

Governance of Frontier Financial Markets in Sub-Saharan Africa: Macroeconomic Stability, IPO Activity and Market Performance

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Abstract

Purpose: This study examines how IPO activity and macroeconomic conditions determine market performance in frontier Sub-Saharan African (SSA) markets, as well as the effects of institutional quality and regional characteristics. **Design/Methodology/Approach:** The study uses a multi-country panel dataset spanning 2000-2022 and an econometric framework with market-level controls and fixed effects to account for endogeneity and institutional and regional heterogeneity. **Findings:** IPO activity shows a positive association with one-year market performance in the baseline fixed effects model (a one-unit increase in IPO count is linked to a 1.88 percentage point higher one-year return, $p = 0.026$), but propensity score matching and an instrumental variable check do not confirm this relationship, and the instrument used is weak. GDP growth and inflation are not significant predictors of IPO activity or market performance once country and year fixed effects are included. The institutional quality split runs counter to expectation: the IPO to performance link is significant only in the lower institutional quality country group in this sample. **Practical Implications:** The findings underline the importance of strengthening institutional quality and maintaining macroeconomic stability when governing SSA frontier markets to improve capital market outcomes and encourage IPO activity and investor participation. **Originality/Value:** This study adds to the frontier-market literature through integrating IPO dynamics with macroeconomic and organisational factors in a multi-country African context. It shows that, in this small six-country sample, macroeconomic conditions do not significantly predict IPO activity or market performance once country and year fixed effects are included, and that the IPO-performance association is not robust to matching.

Keywords

Governance of Frontier Markets, Macroeconomic Stability, IPO Activity, Financial Markets, Sub-Saharan Africa

1. Introduction

Frontier financial markets in Sub-Saharan Africa (SSA) occupy an increasingly important position in global finance despite being characterised by shallow market depth, low liquidity, concentrated ownership, and high macroeconomic volatility (Yartey & Adjasi, 2007; Bekaert & Harvey, 1997; Beck & Levine, 2004). These markets have become important channels for capital mobilisation as governments and firms seek alternatives to bank-based financing (Beck & Levine, 2004; Demirgüç-Kunt & Levine, 1996). However, governance remains fragile due to weak institutions, inconsistent regulation, and limited investor protection (La Porta et al., 2000; Klapper & Love, 2004). Because institutional indicators are often unreliable or unavailable, macroeconomic stability is increasingly used as a proxy for governance quality, reflecting policy credibility, inflation moderation, exchange-rate stability, and economic growth (Klapper & Love, 2004; IMF, 2023; World Bank, 2023). In frontier markets, macroeconomic stability therefore signals institutional effectiveness and regulatory credibility (Connelly et al., 2011; Ross, 1977).

IPO activity provides an important lens for exploring the relationship between macroeconomic governance and market development. IPOs expand liquidity, deepen markets, and attract investors (Ritter & Welch, 2002; Pagano et al., 1998), but they remain highly sensitive to macroeconomic and institutional conditions. Firms are more likely to list during periods of strong GDP growth, low inflation, and exchange-rate stability, which reduce uncertainty and improve investment confidence (Pagano et al., 1998; Ritter & Welch, 2002; Lowry, 2003). Conversely, instability increases information asymmetry and agency problems, discouraging new listings (Stiglitz & Weiss, 1981; Ritter & Welch, 2002). IPO activity similarly shapes market performance through liquidity and volatility effects. In thin frontier markets, even small IPO waves can considerably affect trading activity and volatility (Ellul & Pagano, 2006). IPOs improve liquidity but may increase short-term volatility due to speculation trading and weak institutional participation (Ritter & Welch, 2002; Ljungqvist, 2007). At the same time, macroeconomic instability weakens investor assurance and increases volatility, especially in markets with limited institutional buffers (Bekaert & Harvey, 1997; IMF, 2023).

Despite growing research interest, few studies integrate macroeconomic stability, IPO activity, and market results within a single framework, and limited attention has been paid to macroeconomic stability as a proxy for governance quality in cases where institutional data are weak. The study, therefore, makes three contributions. First, it conceptualises macroeconomic stability as a proxy for governance quality in frontier markets. Second, it provides an integrated empirical test

of the macro-IPO-market performance nexus in SSA. Third, it contributes to policy debates on strengthening governance, stabilising macroeconomic conditions, and promoting IPO activity to deepen frontier capital markets.

2. Theory and Hypotheses

2.1. Theoretical Framework

This study draws on institutional theory, signalling theory, agency theory, market microstructure theory, and financial liberalisation theory to explain how macroeconomic stability shapes IPO activity and how IPOs modify market performance in frontier Sub-Saharan African (SSA) markets. Institutional theory argues that economic behaviour is determined by regulated and informal institutional arrangements (North, 1990; Scott, 2014). In frontier SSA markets, weak regulation and inconsistent enforcement make macroeconomic stability a proxy for governance quality. Steady inflation, exchange rates, and GDP growth signal policy credibility, reduce uncertainty, and encourage firms and investors to participate in equity markets (IMF, 2023; World Bank, 2023; Kaufmann et al., 2011). Conversely, instability raises uncertainty and discourages IPO activity.

Signalling theory explains how firms use IPOs to convey private information about quality within environments with high information asymmetry (Spence, 1973, 2002; Allen & Faulhaber, 1989; Connelly et al., 2011). In frontier markets with weak disclosure systems, IPO decisions carry strong signalling value. Firms are more likely to list during stable macroeconomic periods because stability strengthens the credibility of firm-level signals and improves investor assurance (Kim & Weisbach, 2008). Agency theory points out conflicts between insiders and outside investors (Jensen & Meckling, 1976). These conflicts are intensified in frontier markets due to weak disclosure, concentrated ownership, and low institutional participation (La Porta et al., 2000; Shleifer & Vishny, 1997). Macroeconomic instability increases information asymmetry and uncertainty, thereby raising agency costs and discouraging IPO participation (La Porta et al., 2000). Stable macroeconomic conditions reduce these frictions and support listing activity.

Market microstructure theory explains how liquidity, trading mechanisms, and information flows govern market performance (O'Hara, 1995). Frontier markets are characterised by thin trading, low liquidity, and shallow market depth (Bekaert & Harvey, 1997). IPOs can therefore significantly affect liquidity, turnover, and price discovery, while also generating short-term volatility due to speculative dealings and weak institutional participation (Ellul & Pagano, 2006). Financial liberalisation theory emphasises the role of market openness and financial deepening in affecting capital market development (McKinnon, 1973; Shaw, 1973). Liberalisation increases capital mobility, investor participation, and financing opportunities, thereby strengthening the relationship between macroeconomic stability, IPO activity, and market outcomes (Levine, 2005). Liberalisation without macroeconomic stability may increase exposure to external shocks and volatility.

Collectively, these theories support a macro-IPO-market performance nexus in

which macroeconomic stability reduces uncertainty and agency costs, enhances IPO credibility, increases listing activity, and improves market performance through liquidity and investor participation channels.

2.2. Hypothesis Development

2.2.1. Macroeconomic Stability and IPO Activity

Macroeconomic stability substitutes for weak governance by signalling policy credibility and reducing systemic uncertainty in frontier markets (North, 1990; Kaufmann et al., 2011; IMF, 2023). Firms prefer to go public during stable periods because macroeconomic stability strengthens investor assurance and improves the credibility of IPO signals (Connelly et al., 2011; Chemmanur & Fulghieri, 1999). IPO waves tend to cluster during periods of macroeconomic expansion and stability (Ritter & Welch, 2002; Lowry, 2003).

Accordingly, the study hypothesised that:

H1: Macroeconomic stability influences IPO activity.

H1a: Higher GDP growth increases IPO activity.

H1b: Higher inflation reduces IPO activity.

H1c: Exchange rate instability reduces IPO activity.

2.2.2. IPO Activity and Market Performance

IPOs increase the number of tradable securities, liquidity, and price discovery in thin markets (O'Hara, 1995; Pagano et al., 1998; Ellul & Pagano, 2006). However, IPOs may also increase short-term volatility where institutional participation is weak (Bekaert & Harvey, 1997). Market openness and capital mobility amplify the performance effects of IPOs by improving market efficiency and investor participation (McKinnon, 1973; Shaw, 1973; Levine, 2005). Empirical studies generally find that IPO activity improves liquidity and market outcomes in emerging and frontier markets (Pagano et al., 1998; Ritter & Welch, 2002; Bekaert et al., 2005).

Thus, the study argues that:

H2: IPO activity influences market performance.

H2a: Higher IPO activity improves short-term market performance.

H2b: Higher IPO activity improves long-term market performance.

2.2.3. Macroeconomic Stability and Market Performance

Stable macroeconomic conditions improve investor assurance and market valuation by reducing systemic uncertainty (Kaufmann et al., 2011; IMF, 2023). They signal lower country risk and stronger policy credibility, hence enhancing market participation. Instability weakens disclosure and increases information asymmetry, reducing market efficiency and returns. GDP growth improves market performance, while inflation and exchange-rate instability reduce returns and increase volatility in frontier markets (Boyd et al., 2001; Yartey & Adjasi, 2007).

Accordingly, the study hypothesised that:

H3: Macroeconomic stability directly influences market performance.

H3a: Higher GDP growth improves market performance.

H3b: Higher inflation weakens market performance.

H3c: Exchange-rate instability reduces market performance.

3. Method

The study uses annual panel data for frontier SSA markets covering the period 2000-2022, based on data availability for macroeconomic, IPO, and stock market performance indicators. The sample includes countries classified as frontier markets by MSCI, FTSE Russell, and the IMF, consistent with prior studies examining frontier-market dynamics (Bekaert & Harvey, 1997; Yartey & Adjasi, 2007). Macroeconomic variables are obtained from the World Bank's World Development Indicators and the IMF's macroeconomic datasets, following the approach used in Boyd et al. (2001) for GDP measurement and in IMF (2023) for inflation patterns. IPO data are compiled from stock exchange reports, securities market bulletins, and transaction databases, consistent with prior IPO studies in emerging and frontier markets (Ritter & Welch, 2002; Kim & Weisbach, 2008). Market-performance indicators: market capitalisation, turnover ratio, and volatility are sourced from national exchanges and the African Securities Exchanges Association, following the method used by Yartey and Adjasi (2007) and Bekaert and Harvey (1997). The final dataset is an unbalanced panel reflecting heterogeneous listing activity and data availability across SSA frontier markets, consistent with the empirical structure of prior frontier-market research (Yartey & Adjasi, 2007).

Macroeconomic stability is operationalised using three core indicators widely employed in macrofinance research: GDP growth, inflation, and a lending interest rate measure used as a proxy for exchange rate and monetary stability, EXCHRATE (Boyd et al., 2001). This approach follows the reduced-form governance proxy methodology used by Kaufmann et al. (2011) and the IMF (2023), in which macroeconomic stability reflects policy credibility and institutional effectiveness under data-scarce environments. IPO activity is measured using IPOCOUNT, the annual number of IPOs recorded on each country's stock exchange; IPO proceeds data were not available at the country-year level for this sample and are not part of the estimated measure. This is a change from the original design, which described a combined count and proceeds measure; only IPOCOUNT is estimated in the models reported below. Market performance is captured using MKTPERF_1Y, the one-year percentage change in each country's stock market index. A short-term, one-month performance measure (MKTPERF_1M) was originally planned but is not reported, because the underlying market index data are recorded annually rather than monthly for this sample; only the annual measure is estimated.

3.1. Model Specification

The modelling approach follows the sequential macro-IPO-market performance framework used in Pástor and Veronesi (2005), Lowry (2003), and Kim and Weisbach (2008).

Model 1: Macroeconomic Stability → IPO Activity (H1a-c)

A fixed-effects panel model is used to estimate the effect of macroeconomic stability on IPO activity, following the approach of Lowry (2003), Kim and Weisbach (2008), and Wooldridge (2010). Country fixed effects control for structural differences in market size, regulatory regimes, and institutional quality, while year fixed effects capture global shocks and regular fluctuations in IPO markets.

$$\text{IPOCOUNT}_{i,t} = \alpha_0 + \beta_1 \text{GDPGROWTH}_{i,t} + \beta_2 \text{INFLATION}_{i,t} + \beta_3 \text{EXCHRATE}_{i,t} + \sum \text{CV} + \text{COUNTRY} + \text{YEAR} + \varepsilon_{i,t}$$

Model 2: IPO Activity → Market Performance (H2a-b)

The second model examines how IPO activity influences market performance. This specification follows the liquidity-and-depth framework used in Ellul and Pagano (2006), where IPOs are treated as market-expanding events that affect liquidity, turnover, and volatility.

Short-term performance:

$$\text{MKTPERF}_1 \text{M}_{i,t} = \alpha_0 + \beta_1 \text{IPOCOUNT}_{i,t} + \sum \text{CV} + \text{COUNTRY} + \text{YEAR} + \varepsilon_{i,t}$$

Long-term performance:

$$\text{MKTPERF}_1 \text{Y}_{i,t} = \alpha_0 + \beta_1 \text{IPOCOUNT}_{i,t} + \sum \text{CV} + \text{COUNTRY} + \text{YEAR} + \varepsilon_{i,t}$$

Model 3: Macroeconomic Stability → Market Performance (H3a-c)

The third model estimates the direct effect of macroeconomic stability on market performance, consistent with macro-finance studies showing that GDP growth enhances returns while inflation and exchange-rate instability depress valuations (Boyd et al., 2001; Yartey & Adjasi, 2007).

Short-term performance:

$$\text{MKTPERF}_1 \text{M}_{i,t} = \alpha_0 + \beta_1 \text{GDPGROWTH}_{i,t} + \beta_2 \text{INFLATION}_{i,t} + \beta_3 \text{EXCHRATE}_{i,t} + \sum \text{CV} + \text{COUNTRY} + \text{YEAR} + \varepsilon_{i,t}$$

Long-term performance:

$$\text{MKTPERF}_1 \text{Y}_{i,t} = \alpha_0 + \beta_1 \text{GDPGROWTH}_{i,t} + \beta_2 \text{INFLATION}_{i,t} + \beta_3 \text{EXCHRATE}_{i,t} + \sum \text{CV} + \text{COUNTRY} + \text{YEAR} + \varepsilon_{i,t}$$

3.2. Endogeneity and Robustness Examinations

A Fisher-type panel unit-root test, combining augmented Dickey-Fuller statistics across countries, is used to check stationarity prior to estimation. GDP growth and EXCHRATE reject the null of a unit root at the 5% level; inflation and IPO-COUNT reject the null at the 10% level but not at 5%, so results involving these two series should be read with some caution. IPO activity and stock market performance may be jointly determined, giving rise to concerns about reverse causality. A propensity-score matching correction using nearest-neighbour matching on GDP growth, inflation, and EXCHRATE is applied to adjust for the non-random timing of IPO activity; the resulting average treatment effect on the treated is small and not statistically significant (1.21 percentage points, $p = 0.842$), so this

check does not confirm the baseline association. Regional heterogeneity tests assess differences in the macro-IPO-market performance nexus across West, East, and Southern Africa. An instrumental-variable specification uses each country's lagged regional-peer average IPO count as an instrument for its own IPO count; the first-stage relationship is weak (first-stage F approximately 1.5, well below conventional thresholds), so the second-stage estimate is not a reliable robustness check and is reported for transparency only, not as confirming evidence. A Baron-Kenny mediation test of the path from GDP growth through IPOCOUNT to MKTPERF_1Y produces a small, statistically insignificant indirect effect (Sobel $z = 0.44$, $p = 0.662$).

Models 1 and 3 are estimated on a common estimation sample of 127 country-year observations, and models involving MKTPERF_1Y are estimated on the 90 country-years for which a market index return could be computed, obtained after listwise deletion of country-years with missing macroeconomic, IPO, or market-index data. This is substantially smaller than the 195 observations described in the original submission; the data appendix explains the sources of the reduction. All models are estimated using standard errors clustered at the country level to account for heteroskedasticity and within-country serial correlation (Olokoyo et al., 2020). With only 6 countries in the estimation sample, cluster-robust inference and the year fixed effects should be interpreted cautiously, since some year cells contain very few observations. The panel was designed to cover ten frontier SSA markets: Nigeria, Ghana, Kenya, Tanzania, Uganda, Zambia, Botswana, Mauritius, Cote d'Ivoire, and Senegal. In the estimation sample actually used, Kenya, Cote d'Ivoire, and Senegal are excluded because the underlying IPO data source reports no usable IPO counts for Kenya and reports Cote d'Ivoire and Senegal jointly through the shared regional exchange, BRVM, for which no IPO figures were available; Ghana is further excluded from the fixed-effects regressions because no lending-rate series was available for that country. The estimation sample therefore covers six markets: Nigeria, Botswana, Mauritius, Tanzania, Uganda, and Zambia. All data used in the study are publicly available from the World Bank's World Development Indicators, national central bank statistics, and national exchange bulletins; no confidential or proprietary information is used. A full data appendix follows the References section.

4. Results

4.1. Descriptive Trends in Macroeconomic Conditions and IPO Activity

The patterns show notable variation in macroeconomic conditions and IPO issuance across the six-country estimation sample. In 2004, an average GDP growth rate of 6.05% and average inflation of 8.85% coincided with 16 combined IPOs across the sample. In 2008, despite the global financial crisis, average GDP growth was still 6.26%, with 16 IPOs recorded; the crisis effect is visible mainly in 2020, when average GDP growth fell to negative 5.78% and only 1 IPO was recorded. In 2022, no IPOs were recorded in the two countries with complete 2022 data, along-

side a low average lending-rate proxy of 6.82 (the lowest in **Table 1**) and elevated inflation of 11.22%. These patterns are broadly consistent with the idea that macroeconomic instability coincides with weaker IPO activity, though the small number of countries per year means this pattern should be read as descriptive rather than as a formal test (**Table 1**).

Table 1. Macroeconomic measures and IPO activity by year.

2000	4.84	9.18	23.47	1
2004	6.05	8.85	20.23	16
2008	6.26	11.47	16.29	16
2012	3.92	9.81	15.05	4
2016	4.15	8.04	14.67	5
2020	-5.78	5.25	10.82	1
2022	7.09	11.22	6.82	0

4.2. Descriptive Statistics

Table 2 presents descriptive statistics for the variables in the estimation sample (N = 127 country-years for IPOCOUNT and the macroeconomic variables; N = 90 for MKTPERF_1Y). IPOCOUNT averages 2.25 per country-year, with a median of 0 and a maximum of 78, reflecting the episodic, right-skewed nature of IPO activity in these markets: most country-years have no listings, punctuated by occasional large waves, mainly in Nigeria. GDP growth averages 5.04% (range negative 14.60% to 15.33%), inflation averages 8.30% (range negative 0.29% to 26.03%), and the lending-rate proxy EXCHRATE averages 16.77 (range 5.25 to 46.23). One-year market performance averages 8.56% with a wide range (negative 36.14% to 80.57%), underscoring the volatility of these frontier markets and motivating the heterogeneity checks reported later.

Table 2. Descriptive statistics.

IPOCOUNT	2.25	8.40	0	0	78
GDPGROWTH (%)	5.04	3.85	-14.60	5.46	15.33
INFLATION (%)	8.30	5.07	-0.29	7.08	26.03
EXCHRATE	16.77	7.07	5.25	16.46	46.23
MKTPERF_1Y (%)	8.56	23.80	-36.14	3.94	80.57

Notes: MKTPERF_1M is not estimated because index data are annual; see Section 3.

4.3. Correlation Matrix

Table 3 shows pairwise correlations among key variables (N = 127 for pairs among IPOCOUNT, GDPGROWTH, INFLATION, and EXCHRATE; N = 90 for any pair involving MKTPERF_1Y). None of the correlations between IPOCOUNT and the macroeconomic variables are significant at the 5% level: IPOCOUNT and

GDPGROWTH ($r = 0.072$, $p = 0.422$), IPOCOUNT and INFLATION ($r = 0.147$, $p = 0.100$), and IPOCOUNT and EXCHRATE ($r = -0.007$, $p = 0.937$). IPOCOUNT and MKTPERF_1Y are positively but not significantly correlated ($r = 0.159$, $p = 0.133$). GDPGROWTH is significantly correlated with EXCHRATE ($r = 0.225$, $p = 0.011$), and INFLATION is strongly correlated with EXCHRATE ($r = 0.571$, $p < 0.001$), which is expected given that EXCHRATE is a nominal lending-rate proxy that itself responds to inflation. None of the macroeconomic variables are significantly correlated with MKTPERF_1Y. Overall, the correlation structure does not provide strong univariate support for the hypothesised IPOCOUNT and macroeconomic relationships in this sample.

Table 3. Correlation matrix.

(1) IPOCOUNT	1				
(2) GDPGROWTH	0.072	1			
(3) INFLATION	0.147	0.154	1		
(4) EXCHRATE	-0.007	0.225**	0.571***	1	
(5) MKTPERF_1Y	0.159	0.059	-0.044	0.199*	1

Notes: ***, **, * denote significance at the 1%, 5%, and 10% levels respectively.

4.4. Market Performance by IPO Activity

Above-median IPO activity is associated with a higher mean one-year return than at- or below-median activity (9.88% vs. 7.72%), but the difference is not statistically significant ($t = 0.39$, $p = 0.699$). **Table 4** compares one-year market performance between high- and low-IPO country-years, split at the sample median IPOCOUNT of 0.

Table 4. Market performance by IPO activity level.

High (Above Median)	9.88%	35	0.39	0.699
Low (Below Median)	7.72%	55	—	—

Notes: High IPO activity refers to country-years with IPO counts above the sample median; Low IPO activity refers to country-years below the median.

4.5. Regression Results: Macroeconomic Conditions and IPO Activity

Table 5 reports fixed-effects panel regression results for IPOCOUNT on the macroeconomic variables. None of the three predictors is statistically significant: GDP growth ($\beta = 0.048$, $p = 0.590$), inflation ($\beta = 0.077$, $p = 0.562$), and EXCHRATE ($\beta = -0.190$, $p = 0.507$). The model has an R-squared of 0.320 (adjusted R-squared 0.108); with 6 country and 22-year fixed effects estimated from only 127 observations, the model is close to saturated and the F-statistic under clustered standard errors is not numerically reliable, so it is omitted. With country and year fixed effects included, this sample does not support Hypotheses H1a to

H1c: macroeconomic conditions are not significant predictors of IPO activity once country and year effects are controlled for.

Table 5. Regression results: macroeconomic conditions and IPO activity.

GDPGROWTH	0.048	0.54	0.590
INFLATION	0.077	0.58	0.562
EXCHRATE	-0.190	-0.66	0.507
Constant	2.235	0.74	0.458
Model Statistics			
F-statistic: not reliable under clustering with 6 clusters (omitted)			
R-squared: 0.320; Adjusted R-squared: 0.108			
N = 127			
Year FE: Yes			
Country FE: Yes			

Notes: ***, **, * denote significance at the 1%, 5%, and 10% levels respectively.

4.6. Regression Results: Macroeconomic Conditions and Market Results

Table 6 presents fixed-effects regression results for MKTPERF_1Y on the macroeconomic variables (N = 90). None of the three predictors is statistically significant: GDP growth (beta = -0.70 percentage points, $p = 0.317$), inflation (beta = -0.42 percentage points, $p = 0.688$), and EXCHRATE (beta = 0.50 percentage points, $p = 0.189$). The model has an R-squared of 0.493 (adjusted R-squared 0.248). In this sample, macroeconomic conditions are not significant direct predictors of one-year market performance once country and year fixed effects are controlled for, so Hypotheses H3a to H3c are not supported.

Table 6. Regression results: macroeconomic conditions and market results.

GDPGROWTH	-0.701	-1.00	0.317
INFLATION	-0.424	-0.40	0.688
EXCHRATE	0.498	1.31	0.189
Constant	8.491	1.32	0.187
Model Statistics			
F-statistic: not reliable under clustering with 6 clusters (omitted)			
R-squared: 0.493; Adjusted R-squared: 0.248			
N = 90			
Year FE: Yes			
Country FE: Yes			

Notes: ***, **, * denote significance at the 1%, 5%, and 10% levels respectively.

4.7. Regression Results: IPO Activity and Market Results

Table 7 presents fixed-effects regression results for the effect of IPOCOUNT on MKTPERF_1Y (N = 90). The coefficient on IPOCOUNT is positive and statistically significant (beta = 1.88 percentage points per additional IPO, $p = 0.026$), indicating that higher IPO issuance is associated with stronger one-year returns in this sample. This offers support for Hypothesis H2b. The model has an R-squared of 0.500 (adjusted R-squared 0.282). This finding should be read alongside the robustness checks in Section 4.9, which do not confirm it: propensity score matching and the instrumental-variable check reported there do not support a causal reading of this association.

Table 7. Regression results: IPO activity and market results.

IPOCOUNT	1.881**	2.23	0.026
Constant	6.458***	5.32	0.000
Model Statistics			
F-statistic: not reliable under clustering with 6 clusters (omitted)			
R-squared: 0.500; Adjusted R-squared: 0.282			
N = 90			
Year FE: Yes			
Country FE: Yes			

Notes: ***, **, * denote significance at the 1%, 5%, and 10% levels respectively.

4.8. Instrumental-Variable Robustness Check

As a further robustness check on the IPOCOUNT to MKTPERF_1Y relationship reported in **Table 7**, **Table 8** reports a two-stage least squares specification in which each country's own IPOCOUNT is instrumented with its lagged regional-peer average IPOCOUNT (N = 61, the subsample with a non-missing lagged peer instrument). The first-stage coefficient on the instrument is small and not significant (coefficient = -0.15 , $p = 0.226$), with an approximate first-stage F-statistic of 1.5, well below the conventional threshold of 10 for instrument relevance. The second-stage coefficient on instrumented IPOCOUNT is negative and not significant (coefficient = -0.21 , $p = 0.237$). Because the instrument is weak, this result cannot be interpreted as either confirming or contradicting the baseline finding in **Table 7**; it is reported for transparency, as requested in review, rather than as supporting evidence.

Table 8. Instrumental-variable (2SLS) results: IPO activity and one-year market performance.

First stage: peer IPOCOUNT (lagged)	-0.150	-1.22	0.226
Second stage: IPOCOUNT (instrumented)	-0.211	-1.18	0.237
Model Statistics			

Continued

Approximate first-stage F-statistic: 1.5 (weak instrument)

N = 61

Country FE: Yes

Notes: ***, **, * denote significance at the 1%, 5%, and 10% levels respectively.

4.9. Robustness and Endogeneity Checks

The study uses nearest-neighbour propensity score matching (PSM) to check whether the IPOCOUNT to MKTPERF_1Y association in **Table 7** reflects something other than the macroeconomic covariates. Propensity scores are estimated from a logistic regression of above-median IPO activity on GDP growth, inflation, and EXCHRATE; each above-median country-year is matched to its nearest below-median country-year by propensity score. **Table 9** reports the unmatched difference and the matched average treatment effect on the treated (ATT). The unmatched difference in one-year performance is 2.16 percentage points and not significant ($t = 0.39$, $p = 0.699$, consistent with **Table 4**). After matching on the macroeconomic covariates, the ATT falls to 1.21 percentage points and remains not significant ($t = 0.20$, $p = 0.842$). This does not support a causal reading of the IPOCOUNT to MKTPERF_1Y association reported in **Table 7**; the matched result suggests the unmatched difference may be partly attributable to the macroeconomic covariates rather than to IPO activity itself.

Table 9. Propensity score matching: average treatment effects.

MKTPERF_1Y	Unmatched	9.88	7.72	2.16	—	0.39 ($p = 0.699$)
	Nearest Neighbour (matched)	9.88	8.67	1.21	35.15	0.20 ($p = 0.842$)
Radius and kernel matching were not estimated given the small matched sample (35 treated, 35 controls); only nearest-neighbour matching is reported.						

Notes: Treated = periods with above-median IPO activity; Controls = matched periods with below-median IPO activity. ***, **, * denote significance at the 1%, 5%, and 10% levels respectively.

4.10. Regional Heterogeneity Analysis

Table 10 examines regional heterogeneity in the IPOCOUNT to MKTPERF_1Y link within the six-country estimation sample, grouped into West Africa (Nigeria), East Africa (Uganda, Tanzania, Mauritius), and Southern Africa (Botswana, Zambia); no North African or South African country is in this sample. Each regional coefficient comes from a simple regression of MKTPERF_1Y on IPO-

COUNT within that region, with heteroskedasticity-robust standard errors (fixed effects are not used at this level given the small within-region samples). West Africa shows a positive, significant relationship (beta = 0.034, $t = 2.16$, $p = 0.031$, $R^2 = 0.219$, $n = 13$). East Africa ($n = 48$) and Southern Africa ($n = 29$) show small, not significant relationships (beta = 0.007, $p = 0.838$ and beta = 0.014, $p = 0.419$, respectively). The regional pattern in this sample is therefore concentrated in Nigeria's more active and volatile IPO market, rather than reflecting a general cross-region relationship.

Table 10. Regional heterogeneity analysis.

West Africa	0.034**	2.16	13	0.219
East Africa	0.007	0.20	48	0.001
Southern Africa	0.014	0.81	29	0.012

Notes: ***, **, * denote significance at the 1%, 5%, and 10% levels respectively.

4.11. Institutional Quality Heterogeneity

Table 11 analyses institutional heterogeneity in the IPOCOUNT to MKTPERF_1Y relationship. Countries are split using the World Bank Worldwide Governance Indicators' Regulatory Quality global ranking (2024 data, TheGlobalEconomy.com compilation of World Bank data): Mauritius and Botswana form the higher-regulatory-quality group, and Nigeria, Zambia, Uganda, and Tanzania form the lower-regulatory-quality group. This is a time-invariant, cross-sectional grouping using the most recent available ranking, since a full country-year institutional quality series was not available for this sample. Contrary to the original hypothesis, IPO activity has a significant positive effect on performance only in the lower-regulatory-quality group (beta = 0.027, $t = 2.10$, $p = 0.036$, $R^2 = 0.053$, $n = 50$), while the effect in the higher-regulatory-quality group is small and not significant (beta = 0.003, $t = 0.16$, $p = 0.874$, $R^2 = 0.001$, $n = 40$). This does not support the expectation that stronger institutions amplify the IPO to performance link in this sample; if anything, the pattern here is concentrated in the lower-regulatory-quality group, likely reflecting Nigeria's larger and more volatile IPO activity rather than an institutional-quality effect as such.

Table 11. Institutional quality heterogeneity.

Lower Regulatory Quality	0.027**	2.10	50	0.053
Higher Regulatory Quality	0.003	0.16	40	0.001

Notes: ***, **, * denote significance at the 1%, 5%, and 10% levels respectively.

5. Discussion

The results give only partial support to the macro-IPO-market performance nexus in this six-country sample of frontier Sub-Saharan African (SSA) markets. Macroeconomic stability does not significantly predict IPO activity here, contrary to

H1a to H1c and contrary to the pattern reported in developed and emerging markets (Kim & Weisbach, 2008; Ritter & Welch, 2002; Lowry, 2003; Cai & Wei, 1997). This may reflect the small number of countries and the unbalanced coverage in the estimation sample rather than the absence of a true relationship, and it should temper any claim that macroeconomic stability functions as a governance signal in this setting (Kaufmann et al., 2011; North, 1990). IPO activity is significantly associated with stronger one-year market performance in the baseline fixed-effects model, consistent with microstructure evidence that IPOs expand the pool of tradable securities (O'Hara, 1995; Ellul & Pagano, 2006). However, this association is not confirmed by propensity score matching or by the instrumental-variable check, both of which are reported in Section 4.9. The most defensible reading is that the positive IPOCOUNT to MKTPERF_1Y association observed here is not yet established as a causal effect and may be concentrated in, or driven by, Nigeria's larger and more volatile IPO market rather than reflecting a general frontier-market pattern.

Macroeconomic stability does not significantly predict one-year market performance directly in this sample, which does not support H3a to H3c. This does not confirm the macrofinance literature's finding that GDP growth raises returns while inflation and interest-rate conditions depress them (Boyd et al., 2001) in this particular sample and period; the small number of countries and the unbalanced panel are the most likely reasons for the weaker statistical power, rather than evidence against the underlying theory. The mediation test of the path from GDP growth through IPOCOUNT to MKTPERF_1Y produces a small, statistically insignificant indirect effect, so the sequential macro-IPO-market framework (Pástor & Veronesi, 2005) is not supported as a mediating mechanism in this sample. The institutional-quality heterogeneity results (Section 4.11) also run counter to expectation: the IPOCOUNT to MKTPERF_1Y link is significant only in the lower-regulatory-quality group, not the higher one, which does not support the liberalisation-theory expectation that stronger institutions amplify this link (McKinnon, 1973; Shaw, 1973; Levine, 2005). Taken together, the results in this revised analysis are more modest than originally reported, and should be read as suggestive rather than confirmatory, given the small number of countries and the several robustness checks that do not support the main association.

6. Implications

6.1. Theory

The findings speak to several theoretical strands, though more tentatively than originally claimed. The absence of a significant link between GDP growth and IPO activity in this sample does not support the macroeconomic theories connecting equity issuance to economic expansion, at least not in this small, unbalanced panel. The positive but not robustly confirmed association between IPO activity and one-year performance offers only limited support for extending institutional and agency theories to frontier SSA markets; the institutional-quality split, in particu-

lar, points in the opposite direction from what agency-theory reasoning would predict. The study's main contribution to frontier finance literature is therefore methodological and cautionary: it shows how sensitive macro-IPO-performance findings in thin, unbalanced frontier-market panels are to sample composition, and it illustrates the value of subjecting an initial fixed-effects result to matching and instrumental-variable checks before treating it as evidence of a causal governance mechanism.

6.2. Governance and Market Participants

Because the institutional-quality results in this sample run counter to the expectation that stronger regulatory environments amplify the IPO to performance link, claims about governance and market participants should be stated cautiously pending a larger sample. The one robust descriptive pattern in this analysis is that IPO activity is concentrated in a small number of country-years, mainly in Nigeria, so investors and issuers in these markets should expect IPO waves to be episodic rather than steady. For issuers, the absence of a significant macroeconomic timing effect in this sample suggests that country-level macro conditions alone are not a reliable guide to listing timing; firm-level and deal-level factors not captured in this country-year dataset are likely more important. Policymakers and regulators should treat the institutional-quality finding as an open question for further research with a larger and more balanced country sample, rather than as a settled basis for the claim that improving regulatory quality alone will strengthen the IPO to performance link.

7. Conclusion

This study examined how macroeconomic conditions and IPO activity relate to market performance in six frontier Sub-Saharan African markets between 2000 and 2022. IPO activity is associated with stronger one-year market performance in the baseline fixed-effects model, but this association is not confirmed by propensity score matching or by an instrumental-variable check with a weak instrument, so it should not yet be read as a causal effect. GDP growth, inflation, and the lending-rate proxy used for exchange-rate and monetary stability are not significant predictors of either IPO activity or market performance in this sample once country and year fixed effects are included. The institutional-quality heterogeneity results run counter to the original hypothesis. Overall, this revised analysis supports a more cautious set of conclusions than the original submission: IPO activity in frontier SSA markets is episodic and concentrated in a small number of country-years, and the macro-IPO-performance relationships proposed in the original hypotheses are not well supported by the data actually available for this sample.

Limitations and Future Research

This study has limitations that open avenues for future research. First, reliance on

country-year data limits the analysis of firm-level IPO features, such as ownership, pricing, and governance. Second, macroeconomic variables may not capture informal finance, political risk, or external shocks common in frontier markets; higher-frequency or alternative stability measures could improve robustness. Relationships among IPO activity, macro conditions, and performance may be non-linear, suggesting threshold or regime-switching models. While fixed-effects regression and propensity score matching strengthen inference, future work could apply stronger instruments, structural VARs, or machine learning to address endogeneity more fully. Further research might also examine how institutional reforms, regulatory innovation, and regional integration shape IPO market dynamics over time. A further, more basic limitation of this revised analysis is data coverage: three of the ten originally intended countries (Kenya, Cote d'Ivoire, and Senegal) could not be included because usable IPO counts were not available for them in the underlying data source, and the final estimation sample of 6 countries and at most 127 country-years is small for fixed-effects panel methods with country and year dummies. Results involving MKTPERF_1Y rest on only 90 country-years. The instrumental-variable check in Section 4.8 uses a weak instrument and should not be treated as a confirmatory robustness check. Readers should treat the findings reported here as an initial, small-sample analysis rather than a definitive test of the macro-IPO-performance hypotheses, and future work with a larger, more balanced country-year panel is needed before drawing firm policy conclusions.

Author Contributions

Henry Kwame Afriyie: conceptualisation, methodology, data curation, formal analysis, writing—original draft. Kwaku Ahenkora: conceptualisation, supervision, validation, writing—review and editing. Both authors read and approved the final manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Data Appendix

This appendix lists, for each variable used in the estimation, its source, the series or worksheet it was drawn from, the transformation applied, and the rule used for missing data, in response to the reviewer's request for a data appendix. No IPO proceeds (currency-denominated) data were available at the country-year level in the underlying source, so IPOCOUNT is the only IPO-activity variable estimated; the combined count-and-proceeds measure described in the original Method section could not be constructed. All currency figures in the underlying lending-rate series are already expressed as interest rate percentages and required no currency conversion.

Variable	Source and series	Transformation	Missing-data rule
IPOCOUNT	Country stock exchange annual reports, as compiled in the workbook's #IPO worksheet	Raw annual IPO counts; non-numeric "-" entries recoded as 0	Cote d'Ivoire and Senegal are reported only jointly through the shared BRVM regional exchange, for which no populated figures were available, so both are excluded. Kenya has no row in the source and is also excluded. Other missing country-years are dropped listwise.
GDPGROWTH	World Bank World Development Indicators, GDP growth, annual percent (series NY.GDP.MKTP.KD.ZG)	Used as provided in the workbook's GDP worksheet	Botswana's series was absent from the workbook and was supplemented from World Bank data (Statista compilation of World Bank figures, retrieved 2026). Other missing country-years are dropped listwise.
INFLATION	World Bank World Development Indicators, inflation, consumer prices, annual percent	Used as provided in the workbook's Inflation worksheet	Missing country-years are dropped listwise.
EXCHRATE	World Bank, lending interest rate, percent; used as a proxy for exchange-rate and monetary stability because no exchange-rate series was available in the workbook	Used as provided in the workbook's Nominal Lending Rate worksheet	Ghana's series was absent from the workbook and was not supplemented, so Ghana is excluded from all regression models. Other missing country-years are dropped listwise.
MKTPERF_1Y	National stock exchange annual index levels, workbook's Market Index worksheet	Percentage change in year-end index level from year $t - 1$ to year t	The first sample year for each country has no prior-year value and is therefore missing.
MKTPERF_1M	Not estimated	Not applicable	The workbook records index levels annually, not monthly, so a one-month post-IPO return could not be constructed. This measure is dropped from the analysis.

The institutional-quality grouping used in **Table 11** (higher- versus lower-regulatory-quality country groups) is based on the World Bank Worldwide Governance Indicators' Regulatory Quality global ranking for 2024, as compiled by TheGlobalEconomy.com. Because a full country-year institutional-quality series

was not available for this sample, this grouping is applied as a single, time-invariant classification across the full 2000 to 2022 period, which is itself a limitation of this heterogeneity check.