Determinants of Non-Oil Export Competitiveness in Egypt: Evidence from a VECM Analysis

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Abstract

This study investigates the determinants of Egypt's non-oil export competitiveness during 2000–2023, a period marked by major economic reforms and global shocks. Using annual data from the World Bank's WDI and WGI, the analysis applies Augmented Dickey–Fuller unit root tests, Johansen cointegration, and a Vector Error Correction Model to examine long- and short-run relationships between non-oil exports and key structural and macroeconomic factors. The results indicate a stable long-run equilibrium, with gross fixed capital formation, institutional quality, exchange-rate depreciation, trade openness, and logistics performance exerting significant positive effects on export competitiveness. Short-run dynamics are weaker, reflecting structural rigidities and adjustment lags. The findings highlight the centrality of investment, governance reforms, and trade facilitation in enhancing Egypt's export performance. Policy implications emphasize strengthening productive capacity, improving institutional efficiency, and upgrading logistics. Future research should incorporate firm-level data and explore sectoral heterogeneity in export responses.

***Keywords**: Competitiveness; Non-oil Exports; VECM; Trade Openness; Institutional Quality.*

JEL: F14, F43, O55, C32.

Introduction

Over the past two decades, the question of how developing and emerging economies can strengthen their export competitiveness has moved to the forefront of economic policy debates. This renewed attention reflects not only the intensification of global competition but also the recognition that sustained export growth plays a critical role in enabling structural transformation, easing external constraints, and generating productivity gains. In the case of Egypt, these issues acquire particular urgency. The country continues to rely heavily on imported intermediate inputs, faces persistent external financing pressures, and remains dependent on a narrow set of foreign-exchange sources. Within this context, enhancing the performance of non-oil exports is not merely a trade objective but a central component of the broader development strategy. Non-oil exports offer one of the few channels through which technological upgrading, learning-by-doing, and employment expansion-especially in labor-intensive and medium-technology industries-can take place. As global supply chains become more integrated and standards of competitiveness shift, a more nuanced understanding of the forces shaping export performance becomes essential for designing coherent industrial and trade policies suited to contemporary challenges.

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In academic literature, export competitiveness is widely regarded as a multidimensional construct influenced by macroeconomic fundamentals, productive capacity, institutional arrangements, and the technological sophistication of firms. Early theoretical contributions-from classical and neoclassical trade theories to the Heckscher–Ohlin model-focused on factor endowments and relative prices as the principal determinants of trade patterns (Krugman, 1980; Dornbusch, Fischer, & Samuelson, 1977). Subsequent developments, including New Trade Theory, the product life cycle model, internalization theory, and the broader global value chains (GVC) framework, have expanded the analytical lens to incorporate scale economies, innovation dynamics, firm-specific capabilities, and the organization of production networks across borders (Vernon, 1966; Dunning, 1980; Grossman & Helpman, 1991; Baldwin, 2016). Taken together, these theoretical strands underscore that export competitiveness reflects the interaction of cost conditions, technology diffusion, logistics performance, market access, and institutional quality-an interaction that varies significantly across countries and over time.

The paper is structured as follows. Section 2 reviews the theoretical foundations of export competitiveness and synthesizes the relevant empirical literature. Section 3 clarify Research Problem, Questions, and Significance of the study. Section 4 examines Egypt's non-oil exports sector, with attention to structural composition, geographic distribution, and institutional context. Section 5 outlines the data, methodology, econometric model, and presents and interprets the empirical results. Section 6 discusses the results. Section 7 discusses policy implications arising from the findings and concludes and identifies directions for future research.

Literature Review

Theoretical Foundations of Export Competitiveness

Theoretical perspectives on export competitiveness have evolved through successive developments in international trade and development economics. Classical trade theory, particularly Ricardo's (1817) principle of comparative advantage, established that countries benefit from specializing in goods where they possess relative productivity advantages. This idea continues to underpin modern analyses of competitiveness. The Heckscher–Ohlin (H–O) model (Heckscher, 1919; Ohlin, 1933) further emphasized the importance of factor endowments in shaping export structures. For labor-abundant developing economies such as Egypt, this implies that competitiveness depends largely on utilizing labor resources efficiently and maintaining cost-effective production.

Neo-classical extensions to the H–O framework incorporated technological progress, factor mobility, and economies of scale, highlighting that competitiveness evolves through productivity improvements, capital accumulation, and efficient resource allocation (Krugman, 1980). These approaches also recognize that competitiveness extends beyond cost advantages to include innovation, product quality, and differentiation.

Vernon's (1966) product life cycle (PLC) theory introduced a dynamic dimension by explaining how production shifts from advanced economies to lower-cost developing countries as products mature. For Egypt, this suggests opportunities in mature industries where competitiveness relies on cost efficiency, technological adaptation, and standardized production.

International business theories further expanded the concept by focusing on firm behavior and global production strategies. Internationalization theory (Buckley & Casson, 1976) and Dunning's (1980) eclectic paradigm emphasize how ownership advantages, location-specific factors, and internalization incentives shape firms' international competitiveness. These perspectives suggest that export performance depends not only on macroeconomic conditions but also on firms' strategic capabilities and the domestic investment environment.

Human capital theory (Becker, 1964) and endogenous growth theory (Lucas, 1988) stress the importance of education, skills, and knowledge accumulation in enhancing productivity and supporting export diversification. For Egypt, where non-oil exports remain concentrated in low- and medium-technology products, strengthening human capital is essential for moving toward innovation-driven competitiveness.

Also, the Gravity Model is considered one of the most widely used frameworks in international trade analysis and in measuring export competitiveness and export potential. The model is based on an analogy with Newton's law of gravity, suggesting that trade flows between countries increase with the size of their economies and decrease with geographical distance and trade costs. The Gravity Model has been extensively applied to examine export performance through variables such as GDP, population size, trade openness, transportation costs, trade agreements, and institutional quality. Empirical studies have demonstrated that the model provides an effective framework for evaluating countries' export capacity and their ability to penetrate foreign markets, particularly in bilateral trade analyses and studies of international trade flows among trading partners (Tinbergen, 1962; Anderson, 1979; Helpman et al., 2008). Consequently, the Gravity Model has become a standard approach in modern economic literature concerning export competitiveness and regional trade integration.

Overall, the literature views export competitiveness as a multidimensional concept influenced by factor endowments, productivity, technology, institutions, and firm-level capabilities. Contemporary approaches increasingly emphasize the interaction between macroeconomic conditions, structural policies, and microeconomic performance.

Empirical Evidence on Determinants of Export Competitiveness

Empirical studies identify export competitiveness as the outcome of interactions among productivity, exchange rates, institutions, infrastructure, labor dynamics, and foreign investment.

1- **Productivity, Technology, and Firm Capabilities**

A broad body of evidence highlights productivity and technological capability as major determinants of export success. Higher-productivity firms are more likely to enter and sustain export activity. Muratoğlu and Muratoğlu (2016) find that total factor productivity positively affects export performance, especially in technology-intensive industries. Similar evidence from developing countries indicates that innovation, managerial quality, and technology adoption are essential for competitiveness (World Bank, 2022a). In Egypt, productivity gaps, slow technological diffusion, and weak integration into global value chains continue to limit non-oil export growth (World Bank, 2022b).

2- **Exchange Rate Dynamics and Price Competitiveness**

Real effective exchange rate (REER) movements are widely used to assess price competitiveness. Studies such as Raouf (2024) and Lugo-Arias et al. (2024) show that currency depreciation generally improves export performance by enhancing price competitiveness, although the effects differ across sectors and countries. However, exchange-rate adjustments alone are insufficient when domestic supply-side constraints persist. UNCTAD (2005a) argues that efficient logistics and institutional quality are necessary to convert nominal competitiveness into sustained export growth.

3- **Trade Policy, Institutions, and Regional Integration**

Trade liberalization and regional integration can improve export competitiveness through better resource allocation and stronger specialization (UNCTAD, 2005a). Nevertheless, institutional quality remains critical. In Egypt, customs inefficiencies, regulatory rigidities, and administrative delays have reduced the effectiveness of trade reforms and constrained export growth (Elshennawy, 2007).

4- **Infrastructure, Logistics, and Trade Facilitation**

Infrastructure and trade facilitation are key determinants of export performance, particularly for economies integrating into global production networks. Empirical evidence links efficient transport systems, ports, and customs procedures to higher export volumes and diversification (UNCTAD, 2005b). Egypt's un-even performance in the Logistics Performance Index reflects continuing weaknesses in logistics and customs modernization (World Bank, 2022b), which increase export costs and reduce competitiveness.

5- **Labor Costs, Human Capital, and Sectoral Structure**

Labor costs and workforce skills are especially important in labor-intensive industries. Uysal and Mohamoud (2018) find that low labor costs can support export growth, although long-term competitiveness depends on productivity and skill upgrading. Egypt's non-oil sectors, including textiles and agro-processing, continue to face structural challenges such as high energy costs and limited industrial linkages. Human capital limitations identified by Becker (1964) and Lucas (1988) also restrict progress toward higher-value exports.

6- **Foreign Direct Investment and GVC Integration**

Foreign direct investment (FDI) can improve export competitiveness through technology transfer, managerial spillovers, and access to international markets. However, these benefits depend on institutional quality and absorptive capacity (Dunning, 1980; Muratoğlu & Muratoğlu, 2016). Although Egypt has attracted significant FDI inflows since the early 2000s, weak local linkages and limited participation in global value chains have reduced spillover benefits for domestic firms (World Bank, 2022a).

Evidence from Developing and Labor-Intensive Economies

Cross-country studies show that export competitiveness depends on both supply-side factors-such as productivity, infrastructure, and technology-and demand-side variables including exchange rates and external demand (UNCTAD, 2005a). Experiences from Bangladesh and Vietnam demonstrate that sustained export success requires not only low production costs but also improvements in logistics, institutions, and value-chain upgrading (Uysal & Mohamoud, 2018). Although Egypt shares several structural similarities with these economies, institutional inefficiencies, slower industrial upgrading, and weak integration into global production networks continue to constrain export performance (ACET, 2024).

Research Gaps and Implications for Egypt

Despite increasing research on trade competitiveness, studies focusing specifically on Egypt's non-oil export competitiveness during 2000—2023 remain limited. Existing work often concentrates either on aggregate macroeconomic determinants (Raouf, 2024) or individual sectors such as textiles (Elshennawy, 2007), without integrating macroeconomic, structural, and firm-level dimensions within a unified framework. In addition, interaction effects-such as the relationship between trade facilitation and exchange-rate adjustments or between human capital and technology adoption-remain insufficiently explored in the Egyptian context. This study addresses these gaps by applying an econometric framework that captures the interactions among investment, logistics, institutions, exchange-rate dynamics, and firm capabilities in determining Egypt's long-run export competitiveness.

Research Problem, Questions, and Significance

Research Problem

Against this theoretical and policy backdrop, Egypt presents a particularly instructive case. Despite possessing considerable industrial potential and enjoying periods of export expansion-especially following trade liberalization in the early 2000s and the major exchange-rate adjustment in 2016-Egypt's non-oil export performance has remained persistently modest relative to the size of its economy and labor force (World Bank, 2022a). Several assessments point to a constellation of structural constraints that continue to impede stronger export growth: limited productive capacity, elevated import dependence on manufacturing, and weak integration into global value chains (OECD, 2023). High logistics and trade facilitation costs further erode competitiveness, while institutional inefficiencies create additional transaction costs and unpredictability for exporters. The export basket itself remains concentrated in a small set of energy-intensive and low-technology products, leaving the economy exposed to volatility in global commodity markets and external demand. These persistent challenges underscore the need for a comprehensive empirical analysis capable of isolating the macroeconomic, structural, and institutional determinants that most critically shape Egypt's long-run non-oil export performance.

Research Questions

Building on these structural features and the insights derived from trade theory, the present study seeks to address the following central questions:

- What are the key macroeconomic, structural, and institutional determinants of Egypt's non-oil export competitiveness over the period 2000–2023?
- To what extent do investment capacity, logistics performance, trade openness, exchange-rate dynamics, and institutional quality influence non-oil export performance?
- How have major economic reforms, global shocks, and structural shifts affected the long-run trajectory of Egypt's non-oil exports?
- What implications can be derived for designing policies that enhance Egypt's export competitiveness and support a more diversified export structure?

Significance of Study

This study contributes to literature in several interrelated ways. First, it provides an updated and methodologically rigorous assessment of Egypt's non-oil export competitiveness over a long horizon (2000–2023), a period marked by notable domestic reforms-including repeated exchange-rate adjustments-and significant external shocks such as the global financial crisis and the COVID-19 pandemic. Second, the analysis deliberately integrates sectoral evidence with macro-level econometric modeling, enabling the empirical specification to reflect structural features of Egypt's export sector rather than relying solely on aggregate indicators. Third, the study enriches ongoing debates on export competitiveness in labor-abundant developing economies, particularly those facing structural import dependence and limited diversification (Hoekman & Sekkat, 2010; Freund & Pierola, 2015). By identifying the relative contributions of investment, logistics, institutional quality, and openness, the findings offer actionable insights for policymakers seeking to strengthen the foundations of long-run export performance.

Egypt's Non-Oil Exports

Overview of Egypt's Export Sector

Exports have played an important but still limited role in Egypt's growth model. Since the 2000s, exports of goods and services have averaged around one-fifth of GDP, reaching nearly 19 percent in 2023 (World Bank, 2025). Despite several reform efforts, export-led transformation has remained slower than expected, and export performance continues to lag behind the size and potential of the Egyptian economy (World Bank, 2022b).

Historically, Egypt's foreign-exchange earnings have relied heavily on hydrocarbons, tourism, Suez Canal revenues, and remittances, while non-oil merchandise exports contributed less significantly to external balances (World Bank, 2022b). Earlier evidence from UNCTAD (1999) already highlighted the relatively low contribution of exports to industrial output compared with other developing economies, indicating persistent structural weaknesses in export-oriented industrialization.

Although total exports in current U.S. dollars have increased since the early 2000s, export growth and diversification have remained weaker than in comparable emerging markets (World Bank, 2022b, 2025).

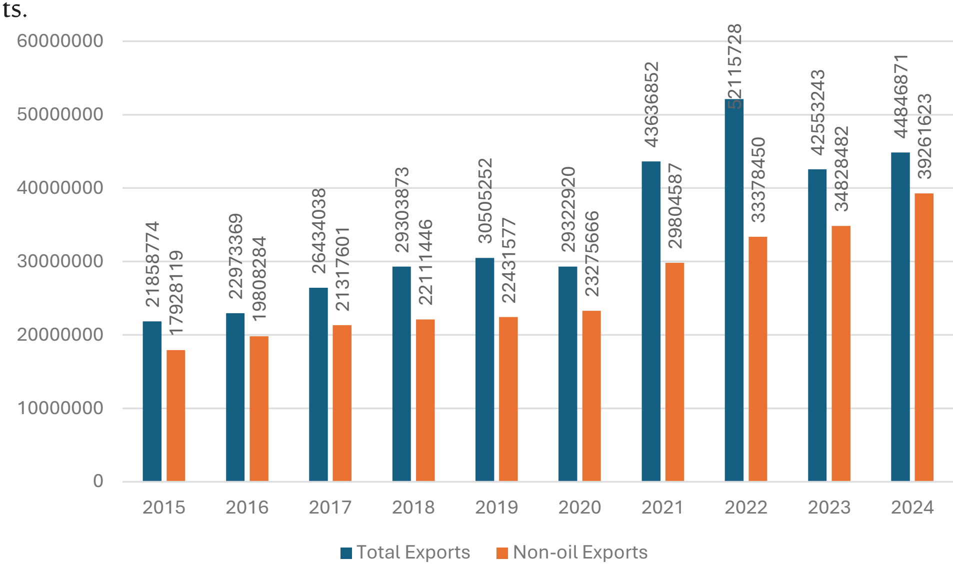
Consequently, policy attention has increasingly focused on strengthening non-oil exports as a more stable source of growth and foreign exchange earnings.

Structure and Composition of Non-Oil Exports

According to UNCTAD, Egypt's export structure remains highly dualistic, with fuels accounting for more than half of merchandise exports, while manufactured goods and food products each contribute around one-fifth (UNCTAD, 2024). Egypt's principal non-oil export sectors include chemicals and fertilizers, building materials, textiles and garments, processed food and agricultural products, and engineering products (World Bank, 2022b).

Data from the Ministry of Trade and Industry indicates substantial growth in non-oil exports during the past decade. Non-oil exports reached approximately US$35.63 billion in 2023 and remained above early-2010s levels despite global and domestic volatility. In the first ten months of 2024, non-oil exports totaled around US$33.35 billion. Recent performance aligns with the sectoral structure described above. For the first nine months of 2025, non-oil exports reached US$36.6 billion, led by building materials (US$11.7 billion), followed by chemicals and fertilizers (US$6.8 billion), food industries (US$5.1 billion), engineering and electronic goods (US$4.7 billion), and agricultural crops (US$3.6 billion). These figures highlight the enduring importance of energy-intensive industries, agro-processing, and light manufacturing. (CBE, 2025)

Figure 1 illustrates the evolution of non-oil exports between 2015 and 2024, showing a general upward trend alongside fluctuations associated with global market conditions and domestic macroeconomic adjustments.



Source: ITC calculations based on UN COMTRADE statistics - 2025.

Figure 1. the value of Egypt's non-oil exports (USD thousands), and its percentage of total exports 2015-2024

Figure 1 shows that non-oil exports increased steadily, particularly after 2020, supported by post-pandemic recovery, stronger global demand for fertilizers and agro-food products, and gradual improvements in manufacturing capacity. However, the share of non-oil exports in total exports remained relatively limited because of the continued dominance of mineral fuels during periods of high energy prices. The decline in 2023 reflected production disruptions, foreign-exchange shortages affecting imported inputs, and weaker gas export revenues, while the partial rebound in 2024 remained insufficient to offset volatility in energy exports. These developments highlight the need for deeper structural reforms to strengthen non-oil productive capacity and reduce dependence on commodity cycles.

To further contextualize these developments, Table 1 details the top ten export product groups between 2015 and 2024, providing a more granular picture of the sectors shaping Egypt's external trade profile.

Table 1. Egypt's Exports (2015-2024) for top 10 Products groups – USD thousand & % of total Exports

Code	Product label	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
'TOTAL	All products	21858774	22973369	26434038	29303873	30505252	29322920	43636852	52115728	42553243	44846871
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
'27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral	3930655	3165085	5116437	7192427	8073675	6047254	13832265	18737278	7724761	5585248
		17.98	13.78	19.36	24.54	26.47	20.62	31.7	35.95	18.15	12.45
'71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad ...	629966	2672287	2116764	1455146	2036292	3009237	1160547	1633022	1859356	3261882
		2.88	11.63	8.01	4.97	6.68	10.26	2.66	3.13	4.37	7.27
'85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...	1742498	1578168	1759149	1554229	1695893	1603186	2397141	2619922	2628295	3003756
		7.97	6.87	6.65	5.3	5.56	5.47	5.49	5.03	6.18	6.7
'08	Edible fruit and nuts; peel of citrus fruit or melons	1117253	1209733	1281922	1392002	1395790	1491128	1713200	1917868	2216528	2608564
		5.11	5.27	4.85	4.75	4.58	5.09	3.93	3.68	5.21	5.82
'39	Plastics and articles thereof	1377354	1189579	1545772	1789937	2006198	1763236	2784541	2782522	2295026	2592715
		6.3	5.18	5.85	6.11	6.58	6.01	6.38	5.34	5.39	5.78
'72	Iron and steel	289509	512398	871923	1048522	687880	725428	1782183	1408616	2339423	2208674
		1.32	2.23	3.3	3.58	2.25	2.47	4.08	2.7	5.5	4.92
'31	Fertilisers	420610	844979	1099281	1378867	1361176	1437022	2225744	3533417	2587735	2185436
		1.92	3.68	4.16	4.71	4.46	4.9	5.1	6.78	6.08	4.87
'07	Edible vegetables and certain roots and tubers	1128103	966615	1070250	907280	1090480	1066385	1085619	1520746	1740895	2059698
		5.16	4.21	4.05	3.1	3.57	3.64	2.49	2.92	4.09	4.59
'62	Articles of apparel and clothing accessories, not knitted or crocheted	865814	889989	989766	1060854	1091820	985854	1328702	1650534	1606255	1937045
		3.96	3.87	3.74	3.62	3.58	3.36	3.04	3.17	3.77	4.32
'25	Salt; sulphur; earths and stone; plastering materials, lime and cement	386951	353964	389925	442758	487116	525625	825701	1089545	1380669	1490188
		1.77	1.54	1.48	1.51	1.6	1.79	1.89	2.09	3.24	3.32

Source: ITC calculations based on UN COMTRADE statistics – 2025

Table 1 confirms the continued concentration of Egypt's exports in primary and resource-based commodities. Mineral fuels (HS-27) consistently dominate export earnings, particularly during 2021–2022 when global gas prices increased sharply. This highlights Egypt's vulnerability to commodity price fluctuations and the limited structural transformation achieved so far.

Non-oil manufactured exports, including electrical machinery (HS-85) and plastics (HS-39), recorded stable but modest shares, indicating gradual rather than transformative industrial upgrading. Agricultural products such as fruits, nuts, and vegetables showed more consistent growth, reflecting Egypt's comparative advantage in agro-food industries. Fertilizer exports also expanded due to stronger global demand and increased production capacity. Overall, despite improvements in some sectors, Egypt's export structure remains highly dependent on commodities, limiting long-term resilience and competitiveness.

Geographic Distribution and Market Access

Egypt's exports are geographically diversified across Europe, the Arab region, and selected emerging markets. According to UNCTAD (2024), Türkiye, Saudi Arabia, Italy, the United Arab Emirates, and the United States represent Egypt's main export destinations.

This distribution reflects Egypt's broad network of trade agreements, including the European Union Association Agreement, GAFTA, and COMESA (Hoekman & Sekkat, 2010). Nevertheless, studies suggest that Egypt has not fully utilized these agreements because of restrictive rules of origin, non-tariff barriers, and limited export readiness among domestic firms (Hoekman & Sekkat, 2010; World Bank, 2022b).

Recent trade-facilitation reforms implemented under UNCTAD's Accelerate Trade Facilitation Programme have improved customs procedures, transparency, and Egypt's implementation of the WTO Trade Facilitation Agreement (UNCTAD, 2025). Such reforms are particularly important for non-oil exporters that depend on reliable logistics and efficient border procedures.

Table 2 presents Egypt's top export destinations between 2017 and 2024, highlighting persistent concentration in European and Gulf markets.

Table 2. Top importing countries from Egypt (2017-2024) – USD Thousands

Importers	2017	2018	2019	2020	2021	2022	2023	2024
World	26434038	29303873	30505252	29322920	43636852	52115728	42553243	44846871
Italy	2209526	2050260	1683577	1474435	2884392	3382272	3254920	3380330
Saudi Arabia	1572721	1433387	1686442	1879584	2241117	2515921	2671807	3363183
Türkiye	1932876	2005554	1748647	1707900	2990617	3959942	3643856	3322335
United Arab Emirates	2758957	2003913	2059984	2936198	1759192	1955242	2223717	3267831
USA	1375707	1722549	2205957	1634601	2542221	2300715	2004738	2259580
Libya, State of	440883	635855	833842	614306	960752	1214854	1839878	1950875
United Kingdom	1099754	1338673	1541403	791865	1166443	1765365	1212310	1572913
Spain	813872	1281977	1043485	818676	1871063	3850348	1616887	1463628
Switzerland	357023	211631	23278	136496	31489	151507	472286	1222317

Source: ITC calculations based on UN COMTRADE statistics - 2025.

Table 2 shows that Egypt's exports remain concentrated in a relatively limited number of markets. European countries-especially Italy and Spain-continue to absorb a significant share of exports, while Türkiye and Saudi Arabia reflect growing regional trade integration and demand for Egyptian industrial and agro-food products. The UAE has also expanded steadily due to its logistical role within regional value chains. U.S. demand has remained relatively stable, whereas Libya's growing imports likely reflect reconstruction activity. Switzerland's fluctuations are largely linked to gold-related transactions. Overall, Egypt remains heavily dependent on European and Gulf markets, with relatively weak penetration into fast-growing African and Asian economies.

Policy and Institutional Environment Shaping Export Performance

Egypt's export performance has been influenced by macroeconomic reforms, industrial policies, and institutional changes. IMF- and World Bank-supported reform programs have focused on exchange-rate liberalization, fiscal adjustment, and structural reforms aimed at improving the business environment (World Bank, 2023; 2025).

The government has also introduced measures to support export-oriented industrialization through export councils, incentive schemes, and projects such as the Suez Canal Economic Zone (World Bank, 2022a; UNCTAD, 1999). However, business-environment assessments continue to identify regulatory complexity, inconsistent enforcement, and weak private-sector dynamism as major obstacles to export growth (World Bank, 2022a).

Trade facilitation has become increasingly important in recent years. According to UNCTAD (2025), customs modernization efforts-including single-window systems, improved risk management, and greater transparency-are expected to reduce trade costs and enhance the competitiveness of non-oil exports.

Key Challenges Affecting Non-Oil Export Competitiveness

Despite ongoing reforms, Egypt continues to face several structural constraints. First, export sophistication and diversification remain limited, with exports still concentrated in low- and medium-technology goods (World Bank, 2022a). Second, many non-oil industries depend heavily on imported inputs, making export performance vulnerable to exchange-rate volatility and commodity-price shocks (World Bank, 2022b). Third, institutional challenges-including regulatory inconsistency and the dominant role of state-owned enterprises-continue to constrain private-sector-led export growth (World Bank, 2022a; 2023). Fourth, logistics and customs performance remain below international benchmarks despite recent improvements (UNCTAD, 2025; World Bank, 2022a). Finally, weak productivity growth and limited innovation continue to hinder structural transformation and technological upgrading (World Bank, 2022b).

Linking Sectoral Characteristics to the Empirical Model

The preceding discussion provides the foundation for the empirical model used in this study. The dependence of key non-oil sectors on investment and industrial capacity supports the inclusion of gross fixed capital formation as a determinant of export supply. The importance of logistics and trade facilitation justifies the use of transport services as a proxy for logistics quality. Likewise, the role of market access and trade integration supports the inclusion of trade openness (Hoekman & Sekkat, 2010; World Bank, 2022a).

Exchange-rate reforms implemented in 2003, 2016, and 2022 also justify incorporating the official exchange rate as a proxy for price competitiveness. Finally, recurring governance and institutional challenges support the inclusion of Control of Corruption as an indicator of institutional effectiveness. Together, these structural characteristics support the use of a long-run econometric framework capable of capturing the complex determinants of Egypt's non-oil export competitiveness.

Methodology

This study employs a quantitative econometric approach to examine the determinants of Egypt's non-oil export -calculated as total exports minus oil exports of HS code 27- competitiveness over the period 2000–2023. Annual time-series data were collected from many reliable sources such as the World Bank's World Development Indicators (WDI), Trade Map (ITC), and the Worldwide Governance Indicators (WGI). The empirical strategy follows established procedures for long-run analysis in international trade and macroeconomic competitiveness studies, including unit root testing, cointegration analysis, and estimation of a Vector Error Correction Model (VECM).

Model Specification

To explore the elasticities between non-oil exports and their key macroeconomic and institutional determinants, the following log-linear functional form is specified:

$$ln(NEX_t) = \beta 0 + \beta 1\, ln(TS_t) + \beta 2\, TO_t + \beta 3\, ln(ER_t) + \beta 4\, ln(GCF_t) + \beta 5\, CC_t + e_t$$

Where:

- $\ln(NEX_t)$: Natural log of non-oil exports (dependent variable).
- $\ln(TS_t)$: Logistics efficiency proxied by transport services (% of service exports).
- TO_t: Trade openness (exports + imports as % of GDP).
- $\ln(ER_t)$: Natural log of the nominal exchange rate (LCU per USD).
- $\ln(GCF_t)$: Natural log of gross fixed capital formation, measuring investment.
- CC_t: Institutional quality captured through the control of corruption index.
- e_t: Error term.

Multicollinearity diagnostics indicated that labor force participation exhibited a Variance Inflation Factor (VIF) exceeding 10, indicating severe multicollinearity. Consequently, labor force was excluded from the final model to avoid biased coefficient estimates.

Econometric Strategy

The empirical strategy consists of three main steps.

1- **Unit Root Tests**

The Augmented Dickey–Fuller (ADF) test is applied to assess the stationarity of all variables. Testing for unit roots is essential to avoid spurious regression. Variables that become stationary upon first differencing are classified as integrated of order one, I(1).

Given the presence of major structural shocks in the Egyptian economy during the study period - including the 2011 political transition, the 2016 exchange-rate liberalization, and the economic disruptions associated with COVID-19 - the study additionally employed the Zivot-Andrews unit root test, which allows for one endogenous structural break within the series. This test was conducted to verify the robustness of the conventional ADF and Phillips-Perron stationarity results in the presence of potential structural breaks.

2- **Johansen Cointegration Test**

If the variables share the same order of integration, the Johansen (1991) cointegration test is employed to determine whether a long-run equilibrium relationship exists between non-oil exports and its determinants. The trace statistic and the 5% critical values guide the decision regarding the number of cointegrating vectors.

3- **Vector Error Correction Model (VECM)**

Upon confirming cointegration, a VECM is estimated to capture both the long-run equilibrium relationship and short-run adjustment dynamics:

$$\Delta Y_\tau = \alpha ECT_{\tau-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta y_{\tau-i} + \mu_\tau$$

Where:

- ECT_{t-1} is the error correction term representing long-run disequilibrium.
- α measures the speed at which deviations from long-run equilibrium are corrected.
- Γ_i capture short-run dynamic interactions between variables.

VECM is preferred over simple OLS because it separates short-run fluctuations from long-run relationships, which is essential when studying structural determinants of export performance.

Empirical Results

1- **Descriptive Statistics**

Table 3 presents the descriptive statistics for all variables. The data show considerable variation over the study period, reflecting Egypt's macroeconomic transitions and trade reforms.

2- **Diagnostic Tests**

- **Multicollinearity**

Before estimation, we tested for multicollinearity using the Variance Inflation Factor (VIF). The initial test showed that **Labor Force** had a VIF > 10, indicating severe multicollinearity. Consequently, it was dropped from the model. All remaining variables showed acceptable VIF levels (< 10).

- **Unit Root Tests**

ADF results indicate all variables are non-stationary at levels but stationary at first differences, confirming they are I(1).

Table 3. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Non-Oil Exports (USD)	16,445,444	9,909,684	2,165,784	34,828,480
Transport Services (%)	39.21	9.19	27.30	61.55
Trade Openness (%)	45.30	11.46	29.86	71.68
Exchange Rate	9.79	6.76	3.47	30.63
Gross Fixed Capital (USD)	37,376,281,556	17,531,062,778	12,922,077,922	72,498,480,243
Control of Corruption	-0.61	0.10	-0.81	-0.44

Source: Eviews 12 output.

Table 4: Variance Inflation Factor (VIF) Results

Variable	VIF	Conclusion
Gross Fixed Capital Formation (ln)	3.20	No Multicollinearity
Exchange Rate (ln)	2.25	No Multicollinearity
Transport Services	2.01	No Multicollinearity
Trade Openness	1.96	No Multicollinearity
Control of Corruption	1.62	No Multicollinearity
Mean VIF	2.21	Acceptable

Source: Eviews 12 output.

Table 5: Augmented Dickey-Fuller (ADF) Unit Root Test

Variable	Level (t-statistic)	Level (Prob.)	1st Difference (t-statistic)	1st Difference (Prob.)	Result
ln(Non-Oil Exports)	-2.405	0.140	-1.413	0.576	I(1)*
ln(Exchange Rate)	0.993	0.994	-2.473	0.122	I(1)
Trade Openness	-0.522	0.888	-2.883	0.047	I(1)
ln(Gr. Fixed Capital)	-0.961	0.767	-3.402	0.011	I(1)
Control of Corruption	-2.759	0.064	-4.125	0.001	I(1)
Transport Services	-2.086	0.250	-1.962	0.304	I(1)*

Source: Eviews 12 output.

*Note: Due to the limited sample size (N=24), some variables exhibit weaker rejection of the null hypothesis at the first difference. However, the subsequent Johansen Test confirms a cointegrating relationship, validating the use of the VECM approach.

The Zivot-Andrews unit root test results generally confirm the findings obtained from the conventional ADF test. All variables remain non-stationary at levels even after accounting for endogenous structural breaks, supporting their integration of order one, I(1). The estimated break dates broadly correspond to major economic and political developments in Egypt, particularly around 2011 and 2016, reinforcing the economic relevance of the identified structural shifts. These findings further justify the use of the Johansen cointegration framework and the VECM specification employed in the study.

Table 6. Zivot-Andrews Unit Root Test Results

Variable	ZA Test Statistic	5% Critical Value	Break Year	Integration Order
ln(Non-Oil Exports)	-2.837	-4.811	2006	I(1)
Transport Services	-3.981	-4.811	2017	I(1)
Trade Openness	-3.446	-4.811	2011	I(1)
ln(Exchange Rate)	-3.217	-4.811	2016	I(1)
ln(Gr. Fixed Capital)	-4.143	-4.811	2006	I(1)
Control of Corruption	-3.734	-4.811	2008	I(1)

Source: Eviews 12 output.

3- Johansen Cointegration Test

The Johansen trace statistic indicates the presence of at least one cointegrating vector among the variables, confirming a long-run equilibrium relationship.

Table 7. Johansen Cointegration Test

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Prob.	Conclusion
None *	177.74	91.11	0.000	Cointegrated
At most 1	113.26	65.82	0.000	-

Source: Eviews 12 output.

4- VECM Estimation

- **Long-Run Estimates**

Table 7 reports the long-run coefficients normalized on non-oil exports. All determinants exhibit statistically significant long-run elasticities.

Table 8. Long-Run Relationship (Normalized on ln(NEX))

Variable	Coefficient	Std. Error	z-statistic	Significance
ln_GCF	2.165	0.080	27.05	***
Control of Corruption	3.041	0.313	9.73	***
ln_Exchange_Rate	0.425	0.061	6.96	***
Trade Openness	0.059	0.003	23.18	***
ln_Transport_Services	0.040	0.003	11.62	***
Constant	-39.31	1.791	-	-

Significant at 1% level. Source: Eviews 12 output.

- **Short-Run Dynamics**

Table 8 presents the estimated short-run coefficients. Short-run impacts are generally weaker, consistent with the structural nature of the determinants.

Table 9. Short-Run VECM Estimates (Dependent Variable: Δln(NEX))

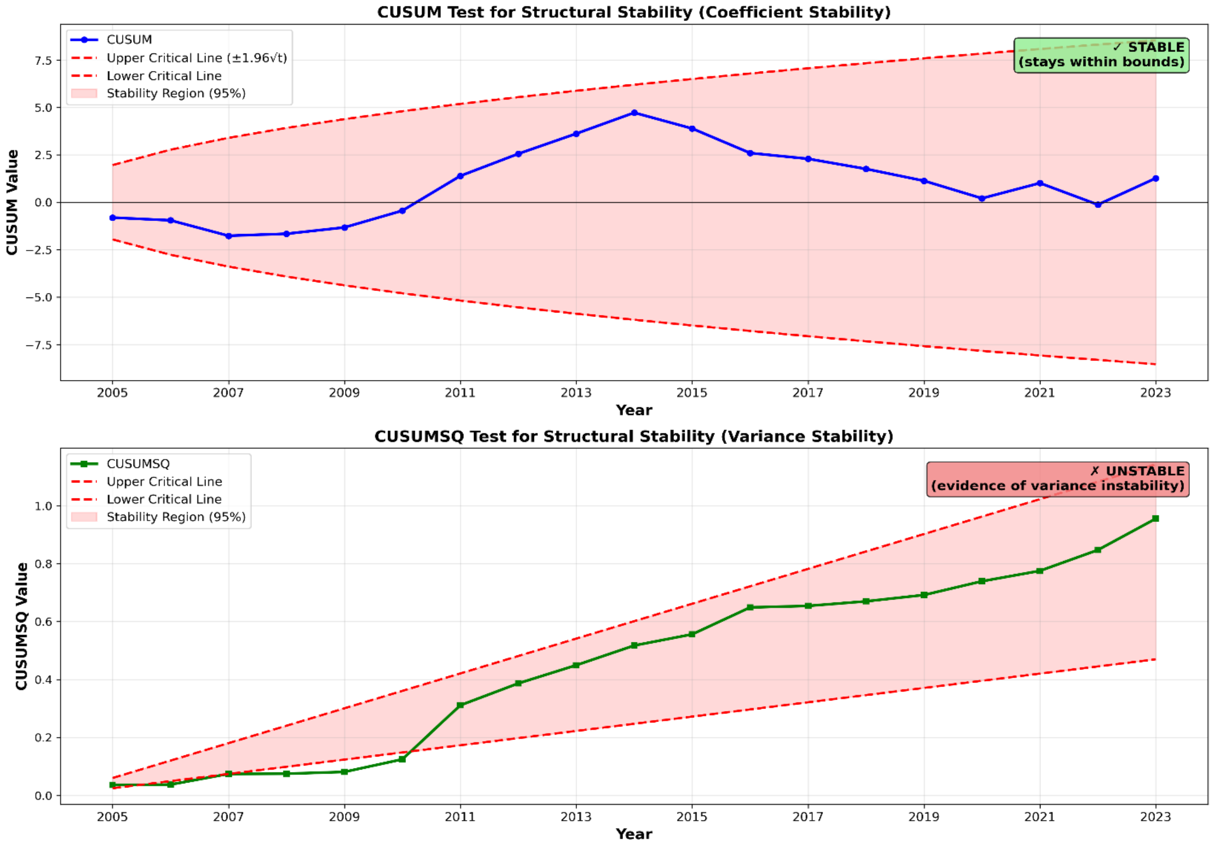
Variable	Coefficient	Std. Error	t-statistic	P-value
ECT(-1)	0.091	0.089	1.02	0.308
Δln_NEX(-1)	0.403	0.183	2.20	0.028
Δln_Transport	0.004	0.005	0.78	0.437
ΔOpenness	-0.001	0.006	-0.22	0.825
Δln_Exchange_Rate	0.368	0.233	1.58	0.115
Δln_GCF	0.549	0.297	1.85	0.064*
ΔControl_Corruption	-0.052	0.372	-0.14	0.888

Significant at 10% level Source: Eviews 12 output.

5- Model Diagnostics

- **Jarque–Bera normality test**: p = 0.004 ⟶ residuals deviate from normality, a common feature in macro time-series with small sample size.
- **Durbin–Watson = 2.33** ⟶ no evidence of problematic autocorrelation.
- Structural Stability Tests (CUSUM & CUSUMSQ)

To examine the structural stability of the estimated model, the study employed the CUSUM and CUSUMSQ tests based on recursive residuals. These tests are commonly used to assess the stability of model coefficients over time and to detect possible structural instability resulting from major economic or political shocks.



Source: Eviews 12 output.

Figure 2. CUSUM & CUSUMSQ tests for structural stability

Structural stability of the model was assessed using the CUSUM and CUSUMSQ tests over the period 2005–2023. The CUSUM test confirms coefficient stability throughout the sample period, as the recursive residuals remain within the critical bounds, indicating no evidence of structural instability in the relationship between non-oil exports and the explanatory variables.

However, the CUSUMSQ test suggests some degree of variance instability over time, possibly reflecting periods of heightened economic volatility associated with major structural shocks. To ensure robustness of statistical inference, White's heteroskedasticity-consistent robust standard errors were employed in estimating the model coefficients and test statistics.

- **Breusch–Godfrey LM Test for Serial Correlation**

The Breusch–Godfrey LM test for serial correlation was applied to examine whether the residuals suffer from autocorrelation. The test results indicate that the null hypothesis of no serial correlation cannot be rejected at conventional significance levels, suggesting that the residuals are free from significant autocorrelation problems.

Table 10. Breusch–Godfrey LM Test for Serial Correlation Results

Test	Statistic	p-value	Conclusion
Breusch–Godfrey LM Test	3.291	0.193	No serial correlation

Source: Eviews 12 output.

- **White Test for Heteroskedasticity**

The White heteroskedasticity test was conducted to examine the constancy of the residual variance. The results show that the null hypothesis of homoskedasticity cannot be reject-

Table 11. White Test for Heteroskedasticity Results

Test	Statistic	p-value	Conclusion
White Heteroskedasticity Test	21.987	0.341	No heteroskedasticity

Source: Eviews 12 output.

ed, indicating no statistically significant evidence of heteroskedasticity in the residuals. These findings confirm the statistical adequacy and robustness of the estimated model.

- **VAR Stability Test (Inverse Roots)**

The stability condition of the VAR/VECM model was examined using the inverse roots of the AR characteristic polynomial. For the model to be stable, all inverse roots must lie inside the unit circle.

The inverse roots test indicates that one root lies outside the unit circle, suggesting some degree of dynamic instability in the estimated VAR/VECM system. This outcome may be attributed to the relatively small sample size, the annual frequency of the data, and the presence of major structural shocks affecting the Egyptian economy during the study period.

Table 12. VAR Stability Test (Inverse Roots) Results

Inverse Root	Modulus	Inside Unit Circle
0.3185 + -0.5057i	0.5977	Yes
0.3185 + 0.5057i	0.5977	Yes
0.7518 + 0.0i	0.7518	Yes
0.773 + -0.1841i	0.7946	Yes
0.773 + 0.1841i	0.7946	Yes
1.3366 + 0.0i	1.3366	No

Source: Eviews 12 output.

Nevertheless, the long-run relationships identified by the cointegration analysis remain economically meaningful and statistically supported by the Johansen cointegration test, as well as by the diagnostic and structural stability tests. Therefore, the results should be interpreted with greater emphasis on long-run structural relationships rather than short-run dynamic adjustments as discussed in the next section.

Discussion

The results indicate that Egypt's non-oil export competitiveness is driven mainly by long-run structural factors rather than short-run cyclical fluctuations. This finding is consistent with the literature emphasizing the importance of productive capacity, institutional quality, and structural transformation in developing economies (UNCTAD, 2005b; World Bank, 2022b). The estimated elasticities suggest that export performance depends primarily on investment, governance, and integration into global markets.

Long-Run Determinants

Gross fixed capital formation (GFCF) is the strongest long-run determinant, with an elasticity of 2.16. This supports evidence that capital accumulation is essential for export competitiveness through expanding productive capacity, facilitating technology adoption, and enabling firms to meet international standards (Hausmann, Hwang, & Rodrik, 2007; Freund & Pierola, 2015). In Egypt, the result reflects persistent supply-side constraints and slow structural transformation that continue to limit non-oil export expansion (World Bank, 2022b).

Institutional quality, proxied by control of corruption, also has a strong positive effect, with an elasticity of 3.04. This finding aligns with studies showing that better governance reduces transaction costs, strengthens contract enforcement, and supports export diversification (Anderson & Marcouiller, 2002; Dollar & Kraay, 2003). Given Egypt's regulatory complexity and administrative inefficiencies, the result highlights the importance of institutional reform for long-run export competitiveness (World Bank, 2022a).

The positive exchange rate elasticity (0.43) indicates that currency depreciation improves export competitiveness by lowering relative export prices. This result is consistent with conventional trade theory and previous empirical findings (Bahmani-Oskooee & Hegerty, 2009; Freund & Pierola, 2015). In Egypt, it reflects export gains observed after major exchange-rate liberalization episodes, particularly in the early 2000s and after the 2016 flotation (World Bank, 2022b).

Trade openness and logistics efficiency also exert positive and statistically significant effects, consistent with evidence emphasizing the role of openness and trade infrastructure in supporting export growth (UNCTAD, 2005a; Portugal-Perez & Wilson, 2012). Improved openness facilitates access to imported inputs and foreign markets, while efficient logistics reduce transaction costs and delivery delays, both of which are critical for Egypt's export-oriented sectors (World Bank, 2022b).

Short-Run Dynamics

Short-run dynamics are comparatively weak, as most short-run coefficients are statistically insignificant. This suggests that export competitiveness evolves gradually and is less responsive to temporary shocks or short-term policy changes. The estimated error correction term (ECT) was found to be positive and statistically insignificant, indicating weak short-run adjustment toward the long-run equilibrium. While the conventional expectation in VECM models is a negative and significant ECT coefficient, similar outcomes are not uncommon in small-sample macroeconomic studies characterized by structural shocks and annual data frequency. Importantly, the Johansen cointegration test still confirms the existence of a long-run equilibrium relationship among the variables. Therefore, the results suggest that although short-run adjustment mechanisms remain weak and slow, the long-run structural relationships identified by the model remain economically meaningful. This pattern is commonly associated with structural rigidities and adjustment costs in developing economies (UNCTAD, 2005a; World Bank, 2022a).

Lagged exports have a strong positive effect on current exports, indicating persistence and path dependence. This finding supports learning-by-exporting arguments, where prior export experience lowers market-entry costs and improves firms' ability to sustain international market participation (Melitz, 2003). In Egypt, established exporters appear to benefit from accumulated experience and business networks.

Investment is only marginally significant in the short run, implying that the benefits of capital accumulation materialize gradually through productivity and capacity expansion rather than immediate export growth (Freund & Pierola, 2015). Overall, the findings confirm that Egypt's non-oil export competitiveness depends mainly on long-term structural conditions-particularly investment, governance quality, and openness-rather than temporary market fluctuations.

Conclusions, Policy Implications, and Future Research

Conclusions

This study examined the long-run and short-run determinants of Egypt's non-oil export competitiveness during 2000–2023 using a Vector Error Correction Model (VECM). The findings show that export competitiveness is driven mainly by long-run structural factors, while short-run fluctuations have relatively limited effects. Gross fixed capital formation emerged as the most influential determinant, highlighting the importance of productive capacity and investment-led industrial expansion. Institutional quality, measured by the control of corruption indicator, also has a significant long-run effect, emphasizing the role of governance in reducing transaction costs and improving the business environment for exporters.

Exchange-rate depreciation positively affects export competitiveness by improving price competitiveness, although its impact is smaller than that of investment and governance. Trade openness and logistics performance also contribute positively in the long run, reflecting the importance of market integration and efficient supply chains. In contrast, most short-run coefficients are statistically insignificant, while the slow adjustment toward equilibrium suggests the presence of structural rigidities that weaken the transmission of short-term shocks. Overall, the results indicate that improving Egypt's non-oil export competitiveness requires structural reforms that strengthen productivity, institutional quality, and export capacity.

Policy Implications

The findings suggest several important policy implications. First, the strong role of gross fixed capital formation highlights the need to prioritize investment-driven industrial upgrading through expanding export-oriented infrastructure, encouraging technological modernization, and improving access to finance. Industrial zones, particularly the Suez Canal Economic Zone, can support integration into regional and global production networks.

Second, the importance of institutional quality emphasizes the need for governance reforms aimed at reducing bureaucratic complexity, improving transparency, and strengthening competition policies. Enhancing anti-corruption measures and simplifying administrative procedures would lower transaction costs and support private-sector participation.

Third, improving logistics and trade facilitation remains essential for reducing trade costs and strengthening integration into global value chains. Continued customs digitalization, implementation of single-window systems, and investments in transport and port infrastructure would improve efficiency, especially for time-sensitive exports.

Fourth, maintaining a competitive and stable exchange-rate environment can support export growth by improving price competitiveness. However, exchange-rate policy alone is insufficient without broader structural reforms addressing supply-side and institutional weaknesses.

Finally, Egypt should increase the utilization of trade agreements such as GAFTA, COMESA, AfCFTA, and the EU Association Agreement by simplifying rules of origin, reducing non-tariff barriers, and improving firms' ability to meet international standards. Greater participation in regional and global value chains would also support export diversification and long-run competitiveness.

Limitations

Several limitations should be considered. First, the use of annual time-series data limits the sample size and reduces the precision of short-run estimates. In addition, some important indicators, including detailed logistics measures, export-quality indices, and firm-level productivity data, were unavailable for the full study period. Another limitation of the study relates to the relatively small sample size associated with annual data for the period 2000–2023. Although Johansen cointegration and VECM approaches are commonly applied in macroeconomic studies with limited annual observations, the results should nevertheless be interpreted with caution due to potential small-sample sensitivity. To mitigate this issue, the study employed a parsimonious lag structure based on optimal lag selection criteria.

Second, the model may suffer from omitted-variable bias. Although the analysis includes major macroeconomic and institutional determinants, export competitiveness is also influenced by innovation, skills, firm heterogeneity, and technological capability, which are difficult to capture through macro-level proxies. Similarly, proxies such as transport services and corruption indicators may not fully reflect the complexity of logistics and governance conditions.

Third, the study period includes major structural shocks, including the 2011 revolution, the 2016 exchange-rate liberalization, and the global disruptions of 2020–2022, which may have introduced nonlinearities and regime shifts not fully captured by the cointegration framework.

Finally, the aggregated nature of the data masks differences across sectors. Egypt's non-oil exports include industries with distinct structures and sensitivities, such as chemicals, textiles, agricultural products, and engineering goods. Sector-specific analysis could therefore provide deeper insights into the determinants of competitiveness.

Future Research

Several areas for future research emerge from this study. First, sector-level econometric analysis using disaggregated export data could identify industry-specific determinants of competitiveness and provide more targeted policy recommendations.

Second, future research could incorporate firm-level data from enterprise surveys or customs records to examine how productivity, innovation, management practices, and export experience influence export performance. Also, it is recommended to incorporate variables like Human capital or education into the studies to enhance the results associated with it.

Third, future studies may apply econometric techniques that account for structural breaks and nonlinearities, such as ARDL models with break tests, threshold cointegration, or Markov-switching approaches, to better capture the effects of major reforms and external shocks.

In addition, incorporating global value chain indicators-such as participation indices and export-quality measures-would provide further insight into Egypt's integration within international production networks.

Finally, future work could evaluate the effectiveness of specific policy interventions, including AfCFTA implementation, customs modernization, and export incentive programs, in improving non-oil export competitiveness in Egypt.

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