Global Shocks and Insulation: Evidence from the Middle East and North Africa*

Michele Castegini[†] Giancarlo Corsetti[‡] Zeina Hasna[§]
Simon Lloyd[¶] Nadine Yamout[‖]

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Abstract

To what extent does exchange-rate flexibility stabilize an economy against external shocks? We study the cross-border transmission of U.S. monetary policy shocks to 18 Middle East, North Africa, and Pakistan (MENAP) economies over 1990–2025, using state-dependent local projections, and find two main results. First, on its own, exchange-rate flexibility offers only partial insulation to external shocks for these economies in the short-to-medium run. Following a U.S. monetary policy shock, activity is significantly better protected in crawling regimes than under fixed pegs. In fully flexible regimes, by contrast, activity contracts significantly, and we find no evidence that it is better insulated than under a peg. Insulation therefore appears non-monotonic in the degree of exchange-rate volatility, rather than increasing with it as the classic Mundell-Fleming view suggests. Second, this does not reflect a breakdown of the exchange rate's role in trade adjustment. Expenditure switching scales monotonically with flexibility, as theory predicts. Instead, domestic financial variables adjust most, and least monotonically, when exchange-rate variability is highest, suggesting that financial, rather than trade, channels help explain the limits to insulation.

JEL Codes: E52, E58, F31, F32, F41, F44.

Key Words: Cross-border spillovers; Exchange-rate regimes; Macroeconomic policy; MENAP economies; U.S. monetary policy.

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[†]European University Institute. Email: Michele.Castegini@eui.eu.
[‡]European University Institute and CEPR. Email: Giancarlo.Corsetti@eui.eu.
[§]International Monetary Fund. Email: ZHasna@imf.org.
[¶]Bloomberg LP and Centre for Macroeconomics. Email: Splloyd@gmail.com.
[‖]American University of Beirut. Email: Nadine.Yamout@aub.edu.lb.

1 Introduction

Recent geopolitical events have highlighted the importance of economic stability in the Middle East, North Africa, and Pakistan (MENAP) region for the global economy as a whole. Together these economies account for around 7–8% of world GDP (PPP) and, more importantly for the rest of the world, a disproportionate share of global hydrocarbon production. At the same time, the region is undergoing substantial political and economic change. While exchange-rate pegs and managed regimes have remained the norm for much of the region since the 1990s, a small number of economies—most notably Pakistan and, more recently, Egypt—have moved toward frameworks with more flexible exchange rates in recent years.

MENAP's economic transitions are occurring in a heavily integrated world economy, where global shocks play an ever-more important role. For small-open economies like those in the MENAP region, U.S. monetary policy especially can explain substantive variation in exchange rates, capital flows, commodity prices and macroeconomic outcomes (Rey, 2015; Miranda-Agrippino and Rey, 2020).

Understanding how MENAP economies are affected by such global shocks, and reconsidering which policy tools and regimes are best suited to stabilize the domestic economic and financial system, is therefore critical. So, in this paper, we analyze the transmission of U.S. monetary policy to MENAP economies, asking how institutional arrangements—most prominently, the degree of exchange-rate flexibility—shape macroeconomic spillovers.

To address this issue, we use data from a quarterly (unbalanced) panel of 18 MENAP economies spanning 1990Q1–2025Q4. Within a state-dependent local-projection setting, we use orthogonal 'surprises' from Bauer and Swanson (2023) to identify exogenous variation in U.S. monetary policy, and estimate how MENAP macro-financial variables respond to these shocks depending on domestic conditions and institutional arrangements.

Our central source of heterogeneity is the degree of exchange-rate *variability*. We extend the *de facto* exchange-rate classification of Ilzetzki et al. (2019) through 2025, and group MENAP economies into three bins that correspond to increasing degrees of realized exchange-rate variability—which we label *Fixed*, *Crawling*, and *Flexible*. We use these categories primarily as indicators of exchange-rate variability (or volatility), rather than as comprehensive descriptions of exchange-rate regime arrangements.

We ask two related questions, which resonate with the classical debate on the 'insulation properties' of the exchange rate. Does the degree of exchange-rate flexibility shape how U.S. monetary policy shocks transmit to MENAP economies? If so, through which channels?

First, we find that exchange-rate flexibility provides only partial insulation in MENAP economies. In Fixed regimes, where the exchange rate does not react as policy rates initially rise to offset depreciation pressure, economic activity and inflation both contract significantly following a contractionary U.S. monetary policy shock. In Crawling regimes, by contrast, the activity response is statistically indistinguishable from zero, and significantly better protected than under Fixed regimes at longer horizons, even though inflation still declines significantly. In Flexible regimes with the highest exchange-rate volatility, however, this additional insulation disappears in response to the external shock. Despite a significant currency depreciation and looser policy rates, activity contracts significantly in these economies, with point estimates larger than under Fixed regimes over most of the horizon; while inflation initially rises, albeit insignificantly, in contrast to the decline seen under the other regimes, before falling back in the second year. For our sample of MENAP economies, the relationship between exchange-rate volatility and macroeconomic stabilization following global shocks therefore appears non-monotonic, rather than uniformly improving with flexibility as the classical Mundell-Fleming view would suggest.

Second, we document why additional flexibility fails to deliver further insulation. This is not because the exchange rate stops functioning as a 'shock absorber' in trade. Rather, financial variables adjust far more, and far less monotonically, as flexibility increases. In trade, the exchange-rate adjustment continues to support insulation. Trade adjustment, via expenditure switching, strengthens with the degree of flexibility, and the trade balance of Flexible-regime economies improves after the shock, in contrast to the deterioration experienced by Fixed and Crawling economies. In finance, however, the pattern reverses. Private credit and credit spreads move by most, and in a markedly non-monotone way, precisely where exchange-rate flexibility is highest: private credit contracts over the first year before recovering, while sovereign spreads, after rising initially, fall sharply in the second year.

These results are robust to a range of alternative specifications. The regime-specific pattern is not explained by oil-exporter status or by a range of other domestic institutional and structural characteristics, including capital-account openness, central bank independence, and fiscal and external debt positions. It also holds under an alternative measure of the U.S. shock (Obstfeld and Zhou, 2023), based on broad U.S. dollar appreciation. It is not driven by any single country in our sample, is robust to focusing on the more balanced panel, and to alternative treatments of the COVID-19 pandemic period.

Taken together, these results qualify the view that exchange-rate flexibility uniformly improves an economy's capacity to absorb external shocks. Some flexibility helps. MENAP economies with crawling arrangements are significantly better insulated than those with the least variable exchange-rate regimes. But the additional flexibility required to float freely delivers no detectable further gain, because financial conditions, rather than trade competitiveness, limit adjustment. For policymakers in MENAP and other emerging markets weighing exchange-rate reform, this suggests that domestic financial conditions, not just external competitiveness, should factor into the case for moving beyond managed flexibility toward a free float. More broadly, our findings suggest that exchange-rate flexibility on its own may not be sufficient to fully insulate small-open economies from external financial shocks in the short run. Realizing more of its stabilizing potential may require complementary domestic policy tools, such as macroprudential measures or capital-flow management, that contain financial-sector volatility directly, echoing broader evidence that monetary autonomy under capital mobility depends on more than the exchange-rate regime alone (Rey, 2015).

At the same time, our results do not speak to the longer-term benefits of exchange-rate flexibility documented elsewhere in the literature (e.g., Obstfeld and Rogoff, 1995; Obstfeld et al., 2005), including its role in facilitating external adjustment, supporting monetary policy credibility and autonomy, reducing the likelihood of exchange-rate misalignments, and enhancing resilience to a wider range of shocks. Rather, our analysis focuses narrowly on the short-run transmission of external shocks and the stabilization properties of exchange-rate variability.

Related Literature. Our paper connects to three strands of literature. First, a large body of work documents the transmission of U.S. monetary policy shocks to the rest of the world, operating through global risk appetite, cross-border bank lending, and capital flows (e.g., Rey, 2015; Bruno and Shin, 2015a,b; Iacoviello and Navarro, 2019; Miranda-Agrippino and Rey, 2020; Obstfeld and Zhou, 2023; Degasperi et al., 2026).

Second, our work relates to a smaller set of studies on U.S. spillovers to the MENAP region specifically. These include Cashin et al. (2013) on MENA business-cycle transmission from systemic economies, Adedeji et al. (2019) on state-dependence with respect to oil prices within the Gulf Cooperation Council (GCC), and Ugazio and Xin (2024) on average U.S. monetary policy spillovers to the broader Middle East and Central Asia. We extend this literature by focusing on exchange-rate flexibility as a source of heterogeneity within a state-dependent local-projection framework, which has been increasingly used to study heterogeneous emerging-market spillovers (e.g., Coman and Lloyd, 2022).

Third, we contribute to the classical debate on the stabilizing properties of exchange-rate flexibility (Meade, 1951; Friedman, 1953; Johnson, 1969; Eichengreen and Sachs, 1985; Obstfeld et al., 2005). While the trilemma view holds that floating rates restore monetary autonomy (Shambaugh, 2004; Klein and Shambaugh, 2015), recent evidence finds that floaters are not systematically better insulated from external shocks than peggers (Corsetti et al., 2026). Relatedly, Gourinchas (2018) shows that whether the classical prediction survives depends on how strong financial spillovers are, estimating intermediate spillovers for Chile. Engaging with this debate for the MENAP region requires classifying each economy's exchange-rate regime over a long and volatile sample, which we do by extending the *de facto* classification of Ilzetzki et al. (2019) through 2025. Our finding that insulation is non-monotonic in the degree of flexibility provides a new insight, showing where, rather than simply whether, the classical prediction is limited in this setting.

Outline. The remainder of the paper proceeds as follows. Section 2 describes our data and the institutional background of the 18 MENAP economies in our sample, including the extended exchange-rate regime classification. Section 3 details our empirical strategy. Section 4 presents our main results on the heterogeneous transmission of U.S. monetary policy shocks across exchange-rate regimes. Section 5 investigates the trade and financial channels underlying this heterogeneity. Section 6 reports robustness exercises. Section 7 concludes.

2 Institutional Background and Data

In this section, we describe our data, summarizing the salient economic features of the MENAP economies we study. We analyze 18 countries in the region with heterogeneous institutional and structural features, over the period 1990Q1–2025Q4. We exclude from our sample MENAP countries that were significantly affected by conflict over the majority of the 1990–2025 period (Syria, Somalia, Sudan, Yemen, and the State of Palestine); for these countries, standard macroeconomic time series are unavailable or unreliable over a substantial period. Data coverage varies by variable and country, so our overall panel is unbalanced.

We analyze the impact of U.S. monetary policy shocks on a wide array of macro-financial variables in the 18 MENAP economies. Our macroeconomic variables of interest include: consumer price inflation, real activity (measured as log real GDP), domestic overnight interest rates (proxying for 'policy rates') and the nominal bilateral exchange rate *vis-à-vis* the U.S. dollar (USD). The financial outcomes we study include sovereign credit spreads and private credit. We also analyze the responses of external balances, including: the trade balance, goods exports and imports, as well as gross capital and portfolio inflows and outflows. Further detail on data sources and variable construction is provided in Appendix A.2.

2.1 Exchange-Rate Flexibility

The role of the exchange rate as a 'shock absorber' in response to foreign shocks has long been studied in academic and policy circles, having been formalized in Mundell (1961) and Fleming (1962). In this tradition, exchange-rate flexibility is typically seen as advantageous. Following a contractionary global shock, exchange-rate flexibility can enable domestic policy to lean against it by supporting domestic demand, while offsetting the fall in external demand via exchange-rate depreciation. We therefore explore the heterogeneous impact of U.S. monetary policy shocks on MENAP economies with respect to exchange-rate flexibility.

The degree of exchange-rate variability is a key dimension of heterogeneity across MENAP countries in our sample. To measure it, we extend the *de facto* exchange-rate regime classification of Ilzetzki et al. (2019). We group their (fine) classification into three bins—summarized in Table 1—which correspond to the lowest, medium and highest degrees of exchange-rate variability. As shorthand, we label these 'Fixed', 'Crawling' and 'Flexible' regimes, respectively. As in Ilzetzki et al. (2019), low flexibility is characterized by exchange-rate volatility of less than $\pm 2\%$ per annum, medium variability between $\pm 2 - 5\%$, and high volatility in excess of $\pm 5\%$.

An important contribution of our work is to extend the classification of exchange-rate regimes for MENAP countries by Ilzetzki et al. (2019). Their published classification ends in 2019, so we extend this through to 2025Q4 using their operational algorithm described in Appendix A.1. This is carried out in three stages. First, we directly identify freely falling episodes. These are defined as any month in which year-on-year CPI inflation is above 40%, or any month in which the domestic exchange rate depreciates by at least 25% against the U.S. dollar (while accelerating by more than 10 percentage points relative to the prior month's move). Second, we

Table 1: Ilzetzki et al. (2019) Exchange-Rate Regime Classification

Regime Name	Numerical Codes	Description
Fixed	1–4	Low exchange-rate flexibility, characterized by: no separate legal tender; pre-announced peg with no margin; currency board; *de facto* peg within ±2% bands.
Crawling	5–10	Mid exchange-rate flexibility, characterized by: pre-announced or *de facto* crawling peg/band; managed float within narrow/wide bands (±5%); moving band that narrows.
Flexible	11–14	High exchange-rate flexibility, characterized by: freely floating (officially or *de facto*); managed float with no pre-announced path; freely falling.

Notes: The table reports the three-bin aggregation of the fifteen-category exchange-rate regime classification of Ilzetzki et al. (2019). Numerical code 15, assigned when dual/parallel-market exchange-rate data are missing or unreliable, is excluded from the estimation sample.

apply a small number of country-specific overrides based on documented policy chronologies. Finally, for the remaining gaps, we use rolling monthly statistics to compute the degree of exchange-rate variability against the ±2% and ±5% thresholds for our bins.

The resulting extended exchange-rate regime classification for the 18 MENAP economies in our sample is summarized in Figure 1, displaying only those quarters in which a country switches regime.[1] It highlights the heterogeneity of exchange-rate regimes across MENAP countries, as well as the evolution of regimes over time.

Two patterns stand out from Figure 1. First, the share of MENAP economies with fixed exchange-rate regimes is significant. Low exchange-rate flexibility has been the dominant 'regime' since 1990. Moreover, this share has not undergone the secular decline toward greater flexibility documented for other emerging markets over the same period. Second, regimes have been reformed, overhauled or forced to adjust on numerous occasions. This has generated substantial within-country regime variation, which we exploit in our subsequent empirical analysis.

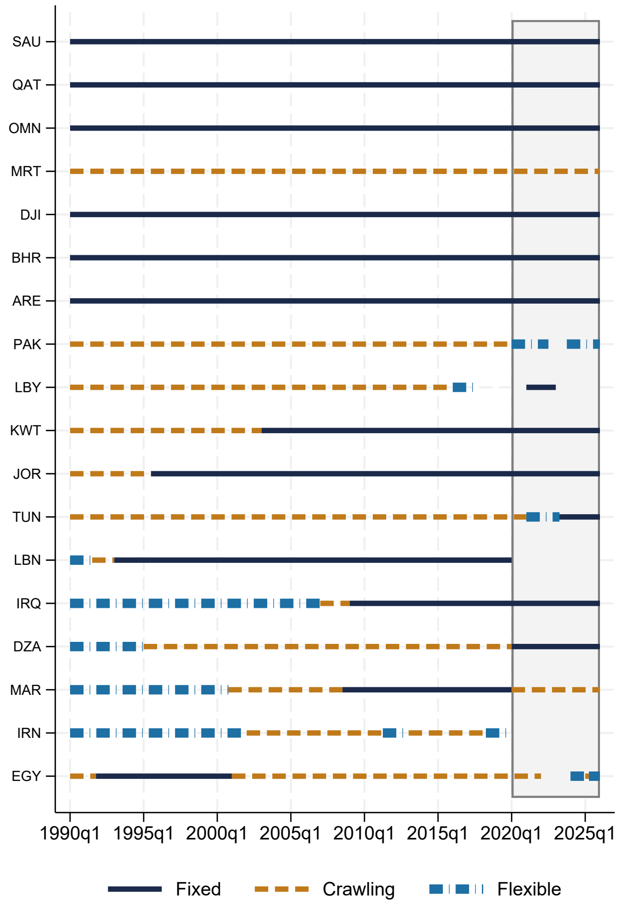
2.2 Other Country Characteristics

In addition to exchange-rate flexibility, we consider other country characteristics that may shape the transmission of U.S. monetary policy shocks to MENAP economies—in part to ensure that our subsequent empirical results pertaining to exchange-rate flexibility are not explained by (omitted) competing hypotheses.

Notable among these is the oil importer/exporter status of MENAP economies. Figure 2 illustrates differences across the region. Oil status is potentially relevant because exporters differ from importers in their external exposure, fiscal capacity, and exchange-rate arrangements. Several oil exporters have maintained hard U.S. dollar pegs over much of the sample (e.g., Bahrain, Oman, Qatar, and Saudi Arabia), while some others had more flexible regimes earlier

[1] Blank cells denote quarters in which dual/parallel-market data are missing or unreliable (code 15 in Ilzetzki et al. (2019)); we drop quarter-country observations in this group from our estimation sample.

Figure 1: Extended Exchange-Rate Classification for MENAP Economies (1990-2025)

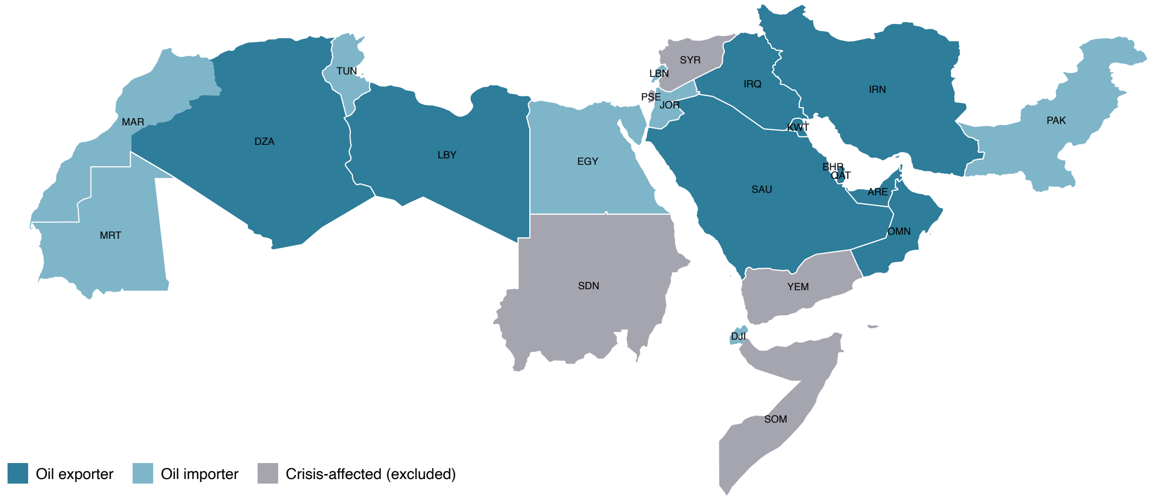


Notes: The figure shows the evolution of exchange-rate regimes for the 18 MENAP economies in our sample from 1990Q1 to 2025Q4. Blank cells denote quarters in which a country is classified as code 15 (dual/parallel-market data missing or unreliable) and is excluded from the estimation sample.

in the sample before subsequently adopting Fixed arrangements (e.g., Algeria and Iraq, both classified as Flexible in the 1990s before moving to Fixed regimes by 2020 and 2009, respectively). Oil importers also display variation in exchange-rate regimes: some have maintained fixed arrangements for long periods (e.g., Jordan and Lebanon), while others have moved toward more flexible frameworks (e.g., Egypt, Morocco, and Tunisia). This overlap between oil status and exchange-rate arrangements motivates a robustness exercise below, where we ask whether the regime-specific transmission patterns are distinct from oil-exporter status and other country characteristics.

Institutional arrangements for MENAP economies have varied in trade and finance too. Central bank independence, as measured by Romelli (2022), has generally increased across the MENAP region, albeit unevenly. Fiscal constraints have bound countries to differing degrees, depending on differences in export revenue, debt levels, and reliance on external financing. Trade and financial integration have also varied across countries. We consider many of these factors in

Figure 2: Oil Importer and Exporter Status of MENAP Economies



Notes: The figure illustrates the oil importer and exporter status of MENAP economies. Dark blue shading indicates oil exporters, while light blue shading indicates oil importers. Countries shaded in gray are MENAP economies excluded from the estimation sample because of limited or unreliable macroeconomic data over a substantial part of the sample period.

our empirical analysis, alongside exchange-rate flexibility and oil status. We examine whether the exchange-rate-regime results are robust to accounting for these additional institutional and structural characteristics.

2.3 Stylized Facts

To motivate the importance of exchange-rate flexibility in MENAP economies, we first explore variation in unconditional moments for key macroeconomic variables across regimes. Recent evidence for advanced economies (Corsetti et al., 2026) suggests that unconditional business-cycle statistics are in fact similar across countries with different degrees of exchange-rate flexibility. These findings stand in contrast to the conventional wisdom that more flexible exchange-rate regimes can act as a shock absorber, and provide *prima facie* evidence of an exchange-rate 'disconnect'. Our findings for MENAP economies differ somewhat. Specifically, both in this unconditional analysis and the conditional local-projection analysis below, there appears to be a non-monotonic relationship between the degree of exchange-rate flexibility and domestic macroeconomic stabilization in MENAP economies.

Table 2 presents the results for our 18 MENAP economies, with corresponding U.S. statistics (over the same sample period) provided for reference. Given substantially sparser real activity data coverage for several MENAP economies prior to 2010, we restrict this exercise to the 2010Q1–2025Q4 sub-period, over which coverage is more balanced across countries. The table reports unconditional moments for key macroeconomic variables, including: activity, policy rates, inflation, and exchange rates. For each variable, we report the standard deviation σ_x,

Table 2: Unconditional Business-Cycle Statistics for MENAP Economies by Degree of Exchange-Rate Flexibility

	U.S.			MENAP								
	Reference			Fixed			Crawling			Flexible		
Panel A: Volatility and Domestic Correlations												
	σ_x	$\rho_{x,Y}$	$\rho_{x,x_{-1}}$	σ_x	$\rho_{x,Y}$	$\rho_{x,x_{-1}}$	σ_x	$\rho_{x,Y}$	$\rho_{x,x_{-1}}$	σ_x	$\rho_{x,Y}$	$\rho_{x,x_{-1}}$
Activity	1.38	1.00	0.40	3.35	1.00	0.66	2.76	1.00	0.51	3.67	1.00	0.31
Policy rate	1.00	0.39	0.94	0.73	0.27	0.92	1.35	0.01	0.90	4.23	-0.18	0.87
Inflation	0.54	0.28	0.53	0.97	-0.06	0.06	1.50	-0.07	0.37	2.73	-0.02	0.18
Exchange rate	—	—	—	0.75	-0.07	0.20	4.54	0.07	0.32	3.72	0.28	0.23
Panel B: Comovement with the U.S.												
				ρ_{x,x^*}	ρ_{x,Y^*}		ρ_{x,x^*}	ρ_{x,Y^*}		ρ_{x,x^*}	ρ_{x,Y^*}	
Activity	—	—	—	0.31	—	—	0.35	—	—	0.32	—	—
Policy rate	—	—	—	0.71	0.30	—	0.53	0.35	—	0.74	0.27	—
Inflation	—	—	—	0.32	0.08	—	0.19	-0.01	—	0.40	-0.02	—
Exchange rate	—	—	—	—	-0.07	—	—	0.07	—	—	0.10	—
Max. # countries	1			14			8			5		

Notes: The table reports the unconditional moments calculated from quarterly data (2010Q1–2025Q4). Where appropriate, series are detrended with a quadratic trend, averaged across countries within each regime group (minimum 10 observations per regime). Columns report statistics for the U.S. and MENAP (split into Fixed, Crawling, and Flexible regimes according to extended Ilzetzki et al. (2019) classification). Activity Y_t is log activity ($\times 100$); policy rate is annualized nominal interest rate, inflation is quarter-on-quarter CPI inflation; the exchange rate is the quarter-on-quarter percent change in the nominal exchange rate vs. USD. For each variable x, the table reports standard deviation σ_x, correlation with domestic activity $\rho_{x,Y}$, and autocorrelation $\rho_{x,x_{-1}}$; where applicable, the bottom panel reports correlation with comparable U.S. variables ρ_{x,x^*} and U.S. activity ρ_{x,Y^*}.

correlation with domestic activity $\rho_{x,Y}$, and autocorrelation $\rho_{x,x_{-1}}$. Where applicable, we also report correlation with comparable U.S. variables ρ_{x,x^*} and U.S. activity ρ_{x,Y^*}.

Relative to the evidence for advanced economies, the unconditional moments for MENAP economies are more heterogeneous across exchange-rate regimes.[2] In particular, policy-rate and inflation volatility rise with the degree of exchange-rate flexibility, while exchange-rate volatility is substantially higher outside fixed regimes. Less surprisingly, these volatilities are also higher than in the U.S.; the standard deviation of macroeconomic variables is at least 2–3 times higher in MENAP economies with flexible exchange-rate regimes than in the U.S.

However, in comparison to the advanced economy evidence where the volatility of activity is more similar across regimes, there appears to be a non-monotonic relationship between the volatility of activity and the degree of exchange-rate flexibility in MENAP economies. The standard deviation of activity is 3.4% for Fixed economies and similar, if slightly higher, for Flexible economies (3.7%). However, volatility in activity is lowest (2.8%) for Crawling-regime economies—suggesting that some degree of exchange-rate flexibility is beneficial for macroeconomic stability in the region. Despite these differences, the comovement of MENAP macroeco-

[2]As a caveat, the comparison may also reflect differences in the span of samples available for the advanced economies and the MENAP region.

nomic variables with the U.S. is generally similar across the different degrees of exchange-rate flexibility. These patterns motivate a more formal test of state-dependence in U.S. monetary policy transmission across exchange-rate regimes, which we turn to next.

3 Empirical Strategy

This section outlines our empirical strategy for estimating the heterogeneous impact of U.S. monetary policy shocks on MENAP economies. We first describe the identification of U.S. monetary policy shocks, and then detail our state-dependent local-projection framework.

3.1 External Shocks

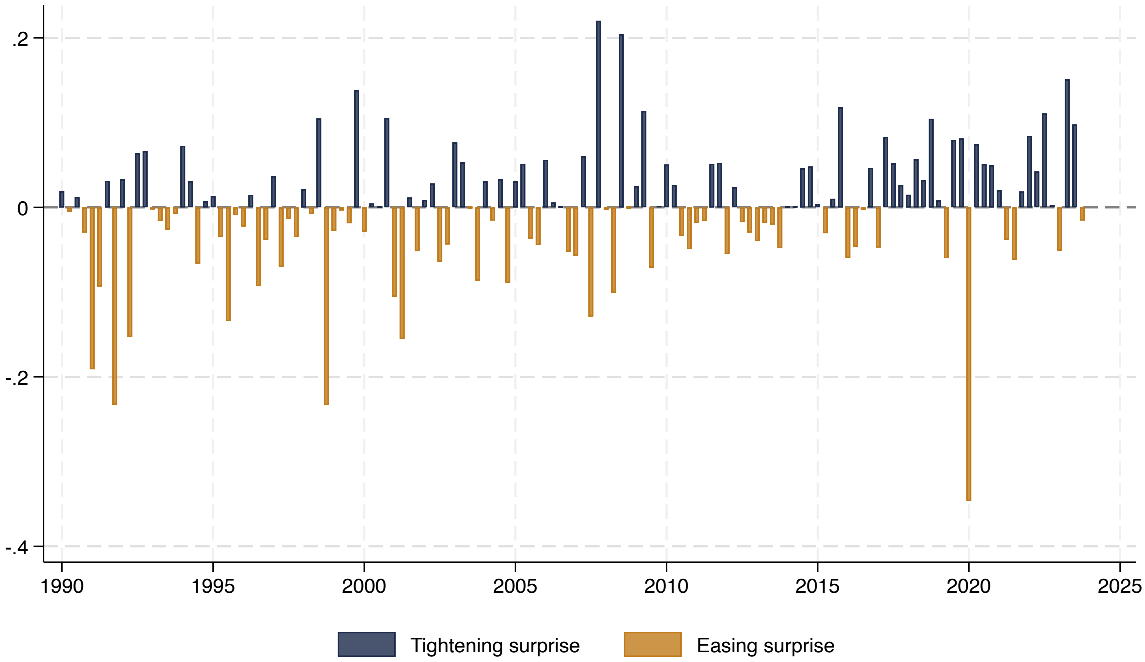
In our baseline analysis, we identify U.S. monetary policy shocks following the approach of Bauer and Swanson (2023). They measure interest-rate movements in a narrow 30-minute window around FOMC announcements following Gürkaynak et al. (2005), Gertler and Karadi (2015), and Jarociński (2022), among others. The key identifying assumption is that within such a short window, the policy announcement itself is the dominant driver of any movement in interest rates. To construct the series, they take the first principal component of the changes in the first four quarterly Eurodollar futures contracts (ED1–ED4). Bauer and Swanson (2023) further orthogonalize the raw surprise with respect to macroeconomic news (Kuttner, 2001).[3] This orthogonalization helps to ensure that the surprise series does not reflect any systematic FOMC response to economic conditions, which also speaks to concerns about the information channel raised in the literature (Nakamura and Steinsson, 2018; Jarociński, 2022; Miranda-Agrippino and Ricco, 2021). We convert the underlying orthogonalized surprises to quarterly frequency by summing surprises within the quarter. In the baseline estimates, impulse responses are reported for a one-standard-deviation surprise tightening in U.S. monetary policy. To further isolate the policy surprise from U.S. macroeconomic conditions (Stock and Watson, 2017), our local projections include lagged global controls: U.S. inflation, industrial production, the federal funds rate, the S&P 500 index, the Gilchrist and Zakrajšek (2012) excess bond premium, and global crude oil prices. Figure 3 plots the quarterly series, distinguishing surprise tightenings (positive values) from surprise loosenings (negative).[4]

In robustness exercises, we complement this U.S. monetary shock with an additional shock: broad U.S. dollar appreciation against advanced-economy currencies, following the identification logic of Obstfeld and Zhou (2023). We measure this shock as the quarter-over-quarter percent change in the trade-weighted index of the U.S. dollar against a basket of advanced-economy currencies, rescaled so that coefficients correspond to a 10% broad-dollar appreciation. The

[3]For macroeconomic news, Bauer and Swanson (2023) choose "a parsimonious and robust set of predictors which also have an intuitive relationship to the Fed's monetary policy rule": nonfarm payrolls surprises, Treasury skewness, 1-year employment growth, and 3-month changes in the S&P 500, commodity prices, and the yield curve slope.

[4]In addition to the analysis reported in subsequent sections, we did explore the extent to which spillovers from U.S. monetary policy shocks to the MENAP region was asymmetric for U.S. tightenings vs. loosenings. However, we did not find significant evidence of asymmetry over our sample.

Figure 3: Quarterly U.S. Monetary Policy Surprises (1990Q1–2025Q4)



Notes: The figure plots the quarterly U.S. monetary policy surprise series from Bauer and Swanson (2023), which is constructed by orthogonalizing high-frequency surprises around FOMC announcements with respect to macroeconomic news. Positive values indicate surprise tightenings, while negative values indicate surprise loosenings.

identifying assumption is that individual MENAP economies have negligible influence over bilateral exchange rates among advanced-economy currency pairs. Since the dollar index may respond to common global shocks, we also control for a broader set of global variables than for the monetary policy shock, including both lagged and contemporaneous oil prices, the VIX, U.S. CPI inflation, U.S. industrial production, the Wu and Xia (2016) shadow rate, the Chicago Fed's Adjusted National Financial Conditions Index, a common activity factor from a broad panel of emerging and developing economies, and another factor specific to the MENAP region. Further details on the construction of this shock are provided in Appendix A.3.

3.2 State-Dependent Local Projections

We estimate impulse responses to external shocks within a local projections framework (Jordà, 2005) with state dependence in macro-financial spillovers to MENAP economies. Denoting the shock of interest by S_t, we estimate variants of the following state-dependent local-projection regression:[5]

$$
\begin{aligned}
y_{i,t+h}-y_{i,t-1}=&\alpha_{i,h}+\beta_h^{fix}\left(S_t\times Fix_{i,t-1}\right)+\beta_h^{crawl}\left(S_t\times Crawl_{i,t-1}\right)+\beta_h^{flex}\left(S_t\times Flex_{i,t-1}\right)\\
&+\sum_{\ell=1}^{L}\left[\gamma_{\ell,h}y_{i,t-\ell}+\phi_{\ell,h}S_{t-\ell}\right]+\sum_{m=0}^{M}\left[\boldsymbol{\theta}'_{m,h}\mathbf{G}_{t-m}+\boldsymbol{\psi}'_{m,h}\mathbf{C}_{i,t-m}\right]+\varepsilon_{i,t+h} \qquad (1)
\end{aligned}
$$

where $y_{i,t+h}$ is the outcome of interest for country i at horizon h ($h=0,1,2,...,8$ quarters), estimated separately for each of the outcome variables and S_t is the external shock. $Fix_{i,t}$, $Crawl_{i,t}$, and $Flex_{i,t}$ denote indicator variables for the exchange-rate regime of country i, drawing on the classification explained in Section 2.1. These are dummy variables equal to 1 if country i belongs to the respective exchange-rate regime, and 0 otherwise. They are lagged one period (i.e., one quarter) to ensure that the exchange-rate regime is not contemporaneously affected by the external shock S_t.[6] Lagged levels of the outcome variable, $y_{i,t-\ell}$, are incorporated to account for potential persistence in the outcome variable (Montiel Olea and Plagborg-Møller, 2021). All lag lengths for the shock, outcome, and control variables are set to $L=M=4$ quarters, informed by information criteria.

The vector $\mathbf{G}_t$ collects the global controls appropriate to the shock under consideration, which differ between the monetary policy and the dollar shocks and are detailed in Section 3.1. $\mathbf{C}_{i,t}$ is common to both specifications and comprises domestic real activity growth, the change in the domestic policy rate, as well as two lagged indicators of the exchange-rate regime (i.e., $Crawl_{i,t}$ and $Flex_{i,t}$, with $Fix_{i,t}$ excluded to avoid multicollinearity). Following Corsetti et al. (2026), we exclude the first year of the COVID-19 pandemic (2020Q1–2020Q4) from the estimation sample; these quarters remain in the panel so that lagged and lead terms for neighboring quarters are unaffected. All variants of regression (1) include country fixed effects $\alpha_{i,h}$ to control for country-specific, time-invariant characteristics. $\varepsilon_{i,t+h}$ is the error term. We compute standard errors using the panel-robust estimator of Driscoll and Kraay (1998).

The coefficients β_h^{fix}, β_h^{crawl}, and β_h^{flex} capture the state-dependent responses of the outcome variable to a time-t shock conditional on the exchange-rate regime at time $t-1$. When we focus on the differences in responses across exchange-rate regimes, we adapt the regression to include time fixed effects $f_{t,h}$ in the following way:

$$
\begin{aligned}
y_{i,t+h}-y_{i,t-1}=&\alpha_{i,h}+\delta_h^{crawl}\left(S_t\times Crawl_{i,t-1}\right)+\delta_h^{flex}\left(S_t\times Flex_{i,t-1}\right)\\
&+\sum_{\ell=1}^{L}\left[\gamma_{\ell,h}y_{i,t-\ell}+\phi_{\ell,h}S_{t-\ell}\right]+\sum_{m=0}^{M}\boldsymbol{\psi}'_{m,h}\mathbf{C}_{i,t-m}+f_{t,h}+\varepsilon_{i,t+h} \qquad (2)
\end{aligned}
$$

where $\delta_h^i\approx\beta_h^i-\beta_h^{fix}$ for $i\in\{crawl,flex\}$. These coefficients therefore capture the differential

[5] Coman and Lloyd (2022) use a similar state-dependent local projection setup to study how the impact of U.S. monetary policy shocks on emerging markets varies with respect to the domestic macroprudential policy stance.

[6] To support this modeling choice, we additionally assessed the extent to which the U.S. monetary policy significantly predicted changes in MENAP exchange-rate regimes using Logit and Probit models. However, we found no significant evidence that the U.S. surprise impacted regime switches in a two-year period after the shock.

responses of the outcome variable to a time-t shock conditional on the exchange-rate regime at time $t-1$ relative to the fixed exchange-rate regime.[7] Since the time fixed effects absorb country-invariant, but time-varying variation, this specification does not include global controls $\mathbf{G}_t$.

4 Cross-Border Transmission to MENAP Economies

In this section, we apply our state-dependent local-projection framework to analyze the impact of U.S. monetary policy on macroeconomic outcomes in MENAP economies. As context, the U.S. monetary policy shock has a significant impact on U.S. macroeconomic and financial outcomes, as well as on global activity and financial conditions. Using the Bauer and Swanson (2023) surprise, Appendix B.1 summarizes its estimated impact on U.S. outcomes. Consistent with related literature (e.g., Gertler and Karadi, 2015; Miranda-Agrippino and Rey, 2020), a surprise tightening leads to a decline in U.S. activity, accompanied by a rise in U.S. policy rates and a fall in U.S. inflation. As Iacoviello and Navarro (2019) and Degasperi et al. (2026) show, the U.S. monetary shock also has significant international effects. Global activity contracts, especially in emerging markets. On the financial side, global risk appetite deteriorates after the shock: world stock markets contract, equity holdings fall consistent with a worldwide rebalancing toward safe assets, and cross-border flows contract.

4.1 Average Responses

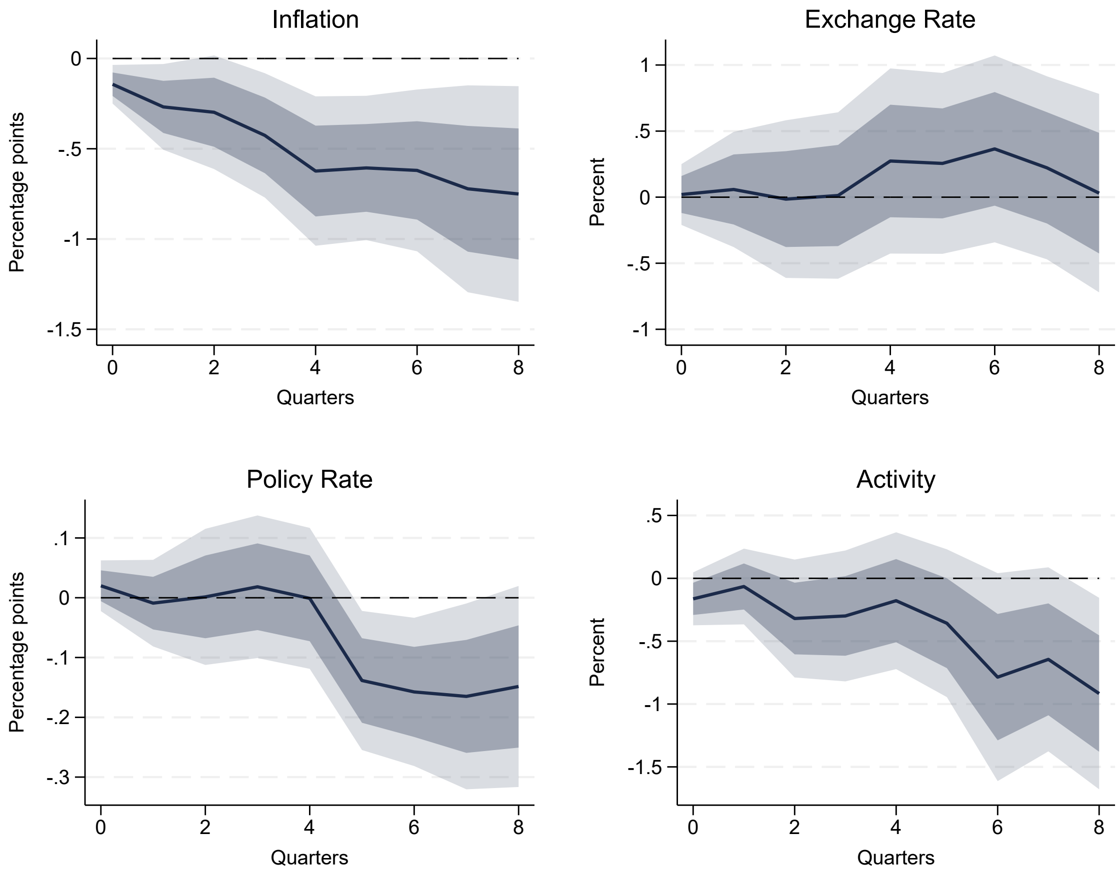
While the global impact of U.S. monetary policy shocks is well-documented, the transmission of these shocks to MENAP economies specifically is less widely studied. So, before analyzing the heterogeneous impact of U.S. monetary policy shocks across exchange-rate regimes, we first discuss the average responses of MENAP economies to a surprise tightening in U.S. monetary policy. To do so, we estimate a variant of local-projection specification (1), where the three interaction terms with exchange-rate regimes are replaced with a single regressor, S_t. This allows us to estimate the average response of MENAP economies to a U.S. monetary policy shock, without conditioning on exchange-rate regimes.

Figure 4 presents the estimated impulse responses of key macroeconomic variables to a one-standard-deviation surprise tightening in U.S. monetary policy, averaged across the 18 MENAP economies in our sample. Overall, the results are consistent with other global evidence on the cross-border transmission of U.S. monetary policy shocks (e.g., Iacoviello and Navarro, 2019; Degasperi et al., 2026).

A surprise tightening in U.S. monetary policy leads to a contraction in MENAP activity and a fall in inflation. These effects are persistent and become statistically significant at the two-year horizon. The average impact of the shock on MENAP exchange rates and interest rates

[7] The association between coefficients from regressions (1) and (2) is only approximate, since the specification of controls is slightly different. Regression (1) cannot include time fixed effects owing to multicollinearity, so contains observed macroeconomic controls $\mathbf{G}_t$; (2) contains time fixed effects $f_{t,h}$ instead.

Figure 4: Average Responses of Macroeconomic Variables in MENAP Economies to a U.S. Monetary Policy Shock



Notes: The figure presents the average impulse responses of key macroeconomic variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections. Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

is less clear cut, which we subsequently show reflects heterogeneous responses across exchange-rate regimes. Bilateral MENAP exchange rates do depreciate against the U.S. dollar, albeit insignificantly, consistent with the global evidence for the U.S. dollar more broadly (Degasperi et al., 2026). Although insignificant over the first year, the average impact of the shock on MENAP policy rates is negative and significant in the second year, reflecting the loosening of domestic monetary conditions in response to contractionary spillover effects from the U.S. shock.

As Appendix B.2 documents, the contractionary macroeconomic effects of the U.S. shock extend to other dependent variables. Following the shock, MENAP external balances deteriorate, driven by a significant contraction in exports. Financial conditions tighten, with significant reductions in private credit. MENAP economies also face capital outflows, with cross-border flows contracting on impact before stabilizing. The coefficients underlying the headline macroeconomic figures are tabulated in Appendix B.4.

4.2 Differences Across Exchange-Rate Regimes

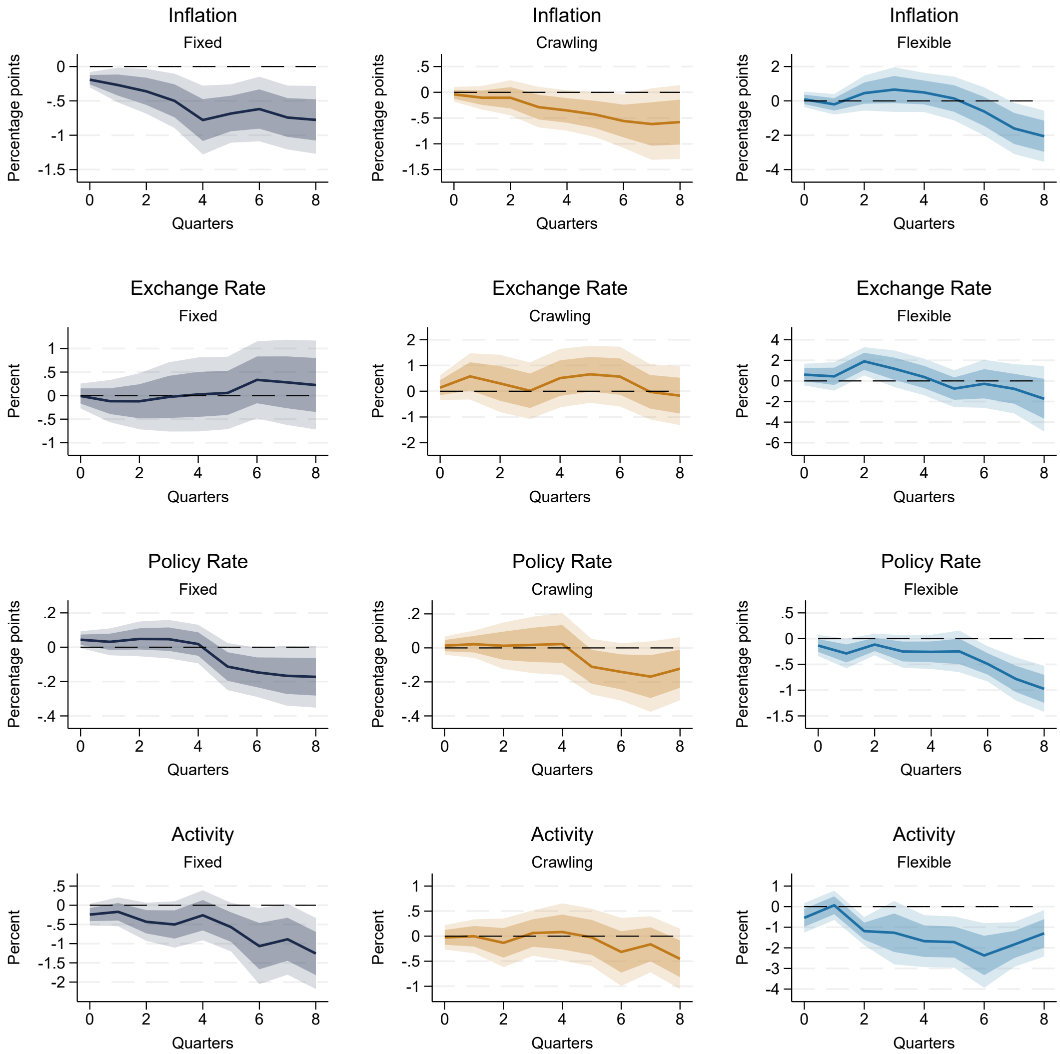
Estimating regression (1) and conditioning on exchange-rate volatility in MENAP economies reveals marked differences across regimes, which are masked by the average responses discussed in the previous subsection but are consistent with those uncovered from the unconditional analysis in Section 2.3. Figure 5 presents the estimated impulse responses of key macroeconomic variables to a one-standard-deviation surprise tightening in U.S. monetary policy, conditional on the exchange-rate regime of MENAP economies: Fixed (gray), Crawling (orange), and Flexible (blue). Most striking is the finding that the degree of macroeconomic stabilization following the U.S. monetary shock is non-monotonic with the degree of exchange-rate flexibility.

Somewhat mechanically, a surprise U.S. monetary tightening has an insignificant effect on the bilateral exchange rate against the U.S. dollar for MENAP economies with low exchange-rate flexibility. With the currency pegged, the exchange rate cannot adjust to absorb the shock. To defend the peg, domestic policy rates increase on impact in these fixed regimes, tightening monetary conditions in lockstep with U.S. policy rates. As a consequence, tighter U.S. monetary policy results in significant and persistent reductions in economic activity (around 1.2% after two years, similar in magnitude to the U.S. response) and inflation in these economies over the following two years. As activity and inflation decline, domestic policy rates fall significantly during the second year, consistent with a delayed easing response to the resulting domestic slowdown.

Comparing the responses across low and medium degrees of exchange-rate flexibility (i.e., Fixed vs. Crawling) reveals insights consistent with the classical view of the exchange rate as a shock absorber embedded in the transmission mechanism of the Mundell-Fleming model. The U.S. monetary policy tightening shock is associated with somewhat more, though broadly insignificant, depreciation of the MENAP currency against the U.S. dollar. Because the currency moves, domestic policy rates do not increase in the near term to defend the less rigid arrangement. Although there is some significant reduction in inflation following the U.S. monetary shock for these mid-flexibility MENAP economies, this is not the case for economic activity. Unlike in the fixed-regime economies, the U.S. monetary policy shock has no significant effect on activity in crawling MENAP economies, consistent with the idea that some exchange-rate flexibility can help to absorb external shocks. Figure B3 in Appendix B.3, which estimates the differential response of Crawling relative to Fixed regimes directly using specification (2), confirms this. The Crawling-Fixed activity differential is statistically insignificant on impact but turns significant from around the fifth quarter onward, and remains close to conventional significance through the remainder of the two-year horizon, indicating that crawling-regime economies display more favorable activity responses than fixed-regime economies in this sample at longer horizons.

However, the responses of macroeconomic variables in MENAP economies with high exchange-

Figure 5: Heterogeneous Responses of Macroeconomic Variables in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime



Notes: The figure presents the heterogeneous impulse responses of macroeconomic variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

rate flexibility highlight the non-monotonic relationship between stabilization and exchange-rate flexibility, which is less consistent with the classical view of the exchange rate as a shock absorber. For these economies, a U.S. monetary policy shock results in a significant depreciation of the domestic currency against the U.S. dollar, which peaks at close to 2% after two quarters. The higher cost of foreign currency appears to pass through to inflation somewhat, which increases (albeit insignificantly) in the first year, in contrast to the other regimes and the global deflationary response, before declining in the second year. Without the need to defend an exchange-rate peg, policy rates fall significantly to support demand. But overall, as in the Fixed economies—and unlike the Crawling economies—activity declines significantly in the Flexible regimes, falling by around 2% after one and a half years. The point estimates are larger than under Fixed regimes over most of the horizon, converging only by the two-year mark, when both regimes show a decline of around 1.3%. The differential estimates from regression (2), shown in Figure B3 of Appendix B.3, are less precisely estimated: the Flexible-Fixed activity differential is not statistically significant at conventional levels. These estimates therefore provide no evidence that the additional flexibility improves insulation relative to a peg. In contrast, the inflation response is significantly larger after around one year in the Flexible economies and the policy response significantly looser.

Thus, while some increase in exchange-rate flexibility—from fixed to crawling—does appear to better insulate economic activity in MENAP economies from the external U.S. monetary shock, the evidence does not support a simple monotonic insulation ranking in which greater exchange-rate flexibility always delivers more stable macroeconomic outcomes. The next section investigates the mechanisms behind this pattern by examining whether exchange-rate adjustment operates mainly through external balances or through financial conditions.

5 Adjustment via Trade and Finance

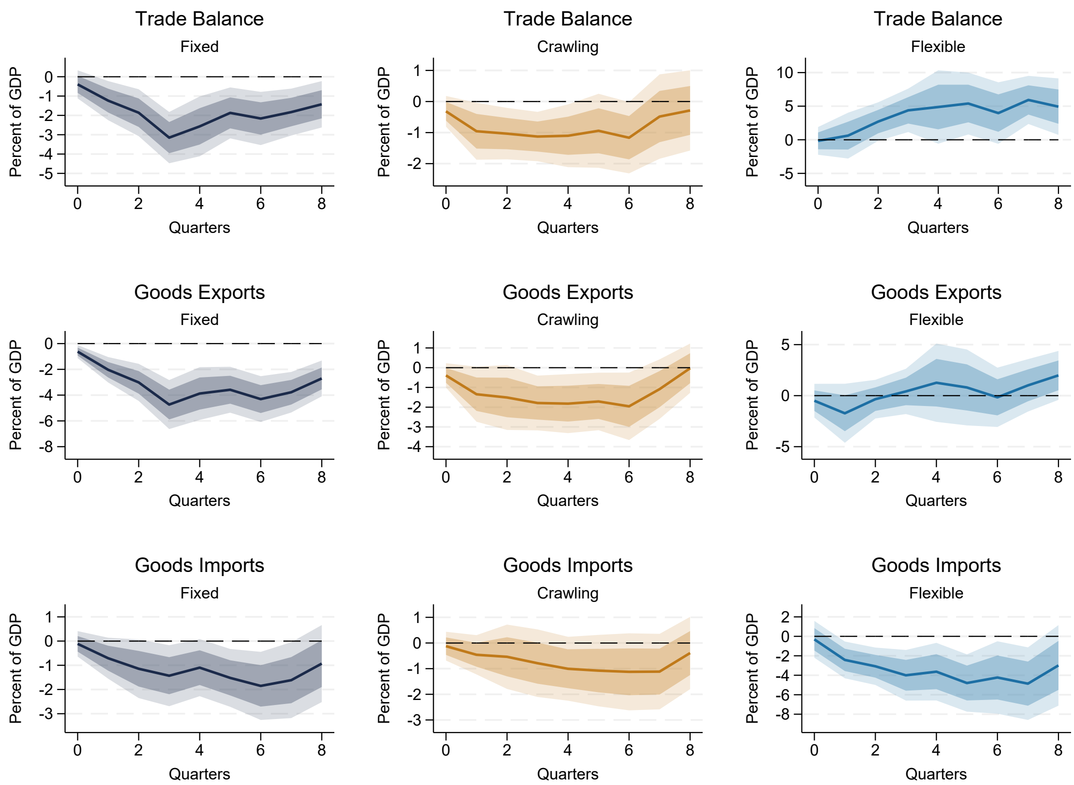
On the face of it, the non-monotonic relationship between exchange-rate flexibility and the spillovers from U.S. monetary policy shocks highlighted in Section 4.2 poses a challenge to the classic Mundell-Fleming 'shock-absorber' logic. At least for economic activity, more exchange-rate flexibility does not necessarily imply more stable outcomes. In this section, we look in more detail at other macroeconomic outcomes in MENAP economies to ask why this is the case.

The role of the exchange-rate regime in external adjustment is central to the Mundell-Fleming view. When flexible, exchange rates can endogenously respond to reconcile imbalances in the demand and supply for goods, services and assets. In theory, expenditure-switching effects can reallocate demand toward countries whose currency depreciates. Even if the widespread use of a vehicle currency in pricing exports can reduce these effects, monetary policy can still stabilize domestic demand by boosting spending on domestic goods, partly through the effects of a currency depreciation on the relative price of imports. As pointed out by Harry Johnson among others (Johnson, 1969; Obstfeld, 2020), the main advantage of exchange-rate flexibility is to endow domestic authorities with a degree of freedom they can use to stabilize their economies. The question is then the extent to which they are able to take advantage of this additional degree of freedom.

5.1 Exchange Rates as a Shock Absorber in Trade

To investigate the role of exchange-rate adjustment in trade for MENAP economies, we re-estimate regression (1) with external-balance measures as the dependent variable, specifically:

Figure 6: Heterogeneous Responses of External Balances in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime



Notes: The figure presents the heterogeneous impulse responses of external balances in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

the trade balance, goods exports and goods imports. Figure 6 presents the estimated impulse responses across exchange-rate regimes.

In contrast to our results for macroeconomic aggregates, the results for trade components in Figure 6 are more in line with the conventional view of the exchange rate as a shock absorber. In response to a surprise U.S. monetary policy tightening, the trade balance of fixed regimes deteriorates substantially—with a peak decline of 3 percentage points within the first year. Crawling-regime economies see some decline in their trade balance, albeit smaller—around 1–1.5 percentage points over a 6 to 18-month horizon. In contrast, the trade balance of MENAP economies with the most flexible exchange rates improves in the two years after a surprise U.S. monetary policy tightening.

The monotonic response of MENAP trade balances to U.S. monetary policy shocks with respect to the degree of exchange-rate flexibility appears to be driven by goods exports. Following a U.S. monetary policy tightening, goods exports from MENAP economies with the least flexible exchange rates (Fixed and Crawling) decline significantly. Global demand falls and the limited exchange-rate adjustment contains the extent to which a domestic depreciation can engineer offsetting expenditure-switching effects. In contrast, goods exports from MENAP economies with flexible exchange rates do not decrease in the two years after a surprise U.S. monetary policy tightening. On the other side of the trade balance, goods imports fall significantly in MENAP economies, regardless of the degree of exchange-rate flexibility. The decline in goods imports in flexible exchange-rate regimes is quantitatively larger than for fixed or crawling economies, consistent with expenditure switching within MENAP economies as their exchange rate depreciates against the U.S. dollar,[8] as well as with weaker domestic activity. The differential responses in Appendix Figure B4 broadly confirm this trade-channel pattern, especially for Flexible regimes relative to Fixed regimes.

So, when considering the response of trade in MENAP economies to U.S. monetary policy shocks, the exchange rate appears to be "doing its job". Expenditure switching appears to scale monotonically with exchange-rate flexibility, as the Mundell-Fleming model predicts and in spite of increased use of vehicle currencies in export pricing.

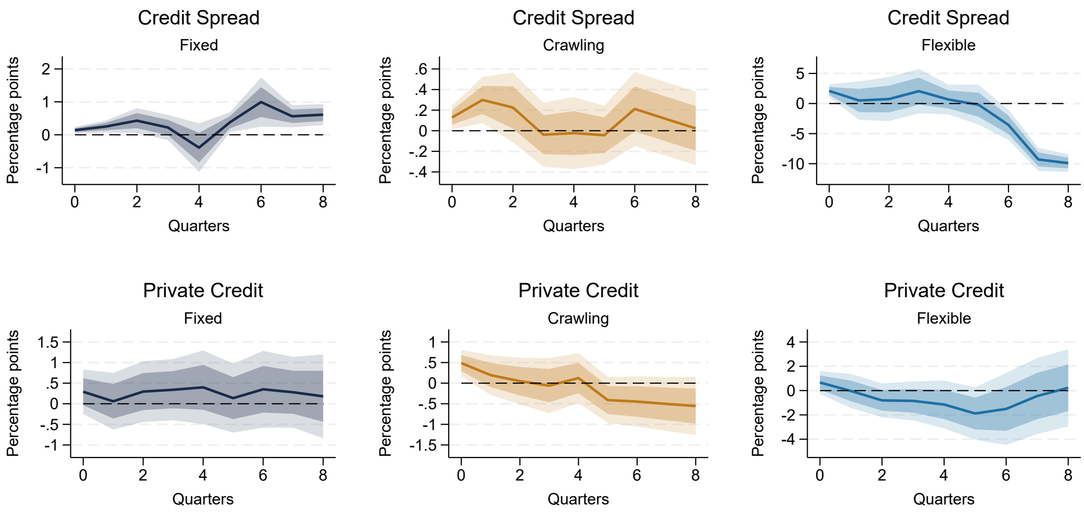
5.2 Exchange Rates as an Amplifier in Finance

To investigate the roots of the non-monotonic responses of activity with respect to exchange-rate flexibility, we turn to analyzing financial responses in MENAP economies. Figure 7 presents estimates of equation (1) when financial variables—specifically credit spreads and quantities of private credit (lending to households and businesses)—are used as dependent variables.

The responses of credit conditions across exchange-rate regimes are more in line with economic activity. Some degree of exchange-rate flexibility (from Fixed to Crawling) appears to insulate credit conditions, while high levels of exchange-rate flexibility are associated with much larger swings. In response to a U.S. monetary policy tightening, MENAP economies with the least flexible exchange-rate regimes face a modest tightening of credit spreads, becoming significant from around the sixth quarter; private credit, by contrast, is little changed, with confidence bands that include zero throughout the two-year horizon. Economies with crawling regimes see even more muted responses in credit conditions. Credit spreads and private credit respond insignificantly to the exogenous U.S. monetary policy impulse. Credit conditions move by far the most in the MENAP economies with the highest degree of exchange-rate flexibility, though not in the direction of a simple, persistent tightening. Credit spreads are little changed over the first year before falling sharply and significantly, reaching around -10 percentage points relative to the Fixed regime by the two-year horizon. Private credit declines by around -1.5% after four quarters before recovering to around zero by the two-year horizon. Cross-border capital and portfolio flows also show larger adjustment under high exchange-rate flexibility (see Appendix B.5 for detail). This pattern is consistent with the stronger-spillover case in Gourin-

[8] Recall that, under dollar pricing, exchange rate depreciation may have limited effect on the price competitiveness of exports, but can still redirect internal demand away from imports through imported inflation.

Figure 7: Heterogeneous Responses of Financial Variables in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime



Notes: The figure presents the heterogeneous impulse responses of financial variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

chas (2018): policy rates in Flexible regimes fall significantly after the shock, yet activity still contracts, suggesting that the financial channel offsets much of the stimulus that the exchange rate and domestic easing would otherwise deliver.

6 Robustness

We close the empirical analysis by asking whether the main results are robust along several dimensions. These checks cover both the regime-specific macroeconomic responses in Section 4.2 and the external-balance and financial-channel results in Section 5. Appendix B.6 reports the macroeconomic robustness exercises, while Appendix B.7 reports the corresponding exercises for external and financial variables. Overall, the evidence supports the central conclusions. The transmission of external shocks differs systematically across exchange-rate regimes, and the relationship between exchange-rate flexibility and macroeconomic stabilization is not monotonic.

Other Domestic Institutional Features. First, we ask whether the exchange-rate regime results are proxying for other domestic characteristics. We begin with oil-exporter status. This is important in the MENAP context because several long-standing pegs are maintained by oil exporters, while more flexible regimes belong to oil importers. Splitting the sample by oil status does not reproduce the same pattern of heterogeneity as the exchange-rate regime split in Section 4.2. The responses of policy rates and economic activity are statistically indistinguishable between the two groups. Consistent with the surprise U.S. monetary tightening weighing on the global demand for oil, oil exporters face a significant depreciation of their currency against the U.S. dollar. Oil importers, on the other hand, see no significant change in currency *vis-à-vis* the U.S. dollar. However, other macroeconomic outcomes respond similarly, with the exception of contemporaneous inflation dropping more for oil exporters. Weaker global demand, on account of the surprise U.S. tightening, weighs on domestic MENAP activity and inflation. In both oil importing and exporting countries, inflation and activity decline significantly after two years. Policy rates eventually fall to lean against these macroeconomic impacts. The corresponding external and financial results show that oil status matters for export exposure, but it does not replicate the regime-specific trade and credit patterns emphasized in Section 5.

More generally, we augment the differential-response specification in Equation (2) with interactions between the U.S. monetary policy shock and other country characteristics, including capital-account openness, central bank independence, external debt, public debt, reserves and oil-exporter status. The objective of this exercise is to check whether the differential effects we find across exchange-rate regimes are robust to controlling for a range of competing hypotheses. The regime differentials remain broadly stable. For the macroeconomic variables, the Crawling-Fixed activity differential remains positive at longer horizons in most specifications. The Flexible-Fixed inflation and exchange-rate differentials also remain visible and the differential response in activity between Fixed and Flexible economies remains insignificant. For the external and financial variables, the trade-balance improvement under Flexible regimes and the larger financial adjustment under high exchange-rate flexibility also remain visible across the different specifications. Some specifications become noisier, especially those involving fiscal characteristics with more limited coverage, but the results do not point to a single alternative channel that absorbs the exchange-rate pattern.

Alternative Shock. Second, we replace the U.S. monetary policy surprise with a broad U.S. dollar appreciation shock from Obstfeld and Zhou (2023). This exercise is useful because the baseline U.S. monetary tightening works partly through dollar appreciation and tighter global financial conditions. The broad-dollar shock produces a similar regime ordering for the macroeconomic outcomes: Flexible regimes experience the largest nominal adjustment and a clear contraction in activity, while Fixed and Crawling regimes display more muted responses. The external and financial results are also consistent with the baseline mechanism, with a stronger adjustment under Flexible regimes. The main findings therefore do not depend on the specific high-frequency U.S. monetary policy shock used in the baseline.

Single-Country Exclusions. Third, we re-estimate the regime-specific impulse responses leaving out one country at a time. The resulting responses remain close to the full-sample estimates for both the macroeconomic variables and the external and financial channels. This exercise is particularly important for the Flexible group, where the number of country-regime observations is smaller. The large depreciation, inflation response, activity contraction, and associated financial adjustment in Flexible regimes are not driven by a single country.

More Balanced Panel. Fourth, we re-estimate the regime-specific responses over the 2008Q1–2025Q4 period, when coverage of real activity and several financial variables is more balanced across MENAP economies. The main conclusions are unchanged. Crawling regimes continue to display stronger real-side insulation than Fixed regimes, while Flexible regimes still exhibit larger nominal adjustment and weaker activity than Crawling regimes after the first few quarters. The trade and financial channel results also remain broadly consistent with the baseline, supporting the interpretation that the non-monotonic macroeconomic pattern is not an artifact of uneven data coverage in the earlier part of the sample.

Treatment of the COVID-19 Pandemic Period. As a final check, we change how the estimation handles the COVID-19 pandemic. The baseline excludes 2020Q1–2020Q4 from the estimation sample while keeping these observations in the panel to preserve leads and lags around neighboring quarters. Here, we instead retain the period and include a contemporaneous 2020 dummy among the controls. The regime-specific macroeconomic responses and the external and financial-channel patterns remain close to the baseline estimates. This indicates that the main results are not driven by the treatment of the pandemic year.

Taken together, these checks show that the paper's two central findings are robust: exchange-rate flexibility does not generate a monotonic ranking of macroeconomic insulation, and the trade and financial-channel patterns survive alternative groupings, additional interaction controls, an alternative external shock, influential-country concerns, a more balanced panel period, and an alternative treatment of the COVID-19 period.

7 Conclusions

This paper studies the cross-border transmission of U.S. monetary policy shocks to 18 MENAP economies over 1990–2025. Using state-dependent local projections and an extended classification of *de facto* exchange-rate regimes, we document two main results.

First, exchange-rate flexibility provides only partial insulation from U.S. monetary policy shocks. MENAP economies with crawling arrangements are significantly better protected than those with hard pegs, but activity in fully flexible economies contracts significantly, and we find no evidence that it is better insulated than under a fixed exchange rate. This non-monotonic pattern is inconsistent with the view that greater exchange-rate flexibility uniformly improves macroeconomic stabilization.

Second, this does not reflect a breakdown of the exchange rate's traditional role in trade for MENAP economies. Expenditure switching scales monotonically with flexibility, as classical theory predicts. Instead, financial conditions, specifically credit spreads and private credit, adjust most where exchange-rate flexibility is highest, pointing to financial rather than trade channels as the source of the non-monotonicity. These findings are robust to controlling for oil-exporter status and other domestic institutional characteristics, to using an alternative U.S. dollar shock, to excluding individual countries from the sample, to focusing on a more balanced panel period, and to an alternative treatment of the COVID-19 pandemic period. Further work is needed to establish why financial conditions amplify at high flexibility in MENAP economies specifically—for example through the role of external debt currency composition, banking-sector foreign liabilities, or shallow domestic capital markets.

For policymakers in MENAP and other emerging markets, the key message is that exchange-rate flexibility, by itself, is not a sufficient tool for short-run macroeconomic stabilization against external financial shocks. Some flexibility helps, aided by trade adjustment consistent with the classic Mundell-Fleming logic. But high levels of exchange-rate variability appear to hamper financial adjustment following external shocks. So, realizing the stabilization benefits of exchange-rate flexibility in the short run may require complementary policies, such as macro-prudential measures or capital-flow management, that directly address financial-sector volatility. Exchange-rate reform and financial-sector policy should therefore be considered jointly, not in isolation. Importantly though, our findings relate to short-run shock absorption and do not speak to the broader long-run benefits of exchange-rate flexibility documented elsewhere in the literature, including greater monetary policy autonomy, improved external adjustment, and reduced exchange-rate misalignments.

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Appendix

A Data Sources and Variable Construction

A.1 Extending Ilzetzki et al. (2019) Exchange-Rate Regime Classification

The published exchange-rate regime classification of Ilzetzki et al. (2019) (fifteen-category classification) is available at monthly frequency through end-2019. We extend it through 2025Q4 at monthly frequency before collapsing to the quarterly frequency used in estimation. To do so, we apply an operational algorithm in the spirit of Ilzetzki et al. (2019). The extension proceeds in three stages, applied only to country-months for which IRR's own classification is unavailable: (i) direct identification of freely falling episodes; (ii) a set of country-specific overrides based on documented policy chronologies; and (iii) a mechanical statistical fallback for any remaining gaps.

Reference currency. Each country-month is benchmarked against whichever of three candidate anchors—100% USD, a 50/50 USD-EUR basket, or 100% EUR—minimizes the trailing 60-month average absolute monthly change.

Freely falling episodes (Code 14). Freely falling episodes are identified through two channels. First, any month with 12-month CPI inflation above 40% is classified as freely falling. Second, a currency-crash rule flags any month in which the exchange rate depreciates by at least 25% against the U.S. dollar, while accelerating by more than 10 percentage points relative to the prior month's move; this classification is then carried forward for six additional months.

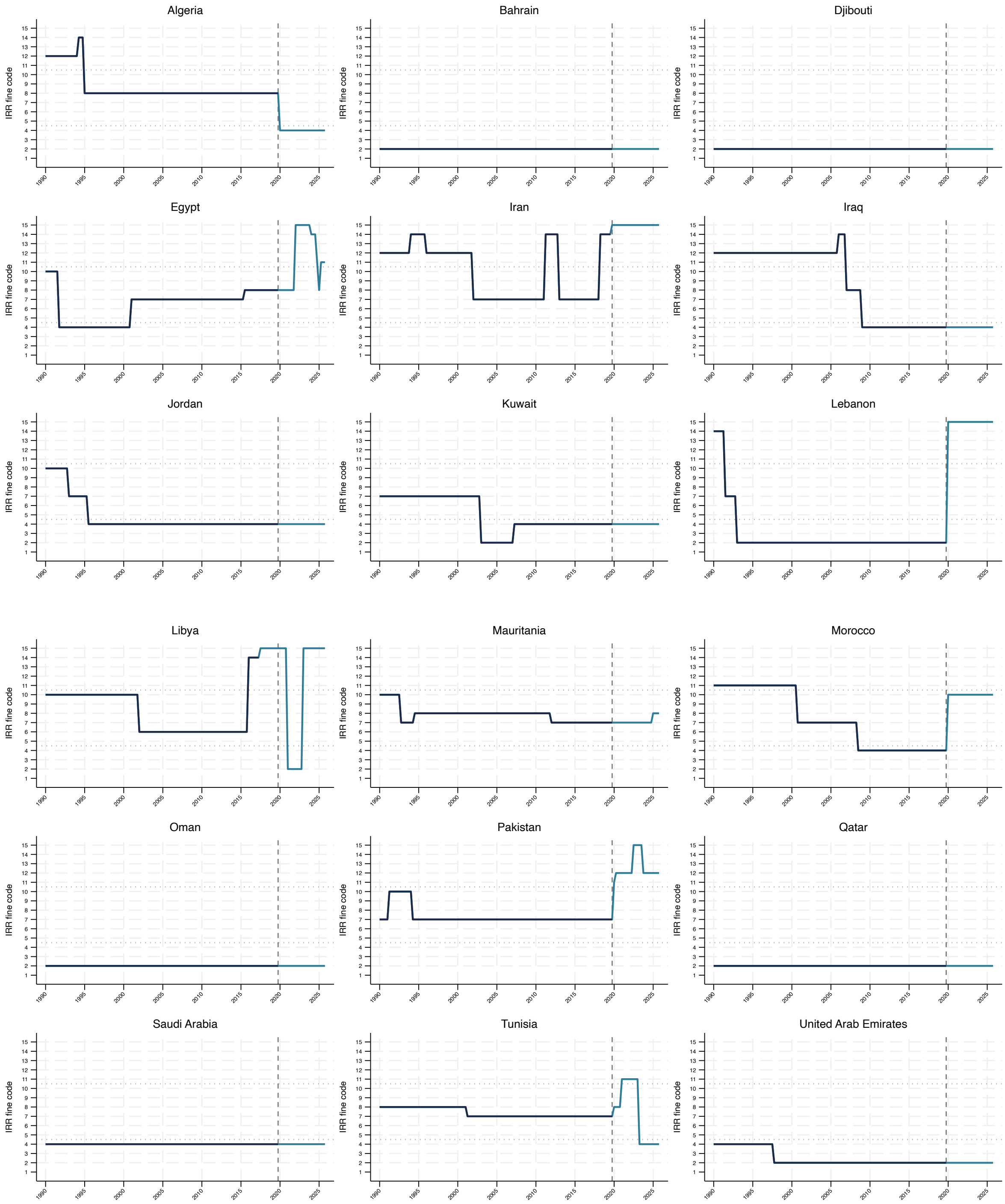
Country-specific overrides. For a small number of countries, we override the classification directly, drawing on documented institutional arrangements or parallel-market chronologies. The Gulf hard-peggers—the United Arab Emirates, Bahrain, Oman, and Qatar, together with Djibouti—are assigned Code 2 (a stable, long-standing U.S. dollar peg). Kuwait, which has maintained an undisclosed weighted-basket peg since May 2007, is assigned Code 4. Morocco's dirham band, widened to ±5% around a disclosed EUR/USD basket rate in March 2020, is coded as a *de facto* band (Code 10) from that date onward. Lebanon and Iran, whose official exchange rates do not reflect genuine price discovery over extended periods, are assigned Code 15 (dual/parallel market, dropped from the estimation sample) throughout the post-2019 extension period. Egypt is coded as a crawling band (Code 8) through January 2022, and as a dual-market episode (Code 15) from February 2022 through March 2024 (spanning persistent central bank intervention, a severe black-market premium, and three step-devaluations that preceded its eventual flotation) after which it is classified by the mechanical fallback described below. Pakistan is coded as a dual-market episode (Code 15) between September 2022 and September 2023, corresponding to an administratively capped interbank rate. Libya alternates between dual-market conditions (Code 15) before January 2021, a unified peg (Code 2) from

January 2021 through December 2022 following a formal SDR-peg devaluation, and dual-market conditions again (Code 15) from January 2023 onward.

Mechanical fallback. Any remaining gaps are filled using rolling monthly statistics computed on the anchor-adjusted exchange-rate series: the share of months within ±1%, ±2%, and ±5% bands, and the share of months in which the currency moves in the same direction (depreciation or appreciation), each computed over a trailing 60-month window. Because a 60-month window reacts slowly to genuine regime changes, we additionally compute the same statistics over a trailing 24-month window, and date the start and end of an episode using whichever window first confirms it, provided the episode is also confirmed by the 60-month window at its core. Countries are classified according to a cascade, from the tightest to the widest band: Code 4 (*de facto* peg) if at least 80% of months fall within ±1% and neither depreciation nor appreciation exceeds 70% persistence (or if the currency has moved by exactly 0% for four consecutive months); Code 7 (*de facto* crawling peg) if the same ±1% band condition holds alongside at least 70% persistence in one direction; Code 8 (*de facto* crawling band) under the analogous conditions for a ±2% band; Code 11 (moving band) for a ±2% band with no persistence requirement; and Code 10 (*de facto* band) if all months fall within ±5%. Any country-month not classified by this band cascade is assigned Code 12 (managed floating) or Code 13 (freely floating), depending on whether a float index—the average absolute monthly move scaled by the inverse of the tight-band share—falls below, or is equal to or above a cutoff of 8.

Aggregation to quarterly frequency. The monthly extended classification is collapsed to quarterly frequency by taking the classification of the last month of each quarter. The resulting extended classification of exchange-rate regimes for the 18 MENAP economies in our sample is summarized in Figure A1. The figure highlights the heterogeneity of exchange-rate regimes across MENAP countries, as well as the evolution of regimes over time.

Figure A1: Extended Exchange-Rate Classification for MENAP Economies (1990–2025)



Notes: Each panel plots one of the 18 MENAP economies in our sample, showing the fine (fifteen-category) exchange-rate regime classification of Ilzetzki et al. (2019) at quarterly frequency, 1990Q1–2025Q4. The darker line shows IRR's own published classification, available through 2019Q4; the lighter line shows our extension, which follows the published series exactly where available and continues it from 2020Q1 onward using the algorithm described above (vertical dashed line marks the 2019Q4 cutoff). Horizontal dotted lines at codes 4 and 10 mark the boundaries of the Fixed/Crawling/Flexible groups summarized in Table 1.

A.2 Data Sources and Transformations

Macro Aggregates. Domestic real GDP is from two sources: real GDP in domestic currency (IMF country desks) and real GDP in USD (CEIC). For each country, we use whichever series has more non-missing observations. Nominal GDP is also used to construct GDP shares for the balance-of-payments and financial variables described below. Where source data are not already seasonally adjusted, we seasonally adjust the series ourselves, regressing log GDP on a full set of calendar-quarter dummies for each country and adding the regression residual back to the country mean. In the local projections, activity enters in log real GDP, so impulse responses are interpreted as cumulative percent deviations relative to the pre-shock quarter.

Prices and Exchange Rates. The domestic consumer price index (2010=100) and the nominal exchange rate (domestic currency per USD) are both drawn from the IMF's International Financial Statistics (IFS). We work with log CPI and log exchange rates in the local projections. Inflation responses are measured as year-on-year log changes in the CPI, and are reported in percentage points. Exchange-rate responses are reported as percent changes in the domestic-currency price of one U.S. dollar relative to the pre-shock quarter; positive values therefore correspond to a depreciation against the U.S. dollar.

Interest Rates and Financial Variables. The domestic overnight interest rate is aggregated from a CEIC-sourced monthly series to quarterly-average values. Sovereign credit spreads are EMBIG spreads, converted to percentage points and averaged at quarterly frequency. Foreign-exchange reserves are IMF IFS reserves excluding gold, specifically the foreign-exchange component. Credit to the private sector is drawn from IMF IFS Other Depository Corporations Survey data.

External Balance and Capital Flows. The trade balance, goods exports (free on board), and goods imports (cost-insurance-freight) are all IMF IFS International Merchandise Trade Statistics series, denominated in USD and expressed as a share of GDP in estimation. Gross capital inflows and outflows are constructed from IMF Balance of Payments statistics as the sum of the liability- and asset-side financial-account flows, respectively: inflows sum net incurrence of liabilities across direct, portfolio, and other investment; outflows sum net acquisition of assets across the same three categories. Portfolio inflows and outflows are the corresponding portfolio-investment-only liability and asset flows.

Global and U.S. controls. The global oil price (Brent crude, USD/barrel) and the VIX are both from FRED. U.S. controls—CPI inflation, industrial production, the Federal Funds rate, and the Chicago Fed's Adjusted National Financial Conditions Index—are also FRED series; the S&P 500 is from Datastream, the U.S. excess bond premium follows Gilchrist and Zakrajšek (2012), and the U.S. shadow rate follows Wu and Xia (2016). The emerging markets and developing economies (EMDEs) and MENAP-specific GDP factors used in the dollar-shock specification (Section 3.1) are each a one-factor dynamic-factor model with AR(1) dynamics, which we estimate over a broad EMDE panel and over our MENAP country panel, respectively.[9]

Classification and Heterogeneity Variables. The exchange-rate regime classification is our extension of Ilzetzki et al. (2019), described in Section 2.1 and Appendix A.1. The central bank independence index averages three sub-indices from Romelli (2022) (Monetary Policy Formulation, Policy Rate Authority, and Statutory Goals). Capital account openness follows the normalized Chinn and Ito (2006) index. External debt is total external debt as a share of GDP, and public debt is general government gross debt as a share of GDP, all from the IMF World Economic Outlook. Oil-exporter status is defined annually using the IMF World Economic Outlook oil trade balance as a share of GDP. The reserves robustness variable is the same foreign-exchange reserves series scaled by broad money.

[9]Each factor is a one-factor dynamic-factor model with AR(1) dynamics, estimated on seasonally-adjusted real GDP growth. The MENAP-specific factor is estimated over the 18-country panel. The broader EMDE factor follows Obstfeld and Zhou (2023)'s 59-country sample.

Table A1: Domestic Variables Coverage By Country

Country	Inflation	Exchange rate	Policy rate	Activity	Trade balance	Exports	Imports	Private credit	Credit spread	Cap. inflows	Port. inflows	Cap. outflows	Port. outflows
Algeria	1990Q1	1990Q1	1990Q1	2002Q3	1990Q1	1990Q1	1990Q1	2001Q4	—	—	—	2021Q1	2021Q1
Bahrain	1990Q1	1990Q1	2007Q1	2008Q1	1990Q1	1990Q1	1990Q1	—	2003Q1	2011Q1	2011Q1	2011Q1	2011Q1
Djibouti	1999Q3	1990Q1	—	—	1990Q1	1990Q1	1990Q1	2002Q4	—	2019Q1	2019Q1	—	2019Q1
Egypt	1990Q1	1990Q1	1991Q1	2002Q2	1990Q1	1990Q1	1990Q1	2001Q4	2001Q3	2011Q1	2011Q1	2011Q1	2011Q1
Iran	1990Q1	1990Q1	—	2004Q2	1990Q1	1990Q1	1990Q1	—	—	—	—	—	—
Iraq	2007Q1	1990Q1	2004Q3	2008Q4	1990Q1	1990Q1	1990Q1	2004Q4	2006Q1	2013Q1	2013Q1	2013Q1	2013Q1
Jordan	1990Q1	1990Q1	1990Q1	1992Q1	1990Q1	1990Q1	1990Q1	2014Q4	2011Q1	1990Q1	1990Q1	1990Q1	1990Q1
Kuwait	1990Q1	1990Q1	1990Q1	2010Q1	1990Q1	1990Q1	1990Q1	2001Q4	2004Q4	2015Q1	2015Q1	2015Q1	2015Q1
Lebanon	2008Q1	1990Q1	1990Q1	2012Q1	1990Q1	1990Q1	1990Q1	—	2000Q1	2002Q1	2002Q1	2002Q1	2002Q1
Libya	2001Q1	1990Q1	—	—	1990Q1	1990Q1	1990Q1	2014Q4	—	—	—	—	—
Mauritania	1990Q1	1990Q1	2006Q1	—	1990Q1	1990Q1	1990Q1	2012Q1	—	2012Q1	2012Q1	2012Q1	2012Q1
Morocco	1990Q1	1990Q1	1995Q2	1998Q3	1990Q1	1990Q1	1990Q1	2001Q4	2000Q1	2003Q1	2003Q1	2003Q1	2003Q1
Oman	2001Q1	1990Q1	2007Q2	2010Q1	1990Q1	1990Q1	1990Q1	2001Q4	2011Q1	—	—	—	—
Pakistan	1990Q1	1990Q1	2015Q2	2015Q3	1990Q1	1990Q1	1990Q1	2001Q4	2001Q2	1990Q1	1990Q1	1990Q1	1990Q1
Qatar	2003Q1	1990Q1	2003Q1	2010Q1	1990Q1	1990Q1	1990Q1	2001Q4	2001Q4	2011Q1	2011Q1	2011Q1	2011Q1
Saudi Arabia	1990Q1	1990Q1	1992Q1	2010Q3	1990Q1	1990Q1	1990Q1	2022Q1	2005Q1	2008Q1	2008Q1	2006Q1	2006Q1
Tunisia	1990Q1	1990Q1	2000Q1	2000Q1	1990Q1	1990Q1	1990Q1	2001Q4	2002Q2	2018Q1	2018Q1	2018Q1	2018Q1
UAE	2007Q1	1990Q1	2007Q4	2012Q1	1990Q1	1990Q1	1990Q1	2001Q4	2004Q1	—	—	—	—

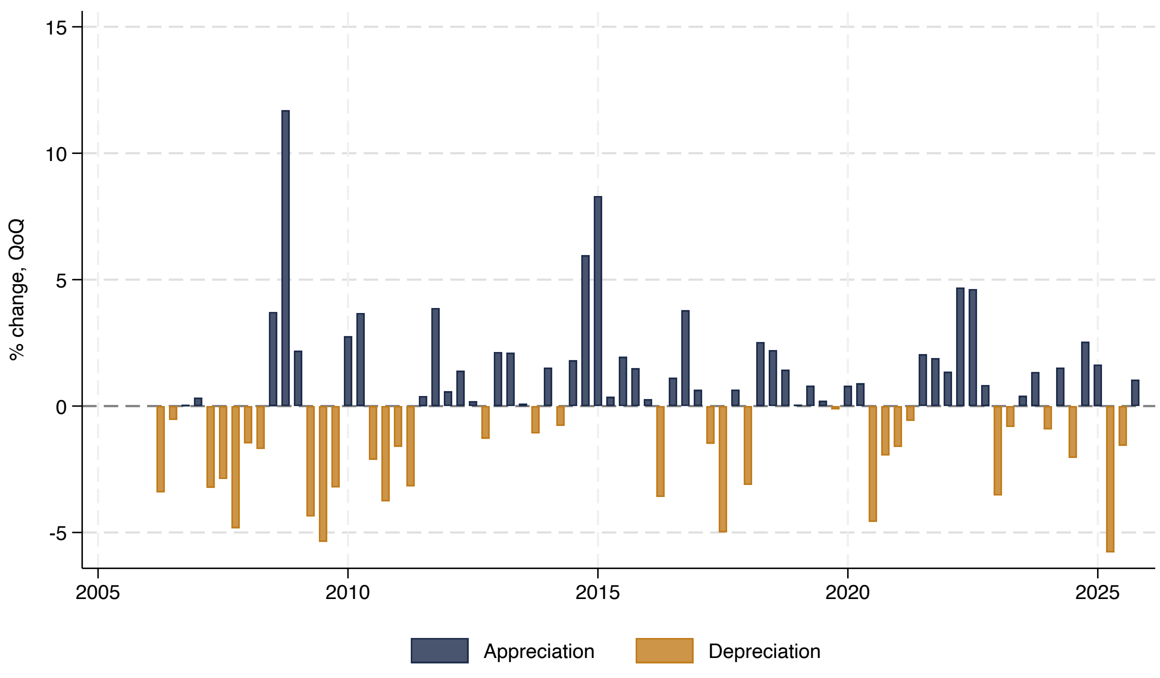
Notes: For each variable and country, the table reports the start quarter of the first non-missing observation used in the estimation sample; '—' indicates that the variable is not available for that country.

A.3 Broad Dollar Shock

Our robustness shock is the quarter-over-quarter percent change in the Federal Reserve's Nominal Advanced Foreign Economies U.S. Dollar Index (FRED: DTWEXAFEGS), a trade-weighted index of the U.S. dollar against a basket of advanced-economy currencies (euro, Japanese yen, Canadian dollar, UK pound sterling, Swiss franc, Australian dollar and Swedish krona). Following the identification logic of Obstfeld and Zhou (2023), we treat broad dollar movements against advanced-economy currencies as plausibly exogenous to individual MENAP economies, conditional on the extensive set of global controls described in Section 3.1. These controls include contemporaneous and lagged values of global oil prices, the VIX, U.S. CPI inflation, U.S. industrial production, the Wu and Xia (2016) shadow rate, the Chicago Fed's Adjusted National Financial Conditions Index, and both the broad EMDE and MENAP-specific GDP factors. In estimation, the raw quarterly percent change is rescaled to a per-10%-appreciation unit.

Figure A2 plots the resulting quarterly series, distinguishing broad-dollar appreciations (positive values) from depreciations (negative values).

Figure A2: Quarterly Broad U.S. Dollar Appreciation (1990Q1–2025Q4)



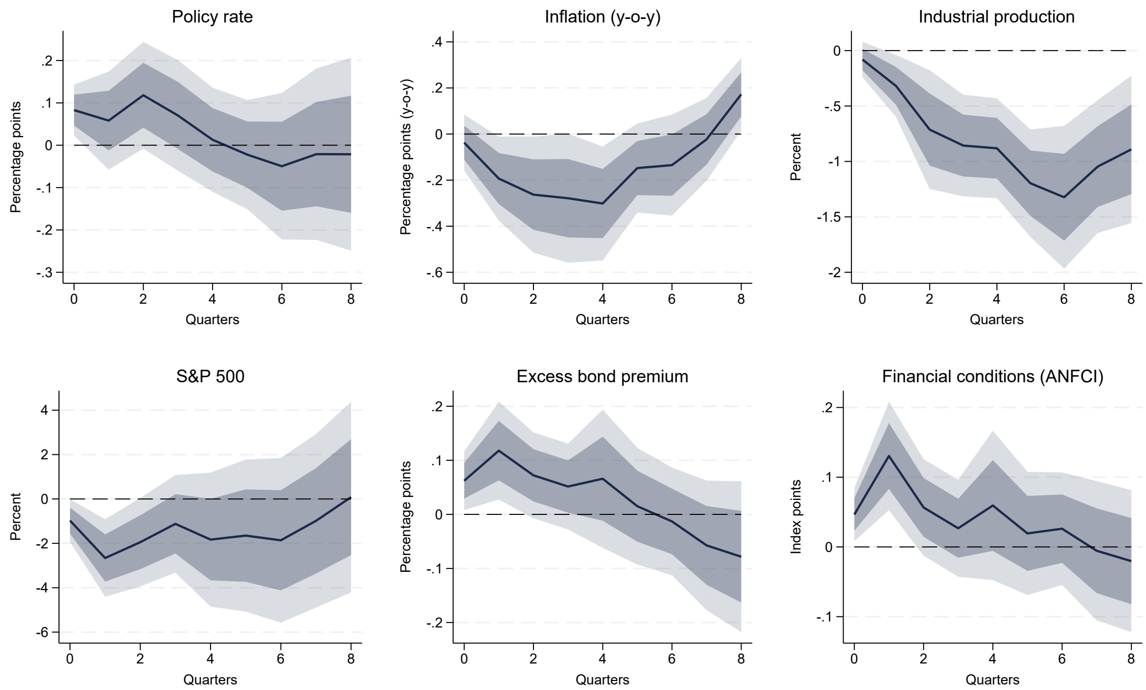
Notes: This figure plots the quarterly percent change in the Nominal Advanced Foreign Economies U.S. Dollar Index (FRED: DTWEXAFEGS). Positive values indicate a broad-dollar appreciation; negative values indicate a depreciation.

B Additional Empirical Results

B.1 Impact of U.S. Monetary Surprise on U.S. Outcomes

Figure B1 confirms that the Bauer and Swanson (2023) surprise behaves like a contractionary U.S. monetary policy shock. Industrial production contracts significantly and persistently, falling by close to 1.3% at its trough around the fifth quarter before partially recovering. Inflation declines significantly over the first two years, troughing at around −0.3 percentage points four quarters after the shock, before rising back above zero by the end of the horizon. The policy rate response rises modestly on impact, before drifting toward zero. Financial conditions tighten on impact and remain significantly tighter for much of the first year and a half. The excess bond premium and the Chicago Fed's Adjusted National Financial Conditions Index both rise significantly, while the S&P 500 falls. Together, these responses validate the interpretation of the shock used in the main analysis as a tightening in U.S. monetary and financial conditions.

Figure B1: Impulse Response Functions of U.S. Variables to a U.S. Monetary Policy Shock



Notes: The figure presents the impulse responses of key U.S. macroeconomic and financial variables to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections. Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on HAC standard errors.

B.2 Average Spillovers to MENAP Economies

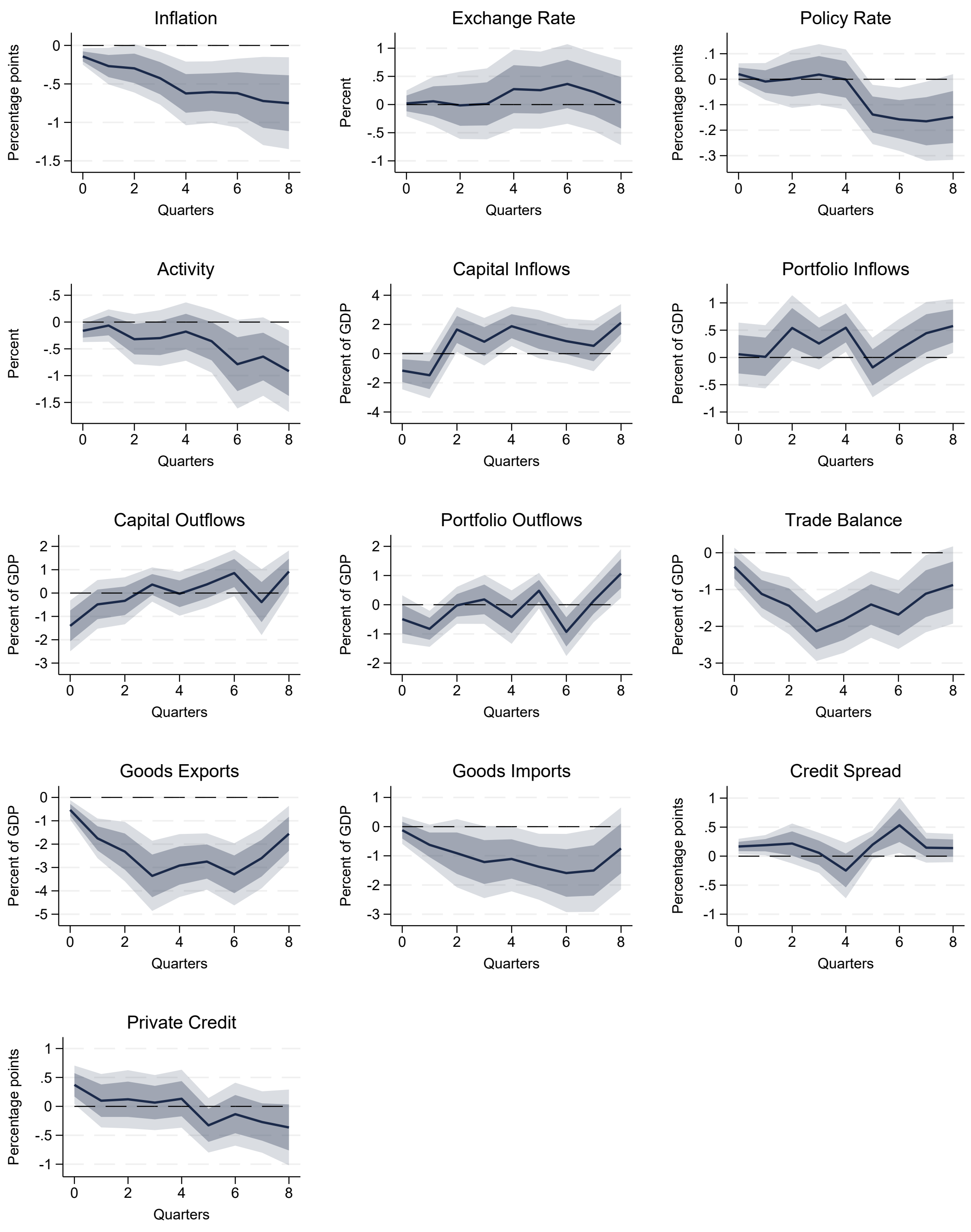
Figure B2 presents the estimated impulse responses for 13 domestic, external, and financial variables to a one-standard-deviation surprise tightening in U.S. monetary policy, averaged across all MENAP economies in our sample.

The figure shows that the contractionary macroeconomic effects documented in Section 4.1 extend to the broader set of outcomes. Inflation and real activity decline persistently after the shock, while the average exchange-rate and policy-rate responses are more muted. The external-balance responses point to weaker trade performance on average: the trade balance deteriorates, goods exports fall sharply, and goods imports also decline. This pattern is consistent with the shock weighing on external demand for MENAP exports while also compressing domestic demand for imports.

Cross-border flows show a short-run contraction followed by normalization: capital and portfolio inflows fall on impact before rebounding, while capital and portfolio outflows also decline initially and then recover later in the horizon.

Domestic financial conditions weaken more gradually. Private credit declines after the first year, while credit spreads move only modestly on average, with a temporary increase around the sixth quarter. Taken together, the average responses indicate that U.S. monetary tightening transmits to MENAP economies through trade, capital-flow, and domestic financial channels, even before conditioning on exchange-rate regimes.

Figure B2: Average Responses of MENAP Economies to a U.S. Monetary Policy Shock



Notes: The figure presents the average impulse responses of key MENAP variables to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections. Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

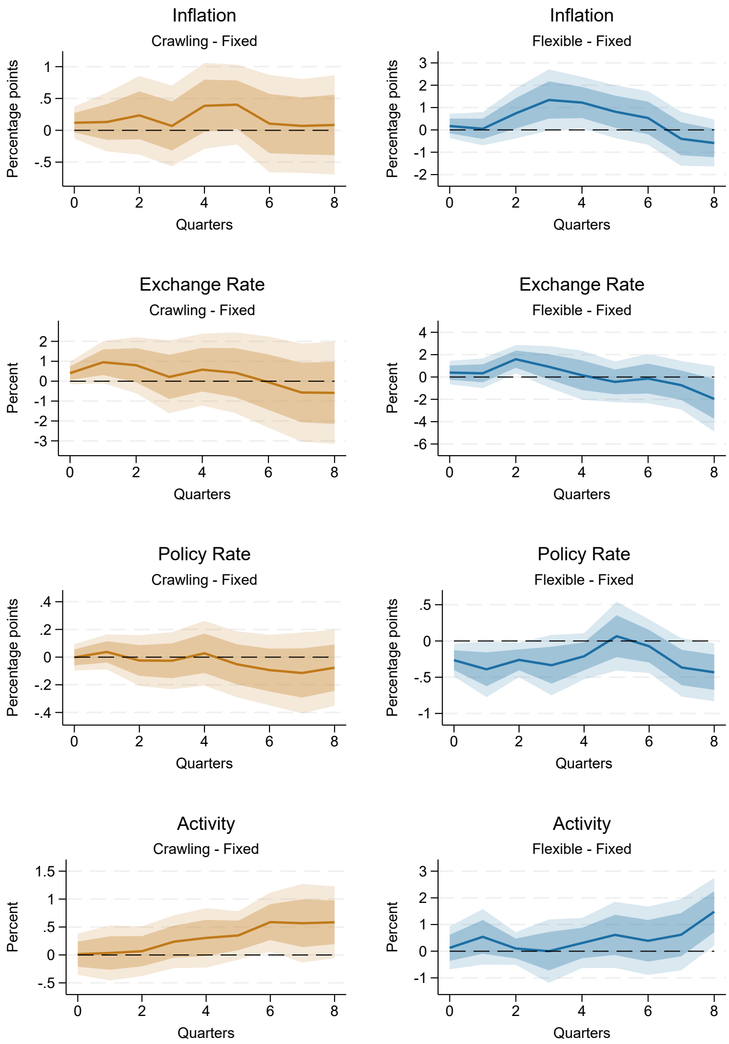
B.3 Differential Responses Relative to the Fixed Regime

Differentials on macroeconomic variables. Figure B3 reports the differential responses of Crawling and Flexible regimes relative to the Fixed-regime benchmark, estimated directly using specification (2). This exercise is useful because it asks whether the differences visible in the regime-specific impulse responses in Section 4.2 are statistically distinguishable from the response under Fixed regimes, rather than simply comparing the significance of each group response separately.

For Crawling regimes, the differential estimates point to stronger insulation of real activity relative to Fixed regimes. The Crawling-Fixed activity differential is small and statistically insignificant on impact, but turns positive and statistically significant from around the fifth quarter onward. By contrast, the Crawling-Fixed differentials for inflation, the exchange rate, and the policy rate are not statistically significant over the two-year horizon. This pattern suggests that medium-flexibility regimes do not differ from Fixed regimes because they engineer a sharply different exchange-rate or inflation response; rather, they appear to experience a milder real-activity contraction at longer horizons.

For Flexible regimes, the differential evidence is strongest for nominal variables at short and medium horizons. The Flexible-Fixed exchange-rate differential is positive and statistically significant around the first few quarters, and the inflation differential is significantly positive around the one-year horizon, consistent with the larger depreciation and inflation response documented in Section 4.2. The policy-rate differential is significantly negative on impact, reflecting the stronger immediate increase in policy rates under Fixed regimes.

Figure B3: Differential Responses of Macroeconomic Variables in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime

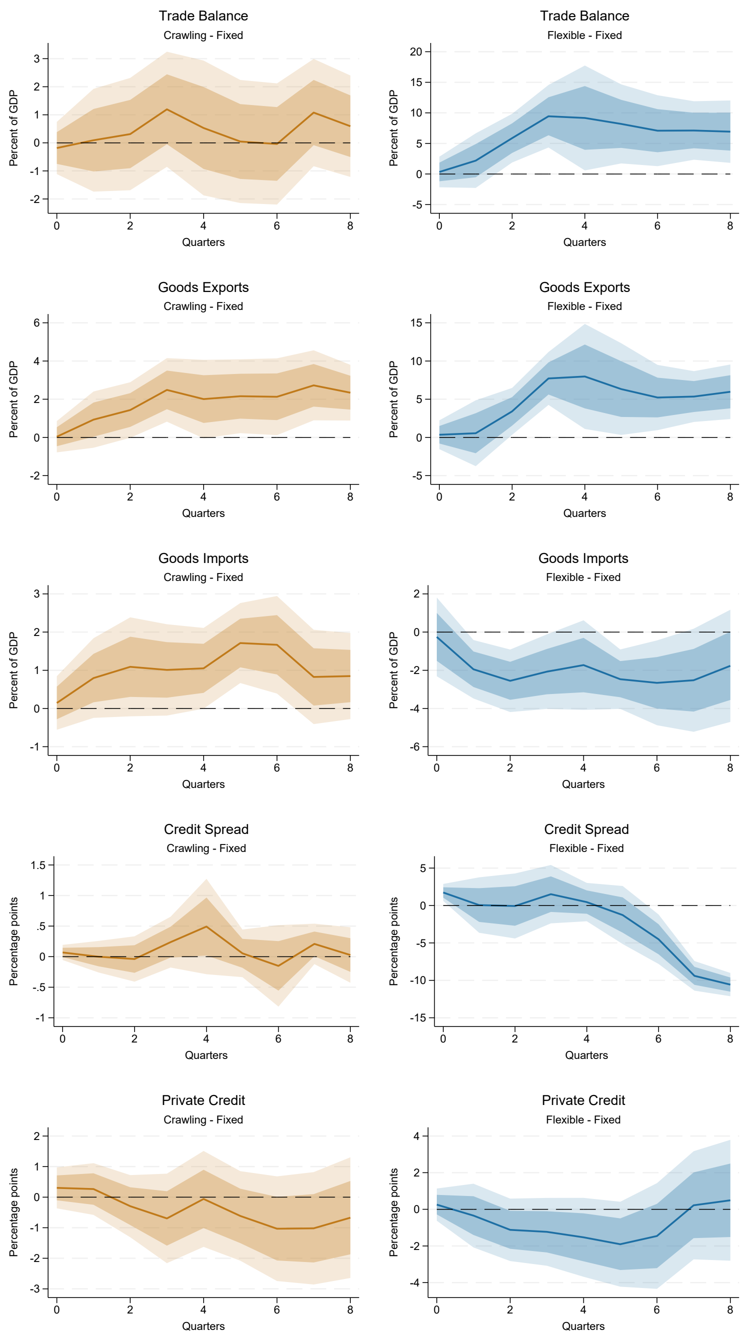


Notes: The figure presents the differences in responses of macroeconomic variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using the state-dependent local projections in Equation (2). The lines represent the responses conditional on the exchange-rate regime with respect to the Fixed regime: Crawling vs. Fixed (orange), and Flexible vs. Fixed (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

Differentials on external and financial variables. Figure B4 reports the differential responses for external balances and financial variables of Crawling and Flexible regimes relative to the Fixed-regime benchmark. These estimates reinforce the interpretation in Section 5. On the trade side, the evidence is strongly consistent with exchange-rate adjustment supporting external rebalancing. The Flexible-Fixed trade-balance differential is positive and statistically significant from around the third quarter onward, reflecting both stronger goods exports and weaker goods imports relative to Fixed regimes. The Crawling-Fixed differentials are more muted for the overall trade balance. For Crawling regimes, goods exports are higher than under Fixed regimes, while goods imports are also higher, consistent with milder domestic-demand compression rather than a stronger expenditure-switching response. Thus, the differential estimates confirm that the trade channel does not explain the weaker macroeconomic performance of Flexible regimes; if anything, the Flexible-regime trade response is more favorable than under Fixed regimes.

The financial variables point to a less benign role for high exchange-rate flexibility, though the pattern is not a simple persistent tightening. The Flexible-Fixed credit-spread differential is positive at short horizons but then turns sharply negative after the first year. Private credit, however, falls more in Flexible regimes over the middle of the horizon, before recovering toward zero. By contrast, Crawling-Fixed differentials for credit spreads and private credit are small and mostly statistically insignificant. Taken together, the additional differentials support the main conclusion that exchange-rate flexibility facilitates trade adjustment, while the macroeconomic costs of high flexibility are more closely associated with financial quantities and broader financial volatility.

Figure B4: Differential Responses of External and Financial Variables in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime



Notes: The figure presents the differences in responses of additional variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using the state-dependent local projections in Equation (2). The lines represent the responses conditional on the exchange-rate regime with respect to the Fixed regime: Crawling vs. Fixed (orange), and Flexible vs. Fixed (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

B.4 Tabulated Headline Impulse Responses

Tables B1 and B2 report the coefficients underlying the headline macroeconomic impulse responses in Figures 4 and 5. The tabulated estimates provide the point estimates and 90% confidence intervals for each horizon, both for the average response and for the regime-specific responses under Fixed, Crawling, and Flexible exchange-rate regimes.

Table B1: Tabulated Headline Responses: Inflation and Exchange Rate

Horizon	Average	Fixed	Crawling	Flexible
Inflation				
$h = 0$	-0.14***	-0.19***	-0.04	0.09
	[-0.25, -0.04]	[-0.30, -0.08]	[-0.18, 0.10]	[-0.36, 0.54]
$h = 1$	-0.27**	-0.27**	-0.11	-0.20
	[-0.51, -0.03]	[-0.52, -0.02]	[-0.34, 0.12]	[-0.80, 0.40]
$h = 2$	-0.30*	-0.36**	-0.11	0.45
	[-0.61, 0.02]	[-0.69, -0.03]	[-0.45, 0.24]	[-0.56, 1.47]
$h = 3$	-0.43***	-0.50***	-0.29*	0.66
	[-0.77, -0.08]	[-0.90, -0.10]	[-0.68, 0.11]	[-0.64, 1.96]
$h = 4$	-0.62***	-0.78***	-0.35*	0.49
	[-1.04, -0.21]	[-1.28, -0.28]	[-0.75, 0.04]	[-0.65, 1.63]
$h = 5$	-0.61***	-0.68***	-0.43*	0.14
	[-1.01, -0.21]	[-1.11, -0.26]	[-0.87, 0.01]	[-1.13, 1.41]
$h = 6$	-0.62***	-0.62***	-0.56**	-0.62
	[-1.07, -0.17]	[-1.09, -0.15]	[-1.08, -0.03]	[-2.01, 0.78]
$h = 7$	-0.72***	-0.74***	-0.62*	-1.61**
	[-1.29, -0.15]	[-1.21, -0.28]	[-1.31, 0.08]	[-3.10, -0.12]
$h = 8$	-0.75***	-0.78***	-0.58*	-2.06***
	[-1.35, -0.15]	[-1.27, -0.28]	[-1.30, 0.14]	[-3.55, -0.57]
Exchange Rate				
$h = 0$	0.02	-0.01	0.14	0.61
	[-0.21, 0.25]	[-0.27, 0.26]	[-0.34, 0.62]	[-0.44, 1.67]
$h = 1$	0.06	-0.12	0.58*	0.44
	[-0.38, 0.49]	[-0.57, 0.33]	[-0.32, 1.48]	[-0.94, 1.83]
$h = 2$	-0.01	-0.12	0.30	1.90***
	[-0.61, 0.58]	[-0.72, 0.47]	[-0.81, 1.41]	[0.53, 3.27]
$h = 3$	0.01	-0.03	0.02	1.18*
	[-0.62, 0.64]	[-0.76, 0.71]	[-1.08, 1.12]	[-0.59, 2.96]
$h = 4$	0.27	0.03	0.51	0.38
	[-0.43, 0.97]	[-0.76, 0.81]	[-0.63, 1.65]	[-1.40, 2.15]
$h = 5$	0.26	0.06	0.66	-0.75
	[-0.43, 0.94]	[-0.71, 0.83]	[-0.45, 1.77]	[-2.53, 1.04]
$h = 6$	0.37	0.33	0.57	-0.28
	[-0.34, 1.07]	[-0.48, 1.15]	[-0.59, 1.73]	[-2.62, 2.06]
$h = 7$	0.22	0.28	-0.02	-0.77
	[-0.47, 0.91]	[-0.62, 1.19]	[-1.10, 1.05]	[-3.16, 1.63]
$h = 8$	0.03	0.23	-0.17	-1.74
	[-0.72, 0.78]	[-0.72, 1.17]	[-1.32, 0.97]	[-4.92, 1.45]

Notes: The table reports impulse-response coefficients corresponding to Figures 4 and 5. The Average column is estimated from the pooled average-response specification; regime-specific columns are estimated from Equation (1). Brackets report 90% confidence intervals based on Driscoll and Kraay (1998) standard errors. *, **, and *** denote significance at the 32, 10 and 5 percent levels, respectively.

Table B2: Tabulated Headline Responses: Policy Rate and Activity

Horizon	Average	Fixed	Crawling	Flexible
Policy Rate				
$h = 0$	0.02	0.04*	0.01	-0.13*
	[-0.02, 0.06]	[-0.01, 0.09]	[-0.04, 0.07]	[-0.34, 0.07]
$h = 1$	-0.01	0.03	0.02	-0.29*
	[-0.08, 0.06]	[-0.05, 0.11]	[-0.06, 0.10]	[-0.58, 0.00]
$h = 2$	0.00	0.05	0.01	-0.11
	[-0.11, 0.12]	[-0.05, 0.15]	[-0.12, 0.15]	[-0.32, 0.10]
$h = 3$	0.02	0.05	0.02	-0.25*
	[-0.10, 0.14]	[-0.07, 0.16]	[-0.15, 0.18]	[-0.57, 0.07]
$h = 4$	0.00	0.02	0.02	-0.26*
	[-0.12, 0.12]	[-0.09, 0.13]	[-0.16, 0.21]	[-0.59, 0.08]
$h = 5$	-0.14**	-0.11*	-0.11*	-0.25*
	[-0.25, -0.02]	[-0.25, 0.02]	[-0.27, 0.05]	[-0.65, 0.16]
$h = 6$	-0.16***	-0.15**	-0.14*	-0.49***
	[-0.28, -0.03]	[-0.29, 0.00]	[-0.31, 0.03]	[-0.83, -0.15]
$h = 7$	-0.17**	-0.17*	-0.17*	-0.78***
	[-0.32, -0.01]	[-0.34, 0.01]	[-0.38, 0.04]	[-1.20, -0.36]
$h = 8$	-0.15*	-0.17*	-0.12*	-0.98***
	[-0.32, 0.02]	[-0.35, 0.01]	[-0.31, 0.06]	[-1.42, -0.53]
Activity				
$h = 0$	-0.16*	-0.24*	-0.02	-0.54*
	[-0.37, 0.05]	[-0.52, 0.04]	[-0.27, 0.22]	[-1.26, 0.17]
$h = 1$	-0.07	-0.17	0.00	0.07
	[-0.37, 0.24]	[-0.55, 0.21]	[-0.34, 0.34]	[-0.65, 0.78]
$h = 2$	-0.32*	-0.43*	-0.13	-1.19***
	[-0.79, 0.15]	[-0.93, 0.07]	[-0.62, 0.35]	[-1.87, -0.51]
$h = 3$	-0.30	-0.50*	0.06	-1.27*
	[-0.82, 0.22]	[-1.11, 0.10]	[-0.39, 0.52]	[-2.80, 0.27]
$h = 4$	-0.18	-0.26	0.08	-1.68***
	[-0.72, 0.37]	[-0.91, 0.39]	[-0.49, 0.65]	[-2.94, -0.42]
$h = 5$	-0.36*	-0.57*	-0.03	-1.72***
	[-0.94, 0.23]	[-1.20, 0.06]	[-0.60, 0.55]	[-2.96, -0.48]
$h = 6$	-0.79*	-1.06**	-0.31	-2.37***
	[-1.61, 0.04]	[-2.06, -0.07]	[-0.99, 0.37]	[-3.94, -0.80]
$h = 7$	-0.64*	-0.89*	-0.16	-1.84***
	[-1.38, 0.09]	[-1.81, 0.04]	[-0.72, 0.40]	[-2.92, -0.75]
$h = 8$	-0.92**	-1.26***	-0.45*	-1.29**
	[-1.68, -0.15]	[-2.18, -0.33]	[-1.06, 0.15]	[-2.42, -0.16]

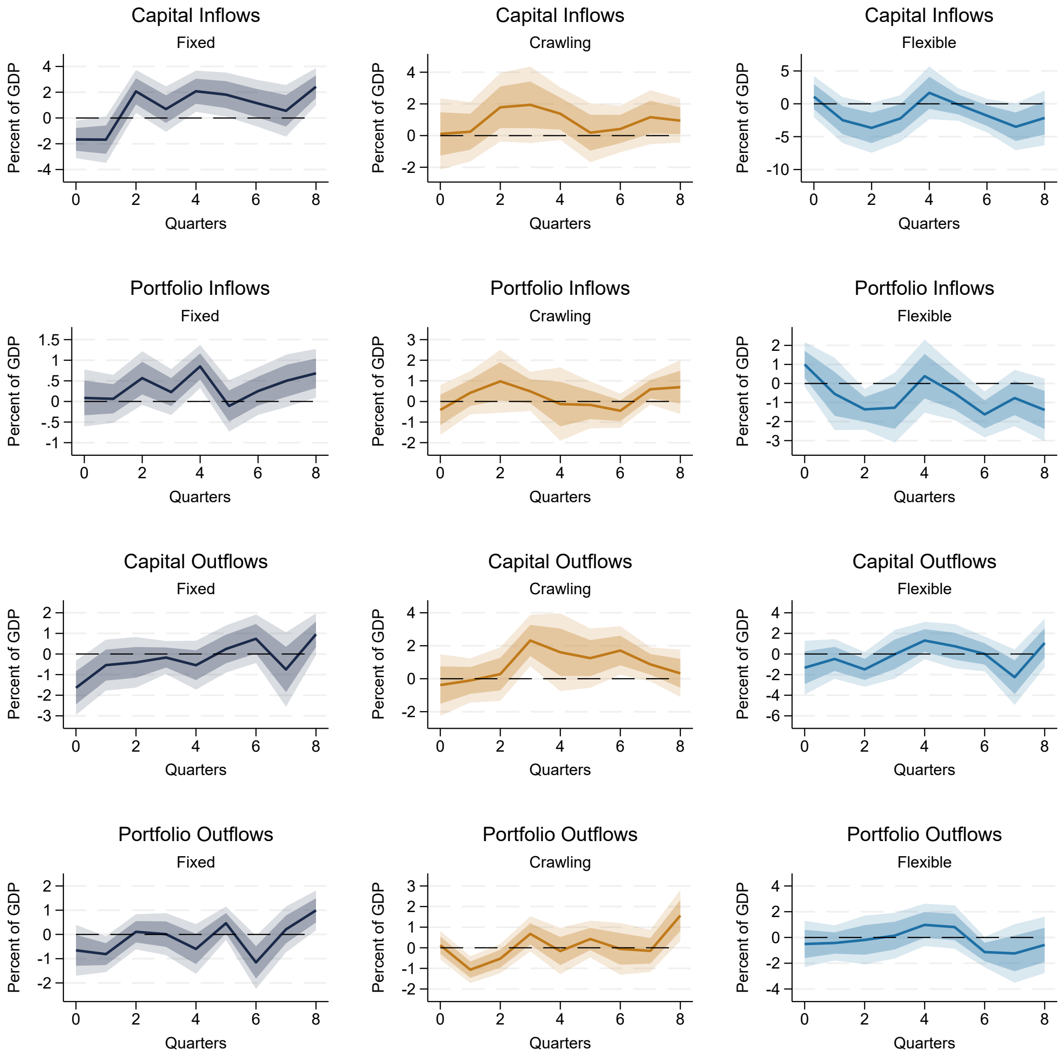
Notes: The table reports impulse-response coefficients corresponding to Figures 4 and 5. The Average column is estimated from the pooled average-response specification; regime-specific columns are estimated from Equation (1). Brackets report 90% confidence intervals based on Driscoll and Kraay (1998) standard errors. *, **, and *** denote significance at the 32, 10 and 5 percent levels, respectively.

B.5 Regime-Specific Responses of Cross-Border Flows

Section 5 discusses the regime-specific responses of external balances and domestic financial conditions shown in Figures 6 and 7. Those results help rationalize the non-monotonic activity responses documented in Section 4.2: trade responses are broadly consistent with the exchange rate acting as a shock absorber, while domestic credit conditions adjust more strongly under high exchange-rate flexibility. Figure B5 complements that discussion by reporting the corresponding responses of cross-border capital and portfolio flows to a one-standard-deviation surprise tightening in U.S. monetary policy.

The flow responses show adjustment in gross cross-border positions even when the exchange rate itself is constrained. Fixed-regime economies experience an initial decline in capital outflows and a subsequent rebound in capital inflows. Crawling-regime economies display relatively contained flow responses, with inflows and outflows moving only modestly over most horizons. Flexible-regime economies experience larger short-run reversals, especially in capital inflows, and the estimates remain more volatile over the horizon. Overall, the flow responses support the broader conclusion that exchange-rate flexibility facilitates trade adjustment, but high flexibility is also associated with less stable financial adjustment.

Figure B5: Heterogeneous Responses of Cross-Border Flows in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime



Notes: The figure presents the heterogeneous impulse responses of cross-border flows in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

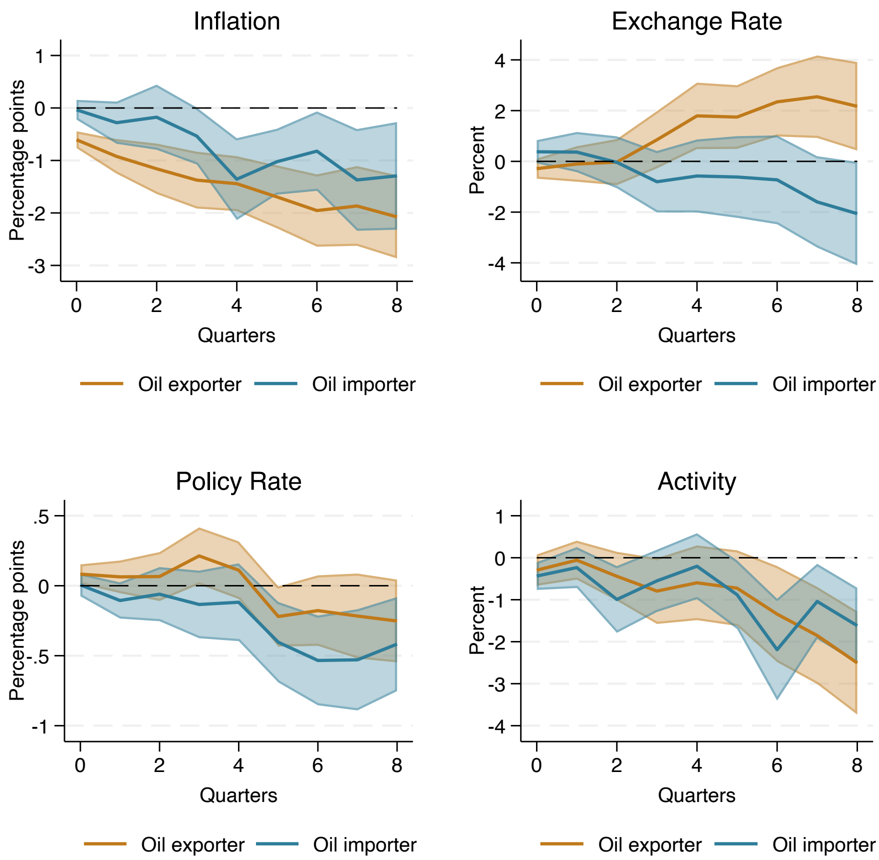
B.6 Robustness: Macroeconomic Responses

B.6.1 Robustness to Other Domestic Institutional Features

As a first check, we condition the response to the U.S. monetary policy shock on oil-exporter status rather than on exchange-rate regime. Oil status is a natural concern in the MENAP sample because the region contains several large hydrocarbon exporters, many of which also maintain relatively stable exchange-rate arrangements. Figure B6 shows that the oil-status split does not reproduce the regime-specific pattern documented in Section 4.2. Both oil exporters and oil importers experience declining inflation and weaker activity after the shock, and the confidence bands overlap for most macroeconomic outcomes.

The clearest difference across oil groups is in the exchange-rate response. Oil exporters depreciate against the U.S. dollar after the shock, while oil importers display a more muted and eventually opposite exchange-rate response. This is consistent with U.S. monetary tightening reducing global demand and weighing on oil-linked external receipts. However, the responses of inflation, policy rates, and activity are much less differentiated across oil status than across exchange-rate regimes. This suggests that the baseline regime results are not simply capturing the distinction between oil exporters and oil importers.

Figure B6: Heterogeneous Responses of Macroeconomic Variables in MENAP Economies to a U.S. Monetary Policy Shock by Oil Status



Notes: The figure presents the heterogeneous impulse responses of macroeconomic variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for oil status. The two lines represent the responses conditional on oil status: Oil Exporters (orange) and Oil Importers (blue). Shaded areas represent 90% confidence intervals based on Driscoll and Kraay (1998) standard errors.

To further test whether the differential responses of macroeconomic variables from Appendix B.3 survive controlling for plausible confounders, we augment Equation 2 with an additional shock interaction capturing one domestic characteristic at a time:

$$\begin{aligned} y_{i,t+h} - y_{i,t-1} = \alpha_i &+ \delta_h^{crawl}\big(S_t \times Crawl_{i,t-1}\big) + \delta_h^{flex}\big(S_t \times Flex_{i,t-1}\big) \\ &+ \lambda_h^{crawl} Crawl_{i,t-1} + \lambda_h^{flex} Flex_{i,t-1} + \kappa_h (S_t \times Z_{i,t-1}) \\ &+ \sum_{l=1}^{4} \xi_l^h L_l(Z_{i,t-1}) + \sum_{l=1}^{4} \gamma_l^h L_l(y_{i,t}) + \sum_{l=1}^{4} \boldsymbol{\psi}_l^h \mathbf{C}_{i,t-l} + \mu_t + \varepsilon_{i,t+h} \end{aligned} \tag{B1}$$

Here $Z_{i,t-1}$ denotes the lagged domestic characteristic included as a competing channel. For continuous characteristics, $Z_{i,t-1}$ is the lagged value standardized to have mean zero and unit variance in the estimation sample. For binary characteristics, such as oil-exporter status, $Z_{i,t-1}$ is the lagged indicator itself. We consider one competing characteristic at a time: capital account openness, central bank independence, external debt, public debt, foreign-exchange reserves, and oil-exporter status. Because $S_t \times Z_{i,t-1}$ varies across countries even within a quarter, it is not absorbed by the quarter fixed effects μ_t.

Tables B3 and B4 report the resulting coefficients on the regime interactions. The core pattern is broadly stable. For Crawling regimes, the activity differential relative to Fixed regimes remains positive at longer horizons in most specifications, while the inflation, exchange-rate, and policy-rate differentials are generally muted. For Flexible regimes, the inflation differential around the one-year horizon and the short-horizon exchange-rate differential remain positive in most specifications, and the policy-rate differential remains negative at short horizons in many cases. Some controls generate noisier estimates, reflecting more limited coverage and the fact that these characteristics are themselves correlated with broader macro-financial conditions. Nonetheless, no single alternative interaction absorbs the exchange-rate-regime pattern.[10]

[10] In the reserves column the Crawling–Fixed differential is significant on impact (0.29), but the regime-specific responses in levels show that this reflects a larger contemporaneous response of the Fixed group rather than any change in the Crawling group, and is therefore consistent with our results.

Table B3: Robustness to Alternative Channels: Inflation and Exchange Rate

Horizon	Baseline	Cap. open.	CBI	Ext. debt	Public debt	Reserves	Oil exp.
Panel A: Inflation							
Shock x Crawling							
$h = 0$	0.12	0.03	0.12	0.19	0.12	0.29**	0.06
	(0.15)	(0.13)	(0.15)	(0.15)	(0.15)	(0.14)	(0.15)
$h = 2$	0.24	-0.05	0.22	0.55	0.22	0.40	0.10
	(0.38)	(0.48)	(0.38)	(0.35)	(0.37)	(0.35)	(0.43)
$h = 4$	0.38	0.35	0.36	-0.03	0.34	0.23	0.40
	(0.41)	(0.58)	(0.41)	(0.46)	(0.42)	(0.50)	(0.45)
$h = 6$	0.11	-0.51	0.04	0.62	0.10	0.21	-0.06
	(0.47)	(0.78)	(0.46)	(0.44)	(0.48)	(0.67)	(0.52)
$h = 8$	0.08	-0.16	0.03	0.46	0.08	0.10	-0.03
	(0.47)	(0.77)	(0.48)	(0.43)	(0.49)	(0.86)	(0.48)
Shock x Flexible							
$h = 0$	0.18	0.07	0.16	0.19	0.10	0.17	-0.02
	(0.33)	(0.35)	(0.32)	(0.32)	(0.32)	(0.36)	(0.33)
$h = 2$	0.74	0.31	0.66	0.78	0.44	1.33**	0.31
	(0.68)	(0.94)	(0.67)	(0.60)	(0.71)	(0.63)	(0.78)
$h = 4$	1.22*	1.07	1.22*	1.06	1.33*	1.47**	1.26*
	(0.70)	(0.71)	(0.63)	(0.71)	(0.75)	(0.68)	(0.71)
$h = 6$	0.53	-0.13	0.34	0.67	0.20	0.67	-0.00
	(0.73)	(0.98)	(0.69)	(0.71)	(0.66)	(0.90)	(0.71)
$h = 8$	-0.59	-0.65	-0.75	-0.47	-0.80	-0.48	-0.94
	(0.64)	(0.86)	(0.62)	(0.62)	(0.55)	(0.84)	(0.59)
Panel B: Exchange Rate							
Shock x Crawling							
$h = 0$	0.40	-0.05	0.41	0.35	0.39	0.52	0.36
	(0.34)	(0.27)	(0.34)	(0.34)	(0.35)	(0.42)	(0.33)
$h = 2$	0.80	0.25	0.77	0.74	0.77	0.78	0.84
	(0.86)	(0.67)	(0.84)	(0.83)	(0.87)	(1.10)	(0.83)
$h = 4$	0.58	0.24	0.44	0.54	0.55	-0.19	0.73
	(1.10)	(1.08)	(1.05)	(1.05)	(1.13)	(1.83)	(1.00)
$h = 6$	-0.05	0.08	-0.22	-0.14	-0.03	-1.92	0.25
	(1.39)	(1.12)	(1.39)	(1.28)	(1.35)	(2.19)	(1.22)
$h = 8$	-0.59	0.48	-0.84	-0.76	-0.54	-3.21	-0.12
	(1.56)	(1.37)	(1.52)	(1.29)	(1.47)	(2.44)	(1.39)
Shock x Flexible							
$h = 0$	0.39	0.06	0.49	0.38	0.37	0.62	0.23
	(0.64)	(0.76)	(0.54)	(0.64)	(0.64)	(0.73)	(0.64)
$h = 2$	1.59**	1.05	1.62**	1.57**	1.66**	1.49	1.72**
	(0.77)	(0.99)	(0.78)	(0.76)	(0.75)	(1.09)	(0.73)
$h = 4$	0.16	-0.30	-0.15	0.14	0.34	-0.34	0.67
	(1.33)	(1.32)	(1.42)	(1.30)	(1.28)	(1.61)	(1.24)
$h = 6$	-0.14	-0.05	-0.57	-0.18	0.13	-0.46	0.85
	(1.34)	(1.28)	(1.59)	(1.36)	(1.28)	(1.67)	(1.55)
$h = 8$	-1.96	-0.50	-2.73	-2.04	-1.57	-2.76	-0.44
	(1.78)	(1.70)	(1.98)	(1.82)	(1.65)	(1.96)	(1.88)

Notes: Each column adds one competing channel to the baseline regime-interaction specification. Continuous competing variables are lagged and standardized before interaction with the shock; dummy variables enter as lagged 0/1 indicators. For time-invariant country characteristics, the level term is absorbed by country fixed effects, while the shock interaction remains identified through variation in the common shock. Coefficients on the regime interactions are reported. Driscoll–Kraay standard errors are in parentheses. * and ** denote significance at the 10 and 5 percent levels, respectively.

Table B4: Robustness to Alternative Channels: Policy Rate and Activity

Horizon	Baseline	Cap. open.	CBI	Ext. debt	Public debt	Reserves	Oil exp.
Panel C: Policy Rate							
Shock x Crawling							
$h = 0$	-0.00	0.03	-0.01	-0.00	-0.00	0.03	0.00
	(0.06)	(0.08)	(0.06)	(0.06)	(0.06)	(0.10)	(0.05)
$h = 2$	-0.02	0.06	-0.04	0.04	-0.03	0.05	-0.03
	(0.11)	(0.14)	(0.11)	(0.11)	(0.11)	(0.18)	(0.10)
$h = 4$	0.03	0.16	0.00	0.06	0.02	0.08	0.03
	(0.14)	(0.20)	(0.14)	(0.15)	(0.14)	(0.25)	(0.13)
$h = 6$	-0.09	0.02	-0.13	-0.03	-0.10	-0.08	-0.08
	(0.15)	(0.17)	(0.16)	(0.18)	(0.16)	(0.24)	(0.14)
$h = 8$	-0.08	0.09	-0.11	0.01	-0.08	-0.03	-0.07
	(0.17)	(0.20)	(0.17)	(0.16)	(0.17)	(0.27)	(0.16)
Shock x Flexible							
$h = 0$	-0.26*	-0.18	-0.29**	-0.27*	-0.27*	-0.28*	-0.26*
	(0.14)	(0.14)	(0.15)	(0.14)	(0.14)	(0.15)	(0.14)
$h = 2$	-0.26*	-0.19	-0.30*	-0.24	-0.28*	-0.25	-0.27*
	(0.14)	(0.16)	(0.16)	(0.15)	(0.15)	(0.18)	(0.15)
$h = 4$	-0.21	0.01	-0.31	-0.20	-0.22	-0.18	-0.19
	(0.19)	(0.26)	(0.19)	(0.20)	(0.19)	(0.28)	(0.18)
$h = 6$	-0.07	0.18	-0.17	-0.06	-0.09	-0.07	-0.03
	(0.22)	(0.30)	(0.26)	(0.23)	(0.23)	(0.35)	(0.23)
$h = 8$	-0.43*	-0.16	-0.53*	-0.41	-0.46*	-0.52	-0.40
	(0.24)	(0.28)	(0.29)	(0.26)	(0.26)	(0.36)	(0.26)
Panel D: Activity							
Shock x Crawling							
$h = 0$	0.01	-0.05	0.01	-0.15	0.01	-0.19	0.02
	(0.23)	(0.28)	(0.23)	(0.24)	(0.22)	(0.37)	(0.21)
$h = 2$	0.07	0.20	0.04	-0.12	0.07	0.14	0.11
	(0.27)	(0.29)	(0.28)	(0.38)	(0.28)	(0.45)	(0.29)
$h = 4$	0.31	0.35	0.27	0.33	0.30	0.37	0.22
	(0.32)	(0.37)	(0.33)	(0.55)	(0.32)	(0.61)	(0.28)
$h = 6$	0.59*	0.97**	0.54	0.12	0.59*	0.39	0.67*
	(0.32)	(0.34)	(0.32)	(0.54)	(0.35)	(0.43)	(0.40)
$h = 8$	0.58	0.73	0.53	0.31	0.58	0.78	0.48
	(0.39)	(0.50)	(0.38)	(0.44)	(0.39)	(0.54)	(0.34)
Shock x Flexible							
$h = 0$	0.13	0.03	0.14	0.09	0.15	0.16	0.14
	(0.49)	(0.62)	(0.54)	(0.48)	(0.50)	(0.42)	(0.54)
$h = 2$	0.10	0.40	0.04	0.08	0.19	-0.01	0.23
	(0.37)	(0.45)	(0.48)	(0.35)	(0.46)	(0.31)	(0.51)
$h = 4$	0.31	0.71	0.23	0.35	0.22	0.29	0.04
	(0.57)	(0.60)	(0.70)	(0.61)	(0.57)	(0.50)	(0.58)
$h = 6$	0.39	1.15	0.28	0.27	0.57	0.73*	0.64
	(0.78)	(0.88)	(0.88)	(0.75)	(0.89)	(0.63)	(0.90)
$h = 8$	1.48*	2.03**	1.34	1.39**	1.48*	1.39**	1.16
	(0.77)	(0.79)	(0.93)	(0.70)	(0.80)	(0.69)	(0.78)
Country FE	YES	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES	YES
Additional interaction	NO	YES	YES	YES	YES	YES	YES

Notes: Each column adds one competing channel to the baseline regime-interaction specification. Continuous competing variables are lagged and standardized before interaction with the shock; dummy variables enter as lagged 0/1 indicators. For time-invariant country characteristics, the level term is absorbed by country fixed effects, while the shock interaction remains identified through variation in the common shock. Coefficients on the regime interactions are reported. Driscoll–Kraay standard errors are in parentheses. * and ** denote significance at the 10 and 5 percent levels, respectively.

Table B5: Country Characteristics by Exchange-Rate Regime

Variable	Fixed	Crawling	Flexible	N_{fix}	N_{crawl}	N_{flex}	ANOVA p
Fiscal space index	4.35 (8.99)	8.18 (9.24)	10.27 (–)	7	5	1	0.704
Capital account openness (Chinn-Ito)	0.73 (0.31)	0.30 (0.25)	0.15 (0.07)	12	10	5	0.000***
Central bank independence index	0.75 (0.15)	0.72 (0.19)	0.64 (0.12)	12	10	5	0.427
Public debt index	53.67 (36.11)	59.84 (37.57)	98.16 (81.52)	14	9	5	0.202

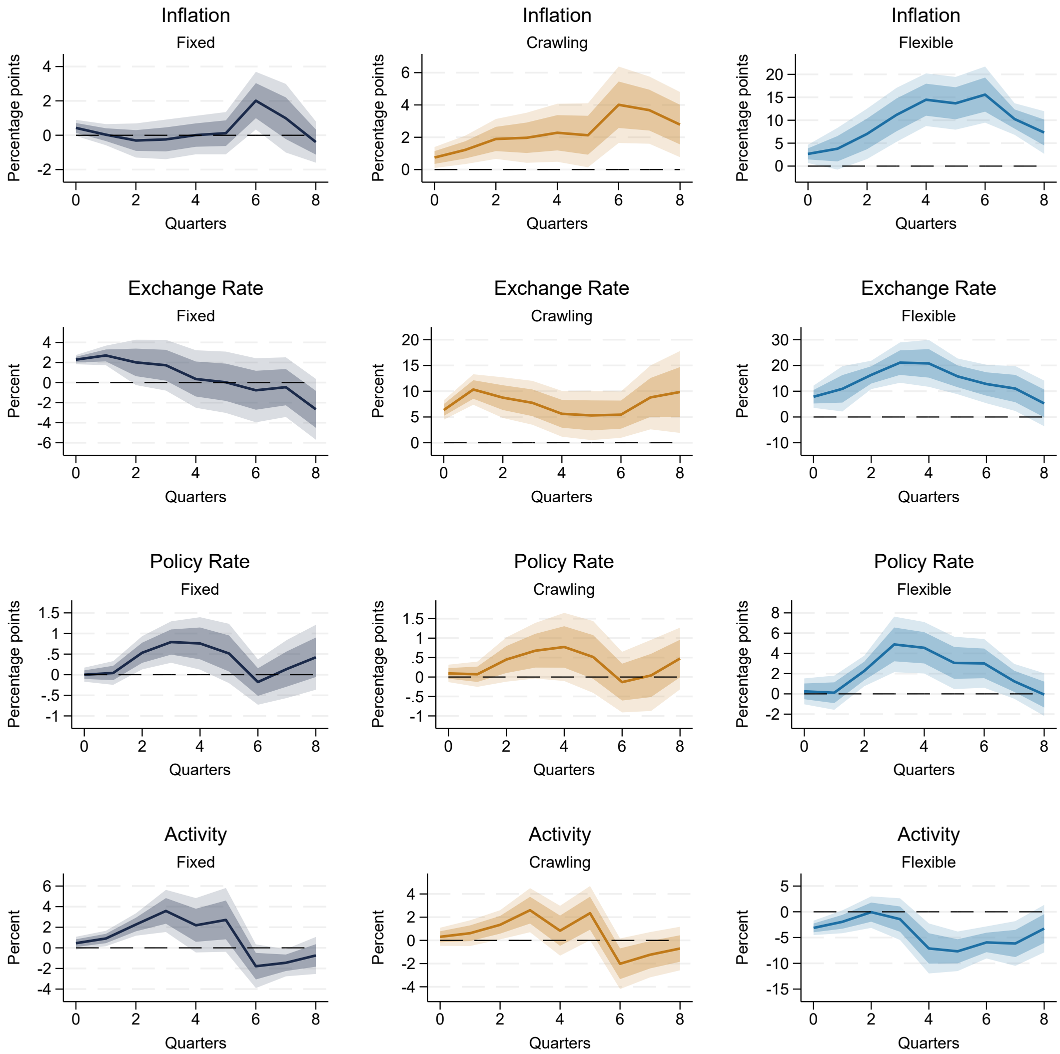
Notes: Cell entries are the mean (standard deviation) of each country's within-regime average, computed only over country-regime cells with at least 10 quarterly observations. N is the number of countries contributing to each group mean. ANOVA p-values test equality of means across the three regime groups. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Flexible group for the fiscal space index contains a single country (standard deviation not defined); this cell should be interpreted with caution.

B.6.2 Robustness to Alternative Shock

To test whether the regime-specific results depend on the particular U.S. monetary policy shock measure, we re-estimate Equation 1 using the broad U.S. dollar shock described in Section 3.1 and Appendix A.3. Figure B7 reports the responses to a 10% broad-dollar appreciation. This exercise is complementary to the baseline because surprise U.S. monetary tightenings are typically associated with dollar appreciation and tighter global financial conditions.

The results are broadly consistent with the baseline regime pattern. Fixed regimes display the most muted exchange-rate response, although activity rises temporarily before falling back toward zero. Crawling regimes show a sizeable depreciation and inflation response, but activity does not contract persistently. Flexible regimes show the strongest macroeconomic adjustment: the exchange rate depreciates sharply, inflation rises substantially, policy rates tighten, and activity contracts persistently after the first few quarters. Thus, replacing the monetary policy surprise with a broad-dollar appreciation shock preserves the main message that high exchange-rate flexibility is associated with more volatile macroeconomic adjustment after external financial shocks.

Figure B7: Heterogeneous Responses of Macroeconomic Variables in MENAP Economies to a Dollar Shock by Exchange-Rate Regime



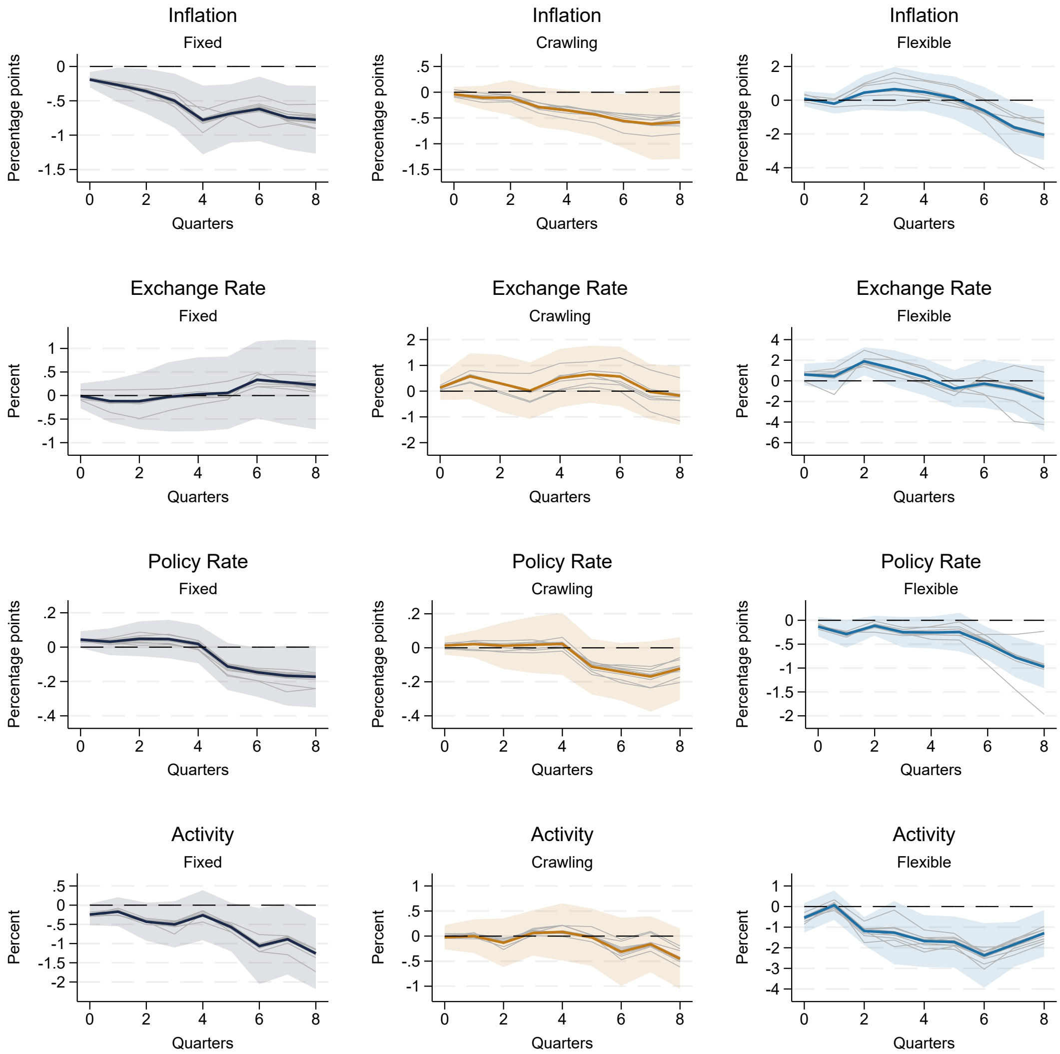
Notes: The figure presents the heterogeneous impulse responses of macroeconomic variables in MENAP economies to a 10% broad-dollar appreciation, estimated using local projections with state-dependent interactions for exchange-rate regimes. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

B.6.3 Robustness to Single-Country Exclusions

To test whether the regime-specific macroeconomic responses are driven by a single country, we re-estimate Equation 1 18 times, each time excluding one MENAP economy from the sample. Figure B8 plots the resulting regime-specific macroeconomic responses. The thick colored lines report the full-sample estimates, while the thin gray lines report the estimates obtained after excluding each country in turn.

The leave-one-out estimates remain close to the full-sample responses for most outcomes and horizons. Fixed-regime responses continue to show muted exchange-rate adjustment and declining inflation and activity. Crawling-regime responses remain comparatively moderate, especially for activity. Flexible-regime responses are more dispersed, as expected given the smaller number of observations in that group, but they continue to display the same qualitative pattern: larger exchange-rate depreciation at short horizons, stronger inflation pressure over the first year, looser policy rates, and weaker activity. The main regime ordering is therefore not driven by any single country.

Figure B8: Leave-One-Out Robustness: Macroeconomic Responses in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime



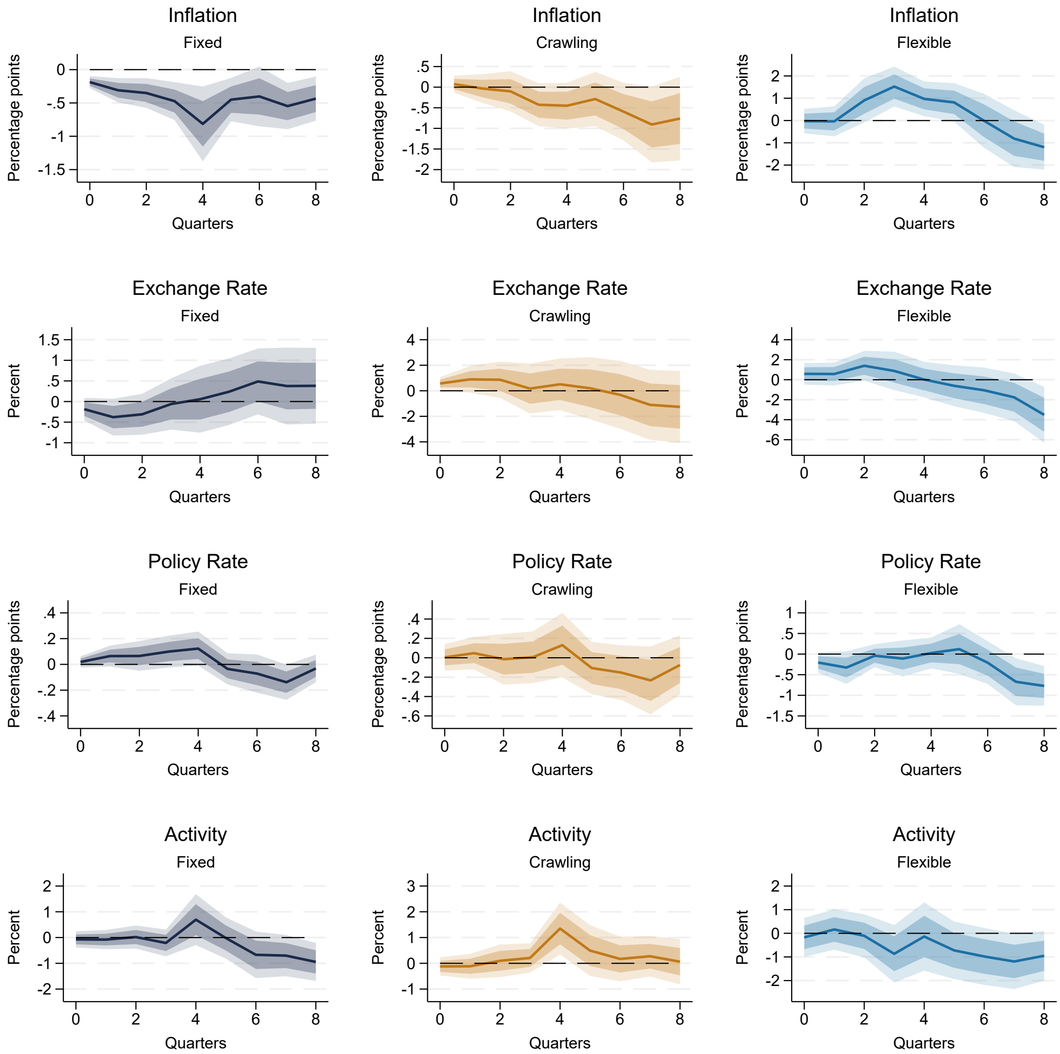
Notes: The figure presents the heterogeneous impulse responses of macroeconomic variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes and leaving one country out at a time. Thick colored lines report the full-sample estimates; thin gray lines report the leave-one-out estimates. Shaded areas represent 90% confidence intervals for the full-sample estimates based on Driscoll and Kraay (1998) standard errors.

B.6.4 Robustness to a More Balanced Panel

We re-estimate the regime-specific macroeconomic responses over the more balanced 2008Q1–2025Q4 sample. This period provides more balanced coverage of real activity and several domestic macro-financial variables across MENAP economies, reducing the possibility that the baseline findings are driven by differences in early-sample availability. Figure B9 reports the resulting responses.

These estimates are broadly consistent with the baseline results in Section 4.2. Fixed regimes continue to show muted exchange-rate adjustment and a decline in inflation, with activity weakening toward the end of the horizon. Crawling regimes again display comparatively stronger real-side insulation: activity does not contract persistently and rises around the one-year horizon, while inflation declines more gradually. Flexible regimes continue to exhibit the largest nominal adjustment, with an initial depreciation and a rise in inflation over the first year. Their activity response is also weaker than in Crawling regimes after the first few quarters. Overall, restricting the sample to the period with more balanced coverage preserves the main non-monotonic pattern. Some flexibility appears to improve macroeconomic insulation, but the highest-flexibility regimes do not deliver uniformly more stable outcomes.

Figure B9: Robustness to a More Balanced Panel: Macroeconomic Responses in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime

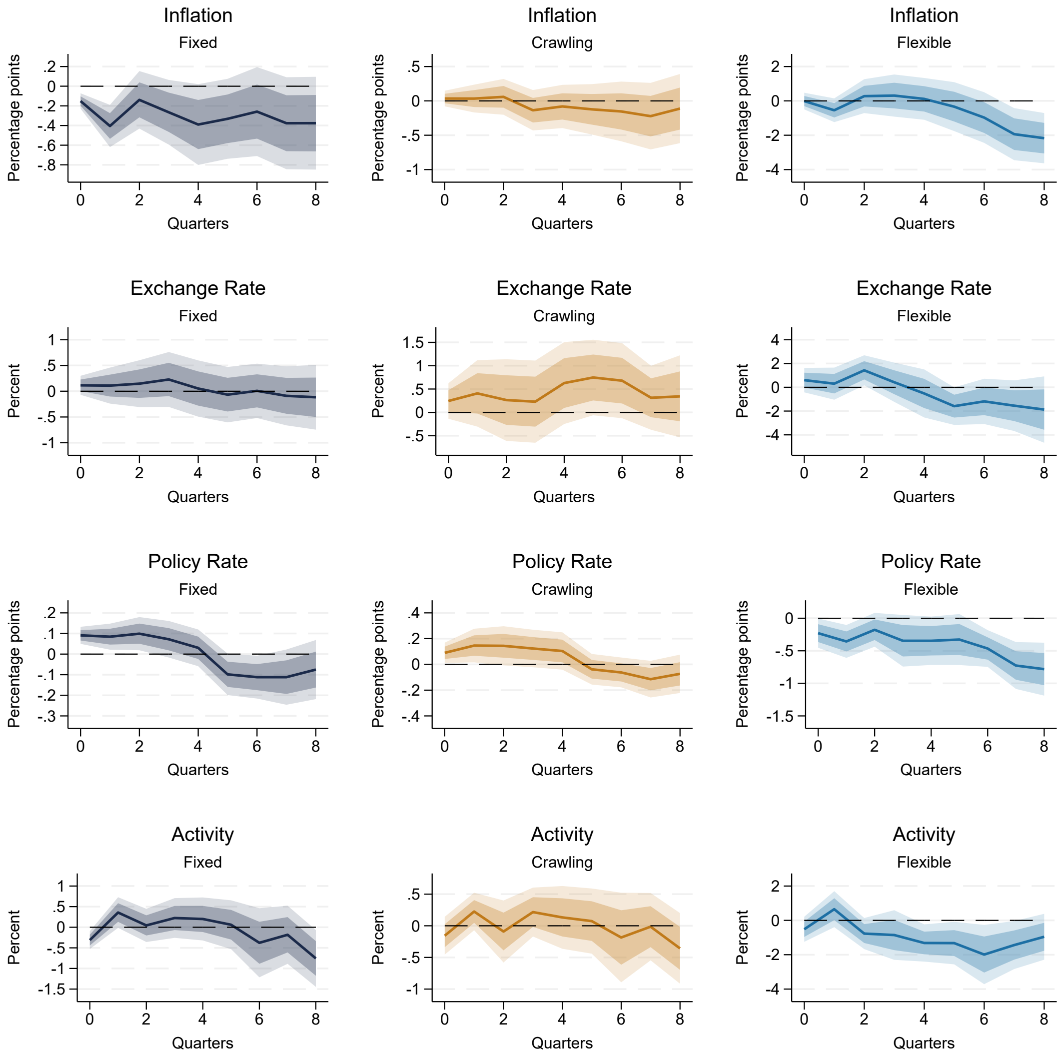


Notes: The figure presents the heterogeneous impulse responses of macroeconomic variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes over the more balanced sample period 2008Q1–2025Q4. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

B.6.5 Treatment of the COVID-19 Pandemic Period

The baseline specification excludes 2020Q1–2020Q4 from the estimation sample while keeping those observations in the panel to preserve the leads and lags used in the local projections. As an alternative treatment of the pandemic period, Figure B10 retains these quarters and instead includes a contemporaneous dummy for 2020 among the controls. The main regime-specific macroeconomic pattern is preserved. Crawling regimes continue to display the most muted activity response, while Flexible regimes continue to experience a sizable activity contraction. The nominal responses are somewhat less uniform than in the baseline, especially for Flexible exchange rates at longer horizons, but the exercise does not overturn the central non-monotonic pattern across regimes.

Figure B10: Treatment of the COVID-19 Pandemic Period: Macroeconomic Responses in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime



Notes: The figure presents the heterogeneous impulse responses of macroeconomic variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes. A contemporaneous dummy for 2020 is included among the controls. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

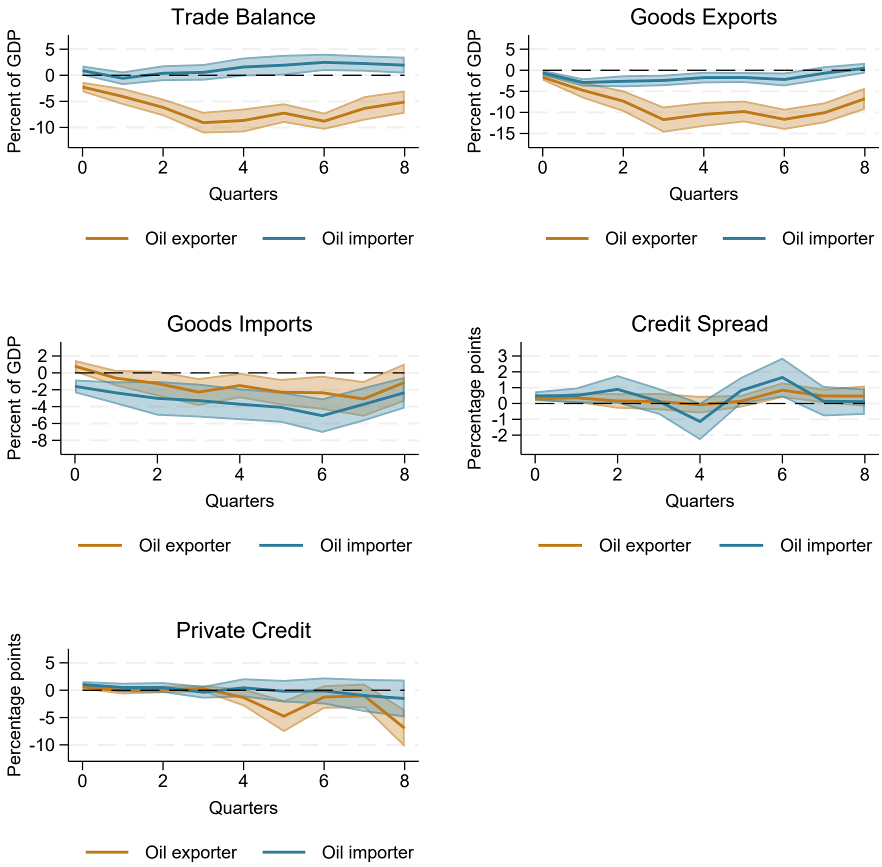
B.7 Robustness: External and Financial Channels

B.7.1 Robustness to Other Domestic Institutional Features

Oil-exporter status is a particularly relevant alternative country characteristic for MENAP economies, since oil exporters differ from oil importers in their external exposure, fiscal capacity, and exchange-rate arrangements. Figure B11 therefore reports the responses of external balances and financial variables separately for oil exporters and oil importers.

The oil-status split shows important differences, but these differences do not simply reproduce the exchange-rate-regime patterns documented in Section 5. On the trade side, oil exporters experience a deterioration in the trade balance after the U.S. monetary policy shock, driven mainly by a sharp fall in goods exports. Oil importers, by contrast, show a more stable trade balance, with weaker imports and relatively muted export responses. On the financial side, credit-spread responses are volatile and do not display a consistently stronger deterioration for oil exporters, while private credit declines more visibly for oil exporters at longer horizons. Overall, oil status captures an important dimension of MENAP heterogeneity, especially through export exposure, but it does not account for the regime-specific trade and financial patterns emphasized in the main text.

Figure B11: Heterogeneous Responses of External and Financial Variables in MENAP Economies to a U.S. Monetary Policy Shock by Oil Status



Notes: The figure presents the heterogeneous impulse responses of external and financial variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for oil status. The two lines represent the responses conditional on oil status: Oil Exporters (orange) and Oil Importers (blue). Shaded areas represent 90% confidence intervals based on Driscoll and Kraay (1998) standard errors.

As above, to test whether the differential responses of external and financial variables from Appendix B.3 survive controlling for plausible confounders, we augment Equation 2 with additional shock interactions capturing other domestic characteristics.

Tables B6, B7, and B8 report the resulting coefficients on the regime interactions. The main external-balance patterns are robust to the inclusion of these additional channels. For Flexible regimes, the trade-balance differential relative to Fixed regimes remains positive and statistically significant at most horizons from the second quarter onward, reflecting both higher goods exports and lower goods imports. The export differential is somewhat attenuated when oil-exporter status is included, but remains positive at longer horizons; the import differential remains negative in most specifications. For Crawling regimes, the trade-balance differential remains weaker and less stable, while goods exports are generally higher and goods imports also tend to be higher relative to Fixed regimes.

The financial-variable results are also broadly consistent with the baseline interpretation. The Flexible-regime credit-spread differential remains positive on impact across all specifications, but turns negative at longer horizons, while private credit declines more strongly than under Fixed regimes at short and medium horizons in most specifications. Crawling-regime financial differentials are smaller and less systematic. These results indicate that the external-rebalancing patterns and the financial adjustment under Flexible regimes are not absorbed by capital-account openness, central bank independence, external debt, fiscal balance, public debt, reserves and oil-exporter status.

Table B6: Robustness to Alternative Channels: Trade Balance and Goods Exports

Horizon	Baseline	Cap. open.	CBI	Ext. debt	Public debt	Reserves	Oil exp.
Panel A: Trade Balance							
Shock x Crawling							
$h = 0$	-0.18	-0.18	-0.18	-0.18	-0.25	0.43	-0.51
	(0.57)	(0.86)	(0.57)	(0.58)	(0.57)	(0.68)	(0.61)
$h = 2$	0.31	0.68	0.32	0.77	0.10	2.39**	-0.36
	(1.22)	(1.05)	(1.23)	(1.14)	(1.26)	(1.19)	(1.44)
$h = 4$	0.53	0.52	0.54	-0.06	0.26	3.03**	-0.64
	(1.46)	(1.40)	(1.42)	(1.49)	(1.34)	(1.48)	(1.28)
$h = 6$	-0.04	0.74	-0.01	0.14	-0.42	2.83**	-1.21
	(1.31)	(1.32)	(1.24)	(1.36)	(1.17)	(1.29)	(1.21)
$h = 8$	0.59	1.06	0.64	0.63	0.32	1.86	-0.16
	(1.10)	(1.34)	(1.04)	(1.31)	(1.04)	(1.34)	(1.23)
Shock x Flexible							
$h = 0$	0.33	0.34	0.38	0.34	-0.02	-0.08	-0.89
	(1.52)	(1.58)	(1.54)	(1.53)	(1.52)	(1.27)	(1.57)
$h = 2$	5.86**	6.27**	5.70**	5.95**	4.68**	4.93**	3.32
	(2.42)	(2.49)	(2.28)	(2.48)	(2.36)	(2.15)	(2.51)
$h = 4$	9.17*	9.15*	9.07*	9.05*	7.74	7.61	4.74
	(5.22)	(5.11)	(5.41)	(5.04)	(5.23)	(4.93)	(4.94)
$h = 6$	7.08**	7.95**	7.27*	7.11**	5.11	5.89*	2.65
	(3.53)	(3.61)	(3.75)	(3.51)	(3.87)	(3.09)	(4.09)
$h = 8$	6.93**	7.42**	7.08**	6.95**	5.32	7.00**	3.95
	(3.10)	(2.93)	(3.32)	(3.06)	(3.67)	(3.29)	(3.72)
Panel B: Goods Exports							
Shock x Crawling							
$h = 0$	0.04	0.17	0.04	0.16	-0.01	0.46	-0.15
	(0.50)	(0.51)	(0.50)	(0.55)	(0.48)	(0.68)	(0.44)
$h = 2$	1.43	1.40*	1.43	1.01	1.29	2.37*	0.81
	(0.88)	(0.74)	(0.88)	(0.97)	(0.86)	(1.24)	(0.88)
$h = 4$	2.01	1.47	2.00*	0.82	1.85	3.06*	1.17
	(1.25)	(0.95)	(1.20)	(1.25)	(1.17)	(1.68)	(0.90)
$h = 6$	2.13*	2.27**	2.11*	1.52	1.87*	3.12**	1.19
	(1.22)	(1.01)	(1.14)	(1.19)	(1.07)	(1.35)	(0.85)
$h = 8$	2.34**	2.20**	2.32**	1.46	2.18**	2.10	1.65**
	(0.89)	(0.92)	(0.82)	(1.22)	(0.73)	(1.92)	(0.60)
Shock x Flexible							
$h = 0$	0.35	0.49	0.44	0.37	0.05	-0.15	-0.34
	(1.15)	(1.15)	(1.19)	(1.14)	(1.14)	(1.07)	(1.13)
$h = 2$	3.41*	3.34*	3.38*	3.28*	2.58	2.19	1.18
	(1.86)	(1.89)	(1.87)	(1.72)	(1.82)	(1.74)	(1.84)
$h = 4$	7.98*	7.34*	7.81*	7.67**	7.11*	6.66	4.96
	(4.18)	(3.88)	(4.42)	(3.81)	(4.11)	(4.22)	(3.83)
$h = 6$	5.22**	5.32**	4.94*	5.02**	3.73	4.31	1.86
	(2.60)	(2.48)	(2.70)	(2.38)	(2.78)	(2.69)	(2.74)
$h = 8$	5.97**	5.73**	5.49**	5.72**	4.89*	5.45**	3.38
	(2.17)	(1.90)	(2.10)	(1.96)	(2.65)	(2.59)	(2.45)
Country FE	YES	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES	YES
Additional interaction	NO	YES	YES	YES	YES	YES	YES

Notes: Each column adds one competing channel to the baseline regime-interaction specification. Continuous competing variables are lagged and standardized before interaction with the shock; dummy variables enter as lagged 0/1 indicators. For time-invariant country characteristics, the level term is absorbed by country fixed effects, while the shock interaction remains identified through variation in the common shock. Coefficients on the regime interactions are reported. Driscoll–Kraay standard errors are in parentheses. * and ** denote significance at the 10 and 5 percent levels, respectively.

Table B7: Robustness to Alternative Channels: Goods Imports

Horizon	Baseline	Cap. open.	CBI	Ext. debt	Public debt	Reserves	Oil exp.
Panel C: Goods Imports							
Shock x Crawling							
$h = 0$	0.15	0.54	0.15	0.33	0.17	0.18	0.31
	(0.43)	(0.59)	(0.43)	(0.46)	(0.44)	(0.58)	(0.51)
$h = 2$	1.09	0.79	1.10	0.30	1.16	0.38	1.14
	(0.79)	(0.96)	(0.79)	(0.74)	(0.81)	(0.74)	(0.89)
$h = 4$	1.05	0.78	1.05	0.65	1.18*	0.40	1.45**
	(0.64)	(1.03)	(0.63)	(0.74)	(0.60)	(0.85)	(0.65)
$h = 6$	1.67**	1.34	1.65**	1.00	1.80**	0.75	1.96**
	(0.78)	(1.06)	(0.76)	(0.80)	(0.76)	(0.83)	(0.72)
$h = 8$	0.85	0.32	0.80	0.12	0.97	0.27	1.01
	(0.68)	(1.03)	(0.66)	(0.79)	(0.65)	(0.75)	(0.70)
Shock x Flexible							
$h = 0$	-0.25	0.18	-0.19	-0.21	-0.23	-0.06	0.34
	(1.25)	(1.18)	(1.20)	(1.24)	(1.29)	(1.20)	(1.38)
$h = 2$	-2.55**	-2.91**	-2.37**	-2.72**	-2.32**	-2.66**	-2.36**
	(0.99)	(1.20)	(0.89)	(1.09)	(1.00)	(0.90)	(1.19)
$h = 4$	-1.73	-2.06	-1.75	-1.82	-1.30	-1.20	-0.28
	(1.43)	(1.80)	(1.43)	(1.52)	(1.47)	(1.18)	(1.59)
$h = 6$	-2.66*	-3.05	-3.05**	-2.80*	-2.32*	-1.73	-1.57
	(1.35)	(1.94)	(1.40)	(1.51)	(1.37)	(1.05)	(1.60)
$h = 8$	-1.77	-2.39	-2.39	-1.92	-1.32	-1.66	-1.16
	(1.79)	(2.27)	(1.87)	(1.91)	(1.88)	(1.60)	(2.08)
Country FE	YES	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES	YES
Additional interaction	NO	YES	YES	YES	YES	YES	YES

Notes: Each column adds one competing channel to the baseline regime-interaction specification. Continuous competing variables are lagged and standardized before interaction with the shock; dummy variables enter as lagged 0/1 indicators. For time-invariant country characteristics, the level term is absorbed by country fixed effects, while the shock interaction remains identified through variation in the common shock. Coefficients on the regime interactions are reported. Driscoll–Kraay standard errors are in parentheses. * and ** denote significance at the 10 and 5 percent levels, respectively.

Table B8: Robustness to Alternative Channels: Credit Spread and Private Credit

Horizon	Baseline	Cap. open.	CBI	Ext. debt	Public debt	Reserves	Oil exp.
Panel D: Credit Spread							
Shock x Crawling							
$h = 0$	0.07	0.12	0.07	0.12	-0.00	0.18	0.03
	(0.08)	(0.09)	(0.08)	(0.08)	(0.10)	(0.12)	(0.13)
$h = 2$	-0.04	-0.22	-0.10	-0.20	-0.54	0.42*	-0.78
	(0.23)	(0.45)	(0.25)	(0.26)	(0.64)	(0.24)	(0.90)
$h = 4$	0.49	0.74	0.48	0.08	0.88	0.30	1.07
	(0.47)	(0.90)	(0.47)	(0.29)	(0.92)	(0.33)	(1.20)
$h = 6$	-0.15	-0.66	-0.12	0.46*	-0.92	0.33	-1.59
	(0.40)	(0.83)	(0.44)	(0.27)	(0.98)	(0.40)	(1.35)
$h = 8$	0.03	-0.19	0.02	0.32	-0.46	0.24	-0.88
	(0.28)	(0.45)	(0.26)	(0.33)	(0.49)	(0.50)	(0.66)
Shock x Flexible							
$h = 0$	1.74**	1.64**	1.70**	1.78**	1.68**	2.04**	1.70**
	(0.69)	(0.71)	(0.71)	(0.67)	(0.71)	(0.67)	(0.75)
$h = 2$	-0.06	-0.82	-0.49	0.13	-0.51	2.29	-0.83
	(2.64)	(3.29)	(2.62)	(2.49)	(2.82)	(1.86)	(3.12)
$h = 4$	0.46	1.13	0.36	0.22	0.85	1.17	1.09
	(1.56)	(1.53)	(1.52)	(1.64)	(1.58)	(1.51)	(1.68)
$h = 6$	-4.51**	-5.61*	-4.44**	-4.02**	-5.30**	-3.15**	-6.18**
	(2.01)	(2.86)	(2.15)	(1.76)	(2.46)	(1.28)	(2.90)
$h = 8$	-10.56**	-10.51**	-10.74**	-10.31**	-11.00**	-10.36**	-11.61**
	(0.95)	(1.20)	(1.01)	(0.89)	(1.12)	(0.98)	(1.25)
Panel E: Private Credit							
Shock x Crawling							
$h = 0$	0.30	0.42	0.20	0.21	0.05	0.40	0.31
	(0.41)	(0.40)	(0.42)	(0.40)	(0.49)	(0.42)	(0.39)
$h = 2$	-0.29	-0.12	-0.43	-0.14	-0.43	-0.06	-0.37
	(0.62)	(0.65)	(0.59)	(0.58)	(0.69)	(0.67)	(0.61)
$h = 4$	-0.06	0.21	-0.29	0.18	-0.05	0.12	-0.02
	(0.95)	(0.88)	(0.91)	(0.96)	(0.92)	(1.11)	(0.88)
$h = 6$	-1.03	-0.89	-1.37	-0.85	-1.14	-0.92	-1.16
	(1.04)	(0.82)	(0.98)	(1.09)	(0.95)	(1.25)	(1.01)
$h = 8$	-0.67	-0.54	-1.14	-0.32	-1.01	-0.49	-0.92
	(1.20)	(0.89)	(1.12)	(1.26)	(1.10)	(1.42)	(1.14)
Shock x Flexible							
$h = 0$	0.26	0.07	-0.02	0.28	-0.16	0.28	0.26
	(0.53)	(0.48)	(0.49)	(0.51)	(0.51)	(0.55)	(0.59)
$h = 2$	-1.12	-1.04	-1.60	-1.11	-1.41	-1.09	-1.25
	(1.04)	(0.95)	(1.09)	(0.99)	(0.93)	(1.07)	(1.02)
$h = 4$	-1.53	-1.06	-2.04	-1.46	-1.67	-1.41	-1.45
	(1.31)	(1.24)	(1.52)	(1.23)	(1.27)	(1.36)	(1.31)
$h = 6$	-1.46	-0.68	-2.13	-1.36	-1.91	-1.50	-1.69
	(1.75)	(1.67)	(2.23)	(1.65)	(1.64)	(1.83)	(1.73)
$h = 8$	0.49	0.01	0.05	1.05	-0.01	0.46	0.05
	(2.01)	(1.54)	(2.21)	(1.85)	(1.93)	(2.07)	(1.80)
Country FE	YES	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES	YES
Additional interaction	NO	YES	YES	YES	YES	YES	YES

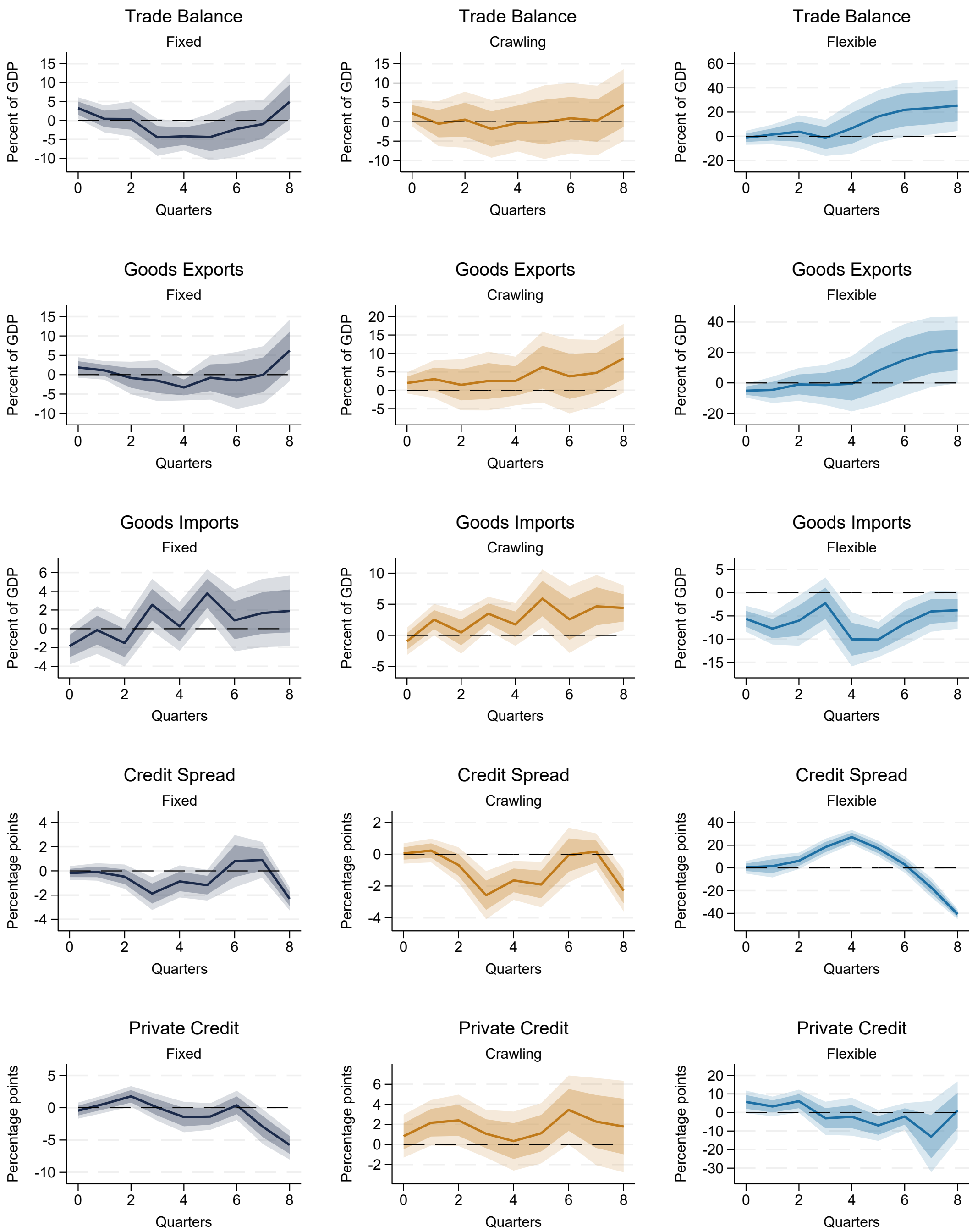
Notes: Each column adds one competing channel to the baseline regime-interaction specification. Continuous competing variables are lagged and standardized before interaction with the shock; dummy variables enter as lagged 0/1 indicators. For time-invariant country characteristics, the level term is absorbed by country fixed effects, while the shock interaction remains identified through variation in the common shock. Coefficients on the regime interactions are reported. Driscoll–Kraay standard errors are in parentheses. * and ** denote significance at the 10 and 5 percent levels, respectively.

B.7.2 Robustness to Alternative Shock

As before, we re-estimate Equation 1 using the broad U.S. dollar shock described in Appendix A.3. Figure B12 reports the responses to a 10% broad-dollar appreciation.

The results are broadly consistent with those in Section 5. On the trade side, the response is most favorable under Flexible regimes: the trade balance improves strongly after the first year, supported by a large increase in goods exports and a decline in goods imports. Crawling regimes display more muted trade-balance adjustment, with both exports and imports rising at longer horizons, while Fixed regimes show a temporary deterioration in the trade balance before recovering near the end of the horizon. On the financial side, the responses again point to greater volatility under Flexible regimes. Credit spreads rise sharply during the first year before reversing later, and private credit is more variable than under Crawling regimes. Overall, the broad-dollar shock confirms the main message that greater exchange-rate flexibility is associated with stronger trade adjustment, but also with less stable financial responses.

Figure B12: Heterogeneous Responses of External and Financial Variables in MENAP Economies to a Dollar Shock by Exchange-Rate Regime



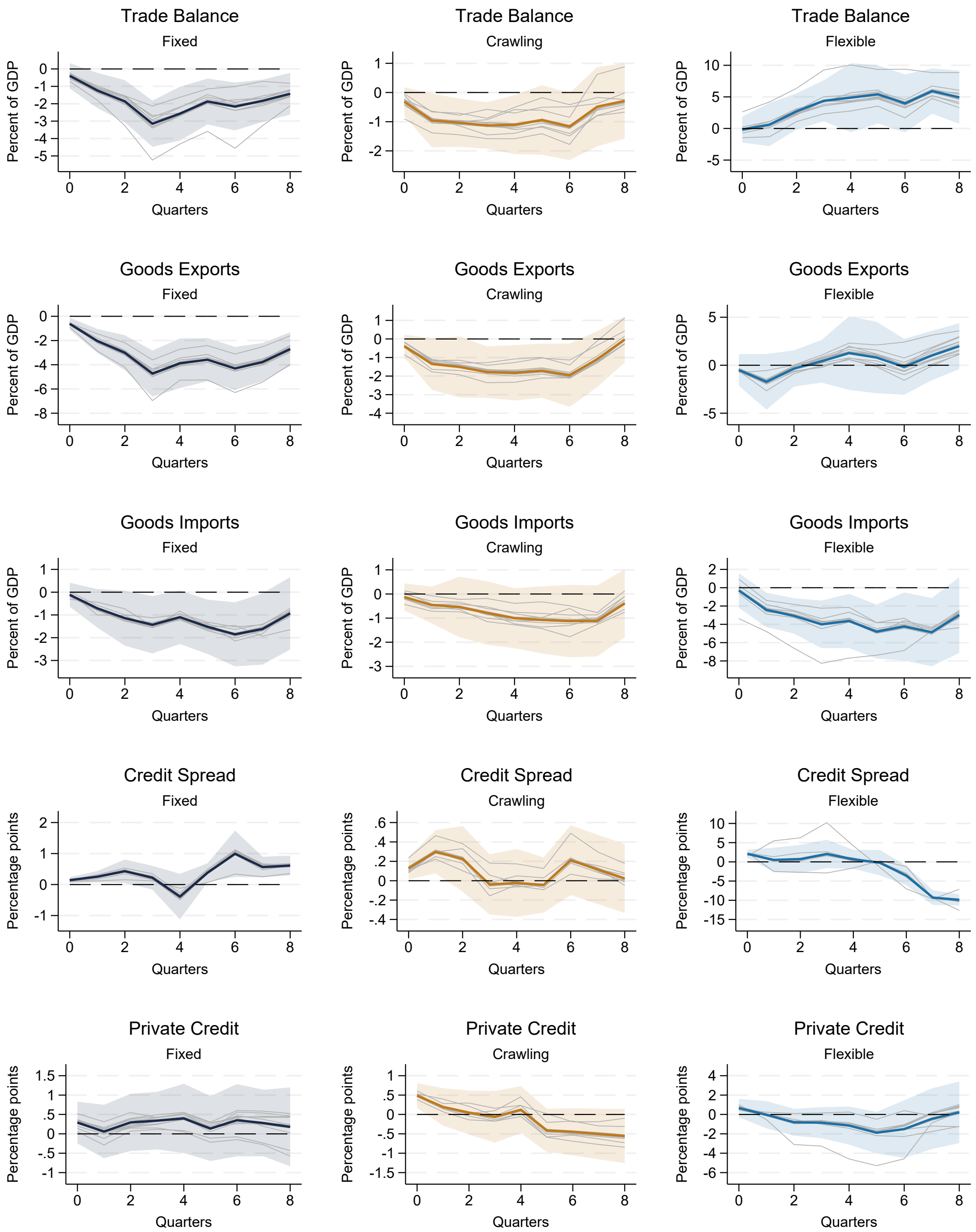
Notes: The figure presents the heterogeneous impulse responses of external and financial variables in MENAP economies to a 10% broad-dollar appreciation, estimated using local projections with state-dependent interactions for exchange-rate regimes. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

B.7.3 Robustness to Single-Country Exclusions

To test whether the results are driven by specific countries, we re-estimate Equation 1 by leaving out each of the 18 countries in turn. Figure B13 plots the resulting regime-specific responses for the external and financial variables studied in Section 5. The thick colored lines report the full-sample estimates, while the thin gray lines report the estimates from each leave-one-out sample.

The leave-one-out estimates support the main external-balance results. The improvement in the trade balance under Flexible regimes remains visible across exclusions, reflecting persistently weaker goods imports and a recovery in goods exports after the initial quarters. Fixed regimes continue to show a weaker trade-balance response, while Crawling regimes remain more muted. The financial responses are more sensitive to the country excluded, particularly for Flexible regimes, but the main pattern is not overturned: credit spreads rise at short horizons before reversing later, and private credit weakens over the middle of the horizon. Overall, the results indicate that the trade and financial patterns emphasized in Section 5 are not driven by any single country.

Figure B13: Leave-One-Out Robustness: External and Financial Responses in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime



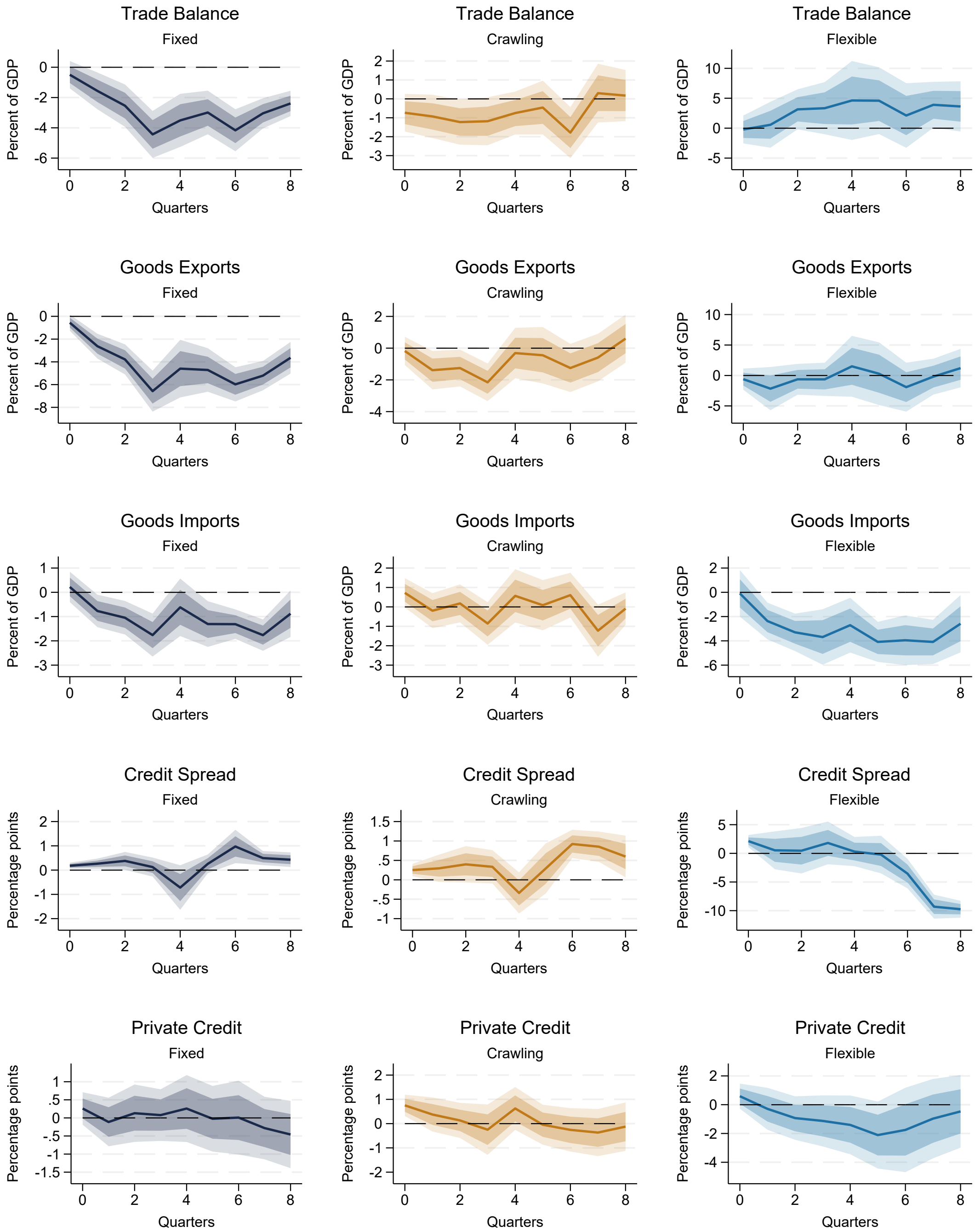
Notes: The figure presents the heterogeneous impulse responses of external and financial variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes and leaving one country out at a time. Thick colored lines report the full-sample estimates; thin gray lines report the leave-one-out estimates. Shaded areas represent 90% confidence intervals for the full-sample estimates based on Driscoll and Kraay (1998) standard errors.

B.7.4 Robustness to a More Balanced Panel

For the trade and financial-channel results, we re-estimate the regime-specific responses over the more balanced 2008Q1–2025Q4 sample. As in Appendix Section B.6, this period provides more balanced coverage across MENAP economies for several variables used in the analysis. Figure B14 reports the corresponding responses for the external-balance and financial variables.

The more balanced panel estimates reinforce the interpretation in Section 5. On the trade side, Fixed regimes continue to experience a deterioration in the trade balance, driven by a sharp fall in goods exports. Crawling regimes display a more muted trade-balance response, with smaller movements in exports and imports. Flexible regimes again show the most favorable trade-balance adjustment: the trade balance improves after the first few quarters, supported primarily by a larger decline in goods imports and a recovery in goods exports toward the end of the horizon. On the financial side, the Flexible-regime responses remain more volatile than those for Fixed and Crawling regimes. Credit spreads rise initially and then fall sharply in the second year, while private credit declines over the middle of the horizon. Overall, restricting the sample to a more balanced panel preserves the main conclusion that exchange-rate flexibility is associated with stronger trade adjustment, but also with more volatile financial responses.

Figure B14: Robustness to a More Balanced Panel: External and Financial Responses in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime

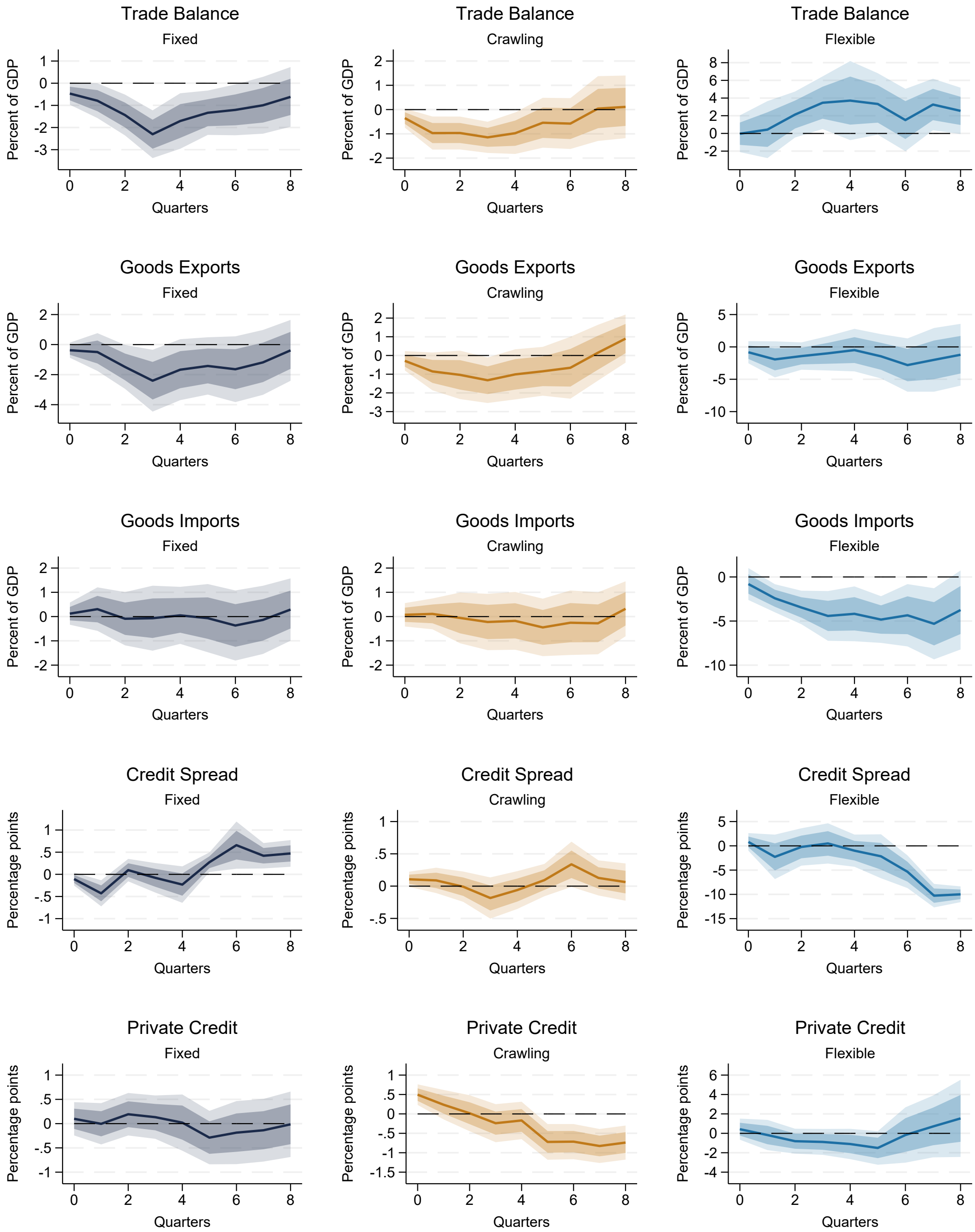


Notes: The figure presents the heterogeneous impulse responses of external and financial variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes over the more balanced sample period 2008Q1–2025Q4. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.

B.7.5 Treatment of the COVID-19 Pandemic Period

For the external and financial variables, we apply the same alternative treatment of the pandemic period by retaining 2020Q1–2020Q4 and adding a contemporaneous 2020 dummy. Figure B15 shows that the main channel interpretation remains intact. Fixed regimes continue to show a weaker trade-balance response, while Flexible regimes display a more favorable trade-balance adjustment driven mainly by a large decline in goods imports. Goods exports are more subdued under Flexible regimes in this specification, so the trade-balance improvement should be read primarily as import compression rather than a broad export expansion. The financial responses also remain concentrated in Flexible regimes: credit spreads fall sharply in the second year and private credit weakens over the middle horizons before recovering. Overall, the treatment of the pandemic period does not materially change the conclusion that the trade channel looks stabilizing under flexibility, while the financial responses are more volatile.

Figure B15: Treatment of the COVID-19 Pandemic Period: External and Financial Responses in MENAP Economies to a U.S. Monetary Policy Shock by Exchange-Rate Regime



Notes: The figure presents the heterogeneous impulse responses of external and financial variables in MENAP economies to a one-standard-deviation surprise tightening in U.S. monetary policy, estimated using local projections with state-dependent interactions for exchange-rate regimes. Contemporary dummy for 2020 included among the controls. The three lines represent the responses conditional on the exchange-rate regime: Fixed (gray), Crawling (orange), and Flexible (blue). Shaded areas represent 90% (light) and 68% (dark) confidence intervals based on Driscoll and Kraay (1998) standard errors.