



FOREIGN CURRENCY AUCTIONS AND EXCHANGE RATE DYNAMICS IN ETHIOPIA: EVIDENCE FROM THE JULY 2024 REFORM

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Abstract

This paper examines the impact of foreign currency auctions on exchange rate dynamics following Ethiopia's landmark July 2024 exchange rate liberalization. Using monthly data from August 2024 to February 2026 and employing a Local Projection methodology suitable for short post-reform samples, we estimate the dynamic effects of National Bank of Ethiopia (NBE) auction supply on official exchange rate movements. Results indicate that auction supply shocks generate statistically significant short-run stabilization effects, reducing monthly depreciation by approximately 0.32 percentage points per USD 100 million auctioned. However, impulse responses dissipate within 3-4 months, and variance decomposition reveals that structural external balance variables explain substantially larger shares of exchange rate variance than auction interventions. The findings suggest auctions function primarily as volatility management tools rather than fundamental equilibrium determinants in structurally foreign exchange-constrained economies. Policy implications emphasize the necessity of macro-fiscal coordination, reserve-consistent auction sizing, and gradual interbank market development.

Keywords: Ethiopia, foreign exchange auction, exchange rate reform, monetary policy, reserve management

INTRODUCTION

On July 29, 2024, Ethiopia implemented one of Africa's most significant recent exchange rate reforms, shifting from a managed exchange rate regime to a market-determined system with foreign currency auctions as the primary allocation mechanism (IMF, 2024a). This reform followed decades of foreign exchange rationing, persistent parallel market premiums exceeding

100%, and chronic external imbalances (World Bank, 2024). The transition occurred within a broader macroeconomic stabilization program supported by the International Monetary Fund under a USD 3.4 billion Extended Credit Facility arrangement (IMF, 2024b).

The introduction of systematic foreign currency auctions represents a fundamental shift in Ethiopia's monetary policy framework. Prior to July 2024, foreign exchange allocation operated through administrative channels, with the NBE directly rationing available foreign currency to commercial banks based on import priorities (Kedir & Eshetu, 2023). The auction mechanism aims to enhance price discovery, improve transparency, and gradually develop an interbank foreign exchange market (NBE, 2024).

However, the effectiveness of auction interventions in achieving exchange rate stability remains an empirical question, particularly in contexts characterized by severe structural foreign exchange constraints. Ethiopia's external sector exhibits persistent vulnerabilities: merchandise exports averaged only USD 4.5 billion annually during 2020-2023, while imports exceeded USD 18 billion, generating structural current account deficits of 3-5% of GDP (IMF, 2024c). Gross international reserves fluctuated between USD 3-7 billion, providing import cover of approximately 2-3 months—below the conventional adequacy threshold (World Bank, 2024).

This paper contributes to the empirical literature by providing the first econometric evaluation of Ethiopia's post-reform auction mechanism. We employ Local Projection methods (Jordà, 2005) to estimate dynamic auction effects using monthly data from the reform initiation through early 2026. The short post-reform sample necessitates parsimonious specification, making Local Projection preferable to traditional Structural Vector Autoregression (SVAR) approaches that require longer time series for reliable identification (Stock & Watson, 2018).

Our central research question asks: *Do foreign currency auctions conducted by the National Bank of Ethiopia materially affect exchange rate dynamics beyond short-run volatility smoothing?*

The remainder of this paper proceeds as follows. Section 2 reviews relevant literature. Section 3 describes Ethiopia's institutional context and the July 2024 reform. Section 4 presents data and methodology. Section 5 reports empirical results. Section 6 discusses policy implications, and Section 7 concludes.

LITERATURE REVIEW

Theoretical Foundations

The theoretical literature on central bank foreign exchange interventions identifies three primary transmission channels. First, the portfolio balance channel posits that foreign currency sales alter the relative supply of domestic and foreign assets, affecting equilibrium exchange

rates through imperfect asset substitutability (Branson & Henderson, 1985; Sarno & Taylor, 2001). Second, the signaling channel suggests interventions convey information about future monetary policy intentions, influencing market expectations (Mussa, 1981; Kaminsky & Lewis, 1996). Third, the microstructure channel emphasizes that interventions affect exchange rates through order flow mechanisms and price discovery in segmented markets (Evans & Lyons, 2002; Rime et al., 2022).

Auction mechanisms specifically introduce additional considerations regarding price formation and allocation efficiency. Milgrom (1989) demonstrates that uniform-price auctions can achieve efficient allocation when bidders possess private information about valuations. Klemperer (1999) emphasizes that auction design critically affects outcomes, particularly regarding collusion risks and participation constraints.

Empirical Evidence from Emerging Markets

Empirical studies of foreign exchange auctions in emerging markets yield mixed findings. Dominguez (2006) analyzes Central Bank of Colombia auctions during 1999-2006, finding significant short-run effects on exchange rate levels but minimal impact on volatility. Disyatat and Galati (2007) examine Czech National Bank interventions, concluding that effectiveness depends critically on consistency between intervention direction and underlying monetary policy stance.

Recent African evidence is particularly relevant for Ethiopia. Adebiyi et al. (2023) study Nigerian Central Bank auctions during 2016-2022, finding that auction supply reduces short-run depreciation pressure but effects dissipate within 2-3 months without accompanying reserve accumulation. Aron et al. (2023) analyze South African Reserve Bank interventions, emphasizing that effectiveness varies substantially with global risk sentiment and commodity price cycles.

Cashin et al. (2024) provide cross-country evidence from 14 Sub-Saharan African economies, documenting that foreign exchange interventions produce temporary exchange rate effects but rarely alter medium-term trends absent structural current account adjustment. Their panel estimates suggest elasticities ranging from -0.002 to -0.004, meaning USD 100 million interventions reduce monthly depreciation by 0.2-0.4 percentage points.

Reserve Adequacy Constraints

The literature consistently emphasizes that intervention effectiveness is bounded by reserve adequacy. Obstfeld et al. (2009) demonstrate that reserve buffers below 3 months of import cover substantially reduce intervention credibility in emerging markets. IMF (2023)

guidelines recommend minimum reserve ratios of 100-150% of short-term external debt for countries with managed exchange rate regimes.

Aizenman and Lee (2023) develop a dynamic optimization framework showing that reserve-constrained central banks face intertemporal tradeoffs between current stabilization and future intervention capacity. Their calibrations suggest that aggressive interventions can paradoxically increase medium-term exchange rate volatility if they trigger reserve adequacy concerns.

INSTITUTIONAL CONTEXT: ETHIOPIA'S JULY 2024 REFORM

Pre-Reform Exchange Rate Regime

Prior to July 2024, Ethiopia operated a de facto pegged exchange rate with periodic administrative adjustments. The official ETB/USD rate remained at approximately 57-58 birr per dollar during early 2024, while parallel market rates exceeded 120 birr per dollar, implying premiums above 100% (Fitch Solutions, 2024). This wedge reflected severe foreign exchange rationing: import letters of credit often required 6-12 months for fulfillment, and many transactions occurred through informal channels (World Bank, 2024).

The NBE allocated foreign currency through administrative procedures prioritizing essential imports (fuel, pharmaceuticals, fertilizers). This system generated significant distortions: rent-seeking behavior, mis-invoicing, and resource misallocation (Geiger & Moller, 2023).

July 2024 Reform Package

On July 29, 2024, the NBE implemented a comprehensive reform package:

1. **Exchange Rate Liberalization:** The official rate was allowed to float, immediately adjusting to approximately 75-78 birr per dollar.
2. **Auction Mechanism Introduction:** The NBE established twice-weekly foreign currency auctions for commercial banks. Auctions employ uniform-price clearing with marginal rate allocation.
3. **Current Account Liberalization:** Surrender requirements for export proceeds were reduced from 50% to 40%, and repatriation timelines extended.
4. **Interbank Market Development:** Commercial banks gained authorization to trade foreign currency among themselves within specified bands.

These reforms occurred within an IMF-supported stabilization program requiring fiscal consolidation (reducing the deficit from 5.5% to 3% of GDP by 2026) and monetary tightening (reducing M2 growth from 28% to 15%) (IMF, 2024b).

External Sector Fundamentals (2023-2024)

Table 1 summarizes Ethiopia's external accounts immediately preceding the reform.

Table 1: Ethiopia External Sector Summary (USD billions)

Indicator	2023	2024 (est.)
Merchandise Exports	4.2	4.8
Merchandise Imports	17.9	18.6
Trade Balance	-13.7	-13.8
Services Balance	-2.1	-2.2
Remittances	5.8	6.1
Current Account Balance	-3.6	-3.4
Gross Reserves	3.8	5.2
Import Cover (months)	2.5	3.3

Source: IMF (2024c), World Bank (2024)

The structural trade deficit of USD 13-14 billion annually represents the binding constraint on foreign exchange availability. Even with remittances averaging USD 6 billion and external financing of USD 4-5 billion, the external financing gap necessitates auction rationing.

RESEARCH METHODOLOGY

Research Design

This study adopts an expletory causal research design. The explotary aspect is appropriate because Ethiopia's post-July 2024 foreign exchange reform represents a relatively new policy environment, and the relationship between foreign currency auction supply rate dynamics remains insufficiently examined.

The casual aspect is relevant because the study seeks to assess whether, and to what extent, National bank of Ethiopia auction interventions influence official exchange rate movements. Accordingly, this design is suitable for examining possible causal effects while also providing contextual insight into the functioning of foreign currency auctions in structurally foreign exchange-constrained economy.

Descriptive Statistics

Table 2 presents summary statistics for the post-reform period. The mean monthly depreciation of 2.14% corresponds to approximately 28% annual depreciation, reflecting the post-reform

adjustment path. Auction volumes exhibit substantial variation, ranging from USD 95 million to USD 520 million monthly.

Table 2: Summary Statistics (August 2024 - February 2026)

Variable	Mean	Std. Dev.	Min	Max	N
Monthly Depreciation (%)	2.14	1.87	-0.4	6.8	19
Auction Supply (USD m)	287	142	95	520	19
Reserves (USD bn)	4.92	0.68	3.7	6.1	19
Trade Balance (USD m)	-1,147	183	-1,450	-820	19

Note: Depreciation calculated as log difference of monthly average exchange rate.

Trade balance is monthly flow.

Stationarity Tests

Given the structural break at reform initiation, we conduct Augmented Dickey-Fuller (ADF) tests on post-reform series.

Table 3: ADF Stationarity Tests (Post-July 2024 Sample)

Variable	ADF Statistic	p-value	Conclusion
$\Delta E_t \backslash \Delta E_t$	-3.82	0.009	I(0)
$A_t \backslash A_t$	-2.91	0.053	I(0)
$Res_t \backslash Res_t$	-2.43	0.138	I(1)
$\Delta Res_t \backslash \Delta Res_t$	-4.21	0.002	I(0)

Results indicate depreciation and auction supply are stationary, while reserves are I(1), requiring first-differencing in level specifications.

Econometric Methodology

Given the short post-reform sample (19 months), we employ Local Projection (LP) methods (Jordà, 2005) rather than traditional SVAR. LP has several advantages for short samples:

1. Does not require lag length specification for impulse responses
2. Robust to model mis-specification
3. Allows flexible nonlinear specifications
4. Provides direct inference on impulse response coefficients

The baseline LP specification estimates separate regressions for each horizon hhh:

$$\Delta E_{t+h} = \alpha_h + \beta_h A_t + \gamma_h \Delta \text{Res}_t + \delta_h \text{TB}_t + \sum_{j=1}^p \phi_{h,j} X_{t-j} + \epsilon_{t+h}$$

$$\Delta E_{t+h} = \alpha_h + \beta_h A_t + \gamma_h \Delta \text{Res}_t + \delta_h \text{TB}_t + \sum_{j=1}^p \phi_{h,j} X_{t-j} + \epsilon_{t+h}$$

Where:

- ΔE_{t+h} = cumulative depreciation from ttt to t+ht+ht+h
- A_t = auction supply at time ttt
- ΔRes_t = monthly reserve change
- TB_t = trade balance
- X_{t-j} = vector of lagged controls (past depreciation, auction amounts)
- $p=1$ (given sample constraints)

We estimate this specification for $h=0,1,2,\dots,6$ months. The coefficient sequence $\{\beta_0, \beta_1, \dots, \beta_6\}$ traces the cumulative impulse response of exchange rate depreciation to a one-unit (USD 1 million) auction shock.

Standard errors are computed using Newey-West HAC estimator with automatic lag selection to account for autocorrelation in the projection residuals (Newey & West, 1987).

Identification Assumption

Our identification strategy assumes that monthly auction supply A_t is predetermined relative to within-month exchange rate movements ΔE_t . This assumption is institutionally justified: the NBE announces auction amounts at the beginning of each period based on reserve conditions and import demand assessments, whereas the exchange rate clears continuously within the month based on auction outcomes and interbank trading. This timing structure implies....

$$E[\epsilon_t | A_t, \Delta \text{Res}_t, \text{TB}_t] = 0 \implies E[\epsilon_t | A_t, \Delta \text{Res}_t, \text{TB}_t] = 0$$

....enabling causal interpretation of β_h coefficients as auction effects on depreciation.

To assess robustness, we also estimate instrumental variables (IV) specifications using lagged reserve levels as instruments for auction supply, exploiting the mechanical relationship whereby higher past reserves enable larger current auctions.

EMPIRICAL RESULTS

Baseline Local Projection Estimates

Table 4 presents baseline LP estimates for horizons $h=0$ to $h=6$.

Table 4: Local Projection Estimates - Auction Impact on Cumulative Depreciation

Horizon	β_h	Std. Error	t-stat	p-value	95% CI
h=0	-0.0032	0.0011	-2.91	0.012	[-0.0056, -0.0008]
h=1	-0.0054	0.0019	-2.84	0.014	[-0.0095, -0.0013]
h=2	-0.0061	0.0024	-2.54	0.025	[-0.0113, -0.0009]
h=3	-0.0049	0.0029	-1.69	0.113	[-0.0111, 0.0013]
h=4	-0.0028	0.0033	-0.85	0.410	[-0.0099, 0.0043]
h=5	-0.0011	0.0036	-0.31	0.763	[-0.0089, 0.0067]
h=6	0.0002	0.0039	0.05	0.961	[-0.0082, 0.0086]

Note: Dependent variable is cumulative depreciation from month t to $t+h$.

All specifications include one lag of depreciation and auction supply.

Newey-West standard errors with automatic lag selection.

Interpretation: The contemporaneous effect ($h=0$) indicates that a USD 100 million increase in auction supply reduces monthly depreciation by 0.32 percentage points ($= -0.0032 \times 100$), significant at the 5% level. The cumulative effect peaks at $h=2$ (0.61 percentage points reduction over two months), then decays, becoming statistically insignificant by month 3 and economically negligible by month 5-6.

Control Variable Estimates

Table 5 presents coefficient estimates for control variables at $h=0$:

Table 5: Control Variable Estimates (Contemporaneous Horizon)

Variable	Coefficient	Std. Error	t-stat	p-value
Auction Supply	-0.0032	0.0011	-2.91	0.012
Δ Reserves	-0.847	0.314	-2.70	0.018
Trade Balance	-0.0018	0.0007	-2.57	0.023
Lagged Depreciation	0.312	0.147	2.12	0.052
Constant	3.24	0.86	3.77	0.002

$R^2 = 0.48$, $N = 18$

Both reserve accumulation and trade balance improvement significantly reduce depreciation pressure, with magnitudes larger than auction effects. A USD 1 billion reserve increase associates with 0.85 percentage point lower depreciation, while a USD 100 million trade balance improvement yields 0.18 percentage point reduction.

Variance Decomposition

To assess relative importance of structural versus policy factors, we conduct Cholesky variance decomposition using a VAR(2) specification on the post-reform sample. Results at 6-month horizon.

Table 6: Variance Decomposition of Exchange Rate Depreciation (6-month horizon)

Shock Source	Share of Variance
Trade Balance	41.3%
Reserves	28.7%
Auction Supply	12.4%
Own Shocks	17.6%

Structural external variables (trade balance and reserves) jointly explain 70% of depreciation variance, compared to 12.4% for auction interventions. This indicates auctions smooth volatility around a depreciation path largely determined by fundamental external imbalances.

Robustness Checks

Alternative Specifications: We estimate several robustness variants:

1. **IV Estimation:** Using lagged reserves as instrument for auction supply yields $\beta_0 = -0.0029$ ($\beta_0 = -0.0029$ (SE = 0.0013), nearly identical to OLS.
2. **Nonlinear Specification:** Adding quadratic auction term shows no significant nonlinearity ($p = 0.67$ for squared term).
3. **Sub-sample Stability:** Excluding the first three months (initial adjustment phase) produces $\beta_0 = -0.0034$ ($\beta_0 = -0.0034$ (SE = 0.0012), confirming baseline estimates.
4. **Alternative Lag Structure:** Using $p=2$ lags (despite small sample) yields $\beta_0 = -0.0031$ ($\beta_0 = -0.0031$ (SE = 0.0015).

All specifications confirm the baseline finding of significant but modest and temporary auction effects.

Inflation Pass-Through Analysis

To examine whether auction-induced exchange rate stabilization affects consumer prices, we estimate the inflation pass-through relationship:

$$\pi_t = \alpha + \lambda \Delta E_t + \theta \Delta E_{t-1} + \epsilon_t \pi_t = \alpha + \lambda \Delta E_t + \theta \Delta E_{t-1} + \epsilon_t$$

Where, π_t is monthly CPI inflation.

Table 7: Exchange Rate Pass-Through to Inflation

Variable	Coefficient	Std. Error	t-stat
ΔE_t	0.38	0.12	3.17
ΔE_{t-1}	0.24	0.13	1.85
Constant	1.21	0.44	2.75

$R^2 = 0.53, N = 18$

Cumulative pass-through ($\lambda + \theta = 0.62$) implies that 10% depreciation increases CPI by approximately 6.2% over two months. This substantial pass-through magnifies the welfare gains from auction-induced exchange rate stabilization.

Combining with auction effectiveness estimates: USD 100 million auction supply reduces depreciation by 0.32 percentage points, which translates to approximately 0.20 percentage point reduction in CPI inflation (0.32×0.62). At Ethiopia's average monthly inflation rate of 2.1%, this represents roughly 10% of baseline inflation.

DISCUSSION

Interpretation of Findings

The empirical results reveal three key patterns:

First, auction interventions significantly affect short-run exchange rate movements. The estimated elasticity of -0.0032 is consistent with cross-country evidence from Cashin et al. (2024) for Sub-Saharan Africa and slightly larger than Nigerian estimates from Adebiyi et al. (2023). This suggests Ethiopia's auction mechanism functions comparably to regional peers.

Second, auction effects are temporary, dissipating within 3-4 months. This rapid decay indicates that auctions primarily smooth adjustment paths rather than fundamentally altering equilibrium rates. The finding aligns with theoretical predictions that interventions cannot sustainably counteract persistent external imbalances (Obstfeld et al., 2009).

Third, structural external variables dominate exchange rate dynamics. Variance decomposition showing that trade balance and reserves jointly explain 70% of depreciation variance underscores that auction policy effectiveness is bounded by fundamental external constraints.

Reserve Adequacy Constraint

Ethiopia's gross international reserves of approximately USD 5 billion (3.3 months import cover as of early 2026) remain below conventional adequacy thresholds. IMF (2023) recommends 4-6 months for commodity exporters with managed exchange rates.

Simple arithmetic illustrates the constraint: with monthly imports of USD 1.5 billion, prudential reserves of 4 months require USD 6 billion. Current reserves of USD 5 billion imply an auction buffer of USD 1 billion before breaching adequacy. At average auction rates of USD 287 million monthly, this buffer finances 3.5 months of current auction intensity.

This calculation highlights the intertemporal tradeoff emphasized by Aizenman and Lee (2023): aggressive current auctions deplete reserves, potentially triggering depreciation expectations that offset stabilization benefits.

Comparison with Reform Peers

Ethiopia's reform experience shares similarities with recent liberalizations in Ghana (2022), Egypt (2024), and Nigeria (2023). All cases exhibited:

- Large initial depreciation (30-50%)
- Introduction of auction mechanisms
- Parallel market premium compression
- Gradual interbank market development

However, Ethiopia's structural trade deficit (USD 13-14 billion annually) is proportionally larger relative to GDP than comparators, implying greater ongoing foreign exchange scarcity. This suggests Ethiopia faces a more binding external constraint than peers.

POLICY RECOMMENDATIONS

1. Rule-Based Auction Sizing

Link monthly auction volumes to a transparent formula incorporating reserve buffers and import demand forecasts. A possible specification:

$$A_t = \min\{\alpha(R_{t-1} - R_{\min}), \beta M_t\}$$

Where,

$R_{\min}$ is prudential minimum reserves, M_t is forecast monthly imports, and α, β are policy parameters. This approach prevents excessive reserve depletion while maintaining stabilization capacity.

2. Enhanced Transparency and Communication

Publish detailed post-auction statistics including clearing rates, bid distributions, and participation rates. Increased transparency anchors expectations and enhances signaling channel effectiveness (Fratzscher et al., 2019).

3. Interbank Market Development

Gradually widen bid-ask bands and reduce direct NBE participation as market depth increases. International experience suggests transitioning from auction-dependent to interbank-based systems enhances resilience (BIS, 2022).

4. Macro-Fiscal Coordination

Auction effectiveness depends critically on consistency with broader macroeconomic policies. Sustained fiscal deficits exceeding 4% of GDP with monetary financing undermine exchange rate stability regardless of auction intensity (Baldacci et al., 2021).

5. Structural Export Promotion

Long-run external sustainability requires export diversification and competitiveness enhancement. While beyond central bank mandate, coordinated government strategy on logistics, energy costs, and trade facilitation is essential for reducing structural foreign exchange scarcity.

LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. First, the short post-reform sample (19 months) constrains statistical power and precludes detailed subsample analysis. Future research incorporating additional data can refine estimates and examine potential nonlinearities or time-variation in auction effectiveness.

Second, we cannot fully isolate auction effects from concurrent reform measures (fiscal consolidation, monetary tightening, current account liberalization). Disentangling these channels would require more granular microeconomic data on firm-level foreign exchange access and pricing.

Third, our analysis focuses exclusively on the official exchange rate. While parallel market premiums have narrowed post-reform (NBE, 2025), comprehensive assessment requires parallel market data, which remain sparse and potentially unreliable.

Fourth, general equilibrium effects—particularly through import compression and export response—are not explicitly modeled. Structural CGE analysis could quantify these broader macroeconomic impacts.

Finally, forward-looking expectations are only indirectly captured through lagged variables. Survey-based exchange rate expectations data would enable more direct examination of the signaling channel.

CONCLUSION

This paper provides the first econometric evaluation of Ethiopia's foreign currency auction mechanism following the July 2024 exchange rate liberalization. Employing Local Projection methods on monthly post-reform data, we find that auction supply significantly reduces short-run depreciation pressure, with elasticities consistent with cross-country evidence from Sub-Saharan Africa. However, effects are temporary, dissipating within 3-4 months, and variance decomposition reveals that structural external variables dominate exchange rate dynamics.

These findings have important policy implications. Foreign currency auctions function effectively as volatility management tools, smoothing adjustment paths and compressing parallel market premiums. However, they cannot substitute for fundamental external sector reform. Long-run exchange rate stability in Ethiopia depends primarily on trade balance improvement, export diversification, reserve accumulation, and macro-fiscal consistency.

The Ethiopian experience illustrates both the promise and limitations of market-based foreign exchange allocation mechanisms in structurally constrained economies. Auctions represent a substantial improvement over administrative rationing, enhancing transparency and price discovery. Yet their stabilization capacity is bounded by reserve adequacy constraints and underlying external imbalances.

As Ethiopia continues its reform transition, optimal policy requires balancing short-run stabilization objectives against medium-run reserve sustainability. Rule-based auction frameworks, enhanced transparency, and coordinated macro-fiscal policies can maximize effectiveness within these constraints. Ultimately, durable external stability requires structural transformation—diversifying exports, improving competitiveness, and reducing import dependence—complementing technical improvements in foreign exchange market architecture.

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