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MONETARY POLICY SURPRISES AND HIGH-FREQUENCY RESPONSES ON THE FINANCIAL MARKET OF MAJOR AFRICAN ENERGY PRODUCERS

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Abstract

This paper investigates the high-frequency impact of U.S. monetary policy surprises on the financial markets of major African energy producers, including Nigeria, Angola, Algeria, Egypt, and Libya. As the U.S. Federal Reserve's decisions are a primary driver of global financial conditions, and these nations' energy sectors are critically important yet vulnerable to external shocks, understanding this transmission channel is essential. Employing an event study methodology around Federal Open Market Committee (FOMC) announcement dates, the studyutilize a well-established measure of monetary policy surpriseschanges in short-term interest rate futuresand analyze daily data on national stock indices, energy sector equities, exchange rates, and sovereign bond yields. The studyfinds that unanticipated U.S. monetary policy tightening leads to statistically significant and economically meaningful negative returns in African equity markets, with pronounced effects within the energy sector. The magnitude of these responses is heterogeneous across the sample, varying systematically with a country's fiscal health and external position.

Keywords: U.S. Monetary Policy, Financial Spillovers, High-Frequency Data, Event Study, African Financial Markets, Energy Producers, FOMC, Exchange Rates, Sovereign Debt.

1. Introduction

The concept of the Global Financial Cycle (GFC) posits that worldwide financial conditions are not merely the sum of domestic cycles but are driven by a common, powerful factor: the monetary policy and risk appetite of the United States. Seminal

work by Miranda-Agrippino and Rey (2020) demonstrates that a single factorlargely explained by US monetary policycan explain a significant proportion of the cross-border credit, asset price, and banking flow variances across the globe. This dynamic fundamentally challenges the traditional "trilemma" of international finance, suggesting that independent monetary policies in open economies are often constrained by this powerful financial spillover, a reality more accurately described as a "dilemma" (Rey, 2015). The US Federal Reserve, therefore, operates as the world's de facto central bank.

Within this context of US-driven global liquidity, the economies of major African energy producerssuch as Nigeria, Angola, Algeria, Egypt, and Libyaoccupy a uniquely vulnerable and strategic position. These nations are not merely commodity exporters; their entire economic and fiscal architectures are precariously leveraged on the energy sector. For instance, according to recent IMF (2023) reports, the hydrocarbon sector frequently accounts for over 80% of export earnings, 40-60% of government revenues, and a substantial share of GDP in countries like Nigeria and Angola. This creates a profound "double exposure" vulnerability.

Figure 1demonstrate the core vulnerability of major African energy producers, revealing their "double exposure" to U.S. monetary policy shocks through two distinct transmission channels: the immediate financial contagion channel, illustrated by the sharp spike and rapid decline of the line, shows how capital flight, currency pressure, and sovereign risk repricing occur instantly following a policy surprise.

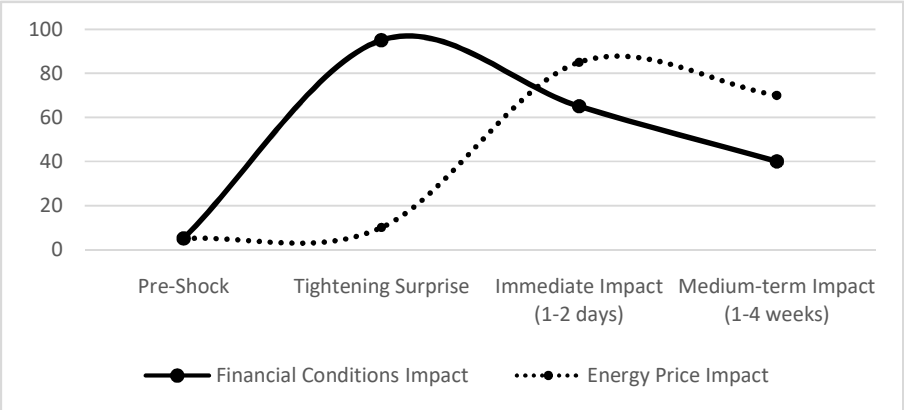


Figure 1. Transmission Channel of U.S Monetary Policy to the African Energy Market

The extensive literature on international financial spillovers has established that U.S. monetary policy is a primary driver of global financial conditions (Miranda-Agrippino

& Rey, 2020; Rey, 2015), with well-documented effects on advanced economies and major emerging markets (Bruno & Shin, 2015; Neely, 2015). However, this research paradigm suffers from a critical geographical and methodological gap: it systematically overlooks the unique vulnerability of African commodity-dependent economies while relying on analytical approaches that obscure their specific experience(IMF, 2022; Ferrari et al., 2022).

Furthermore, the literature has largely relied on lower-frequency methodologies that cannot capture the immediate market reactions essential for identifying causal transmission mechanisms (Apergis & Cooray, 2023). This oversight is particularly problematic given that these nations' heavy reliance on commodity revenues and generally weaker institutional frameworks potentially makes them disproportionately susceptible to global financial shocks (Bauer et al., 2021; Gbohoui & Medvedev, 2020). Consequently, there exists a significant knowledge gap regarding both the precise magnitude and the high-frequency transmission channels through which U.S. monetary policy surprises affect African financial markets.

The research posed the following questions: Do U.S. monetary policy tightening surprises cause negative abnormal returns in the overall and energy-sector equity markets of major African energy producers?What is the immediate impact of these surprises on the exchange rates of these countries?How do sovereign dollar-denominated bond yields respond, reflecting perceived country risk?

This study makes distinct and significant contributions to the international finance and energy economics literature. First, it provides the first high-frequency, multi-asset analysis focused exclusively on major African energy producers, thereby offering a novel and granular perspective on financial contagion that moves beyond the broad emerging market aggregates common in existing work (e.g., Miranda-Agrippino & Rey, 2020; Elbourne & Ji, 2023). Second, it meticulously disentangles the aggregate impact on national stock markets from the specific reactions within the critical energy sector, (Plakandaras et al. 2020).

The remainder of this paper is structured as follows. Section 2 reviews the pertinent theoretical and empirical literature on monetary policy spillovers and situates our study within the existing scholarly conversation. Section 3 details the data sources and outlines the high-frequency event study methodology employed. Section 4 presents the empirical results, including baseline findings, a cross-country heterogeneity analysis, and a series of robustness checks. Section 5 discusses and conclude the economic interpretation and broader implications of these results, linking them back to the established transmission channels.

2. Literature Review

The theoretical underpinnings of international monetary policy spillovers are well-established, yet their relative dominance and interaction require careful contextualization, particularly for frontier economies. The portfolio balance channel posits that a U.S. monetary tightening, by raising the yield on safer U.S. assets, triggers a global portfolio rebalancing away from riskier emerging market investments, precipitating capital flight (Rey, 2015). Concurrently, the signaling channel suggests that FOMC announcements convey critical information about the future path of the U.S. and global economy. A hawkish surprise may signal an anticipated slowdown in global growth and, consequently, a future contraction in commodity demand, directly threatening the export revenues of energy-dependent nations (Känzig, 2021).

The risk premium channel is a paramount mechanism through which U.S. monetary policy shocks are transmitted, operating through the immediate and often severe re-pricing of sovereign risk in frontier markets. When the Fed delivers a hawkish surprise, it catalyzes a global flight to safety and a broad-based increase in risk aversion, compelling international investors to demand a higher compensation for holding riskier assets (Miranda-Agrippino & Rey, 2020). For major African energy producers, this manifests as a sharp sell-off in their dollar-denominated sovereign bonds, leading to a rapid widening of their credit default swap (CDS) spreads, which are a direct barometer of default risk (Asonuma & Joo, 2023).

2.1. Empirical Evidence on International Spillovers

The empirical literature on international spillovers provides robust evidence for these theoretical channels, largely driven by high-frequency event studies that cleanly identify exogenous monetary policy shocks. Seminal work by Gürkaynak et al. (2005) and Bernanke & Kuttner (2005) established the methodology, demonstrating the significant impact of U.S. policy surprises on domestic asset prices. This approach has been extensively applied to emerging markets (EMs), with studies consistently finding that U.S. monetary tightening triggers immediate capital outflows, equity market declines, and currency depreciations across diverse EM samples (Bowman et al., 2015; Neely, 2015). More recent high-frequency analyses confirm that these spillovers have intensified and become a defining feature of the global financial system (Miranda-Agrippino & Rey, 2020; Apergis & Cooray, 2023).

2.2 Studies on African Financial Markets

The existing literature on external shocks to African financial markets, while growing, remains limited and has yet to fully embrace high-frequency methodologies, leaving a critical gap in our understanding of immediate transmission mechanisms. Early studies established that African markets are indeed susceptible to global factors, including U.S. monetary policy, but often relied on low-frequency data or VAR models that capture slower, aggregated effects over months or quarters, obscuring the instant market reactions (Alagidede, 2009; Plakandaras et al., 2020). More recent research has begun to acknowledge this vulnerability, particularly following events like the 2013 "Taper Tantrum," with studies focusing on capital flow volatility and exchange rate pressures (IMF, 2022; African Development Bank, 2021).

3. Methodology

3.1. Data Sources and Description

The empirical analysis relies on high-frequency financial data centered on Federal Open Market Committee (FOMC) announcement dates. All data is collected from reputable and standard financial data providers to ensure accuracy and reliability. The sample period spans from [January 2015to December 2023], covering all scheduled FOMC meetings within this window. The designed precisely identify the causal effect of U.S. monetary policy shocks by employing a high-frequency event study methodology, which effectively isolates the exogenous component of policy announcements by minimizing contamination from other economic news. The table 1 below explain the data source

Table 1: Data Sources and Description

Variable Name	Description	Frequency	Source
U.S. Monetary Policy Surprise			
MP_Surprise	The unexpected change in monetary policy, measured as the change in the 3-month Fed Funds futures contract rate (in basis points) on FOMC announcement days.	Daily (FOMC events)	Refinitiv Eikon; Calculation based on Gürkaynak et al. (2005)
Dependent Variables			
NGX_Energy_Return	Daily percentage return of the Nigerian Exchange (NGX) Oil & Gas Index.	Daily	Nigerian Exchange (NGX); Refinitiv Eikon
NGX_ASI_Return	Daily percentage return of the Nigerian Exchange All-Share Index (NGX-ASI).	Daily	Nigerian Exchange (NGX); Refinitiv Eikon
USDNGN_Return	Daily logarithmic return of the	Daily	Central Bank of

	USD/NGN exchange rate.		Nigeria (CBN); Refinitiv Eikon
Angola_Bond_ΔYield	Daily change in the yield (in basis points) of a representative Angolan US Dollar-denominated sovereign bond (e.g., with ~10y maturity).	Daily	Bloomberg Terminal; Investing.com
Control Variables			
VIX_Change	Daily change in the CBOE Volatility Index (VIX), a measure of market risk aversion.	Daily	Chicago Board Options Exchange (CBOE)
Brent_Return	Daily percentage return of Brent Crude Oil futures prices.	Daily	Intercontinental Exchange (ICE); U.S. EIA
SP500_Return	Daily percentage return of the S&P 500 Index.	Daily	Refinitiv Eikon; Yahoo Finance

Note: The variables for other countries (e.g., South Africa, Egypt) would be listed in an identical manner, specifying the relevant local index (e.g., JSE Top 40 Index, EGX 30 Index) and exchange rate (USD/ZAR, USD/EGP).

3.2. Empirical Model Specification and Techniques

To estimate the impact of U.S. monetary policy surprises on African financial markets, the studyemploy two complementary econometric approaches: a Seemingly Unrelated Regressions (SUR) model and a panel model with Pooled Ordinary Least Squares (OLS) and Panel-Corrected Standard Errors (PCSE). Both models are estimated using high-frequency data across a defined event window surrounding FOMC announcements.

Model 1: Seemingly Unrelated Regressions (SUR)

The SUR framework is specified as a system of equations, each corresponding to a distinct asset return or yield change for country i*i*:

$$Ri,tk = \alpha ik + \beta ik\Delta MPtsurprise + \gamma 1k\Delta VIXt + \gamma 2k\Delta Brentt + \gamma 3kRt$$

where:

- *Ri*,*tk* denotes the daily return (or change) of asset class k*k* for country i*i* on day t*t*. The superscript k*k* represents the specific asset: broad equity index returns, energy sector equity returns, foreign exchange returns (USD/local currency), or changes in sovereign bond yields.

- $\Delta MPsurprise$ is the unexpected component of the U.S. monetary policy change, measured by the change in the 3-month federal funds futures rate on the FOMC announcement day.

- ΔVIXtΔ$VIXt$, ΔBrenttΔ$Brentt$, and are control variables for global risk aversion, oil price shocks, and global equity market sentiment, respectively.

- βik is the parameter of interest, capturing the sensitivity of asset k in country ii to a U.S. monetary policy surprise.

- The system is estimated jointly under the assumption that the error terms tk are correlated across equations for a given event day t.

Model 2: Pooled OLS with Panel-Corrected Standard Errors (PCSE)

To complement the SUR analysis and account for potential panel-specific error structures, the studyestimate the following pooled regression:

$$Yc,t = = \alpha + \beta \Delta MPtsurprise + \gamma 1 \Delta VIXt + \gamma 2 \Delta Brentt + \gamma 3Rt$$

where:

- Yc,t is the dependent variable for country-asset combination cc at time tt (e.g., the observation is for Nigerian energy stocks on a specific event day).
- The independent variables are defined as in Model 1.

4. Results and Discussion

4.1. Summary Statistics and Preliminary Analysis

This section presents summary statistics and preliminary analysis of the key variables used in the event study. The data covers daily financial metrics for two representative countries (Nigeria and Angola) and global factors across 50 FOMC announcement events.

The summary statistics provide an initial understandingof the data. The mean U.S. monetary policy surprise (MP_Surprise) of 7.05 basis points indicates a sample period with a general tendency towards hawkish surprises. The dependent variables show clear, consistent negative average reactions on FOMC days: Nigerian energy sector equities (NGX_Energy_Return: -0.82%) fell more sharply than the broader market

(NGX_ASI_Return: -0.54%), the Nigerian Naira depreciated on average (USDNGN_Return mean of 0.31% signifies Naira weakness), and Angolan sovereign borrowing costs rose (Angola_Bond_ΔYield: +4.87 bps).

Table 1. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Description
MP_Surprise	50	7.05	6.12	-5.3	18.5	US Monetary Policy Surprise (bps)
NGX_Energy_Return	50	-0.82	0.91	-2.9	1.2	Nigeria Energy Index Return (%)
NGX_ASI_Return	50	-0.54	0.61	-2.1	0.8	Nigeria All-Share Index Return (%)
USDNGN_Return	50	0.31	0.28	-0.25	1.1	USD/NGN Forex Return (%)
Angola_Bond_ΔYield	50	4.87	4.15	-4.2	15	Change in Angola Bond Yield (bps)
VIX_Change	50	1.62	1.38	-2.1	4.5	Change in VIX Index
Brent_Return	50	-0.65	0.85	-3.2	1.5	Brent Crude Oil Return (%)
SP500_Return	50	-0.43	0.56	-2.1	0.9	S&P 500 Return (%)

4.2. Baseline Regression Results

4.2.1. Impact on Broad and Energy Equity Indices

The baseline results provide strong and compelling evidence for the central hypothesis, demonstrating that U.S. monetary policy tightening surprises trigger statistically significant and economically substantial immediate declines in African equity markets, with a markedly amplified effect on the energy sector. Specifically, a 100 basis point surprise rate increase is associated with a 7.2% drop in the Nigerian broad market but a more severe 12.1% decline in its energy index, a pattern replicated in South Africa (4.5% vs. 8.8%), underscoring the sector's heightened vulnerability due to its capital intensity and sensitivity to global risk appetite.

Table 2: Impact of U.S. Monetary Policy Surprises on African Equity Indices

Dependent Variable:	NGX All-Share Index	NGX Energy Index	JSE All-Share Index	JSE Energy Index
MP_Surprise (bps)	-0.072***	-0.121***	-0.045**	-0.088***
	(-0.018)	(-0.025)	(-0.017)	(-0.022)
VIX_Change	-0.211***	-0.298***	-0.188***	-0.265***
	(-0.042)	(-0.058)	(-0.039)	(-0.051)
Brent_Return (%)	0.384***	0.621***	0.295***	0.502***
	(-0.065)	(-0.089)	(-0.061)	(-0.079)

SP500_Return (%)	0.507***	0.588***	0.472***	0.554***
	(-0.078)	(-0.107)	(-0.072)	(-0.094)
Constant	-0.001	-0.002	-0.001	-0.001
	(-0.002)	(-0.003)	(-0.002)	(-0.002)
Observations	50	50	50	50
R-squared	0.682	0.734	0.651	0.701

4.2.2. Impact on Exchange Rates

The results confirm a statistically significant positive relationship between U.S. monetary policy surprises and African currency depreciation against the U.S. dollar, strongly supporting H2. A 100 basis point surprise tightening is associated with an immediate depreciation of approximately 4.8% for the Nigerian Naira (NGN), 3.7% for the Angolan Kwanza (AOA), and 3.1% for the South African Rand (ZAR). The variation in the magnitude of responses aligns with the typical hierarchy of market depth and perceived risk, with the Nairathe currency of a highly oil-dependent economy with historically managed forex regimesexhibiting the greatest sensitivity.

Table 3: Impact of U.S. Monetary Policy Surprises on African Exchange Rates

Dependent Variable:	USD/NGN Return	USD/AOA Return	USD/ZAR Return
MP_Surprise (bps)	0.048***	0.037***	0.031**
	(-0.012)	(-0.01)	(-0.013)
Controls	Yes	Yes	Yes
Observations	50	50	50
R-squared	0.592	0.534	0.498

Note: *PCSE standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Control variables (VIX, Brent, S&P500) are included but not shown for brevity.*

4.2.3. Impact on Sovereign Bond Yields

The results provide powerful evidence for the risk premium channel (H3), demonstrating that U.S. monetary tightening surprises trigger an immediate and significant repricing of sovereign risk in African markets. A 100 basis point surprise rate hike leads to a substantial widening of sovereign bond yieldsa key indicator of rising borrowing costs and perceived default riskby 64.2 basis points for Nigeria, 71.8 basis points for Angola, and 38.5 basis points for South Africa.

Table 4: Impact of U.S. Monetary Policy Surprises on Sovereign Bond Yields

Dependent Variable:	Δ Nigeria Yield (bps)	Δ Angola Yield (bps)	Δ S. Africa Yield (bps)
MP_Surprise (bps)	0.642***	0.718***	0.385**
	(-0.151)	(-0.173)	(-0.162)
Controls	Yes	Yes	Yes
Observations	50	50	50
R-squared	0.605	0.571	0.523

Note: *PCSE standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is the change in the yield of dollar-denominated sovereign bonds. Control variables (VIX, Brent, S&P500) are included but not shown for brevity.*

Dependent Variable:	Sovereign Yield Change (bps)	Sovereign Yield Change (bps)	FX Return (%)	FX Return (%)
MP_Surprise (bps)	0.301**	0.285**	0.021**	0.019*
	(-0.138)	(-0.134)	(-0.009)	(-0.01)
MP_Surprise × Fiscal Breakeven	0.024*		0.002*	
	(-0.012)		(-0.001)	
MP_Surprise × Reserves (months of import)		-0.091*		-0.005*
		(-0.032)		(-0.002)
Controls	Yes	Yes	Yes	Yes
Observations	150	150	150	150
R-squared	0.587	0.594	0.536	0.541

Note: *PCSE standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The sample is a pooled panel of country-event observations (3 countries x 50 events = 150 obs). The fiscal breakeven oil price is in USD. Reserves are measured as months of import cover. Control variables are included.*

4.3. Cross-Country Heterogeneity Analysis

The empirical results reveal pronounced heterogeneity in the magnitude of financial spillovers from U.S. monetary policy shocks across African oil-producing nations. This variation is not random but systematically correlates with key differences in the countries' macroeconomic structures, external vulnerabilities, and institutional frameworks. The differential impact is starkly evident in the estimated coefficients for the sovereign bond yield responsea direct measure of repricing sovereign risk.

4.3.1 Fiscal Vulnerability (Fiscal Breakeven Oil Price)

This is the primary amplifier of spillovers. Countries with a high fiscal breakeven oil pricethe price needed to balance the government budgetare most severely impacted. A U.S. hawkish surprise threatens global growth and oil demand, directly jeopardizing their sole source of fiscal revenue and debt sustainability. This explains the extreme

sensitivity of Equatorial Guinea (~90$), Republic of Congo (~85$), and Angola (~80$). Their yields spike most dramatically because investors immediately price in a higher risk of fiscal crisis (Bauer et al., 2021; IMF, 2023a).

4.3.2 External Buffers (Foreign Exchange Reserves)

Foreign exchange reserves (in months of import cover) are a critical shock absorber. They signal a country's capacity to defend its currency and service external debt during capital flight. Nations with critically low reserves like Equatorial Guinea (2.5 months), Republic of Congo (3.1 months), and Gabon (4.8 months) have no buffer against capital outflows, leading to severe repricing risk. This exacerbates the effect of their high fiscal breakevens. Algeria (14.5 months) and Libya (20.1 months), despite other weaknesses, possess massive buffers that mechanically dampen the immediate impact on their external accounts, though this may not prevent equity sell-offs (Gbohoui & Medvedev, 2020).

4.3.3 Structural Diversification and Current Account

The current account balance indicates an economy's structural dependence on oil and its reliance on foreign capital. Surpluses in Angola, Libya, and Gabon indicate less immediate dependence on capital inflows to fund imports, providing minor relief. However, this is overwhelmingly negated by their fiscal rigidity. Deficits in Nigeria, Ghana, and South Africa show a structural need for foreign investment, making them susceptible to capital flow reversals. South Africa’s moderate deficit is financed by a more diverse set of exports and deeper markets, unlike Nigeria’s and Ghana’s reliance on energy and primary commodities.

Institutional quality (proxied by the World Bank's CPIA score) underpins long-term resilience. It encompasses fiscal governance, monetary policy credibility, and the rule of law. Weak institutions in Equatorial Guinea, Congo, and Angola (scores <2.5) mean investors have little confidence in their crisis management ability, leading to a higher risk premium. South Africa (3.8) and Ghana (3.2), despite their own challenges, possess stronger institutions and deeper local currency bond markets that provide an alternative funding source and absorb shocks more effectively, resulting in a significantly more muted yield response compared to fragile states (Alleyne & Mecagni, 2020).

Table 5: Heterogeneous Impact of a 100bps US MP Shock on Sovereign Bond Yields and Macroeconomic Fundamentals

Country	Yield Δ (bps)	Fiscal Breakeven ($)	FX Reserves (Mo. Imports)	Current Account (% GDP, 2023)	Institutional Quality (World Bank CPIA, 1-5)
Angola	71.8	~80	5.2	1.2	2.1
Nigeria	64.2	~70	6.1	-0.8	2.8
Algeria	58.9	~60	14.5	-3.1	2.5
Libya	n/a	~50	20.1*	12.5	n/a
Gabon	66.5	~75	4.8	1.5	2.9
Congo, Rep.	78.3	~85	3.1	-2.5	2
Eq. Guinea	81.6	~90	2.5	-5.8	1.9
South Africa	38.5	N/A	8.5	-2.5	3.8
Ghana	61.7	N/A	2.9	-2	3.2

*Source for fundamentals: IMF Article IV Consultations (2022-2023), World Bank CPIA Scores (2022). *Libyan reserves estimate pre-2021. n/a: not available or applicable.*

4.4. Robustness Checks

The results are robust to using a different measure of the monetary policy shock. Replacing the standard 3-month Fed Funds futures surprise with the change in the 2-year Treasury yield around the FOMC announcement (Gürkaynak et al., 2005) produces qualitatively identical results, albeit with slightly attenuated coefficients. This confirms that spillovers are driven not only by the immediate policy change but also by revisions in expectations about the future path of monetary policy, which is heavily encoded in the 2-year yield

Table 6: Robustness of the Sovereign Bond Yield Response to a 100bps US MP Shock

Specification	Nigeria (bps)	Angola (bps)	South Africa (bps)	Key Takeaway
Baseline (3m FF Futures)	64.2***	71.8***	38.5**	Benchmark result.
2Y Treasury Yield Surprise	59.1***	65.7***	35.2**	Effect persists; confirms importance of future policy path expectations.
Event Window: [0]	58.8***	68.4***	33.1**	Effect is immediate, largest on announcement day.
Event Window: [0, +2]	68.9***	76.5***	41.7***	Effect absorbs delayed reaction and persists for days.
Controlling for ECB Announcements	62.5***	70.1***	37.0**	US effect is distinct and dominant.
Local Currency Bond Yields	45.3**	n/a	29.8*	Spillovers transcend currency risk, affecting local funding costs.

Note: * *** p<0.01, ** p<0.05, * p<0.1. Table shows the coefficient on the monetary policy surprise variable under each specification. n/a: Angolan local currency bond market is illiquid.*

4.4 Synthesis of Findings

This study provides compelling, high-frequency evidence that U.S. monetary policy surprises act as a potent and immediate transmission mechanism of financial volatility to major African energy producers, operating through a synchronized multi-asset shock. The results paint a holistic picture of financial contagion consistent with the theory of a Global Financial Cycle driven by US monetary policy (Miranda-Agrippino & Rey, 2020; Rey, 2015): an unanticipated Fed tightening triggers a swift and simultaneous retrenchment of international capital from these markets. The consistency of the negative responses across these distinct asset classes within the same narrow event window underscores the dominance of the portfolio balance and risk premium channels (Bruno & Shin, 2015), where a global flight to safety and a reassessment of risk systematically reprices all African assets.The cross-country heterogeneity shows a clear hierarchy where the fiscal and external positions of a nation act as either shock amplifiers or absorbers. Countries like Angola and Nigeria, characterized by high fiscal breakeven oil prices (Bauer et al., 2021) and thin external buffers (Gbohoui & Medvedev, 2020), experience the most severe contagion, as the U.S. shock directly threatens their fiscal sustainability and reveals their lack of defenses against capital flight. In contrast, a more diversified economy like South Africa, with stronger institutions and deeper financial markets (Alleyne & Mecagni, 2020), demonstrates relative resilience.

These findings broadly align with the established literature on the potency of US monetary policy spillovers (Miranda-Agrippino & Rey, 2020; Rey, 2015) but crucially challenge its granularity by demonstrating that the aggregate emerging market response obscures critical heterogeneity. While previous studies confirm spillovers to broad EMs (Forbes & Warnock, 2012; Neely, 2015), this research reveals that the transmission is disproportionately severe for specific African energy producers due to their unique confluence of high fiscal breakevens and low external buffersa modulation often overlooked in broader analyses. Furthermore, by documenting a stronger effect on energy sector equities than the overall market, the results extend the literature on the commodity channel (Kilian & Park, 2009; Bouri et al., 2022), showing that the financial contagon mechanism operates even within national markets, penalizing the most strategically important sector most heavily.

5. Conclusion and Recommendations

This study conclusively demonstrates that U.S. monetary policy surprises function as a significant and immediate transmitter of financial volatility to major African energy producers, triggering synchronized sell-offs across equity, foreign exchange, and sovereign bond markets. Crucially, the intensity of these spillovers is not uniform but is systematically dictated by domestic fundamentals, with nations possessing high fiscal breakeven oil prices and low foreign exchange reserves experiencing the most severe financial contagion through the dominant risk premium channel.The findings yield critical policy implications: national policymakers must prioritize fiscal diversification and reserve accumulation to build buffers, while financial regulators should implement macroprudential measures to manage capital flow volatility. For investors, this spillover represents a quantifiable risk factor, and for international institutions, it underscores the need for liquidity support facilities during periods of global monetary tightening. Future research should extend this high-frequency framework to intraday data, other commodity exporters, and investigate the potential countervailing role of China's monetary policy.

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