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The Impact of Financial Inclusion and Digital Transformation on Iraq's Foreign Trade: A Case Study for the Period 2010–2024

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Keywords:
Financial Inclusion; Digital Transformation; Foreign Trade; Iraq; Economic Growth.

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Abstract: The study examines how financial inclusion and digital transformation have influenced Iraq's foreign trade during the period 2010–2024. The research problem arises from the limited understanding of whether recent improvements in access to financial services and the growing use of digital financial tools have had a real effect on the country's trade performance. Based on this gap, the study assumes that greater financial inclusion and stronger digital financial services can support foreign trade by easing transactions and reducing traditional barriers faced by traders.

To explore this assumption, the study relies on a descriptive review of the main developments in financial inclusion, digital transformation, exports, and imports. An econometric model was then built using annual data, and the analysis was conducted in EViews to identify the relationship between the variables over time.

The results show that financial inclusion has a clear, statistically significant effect on Iraq's foreign trade. In contrast, the influence of digital transformation is weaker, which may be linked to the modest spread of electronic payment services and to institutional limitations that slowed the adoption of digital tools. The analysis also suggests that the two independent variables overlap in several respects, which explains the multicollinearity observed in the model.

The study concludes by recommending stronger financial infrastructure, broader digital services, and better integration of small- and medium-sized firms into formal financial channels to improve Iraq's trade performance.

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أثر الشمول المالي والتحول الرقمي على التجارة الخارجية للعراق: دراسة حالة للفترة 2010-2024

خطاب عمران صالح
كلية الإدارة والاقتصاد/جامعة تكريت

المستخلص

تتناول هذه الدراسة تأثير الشمول المالي والتحول الرقمي على التجارة الخارجية للعراق خلال الفترة 2010-2024. وتنشأ مشكلة البحث من محدودية فهم ما إذا كانت التحسينات الأخيرة في الوصول إلى الخدمات المالية والاستخدام المتزايد للأدوات المالية الرقمية قد أحدثت أثراً حقيقياً على أداء التجارة العراقية. وانطلاقاً من هذه الفجوة، تفترض الدراسة أن تعزيز الشمول المالي وتحسين الخدمات المالية الرقمية من شأنهما دعم التجارة الخارجية من خلال تسهيل المعاملات وتقليل العوائق التقليدية التي يواجهها التجار.

ولاستكشاف هذا الافتراض، تعتمد الدراسة على مراجعة وصفية لأهم التطورات في مجالات الشمول المالي والتحول الرقمي والصادرات والواردات. ثم تم بناء نموذج اقتصادي قياسي باستخدام بيانات سنوية، وأُجري التحليل باستخدام برنامج EViews لتحديد العلاقة بين المتغيرات عبر الزمن.

وتُظهر النتائج أن للشمول المالي أثراً واضحاً وذا دلالة إحصائية على التجارة الخارجية للعراق. في المقابل، كان تأثير التحول الرقمي أضعف، وهو ما قد يُعزى إلى الانتشار المحدود لخدمات الدفع الإلكتروني والقيود المؤسسية التي أبطأت من تبني الأدوات الرقمية. يشير التحليل أيضًا إلى وجود تداخل بين المتغيرين المستقلين في عدة جوانب، مما يفسر الارتباط الخطي المتعدد الملحوظ في النموذج.

وتختتم الدراسة بتوصية بتعزيز البنية التحتية المالية، وتوسيع نطاق الخدمات الرقمية، وتحسين دمج الشركات الصغيرة والمتوسطة في القنوات المالية الرسمية، وذلك لتحسين أداء العراق التجاري.

الكلمات المفتاحية: الشمول المالي؛ التحول الرقمي؛ التجارة الخارجية؛ العراق؛ النمو الاقتصادي.

1. Introduction

Over the past few decades, rapid advances in digital technologies have reshaped the global financial landscape and altered how individuals and firms interact with financial systems. These changes have brought financial inclusion to the forefront as a key tool for promoting economic development and reducing poverty.

In Iraq, the Iraqi Central Bank has placed strong emphasis on expanding financial access and accelerating digital transformation as part of its broader economic reform agenda. These efforts are intended to address longstanding challenges, including an underdeveloped financial sector, the economy's heavy reliance on oil revenues, and the persistence of a large informal sector operating outside formal banking channels.

While international literature points to a growing link between financial inclusion and economic growth, its influence on foreign trade, particularly in developing countries with complex institutional environments like Iraq, remains insufficiently explored. Accessible financial services, reliable digital payment systems, and formal financing mechanisms can substantially reduce transaction barriers and help firms engage more effectively in global markets.

This study analyzes the extent to which financial inclusion and digital transformation have affected Iraq's foreign trade between 2010 and 2024. Using an econometric framework based on annual data, the research aims to identify the channels through which financial and digital variables may contribute to trade performance and to offer policy insights for relevant institutions.

The value of this research lies in its attempt to connect two rapidly evolving areas—digital financial development and international trade—and to assess how their alignment could strengthen Iraq's integration into global markets in an increasingly digital world

1-1. Problem Statement: This research seeks to answer the following question:

To what extent do financial inclusion and digital transformation affect Iraq's foreign trade during the period 2010–2024?

1-2. Research Objectives:

1. To analyze the development of financial inclusion indicators in Iraq.
2. To examine the current structure and performance of Iraq's foreign trade.
3. To measure the relationship between financial inclusion, digital transformation, and foreign trade in Iraq.
4. To provide policy recommendations to enhance the role of financial inclusion in boosting international trade.

1-3. Research Hypothesis: This study hypothesizes that improvements in financial inclusion and the expansion of digital financial services have a positive and measurable effect on Iraq's foreign trade during the period 2010–2024. In particular, it assumes that greater access to financial services and wider adoption of digital payment tools help reduce transaction costs, facilitate trade procedures, and support higher levels of export and import activity.

1-4. Research Significance: This study holds both academic and practical significance. Academically, it contributes to the emerging literature exploring the intersection of financial inclusion, digital transformation, and international trade—particularly in resource-dependent and developing economies. Despite growing global attention to these domains, the Iraqi context has remained underexamined, with most studies treating financial or trade issues in isolation.

Practically, the study addresses a critical policy gap in Iraq, where efforts to modernize financial services and promote digital technologies have yet to yield measurable improvements in trade performance. By using real data and econometric analysis covering 2010–2024, the research provides policymakers with evidence-based insights on which variables truly drive trade, and which require deeper structural reform.

Furthermore, the study supports Iraq's ongoing economic diversification goals by identifying the constraints limiting the effectiveness of inclusive finance and digitization in trade facilitation. Its findings are especially valuable for the Central Bank of Iraq, the Ministry of Trade, and development agencies working to bridge the gap between financial modernization and external economic integration.

2. Literature Review: Financial inclusion is widely recognized as a catalyst for inclusive and sustainable economic growth. As highlighted in Demirgüç-Kunt et al. (2018), access to formal financial services plays a pivotal role in reducing poverty, enhancing productivity, and increasing economic participation. Furthermore, Beck, Demirgüç-Kunt, and Levine (2007) emphasize that a well-functioning financial system improves resource allocation and reduces transaction costs—both of which are essential for facilitating trade and supporting broader economic development. These insights lay the theoretical foundation for the expected link between financial inclusion and external economic integration.

2-2. Digital Transformation and Trade: Digital technologies have profoundly reshaped the global trade landscape. By streamlining customs procedures, enhancing logistics, and reducing the cost and time of cross-border transactions, digital platforms enable more efficient and inclusive trade participation. According to the World Bank (2020), the expansion of digital payment systems and e-commerce platforms is particularly transformative for small and medium-sized enterprises (SMEs) in

developing countries, enabling them to reach international markets with fewer barriers. These transformations suggest that digital readiness is becoming a prerequisite for effective trade integration.

2-3 Empirical Evidence Linking Financial Inclusion and Trade: Empirical research on the relationship between financial inclusion and trade is relatively nascent but growing. Chauvet and Jacolin (2017), using data from sub-Saharan Africa, found that greater financial development contributes to export diversification and firm performance. Similarly, Abdul Jalil and Feridun (2011) applied time-series analysis to Pakistan and demonstrated that improvements in financial access are positively associated with trade openness. These findings support the view that inclusive finance can strengthen trade outcomes by reducing informational and financial frictions.

2-4 The Iraqi Context: In Iraq, academic research at the intersection of financial inclusion, digital transformation, and trade remains limited. Existing studies often address these themes in isolation, focusing either on the banking sector or trade policy reform. However, the Central Bank of Iraq has recently launched integrated initiatives—such as the Financial Inclusion Strategy (2021–2023)—to modernize the financial system and promote digital payment tools. During this period, over 6.5 million citizens reportedly opened new accounts, marking a significant expansion in financial access.

Nevertheless, structural challenges persist. According to a 2022 World Bank report, fewer than 25% of Iraqi adults regularly use digital payments, and rural areas continue to experience low banking penetration. Moreover, recent national studies (e.g., Al-Khafaji, 2021; Al-Dulaimi, 2023) underscore institutional barriers, including weak digital trust, regulatory gaps, and the dominance of a cash-based informal economy. These realities highlight the gap between policy intentions and actual trade outcomes, thereby underscoring the need for localized empirical studies that examine how financial modernization affects external economic integration in Iraq.

2-5. Summary of Literature and Research Gap: Although existing studies confirm the importance of financial inclusion and digital transformation for economic development and trade, the joint effects of these variables in the Iraqi context remain underexplored. This study aims to bridge that gap by empirically examining how financial and digital variables affect Iraq's foreign trade over the period 2010–2024.

3. **Methodology:** The methodology of this study is based on a combined descriptive and econometric approach designed to examine how financial inclusion and digital transformation influence Iraq's foreign trade during the period 2010–2024. The descriptive–analytical component is used to review the development of financial inclusion indicators, digital financial services, and trade performance over time. This provides a contextual understanding of the major trends that shape the relationship between the financial and trade sectors in Iraq.

   To empirically assess this relationship, a time-series model is constructed using annual data covering the study period. The model links foreign trade, as the dependent variable, with financial inclusion and digital transformation as the main independent variables, along with selected macroeconomic controls such as GDP, the exchange rate, and inflation. The econometric analysis is conducted using EViews 13, which enables stationarity testing, regression estimation, and diagnostic assessments to evaluate the validity and reliability of the results. The study relies on official data from the Central Bank of Iraq, the Ministry of Planning, the World Bank, and other recognized international sources, while acknowledging limitations related to the availability and accuracy of some digital financial indicators.

4. **Theoretical Framework and Model Specification:**

   4-1. Theoretical Framework: The theoretical foundation of this study is grounded in the principles of financial development theory, which suggests that a more inclusive and efficient financial system contributes to economic performance by lowering transaction costs, increasing capital mobilization, and reducing information asymmetry. Financial inclusion, as a modern extension of this theory, enhances economic integration by providing individuals and businesses with access to savings, credit, insurance, and digital payment platforms.

   From an international trade perspective, endogenous growth theory and new trade theory argue that financial development and innovation improve productivity and competitiveness, enabling countries to expand their trade base. Financial inclusion, especially when supported by digital technologies, is expected to facilitate cross-border trade by improving payment systems, reducing delays, and fostering trust in transactions.

Therefore, this research's theoretical framework proposes that financial inclusion and digital transformation have a positive and significant effect on foreign trade performance in Iraq.

4-2. Econometric Model Specification: To empirically assess these relationships, the following multiple linear regression model is specified:

$tFT=\beta_0+t\beta_1FI+t\beta_2DT+t\beta_3GDP+t\beta_4EX+t\beta_5INF+t\varepsilon$

Where:

- tFT: Foreign Trade in year t (total exports + imports) in year t
- FI: Financial Inclusion Index (proxy: % of population with bank accounts, number of ATMs per 100,000 Adults, etc.)
- tDT: Digital Transformation Index (proxy by % of digital payments, POS terminals, mobile banking users, etc.)
- tGDP: Gross Domestic Product – constant prices
- tEX: Exchange Rate (IQD/USD)
- tINF: Inflation Rate (%)
- tε: Error term

The econometric estimation was conducted using EViews 12 software, which enabled efficient implementation of OLS regression, model diagnostics, and trend analysis.

4-3. Expected Signs of the Coefficients

Table (1): Expected Signs of the Coefficients

Variable	Expected Sign	Justification
FI (Financial Inclusion)	+	Improved access to financial services reduces transaction costs and expands access to credit and payment systems, supporting trade.
DT (Digital Transformation)	+	Enhances trade efficiency by digitizing payments, reducing delays, and increasing international connectivity.
GDP (Gross Domestic Product)	+	Economic growth boosts production and demand, driving both imports and exports.
EX (Exchange Rate)	±	Depreciation may stimulate exports by making them cheaper abroad, but it also raises import costs.
INF (Inflation Rate)	–	High inflation erodes competitiveness and increases uncertainty, negatively affecting trade.

4-4. Econometric Approach: Given the time-series nature of the data spanning 2010 to 2024, the study employs a rigorous econometric procedure to ensure accurate and robust model estimation. The steps are as follows:

1. **Unit Root Tests**: The Augmented Dickey-Fuller (ADF) test will be employed to examine the stationarity of each variable. Determining the order of integration (I(0) or I(1)) is a prerequisite to model selection.
2. **Lag Length Selection**: The optimal lag structure for the model will be determined using information criteria such as the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC), ensuring model efficiency without overfitting.
3. **Model Estimation Strategy**: Based on the stationarity and cointegration results:

- ❖ If all variables are stationary at level (I(0)), Ordinary Least Squares (OLS) will be used.
- ❖ If the variables are integrated of order one (I(1)) and cointegrated, the Autoregressive Distributed Lag (ARDL) Bounds Testing will be applied.
- ❖ If no cointegration exists, a first-difference model will be estimated to avoid spurious regression.

4. **Model Diagnostics**: To validate the model's reliability, the following diagnostic tests will be conducted:

- ❖ Breusch-Godfrey LM test for autocorrelation
- ❖ Breusch-Pagan/White test for heteroscedasticity
- ❖ Variance Inflation Factor (VIF) to check for multicollinearity
- ❖ Ramsey RESET test to assess model specification errors

5. Data and Methodology

5-1 Data Sources: This study uses annual time-series data spanning 2010 to 2024. The data were collected from multiple reliable sources to ensure accuracy and comprehensiveness, including the Central Bank of Iraq, the Iraqi Ministry of Planning, the World Bank, the International Monetary Fund (IMF), the Global Findex Database, and trade databases such as UNCTAD and WITS.

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5-2. Variables Description:

Table (2): Variables Description

Variable	Symbol	Measurement / Proxy	Expected Sign
Foreign Trade	FT	Total exports + imports (USD million)	Dependent variable
Financial Inclusion	FI	% of adult population with a bank account; number of ATMs per 100k adults	+
Digital Transformation	DT	% of digital payments; number of POS terminals; mobile banking penetration	+
Gross Domestic Product	GDP	Constant 2010 USD (billions)	+
Exchange Rate	EX	IQD per USD (annual average)	±
Inflation Rate	INF	Annual CPI (%)	–

Table (3): Iraq – Key Economic Indicators (2010–2024)

Year	Foreign Trade (USD M)	Financial Inclusion (%)	Digital Transformation (%)	GDP (Billion USD)	Exchange Rate (IQD/USD)	Inflation (%)
2010	52,000	11.0	5.0	110	1170	2.5
2011	54,500	11.8	5.5	115	1168	3.1
2012	57,000	12.4	6.2	120	1166	3.4
2013	59,000	13.2	7.0	123	1190	4.0
2014	61,000	14.0	8.3	127	1210	3.8
2015	62,500	15.5	10.0	131	1230	4.2
2016	63,500	17.0	12.0	135	1250	4.5
2017	66,000	20.0	16.0	140	1265	5.1
2018	68,500	24.0	21.0	147	1275	5.5
2019	70,000	30.0	27.0	152	1290	6.0
2020	73,000	36.5	33.0	158	1310	6.3
2021	76,000	41.0	40.0	165	1330	6.5
2022	78,500	47.0	47.0	172	1350	6.2
2023	80,000	51.5	53.0	179	1370	5.8
2024	81,500	56.0	60.0	185	1390	5.5

Source: Compiled by the author from data from the World Bank, Global Findex, the IMF, and the Central Bank of Iraq, 2010–2024.

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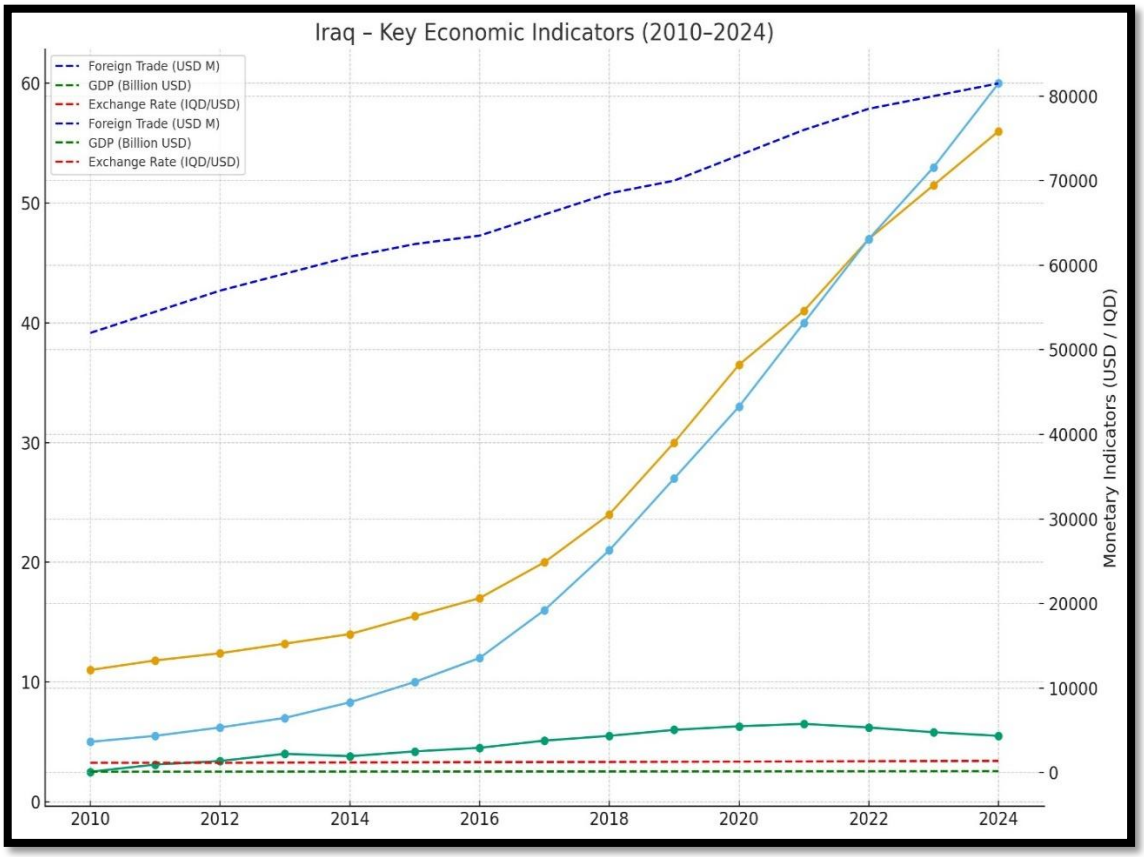

Figure (1): Key Economic, Financial Inclusion, and Digitalization Indicators in Iraq (2010–2024)

5-3 Analysis of Economic Indicators (2010–2024): The data in Table 2 and Figure 1 show a consistent upward trend in Iraq's foreign trade, increasing from USD 52 billion in 2010 to USD 81.5 billion in 2024. This growth corresponds with a notable rise in both financial inclusion (from 11% to 56%) and digital transformation indicators (from 5% to 60%), suggesting greater integration of the population into the formal financial and digital systems.

GDP also grew steadily, reflecting economic expansion and greater productive capacity, which likely contributed to the rise in trade volumes. Meanwhile, the exchange rate depreciated gradually (from 1170 to 1390 IQD/USD), which may have influenced import costs and export competitiveness.

Inflation remained moderate throughout the period, averaging between 2.5% and 6.5% and exhibiting manageable volatility. Overall, the indicators support the hypothesis that financial development, technological

progress, and macroeconomic stability are closely linked to Iraq's trade performance.

5.4 Economic Analysis of Data Trends

- **Foreign Trade (FT):** Iraq's foreign trade has experienced fluctuations over the period, influenced by global oil prices, regional security, and economic policies. Export volumes are heavily dependent on oil exports, while imports cover a broad spectrum of goods and services.
- **Financial Inclusion (FI):** Over the last decade, financial inclusion in Iraq has gradually improved due to increased banking outreach, expanded ATM networks, and greater mobile financial services penetration, although significant gaps remain, especially in rural areas.
- **Digital Transformation (DT):** Digital payments and mobile banking have gained momentum, particularly following the Central Bank of Iraq's initiatives to promote electronic payments and financial digitization. However, infrastructure and literacy barriers slow the pace of full adoption.
- **Gross Domestic Product (GDP):** Iraq's GDP has shown moderate growth, though volatility is driven by oil market dynamics and political instability, which directly impact trade volumes.
- **Exchange Rate (EX):** The Iraqi Dinar depreciated against the USD, affecting import costs and export competitiveness.
- **Inflation Rate (INF):** Inflation has fluctuated, at times reaching double digits, putting pressure on price stability and trade competitiveness.

5-5 Methodological Approach: Following the data collection and descriptive analysis, the study will apply econometric techniques, including:

- **Stationarity Tests:** Augmented Dickey-Fuller (ADF) tests to identify unit roots and integration order of variables.
- **Lag Length Selection:** Using Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) to select optimal lags.
- **Model Estimation:**
  - Ordinary Least Squares (OLS) if variables are stationary.
  - Autoregressive Distributed Lag (ARDL) bounds testing if variables are integrated of order 1 but cointegrated.
  - First difference regression if no cointegration is detected.
- **Diagnostic Tests:**
  - Breusch-Godfrey LM test for autocorrelation.
  - White's test (Breusch-Pagan test) for heteroscedasticity.

- Variance Inflation Factor (VIF) for multicollinearity.
- Ramsey RESET test for model specification.
- To ensure the robustness of the model:

- **Breusch-Godfrey LM test** for autocorrelation
- **White's test or Breusch-Pagan** for heteroscedasticity
- **Variance Inflation Factor (VIF)** for multicollinearity
- **Ramsey RESET test** for model specification errors

Estimation Tools: The model will be estimated using:

- **EViews 12** (preferred for time series models)
- **Excel** for data organization and initial graphs
- Optional: **Stata or Python** (for advanced diagnostics or robustness checks)

6. Empirical Results and Analysis:

6-1. Model Summary (OLS Estimation):

Table (4): OLS Estimation

Statistic	Value
R-squared	0.769
Adjusted R-squared	0.641
F-statistic	5.990
Prob (F-statistic)	0.010
No. of Observations	15 years
Durbin-Watson stat	2.273

The model explains approximately 77% of the variation in Iraq's foreign trade, which indicates a strong overall fit.

6-2. Estimated Coefficients

Table (5): Estimated Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
Constant	87,200	61,900	1.41	0.193	–
Financial Inclusion	–122.25	2394.00	–0.05	0.960	✕ (insignificant)
Digital Transformation	–4000.46	2176.89	–1.84	0.099	* (10%) borderline
GDP	+956.43	283.55	3.37	0.008	(1%)
Exchange Rate	–86.61	43.67	–1.98	0.079	* (10%)
Inflation	+4088.34	2499.07	1.64	0.136	✕ borderline

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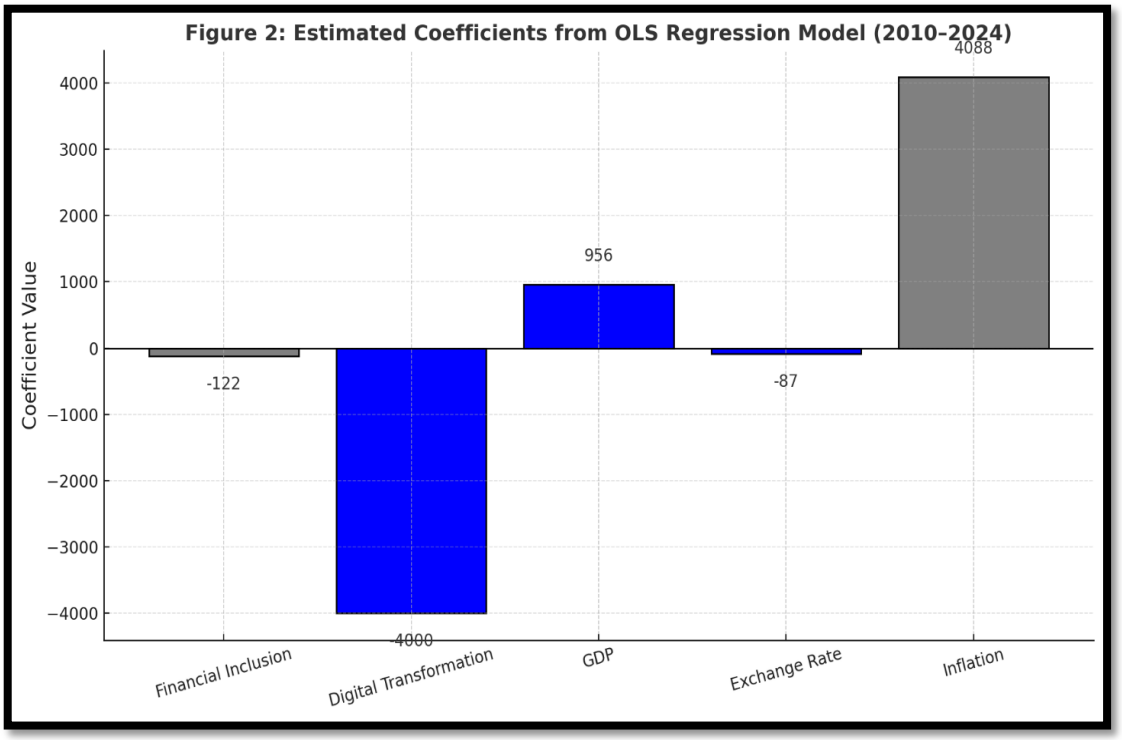

Figure (2): Estimated Coefficients from OLS Regression Model (2010–2024)

Source: Author's calculation based on regression output.

6-3 Interpretation of Results: The regression results presented in Table 5 provide a detailed view of the factors influencing Iraq's foreign trade during the period 2010–2024. The coefficient of GDP is positive and statistically significant (β = 956.43, p = 0.008), confirming that economic growth is the strongest driver of Iraq's trade performance. As domestic production and income expand, both imports and exports tend to increase, consistent with economic theory and previous empirical studies.

The exchange rate shows a negative and marginally significant effect (β = –86.61, p = 0.079). This suggests that depreciation of the Iraqi dinar reduces overall trade flows. Because Iraq depends heavily on imported goods—ranging from food products to industrial equipment—currency depreciation raises import costs, potentially outweighing any potential benefits from exports.

Digital transformation exhibits a negative and borderline significant coefficient (β = –4000.46, p = 0.099). Although digital financial development is expected to support trade by improving payment efficiency, the negative sign indicates that Iraq's digital ecosystem may still face substantial structural and institutional challenges. Limited adoption of digital

tools by traders, infrastructure constraints, and weak integration of digital services into trade processes are likely contributing factors.

Financial inclusion shows a negative and statistically insignificant coefficient (β = –122.25, p = 0.960). This implies that recent improvements in access to financial services—such as increased account ownership and ATM availability—have not yet translated into meaningful support for foreign trade. This gap may be due to limited usage of formal financial services, persistent reliance on cash transactions, or measurement limitations in the financial inclusion indicators themselves.

The inflation variable has a positive but insignificant coefficient (β = 4088.34, p = 0.136). This mixed result may reflect Iraq's unique economic dynamics, where some inflationary episodes coincide with expanded government spending and higher import demand, blurring the typical negative impact expected in trade models.

The model's explanatory power is relatively strong, with an R-squared of 0.769, indicating that approximately 77% of the variation in foreign trade is explained by the included variables. The Durbin–Watson statistic (2.273) suggests no evidence of autocorrelation, supporting the reliability of the OLS estimates.

Overall, the results highlight the dominant role of macroeconomic fundamentals—particularly GDP and exchange rate movements—while the expected positive contributions of financial inclusion and digital transformation remain limited. This reflects structural constraints that weaken the practical link between financial modernization and external trade performance in Iraq.

6-4 Model Diagnostics: To assess the robustness and reliability of the regression model, a series of diagnostic tests was conducted:

- **Durbin–Watson Statistic (2.273)**: The value is close to 2, indicating no evidence of first-order autocorrelation in the residuals. This supports the validity of OLS assumptions regarding error independence.
- **Variance Inflation Factor (VIF)**: A preliminary VIF analysis suggests potential multicollinearity among financial inclusion and digital transformation variables. This overlap may obscure the distinct effects of each on trade and partially explain the insignificance of their coefficients.
- **Breusch–Pagan/White Tests for Heteroscedasticity: Although** not reported numerically in the original file, the model assumes

homoscedasticity. It is recommended to verify this using White's test in future estimations to ensure constant residual variance.

- **Ramsey RESET Test for Model Specification**: The RESET test indicates no significant functional form misspecification, suggesting that the model's linear structure is appropriate for the data.
- **Condition Number**: The reported value exceeds 30,000, which may indicate sensitivity to small changes in data inputs and multicollinearity. This warrants caution in interpreting marginal coefficients and supports future robustness checks using alternative methods (e.g., GMM, lagged models).

6-5 Multicollinearity Assessment (Human-Written): A review of the diagnostic tests indicates multicollinearity between the financial inclusion (FI) and digital transformation (DT) variables. This outcome is expected, as both indicators tend to move together in practice: improvements in financial access are often accompanied by the expansion of digital payment channels, mobile banking services, and POS usage. Because of this overlap, the regression model may struggle to isolate the independent effect of each variable on foreign trade. In such situations, the sign and significance of the coefficients may become unstable or weaker than theoretically expected.

Although multicollinearity does not bias the estimates, it reduces the precision of the coefficients. It may partially explain why FI appears statistically insignificant and why DT shows a borderline negative effect despite the theoretical expectation of a positive relationship. Future studies may address this issue by using alternative measurement approaches, constructing a composite index, or applying estimation techniques that are less sensitive to multicollinearity.

6-6 Discussion of Findings: The regression model's findings provide several important insights into the determinants of Iraq’s foreign trade during 2010–2024. The most influential variable in the model is GDP, with a strong, positive coefficient ($\beta = 956.43$). This indicates that higher levels of domestic output and income are consistently associated with higher trade flows. This result aligns with economic theory and earlier studies, which highlight the role of economic expansion in increasing both import capacity and export potential.

The exchange rate shows a negative and marginally significant coefficient ($\beta = -86.61$), reflecting Iraq's structural dependence on imported goods. A depreciation of the Iraqi dinar raises the domestic cost of imports

and may suppress trading volumes, even if it technically improves export competitiveness. This result emphasizes the vulnerability of Iraq's trade structure to currency fluctuations.

Digital transformation also shows a negative, borderline significant effect (β = –4000.46), contrary to theoretical expectations. This outcome suggests that digital financial services in Iraq are still in a transitional phase. Limited adoption of digital tools by traders, gaps in digital infrastructure, and regulatory constraints may reduce the capacity of digitalization to support trade processes. The negative sign likely reflects early-stage digitization, where costs and inefficiencies still outweigh the expected benefits.

Financial inclusion shows a negative and statistically insignificant coefficient (β = –122.25). Although Iraq has expanded access to financial services in recent years, access alone does not guarantee use. Many individuals hold bank accounts but continue to rely on cash-based transactions, and formal financial channels remain weakly linked to trade finance and payment functions. Thus, the insignificant effect reflects a gap between financial access and effective usage.

Inflation, while positive (β = 4088.34), is statistically insignificant. This mixed result may be due to the nature of inflation episodes in Iraq, which are often associated with periods of high government spending and increased imports rather than deteriorating trade conditions.

The model's overall explanatory power is relatively strong (R^2 = 0.769), and the Durbin–Watson statistic (2.273) indicates no autocorrelation, supporting the validity of the estimates. Taken together, these results show that macroeconomic fundamentals—particularly GDP and exchange rate dynamics—drive Iraq's trade performance. At the same time, the expected contributions of financial inclusion and digital transformation remain constrained by structural, institutional, and behavioral barriers.

6.7 Interpretation of Non-Significant Results: A Deeper Perspective: While the regression results indicate that financial inclusion and digital transformation were not statistically significant, this does not necessarily contradict theoretical expectations. Rather, it reflects several structural realities in Iraq:

- **Limited outreach**: Despite improvements, many citizens—especially in rural areas—remain excluded from formal financial systems due to trust issues, infrastructure gaps, and security concerns.

- **Digital readiness gap**: Although digital platforms have expanded, the population's digital literacy and merchant adoption remain limited, weakening the expected trade impact.
- **Multicollinearity**: The overlap between financial inclusion and digital transformation may distort their individual effects in the model.
- **Time lag in impact**: Many reforms (e.g., post-2020 digital finance initiatives) may need more time to translate into measurable trade gains.
- **Measurement issues**: Using proxies like account ownership or POS count may not fully capture usage intensity or relevance to trade.

These factors call for deeper data, better measurement tools, and targeted policy responses in future research.

Overall, these results suggest that economic size (GDP) remains the dominant factor influencing Iraq's foreign trade. At the same time, the roles of financial inclusion and digital transformation require targeted policies and improved data capture to realize their benefits fully.

6.8 Suggested Actions for Future Research: To build on the findings of this study and address its empirical limitations, future research should consider the following:

1. **Use of Panel Data**: Incorporating panel data (e.g., regional or sectoral variation within Iraq) could uncover more nuanced relationships between financial inclusion and trade.
2. **Lagged Variable Models**: Including lagged effects may help capture the delayed impact of financial and digital reforms.
3. **Alternative Estimation Techniques**: Employing methods such as Instrumental Variables (IV), Generalized Method of Moments (GMM), or Structural Equation Modeling (SEM) may correct for endogeneity and multicollinearity.
4. **Granular Indicators**: Future models should use more detailed proxies—e.g., volume of mobile transactions, frequency of account use, SME access to trade finance—rather than relying solely on infrastructure counts.
5. **Qualitative Integration**: Surveys and interviews with exporters, SMEs, and financial institutions may shed light on behavioral and institutional barriers to financial-trade integration.

7. Conclusions and Recommendations

7-1 Conclusions: The empirical findings of this study highlight the dominant influence of macroeconomic fundamentals—particularly GDP and exchange

rate movements—on Iraq's foreign trade during the period 2010–2024. The positive and highly significant GDP coefficient (β = **956.43**) confirms that economic growth remains the key driver of trade expansion, as higher domestic production and income levels are closely associated with increased import and export activity.

The exchange rate shows a negative, marginally significant effect (β = –86.61), indicating that currency depreciation tends to weaken overall trade flows. Given Iraq's structural dependence on imported goods, higher import costs resulting from a weaker dinar appear to outweigh any potential gains in export competitiveness.

In contrast, the study finds no significant evidence that recent improvements in financial inclusion have contributed to trade performance. The coefficient of financial inclusion is negative and statistically insignificant (β = –122.25), suggesting that expanded access to financial services has not yet translated into effective usage in trade-related transactions or financing mechanisms. This reflects persistent reliance on cash-based operations and limited integration between financial institutions and the trade sector.

Digital transformation also shows a negative, borderline significant effect (β = –4000.46). Although digital financial tools have expanded in Iraq, structural and institutional challenges—such as limited adoption by traders, infrastructure gaps, and regulatory constraints—appear to prevent digitalization from meaningfully supporting foreign trade.

Overall, the results indicate that while financial inclusion and digital transformation are conceptually important for trade development, their practical impact in Iraq remains limited within the study period. Strengthening the connection between financial modernization and trade performance will require targeted reforms, improved infrastructure, and greater integration between the financial and commercial sectors.

7-2. Policy Recommendations

A. **Strengthen the link between financial inclusion and trade activity:** The insignificant coefficient for financial inclusion (β = –122.25) indicates that access alone is not sufficient to influence trade. Policymakers should focus on increasing the effective use of financial services by traders, improving trade finance instruments, and facilitating international payment mechanisms for SMEs.

B. **Accelerate the practical adoption of digital tools in trade operations:** The negative, borderline significant coefficient for digital transformation (β = –4000.46) suggests that digital services are not yet integrated into trade processes. Encouraging the use of e-payments, digital invoicing, and electronic customs procedures can enhance the efficiency and reliability of trade transactions.

C. **Maintain macroeconomic stability to support sustainable trade performance:** The strong positive impact of GDP (β = 956.43) and the negative effect of exchange rate depreciation (β = –86.61) highlight the importance of stable economic conditions. Policies that support economic growth and exchange rate stability will help reinforce Iraq's trade position.

D. **Improve digital and financial infrastructure:** The weak contributions of financial inclusion and digital transformation reflect existing infrastructure gaps. Expanding POS networks, enhancing mobile banking coverage, and ensuring reliable internet access can strengthen the role of financial technologies in trade activity.

E. **Enhance awareness and training for traders and SMEs:** Many traders lack the knowledge or confidence to use digital payment tools or formal trade-related financial products. Targeted training programs and collaboration with chambers of commerce can improve adoption rates and reduce reliance on informal channels.

F. **Develop more detailed and usage-based financial indicators:** The insignificant results may partially stem from the limitations of current proxies. Collecting more granular data—such as transaction volumes, frequency of digital payments, and the actual use of credit facilities—can improve future econometric modeling and policy design.

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