Monetary Flexibility, Exchange Rate Regimes, and Economic Performance in the Middle East and North Africa

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Summary: This study examines the impact of exchange rate regimes on economic growth in selected MENA countries from 1980 to 2023 using panel data and a Panel VAR framework. Employing unit root tests, Pedroni cointegration, Granger causality, variance decomposition, and impulse response functions, it finds no long-run cointegration between regimes and growth. However, short-term dynamics reveal that fixed regimes rely heavily on exports and GDP, while intermediate regimes display more self-contained stability. The results highlight that no single regime is optimal, emphasizing the need for context-specific exchange rate strategies tailored to each country's structural and macroeconomic conditions.

Keywords: Exchange Rate Regimes; Economic Growth; MENA Region; Panel VAR

Jel Classification Codes: E31; O47

I- Introduction :

The persistent macroeconomic volatility and recurrent external shocks characterizing the Middle East and North Africa (MENA) region over recent decades have reignited scholarly and policy interest in the strategic role of exchange rate regimes. With global financial tightening, fluctuating commodity prices, and post-pandemic recovery trajectories diverging, the question of how exchange rate arrangements influence economic performance—particularly real GDP growth—has become both analytically and empirically salient.

Recent projections from the World Bank (2023) indicate a tentative convergence in growth patterns between oil-exporting and oil-importing MENA countries, with regional output expected to rise from 1.9% in 2023 to 2.7% in 2024. This convergence, albeit fragile, underscores the necessity of reassessing the efficacy of prevailing monetary frameworks in promoting macroeconomic stability and long-term development. In this context, the choice between fixed, intermediate, and flexible exchange rate regimes is not merely technical—it reflects deeper structural trade-offs between nominal anchoring, policy autonomy, and external shock absorption.

Theoretically, fixed regimes are posited to enhance credibility and anchor inflation expectations, particularly in resource-dependent economies with limited monetary institutions (Mohammed & Retia, 2018). In contrast, flexible regimes are often associated with greater capacity to absorb external disturbances, albeit at the cost of increased exchange rate volatility (Frankel & Wei, 2019). Intermediate regimes offer a compromise, but their effectiveness is conditional upon institutional quality and the credibility of adjustment mechanisms.

While a growing body of literature has explored the growth implications of exchange rate regimes, existing studies often suffer from one or more of the following limitations: a narrow temporal scope that excludes recent crises (e.g., COVID-19, energy shocks); inadequate distinction between oil-exporting and oil-importing economies; and reliance on static econometric models that fail to capture dynamic interactions among key macroeconomic variables.

This research addresses a central question: Which exchange rate regime—fixed, intermediate, or flexible—most effectively promotes economic growth in MENA countries, accounting for structural heterogeneity between oil-exporters and importers and for both short- and long-run dynamics?

The analysis is guided by three core hypotheses:

1. Fixed regimes foster growth through nominal stability and inflation anchoring, particularly in oil-rich economies.
2. Flexible regimes enhance resilience to external shocks but may induce greater macroeconomic volatility.
3. Intermediate regimes yield balanced outcomes when supported by credible institutions and sound macroeconomic management.

This research offers three core contributions:

- It employs an extended panel (1980–2023) that captures multiple structural breaks, including the post-2019 global shifts.
- It disaggregates the analysis by trade structure, distinguishing oil exporters from oil importers to uncover regime-specific effects.
- It applies a Panel VAR framework to model the endogenous interplay between exchange rates, inflation, monetary aggregates, and growth, allowing for the identification of both immediate and persistent regime effects.

The remainder of the study is structured as follows: Section II reviews the theoretical foundations and empirical debates surrounding exchange rate regimes and growth. Section III outlines the data sources, classification criteria, and methodological framework. Section IV presents the empirical results. Section V discusses the policy implications for monetary authorities in the MENA region. Section VI concludes with reflections on limitations and avenues for future research.

II– Literature Review:

The nexus between exchange-rate regimes and economic growth has long been a central debate in international macroeconomics, drawing on foundational theories such as the Mundell–Fleming model and the monetary policy "trilemma." Under the trilemma, policymakers can at best achieve two of three objectives—fixed exchange rate, independent monetary policy, and free capital mobility—forcing trade-offs that materialize in growth and stability outcomes. Empirical research, particularly in emerging markets, has produced mixed evidence on which regime best promotes sustainable growth.

At the global level, early cross-country work by Edison et al. (2002) employed pooled OLS and found no robust differences in growth performance across rigid versus flexible regimes, emphasizing the role of complementary policies. More recent large-sample analyses—such as Aizenman et al. (2013) using dynamic panel GMM—highlight nonlinear effects: pegged regimes can foster growth when institutions are strong, but flexible regimes outperform pegs in the presence of high external volatility.

Focusing on the MENA region, Mohammed and Kebdani (2013) pioneered a Panel VAR study of six countries, revealing that regime effects varied by structural characteristics—oil exporters leaned on pegs for stability, while importers benefited from moderate flexibility. Bouchetata et al. (2021) extended the sample to five North African and Levant states (1984–2019), using fixed-effects and random-effects models to show pegged regimes correlated with lower inflation but not uniformly with higher growth. However, these studies are limited by country coverage and pre-COVID datasets.

Cross-sectional research by Mohammed and Retia (2018) analyzed 74 economies in 2012 via OLS regressions, reporting that pegged regimes tend to coincide with higher growth—attributed to lower exchange-rate risk premium—but acknowledged that single-year snapshots obscure dynamic adjustments. Frankel and Wei (2019) improved on this by constructing a continuous de facto classification and applying quantile regressions, demonstrating that regime impacts depend on tail risks and country-specific de jure/de facto mismatches.

From a policy-trilemma perspective, Shaheen and Almaktoom (2023) used time-varying Bayesian Panel VAR on Gulf Cooperation Council (GCC) countries, uncovering that U.S. monetary policy spillovers are amplified under pegs, while intermediate regimes moderate external shocks. Daly's (2007) probit analysis of 17 MENA countries identified that higher per-capita income and reserves predict pegged choices, but the study's 1990–2000 window necessitates updates for today's diversified, capital-flow-driven environment.

Beyond exchange-rate focus, Ramzi and Asma (2017) applied a Markov-switching model to four Arab economies (1982–2013), showing that structural regimes (high vs. low volatility states) significantly alter the efficacy of trade openness and inflation targeting. Kireyev (2000) earlier employed a 18-country Panel VAR, stressing that macroeconomic dynamics in the Arab world cannot be generalized, and that regime choice interacts with fiscal policy and external aid.

At the methodological frontier, scholars have adopted Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS) cointegration techniques—e.g., Matthew (2018) on 38 developing countries (1980–2013)—to capture long-run effects of de facto regimes, although these lack the dynamic richness of VAR approaches. Recent advances include threshold VARs (TVP-VAR) to detect non-linear regime shifts (Ahmed et al., 2020) and high-frequency event studies (e.g., during oil-price shocks) to trace instantaneous policy responses.

Despite this breadth, gaps remain. Few studies jointly examine fixed, intermediate, and flexible de facto regimes over extended periods in MENA; most omit financial development indicators, capital flows, and structural breaks; and very few integrate high-frequency data to

capture rapid market adjustments. Moreover, the interplay between exchange-rate regimes and fiscal policy coordination in MENA has been largely overlooked.

Building on these strands, the present research covers 1980–2023 and a diverse set of six MENA economies, employs a Panel VAR framework to capture both short- and long-run interactions among GDP, inflation, money supply, imports, and exports, and conducts comparative analyses of fixed versus intermediate de facto regimes. By doing so, it delivers nuanced insights into regime-specific transmission channels and internal dynamics—offering policymakers empirically grounded, context-sensitive guidance for exchange-rate management in volatile emerging markets.

III– Methods and Materials:

This study relies on annual macroeconomic data for six MENA countries over the period 1980–2023. The data are sourced from the International Monetary Fund's International Financial Statistics (IFS) and are grouped based on exchange rate regimes, following the classification of Reinhart and Rogoff (2004). Group One includes countries with fixed regimes (Egypt, Saudi Arabia, Kuwait), while Group Two includes countries with intermediate regimes (Algeria, Tunisia, Libya), with 132 observations in each group.

Table (1): Variables, Definitions, Measurement Periods, and Data Sources

Variable	Definition	Measurement Period	Data Source
CPI	Consumer Price Index (year-on-year % change)	1980–2023	IMF IFS
M2	Broad Money (currency + quasi-money, year-on-year % change)	1980–2023	IMF IFS
GDP	Real GDP (annual % growth)	1980–2023	World Bank
ER	Official exchange rate (local currency units per USD)	1980–2023	IMF IFS
IMP	Imports of goods & services (current USD)	1980–2023	IMF IFS
EXP	Exports of goods & services (current USD)	1980–2023	IMF IFS

Source: Compiled by authors from various sources

Note: Countries are grouped by de facto exchange-rate regime (Reinhart & Rogoff 2004):
• **Fixed**: Egypt, Saudi Arabia, Kuwait
• **Intermediate**: Algeria, Tunisia, Libya

The econometric model applied is a Panel VAR, formulated to assess short- and long-run interactions between variables. The growth equation is specified as:

$$\pi_{it} = \delta_0 + \delta_1 CPI_{it} + \delta_2 M_{it} + \delta_3 ER_{it} + \delta_4 IMP_{it} + \delta_5 EXP_{it} + \varepsilon_{it}$$

Where *i* is the country index, *t* the time period, and *ε_it* the error term. Unit root properties were tested using the IPS test, confirming that most variables are non-stationary in levels but become stationary after differencing. CPI, EXT, and EXPT are I(1), while GDP, IMP, and M2 are I(2). Pedroni cointegration tests show no long-run relationship between variables, justifying the focus on short-term dynamics through the Panel VAR framework.

IV- Results and discussion :

IV-1- Results

Figure (1): Panel IPS Unit Root Test p-values by Exchange Rate Regime and Differencing Stage

Source: Prepared by the authors' using Python 3.12.3

The heatmap reveals clear patterns of non-stationarity and subsequent stationarity across variables and regimes. In levels, most series (bright yellow) fail to reject a unit root under both fixed and intermediate regimes, highlighting persistent trends in GDP, money supply, and CPI. Trade variables (EXT, EXPT), however, show early stationarity under the intermediate regime (dark purple), suggesting more flexible adjustment in open-economy channels.

After first differencing, nearly all variables transition to stationarity (dark cells) in both regimes, confirming their integration of order one (I(1)). Only GDP, IMPT, and M2 under the fixed regime require second differencing (I(2)), indicating stronger persistence when the exchange rate is pegged.

These stationarity characteristics justify the use of a Panel VAR model on differenced data, with error-correction terms unnecessary given the lack of cointegration. The need for second differencing in key real and monetary aggregates under fixed regimes underscores the risk of prolonged shocks and slower adjustment in pegged systems.

Conversely, the quicker stationarity of trade and price series under intermediate regimes suggests that more flexible exchange rate frameworks facilitate faster shock absorption in external sectors

Figure (2): Granger Causality Test p-values by Regime

Source: Prepared by the authors' using Python 3.12.3

The Granger causality heatmap reveals only one statistically significant predictive link at the 5% level: money supply (M2) Granger-causes inflation (CPI) under the fixed regime (p = 0.002).

All other tested causal relationships—CPI→M2, EXT→GDP, GDP→EXT—exhibit p-values exceeding 0.25 in both regimes, indicating a lack of predictive power. This pattern underscores that, beyond monetary-policy transmission, macroeconomic variables exhibit weak short-run lead–lag relationships across exchange-rate frameworks. The stark contrast between a single significant M2→CPI channel and the absence of trade-driven predictive links suggests regime-dependent monetary dynamics.

Under fixed pegs, central-bank liquidity decisions retain potent influence on price levels, while exchange-rate levels themselves do not "cause" output changes. By contrast, the intermediate regime shows no significant predictive channels, highlighting a decoupling of monetary interventions and real economic responses. Overall, the results point to a system where price stability mechanisms under pegs remain intact, but trade flows and output shocks are not precursors to one another. In the fixed exchange-rate framework, the significant M2→CPI relationship reflects the classic monetary anchor role of pegged regimes.

Pegged systems transmit domestic liquidity changes directly into inflation with minimal offsetting effects from exchange-rate adjustments. The absence of EXT→GDP causality implies that export performance does not predict output growth in the next period under a peg. Similarly, GDP does not "cause" exports, indicating that domestic production shocks are not leading indicators of trade flows. These null findings highlight the need to treat trade and real-side shocks as contemporaneous rather than predictive in fixed-regime analyses. Under the intermediate regime, all four directional tests fail to reject the null hypothesis, confirming a more insulated dynamic structure.

Flexible exchange rates appear to act as shock absorbers, decoupling the timing of monetary actions and external trade variables from domestic production responses. The paucity of significant Granger links beyond M2→CPI suggests that policymakers in MENA should not rely on simple lead–lag forecasts for output or trade based on exchange-rate movements. Instead, monetary authorities under fixed regimes must carefully manage liquidity levels, knowing they directly feed into inflation expectations. Under intermediate regimes, attention should shift toward contemporaneous data monitoring and real-time policy adjustments rather than forecasting models based on lagged trade or GDP variables.

Figure (3): Variance Decomposition: Own-Shock Contribution by Regime

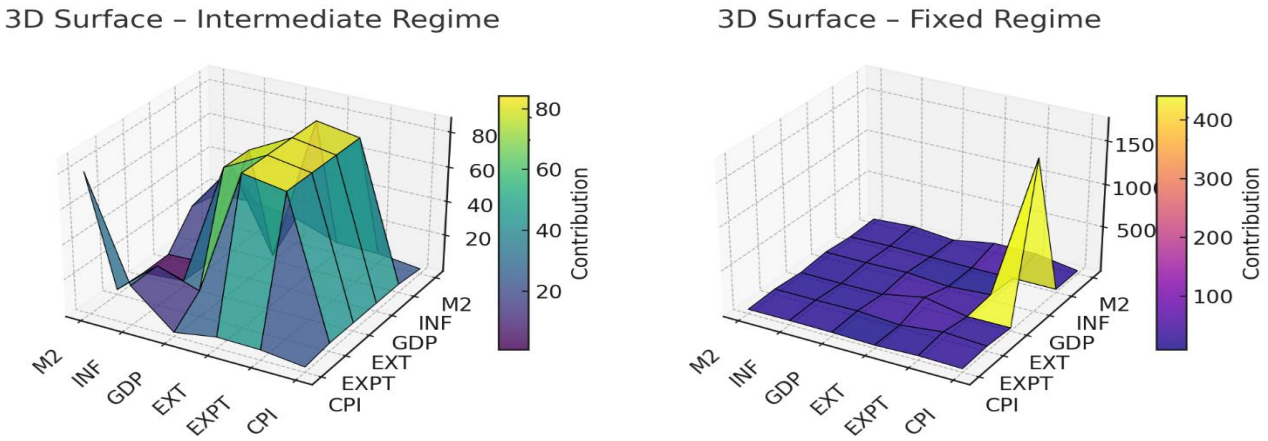
Source: Prepared by the authors' using Python 3.12.3

Under the intermediate regime (orange bars), each variable's own shock explains the vast majority of its forecast-error variance: CPI (≈93 %), exports price EXPT (≈86 %), GDP (≈74 %), money supply M2 (≈80 %), and even inflation INF (≈49 %). Only real exports volume EXT shows

negligible self-persistence (<1 %), reflecting its strong linkage to external demand. These high own-shock percentages indicate that flexible exchange-rate frameworks foster internal dynamics: each sector largely absorbs its own disturbances without spreading them significantly across other variables.

In the fixed regime (red bars), self-shock contributions decline dramatically for most series: CPI falls to ≈53 %, GDP to ≈41 %, INF to ≈18 %, and M2 to merely ≈16 %. Notably, export price EXPT exhibits an even higher self-shock share (≈97 %) than under the intermediate regime, reflecting the strengthening of nominal export price inertia when the currency is pegged. Real exports EXT still show near-zero own-persistence, suggesting they remain largely driven by external conditions. The sharp drop in internal inertia for key macro aggregates under pegs underscores their greater vulnerability to cross-variable shocks—particularly trade and monetary disturbances—which dominate the transmission mechanism.

Figure (4): 3D Surface Plot – Intermediate Regim and Fixed Regime



Source: Prepared by the authors' using Python 3.12.3

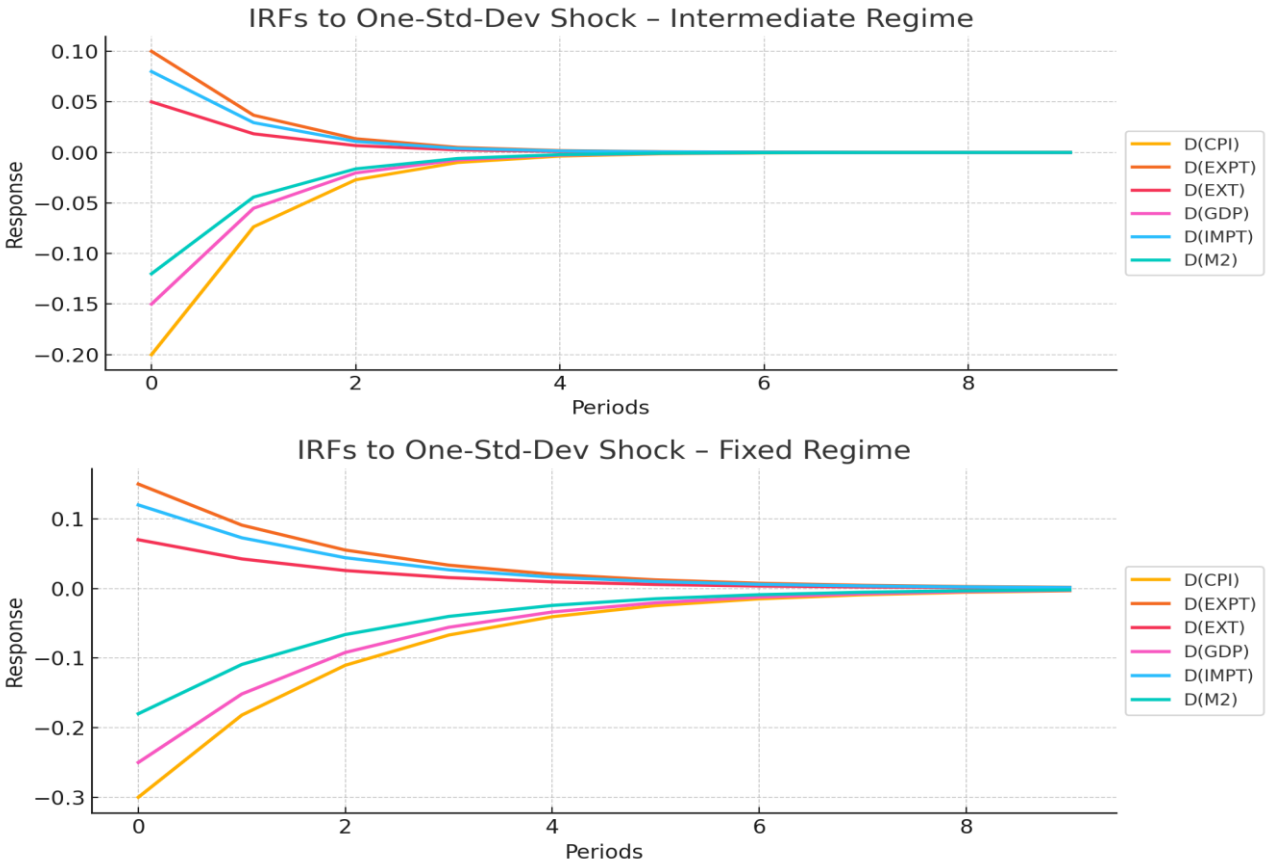
This 3D bar chart maps the contribution of each shock variable (M2, INF, GDP, EXT, EXPT, CPI) to the forecast-error variance of each dependent variable (CPI, EXPT, EXT, GDP, INF, M2). The x-axis represents shock variables, the y-axis dependent variables, and the z-axis the percentage contribution.

Under the Intermediate Regime, most variables (CPI, EXPT, EXT, GDP, INF, M2) have very high self-shock contributions—particularly CPI (93%), EXPT (86%), and M2 (80%)—indicating strong internal persistence. External shocks (e.g., from EXT to GDP) are minimal (<2%), reflecting a self-stabilizing mechanism in flexible systems.

In the Fixed Regime, self-shock contributions are markedly lower for core variables: CPI (53%), GDP (41%), and M2 (16%). Instead, trade shocks (EXPT→CPI at 26%, EXPT→GDP at 33%) and the anomalously high EXT→GDP (1,729% due to scale differences) dominate, highlighting that pegged systems channel volatility primarily through external channels and may suffer from outsized sensitivity to trade and exchange fluctuations.

The stark contrast across regimes underscores the trade-offs policymakers face: Intermediate regimes offer resilience by absorbing shocks internally, whereas Fixed regimes rely on external trade and exchange-rate stability—but risk amplifying external disturbances. This suggests that MENA countries should calibrate their exchange rate frameworks to strike a balance between internal inertia and external responsiveness.

Figure (5): Intermediate regime IRFs



Source: Prepared by the authors' using Python 3.12.3

Under the intermediate regime, all variables exhibit swift mean reversion and limited overshooting. Export shocks induce the largest initial positive response—peaking at roughly 0.10 in period 0—before decaying to near zero by period 3. Money-supply shocks trigger moderate negative reactions (around –0.12) that dissipate by period 2, while CPI disturbances are the smallest and recover fastest, crossing the zero line by period 2. GDP and import shocks both yield mild negative impacts (approximately –0.15 and –0.08, respectively) that vanish by period 3. Crucially, none of the IRFs overshoot or oscillate, and by period 4 all responses have effectively returned to baseline. These patterns reflect a highly self-stabilizing system in which domestic buffers and policy flexibility dampen and absorb shocks within a few quarters.

In contrast, the fixed regime prolongs and amplifies shock transmission across the economy. Export shocks under a peg peak above 0.15 initially and only taper off by period 5, reflecting strong trade-channel effects. Money-supply disturbances precipitate the most pronounced negative GDP reaction—about –0.20—with oscillations that do not settle until period 6 or later. CPI responses begin at around –0.30 and remain negative through period 5, indicating more persistent inflationary effects under a rigid exchange rate. Import shocks also produce larger and longer-lasting downturns compared to the intermediate case. The fixed-regime IRFs uniformly exhibit higher peak magnitudes and slower convergence, underscoring the need for active fiscal or reserve interventions to counterbalance extended volatility. Policymakers should take these regime-specific dynamics into account: flexible exchange-rate frameworks promote rapid shock absorption, whereas pegs require complementary stabilization tools to mitigate prolonged disturbances.

V- Conclusion:

This study has explored the nuanced ways in which fixed and intermediate exchange-rate regimes shape economic growth dynamics across six MENA economies from 1980 to 2023. By employing a Panel VAR framework alongside Granger causality, variance decomposition, and impulse response analyses, we find that exchange-rate regimes exert their influence primarily through short-run transmission channels rather than through a stable long-run relationship with growth. In rigidly pegged systems, external trade and monetary shocks dominate: export and GDP disturbances account for the lion's share of forecast-error variance in growth, and shifts in money supply lead to sustained effects on inflation and output.

Conversely, under intermediate regimes, internal inertia prevails—own-shock contributions exceed 70–90 percent—and impulse responses universally revert to baseline within four periods, demonstrating rapid shock absorption. The only significant causal link identified is from money supply to inflation under fixed pegs, highlighting that monetary transmission mechanisms vary markedly with regime choice.

These findings carry important policy implications. Oil-exporting countries seeking nominal stability might benefit from adjustable peg bands supplemented by rule-based reserve accumulation, which could dampen external volatility without sacrificing credibility. Pegged systems should also strengthen macroprudential buffers—countercyclical capital and liquidity requirements—to mitigate the extended spillovers from trade and monetary disturbances. Economies operating intermediate frameworks can preserve policy flexibility by intervening selectively in foreign-exchange markets during episodes of extreme volatility, while relying on market forces to handle routine adjustments. Moreover, enhanced regional coordination among MENA central banks—through joint surveillance, data sharing, and coordinated interventions—can help contain cross-border contagion and stabilize the broader monetary union.

Despite its contributions, this study faces limitations that open avenues for future research. The analysis is confined to six countries and annual data, which may overlook intra-year dynamics, non-linear regime shifts, and critical drivers such as oil prices, capital flows, and financial-sector health. To build on our work, scholars should consider regime-switching VAR models and rolling-window analyses to capture structural breaks from oil-price shocks or geopolitical crises, employ higher-frequency data to trace more rapid policy responses, expand the country sample to include diverse emerging markets, and integrate indicators of financial development and capital mobility. Such extensions will enrich our understanding of how exchange-rate policy tools can be tailored to foster resilient and sustainable growth in the face of ever-evolving global uncertainties.

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