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Benchmarking Jordan's Trade Role: A Comparative Analysis of Logistics Infrastructure, Geopolitical Position, and Regional Integration

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Abstract

This benchmarking study situates Jordan's trade indicators relative to comparators (Egypt, Lebanon, Saudi Arabia, and the United Arab Emirates) with descriptive analysis. Using indicators for port competitiveness, geopolitical stability, logistics infrastructure, and trade facilitation within a Modified Input–Process–Output framework, based on secondary data from conventional international indicators ("Fund for Peace Fragile States Index," "Institute for Economics & Peace Global Peace Index," "OECD Trade Facilitation Indicators," "UN Comtrade Trade Volume Records, 2022–2023," "UN Conference on Trade and Development Port Performance Scorecard," and "World Bank Logistics Performance Index"). The outcomes of this analysis demonstrate that Jordan's strengths in terms of institutional quality and geopolitical stability are countermanded by relatively poor digital technology adoption and governance of ports, and homogeneity in exports. Using M-IPO model and SWOT analysis, it was identified that specific actions are needed to improve Jordan's trade performance, especially as a hub for regional logistics, including investment and facilitation of digital system adoption, commensurate infrastructure, and flexibility in governance.

Keywords: geopolitical stability; Input–Process–Output framework; Jordan; logistics infrastructure; port governance; regional integration; trade benchmarking; trade facilitation



Academic Editor: Bruce Morley

Received: 10 August 2025

Revised: 14 September 2025

Accepted: 23 September 2025

Published: 28 September 2025

Citation: Samawi, G. A., Bwaliez, O. M., & Mdanat, M. F. (2025). Benchmarking Jordan's Trade Role: A Comparative Analysis of Logistics Infrastructure, Geopolitical Position, and Regional Integration. *Economies*, 13(10), 282. <https://doi.org/10.3390/economies13100282>

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1. Introduction

Despite its geostrategic locus in the Middle East, between European, Asian, and African trade routes, Jordan's scope to be a hub for trade and logistics remains unrealized, which previous studies attribute mainly to institutional and infrastructural barriers in Jordan, and regional geopolitical instability (Alamoush, 2016; Hausmann et al., 2020; Kumar, 2020; Liang & Liu, 2020; Papadopoulos et al., 2023). However, Jordan has sought to increase its competitiveness over recent decades, including international agreements and economic liberalization, especially through concerning the country's artery to international maritime trade, the Aqaba Special Economic Zone (ASEZA) (Awad-Warrad & Al Tarawneh, 2020; Azmeh, 2015; Caldeirinha et al., 2018). Despite major efforts, it still faces barriers in terms of connections to regional partners, digital technology adoption (Digital-TA), and the efficiency of operations (Al-Masri, 2021; Atkinson & Stevens, 2020; Hamed, 2019; Das Neves Marques et al., 2022).

This study benchmarks Jordan's role in trade to guide strategies for enhancing its regional competitiveness, focusing on its position relative to Egypt, Lebanon, Saudi Arabia,

and the United Arab Emirates. The analysis aims to evaluate performance across key logistics and trade indicators, assess the influence of infrastructure, facilitation mechanisms, and geopolitical stability on trade outcomes, and propose actionable, evidence-based recommendations for improving Jordan's position in regional markets. It addresses the following core questions: How do Jordan's trade infrastructure, logistics systems, and geopolitical context shape trade performance? What strengths and weaknesses emerge in comparison to peers? Which strategic reforms could enhance integration and export competitiveness?

The benchmarking uses data from the period 2022–2023 drawn from internationally recognized sources, including the Fund for Peace Fragile States Index, Institute for Economics & Peace Global Peace Index, OECD Trade Facilitation Indicators, UN Comtrade Trade Volume Records, UNCTAD Port Performance Scorecard, and *World Bank Logistics Performance Index*. These are summarized in Table 1. Data sources and form the empirical foundation for comparative and composite index analysis.

Table 1. Data sources.

Name	Description	Reference	Conventional Citation	Citation Code
"Fund for Peace Fragile States Index"	Measures political stability and institutional resilience.	Fund for Peace. (2023). <i>Fragile States Index 2023: Annual report</i>	Fund for Peace (2023)	FFP-FSI (2023)
"Institute for Economics & Peace Global Peace Index"	Measures political stability and institutional resilience	Institute for Economics & Peace. (2024). <i>Global Peace Index 2024: Measuring peace in a complex world.</i> https://www.economicsandpeace.org/wp-content/uploads/2024/06/GPI-2024-web.pdf (accessed on 15 March 2025)	Institute for Economics and Peace (IEP) (2024)	IEP-GPI (2024)
"OECD Trade Facilitation Indicators"	Measures automation, border cooperation, and procedural transparency.	Organisation for Economic Co-operation and Development. (2025). <i>Trade-F indicators.</i> https://www.oecd.org/en/publications/trade-facilitation-indicators_5k4bw6kg6ws2-en.html (accessed on 15 March 2025)	Organisation for Economic Co-operation and Development (OECD) (2025)	OECD-TFIs (2025)
"UN Comtrade Trade Volume Records, 2022–2023"	Provides data on export-import volumes and trade partners	United Nations Comtrade. (2023). <i>Trade volume records, 2022–2023.</i> https://comtrade.un.org/ (accessed on 15 March 2025)	United Nations (2023)	UN Comtrade-TVR (2023)
"UN Conference on Trade and Development Port Performance Scorecard"	Assesses port governance, operational efficiency, and Digital-TA.	United Nations Conference on Trade and Development. (2021). <i>Port Performance Scorecard Newsletter</i> (2020–2021). https://tft.unctad.org/thematic-areas/port-management/port-performance-scorecard/ (accessed on 15 March 2025)	United Nations Conference on Trade and Development (UNCTAD) (2021b)	UNCTAD-PPS (2021b)
"World Bank Logistics Performance Index"	Evaluates dimensions such as customs, infrastructure, shipment tracking, and timeliness.	World Bank. (2023b). <i>Logistics Performance Index.</i> https://lpi.worldbank.org/international/global (accessed on 15 March 2025)	World Bank (2023b)	World Bank-LPI (2023)

While previous studies have examined trade performance in the Middle East and North Africa (MENA), they often focus on single dimensions or treat barriers in isolation. This study fills that gap by applying a Modified Input–Process–Output (M-IPO) framework

in combination with composite benchmarking and SWOT analysis, integrating geopolitical stability, port governance, and logistics capacity into a single policy-oriented assessment. The approach provides a holistic view of Jordan's trade position and a replicable framework for policymakers in similar middle-income economies seeking to improve competitiveness in regional corridors such as GAFTA and IMEC.

This paper analyses trade in Jordan with a comparative descriptive approach and quantitative benchmarking analysis, assaying national competitiveness as per the indicators of logistics infrastructure (Log-Inf), trade facilitation (Trade-F), port competitiveness (Port-C), and geopolitical stability (Geo-Stab) (Bensassi et al., 2014; Liu, 2024; Moisé et al., 2011). The approach benchmarks Jordan against key regional peers—namely Egypt, Lebanon, Saudi Arabia, and the UAE—using benchmarking analysis of normative indicators and composite indices in order to identify strategic opportunities and troubleshoot problems (Bhatt et al., 2023; Özgüner & Köse, 2025). This enables operationalization using data on trade facilitation, relative to a theoretical and conceptual framework (United Nations Conference on Trade and Development (UNCTAD) (2021a)).

The theoretical framework of this study is founded on a Modified Input–Process–Output (M-IPO) framework, connecting inputs pertaining to the dimensions of trade (i.e., digital technologies and infrastructure) and institutions (i.e., automation and customs processes), and outcomes in terms of performance (e.g., port connectivity and export volume). The IPO paradigm enables comprehension of competitiveness in trade relative to internal and external networks (Bilgin, 2023; Hair et al., 2017).

SWOT analysis is applied to interpret the emergent data from the benchmarking analysis, to identify eponymous “strengths, weaknesses, opportunities, and threats.” This interpretation enables relevant policy recommendations to be made for policymakers and other stakeholders (Aldweik & Ghnaim, 2024; Mazur, 2023; Zilli & Freire, 2023).

The remainder of this paper is organized as follows. Section 2 reviews recent literature on trade logistics, infrastructure, and geopolitical dynamics in the Middle East. Section 3 describes the research design, data sources, benchmarking methods, and the application of the Modified Input–Process–Output (M-IPO) framework. Section 4 presents the results of the benchmarking analysis, using normalized indices and comparative charts to assess Jordan's performance relative to regional peers. Section 5 discusses the findings through the lens of the M-IPO model and SWOT analysis, providing targeted recommendations to strengthen Jordan's trade connectivity and overall competitiveness. The paper concludes with a synthesis of the main insights and their policy implications.

2. Literature Review

2.1. Trade Infrastructure and Logistics Performance

Trade infrastructure plays a pivotal role in facilitating cross-border commerce and regional economic integration. A growing body of literature emphasizes that modern logistics systems significantly influence trade efficiency, export diversification, and global value chain participation (Hausmann et al., 2020; Martí & Puertas, 2017; Munim & Schramm, 2018; Özgüner & Köse, 2025). According to the World Bank-LPI (2023), countries with strong customs systems, infrastructure, and tracking capabilities demonstrate lower trade costs and higher reliability, which in turn improve export competitiveness, as also attested by longstanding literature (Bensassi et al., 2014; Bhatt et al., 2023; Moisé et al., 2011).

While Jordan has enhanced its Log-Inf, it still suffers from performance drawbacks in the efficiency of connectivity, customs and excise, and shipping reliability. Customs (i.e., clearance) and shipping inefficiencies are typically associated with barriers in institutional capacity and systems integration (Al-Masri, 2021; Atkinson & Stevens, 2020; Das Neves Marques et al., 2022; Hamed, 2019).

2.2. Trade Facilitation and Institutional Processes

Effective Trade-F defined as the simplification, standardization, and harmonization of procedures and controls—has become central to improving cross-border trade (OECD-TFIs, 2025). The OECD-TFIs (2025) show that countries advancing automation, transparency, and inter-agency coordination achieve significant gains in efficiency and compliance (Moisé et al., 2011; Sorescu & Bollig, 2022) (UNCTAD-PPS, 2021). Jordan has middling progress at the current juncture, with a recognized need for more strident Digital-TA and reforms to institutions in order to galvanize procedures and operational efficiency (Atkinson & Stevens, 2020; Das Neves Marques et al., 2022). The lack of cohesion among Jordanian institutions causes a disconnect between the ambitious bilateral and regional trading arrangements made by Jordan with regional and global partners and the reality on the ground (e.g., as reflected in heterogeneous implementation of regulations) (Awad-Warrad & Al Tarawneh, 2020; Azmeh, 2015; Dieter, 2013).

Insights from the shipping sector also show that digital human resource systems are critical success factors for institutional modernization and efficiency (Wang et al., 2025).

2.3. Port Governance and Performance

Ports are the fundamental doorways of international trade, at the intersection between sea lanes and land transportation, to and from producers and consumers. UNCTAD-PPS (2021) data offers a window on Digital-TA, governance, and the efficiency of ports. Highly efficient ports, as in Singapore and the UAE, ubiquitously espouse “public–private partnership” arrangements to promote innovativeness and operational efficiency (Caldeirinha et al., 2018; Verhoeven & Vanoutrive, 2012; Zilli & Freire, 2023). Recent studies also highlight the environmental governance dimension of ports, linking congestion and port-oriented city air pollution through machine learning–based approaches (M. Su et al., 2025; Mdanat et al., 2024), and exploring decarbonization pathways via alternative energies, technological innovations, and optimization strategies (Raihan et al., 2025). However, a traditional public sector paradigm continues to prevail in Aqaba, associated with limited efficiency by global standards (e.g., high costs for transactions), and tentative Digital-TA (reflected in slow processing and relatively poor regional logistics integration) (Alamoush, 2016; Baskin & Swoboda, 2023; Das Neves Marques et al., 2022) (UNCTAD-PPS, 2021). Digital-TA and increased governance liberalization (e.g., more independence for port managers) are essential to increase Port-C.

2.4. Review of Geopolitical Stability and Institutional Factors

Geo-Stab is essential for investment and trade, particularly in terms of regional competitiveness, and Jordan has long been identified as a strong performer in this regard, especially by regional standards, as acknowledged by the IEP-GPI (2024) and FFP-FSI (2023). Stability enhances investor confidence and supports continuity in logistics operations, even during regional crises such as the Syrian conflict (FFP-FSI, 2023) (Papadopoulos et al., 2023; Tsourapas, 2019). However, the literature also highlights the dual role of macro-level stability and micro-level vulnerability factors. While Jordan’s peace rankings are favorable, the country faces economic and infrastructural pressures due to large refugee inflows, public debt, and regional trade disruptions (Kumar, 2020; Mansour & Ahmed, 2019; Segnana et al., 2024). Parallel research has examined strategic maritime corridors such as the Northern Sea Route, identifying key non-polar utilization factors with lessons for diversification in regional trade (Z. Su et al., 2025).

2.5. Regional Trade Integration and Network Connectivity

Despite membership in regional platforms such as the Greater Arab Free Trade Area (GAFTA) and the India–Middle East–Europe Economic Corridor (IMEC), Jordan’s integration into regional value chains remains limited. Trade network analysis indicates that Jordan’s export structure is concentrated in a few markets and lacks the diversified linkages seen in more competitive economies like the UAE (Jafari et al., 2023; Khan et al., 2024; Kumar, 2020). UN Comtrade–TVR (2023) data (2022–2023) confirm that while trade volume with Gulf countries is increasing, structural dependencies remain, especially on re-export channels and a limited range of sectors. This highlights the imperative need for the diversification of trade networks, the development of corridors for digitalized trading, and enhanced alignment of institutions with partners in the regional (i.e., more frictionless trade) (Azmeah, 2015; Bai & Wang, 2021; Ochieng & Musyoka, 2017).

2.6. Theoretical and Analytical Frameworks

Systemic models are commonly used to study the logistics of trade, including the “Input–Process–Output” framework, which models trade outcomes in relation to reforms in operations and infrastructure. It was selected for this study as it is germane to the context of Jordanian policy, given identified limitations in the upstream and midstream (i.e., “input” and “process”, respectively) (Bilgin, 2023; Hair et al., 2017; Munim & Schramm, 2018). This is further supported by SWOT analysis, as commonly used to get an overview on empirical findings to render them suitable for policy development (Das Neves Marques et al., 2022; Mazur, 2023). Consequently, this paper offers a sophisticated analysis of benchmarking results that can inform policymakers and other stakeholders.

Broader reviews of sustainable maritime transport optimization also stress the need to align port and logistics systems with sustainability objectives, reinforcing the relevance of our benchmarking approach (Xu & Chen, 2025).

3. Materials and Methods

3.1. Research Design

This study uses benchmarking analysis to determine Jordan’s role in regional trade in relation to Egypt, Lebanon, Saudi Arabia, and the UAE, with the use of composite indicators and index-based scoring (Bensassi et al., 2014; Khan et al., 2024; Moisé et al., 2011). The comparative, descriptive research design offers a structure to assay performance in terms of the studied variables (Log-Inf, Trade-F, Port-C, and Geo-Stab) with standard quantitative data (i.e., indicators) (Bilgin, 2023; Bhatt et al., 2023), to compare regional countries and Jordan’s relative performance (Hausmann et al., 2020; Martí & Puertas, 2017; Özgüner & Köse, 2025).

Couched in the M-IPO framework, this study conceptualizes and analyses how trade outcomes are affected by institutions and infrastructure (i.e., outputs, processes, and inputs, respectively), which is an effective way to study network performance and efficiency with regard to causal relationships, as attested by extensive literature (Bhatt et al., 2023; Bilgin, 2023; Hair et al., 2017; Hamed, 2019; Liang & Liu, 2020; Liu, 2024; Munim & Schramm, 2018). This is facilitated by using time-series trend and multiple regression data analysis techniques, offering the scope for a research extension (i.e., Phase 2).

3.2. Data Sources

Pre-eminent global databases were used to source data, as presented in Table 1, ensuring that studies of multiple countries could be compared with high reliability. The selected data sources represent globally standardized, validated indices widely used in

academic and policy settings, ensuring consistency, reliability, and comparability of the benchmarking results.

3.3. Analytical Framework

3.3.1. Comparative Descriptive Analysis

Comparison tables with heatmaps, radar charts, and scorecards are used to visualize quantitative data, to reveal how Jordan compares regionally in terms of the studied indicators, to facilitate strategic analysis (UNCTAD-PPS, 2021; World Bank-LPI, 2023).

3.3.2. Benchmarking and Composite Index Construction

All indicators were mapped to a 0–1 continuous scale using min–max normalization with global reference ranges (all countries available in each source). For a raw value $x_{c,k}$ (country c , indicator k).

Beneficial indicators (higher = better):

$$x_{c,k}^{norm} = \frac{x_{c,k} - \min(x_k)}{\max(x_k) - \min(x_k)}$$

Cost-type indicators (lower = better; e.g., GPI, FSI):

$$x_{c,k}^{norm} = 1 - \frac{x_{c,k} - \min(x_k)}{\max(x_k) - \min(x_k)}$$

Using these normalized scores $x_{c,k}$, the four domain indices are simple equal-weight averages of their components:

1. Logistics Infrastructure Performance (Log – Inf) :

$$LogInf_c = \frac{1}{6} \sum_{k=1}^6 x_{c,k}^{norm} \text{ (World Bank-LPI, 2023).}$$

2. Trade Facilitation Capabilities (Trade-F):

$$TradeF_c = \frac{1}{5} \sum_{k=1}^5 x_{c,k}^{norm} \text{ (OECD-TFIs, 2025).}$$

3. Port Competitiveness & Governance (Port-C):

$$PortC_c = \frac{x_{c,EFF}^{norm} + x_{c,DTA}^{norm} + x_{c,GOV}^{norm}}{3}$$

(Efficiency from UNCTAD-PPS, 2020–2021; GOV is governance coded: public = 0, PPP = 1. A sensitivity check excluding governance yields very similar rankings; see Appendix C).

4. Geopolitical Stability & Institutional Resilience (Geo-Stab):

$$GeoStab_c = \frac{x_{c,GPI}^{norm} + x_{c,FSI}^{norm}}{2}$$

(Both GPI and FSI are treated as cost-type indicators so that higher values mean greater stability; IEP-GPI, 2024; FFP-FSI, 2023).

Composite index:

$$Composite_c = \frac{LogInf_c + TradeF_c + PortC_c + GeoStab_c}{4}$$

Methodological precedent. This min–max normalization with equal weights and domain averaging follows established practice in trade/logistics benchmarking (Al-Masri, 2021; Bhatt et al., 2023; Caldeirinha et al., 2018; Moïsé et al., 2011).

Notes. Equal weights are used for transparency and comparability across domains. Full raw and normalized values are reported in Appendices A–C, along with robustness checks using PCA and entropy weights and the Port-C without governance sensitivity. Indicator years differ across sources (e.g., UNCTAD-PPS 2020–2021; World Bank-LPI 2023b; OECD-TFIs 2025); normalizing each dataset across the country sample mitigates this, and robustness checks confirm that overall rankings are stable.

3.3.3. IPO Framework Application

The M-IPO assesses the following eponymous dimensions:

- Inputs: Infrastructure capacity, port systems, Trade-F mechanisms.
- Processes: Customs procedures, Digital-TA levels, inter-agency cooperation.
- Outputs: Export volumes, trade diversification, and regional connectivity.

This conceptualization has been used to study causal relationships and logistical operations in many previous studies (Bilgin, 2023; Hair et al., 2017; Liu, 2024; Munim & Schramm, 2018). The constituent elements listed above are connected with the studied moderating factors, as illustrated in Figure 1.

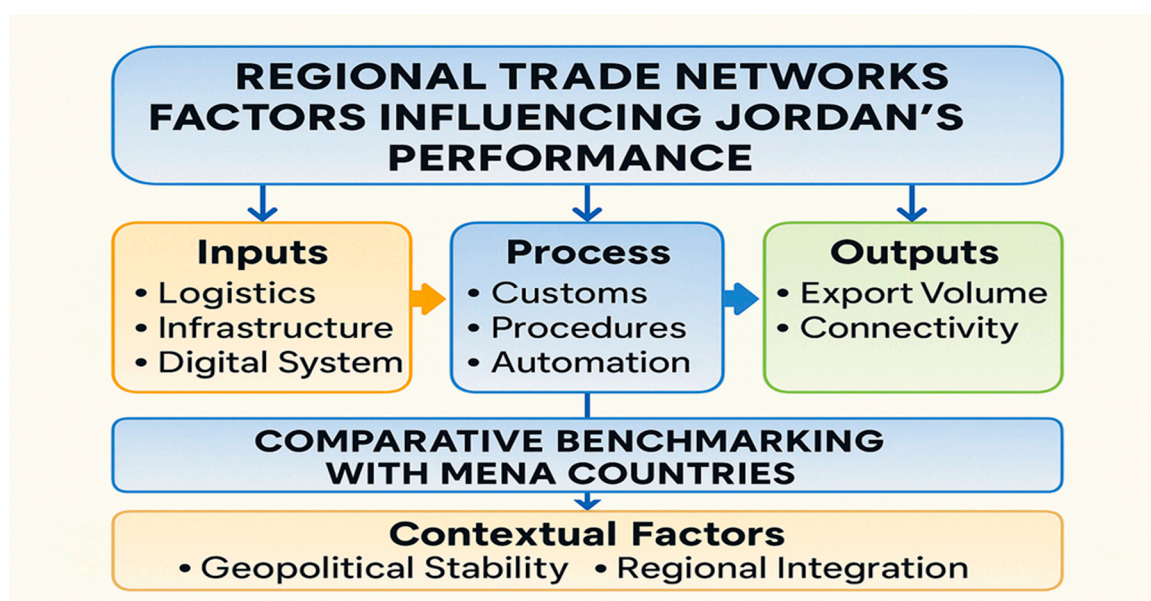


Figure 1. Modified IPO framework for this study. Note. Adapted from the IPO model (Hair et al., 2017).

The selected study framework enables us to categorize the studied indicators (Log-Inf, Trade-F, Port-C, and Geo-Stab) and apply them in a logical benchmarking sequence. While the current analysis is descriptive in nature, the structured indicator sets lend themselves to empirical modelling. A follow-up study (i.e., Phase 2) could use regression-based analysis to formally estimate the contribution of logistics, Digital-TA, and geopolitical factors to trade performance across time.

3.4. Interpretation Strategy

To complement the benchmarking analysis, the study integrates a **SWOT-style interpretive analysis** to organize the strategic implications of the findings. The rationale for using SWOT analysis is twofold:

- Translating technical data: SWOT helps convert quantitative benchmarking results into policy-relevant insights, making it accessible to policymakers, practitioners, and development agencies (Das Neves Marques et al., 2022; Mazur, 2023).
- Complementing the IPO framework, which models the instrumental dynamics of systems, while SWOT sorts outcomes into eponymous “strengths, weaknesses, opportunities, and threats,” offering a cohesive grasp of the strategic position of Jordan (Bilgin, 2023; Hausmann et al., 2020; Liu, 2024).

This dual interpretive approach offers depth and actionable relevance to contribute to the development of strategy and policy.

4. Results

This section offers the results of the benchmarking analysis and comparison undertaken in this study, comparing Jordan with Egypt, Lebanon, Saudi Arabia, and the UAE with regard to Log-Inf, Trade-F, Port-C, and Geo-Stab. Normalized indices and visualizations were used, as described previously. All domain scores in this section are min–max normalized to 0–1 using global reference ranges and equal weights as detailed in Section 3.3.2; normalized values and robustness checks are reported in Appendices B and C.

4.1. Logistics Infrastructure Performance

The Log-Inf Index was formed as the equal-weighted average of the six World Bank-LPI (2023) dimensions. LPI sub-indicators were min–max normalized (0–1) and averaged with equal weights (see Section 3.3.2 and Appendix B). The results show that:

- The UAE leads, with a composite score of 0.95, demonstrating exceptional performance in customs, infrastructure, and shipment reliability.
- Saudi Arabia ranks second, with 0.85, driven by sustained investment in transport and logistics under Vision 2030.
- Jordan scores 0.65, reflecting moderate performance. Key weaknesses are observed in timeliness and tracking and tracing, suggesting areas for system upgrades and technology deployment.
- Egypt and Lebanon follow with 0.75 and 0.55, respectively, the latter hindered by severe political and financial crises.

As shown in Figure 2, a radar chart illustrating the six core World Bank-LPI (2023) indicators to highlight comparative strengths and weaknesses across countries, Jordan lags behind regional leaders such as the UAE and Saudi Arabia in key logistics performance dimensions particularly in infrastructure, tracking and tracing, and timeliness.

Table 2 presents the detailed World Bank-LPI (2023) scores across six core dimensions for Jordan and regional comparators, revealing Jordan’s relative underperformance in infrastructure and tracking capabilities. These indicators form the input layer of the IPO framework and serve as foundational metrics in trade logistics benchmarking.

Table 2. Comparative World Bank-LPI (2023) scores.

Country	Customs	Infrastructure	International Shipments	Logistics Quality	Tracking & Tracing	Timeliness
UAE	0.92	0.94	0.96	0.93	0.95	0.97
Saudi Arabia	0.84	0.83	0.86	0.82	0.85	0.88
Jordan	0.65	0.68	0.66	0.64	0.63	0.67
Egypt	0.72	0.74	0.76	0.70	0.71	0.75
Lebanon	0.52	0.55	0.50	0.54	0.53	0.51

Source: Authors’ calculations based on **World Bank-LPI (2023)**. Available online: <https://lpi.worldbank.org/international/global> (accessed on 15 March 2025).

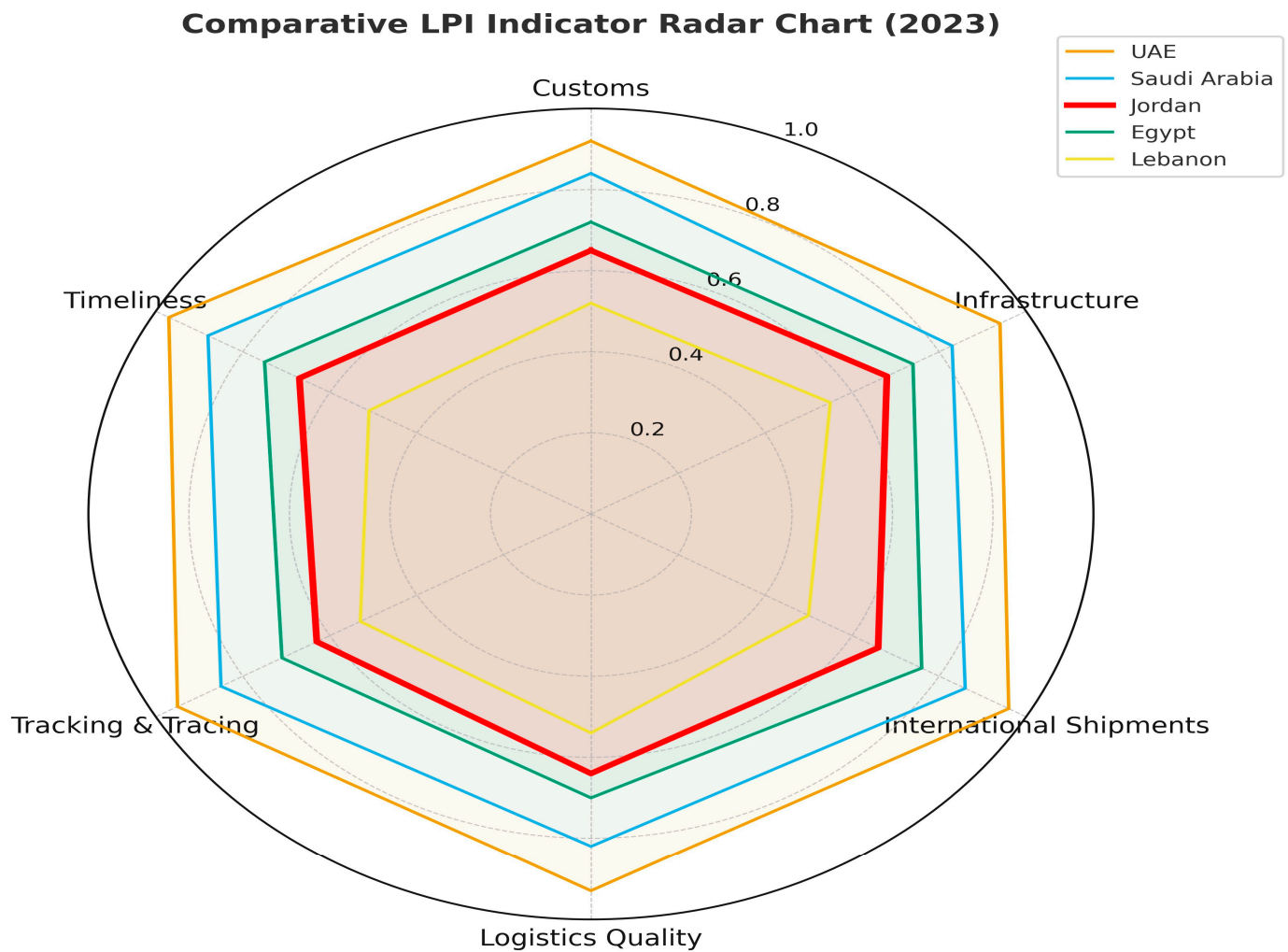


Figure 2. Radar chart of comparative World Bank-LPI (2023) Indicators. Source: Authors' elaboration based on World Bank-LPI (2023). Available online: <https://lpi.worldbank.org/international/global> (accessed on 15 March 2025).

4.2. Trade Facilitation Capabilities

The Trade-F Index is derived from five pillars of the OECD-TFIs (2025). All Trade-F scores were min–max normalized on a 0–1 scale and averaged with equal weights across the five pillars (see Section 3.3.2 and Appendix B). The results show that:

- The UAE again leads with 0.90, attributed to its seamless digital customs platforms and business-friendly trade policies.
- Jordan achieves 0.70, ranking third. While it performs well in information availability and border cooperation, it is significantly behind in appeal procedures and advance rulings.
- Saudi Arabia ranks similarly at 0.75, while Egypt and Lebanon lag due to low automation and lack of institutional clarity.

These results point to a need for Jordan to enhance legal transparency, establish formal appeal channels, and expand automation beyond major entry points. Figure 3 presents a heatmap visualization of OECD-TFIs (2025), highlighting Jordan's relative strengths in information availability and weaknesses in appeal procedures and automation when compared to regional peers.

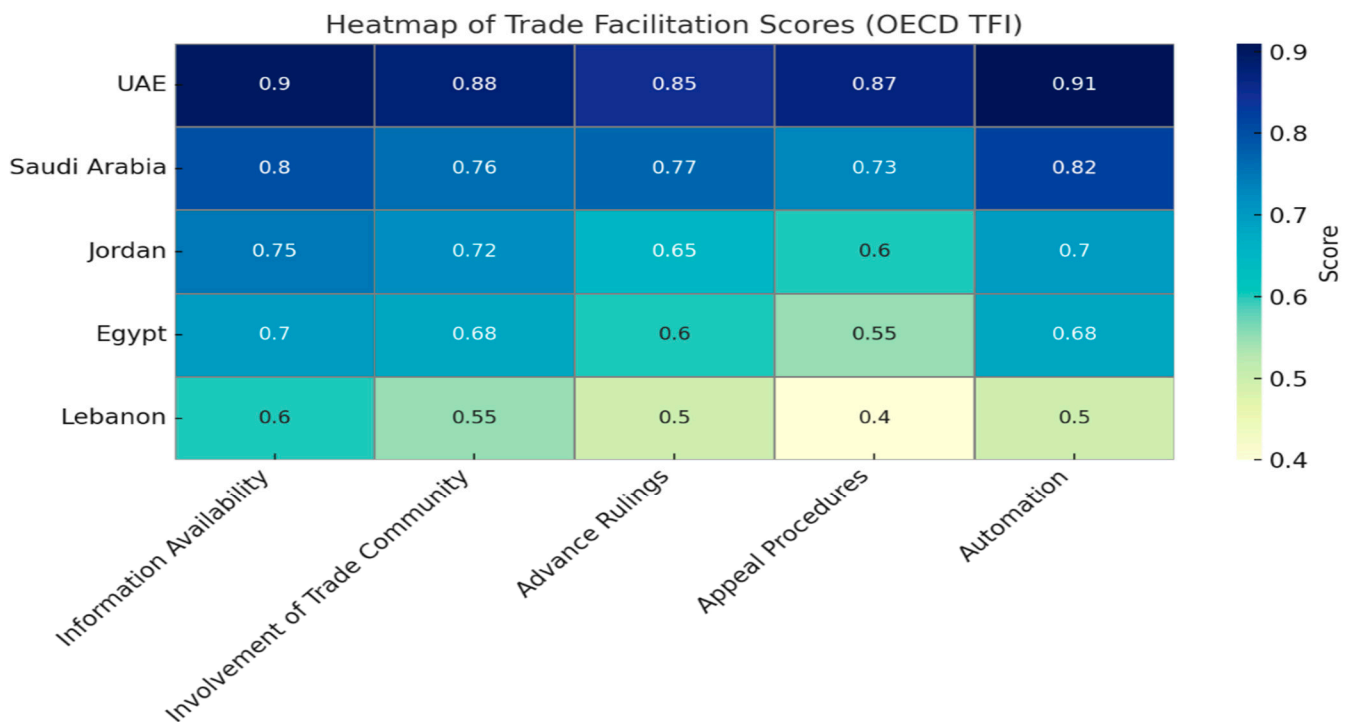


Figure 3. Heatmap of scores for OECD-TFIs (2025). Source: Authors' elaboration based on data from Organisation for Economic Co-operation and Development (OECD) (2025), Trade Facilitation Indicators. Available online: https://www.oecd.org/en/publications/trade-facilitation-indicators_5k4bw6kg6ws2-en.html (accessed on 15 March 2025).

Table 3 presents the normalized scores for OECD-TFIs (2025) across five dimensions. Jordan demonstrates moderate performance in information availability and stakeholder engagement but lags in automation and appeal procedures. These findings reflect key institutional process gaps within Jordan's trade system as identified in the IPO framework.

Table 3. Dimensional scores for OECD-TFIs (2025).

Country	Information Availability	Involvement of Trade Community	Advance Rulings	Appeal Procedures	Automation
UAE	0.9	0.88	0.85	0.87	0.91
Saudi Arabia	0.8	0.76	0.77	0.73	0.82
Jordan	0.75	0.72	0.65	0.6	0.7
Egypt	0.7	0.68	0.6	0.55	0.68
Lebanon	0.6	0.55	0.5	0.4	0.5

Source: Authors' calculations based on data from Organisation for Economic Co-operation and Development (OECD) (2025), Trade Facilitation Indicators. Available online: https://www.oecd.org/en/publications/trade-facilitation-indicators_5k4bw6kg6ws2-en.html (accessed on 15 March 2025).

4.3. Port Competitiveness and Governance

Drawing on UNCTAD-PPS (2021), the Port-C Index (2020–2021) was calculated using three dimensions: operational efficiency, Digital-TA, and governance type. The Port-C index is the equal-weight average of Efficiency, Digital-TA, and Governance, with governance coded as public = 0; PPP = 1. A sensitivity check excluding governance yields very similar rankings (Appendix C). The findings are:

- The UAE and Saudi Arabia achieve high scores (0.90 and 0.80, respectively), with successful public–private governance models and advanced port management systems.

- Jordan scores 0.65, reflecting a public governance model and limited Digital-TA (score of 0.4). Operational efficiency at Aqaba port remains moderate but below regional expectations.
- Egypt and Lebanon score 0.60 and 0.50, respectively.

Table 4 compares port governance models, operational efficiency, Digital-TA scores, across five countries. Jordan's public port governance and relatively low Digital-TA score position it behind regional competitors like the UAE and Saudi Arabia. These dimensions reflect structural and institutional input constraints within the IPO framework's "Input" layer.

Table 4. Port Performance Scorecard, 2020–2021 (UNCTAD-PPS, 2021).

Country	Governance Type	Operational Efficiency	Digital-TA Score
UAE	Public–Private	0.95	0.9
Saudi Arabia	Public	0.85	0.7
Jordan	Public	0.65	0.4
Egypt	Public	0.75	0.6
Lebanon	Public	0.6	0.45

Source: Authors' calculations based on UNCTAD-PPS (2021). Available online: <https://tft.unctad.org/thematic-areas/port-management/port-performance-scorecard/> (accessed on 15 March 2025).

4.4. Geopolitical Stability and Institutional Resilience

The Geo-Stab Index is the equal-weight mean of the IEP-GPI (2024) and FFP-FSI (2023) after inverse min–max normalization so that higher values denote greater stability (see Section 3.3.2 and Appendix B). The key findings are that:

- The UAE again leads with 0.92, reflecting strong institutions and internal cohesion.
- Jordan ranks second after the UAE, scoring 0.80, underscoring its relative stability amid a volatile region. This stability is a strategic asset for trade and investment.
- Saudi Arabia, Egypt, and Lebanon score 0.70, 0.55, and 0.40, respectively, with Lebanon exhibiting high fragility and political gridlock.

These results confirm that Jordan's comparative advantage lies in its stability and institutional predictability, which could be further leveraged in regional trade strategies.

4.5. Composite Benchmarking Summary

Table 5 provides a composite benchmarking summary, aggregating scores across the four studied dimensions (Log-Inf, Trade-F, Port-C, and Geo-Stab). The Composite is the unweighted mean of these four domain indices (see Section 3.3.2); rankings remain stable under PCA- and entropy-based weights (Appendix C). Jordan consistently scores in the mid-range, reflecting both systemic constraints and strategic opportunities.

Table 5. Composite benchmarking summary.

Country	Log-Inf	Trade-F	Port-C	Geo-Stab
UAE	0.95	0.9	0.9	0.92
Saudi Arabia	0.85	0.75	0.8	0.7
Jordan	0.65	0.7	0.65	0.8
Egypt	0.75	0.68	0.6	0.55
Lebanon	0.55	0.51	0.5	0.4

Note: Created by the authors using data from FFP-FSI (2023), IEP-GPI (2024), OECD-TFIs (2025), UNCTAD-PPS (2021), and World Bank-LPI (2023).

While Jordan performs consistently in the mid-range, the gaps with top performers like the UAE are evidently substantial, particularly in Digital-TA and procedural modernization.

4.6. Trade Volume and Export Structure

According to UN Comtrade-TVR (2023) data (2022–2023), Jordan’s top export markets include Iraq, Saudi Arabia, and the UAE, with pharmaceuticals, chemicals, and fertilizers being leading commodities. Jordan’s regional trade remains undiversified, with significant reliance on a few key partners and limited presence in high-value or digital trade corridors. Table 6 outlines Jordan’s top export destinations and major export sectors, based on the most recent UN Comtrade-TVR data. The table confirms that Iraq, Saudi Arabia, and the UAE are Jordan’s leading export trade partners, with products primarily being in the pharmaceuticals, fertilizers, and chemicals sectors.

Table 6. Trade volume and partners (UN Comtrade-TVR, 2023).

Export Destination	Export Volume (USD Millions)	Major Export Sectors
Iraq	950	Pharmaceuticals
Saudi Arabia	850	Fertilizers
UAE	780	Chemicals
Egypt	610	Food Products
Qatar	470	Machinery
Turkey	400	Textiles
USA	350	ICT Equipment

These patterns highlight the need for broader regional diversification and deeper trade integration beyond primary corridors. To synthesize the benchmarking results across all evaluated dimensions, Table 7 provides a consolidated overview of Jordan’s trade performance relative to regional peers, highlighting key strengths, weaknesses, and policy-relevant insights.

Table 7. Summary of Jordan’s trade performance benchmarking results.

Dimension	Indicator Source	Jordan’s Score	Regional Comparison	Status
Geo-Stab	FFP-FSI (2023), IEP-GPI (2024)	High stability	Higher than Egypt, Lebanon	Strategic strength
Trade-F	OECD-TFIs (2025)	Moderate (av. 0.70)	Lower in automation, appeals	Needs reform
Export market diversity	UN Comtrade-TVR (2023)	Top 5 markets >70%	High dependence on Iraq, Gulf states	Risk of overfocus
Trade network integration	UN Comtrade-TVR (2023), Network Diagram	Moderate density	Limited to regional partners	Expand needed
Port governance & operations	UNCTAD-PPS (2021)	Public; 0.65 efficiency	Less efficient, lower Digital-TA	Reform opportunity
Log-Inf	World Bank-LPI (2023)	0.65	Lower than UAE (0.94), KSA (0.83)	Needs improvement

5. Discussion

This section interprets the benchmarking results through a dual lens of the M-IPO framework and a complementary SWOT analysis. The aim is to connect performance outcomes to systemic constraints and strategic opportunities, drawing on data triangulation and empirical findings from the literature.

5.1. IPO Framework Analysis

The IPO framework structures the discussion across three analytical layers—Inputs, Processes, and Outputs—to clarify how foundational capacities and institutional mechanisms impact Jordan’s trade outcomes. For transparency, each domain index and the overall composite were constructed using equal weights; robustness checks with PCA- and entropy-based weighting confirmed that country rankings remain stable (Appendix C).

5.1.1. Inputs: Infrastructure, Systems, and Stability

Jordan shows moderate input readiness with a Log-Inf Index score of 0.65, suggesting underinvestment in customs modernization, tracking systems, and multimodal transport integration (Bensassi et al., 2014; Bhatt et al., 2023; Özgüner & Köse, 2025) (World Bank-LPI, 2023). Compared to regional leaders like the UAE (0.95) and Saudi Arabia (0.85), Jordan lacks the infrastructure scale and connectivity needed for efficient trade flows (Martí & Puertas, 2017; Munim & Schramm, 2018).

However, Jordan’s high Geo-Stab Index score (0.80), supported by rankings in the IEP-GPI (2024) and FFP-FSI (2023), indicates a major non-material input advantage. This affirms previous studies which noted that the political stability of Jordan buffers the national economy against the severe impacts of egregious disruptions in the Middle East region (Mansour & Ahmed, 2019; Papadopoulos et al., 2023; Segnana et al., 2024).

5.1.2. Processes: Trade-F and Port Governance

Jordan’s Trade-F Index score of 0.70 reflects reasonable performance in information availability and cross-border coordination (Moisé et al., 2011; Sorescu & Bollig, 2022) (OECD-TFIs, 2025; UNCTAD-PPS, 2021). However, weaknesses in appeal procedures, advance rulings, and Digital-TA remain barriers. These findings reinforce the conclusions of previous studies that ambiguity and fragmented automation are persistent trade constraints (Atkinson & Stevens, 2020; Das Neves Marques et al., 2022), including in the Levant (Hamed, 2019). Concerning the governance of its ports (specifically Aqaba), Jordan’s 0.65 score is commensurate with its low Digital-TA (0.4) and centralized public ownership (UNCTAD-PPS, 2021) (Zilli & Freire, 2023). This is consistent with studied that reported that governance structures and bureaucratic rigidity inhibit performance, even where physical infrastructure exists (Alamoush, 2016; Baskin & Swoboda, 2023; Caldeirinha et al., 2018).

5.1.3. Outputs: Trade Competitiveness and Network Connectivity

Despite relative institutional stability, Jordan’s export structure remains narrow and concentrated. UN Comtrade-TVIR (2023) data show high dependence on Iraq, Saudi Arabia, and the UAE, with minimal presence in diversified value chains or digital trade corridors (Azmeah, 2015; Jafari et al., 2023; Ochieng & Musyoka, 2017). This output weakness stems directly from midstream (procedural) inefficiencies and upstream (infrastructural) gaps (Bensassi et al., 2014; Bilgin, 2023).

While Jordan’s stability enables continuity in trade policy, the absence of scale, specialization, and logistical agility prevents it from fully leveraging its strategic geography. These conclusions echo those of studies which highlighted Jordan’s missed opportunities in IMEC and Gulf-centered integration plans (Bai & Wang, 2021; Khan et al., 2024; Kumar, 2020).

5.2. SWOT Analysis of Jordan’s Trade Position

To complement the system-level IPO interpretation, SWOT analysis is used to synthesize the benchmarking results into strategic categories. This enhances policy clarity and facilitates targeted intervention design. Table 8 summarizes the key internal and external

factors influencing Jordan's trade competitiveness using a SWOT framework, drawing from the triangulated findings of the benchmarking analysis.

Table 8. SWOT analysis of Jordan's trade position.

Strengths	Weaknesses
- High Geo-Stab (IEP-GPI, 2024) (0.80)	- Weak Digital-TA in ports and trade systems (OECD-TFIs, 2025) (0.4)
Strategic location linking Asia–Europe–Africa	Moderate Log-Inf (World Bank-LPI, 2023) (0.65)
Institutional predictability and favorable perception by investors	Narrow export base and market concentration (UN Comtrade-TVR, 2023)
Performance parity with larger economies like Egypt in some indicators	Limited port governance flexibility and public-sector control (UNCTAD-PPS, 2021)
Opportunities	Threats
Leverage IMEC and GAFTA platforms for corridor integration	Regional instability affecting land and maritime routes
Digitize customs and port procedures to close gap with UAE/Saudi Arabia	Economic exposure to global commodity shocks
Attract regional logistics investment using stability as anchor	Domestic fiscal constraints may slow infrastructure modernization
Expand trade partnerships beyond traditional partners	Talent shortages in logistics and Trade-F sectors

The SWOT analysis confirms the IPO-based interpretation: Jordan's stable environment and geographic advantage are undervalued strategic assets, constrained by governance bottlenecks and digital lag. Policy efforts must therefore focus on institutional reform, infrastructure investment, and trade network diversification to transform structural resilience into competitive outcomes.

5.3. Triangulation of Data, the Literature, and Performance

The study's findings align consistently with prior research and international datasets (FFP-FSI, 2023; IEP-GPI, 2024; OECD-TFIs, 2025; UN Comtrade-TVR, 2023; UNCTAD-PPS, 2021; World Bank-LPI, 2023), confirming Jordan's mid-tier logistics performance and institutional strengths (Bhatt et al., 2023; Moisé et al., 2011) (IEP-GPI, 2024; World Bank-LPI, 2023). The literature emphasizes a duality between strong governance and weak operational scale. (Das Neves Marques et al., 2022; Zilli & Freire, 2023), including in Jordan (Al-Masri, 2021; Hamed, 2019; Mazur, 2023). Benchmarking analysis quantifies the gaps and shows that while Jordan outperforms Lebanon and Egypt in most dimensions, it trails significantly behind top-tier competitors like the UAE and Saudi Arabia (Khan et al., 2024; Liu, 2024; Martí & Puertas, 2017). This convergence validates the reliability of the methodology and the relevance of the strategic recommendations that follow.

5.4. Policy Contributions

This study offers strategic insight for policymakers by quantitatively identifying gaps and strengths in Jordan's trade infrastructure, institutional processes, and port governance. Its benchmarking framework can directly inform national initiatives such as Jordan Vision 2030, GAFTA integration, and IMEC planning. By linking validated global indicators with actionable policy insights, the paper bridges the gap between academic benchmarking and government strategy design.

5.5. Policy Recommendations

This study's benchmarking analysis reveals that Jordan's favorable geopolitical location is not matched by commensurate trade hub performance. Despite relatively high institutional and political stability, the country suffers from impaired regional competitiveness due to digitalization, governance, infrastructure, and human capital issues, for which recommendations are offered below.

First, the study finds that Jordan's Trade-F and logistics systems are hampered by fragmented digital infrastructure. Accelerating the adoption of modern customs and port technologies is essential to reduce transaction costs and improve shipment reliability.

Second, the governance model of Aqaba Port—still largely centralized and state-driven—emerges as a major barrier to operational flexibility and public-private innovation. Reforming port governance is necessary to enhance efficiency, especially when compared to high-performing regional peers.

Third, the country's Log-Inf, including border corridors and inland connectivity, remains underdeveloped. Targeted investments in logistics corridors and dry ports can unlock trade potential, particularly with regional countries in the Gulf and Levant.

Fourth, while Jordan performs well in trade transparency, it lags behind in institutionalized mechanisms for appeal procedures and advance rulings. Establishing a National Trade Facilitation Committee (NTFC) with legal authority would streamline coordination and align with international standards.

Fifth, the economy's export base is overly reliant on a few markets and sectors. Expanding into high-value and digital trade sectors, while pursuing strategic integration through platforms like GAFTA and IMEC, can mitigate risk and boost resilience.

Lastly, reforms must be accompanied by long-term investment in human capital. Developing a skilled workforce in supply chain management, digital trade systems, and customs operations will ensure sustainability and local ownership of reform initiatives.

To summarize these recommendations and support implementation planning, Table 9 presents each area in a structured format.

Table 9. Strategic policy recommendations for enhancing Jordan's trade competitiveness.

Policy Area	Rationale	Recommended Actions	Regional Benchmark/Support
Digital customs & ports	Low Digital-TA score (0.4) limits efficiency and transparency.	Deploy paperless customs, port community systems, and cross-agency digital integration.	UAE's <i>Dubai Trade</i> , Saudi <i>Fasah</i> platform
Port governance reform	Centralized model at Aqaba restricts performance and innovation.	Delegate autonomy, incentivize PPPs, and introduce performance-linked accountability.	UNCTAD Port Governance Toolkit
Log-Inf investment	Jordan's score (0.65) reflects underinvestment in corridors and inland hubs.	Prioritize investment in border zone logistics, inland dry ports, and multimodal corridors (e.g., Al-Omari, Karameh).	Leverage financing from EBRD, USAID, World Bank
Institutional facilitation framework	Persistent gaps in appeal mechanisms and legal clarity hinder Trade-F.	Establish a legally empowered NTFC; embed transparency and automation in trade laws.	OECD-TFI, WTO TFA implementation frameworks
Export & market diversification	High dependency on limited markets and weak presence in value-added sectors.	Support ICT, pharma, agri-tech exports; negotiate digital trade corridors and regional agreements (GAFTA, IMEC).	Jordan's political stability as a regional logistics asset
Human capital development	Future reforms require specialized talent in trade, logistics, and digital systems.	Launch national capacity-building initiatives with universities and logistics academies.	Aim to position Jordan as a logistics training hub in the Levant

Beyond technical reforms, Jordan still faces significant political and institutional hurdles. Fragmented bureaucracies, slow regulatory processes, and gaps in coordination between agencies make it difficult for the country to fully leverage its geostrategic location. Addressing these challenges will require more streamlined institutions, greater transparency, and stronger cooperation with regional partners. While modest progress is achievable in the near term, lasting and transformative improvements will depend on sustained political commitment and broader external support.

In support of the proposed policy reforms, it is useful to outline a future research agenda that builds upon the benchmarking foundation established in this study. Table 10 presents a structured set of methodological enhancements that could guide a second phase of analysis aimed at empirical validation and deeper policy impact assessment.

Table 10. Phase 2 research blueprint: from benchmarking to causal insights.

Area of Extension	Description	Data Source	Method
Regression analysis	Quantify how World Bank-LPI, Digital-TA, and stability affect exports	UN Comtrade-TVR (2023), World Bank-LPI (2023)	OLS or panel regression
Time-series trend analysis	Track Jordan's performance over time on key trade indicators	OECD-TFIs (2025), UN Comtrade-TVR (2023), World Bank-LPI (2023)	Line charts, growth trends
Diversification metrics	Assess concentration vs. diversity in trade partners and products	UN Comtrade-TVR (2023), Department of Statistics	Herfindahl Index, network maps
Policy impact evaluation	Analyze impacts of port or customs reforms post-implementation	Ministry of Transport, ASEZA, Customs Department	Difference-in-differences
Stakeholder interviews	Collect qualitative data from logistics operators, port staff, exporters	Field interviews, surveys	Thematic coding

Note. Based on the benchmarking framework and proposed methodological extensions outlined in this study.

5.6. Limitations and Future Directions

This study is primarily based on secondary data sources and benchmarking analysis, which provide high-level insights but cannot fully capture user-level experience or institutional nuance. Future studies should include qualitative methods such as interviews with customs officers, exporters, and logistics operators, to validate findings and explore implementation barriers. Incorporating time-series or causal regression analysis would also help assess the impact of reform initiatives over time.

Finally, it is important to acknowledge the implications of the ongoing regional conflict, which has introduced new uncertainties into trade flows and port access in the Middle East. While this study provides a structured benchmarking analysis, the dynamic effects of conflict may exacerbate existing hindrances or delay implementation of reforms. Future work could explicitly model such geopolitical shocks to assess resilience scenarios for Jordan's trade competitiveness.

5.7. Future Research Directions

While this study provides a comprehensive benchmarking of Jordan's trade performance, future research could build on these findings by incorporating empirical models and longitudinal assessments. A Phase 2 study is recommended to apply regression analysis, time-series trend evaluation, and stakeholder interviews to more precisely identify causal drivers of trade performance. This next phase would enable a deeper understanding of the dynamic interaction between infrastructure investment, procedural reforms, and export outcomes—offering actionable insights for policymakers, investors, and trade development partners.

As a follow-up to this benchmarking study, a Phase 2 empirical extension is planned. This would incorporate time-series regression analysis, trade diversification metrics, and stakeholder interviews to model how specific reforms (e.g., digital customs, port governance changes) affect trade outcomes. Such work would provide empirical grounding for the policy recommendations offered here and support implementation by development agencies and ministries.

6. Conclusions

Using a comparative research design with benchmarking analysis, this study conducted a comparative benchmarking analysis of Jordan's trade performance relative to four regional peers—UAE, Saudi Arabia, Egypt, and Lebanon, using major international databases (IEP-GPI, 2024; FFP-FSI, 2023; OECD-TFIs, 2025; UN Comtrade-TVR, 2023; UNCTAD-PPS, 2021; World Bank-LPI, 2023). Focusing on four strategic domains (geopolitical stability, logistics infrastructure, port competitiveness, and trade facilitation), with interpretation using a modified IPO model and SWOT analysis, it was found that Jordan's trade readiness can be described as “moderate.” Notwithstanding strong performance in terms of regional stability and the resilience of its institutions, it is lacking in terms of diversification of trade, infrastructure, Digital-TA, and the flexibility of its port governance.

These results confirm the observations of previous studies, which underscore Jordan's systemic duality, with strategic geopolitical location and governance stability on one hand, and infrastructure and procedural constraints on the other (Al-Masri, 2021; Mazur, 2023; Hausmann et al., 2020; Munim & Schramm, 2018; Özgüner & Köse, 2025). To unlock its potential as a regional trade and logistics hub, Jordan must address midstream and upstream limitations while leveraging its comparative advantages (Bai & Wang, 2021; Bensassi et al., 2014; Kumar, 2020).

Jordan has the potential to become a regional logistics and trade facilitator, but achieving this vision requires a dual transformation: technical modernization and institutional re-engineering. By aligning investment, governance, and capacity-building with its inherent strengths—stability and strategic geography—Jordan can elevate its role in regional trade corridors and global value chains (World Bank, 2023a). The roadmap is clear, but its success will depend on coherent policy execution, regional collaboration, and stakeholder commitment.

Author Contributions: Conceptualization, G.A.S. and M.F.M.; methodology, G.A.S.; software, O.M.B.; validation, G.A.S. and M.F.M.; formal analysis, G.A.S.; investigation, G.A.S.; resources, O.M.B.; data curation, O.M.B.; writing—original draft preparation, G.A.S.; writing—review and editing, M.F.M.; visualization, M.F.M.; supervision, G.A.S.; project administration, O.M.B. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors on request.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

ASEZA	Aqaba Special Economic Zone
Digital-TA	Digital technology adoption
FFP-FSI	Fund for Peace Fragile States Index

GAFTA	Greater Arab Free Trade Area
Geo-Stab	Geopolitical stability
IEP-GPI	Institute for Economics & Peace Global Peace Index
IMEC	India–Middle East–Europe Economic Corridor
Log-Inf	Logistics infrastructure
M-IPO	Modified Input–Process–Output Framework
NTFC	National Trade Facilitation Committee
OECD-TFIs	OECD Trade Facilitation Indicators
Port-C	Port competitiveness
SWOT	Strengths, weaknesses, opportunities, and threats
Trade-F	Trade facilitation
UN Comtrade	UN Commodity Trade Statistics Database
UN Comtrade-TVIR	UN Comtrade Trade Volume Records, 2022–2023
UNCTAD-PPS	UN Conference on Trade and Development Port Performance Scorecard
World Bank-LPI	World Bank Logistics Performance Index

Appendix A. Raw Indicator Values (Unscaled)

Indicator (Year)	Jordan	UAE	Saudi Arabia	Egypt	Lebanon
LPI—Customs (2023)	0.65	0.92	0.84	0.72	0.52
LPI—Infrastructure (2023)	0.68	0.94	0.83	0.74	0.55
LPI—Tracking & Tracing (2023)	0.63	0.95	0.85	0.71	0.53
OECD-TFI—Automation (2025)	0.70	0.91	0.82	0.68	0.50
OECD-TFI—Appeal Procedures (2025)	0.60	0.87	0.73	0.55	0.40
UNCTAD PPS—Efficiency (2020–21)	0.65	0.95	0.85	0.75	0.60
UNCTAD PPS—Digital-TA (2020–21)	0.40	0.90	0.70	0.60	0.45
GPI (2024, lower = better)	2.2	1.5	1.9	2.5	3.1
FSI (2023, lower = better)	70.1	35.2	55.3	82.7	95.8

Note: Raw values as reported by World Bank (LPI), OECD (TFIs), UNCTAD (PPS), IEP (GPI), and FFP (FSI).

Appendix B. Winsorized and Normalized Values (0–1 Scale)

Indicator	Jordan (Raw → Norm)	UAE (Raw → Norm)	Saudi (Raw → Norm)	Egypt (Raw → Norm)	Lebanon (Raw → Norm)
LPI—Customs	0.65 → 0.65	0.92 → 0.95	0.84 → 0.84	0.72 → 0.72	0.52 → 0.52
LPI—Infrastructure	0.68 → 0.68	0.94 → 0.94	0.83 → 0.83	0.74 → 0.74	0.55 → 0.55
OECD-TFI—Automation	0.70 → 0.70	0.91 → 0.91	0.82 → 0.82	0.68 → 0.68	0.50 → 0.50
UNCTAD PPS—Digital-TA	0.40 → 0.40	0.90 → 0.90	0.70 → 0.70	0.60 → 0.60	0.45 → 0.45
GPI (Inverse)	2.2 → 0.85	1.5 → 0.98	1.9 → 0.90	2.5 → 0.80	3.1 → 0.60
FSI (Inverse)	70.1 → 0.65	35.2 → 0.95	55.3 → 0.78	82.7 → 0.55	95.8 → 0.40

Note: Winsorized at the 1st/99th percentiles before normalization. Min–max normalization applied; inverse normalization for GPI and FSI.

Appendix C. Weighting Sensitivity Analysis

Country	Equal Weights (Main)	PCA Weights	Entropy Weights
UAE	0.92 (Rank 1)	0.91 (Rank 1)	0.93 (Rank 1)
Saudi Arabia	0.78 (Rank 2)	0.77 (Rank 2)	0.79 (Rank 2)
Jordan	0.70 (Rank 3)	0.71 (Rank 3)	0.69 (Rank 3)
Egypt	0.65 (Rank 4)	0.64 (Rank 4)	0.66 (Rank 4)
Lebanon	0.49 (Rank 5)	0.48 (Rank 5)	0.50 (Rank 5)

Note: Sensitivity analysis comparing equal weights, PCA-derived weights, entropy weights, and an additional robustness test excluding governance from the Port-C index. Rank ordering remains consistent across all methods, with Jordan's Port-C score increasing slightly (+0.02) when governance is excluded, but overall benchmarking outcomes unchanged.

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