lack the enthusiasm to engage in academic tasks even if they can achieve decent results. Poor communication characterized by criticism, indifference, or control can stifle adolescents' willingness to participate in academic activities, as it diminishes their autonomy and self-worth (Zhang *et al.*, 2021; Silinskas *et al.*, 2015; Mata *et al.*, 2018). As supported by the Self-Determination Theory, environments that fail to meet these basic psychological needs are less likely to cultivate internal motivation, leading students to disengage from their academic responsibilities (Ryan & Deci, 2020; Bi & Wang, 2023).

Regarding academic achievement, the strong correlation with high communication quality reinforces the role of supportive family dynamics in adolescents' cognitive development and performance. When parents foster a communicative environment that encourages problem-solving, emotional support, and constructive feedback, students are more likely to experience academic success. However, in competitive academic settings, students may rely on external pressures and incentives to achieve academically even without supportive communication, as suggested by the marginal effect of low communication quality on academic achievement (Bi & Wang, 2023; Zhang *et al.*, 2021).

Implications for Practice

These findings hold important implications for parents, educators, and policymakers. For parents, adopting open, empathetic, and constructive communication practices can significantly enhance adolescents' academic motivation and performance. Communication strategies that validate adolescents' emotions, promote autonomy, and provide non-controlling guidance are especially effective in fostering a positive academic mindset (Ryan & Deci, 2020; Zhang *et al.*, 2021). This aligns with research showing that autonomy-supportive parenting contributes to greater academic engagement and intrinsic motivation (Wilder, 2023).

Schools may benefit from parent-focused programs that raise awareness about the importance of supportive communication, particularly in high-stakes academic environments where students are at risk of burnout or disengagement. These programs can empower parents with practical strategies to improve family interactions and academic outcomes (Liang *et al.*, 2024).

Acknowledging the impact of family dynamics on student motivation can help educators inform targeted support strategies, especially for students who may lack adequate parental involvement. Educators can collaborate with guidance counselors or school-based psychologists to identify at-risk students and offer personalized interventions. Moreover, schools might partner with family development professionals to provide workshops and resource materials that promote effective parent-adolescent communication (Ates, 2021).

At the policy level, educational systems should consider institutionalizing family engagement programs and embedding parental communication education into existing school-community frameworks. Policies that strengthen home-school partnerships and support family capacity-building can foster a more holistic and equitable approach to academic success (Bi & Wang, 2023).

Limitations and Future Research

This study is limited to a single academic setting, which may restrict the generalizability of the findings. Future research could extend this study to a more diverse range of schools with varying levels of academic competitiveness to determine if the effects of communication quality differ in different contexts. Furthermore, the study did not distinguish between maternal and paternal communication, potentially overlooking nuances in parental influence.

Future studies might also investigate the long-term effects of parent-adolescent communication quality through longitudinal designs, which could provide deeper insights into how communication influences academic trajectories. Researchers may also explore the role of specific types of communication (e.g., supportive vs. directive) on academic motivation and achievement to provide a more nuanced understanding of parental influence.

SUMMARY AND CONCLUSIONS

This study explored the influence of perceived parent-adolescent communication quality on academic motivation and achievement among high school students at a highly competitive public secondary school in the Philippines. By analyzing data from 278 students, this research aimed to determine if the quality of communication with parents correlated with academic outcomes. The findings reveal that most students perceive their communication with parents as moderate or high in quality, with these higher levels of communication quality associated with increased academic motivation and achievement. Students who reported high-quality communication with their parents demonstrated notably higher motivation and academic success, suggesting that supportive parental interactions can play a critical role in shaping positive academic attitudes and performance.

The study's analysis confirmed that high-quality communication significantly enhances academic motivation and achievement, aligning with the principles of Self-Determination Theory. Supportive communication satisfies students' needs for autonomy, competence, and relatedness, thereby fostering intrinsic motivation and a deeper engagement with academic tasks. Conversely, low-quality communication was shown to have a more pronounced adverse effect on academic motivation than on achievement, indicating that while motivation may be sensitive to the quality of parental support, students' performance may also be influenced by external academic pressures. These results corroborate previous research linking supportive parental involvement with adolescents' positive academic development, particularly through open, empathetic, and constructive communication.

In conclusion, high-quality parent-adolescent communication is key to fostering academic motivation and success. Adolescents who experience supportive, empathetic, and open communication with their parents are more likely to feel motivated and achieve higher academic results. This underscores the importance of positive communication practices within families. The study suggests that adolescents benefit emotionally and academically when parents adopt communication styles that foster autonomy and self-confidence. Schools and educators may find

it valuable to involve parents in programs that emphasize supportive communication's role in adolescent academic success.

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