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Asymmetric Exchange Rate Pass-Through to Consumer Prices in Afghanistan: Monthly Evidence from a NARDL Model, 2007–2025

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Abstract

This study examines asymmetric exchange rate pass-through to consumer prices in Afghanistan over the period 2007–2025. It aims to measure and compare the short-run and long-run effects of depreciation and appreciation of the Afghan afghani against the U.S. dollar on the Consumer Price Index (CPI). The central research question is whether depreciation and appreciation of the afghani have exerted asymmetric effects on consumer prices in Afghanistan over the short and long run. The analysis employs 228 monthly observations and a nonlinear autoregressive distributed lag (NARDL) model. The exchange rate is expressed as Afghanis per U.S. dollar (AFN per USD), and its positive and negative changes are decomposed separately. The model also controls for the global food price index, oil prices, a post-August 2021 dummy variable, and seasonal effects. The Pesaran–Shin–Smith bounds test confirms the existence of a long-run relationship. In the baseline model, a 1% depreciation of the afghani is associated with an approximately 0.72% increase in consumer prices in the long run, whereas a 1% appreciation is associated with an approximately 0.37% decrease. The Wald test indicates that the difference between these effects is statistically significant. The direction of this long-run asymmetry is preserved across all major specifications; however, the difference is not statistically significant at the 5% level in the linear-trend specification or in the post-April 2015 subsample. Evidence of short-run asymmetry is less consistent and remains sensitive to the definition of the exchange rate series, the sample period, and the variance estimator. The global food price index also has a positive and statistically significant long-run effect on consumer prices. These findings underscore the importance of limiting excessive exchange rate volatility and addressing Afghanistan's vulnerability to global food price shocks.

Keywords: *Afghanistan; Exchange Rate Pass-Through; Inflation; Consumer Price Index; Asymmetry; NARDL*

1. Introduction and Statement of the Problem

1.1. Background and Significance of the Issue

Price stability is an important prerequisite for macroeconomic stability. In economies that rely substantially on imported consumer goods and production inputs, exchange rate movements can play a significant role in determining domestic prices. This issue is particularly important in Afghanistan, where limited domestic production capacity and a high degree of import dependence make fluctuations in the value of the Afghan afghani against the U.S. dollar a potentially important channel through which external shocks are transmitted to the domestic price level.

Badr (2025), using quarterly data and ARDL and ECM frameworks, shows that the exchange rate is among the principal determinants of the price level in Afghanistan in the long run and links its importance to the country's dependence on imports and external sources of foreign exchange. The relationship is also directly relevant from a policy perspective. Da Afghanistan Bank (DAB) identifies domestic price stability as the primary objective of monetary policy

and includes the containment of exchange rate volatility among its policy objectives. In addition, Afghanistan's official exchange rate framework is based on a managed floating regime (DAB, n.d.-a). Within such a framework, understanding the magnitude and speed of exchange rate pass-through is important for assessing the extent to which exchange rate fluctuations may threaten price stability.

The issue is equally important for households because increases in consumer prices directly reduce purchasing power. In an economy with limited capacity to substitute domestically produced goods for imports, adjusting consumption in response to price shocks may also be more difficult.

Examining the period from 2007 to 2025 makes it possible to assess the exchange rate–price relationship under varying macroeconomic conditions. During this period, Afghanistan experienced episodes of inflation and deflation, substantial fluctuations in the value of the afghani, and major political and financial changes. Badr (2025) identifies three deflationary episodes during the past two decades and characterizes the episode beginning in April 2023 as the longest, attributing it partly to weak domestic demand, appreciation of the afghani, and declines in some global prices. Such changes suggest that the relationship between the exchange rate and domestic prices should not be evaluated solely on the basis of a short sample period or a single economic environment.

1.2. Statement of the Problem

Existing empirical studies on Afghanistan emphasize the importance of the exchange rate, but they do not reach uniform conclusions regarding the magnitude, time horizon, or even statistical significance of its effect on domestic prices. Arian and Arabi (2020), using quarterly data from 2003Q1 to 2019Q2 and a VAR framework, report incomplete exchange rate pass-through to domestic prices and show that import prices and the Consumer Price Index (CPI) respond differently over the short and long run. Safi and Mashal (2020), in a study conducted by Da Afghanistan Bank using monthly data, also confirm a relationship between the exchange rate and inflation.

In contrast, Akhonzada (2026), using annual data from 2000 to 2024 and an OLS approach, finds no statistically significant effect of the official exchange rate or import value on inflation. At the other end of the spectrum, Badr (2025) identifies the exchange rate as the most important long-run driver of the domestic price level. These differing results highlight the need to re-examine the relationship using higher-frequency data and alternative econometric specifications. Differences in data frequency, sample period, and estimation method may explain part of the variation across previous findings. However, these factors alone do not address whether the direction of exchange rate movements also affects the strength of pass-through.

The problem addressed in the present study therefore extends beyond the conventional question of whether the exchange rate affects domestic prices. Most existing studies on Afghanistan have examined exchange rate movements within a linear framework. Under such a specification, depreciation and appreciation of equal magnitude are effectively assumed to generate effects of the same size but in opposite directions, and a single coefficient is estimated for both types of exchange rate movement.

This assumption may conceal important features of actual price-setting behavior. Depreciation of the afghani can increase the domestic-currency cost of imported final goods and production inputs, thereby placing upward pressure on consumer prices. An appreciation of the afghani, however, may not necessarily lead to an equivalent or equally rapid decline in consumer prices. If prices respond differently to depreciation and appreciation, a linear specification estimating only an average exchange rate effect may fail to capture the full mechanism of exchange rate pass-through.

1.3. Research Gap and Novelty

Accordingly, the research gap addressed in this study is not limited to whether a relationship exists between the exchange rate and domestic prices. Rather, it concerns how that relationship is specified and estimated.

Among the studies on Afghanistan reviewed for this research, no study was identified that explicitly decomposes positive and negative changes in the AFN per USD exchange rate and tests their asymmetric pass-through to the Consumer Price Index within a nonlinear autoregressive distributed lag (NARDL) framework.

The novelty of the present study therefore does not lie in reintroducing the already established relationship between exchange rates and prices. Instead, it lies in examining whether depreciation and appreciation of the afghani produce different effects on consumer prices over the short and long run.

The structural change associated with 2021 is also controlled for in the empirical analysis. However, because Badr (2025) has already examined evidence of a structural break in the third quarter of 2021, the inclusion of this break is not presented as an independent contribution of the present study.

1.4. Research Objective, Question, and Contribution

Against this background, the objective of the study is to measure and compare the short-run and long-run pass-through of depreciation and appreciation of the Afghan afghani against the U.S. dollar to consumer prices in Afghanistan over the period 2007–2025.

The main research question is:

Did depreciation and appreciation of the Afghan afghani against the U.S. dollar have asymmetric effects on consumer prices in Afghanistan in the short run and the long run during 2007–2025?

This study contributes to the existing literature in three respects. First, rather than imposing a single linear exchange rate effect, it separately examines the two directions of exchange rate movement. Second, it uses 228 monthly observations covering a relatively long period and a variety of macroeconomic conditions. Third, the NARDL framework allows short-run and long-run asymmetries to be examined separately.

Estimating these differences can provide a more precise assessment of the sensitivity of domestic prices to exchange rate movements and offer a stronger empirical basis for evaluating policies related to price stability and exchange rate management in Afghanistan.

2. Theoretical Framework

2.1. Mechanisms of Exchange Rate Pass-Through to Consumer Prices

Exchange rate pass-through (ERPT) refers to the extent to which changes in the exchange rate are transmitted to domestic prices. In its simplest form, a depreciation of the domestic currency raises the local-currency price of imported goods, and this increase may subsequently be passed on to final consumer prices.

The effect of exchange rate movements is not limited to final imported goods. Domestic producers that rely on imported raw materials, machinery, energy, packaging, or other intermediate inputs may also face changes in production costs. Accordingly, exchange rate movements can affect consumer prices through both a direct import-price channel and an indirect production- and distribution-cost channel.

Exchange rate pass-through is considered complete when a change in the exchange rate is fully reflected in domestic prices. By contrast, pass-through is incomplete when only part of the exchange rate shock is transmitted to prices. Domestic costs, profit margins, and gradual price adjustment can all contribute to incomplete pass-through to the Consumer Price Index (CPI).

However, pass-through need not be either complete or constant over time. Firms facing changes in costs may adjust selling prices, profit margins, or both, and the extent of these adjustments may depend on market conditions, demand, competition, and firms' perceptions regarding the persistence of the underlying shock. Taylor (2000) argues that the perceived persistence of cost changes and the prevailing inflation environment affect firms' pricing power and the degree of exchange rate pass-through. When a cost shock is regarded as temporary, firms may have less incentive to fully adjust their prices.

Shintani et al. (2013) further show that the relationship between inflation and the degree of exchange rate pass-through may be nonlinear and that the strength of ERPT can vary with the inflation environment. From a theoretical perspective, the pass-through coefficient should therefore not necessarily be treated as constant or independent of broader economic conditions. Consequently, a fixed linear relationship may conceal heterogeneous price responses to different types of exchange rate shocks.

2.2. Theoretical Rationale for Asymmetry

The assumption of symmetry implies that depreciation and appreciation of the domestic currency of equal magnitude produce price effects of the same absolute size but in opposite directions. In practice, several mechanisms may generate an asymmetric relationship.

One such mechanism is downward price rigidity. Firms may pass increases in costs caused by currency depreciation on to consumers relatively quickly, while failing to reduce selling prices by an equivalent amount when import costs

decline. In such circumstances, part of the reduction in costs associated with currency appreciation may instead be absorbed into profit margins. As a result, consumer-price responses to depreciation and appreciation may differ.

Market structure and profit-margin adjustment can also contribute to such asymmetry. Firms with greater pricing power may respond more rapidly to rising costs by increasing their prices, whereas an appreciation of the domestic currency may not necessarily compel them to reduce prices proportionately. Expectations may also matter. If currency depreciation is perceived as more persistent than appreciation, firms may react differently to two exchange rate shocks of equal magnitude.

Delatte and López-Villavicencio (2012), by separating positive and negative exchange rate changes, show that price responses to appreciation and depreciation can differ in both the short run and the long run. The theoretical implication is that a single linear coefficient may combine two distinct adjustment mechanisms into one average effect.

In the present study, asymmetry is not defined ex ante as necessarily implying a stronger effect of depreciation than appreciation. Rather, the central issue is whether the data reveal a statistically significant difference between the effects associated with the two directions of exchange rate movement. This approach avoids imposing the expected direction of the result on the model and allows the existence, magnitude, and direction of asymmetry to be determined empirically.

2.3. Research Hypotheses

Based on the theoretical framework outlined above, the following two hypotheses are tested:

H1: The long-run effect of depreciation of the Afghan afghani on consumer prices differs from the long-run effect of appreciation of the afghani.

H2: The short-run effect of depreciation shocks to the Afghan afghani on consumer prices differs from the short-run effect of appreciation shocks.

Support for these hypotheses requires a statistically significant difference between the effects associated with the two directions of exchange rate movement. Numerical differences between the estimated coefficients alone are not sufficient evidence of asymmetric exchange rate pass-through.

3. Literature Review and Identification of the Research Gap

3.1. International Studies on Asymmetric Exchange Rate Pass-Through

Recent literature on exchange rate pass-through suggests that the assumption of a linear and symmetric price response can be restrictive in many economies. Delatte and López-Villavicencio (2012), examining four advanced economies, estimate asymmetric short-run and long-run effects of exchange rate movements. Their main finding is that price responses to currency appreciation and depreciation are not identical and that, particularly over the long run, depreciation may generate stronger pass-through than appreciation. The relevance of this study to the present research lies in demonstrating that combining both directions of exchange rate movement into a single linear coefficient may conceal important differences in price-setting behavior.

Shintani et al. (2013) approach the issue from a different perspective by examining the relationship between inflation and the degree of exchange rate pass-through within a nonlinear framework. Their findings indicate that ERPT may vary with the inflation environment and therefore need not remain constant over time. This result weakens the assumption of a stable pass-through coefficient and strengthens the case for considering nonlinearities in the exchange rate–price relationship.

The development of the NARDL framework further made it possible to decompose positive and negative changes in explanatory variables and to test short-run and long-run asymmetries separately. This methodological development shifted the empirical question from simply asking how large exchange rate pass-through is to examining how the magnitude of pass-through may differ depending on the direction of exchange rate movement.

Taken together, international studies highlight two points that are particularly relevant to the present research. First, ERPT may depend on the direction of the exchange rate shock. Second, when asymmetry is present, a linear model may produce an average estimate that fails to fully reflect actual price responses. Nevertheless, neither the magnitude nor the direction of asymmetry is necessarily the same across countries, as these may depend on economic structure, inflation conditions, the degree of competition, and market characteristics.

3.2. Evidence from Developing and Asian Economies

The issue of asymmetric exchange rate pass-through may be especially relevant for developing economies, which often exhibit greater dependence on imports, shallower financial systems, and greater vulnerability to external shocks.

Kassi et al. (2019), examining a group of emerging and developing Asian economies, provide evidence of asymmetric exchange rate pass-through to consumer prices. Their results suggest that CPI responses to currency depreciation and appreciation may differ and that the degree of asymmetry is also heterogeneous across countries. This implies that the experience of one economy cannot automatically be generalized to another without country-specific empirical testing.

Mendali and Das (2024) investigate the issue for India using monthly data from March 1993 to March 2021 and a NARDL model. Their specification includes the exchange rate, CPI, output gap, money supply, and oil prices, while also accounting for structural breaks. Their results indicate that exchange rate shocks do not produce statistically significant changes in consumer prices in the long run.

This finding is important for the present study for two reasons. First, the use of NARDL does not necessarily imply that significant asymmetry or strong exchange rate pass-through will be detected. Second, evidence of asymmetric pass-through in some emerging economies does not mean that either the direction or the magnitude of asymmetry can be predetermined for Afghanistan. The result must therefore be derived from the Afghan data rather than inferred from the experience of other countries.

These studies also demonstrate the importance of controlling for relevant external and domestic influences when estimating ERPT. Incorporating global prices, demand conditions, or monetary variables can reduce the risk of attributing all movements in domestic prices to exchange rate fluctuations. This consideration is reflected in the present study through the inclusion of the global food price index and oil prices as external control variables.

3.3. Studies on Afghanistan

Previous research on Afghanistan shows that the relationship between exchange rates and domestic prices has already received empirical attention, although the methodologies employed and the resulting findings are not uniform.

Safi and Mashal (2020), in a study conducted by Da Afghanistan Bank, use monthly data together with correlation analysis, ordinary least squares regression, and Granger causality tests to examine the relationship between the AFN per USD exchange rate and inflation. They find the exchange rate to be statistically significant in explaining inflation and report Granger causality running from the exchange rate to inflation. However, the main specification is both bivariate and linear, and the authors also report residual autocorrelation. The study therefore provides evidence of the importance of the exchange rate but does not address whether depreciation and appreciation of the afghani have different effects on domestic prices.

Arian and Arabi (2020) use quarterly data from 2003Q1 to 2019Q2 and a VAR framework, together with cointegration analysis, impulse response functions, and variance decomposition, to investigate exchange rate pass-through along the price chain. Their results indicate incomplete exchange rate pass-through and show that import prices and the CPI respond differently over short- and long-run horizons. An important strength of their study is the analysis of pass-through dynamics in a multivariate setting. However, the VAR specification does not model depreciation and appreciation separately.

Fakhar et al. (2025), using quarterly data from 2015 to 2023 and an ARDL model, examine the relationship among the exchange rate, inflation, and money supply in both the short and long run. They find statistically significant contemporaneous and lagged exchange rate effects on inflation in the short run but do not report evidence of a long-run relationship among the exchange rate, inflation, and money supply.

This result differs from Badr (2025), who, using quarterly data and ARDL and ECM models, concludes that the exchange rate is the most important long-run driver of the domestic price level because of Afghanistan's dependence on imports and external sources of foreign exchange. Badr also examines and confirms evidence of a structural break in the third quarter of 2021.

The most recent study in this group is Akhonzada (2026), which uses annual data from 2000 to 2024, descriptive statistics, correlation analysis, and OLS regression to examine the effects of the official exchange rate and import value on inflation. In contrast to several earlier studies, it finds no statistically significant effect of either the official exchange

rate or imports on inflation and relates this result to characteristics such as dollarization, informal foreign exchange markets, and Afghanistan's institutional structure.

The differences between the findings of Akhonzada (2026), Safi and Mashal (2020), Badr (2025), and Fakhar et al. (2025) suggest that estimates of exchange rate pass-through in Afghanistan are sensitive to data frequency, sample period, and model specification.

3.4. Synthesis and Research Gap

The literature reviewed above indicates that existing studies do not provide a uniform conclusion regarding the importance of the exchange rate for domestic prices in Afghanistan. Some studies report statistically significant short-run effects, others emphasize long-run effects, while some find no statistically significant effect of the official exchange rate.

At the same time, the reviewed studies on Afghanistan have generally introduced the exchange rate in a linear form and have not separately estimated the effects of depreciation and appreciation of the afghani.

The principal research gap addressed in this study therefore lies in testing the existence and magnitude of asymmetric exchange rate pass-through in both the short run and the long run using monthly data for 2007–2025 and a NARDL framework.

In addition to separating the two directions of exchange rate movement, this design allows the analysis to control for external price shocks and the structural change associated with 2021. In this way, the study seeks to determine whether a linear specification conceals meaningful differences between the transmission of afghani depreciation and appreciation to consumer prices in Afghanistan.

4. Data and Methodology

4.1. Data, Study Period, and Harmonization of the Series

This study uses monthly data from January 2007 to December 2025, comprising a total of 228 observations. Monthly frequency is selected for two reasons. First, it allows relatively rapid exchange rate dynamics to be captured. Second, it provides a sufficiently large number of observations to distinguish between short-run and long-run effects within the NARDL framework.

The dependent variable is Afghanistan's overall Consumer Price Index (CPI). The underlying CPI series was obtained from the World Bank's Global Economic Monitor (GEM) and rebased so that April 2015 equals 100 (World Bank, n.d.-a). This transformation only standardizes the scale of the index and does not alter slope coefficients in the logarithmic specification.

Because the GEM series was incomplete after January 2025, monthly CPI observations for the remainder of 2025 were completed using the World Bank's Afghanistan Economic Monitor reports, which draw on data from Afghanistan's National Statistics and Information Authority (World Bank, 2025a, 2025b, 2025c, 2026).

The exchange rate is defined as the number of Afghanis per U.S. dollar (AFN per USD). Accordingly, an increase in the exchange rate represents a depreciation of the afghani, whereas a decrease represents an appreciation.

For January 2007 through May 2021, the monthly period-average exchange rate series from GEM was used (World Bank, n.d.-a). After May 2021, the publicly available GEM series for Afghanistan did not contain monthly observations. Therefore, for June 2021 through December 2024, monthly averages from Da Afghanistan Bank (DAB) were used (DAB, n.d.-b).

The publicly available DAB file reports months according to the Solar Hijri calendar. Accordingly, the average of the cash buying and selling rates was calculated for each month, and each Solar Hijri month was matched to its corresponding Gregorian-month label. This extension should not be interpreted as an exact Gregorian-calendar monthly average, and the resulting calendar mismatch is explicitly addressed in the robustness analysis.

The consistency of the merged exchange rate series was assessed using 173 overlapping monthly observations from GEM and DAB. The mean absolute difference between the two series was 0.0456 afghani, while the mean bias was 0.0227 afghani. For 2025, exact Gregorian-calendar monthly averages reported by the World Bank on the basis of DAB data were used (World Bank, 2025a, 2025b, 2025c, 2026).

In addition to the baseline exchange rate series, an alternative series based consistently on the DAB definition was constructed for the entire 228-month period. Re-estimating the model with this alternative series is treated as a mandatory robustness check.

After collection, all series were merged into a master dataset using a unique YYYYMM time identifier. Data-quality checks included verification of 228 consecutive months, absence of duplicate observations, absence of missing values in the baseline-model variables, and positivity of all observations prior to logarithmic transformation. No linear interpolation or statistical imputation was used for any of the main variables.

The use of the CPI level rather than the annual inflation rate is deliberate. The objective is to estimate the cumulative pass-through of exchange rate shocks to the consumer price level, and the NARDL framework permits the estimation of a long-run relationship among the logarithmic price level and the decomposed exchange rate components.

Two global variables are included to control for external price pressures. The first is the Food and Agriculture Organization of the United Nations Food Price Index (FFPI), which measures monthly changes in international prices for a basket of food commodities (FAO, n.d.). The second is the World Bank's average crude oil price from the Pink Sheet, expressed in U.S. dollars per barrel (World Bank, n.d.-b). Both series are available at monthly frequency throughout the study period.

A dummy variable, POST21, is also defined as equal to one from August 2021 onward and zero otherwise. The selection of this breakpoint is consistent with the institutional change of August 2021 and with Badr's (2025) evidence of a structural break in the third quarter of 2021. Eleven monthly dummy variables are additionally included to control for seasonality, with January serving as the reference category.

4.2. Operational Definition of Variables and Asymmetric Decomposition of the Exchange Rate

To reduce scale heterogeneity, facilitate elasticity-based interpretation, and stabilize variance, the CPI, exchange rate, FFPI, and oil price series are transformed into natural logarithms.

The baseline relationship is specified as:

$$\ln(CPI_t) = f(EX_t^+, EX_t^-, \ln(FFPI_t), \ln(OIL_t), POST21_t, S_t) \quad (1)$$

where S_t denotes the vector of monthly seasonal dummy variables.

Following Shin et al. (2014), changes in the logarithm of the exchange rate are decomposed into positive and negative partial sums:

$$EX_t^+ = \sum_{j=1}^{t} \max[\Delta \ln(EX_j), 0] \quad (2)$$

and

$$EX_t^- = \sum_{j=1}^{t} \min[\Delta \ln(EX_j), 0] \quad (3)$$

Under this definition, the positive component is always non-negative and the negative component is always non-positive. Both are constructed from changes in the same logarithmic exchange rate series. The decomposition therefore does not introduce new shocks into the data; rather, it represents the historical path of exchange rate changes according to their direction.

Given that the exchange rate is expressed as AFN per USD, EX_t^+ represents the cumulative depreciation of the afghani, whereas EX_t^- represents its cumulative appreciation. This decomposition allows the direction and magnitude of pass-through from depreciation and appreciation to be estimated separately without imposing the direction of asymmetry in advance.

4.3. NARDL Specification and Tests of Asymmetry

Short-run and long-run relationships are estimated using the nonlinear autoregressive distributed lag (NARDL) framework developed by Shin et al. (2014).

The unrestricted error-correction representation can be written as:

$$\Delta y_t = \alpha + \rho y_{t-1} + \theta^{+} EX_{t-1}^{+} + \theta^{-} EX_{t-1}^{-} + \delta' Z_{t-1} + \sum_{i=1}^{p-1} \phi_i \Delta y_{t-i} + u_t \quad (4a)$$

where

$$u_t = \sum_{j=0}^{q-1} \left(\pi_j^{+} \Delta EX_{t-j}^{+} + \pi_j^{-} \Delta EX_{t-j}^{-} \right) + \sum_{j=0}^{r-1} \psi_j' \Delta Z_{t-j} + \gamma POST21_t + \mu' S_t + \varepsilon_t \quad (4b)$$

Here,

$$y_t = \ln(CPI_t)$$

and (Z_t) includes $\ln(FFPI_t)$ and $\ln(OIL_t)$.

The long-run coefficients associated with depreciation and appreciation of the afghani are obtained as:

$$\beta^{+} = -\frac{\theta^{+}}{\rho}, \qquad \beta^{-} = -\frac{\theta^{-}}{\rho} \quad (5)$$

Long-run asymmetry is assessed using a Wald test of the null hypothesis:

$$H_0 : \beta^{+} = \beta^{-} \quad (6)$$

Short-run asymmetry is tested through the equality of the sums of the coefficients associated with changes in the positive and negative exchange rate components:

$$H_0 : \sum_j \pi_j^{+} = \sum_j \pi_j^{-} \quad (7)$$

Rejection of the null hypothesis constitutes statistical evidence of asymmetry. A numerical difference between the estimated coefficients alone is not treated as sufficient evidence of asymmetric pass-through.

Dynamic multipliers are also calculated to trace the adjustment path following an exchange rate shock and to compare the speed and trajectory of CPI responses to depreciation and appreciation over different horizons (Shin et al., 2014).

The existence of a long-run level relationship is examined using the ARDL bounds-testing framework of Pesaran et al. (2001). The baseline specification follows Case III, in which an intercept is included but no deterministic trend is imposed.

Four level variables—EX^{+}, EX^{-}, ln(FFPI), and ln(OIL)—enter the long-run relationship, while POST21 and the seasonal dummies are treated as fixed controls outside the level restrictions.

Because the asymptotic Pesaran–Shin–Smith critical bounds are derived under conventional, non-robust covariance assumptions, the bounds test itself is reported using the standard non-robust covariance estimator. By contrast, inference for the estimated coefficients and Wald tests is based on HC3 heteroskedasticity-robust standard errors.

In addition to the asymptotic critical bounds, sample-specific critical bounds are calculated using 100,000 simulations with a fixed random seed of 20260810. These simulations are intended to assess the implications of the finite sample size for the critical values and are not interpreted as a correction for heteroskedasticity.

4.4. Estimation Strategy, Diagnostic Tests, and Robustness Analysis

Before estimating the NARDL model, the statistical properties of the series are examined using descriptive statistics and time-series plots. No observation is removed solely because it represents a large change unless a verifiable data error is identified. Consequently, genuine exchange rate spikes that contain economically relevant information are retained in the sample.

Unit-root properties are then examined using the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests in levels and first differences (Dickey & Fuller, 1979; Phillips & Perron, 1988). Application of the ARDL bounds-testing procedure requires that none of the variables be integrated of order two, I(2), because the critical bounds of Pesaran et al. (2001) are designed for combinations of I(0) and I(1) variables.

Given the 228 monthly observations, an initial maximum lag length of six months is adopted for the baseline model. The final lag structure is selected by comparing the Akaike Information Criterion (AIC) and Schwarz/Bayesian Information Criterion (SIC/BIC), together with the principle of parsimony, retention of the theoretically relevant variables, and residual diagnostics.

Sensitivity to lag selection is additionally examined by extending the maximum lag search to 12 months. Where a long-run relationship is identified, the error-correction model is estimated and the sign and statistical significance of the error-correction term (ECT) are examined.

Model adequacy is evaluated using the Breusch–Godfrey test for residual serial correlation, the Breusch–Pagan test for heteroskedasticity, the Ramsey RESET test for functional-form or specification error, the Jarque–Bera test for residual normality, and the CUSUM, CUSUMSQ, and Hansen tests for parameter stability.

Where heteroskedasticity is detected, HC3 standard errors are used as the basis for coefficient inference and Wald tests. HC3 is not treated as a remedy for functional-form misspecification identified by the RESET test.

The robustness analysis includes re-estimation using the consistently defined DAB exchange rate series, subsamples beginning after March 2011 and April 2015, specifications including a linear time trend, expansion of the maximum lag length to 12 months, and interaction of the positive and negative exchange rate components with POST21 to test whether pass-through slopes changed after August 2021.

The 2011 and 2015 subsamples are motivated by historical changes in the CPI base and basket (DAB, 2021). Robustness is evaluated by considering both the persistence of coefficient signs and the stability of statistical significance, and any weakening of the evidence is reported explicitly.

A continuous and consistently defined monthly series for an internal control variable such as M2 or a real-activity indicator was not available for the full 2007–2025 period. Rather than mechanically combining inconsistent series, such variables were therefore excluded from the baseline specification. This limitation is explicitly considered in the discussion section.

For reproducibility, the final dataset retains the monthly identifier, raw and transformed values, positive and negative exchange rate components, seasonal dummy variables, and the source of each series. Estimation was conducted using Python 3.13.5 and Statsmodels 0.14.6. The primary significance level is 5%, while the 1% and 10% levels are reported only as supplementary information.

5. Empirical Results

5.1. Descriptive Characteristics of the Data

The empirical analysis is based on 228 monthly observations covering the period from January 2007 to December 2025. Descriptive statistics indicate substantial variation in the main variables over the study period.

The Consumer Price Index has a mean of 105.35 and a standard deviation of 22.54. The minimum CPI value is observed in January 2007, while the maximum occurs in July 2022. The exchange rate ranges from 45.11 to 104.47 Afghanis per U.S. dollar, with a sample mean of 64.60. Its maximum value is recorded in January 2022. The global food price index ranges from 78.48 to 160.22, while the average crude oil price varies between USD 21.04 and USD 132.83 per barrel.

These variations indicate that the sample covers markedly different episodes of price and exchange rate conditions. At this stage, however, they are reported only as descriptive characteristics of the data, while causal and economic interpretations are reserved for the discussion section.

Table 1
Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
CPI	228	105.35	22.54	59.99	148.63
Exchange Rate (AFN per USD)	228	64.60	13.74	45.11	104.47
FFPI	228	111.38	17.34	78.48	160.22
Oil (USD/bbl)	228	75.20	22.71	21.04	132.83

Source: Author's calculations based on the compiled dataset.

5.2. Unit-Root Tests

To determine the order of integration of the variables, the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests are applied to both levels and first differences.

For ln CPI and ln EX, the ADF test fails to reject the null hypothesis of a unit root in levels, whereas both variables become strongly stationary after first differencing.

For ln FFPI and ln OIL, the ADF test rejects the unit-root null at approximately the 5% level in levels, whereas the PP test does not. Rather than imposing a definitive classification in the presence of this divergence, the results are interpreted conservatively.

More importantly, all four variables are stationary in first differences under both tests. Therefore, there is no evidence that any variable is integrated of order two, I(2), satisfying the integration-order requirement for the NARDL/bounds-testing approach.

Table 2
Unit-Root Test Results

Variable	ADF Level (p)	PP Level (p)	ADF First Difference (p)	PP First Difference (p)	Conclusion
lnCPI	0.313	0.474	< 0.001	≤ 0.01	I(1)
lnEX	0.648	0.943	< 0.001	≤ 0.01	I(1)
lnFFPI	0.043	0.454	< 0.001	≤ 0.01	I(0)/I(1), not I(2)
lnOIL	0.035	0.164	< 0.001	≤ 0.01	I(0)/I(1), not I(2)

Source: Author's calculations.

5.3. Lag Selection and Testing for a Long-Run Relationship

With an initial maximum lag length of six months, alternative model specifications were compared on the basis of AIC, SIC/BIC, parsimony, and residual diagnostics. The NARDL(2,1,1,1,1) specification was selected as the baseline model.

Extending the maximum lag search to 12 months showed that BIC favored the slightly more parsimonious NARDL(1,1,1,1,1) specification. Re-estimation using this alternative lag structure did not change the direction of the long-run result, indicating that the baseline finding is not dependent on a single maximum-lag choice.

The bounds test was conducted under Case III, with four variables entering the level relationship. The resulting F-statistic is 6.243. At the 5% significance level, the asymptotic lower and upper bounds for I(0) and I(1) are 2.637 and 3.791, respectively. The test statistic therefore exceeds the upper critical bound.

To assess finite-sample sensitivity, 100,000 simulations were conducted using a fixed random seed. The corresponding sample-specific 5% lower and upper bounds are 2.910 and 4.067, respectively, with an upper-bound p-value of 0.0018. Since 6.243 > 4.067, the evidence of a long-run level relationship is preserved under both the asymptotic and sample-specific critical bounds.

The bounds test is reported using the standard non-robust covariance estimator. HC3 standard errors are subsequently used for inference on coefficients and Wald tests and are not treated as a substitute for the distributional assumptions underlying the Pesaran–Shin–Smith bounds procedure.

5.4. Short-Run and Long-Run Coefficients

The long-run estimates reveal a clear difference between the two directions of exchange rate movement.

The long-run elasticity associated with the positive exchange rate component, representing depreciation of the afghani, is estimated at 0.721. The HC3-based 95% confidence interval ranges from 0.619 to 0.823. Thus, holding other factors constant, a 1% depreciation of the afghani is associated with an approximately 0.72% increase in the CPI in the long run.

The long-run coefficient on the negative exchange rate component is 0.371. Because EX^- becomes more negative when the afghani appreciates, a 1% appreciation implies an approximately 0.37% decline in the CPI in the long run. The corresponding 95% confidence interval ranges from 0.189 to 0.554.

The direction of the price response is therefore consistent with theoretical expectations, but the magnitude of the response to appreciation is substantially smaller than the response to depreciation.

Among the external control variables, the long-run elasticity of the FFPI is 0.667 and statistically significant. In contrast, the oil-price coefficient is approximately −0.067 and is not statistically significant at the 5% level. In the baseline specification, global food prices therefore exhibit a stronger long-run association with Afghanistan's CPI than oil prices. The economic interpretation of this difference is discussed in Section 6.

The error-correction coefficient, −0.1086, is negative and statistically significant at below the 1% level. Its sign is consistent with convergence toward long-run equilibrium and indicates that approximately 10.9% of a deviation from equilibrium is corrected each month.

In the short run, the coefficient on the contemporaneous change in the positive exchange rate component is 0.271 and statistically significant using HC3 standard errors ($p = 0.0046$). Accordingly, a 1% depreciation shock in the month in which it occurs is associated with an approximately 0.27% increase in the CPI.

The contemporaneous coefficient on the negative component is 0.044 and is not individually statistically significant ($p = 0.539$). Because an appreciation shock is negative, its corresponding effect on the CPI is also negative.

The short-run coefficients on the FFPI and oil prices are not statistically significant under the robust specification. The POST21 dummy also carries a negative and statistically significant coefficient; however, a structural interpretation of this coefficient without considering regime changes and model specification could be misleading. Its economic interpretation is therefore reserved for the discussion section.

Table 3
Short-Run and Long-Run NARDL Coefficients

Variable	Coefficient	HC3 Robust SE	p-value
Long-run EX^+	0.721	0.052	< 0.001
Long-run EX^-	0.371	0.093	< 0.001
Long-run FFPI	0.667	0.115	< 0.001
Long-run Oil	−0.067	0.066	0.308

Variable	Coefficient	HC3 Robust SE	p-value
ΔEX^{+}	0.271	0.095	0.0046
ΔEX^{-}	0.044	0.072	0.539
ECT(−1)	−0.1086	0.028	< 0.001

Source: NARDL estimation by the author.

5.5. Tests of Asymmetry and Dynamic Multipliers

The first research hypothesis is examined using a Wald test of equality between the two long-run exchange rate coefficients. Using HC3 standard errors, the Wald statistic is 10.14, with a p-value of 0.0017. The null hypothesis of equal long-run effects is therefore rejected.

Given that the long-run depreciation coefficient is approximately 0.72, compared with approximately 0.37 for appreciation, the baseline model provides evidence of long-run asymmetry, with stronger pass-through from depreciation of the afghani.

By contrast, the HC3-based short-run Wald test yields a p-value of 0.103. At the 5% significance level, the null hypothesis of equal short-run effects therefore cannot be rejected. The numerical difference between the short-run coefficients alone is insufficient to establish the second hypothesis. This distinction between numerical and statistically significant asymmetry is maintained throughout the interpretation of the results.

The dynamic multipliers further illustrate differences in the adjustment paths. Following a 1% depreciation shock, the cumulative increase in the CPI rises from approximately 0.27% in the impact month to 0.56% after six months, 0.65% after 12 months, and 0.71% after 24 months, gradually approaching its estimated long-run value.

In response to a 1% appreciation shock, the cumulative decline in the CPI increases from approximately 0.04% in the impact month to 0.24% after six months, 0.32% after 12 months, and 0.36% after 24 months.

Table 4
Dynamic Exchange Rate Multipliers

Horizon after Shock	Depreciation	Appreciation
Month 0	0.271% increase	0.044% decrease
Month 1	0.370% increase	0.088% decrease
Month 3	0.468% increase	0.160% decrease
Month 6	0.559% increase	0.236% decrease
Month 12	0.655% increase	0.316% decrease
Month 24	0.710% increase	0.362% decrease
Long run	0.721% increase	0.371% decrease

Source: Author's calculations of dynamic multipliers based on the estimated model.

5.6. Diagnostic and Robustness Tests

The Breusch–Godfrey test with 12 lags provides no evidence of residual serial correlation ($p = 0.401$). In contrast, the Breusch–Pagan test rejects the null of homoskedasticity ($p < 0.001$), while the Jarque–Bera test also rejects residual normality. Accordingly, the principal coefficient inference and Wald tests are based on HC3 standard errors, and extreme observations are not removed solely to improve residual normality.

Regarding parameter stability and functional form, the CUSUM test provides no evidence of overall instability ($p = 0.775$). However, CUSUMSQ shows a limited crossing of the critical bounds during part of the sample, and the Hansen test also raises concerns regarding complete parameter stability.

Most importantly, the Ramsey RESET test is statistically significant in the baseline model ($p = 0.0041$). This finding is interpreted as a warning of possible functional-form or specification error and is not considered to have been "solved" by the use of HC3 standard errors. For this reason, the main result is interpreted only in conjunction with the alternative specifications.

Table 5
Robustness Tests of Asymmetric Exchange Rate Pass-Through

Specification	LR Depreciation	LR Appreciation	Long-Run Wald p	Short-Run Wald p	RESET p
Baseline: NARDL(2,1,1,1,1)	0.721	0.371	0.0017	0.103	0.0041
Consistent DAB series	0.701	0.342	0.0006	0.010	0.0024
Post-March 2011 sample	0.599	0.420	0.0061	0.340	0.177
Post-April 2015 sample	0.446	0.325	0.066	0.424	0.117
Linear-trend specification	0.633	0.380	0.367	0.136	0.0039
12-month lag ceiling; BIC: NARDL(1,1,1,1,1)	0.727	0.392	0.0007	0.066	0.012

Source: Author's calculations. LR coefficients are long-run elasticities; the reported Wald and RESET p-values correspond to the respective re-estimated specifications.

Table 5 shows that the direction of long-run asymmetry is preserved across all specifications: the estimated depreciation effect is consistently larger than the appreciation effect. Statistical significance, however, is not equally stable across specifications.

The baseline model, the consistently defined DAB series, the post-2011 sample, and the alternative lag specification provide statistically significant evidence of long-run asymmetry. In the shorter post-April 2015 sample, however, the evidence weakens at the 5% significance level, while the long-run Wald test is also insignificant in the linear-trend specification.

The linear trend itself is statistically insignificant ($p = 0.740$), and the RESET test continues to reject that specification. Thus, mechanically adding a linear trend does not resolve the functional-form concern affecting the full-period model.

In contrast, the RESET test is not rejected for the post-2011 and post-2015 samples ($p = 0.177$) and ($p = 0.117$), respectively). This suggests that part of the baseline specification warning may be related to long-run heterogeneity in the series and changes in the statistical construction of the CPI.

Tests for changes in pass-through slopes after August 2021 also fail to provide compelling evidence of coefficient shifts. The joint test of the level interactions between EX^{+} and EX^{-} and POST21 yields a p-value of 0.303, while the corresponding joint test of short-run interactions produces a p-value of 0.493. Accordingly, the 2021 break is not interpreted in this study as evidence of a statistically established change in ERPT slopes.

Evidence of short-run asymmetry remains mixed. The consistently defined DAB series supports short-run asymmetry ($p = 0.010$), and the use of HAC inference in the baseline model also produces a statistically significant short-run Wald test ($p = 0.015$). However, the post-2011 and post-2015 samples and the linear-trend specification do not yield the same conclusion.

The second research hypothesis therefore cannot be considered conclusively supported. Regarding the first hypothesis, the more precise conclusion is that the direction of long-run asymmetry is preserved across all specifications and is statistically significant in most specifications, although the strength of the evidence remains sensitive to the sample period and functional form.

6. Discussion and Interpretation of the Findings

6.1. Interpretation of the Main Finding

The principal finding of this study is that, in the baseline specification, exchange rate pass-through to consumer prices in Afghanistan is asymmetric in the long run, with depreciation of the afghani producing a larger effect on the CPI than appreciation.

The direction of this difference is preserved across all robustness specifications, although the statistical strength of the evidence is not uniform. In particular, the evidence weakens at the 5% significance level in the linear-trend specification and in the shorter post-April 2015 sample. The long-run result should therefore be interpreted as strong in the baseline model and in most alternative specifications, but sensitive to certain sample and functional-form choices.

By contrast, the evidence of short-run asymmetry is not uniform from the outset and remains sensitive to the definition of the exchange rate series, the sample period, and the method used to estimate the variance-covariance matrix.

Several mechanisms may help explain the observed pattern, although the aggregate data used in this study do not allow their individual contributions to be identified directly. In an economy where a substantial share of consumer goods and production inputs is imported, depreciation of the domestic currency raises the afghani cost of imports and may create stronger incentives for firms to pass these higher costs on to consumers.

In the opposite direction, appreciation of the afghani does not necessarily produce an equivalent reduction in consumer prices. Domestic costs, inventories purchased at earlier exchange rates, and the possibility of adjusting profit margins may limit the extent to which lower import costs are transmitted to final prices.

This interpretation is consistent with the theoretical arguments concerning downward price rigidity and profit-margin adjustment in the ERPT literature. However, these channels should be understood as plausible mechanisms rather than as causal relationships directly established by the present macroeconomic analysis.

The statistical significance of the global food price index further reinforces the importance of external price channels for Afghanistan. In contrast, the lack of statistical significance of oil prices in the baseline specification should not be interpreted as evidence that energy prices are economically irrelevant.

Rather, it indicates that, after controlling for the exchange rate, global food prices, the post-2021 shift, and the model's dynamics, the independent effect of global oil prices on the aggregate CPI cannot be estimated with sufficient statistical precision. It would therefore be inappropriate to infer from this coefficient that changes in energy prices have no effect on transportation or domestic production costs.

6.2. Comparison with Previous Studies

The long-run finding of this study is consistent with part of the existing literature on Afghanistan while extending that literature analytically.

Badr (2025) identifies the exchange rate as one of the most important long-run determinants of the domestic price level in Afghanistan and links this relationship to the country's dependence on imports and external sources of foreign exchange. The present study similarly confirms the importance of the long-run relationship between exchange rates and prices, but further shows that the magnitude of this relationship depends on the direction of exchange rate movement.

This implies that a single linear coefficient may conceal meaningful differences between the pass-through of depreciation and appreciation of the afghani.

The findings are also broadly consistent with Safi and Mashal (2020) and Arian and Arabi (2020) regarding the existence of exchange rate pass-through to domestic prices. The DAB study reports a statistically significant relationship between the exchange rate and inflation, while Arabi and Arian find incomplete pass-through and different price dynamics across time horizons.

The present study complements these findings by explicitly separating positive and negative exchange rate shocks.

By contrast, Fakhar et al. (2025) identify statistically significant short-run exchange rate effects but do not confirm a long-run relationship. The difference between their findings and those of the present study may reflect differences in sample length, quarterly rather than monthly data frequency, the use of a linear ARDL specification, and the definition of the dependent variable.

From an international perspective, the direction of the long-run result is consistent with Delatte and López-Villavicencio (2012), who also find that the pass-through associated with currency depreciation and appreciation need not be equal.

The evidence reported by Kassi et al. (2019) for emerging and developing Asian economies likewise emphasizes heterogeneity and the possibility of asymmetric ERPT.

Nevertheless, the Afghan result should not be regarded simply as a replication of these international findings. The magnitude and statistical significance of exchange rate pass-through depend on country-specific characteristics, including market structure, import composition, inflation conditions, and the exchange rate regime.

For the same reason, the mixed short-run evidence obtained in this study is itself informative. The use of a NARDL framework does not imply that asymmetry must necessarily be detected over both short- and long-run horizons.

6.3. Afghanistan-Specific Features and Policy Relevance

For Afghanistan, the difference between the effects of depreciation and appreciation is particularly important from a policy perspective.

If the upward price effect of depreciation is stronger than the downward price effect of appreciation, a subsequent recovery of the exchange rate may not fully reverse the increase in consumer prices generated during the earlier depreciation episode.

This suggests that preventing severe and persistent exchange rate instability may be more effective than attempting to offset its price consequences after they have already materialized. This interpretation is also consistent with Da Afghanistan Bank's stated emphasis on price stability and the containment of excessive exchange rate volatility.

At the same time, the results should not be interpreted as supporting exchange rate stabilization at any cost. The model only indicates that exchange rate movements matter for the domestic price level. It does not estimate an equilibrium exchange rate, the costs of foreign exchange intervention, or an optimal exchange rate regime.

The statistical significance of the FFPI also indicates that price stability in Afghanistan is not solely an exchange rate issue. Global food price shocks constitute another important source of domestic price pressure.

The principal policy implication is therefore the need to consider both exchange rate stability and vulnerability to global commodity prices rather than reducing inflation management to a single variable.

6.4. Limitations of the Study

The findings should be interpreted in light of several limitations.

First, after the discontinuation of the monthly GEM exchange rate series, the baseline exchange rate variable was extended using DAB data. Although the consistency of the two sources was validated and the model was re-estimated using a uniformly defined DAB series, the calendar mismatch between Solar Hijri and Gregorian monthly observations cannot be eliminated completely.

Second, changes in the base year and composition of the CPI basket over the sample period may contribute to long-run heterogeneity in the series. This issue was examined using the post-2011 and post-2015 subsamples. The direction of long-run asymmetry remains unchanged, although statistical significance weakens in the shorter post-2015 sample.

Third, the RESET test for the baseline model and some parameter-stability tests raise concerns regarding the specification over the full sample period. These concerns are not concealed through the use of HC3 standard errors.

Alternative specifications show that the RESET test is not rejected in the shorter subsamples, while the addition of a linear trend does not resolve the RESET problem and also weakens the long-run Wald evidence.

Accordingly, the long-run finding should be characterized as robust in direction and relatively robust in statistical significance, rather than as a relationship that is entirely invariant to model specification.

Fourth, a continuous and consistently defined monthly series for desirable domestic control variables such as M2 or a real-activity indicator was not available for the entire 2007–2025 period in the final dataset. Mechanically combining discontinuous series could itself introduce measurement error.

Fifth, the aggregate macroeconomic model cannot directly identify firm-level pricing behavior, profit margins, or differences across commodity groups.

In addition, the sample-specific simulation of the bounds critical values addresses finite-sample considerations but should not be interpreted as a heteroskedasticity-robust version of the bounds test.

The principal finding should therefore be understood as empirical evidence of long-run asymmetry at the level of the aggregate CPI, subject to the limitations described above, rather than as proof of a specific microeconomic transmission mechanism.

7. Conclusion and Policy Implications

This study began with the question of whether depreciation and appreciation of the Afghan afghani against the U.S. dollar had asymmetric effects on consumer prices in Afghanistan in the short run and the long run over the period 2007–2025. The analysis of 228 monthly observations indicates that the answer differs across the two time horizons.

In the baseline model, the long-run effect of afghani depreciation is significantly larger than that of appreciation, and the direction of this difference is preserved across all robustness specifications. However, the statistical strength of the

evidence is not uniform across specifications and weakens in the linear-trend model and in the shorter post-April 2015 sample. The first research hypothesis is therefore supported subject to specification sensitivity rather than unconditionally.

In the short run, tests of asymmetry produce non-uniform results depending on the definition of the exchange rate series, the sample period, and the variance estimator. The available evidence is therefore insufficient to conclusively support the second research hypothesis.

The main economic implication of the findings is that an improvement in the exchange rate does not necessarily reverse the price effects generated by an earlier depreciation of the afghani to the same extent. This asymmetry may contribute to the persistence of some price pressures after episodes of domestic-currency depreciation and indicates that the direction of exchange rate movements, in addition to their magnitude, matters for understanding inflation dynamics in Afghanistan.

The evidence regarding the global food price index further demonstrates that domestic price developments are not determined by the exchange rate alone. External shocks, particularly those originating in global food markets, constitute an important component of Afghanistan's inflationary environment.

The first policy implication is therefore the importance of preventing excessive and persistent exchange rate volatility. If pass-through from depreciation is stronger than that from appreciation, the price cost of a period of currency weakening may not be fully reversed by a subsequent recovery in the exchange rate. Monetary and exchange rate policies should therefore place greater emphasis on limiting severe instability, managing expectations, and maintaining confidence in the domestic currency rather than relying primarily on corrective intervention after shocks have occurred.

This conclusion should not be interpreted as support for administratively fixing the exchange rate or targeting a particular exchange rate level. The present study does not estimate the equilibrium exchange rate or the costs of foreign exchange intervention.

Second, the management of price stability in Afghanistan should not be restricted to the foreign exchange market. The statistical significance of global food prices suggests that regular monitoring of international food markets, strengthening reserves and mechanisms for securing essential commodities, and reducing vulnerabilities in import supply chains may form part of a broader strategy for limiting inflationary pressures. Policies concentrating exclusively on the exchange rate risk overlooking the contribution of non-exchange-rate external shocks.

Third, the findings highlight the importance of improving the quality and continuity of monthly macroeconomic statistics. Calendar differences in some exchange rate observations and changes in the CPI base and basket over the sample period, although addressed through robustness tests, demonstrate the importance of publishing consistent, retrievable monthly series accompanied by clear metadata. Continued publication of exchange rate, price, trade, money supply, and other macroeconomic indicators using stable definitions would materially improve the quality of future empirical analysis and policy evaluation.

The study is subject to several limitations. Because the analysis is conducted using the aggregate CPI, it cannot identify differences in exchange rate pass-through across food, energy, housing, and other expenditure categories. The aggregate model also cannot directly observe firms' price-setting behavior, profit margins, or differences between official and informal foreign exchange markets.

Future research could use disaggregated price indices, micro-level data, and models allowing for multiple structural breaks to examine the commodity groups in which asymmetry is strongest and whether the transmission mechanism has changed since 2021.

Despite these limitations, the findings indicate that understanding inflation dynamics in Afghanistan requires moving beyond the assumption of linear exchange rate pass-through. Distinguishing between depreciation and appreciation of the afghani provides a more precise representation of the relationship between exchange rate movements and consumer prices.

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