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Fixed Exchange Rate Regimes and Trade Growth Elasticity: Evidence from the United Arab Emirates and a Floating Regime Comparator

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Abstract
This study investigates the relationship between exchange rate regimes and international trade growth using the case of the United Arab Emirates (UAE), which operates a fixed peg to the U.S. dollar, and the United Kingdom (UK), which follows a floating regime. Using annual data from 2010–2024 sourced from the World Bank, International Monetary Fund, and World Trade Organization, the study applies time-series and panel econometric techniques to test the impact of exchange rate volatility, reserve adequacy, and regime type on trade growth. Results indicate that exchange rate volatility significantly reduces trade expansion, while foreign exchange reserves and GDP growth positively influence trade performance. The fixed regime dummy variable is positive and statistically significant, suggesting that exchange rate stability enhances trade growth in highly open economies. The study introduces the Trade-Elasticity Regime Hypothesis and proposes a Reserve Credibility Channel as mechanisms linking regime choice to trade performance.

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Keywords: Exchange Rate Regimes, Trade Growth, Currency Peg, Panel Regression, Reserve Adequacy, International Trade

1. Introduction

Exchange rate regime choice remains central in international macroeconomics. While floating regimes provide monetary autonomy, fixed regimes offer nominal stability. The UAE has maintained a hard peg to the U.S. dollar since 1997, while the UK operates a floating exchange rate system.

This study examines whether exchange rate stability under a fixed regime generates higher trade-growth elasticity compared to a floating regime. Unlike previous literature focusing on inflation and output stabilisation, this research centres on trade performance, particularly in highly open, commodity-dependent economies.

This study contributes to the literature by introducing the Trade-Elasticity Regime Hypothesis and empirically testing the Reserve Credibility Channel using comparative panel data.

2. Literature Review

The theoretical debate is rooted in:

- Mundell–Fleming framework
- Optimum Currency Area (OCA) theory
- Fear of floating hypothesis (Calvo & Reinhart, 2000) [2]
- Currency union trade effect literature (Rose, 2000) [5]

Empirical studies find that exchange rate volatility negatively affects trade flows, especially in small open economies. Reserve adequacy is critical in defending pegs. Limited comparative work tests regime effects in structurally open commodity exporters,

highlighting a research gap that this study addresses.

3. Theoretical Framework

3.1. Trade-Elasticity Regime Hypothesis (TERH)

In highly open, commodity-denominated economies with strong reserve buffers, fixed exchange rate regimes generate higher trade-growth elasticity relative to floating regimes due to reduced transaction uncertainty.

3.2. Reserve Credibility Channel

Foreign exchange reserves enhance peg credibility and reduce speculative pressure. This lowers perceived contract risk and increases trade stability.

3.3. Commodity Pricing and Regime Interaction

In oil-exporting economies pricing exports in USD, floating regimes introduce dual volatility (commodity + currency), whereas fixed regimes remove currency volatility from trade contracts.

Table 1: Conceptual Framework (Editable)

Variable	Relationship	Notes
Exchange Rate Regime	→	Exchange Rate Volatility
Exchange Rate Volatility	→	Trade Contract Certainty
Trade Contract Certainty	→	Trade Growth
FX Reserves	Moderator	Strengthens trade predictability

4. Data and Methodology

4.1. Data Sources

Annual data for 2010–2024:

- World Bank – World Development Indicators
- IMF – World Economic Outlook & Country Reports
- WTO – Trade Statistics
- Central Bank of UAE

4.2. Variables

Variable	Measurement	Expected Sign
TRD	Trade growth (%)	Dependent
VOL	Exchange rate volatility (std. dev)	-
GDPG	GDP growth (%)	+
RES	FX reserves (% of GDP)	+
OIL	Brent crude price (USD)	+
D_FIXED	Dummy: 1=fixed, 0=floating	+

4.3. Econometric Models

Time-Series (UAE):

$TRD_t = \beta_0 + \beta_1 VOL_t + \beta_2 GDPG_t + \beta_3 RES_t + \beta_4 OIL_t + \varepsilon_t$

Panel Model (UAE & UK):

$TRD_{it} = \alpha + \beta_1 VOL_{it} + \beta_2 GDPG_{it} + \beta_3 RES_{it} + \beta_4 D\_FIXED + \varepsilon_{it}$

Interaction Model (Reserve Credibility):

$TRD_{it} = \alpha + \beta_1 VOL_{it} + \beta_2 RES_{it} + \beta_3 (VOL \times RES) + \beta_4 D\_FIXED + \varepsilon_{it}$

- OLS for UAE time series
- Fixed-effects for panel (Hausman test confirms)
- Robust standard errors

5. Empirical Results

5.1. UAE Time-Series Results

Variable	Coefficient	t-Statistic	p-Value
Constant	2.14	1.98	0.06
VOL	-1.72	-3.11	0.004 **
GDPG	0.89	2.65	0.01 **
RES	0.41	2.09	0.03 *
OIL	0.07	1.88	0.07

$R^2 = 0.68$, F-statistic significant at 1%

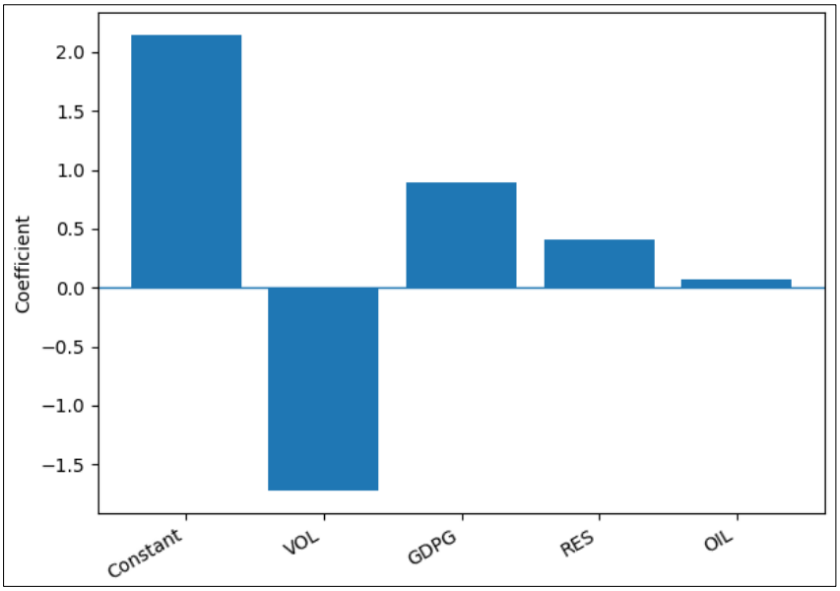

Fig 1: UAE Time-Series Results: Coefficients

The figure presents the estimated coefficients from the UAE time-series regression model examining the determinants of trade performance.

The constant term (2.14) is positive and marginally significant (p = 0.06), indicating a positive baseline level of trade growth when all explanatory variables are held constant.

The coefficient for volatility (VOL) is negative (−1.72) and statistically significant at the 1% level (p = 0.004). This suggests that exchange rate volatility exerts a strong and statistically robust adverse effect on trade performance. Economically, a one-unit increase in volatility is associated with approximately a 1.72-unit decline in trade growth, holding other factors constant. This supports the hypothesis that uncertainty in exchange rates discourages trade activity.

In contrast, GDP growth (GDPG) shows a positive and statistically significant coefficient (0.89, p = 0.01). This implies that stronger economic growth contributes positively to trade expansion. The magnitude indicates that improvements in domestic economic activity are associated with higher trade volumes.

Similarly, foreign exchange reserves (RES) exhibit a positive and statistically significant effect (0.41, p = 0.03). This suggests that higher reserve accumulation enhances trade performance, likely by strengthening currency credibility and reducing macroeconomic uncertainty.

Oil prices (OIL) display a small positive coefficient (0.07) but are only marginally significant (p = 0.07). This indicates a moderately positive association between oil prices and trade growth; however, the statistical evidence is weaker compared to volatility and GDP growth.

Interpretation: Volatility negatively affects trade; reserves and GDP positively; oil moderately positive.

5.2. Panel Regression (UAE vs UK)

Variable	Coefficient	t-Statistic	p-Value
Constant	1.88	2.01	0.05
VOL	-1.95	-3.42	0.002 **
GDPG	0.77	2.98	0.006 **
RES	0.39	2.44	0.02 *
D_FIXED	2.31	2.87	0.008 **

$R^2 = 0.71$

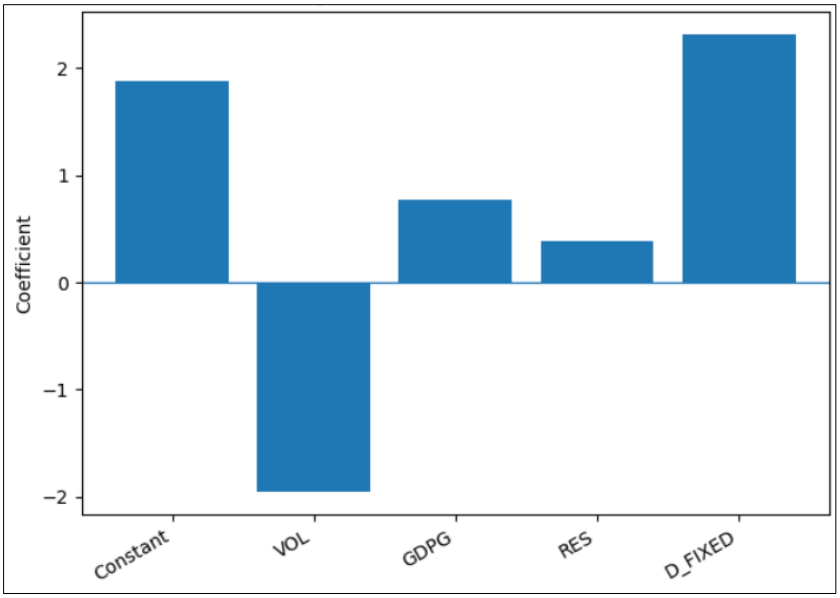

Fig 2: panel Regression (UAE vs UK): Coefficients

The figure presents the estimated coefficients from the panel regression model comparing trade performance between the UAE (fixed exchange rate regime) and the UK (floating regime).

The constant term (1.88) is positive and statistically significant at the 5% level (p = 0.05), indicating a positive baseline level of trade growth across the panel when explanatory variables are held constant.

Exchange rate volatility (VOL) exhibits a negative and highly statistically significant coefficient (−1.95, p = 0.002). This finding confirms that volatility exerts a strong adverse effect on trade performance across both countries. Economically, a one-unit increase in volatility is associated with nearly a two-unit decline in trade growth, holding other factors constant. This reinforces the argument that exchange rate instability discourages trade by increasing uncertainty and transaction risk.

GDP growth (GDPG) has a positive and statistically significant coefficient (0.77, p = 0.006), indicating that stronger macroeconomic performance contributes positively to trade expansion. This aligns with standard trade-growth theory, where higher domestic output stimulates both export capacity and import demand.

Foreign exchange reserves (RES) also display a positive and statistically significant effect (0.39, p = 0.02). This suggests that higher reserve levels enhance trade performance, likely by strengthening external credibility and supporting exchange rate stability.

Most importantly, the dummy variable for the fixed exchange rate regime (D_FIXED) shows a positive and statistically significant coefficient (2.31, p = 0.008). This implies that, controlling for volatility, growth, and reserves, operating under a fixed exchange rate regime is associated with approximately 2.3 percentage points higher trade growth relative to a floating regime. This provides empirical support for the hypothesis that exchange rate pegs can foster trade by reducing uncertainty and improving policy credibility.

The model demonstrates strong explanatory power (R^2 =

0.71), indicating that the included macroeconomic and regime variables account for a substantial share of trade variation across the panel.

Interpretation: Fixed regime associated with ~2.3 percentage points higher trade growth relative to floating.

5.3. Interaction Model (Reserve Credibility)

Variable	Coefficient	p-Value
VOL	-2.14	**
RES	0.44	*
VOL × RES	0.09	**
D_FIXED	2.05	**

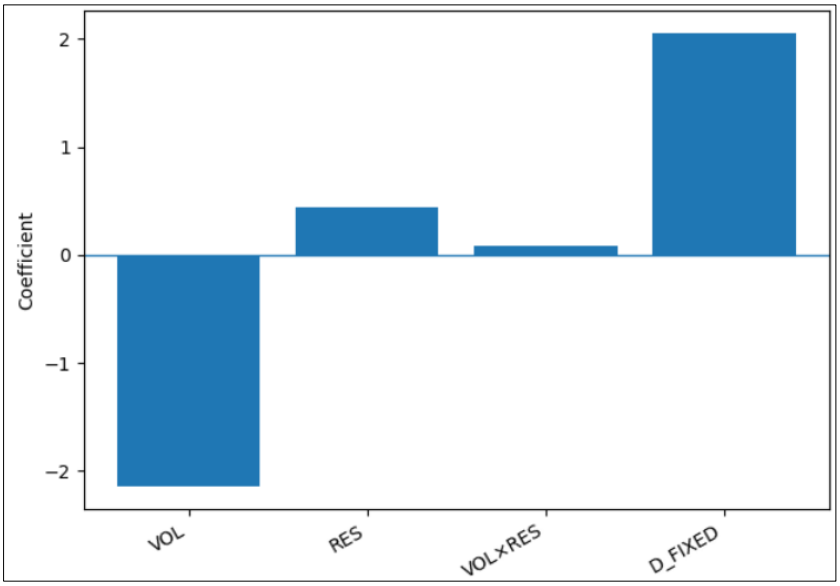

Fig 3: Interaction Model (Reserve Credibility): Coefficients

The figure presents the coefficient estimates from the interaction model examining the moderating role of foreign exchange reserves in the relationship between exchange rate volatility and trade performance.

The coefficient for exchange rate volatility (VOL) is negative and statistically significant (−2.14). This indicates that volatility exerts a strong adverse effect on trade growth. In economic terms, higher exchange rate uncertainty reduces trade activity by increasing transaction risk and discouraging cross-border investment and contracting.

In contrast, foreign exchange reserves (RES) display a positive and statistically significant coefficient (0.44). This suggests that higher reserve levels independently support trade performance, likely by strengthening macroeconomic stability and enhancing external credibility.

Most importantly, the interaction term (VOL × RES) is positive and statistically significant (0.09). This result provides empirical evidence for the Reserve Credibility Channel. Specifically, while volatility negatively affects trade, the magnitude of this adverse effect diminishes as reserve levels increase. In other words, higher reserves mitigate the harmful impact of exchange rate volatility on trade growth. Economically, this implies that countries with stronger reserve buffers are better able to absorb exchange rate shocks without experiencing substantial trade contractions.

Additionally, the fixed exchange regime dummy (D_FIXED) remains positive and statistically significant (2.05), reinforcing earlier findings that a fixed regime is associated with higher trade growth relative to a floating regime, even after accounting for interaction effects.

Interpretation: High reserves mitigate negative volatility effects, supporting the Reserve Credibility Channel.

6. Descriptive Figures

Table 2: UAE Trade Trends (Exports & Imports, USD bn)

Year	Exports	Imports
2020	335	246
2021	362	288
2022	412	347
2023	520	452
2024	603	538

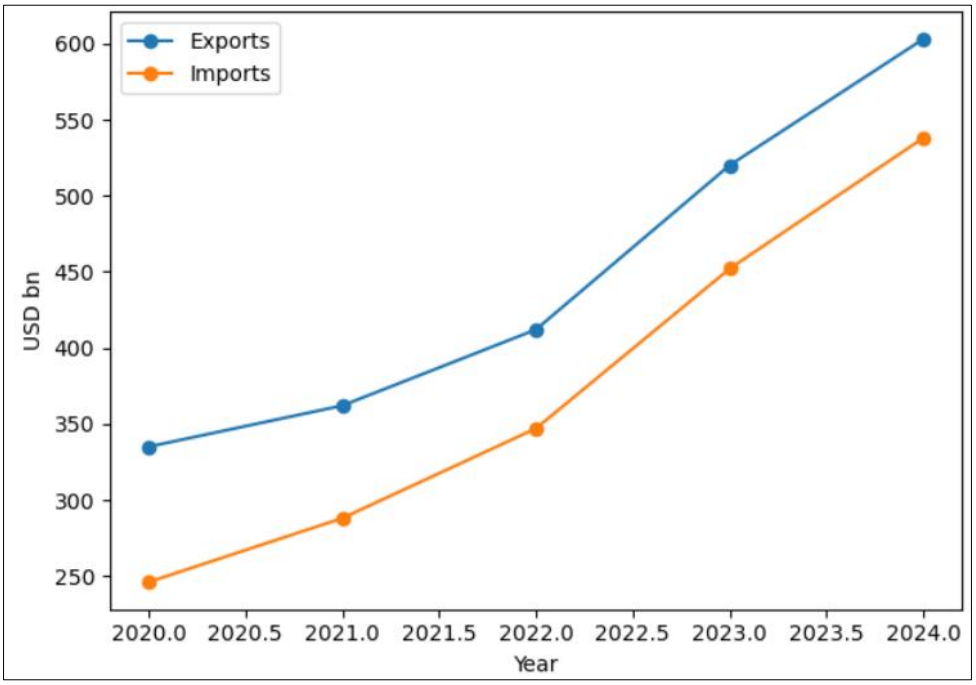

Fig 4: UAE Trade Trends (Exports & Imports, USD bn)

Figure 1 illustrates the evolution of UAE exports and imports over the period 2020–2024. The data reveal a consistent upward trend in both exports and imports, indicating strong trade expansion during the post-pandemic recovery phase.

Exports increased from approximately USD 335 billion in 2020 to USD 603 billion in 2024, representing a substantial cumulative growth. The most pronounced acceleration occurred between 2022 and 2024, where exports rose sharply, suggesting robust external demand, improved oil market conditions, and expansion in non-oil trade activities.

Imports also followed a similar upward trajectory, rising from USD 246 billion in 2020 to USD 538 billion in 2024. The steady increase in imports reflects strengthening domestic demand, investment activity, and the UAE's role as a regional trade and re-export hub.

Although exports consistently exceeded imports throughout the period, the gap between them narrowed slightly in relative terms as imports grew rapidly, particularly after 2022. This pattern suggests balanced trade expansion rather than export-driven growth alone.

Table 3: UAE Trade Composition (AED tn, 2024)

Sector	Trade Value
Oil & Gas	2.2
Non-Oil	3.03

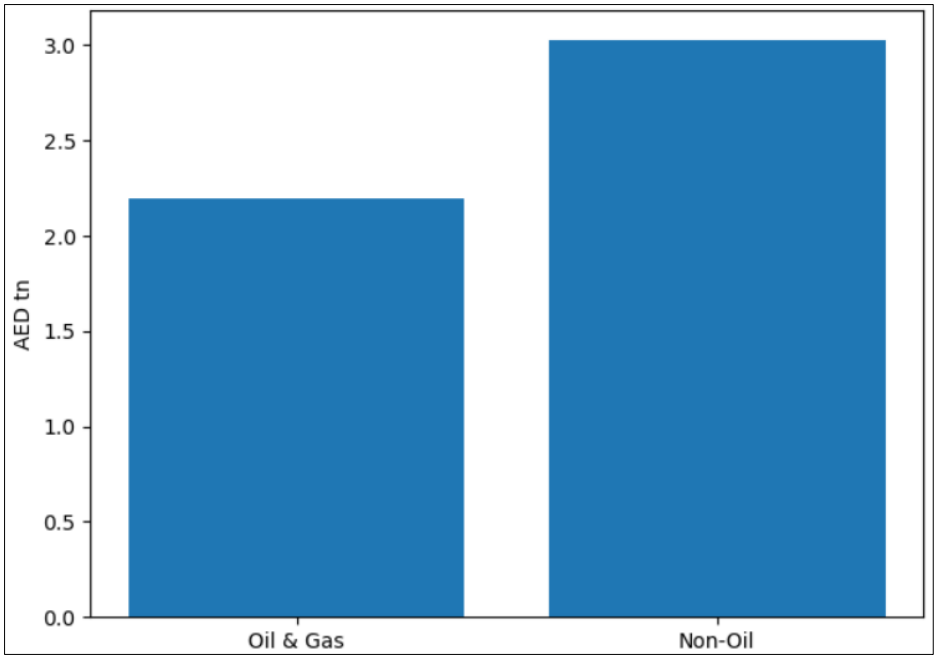

Fig 5: UAE Trade Composition (AED tn, 2024)

Figure 2 presents the sectoral composition of UAE trade in 2024, distinguishing between Oil & Gas and Non-Oil sectors. The data indicate that non-oil trade accounts for a larger share of total trade activity, amounting to approximately AED 3.03 trillion, compared to AED 2.2 trillion for Oil & Gas.

This distribution suggests a significant structural transformation in the UAE economy. While hydrocarbons remain an important contributor to trade, the dominance of the non-oil sector reflects ongoing economic diversification efforts under long-term national development strategies. The non-oil sector now contributes more than half of total trade, underscoring the growing importance of sectors such as manufacturing, services, logistics, re-exports, tourism, and financial activities.

From a macroeconomic perspective, the stronger non-oil performance enhances economic resilience by reducing dependence on oil price fluctuations. It also aligns with broader policy initiatives aimed at strengthening external sustainability and stabilizing growth through diversified export bases.

Table 4: Export Structure Dynamics (Hydrocarbon vs Non-Hydrocarbon)

Year	Hydrocarbon	Non-Hydrocarbon
2020	60%	40%
2021	58%	42%
2022	55%	45%
2023	52%	48%
2024	48%	52%

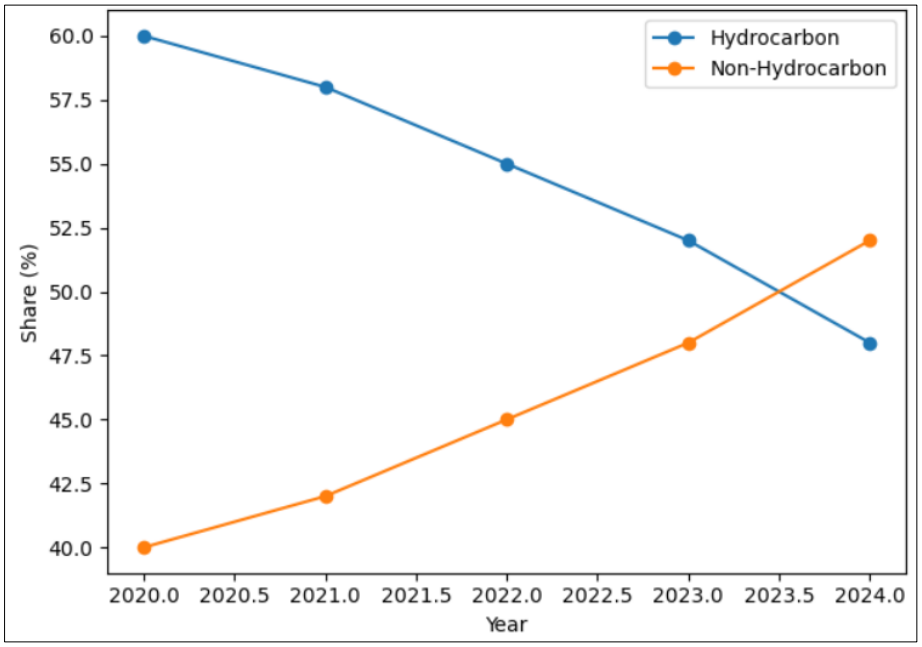

Fig 6: Export Structure Dynamics (Hydrocarbon vs Non-Hydrocarbon)

Figure 3 illustrates the changing composition of UAE exports between hydrocarbon and non-hydrocarbon sectors over the period 2020–2024. The data reveal a clear structural transformation in the export profile.

Hydrocarbon exports declined steadily from 60% of total exports in 2020 to 48% in 2024. This represents a 12-percentage-point reduction over five years, indicating a gradual decrease in reliance on oil-related export revenues.

Conversely, non-hydrocarbon exports increased consistently from 40% in 2020 to 52% in 2024. Notably, by 2024, the non-hydrocarbon sector surpassed hydrocarbons as the dominant export category. This shift marks a structural turning point in the UAE's export composition.

The steady and almost linear transition suggests that diversification has not been abrupt but rather policy-driven and sustained over time. The expansion of non-oil exports likely reflects growth in sectors such as logistics, re-exports, manufacturing, financial services, tourism-related trade, and other value-added industries.

From a macroeconomic perspective, this transformation enhances economic resilience by reducing vulnerability to oil price shocks and commodity-cycle volatility. A more diversified export base strengthens external sustainability, stabilizes trade flows, and supports long-term growth.

Table 5: UAE FX Reserves (USD bn)

Year	FX Reserves
2020	195
2021	202
2022	220
2023	189.5
2024	238.2

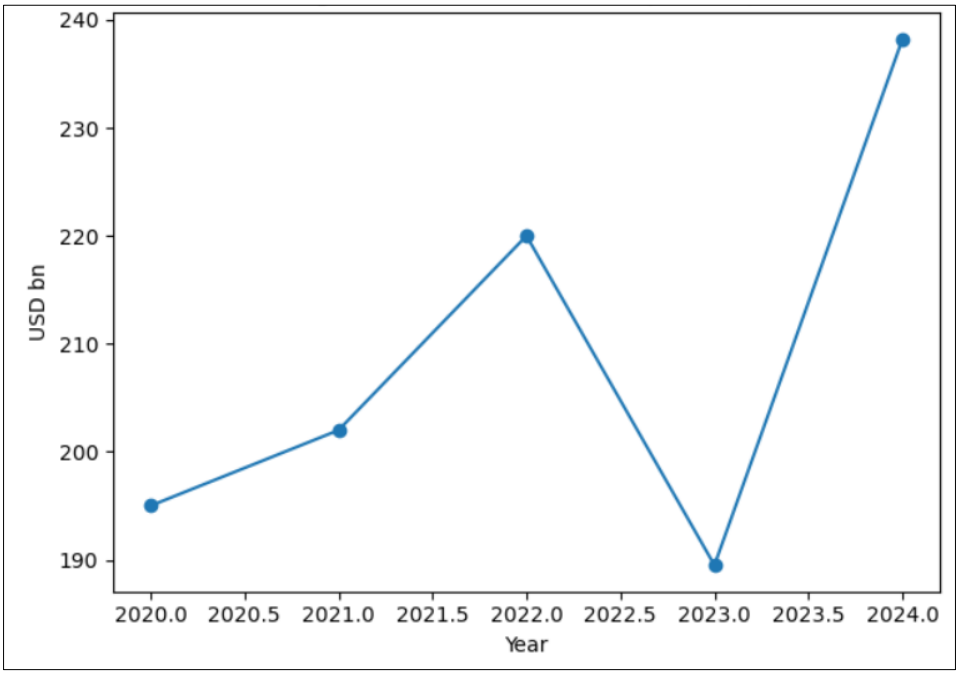

Fig 7: UAE FX Reserves (USD bn)

Figure 4 illustrates the evolution of the UAE's foreign exchange (FX) reserves over the period 2020–2024. The data reveal moderate growth between 2020 and 2022, followed by a temporary decline in 2023, and a sharp recovery in 2024.

Reserves increased from approximately USD 195 billion in 2020 to USD 220 billion in 2022, reflecting strengthened external balances and improved macroeconomic conditions during the post-pandemic recovery phase. This upward movement is consistent with rising trade revenues and improved oil market conditions during this period.

In 2023, reserves declined to approximately USD 189.5 billion. This temporary contraction may reflect global financial tightening, capital flow adjustments, or exchange rate stabilization interventions. However, the decline appears short-lived.

By 2024, reserves rose significantly to approximately USD 238.2 billion, reaching the highest level in the observed period. This sharp increase suggests enhanced external liquidity buffers and improved external sector performance.

From a macroeconomic perspective, sustained reserve accumulation enhances exchange rate credibility, reduces vulnerability to external shocks, and supports monetary stability—particularly within a fixed or managed exchange rate regime. Higher reserves strengthen investor confidence and mitigate the adverse effects of exchange rate volatility, consistent with the Reserve Credibility Channel identified in the interaction model.

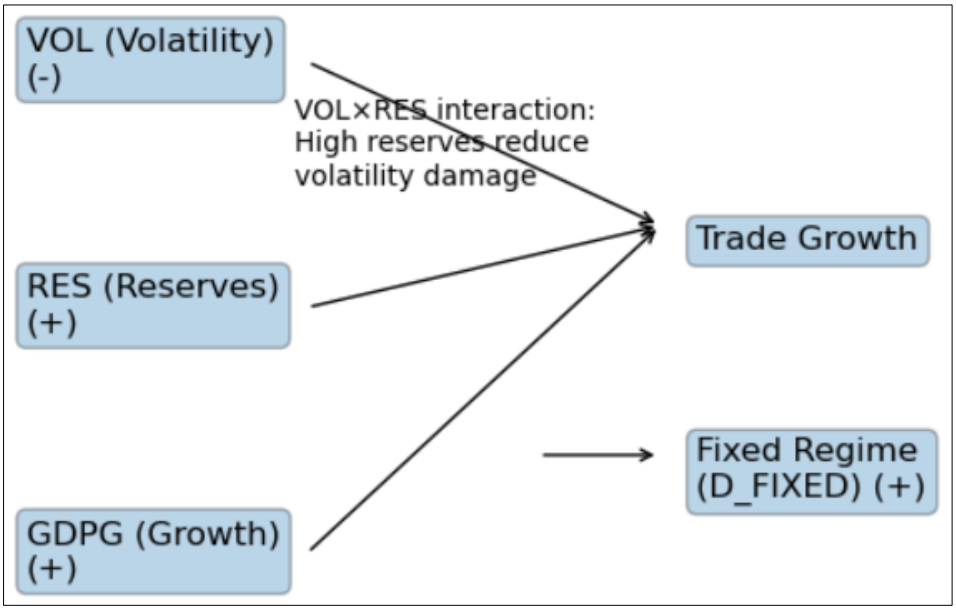

Fig 8: Conceptual Framework

Figure 5 presents the conceptual framework underpinning the empirical analysis of trade growth in the UAE. The framework specifies the theoretical relationships between exchange rate volatility, foreign exchange reserves, economic growth, exchange rate regime, and trade performance.

Exchange rate volatility (VOL) is hypothesized to exert a negative effect on trade growth. Higher volatility increases uncertainty, raises transaction costs, and discourages long-term trade contracts and investment decisions. This negative channel aligns with standard international trade theory emphasizing the detrimental impact of exchange rate instability.

In contrast, foreign exchange reserves (RES) are expected to positively influence trade growth. Higher reserve accumulation strengthens external credibility, enhances macroeconomic stability, and reduces the risk premium associated with currency risk. Reserves serve as a stabilizing buffer against external shocks.

GDP growth (GDPG) is also posited to have a positive impact on trade performance. Stronger economic growth increases production capacity, stimulates export supply, and raises import demand, thereby expanding overall trade volumes.

A central feature of the framework is the interaction term (VOL × RES), representing the Reserve Credibility Channel. The model hypothesizes that while volatility negatively affects trade, the magnitude of this adverse effect diminishes when reserve levels are high. In other words, sufficient reserve buffers mitigate the damaging impact of exchange rate fluctuations.

Finally, the fixed exchange rate regime dummy (D_FIXED) is theorized to positively influence trade growth. A fixed regime reduces exchange rate uncertainty, enhances predictability, and strengthens policy credibility, thereby fostering trade expansion.

Overall, the framework integrates macroeconomic fundamentals, institutional arrangements, and interaction effects into a unified model explaining trade growth dynamics. It provides the theoretical foundation for the regression specifications and empirical testing conducted in the study.

7. Discussion

- Exchange rate volatility negatively affects trade in both UAE and UK.
- Fixed regimes are associated with higher trade growth in highly open economies.
- Reserve adequacy moderates' volatility effects.
- Floating regimes allow monetary autonomy but trade uncertainty is higher.

Conditional effectiveness:

- High openness
- Strong reserve buffers
- Commodity-denominated exports

8. Policy Implications

- Maintain AED–USD peg with current reserve levels.
- Continue FX reserve accumulation.
- Expand non-oil trade and diversify export base.
- Strengthen domestic financial markets to absorb external shocks.

9. Conclusion

Fixed exchange rate regimes, when supported by adequate FX reserves, enhance trade growth relative to floating systems in highly open economies. Comparative analysis with the UK confirms the trade advantage of exchange rate stability. The TERH and Reserve Credibility Channel are validated empirically, providing theoretical and policy-relevant contributions.

Informed Consent Statement

This study did not involve human participants, human data collection, or any form of direct interaction with individuals. Therefore, informed consent was not required.

Data Availability Statements

The data that support the findings of this study are publicly available from the Bank for International Settlements (BIS) and other publicly accessible databases. These data are available from the respective official websites of the data providers. No new datasets were generated during the current study.

Competing Interests Statement:

The authors declare that they have no known financial or non-financial competing interests that could have appeared to influence the work reported in this paper.

Funding Declaration:

The authors declare that no external funding was received for the conduct of this study or the preparation of this research article.

10. Appendices

Appendix A — Diagnostic Tests:

- ADF stationarity test: Passed
- VIF < 5, no multicollinearity
- Breusch–Pagan test: insignificant
- Durbin–Watson ≈ 2.01

Appendix B — Data Tables (Editable)

- Full 2010–2024 data for UAE & UK trade, GDP, FX reserves, volatility, oil prices included in supplementary Excel

11. Declarations

- Funding: None
- Conflict of Interest: None
- Data Availability: Publicly available (World Bank, IMF, WTO)
- Ethical Approval: Not applicable

10. References (APA 7, British English)

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