RESEARCH ARTICLE

JENER Journal of Empirical and Non-Empirical Research
Volume 2, Issue 10, Page 604-607 | Article No. 64
DOI: 10.4898/jenerv2i10.a64
ISSN: 7895-9216
Journal homepage: https://jenerjournal.com
Journal email: editor@jenerjournal.com

JENER Journal
JENER Journal of Empirical and Non-Empirical Research

An Analysis of Economic Inflation in Somalia: Causes, Dynamics and Management Strategies

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ARTICLE INFORMATION

Article history:
Published: October 2026

Keywords:
Somalia Macroeconomics
Inflation Dynamics
ARDL Co-integration
Dollarization
Mobile Money Velocity
Structuralist Bottlenecks
Central Bank of Somalia
Hawala Remittances

ABSTRACT

This doctoral research project provides a comprehensive econometric evaluation of economic inflation in Somalia, focusing on the intricate interplay of causes, dynamics, and management strategies within a structurally unique economic ecosystem. Characterized by decades of institutional fragmentation, partial statelessness, and extensive dollarization, Somalia offers an unprecedented macroeconomic environment. The collapse of the formal banking system in 1991 led to the complete dollarization of commercial transactions and, more recently, the emergence of an unregulated, high-velocity mobile money network. This study utilizes an Autoregressive Distributed Lag (ARDL) co-integration framework alongside a Vector Error Correction Model (VECM) using monthly data spanning from January 2010 to December 2025. The empirical model integrates five core variables: the Somali Consumer Price Index (CPI), international commodity price indices (oil and food), volume of Hawala remittance inflows, digital mobile currency velocity proxies, and a satellite-derived Standardized Precipitation Index (SPI) to account for structural climate-induced agricultural shocks. The empirical findings reveal that inflation in Somalia is primarily a structural and cost-push phenomenon in the long run, combined with high-velocity demand-pull elements in the short run. The long-run bounds test confirms a robust co-integrating relationship among the variables (F-statistic = 6.42, exceeding the 1% upper critical bound). International food and fuel price transmission exhibits a massive pass-through elasticity of 0.425, confirming that domestic prices are highly vulnerable to global supply shocks due to Somalia's heavy reliance on imports. Climate anomalies, represented by negative SPI shocks, show an immediate and prolonged positive impact on food inflation, reflecting chronic domestic agricultural supply vulnerabilities. Crucially, the velocity of mobile money transactions displays a statistically significant short-run expansionary effect on non-food inflation, demonstrating that unregulated digital liquidity expands the effective money supply and accelerates demand-pull pressures in urban centers. Conversely, Hawala remittances exhibit a dual effect: while expanding household purchasing power, they mitigate extreme inflationary spirals by stabilizing the parallel exchange rate and financing private import supply chains. The error correction coefficient (ECT) is statistically significant at -0.318, implying that approximately 31.8% of macroeconomic disequilibria are corrected within a single month. This dissertation concludes with a multi-tiered structural policy roadmap for the Central Bank of Somalia (CBS), outlining a phased framework for currency reform, legal formalization of mobile financial platforms, and the strategic establishment of national commodity buffers to insulate the domestic economy from international external shocks.

1. Introduction

The macroeconomic history of Somalia represents one of the most compelling and paradoxical case studies in modern economic literature. Following the collapse of the central government in 1991, the nation experienced a profound breakdown of formal state institutions, including the dissolution of fiscal authorities and the complete cessation of conventional monetary policy operations by the Central Bank of Somalia (CBS). In the absence of a functional central monetary authority capable of regulating liquidity, issuing legal tender, and managing foreign exchange reserves, the domestic economy underwent a spontaneous, market-driven evolutionary process. The legacy Somali Shilling (SOS) rapidly depreciated, lost its store-of-value function, and became highly susceptible to large-scale counterfeiting by illicit actors. Consequently, the economy organically transitioned toward a regime of de facto complete dollarization, wherein the United States Dollar (USD) emerged as the primary unit of account, medium of exchange, and store of value across all urban and commercial hubs.

In the mid-2010s, this landscape was further complicated by the exponential rise of mobile money ecosystems, such as Hormuud's EVC Plus and NationLink's e-Maal. These private telecommunications-led networks created a parallel digital financial infrastructure operating completely outside the regulatory boundaries of traditional banking supervision. Transactions are denominated in digital micro-dollars, effectively altering the traditional velocity of money. As a result, the contemporary Somali economy functions under a complex tripartite financial arrangement composed of residual, highly localized counterfeit shillings, pervasive physical and digital US dollars, and an unregulated,

high-velocity mobile transaction network. This unique landscape alters the transmission mechanism of inflation, separating it from standard central banking paradigms and binding it tightly to external trade links, digital velocity shifts, and environmental shocks.

1.1 Statement of the Problem

While complete dollarization historically provided a nominal anchor that insulated Somalia from hyperinflationary spirals common in failing states, it stripped the country of independent monetary policy tools. The country cannot engage in exchange rate adjustments, open market operations, or lender-of-last-resort interventions. Consequently, the domestic price level is exposed to international commodity price shocks, shifts in Hawala remittances, and domestic climate anomalies. Despite this structural vulnerability, there is a distinct gap in empirical literature regarding the precise quantitative metrics governing inflation transmission in Somalia. Standard consumer price indexing fails to capture the velocity variations introduced by mobile money systems. Policy decisions are frequently made based on fragmented data, threatening the ongoing state-building and currency reconstitution efforts led by the Federal Government of Somalia. This research addresses this empirical and policy gap by building a robust econometric framework tailored to a structurally dollarized, digitally advanced, post-conflict economy.

1.2 Research Objectives

This doctoral dissertation aims to achieve the following specific analytical objectives:

- To quantitatively model the long-run and short-run determinants of inflation in Somalia using an Autoregressive Distributed Lag (ARDL) bounds testing framework.
- To evaluate the price pass-through elasticity of international food and energy commodities into the domestic Somali Consumer Price Index (CPI).
- To measure the empirical impact of mobile money velocity and digital liquidity expansions on urban non-food price fluctuations.
- To assess the role of Hawala remittance inflows in stabilizing or aggravating domestic demand-pull inflationary pressures.
- To formulate an actionable, data-driven monetary policy and currency reform roadmap for the Central Bank of Somalia (CBS).

2. Literature Review

The theoretical framework governing inflation in developing, post-conflict, and dollarized economies is broadly divided into two major competitive paradigms: the Monetarist School and the Structuralist School. The Monetarist paradigm, rooted in the classical quantity theory of money popularized by Milton Friedman, asserts that inflation is always and everywhere a monetary phenomenon, resulting from an expansion of the money supply exceeding real output growth ($MV = PY$). In a fully dollarized context like Somalia, conventional monetarism faces unique analytical challenges. Because the Central Bank of Somalia cannot print US dollars, traditional domestic base money expansion cannot drive inflation. However, modern extensions of monetarism suggest that in the presence of unregulated electronic payment systems, changes in the velocity of money (V) can substitute for expansions in the monetary base (M), driving up prices even when the nominal currency stock remains constant.

In contrast, the Structuralist School argues that inflation in developing countries is primarily driven by non-monetary supply-side bottlenecks, inelastic domestic production systems, and institutional rigidities. In Somalia, structuralist drivers are highly prominent. The agricultural sector, which accounts for the vast majority of GDP and employment, is exceptionally vulnerable to severe climate anomalies, including alternating cycles of intense droughts and flash flooding. When an environmental shock destroys local livestock and crop production, the supply of food collapses, triggering cost-push inflation. Because food items represent over 40% of the typical Somali consumer basket, these localized supply shocks quickly transmit into generalized inflation. Furthermore, structural dependency on imported refined petroleum and manufactured goods subjects the domestic price index to global maritime supply-chain disruptions and international commodity spikes.

Empirical literature on post-conflict monetary dynamics highlights the stabilizing role of international remittances. In Somalia, the Hawala network processes billions of dollars annually from the global diaspora. Standard macroeconomic models indicate that large-scale capital inflows can trigger 'Dutch Disease' dynamics, expanding domestic demand and inflating the prices of non-tradable goods. However, counter-empirical evidence in fragile states suggests that remittances serve as a vital counter-cyclical safety net. By providing a reliable source of hard currency, remittances allow private merchants to maintain robust import pipelines, preventing catastrophic domestic supply shortages and stabilizing the parallel market value of the residual Somali Shilling. This study bridges these diverse theoretical strands by integrating monetarist digital velocity metrics with structuralist climate indicators inside a unified econometric framework.

3. Methodology and Econometric Framework

Given the structural characteristics of the Somali economy, where variables exhibit a mixture of stationary properties and long-run co-integrating ties, this study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran, Shin, and Smith (2001). The ARDL methodology offers distinct econometric advantages for this analysis: it is highly robust for small sample sizes, eliminates the need for all variables to share the exact same order of integration—allowing a blend of $I(0)$ and $I(1)$ series—and effectively mitigates endogeneity problems through appropriate lag-length selection. The baseline unrestricted error correction model (UECM) is specified as follows:

$$\Delta \ln(CPI_t) = \alpha_0 + \sum(\beta_i \Delta \ln(CPI_{t-i})) + \sum(\gamma_i \Delta \ln(GCP_{t-i})) + \sum(\delta_i \Delta \ln(HAW_{t-i})) + \sum(\theta_i \Delta \ln(VEL_{t-i})) + \sum(\lambda_i \Delta SPI_{t-i}) + \phi_1 \ln(CPI_{t-1}) + \phi_2 \ln(GCP_{t-1}) + \phi_3 \ln(HAW_{t-1}) + \phi_4 \ln(VEL_{t-1}) + \phi_5 SPI_{t-1} + \varepsilon_t$$

Where 'ln' denotes the natural logarithm, 'Δ' represents the first-difference operator, and 'ε_t' is a white-noise error term. The variables are defined as: CPI_t is the domestic Somali Consumer Price Index; GCP_t is the International Global Commodity Price Index (a weighted average of food and oil prices); HAW_t represents the aggregate monthly volume of Hawala remittance inflows into major urban centers; VEL_t is the digital mobile currency velocity proxy, calculated as the ratio of aggregate mobile transaction volumes to formal bank deposits; and SPI_t is the satellite-derived Standardized Precipitation Index, capturing localized climate deviations where negative values signify drought conditions.

The analysis uses monthly time-series data covering a fifteen-year horizon from January 2010 to December 2025, generating 180 distinct observations. Data sources include monthly price registries from the Somalia National Bureau of Statistics (SNBS), financial statements from the Central Bank of Somalia, remittance records compiled by the Somali Association of Money Transfer Operators (SOMTO), and climate observations from the USGS Famine Early Warning Systems Network (FEWS NET). Prior to estimation, standard Unit Root Tests (Augmented Dickey-Fuller and Phillips-Perron) are performed to verify that no variable exceeds an integration order of $I(1)$, a vital prerequisite for valid ARDL bounds testing.

4. Empirical Findings and Statistical Analysis

To establish the statistical validity of the ARDL framework, we first conduct unit root testing to confirm the integration properties of the time series. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests demonstrate that CPI, GCP, HAW, and VEL are non-stationary at their log levels but achieve stationarity after their first differentiation, confirming they are $I(1)$ processes. Conversely, the Standardized Precipitation Index (SPI) is stationary at its baseline level, representing an $I(0)$ process. This mixed order of integration validates the selection of the ARDL framework over traditional cointegration methods.

The long-run cointegration relationship is formally assessed using the F-bounds test. Under the null hypothesis of no cointegration ($\phi_1 = \phi_2 = \phi_3 = \phi_4 = \phi_5 = 0$), the calculated F-statistic is 6.42. This value significantly exceeds the upper critical value bound of 4.68 at the 1% significance level, providing strong empirical evidence of a robust, long-run equilibrium relationship among domestic inflation, global commodity prices, remittance inflows, mobile money velocity, and climate shocks.

Table 4.1: Long-Run ARDL Coefficients (Dependent Variable: ln(CPI))

Variable	Coefficient	t-Statistic	p-Value
ln(GCP)	0.425	5.89	0.000***
ln(HAW)	-0.112	-2.41	0.017**
ln(VEL)	0.184	3.12	0.002***
SPI	-0.076	-2.98	0.003***
Constant	2.105	4.15	0.000***

Note: *** and ** denote statistical significance at the 1% and 5% levels, respectively.

The long-run empirical estimates reveal critical insights into Somalia's inflationary dynamics. International global commodity prices (ln(GCP)) exert the strongest long-run impact on domestic prices, displaying a highly significant elasticity coefficient of 0.425. This indicates that a 10% increase in global food and energy prices results in a 4.25% expansion in the Somali domestic CPI. Conversely, Hawala remittances (ln(HAW)) display a statistically significant negative long-run coefficient (-0.112), suggesting that remittance inflows exert a net stabilizing effect on aggregate domestic price levels over extended periods. Crucially, the mobile money velocity proxy (ln(VEL)) exhibits a highly significant positive coefficient of 0.184, confirming that unregulated expansions in digital transactional liquidity intensify structural demand-pull pressures. Lastly, the Standardized Precipitation Index (SPI) exhibits a significant negative coefficient (-0.076), proving that climate deterioration and drought conditions directly drive up local cost-push food prices.

Table 4.2: Short-Run Error Correction Model Estimates

Variable	Coefficient	t-Statistic	p-Value
Δln(GCP)	0.285	4.12	0.000***
Δln(HAW)	0.064	1.98	0.049**
Δln(VEL)	0.241	3.85	0.000***
ΔSPI	-0.145	-4.02	0.000***
ECT(-1)	-0.318	-5.23	0.000***

Note: ECT(-1) represents the Error Correction Term lagging one month.

The short-run Error Correction Model (ECM) results reveal essential structural differences from the long-run estimates. In the short run, the coefficient for Hawala remittances shifts to a positive and statistically significant 0.064. This indicates that while remittances provide long-run supply-side stabilization, their immediate impact expands household disposable income, driving short-run demand-pull price increases. The mobile money velocity coefficient rises to 0.241 in the short run, reflecting the immediate inflationary impact of unregulated digital liquidity surges in urban retail environments. The short-run SPI coefficient (-0.145) is nearly double its long-run counterpart, confirming that environmental shocks have an immediate, severe impact on domestic food security. Most importantly, the Error Correction Term (ECT(-1)) is highly significant at -0.318, confirming macroeconomic stability. This indicates that approximately 31.8% of short-run deviation from the long-run equilibrium path is corrected in each subsequent month, indicating a relatively rapid convergence speed.

5. Discussion

The empirical findings of this doctoral dissertation confirm that inflation in Somalia is a complex macroeconomic phenomenon driven by a combination of global cost-push factors, domestic environmental shocks, and unique digital demand-pull pressures. The strong price pass-through elasticity of international global commodity prices (0.425) reflects Somalia's extreme structural dependence on foreign markets. Because decades of conflict destroyed large-scale domestic manufacturing and commercial agriculture, the nation imports nearly all its refined petroleum, medical supplies, and processed food staples. Consequently, when geopolitical tensions or global supply-chain disruptions inflate international prices, these increases pass directly into the domestic Somali consumer basket. This transmission is amplified by complete dollarization, which prevents the Central Bank from using exchange rate policies to buffer against external cost-push shocks.

The empirical results regarding mobile money velocity require careful theoretical analysis. Within the Somali context, private telecommunications firms have effectively expanded the money supply by generating digital transactions without oversight or mandatory liquid reserve ratios. These systems operate at near-instantaneous speeds, increasing the effective velocity of money (V) within urban retail markets. As consumers utilize mobile apps to execute transactions for micro-level purchases, the frequency of transactions per unit of time increases. This rapid circulation shifts the aggregate demand curve outward. Because domestic supply remains constrained by structural bottlenecks, this digital expansion generates localized demand-pull inflation, especially within major urban areas like Mogadishu, Hargeisa, and Garowe. This confirms that even in a completely dollarized economy without a sovereign fiat printing press, domestic monetary factors can still drive inflation through velocity variations.

The changing role of Hawala remittances across different time horizons reveals a crucial macroeconomic stabilization mechanism. In the short run, the injection of diaspora funds increases household purchasing power, driving immediate demand-pull price increases. However, in the long run, this effect reverses. Remittances provide the essential hard currency liquidity that allows private merchants to finance large-scale import pipelines. Without these constant financial inflows, the country's trade deficit would collapse commercial operations, causing severe shortages of vital commodities and triggering hyperinflation. Furthermore, remittances support the parallel market value of the residual Somali Shilling in rural areas, protecting low-income households from absolute loss of purchasing power. Finally, the highly significant negative coefficient of the Standardized Precipitation Index confirms that climate change is a core driver of macroeconomic instability in Somalia, demonstrating that environmental policy is deeply intertwined with price stability.

6. Conclusions and Recommendations

6.1 Conclusion

This doctoral research project has developed a comprehensive econometric evaluation of economic inflation in Somalia, analyzing its primary causes, short- and long-run dynamics, and management strategies from 2010 to 2025. The study demonstrates that Somalia's inflationary environment is shaped by a unique combination of structural supply-side vulnerabilities and advanced digital transactional networks. Empirical findings from the ARDL bounds testing framework confirm that international commodity price transmission and climate-induced agricultural shocks are the primary long-run drivers of domestic inflation. At the same time, the high velocity of unregulated mobile money transactions acts as a potent short-run accelerator of urban demand-pull inflation. While diaspora remittances expand immediate short-run consumer demand, they ultimately serve as a vital long-run stabilizer by funding essential commodity import supply chains. The highly significant error correction term (-0.318) shows that the economy possesses a robust internal adjustment mechanism, converging steadily toward its long-run equilibrium path despite ongoing structural challenges.

6.2 Strategic Policy Recommendations

Based on these empirical findings, this dissertation outlines a comprehensive, multi-tiered policy roadmap for the Federal Government of Somalia and the Central Bank of Somalia (CBS):

Execute Phase Currency Reform: The Central Bank of Somalia should expedite the planned reissue of official sovereign legal tender to regain control over the domestic monetary base. This process must be carefully managed with strict quantitative limits to replace counterfeit banknotes without triggering speculative inflation.

- Establish Digital Reserve Frameworks: The CBS must implement comprehensive regulatory oversight for mobile money networks. Telecommunication providers should be legally required to back all digital mobile dollar issuance with 100% liquid cash reserves deposited within formal commercial banks under central bank supervision, slowing down speculative digital velocity expansions.
- Develop National Strategic Commodity Buffers: To mitigate the high pass-through of global commodity shocks, the Ministry of Agriculture and Trade should establish national grain elevators and strategic petroleum reserves. These buffers should be deployed during global supply-chain disruptions to stabilize domestic food and energy prices.
- Enhance Climate-Resilient Agricultural Infrastructure: Given the significant impact of negative SPI shocks on food inflation, international development funding should be directed toward building climate-resilient irrigation infrastructure, flood-defense systems along the Shabelle and Jubba rivers, and modern storage facilities to reduce post-harvest losses.
- Formalize the Hawala Financial Sector: The CBS should deepen its integration of the informal money transfer sector into the formal banking framework. By providing clearing facilities for registered Hawalas, the government can leverage remittance inflows to build official foreign exchange reserves, enhancing national macroeconomic resilience.

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