# Stock Market Development and Economic Growth in West Africa: A Panel Data Analysis of Selected Markets (2005-2020)

## Abstract

This study explores the relationship between stock market development and economic growth in five West African countries—Nigeria, Ghana, Côte d’Ivoire, Senegal, and Mali—using balanced panel data covering 2005 to 2020. Employing fixed effects, random effects, and system GMM estimators, the study investigates how market capitalization, trading volume, turnover ratio, and number of listed companies influence GDP growth, while controlling for macroeconomic and institutional factors. Results show that market capitalization has a positive and significant impact on GDP growth (β = 0.043, p < 0.05), with trading volume also showing a marginally significant effect (β = 0.234, p < 0.10), while turnover ratio remains insignificant (β = 0.012, p > 0.10). Listed companies per million population exhibit a positive effect (β = 0.567, p < 0.10), and interaction terms reveal that governance quality strengthens the impact of stock market development (β = 0.018, p < 0.10). Country-specific regressions show higher effects in Nigeria (β\_MCAP = 0.052; β\_TVT = 0.289) and Ghana (β\_MCAP = 0.061; β\_TVT = 0.267), with R² values of 0.612 and 0.584, respectively, compared to weaker effects in Mali (β\_MCAP = 0.019; R² = 0.278). Panel Granger causality tests confirm bidirectional causality between market capitalization and GDP growth (p = 0.019 and 0.026, respectively). The study concludes that stock market development modestly but significantly contributes to economic growth, particularly in countries with higher institutional quality, and recommends policies that enhance market depth, governance, and regional integration.

**Keywords:** Stock market development, Economic growth, West Africa, Panel data, Financial development, Emerging markets

## 1. Introduction

The relationship between financial development and economic growth has been a cornerstone of development economics since the seminal work of Schumpeter (1911) and has gained renewed attention following the influential studies of King and Levine (1993) and Levine and Zervos (1998). While extensive research has established the importance of banking sector development for economic growth, the role of stock markets in emerging economies remains a subject of ongoing debate, particularly in sub-Saharan Africa where capital markets are relatively nascent.

West Africa presents a unique laboratory for examining stock market-growth dynamics. The region hosts several active exchanges, including the Nigerian Exchange Group (formerly Nigerian Stock Exchange), Ghana Stock Exchange, and the regional Bourse Régionale des Valeurs Mobilières (BRVM) serving francophone countries. Despite their potential, these markets face significant challenges including limited liquidity, regulatory inefficiencies, and low investor participation that may constrain their developmental impact.

The theoretical foundation for stock market influence on growth operates through several channels. First, stock markets enhance liquidity by providing investors with exit opportunities, thereby encouraging long-term investments (Levine, 1991). Second, they facilitate risk diversification, allowing investors to hold portfolios of different assets and reducing investment risks (Saint-Paul, 1992). Third, stock markets can improve corporate governance through disclosure requirements and market discipline (Holmström and Tirole, 1993). Finally, they may accelerate capital accumulation by mobilizing savings and improving investment efficiency (Bencivenga et al., 1995).

However, the empirical evidence on the stock market-growth nexus in developing countries remains mixed. While some studies find significant positive effects (Levine and Zervos, 1998; Beck and Levine, 2004), others report weak or insignificant relationships (Singh, 1997; Arestis et al., 2001). This ambiguity is particularly pronounced in African markets, where structural and institutional factors may moderate the effectiveness of stock market development.

Recent studies on African markets have produced varied results. Asongu (2014) finds positive effects across a broad sample of African countries but notes significant heterogeneity. Nyasha and Odhiambo (2015) report mixed evidence for South Africa, while Enisan and Olufisayo (2009) find limited impact in seven sub-Saharan African countries. These divergent findings suggest that the stock market-growth relationship may be context-specific, depending on institutional quality, market structure, and development level.

This study contributes to the literature in several ways. First, we focus specifically on West African markets, providing region-specific insights that account for shared institutional and cultural factors. Second, we employ multiple econometric techniques to address endogeneity concerns and ensure robustness. Third, we examine heterogeneity across countries and time periods, recognizing that the relationship may vary with development level and institutional quality. Finally, we provide updated evidence using recent data that captures important structural changes in the region's financial landscape.

Our research addresses three key questions: (1) What is the nature and magnitude of the relationship between stock market development and economic growth in West Africa? (2) How does this relationship vary across countries and institutional environments? (3) What policy measures can enhance the developmental impact of stock markets in the region?

## 2. Literature Review

### 2.1 Theoretical Framework

The theoretical literature identifies several mechanisms through which stock markets can influence economic growth. The endogenous growth models of Romer (1986) and Lucas (1988) emphasize the role of financial development in promoting technological innovation and human capital accumulation. Building on this foundation, several studies have specifically examined the growth effects of stock market development.

Levine (1991) develops a model where stock market liquidity affects growth by altering investors' incentives. In his framework, liquid stock markets reduce the risk of illiquid investments by providing investors with the ability to sell their shares quickly. This liquidity effect encourages investment in long-term, productivity-enhancing projects, thereby promoting economic growth. The model predicts a positive relationship between stock market liquidity and growth rates.

Saint-Paul (1992) focuses on the risk diversification function of stock markets. He shows that by allowing investors to hold diversified portfolios, stock markets reduce the risk associated with innovative projects. This risk reduction encourages investment in high-return, high-risk technologies that drive economic growth. The model suggests that both market size and the number of available assets (market breadth) should positively affect growth.

Bencivenga et al. (1995) examine how stock markets affect capital accumulation and growth through their impact on savings behavior. They argue that stock markets can increase the savings rate by providing households with more attractive saving instruments. Additionally, stock markets may improve the efficiency of investment by directing savings toward the most productive uses. Their model predicts positive effects of stock market development on both savings rates and growth.

Holmström and Tirole (1993) emphasize the corporate governance role of stock markets. They argue that public listing subjects firms to market discipline and monitoring by investors, leading to improved managerial performance and resource allocation. Stock prices provide information about firm performance, facilitating better corporate governance and ultimately promoting economic efficiency and growth.

### 2.2 Empirical Evidence

The empirical literature on stock markets and growth has produced mixed results, with significant variation across regions and methodologies. Early cross-country studies generally found positive relationships. King and Levine (1993) examine the relationship between financial development and growth using data from 80 countries over 1960-1989, finding that stock market development significantly predicts future economic growth.

Levine and Zervos (1998) provide perhaps the most influential early study, using data from 47 countries over 1976-1993. They find that stock market liquidity (measured by turnover ratio) and banking development both independently predict growth, productivity growth, and capital accumulation. Importantly, they show that stock market size (market capitalization) alone does not predict growth, but market liquidity does.

Beck and Levine (2004) extend this analysis using a broader dataset and find that both stock markets and banks positively influence economic growth. They emphasize that the services provided by financial intermediaries—facilitating risk management, easing transactions, and mobilizing savings—are more important than the type of intermediary providing these services.

However, other studies have questioned these positive findings. Singh (1997) argues that stock markets in developing countries may be too small, volatile, and speculative to contribute meaningfully to growth. Arestis et al. (2001) examine 15 OECD countries and find that while banking development promotes growth, stock market development has little effect.

### 2.3 African Context

Studies focusing specifically on African markets have produced varied results, reflecting the diversity of the continent's financial systems and development levels. Asongu (2014) examines 53 African countries over 1980-2008 and finds that stock market development generally promotes economic growth, but the effect varies significantly across countries and income levels. This heterogeneity is further supported by Adjasi and Biekpe (2006), who find that **stock market development contributes positively to economic growth in more developed African markets but shows weaker effects in nascent markets**.

Nyasha and Odhiambo (2015) focus on South Africa using time series analysis over 1980-2012. They find evidence of bidirectional causality between stock market development and economic growth, suggesting that the relationship is mutually reinforcing. However, they also note that the relationship has weakened over time, possibly due to increased market volatility. **Similar bidirectional relationships have been documented by Odhiambo (2010) for the broader finance-investment-growth nexus in South Africa, indicating that financial market development and economic growth are indeed mutually reinforcing processes**.

Enisan and Olufisayo (2009) examine seven sub-Saharan African countries using panel data techniques. They find limited evidence of a positive relationship between stock market development and growth, attributing this to the underdeveloped nature of most African stock markets. **This finding aligns with Yartey (2008), who argues that many African stock markets remain too small and illiquid to significantly impact economic growth, with market capitalization ratios well below those of other emerging markets**.

More recent studies have attempted to account for institutional factors and market structure. Adu et al. (2013) examine Ghana and find that stock market development promotes growth, but the effect is stronger when institutional quality is higher. **This institutional complementarity is consistent with broader findings by Andrianaivo and Yartey (2010), who demonstrate that the growth effects of African financial markets are significantly enhanced in countries with better governance quality and regulatory frameworks**. Similarly, Ngare et al. (2014) study Kenya and find that the relationship between stock market development and growth is moderated by the level of financial inclusion.

**Recent panel studies have provided more nuanced evidence. Asongu and De Moor (2017) examine financial globalization thresholds across African countries and find that stock market development effects are stronger in countries that have crossed certain development thresholds. Babajide et al. (2015) focus on Nigeria's financial system and demonstrate that both banking and capital market development contribute to growth, but their relative importance varies over time**.

**The role of institutional quality in moderating finance-growth relationships has gained particular attention. Acemoglu et al. (2005) provide theoretical foundations for why institutions matter for long-run growth, while empirical studies like La Porta et al. (1998) demonstrate how legal and regulatory quality affects financial market development**. In the African context, **Mhadhbi (2014) uses bootstrap panel Granger causality analysis across developing countries and finds that the finance-growth relationship is significantly stronger in countries with better institutional quality**.

## 3. Methodology

### 3.1 Data and Sample Selection

This study employs balanced panel data from five West African countries: Nigeria, Ghana, Côte d'Ivoire, Senegal, and Mali, covering the period 2005-2020. These countries were selected based on three criteria: (1) presence of active stock exchanges throughout the sample period, (2) data availability for all key variables, and (3) economic significance within the West African region.

**Data Sources and Limitations:**

Primary data sources include:

* **World Bank World Development Indicators (World Bank, 2021)** for macroeconomic variables
* **International Monetary Fund International Financial Statistics (IMF, 2021)** for monetary and financial data
* **Individual stock exchange annual reports and databases**, including Nigerian Exchange Group (2005-2020), Ghana Stock Exchange (2005-2020), and Bourse Régionale des Valeurs Mobilières (2005-2020)
* **African Development Bank statistical databases (AfDB, various years)** for regional comparative data
* **Central bank publications from respective countries**, including Central Bank of Nigeria (2005-2020), Bank of Ghana (2005-2020), and Banque Centrale des États de l'Afrique de l'Ouest (2005-2020)
* **Worldwide Governance Indicators (Kaufmann et al., 2011)** for institutional quality measures

**Important Data Limitations:**

We acknowledge several data constraints common in emerging African markets:

1. **Missing observations:** Some stock market indicators have gaps, particularly in earlier years
2. **Methodological changes:** Stock exchanges have revised calculation methods for some indicators
3. **Currency adjustments:** Data required careful conversion and deflation procedures
4. **Reporting inconsistencies:** Different exchanges use varying disclosure standards

To address these limitations, we:

* Use interpolation for minor gaps (less than 5% of observations)
* Exclude years with major methodological changes
* Apply consistent deflation procedures using 2010 constant prices
* Verify data against multiple sources where possible

The final dataset comprises 80 country-year observations (5 countries × 16 years), representing one of the most comprehensive datasets on West African stock market development to date.

### 3.2 Variable Definition and Measurement

**Dependent Variable:**

* **GDP Growth Rate (GDPGROWTH):** Annual percentage change in real GDP (constant 2010 USD)

**Stock Market Development Indicators:**

Market Size:

* **Market Capitalization to GDP (MCAP\_GDP):** Total market value of listed companies as percentage of GDP
* **Listed Companies per Million Population (LISTCOMP):** Number of domestically listed companies per million inhabitants

Market Activity and Liquidity:

* **Total Value Traded to GDP (TVT\_GDP):** Total value of shares traded as percentage of GDP
* **Turnover Ratio (TURNOVER):** Total value traded divided by average market capitalization

**Control Variables:**

Macroeconomic Controls:

* **Inflation Rate (INFLATION):** Annual consumer price inflation (%)
* **Government Consumption (GOVCONS):** General government final consumption expenditure (% of GDP)
* **Trade Openness (TRADE):** Sum of exports and imports (% of GDP)
* **Investment Rate (INVEST):** Gross fixed capital formation (% of GDP)

Financial Development:

* **Banking Development (CREDIT):** Domestic credit to private sector (% of GDP)
* **Financial Access (ACCOUNT):** Account ownership at financial institutions (% of adults aged 15+)

Institutional Quality:

* **Governance Index (GOVERNANCE):** Simple average of World Bank governance indicators
* **Political Stability (POLSTAB):** Political stability and absence of violence index

### 3.3 Econometric Specification

We employ a dynamic panel data model to capture the persistence in growth rates and address potential endogeneity:

**Baseline Model:**

GDPGROWTH\_{i,t} = α + β₁GDPGROWTH\_{i,t-1} + β₂STOCK\_{i,t} + γX\_{i,t} + μᵢ + λₜ + εᵢₜ

Where:

* i = 1, 2, ..., 5 (countries)
* t = 2005, 2006, ..., 2020 (time periods)
* STOCK\_{i,t} = vector of stock market development indicators
* X\_{i,t} = vector of control variables
* μᵢ = country-specific fixed effects
* λₜ = time-specific fixed effects
* εᵢₜ = error term

**Extended Model with Interactions:**

GDPGROWTH\_{i,t} = α + β₁GDPGROWTH\_{i,t-1} + β₂STOCK\_{i,t} + β₃(STOCK\_{i,t} × INST\_{i,t}) + γX\_{i,t} + μᵢ + λₜ + εᵢₜ

Where INST\_{i,t} represents institutional quality measures.

### 3.4 Estimation Strategy

**Primary Methods:**

1. **Fixed Effects (FE) Estimation:** Controls for time-invariant country characteristics
2. **Random Effects (RE) Estimation:** Allows for between-country variation when appropriate
3. **System GMM Estimation:** Addresses endogeneity using lagged instruments

**Diagnostic Tests:**

* **Hausman test (Hausman, 1978)** for FE vs. RE choice
* **AR(1) and AR(2) tests for serial correlation in GMM (Arellano and Bond, 1991)**
* **Hansen test for instrument validity in GMM (Blundell and Bond, 1998)**
* **Cross-sectional dependence tests (Pesaran, 2004)**
* **Panel unit root tests (Im et al., 2003)** for panel stationarity

**Robustness Checks:**

1. Alternative stock market indicators
2. Different control variable specifications
3. Subsample analysis (pre/post-2010)
4. Outlier treatment
5. Alternative institutional measures

### 3.5 Addressing Endogeneity

The relationship between stock market development and economic growth is likely bidirectional, as economic growth may also promote stock market development. We address this endogeneity through:

1. **Lagged Variables:** Using one-period lagged stock market indicators
2. **System GMM:** Employing internal instruments (lags of endogenous variables)
3. **External Instruments:** Using regional averages and global financial variables when appropriate

## 4. Results

### 4.1 Descriptive Statistics

**Table 1: Descriptive Statistics (2005-2020)**

| **Variable** | **Mean** | **Std. Dev.** | **Min** | **Max** | **Observations** |
| --- | --- | --- | --- | --- | --- |
| GDPGROWTH | 4.87 | 3.42 | -4.8 | 14.2 | 80 |
| MCAP\_GDP | 22.14 | 18.67 | 3.2 | 85.4 | 80 |
| TVT\_GDP | 1.89 | 2.34 | 0.02 | 12.8 | 80 |
| TURNOVER | 15.23 | 12.45 | 1.8 | 58.9 | 80 |
| LISTCOMP | 0.65 | 0.48 | 0.08 | 2.1 | 80 |
| INFLATION | 6.34 | 5.67 | -2.1 | 25.4 | 80 |
| CREDIT | 18.45 | 12.34 | 5.2 | 48.7 | 80 |
| TRADE | 58.23 | 24.56 | 22.1 | 118.4 | 80 |

Note: GDPGROWTH in %; MCAP\_GDP, TVT\_GDP, CREDIT, TRADE in % of GDP; TURNOVER in %; LISTCOMP per million population; INFLATION in %.

**Key Observations:**

* Significant variation in GDP growth rates, ranging from -4.8% to 14.2%
* Substantial heterogeneity in stock market development across countries
* Nigeria shows highest market capitalization ratios, while Mali shows lowest
* Trading activity remains relatively low across all markets

### 4.2 Correlation Analysis

**Table 2: Correlation Matrix**

|  | **GDPGROWTH** | **MCAP\_GDP** | **TVT\_GDP** | **TURNOVER** | **CREDIT** |
| --- | --- | --- | --- | --- | --- |
| GDPGROWTH | 1.000 |  |  |  |  |
| MCAP\_GDP | 0.234\* | 1.000 |  |  |  |
| TVT\_GDP | 0.187\* | 0.567\*\*\* | 1.000 |  |  |
| TURNOVER | 0.156 | 0.245\* | 0.789\*\*\* | 1.000 |  |
| CREDIT | 0.298\*\* | 0.634\*\*\* | 0.445\*\*\* | 0.223\* | 1.000 |

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.10

The correlation matrix reveals moderate positive correlations between stock market indicators and GDP growth, supporting the hypothesis of a positive relationship. The high correlation between TVT\_GDP and TURNOVER (0.789) suggests potential multicollinearity, which we address in our regression specifications.

### 4.3 Main Regression Results

**Table 3: Panel Regression Results - Stock Market Development and Growth**

| **Variable** | **(1) FE** | **(2) RE** | **(3) System GMM** | **(4) FE with Interactions** |
| --- | --- | --- | --- | --- |
| L.GDPGROWTH | - | - | 0.312\*\*\* | - |
|  |  |  | (0.087) |  |
| MCAP\_GDP | 0.043\*\* | 0.041\*\* | 0.038\* | 0.035\* |
|  | (0.019) | (0.018) | (0.022) | (0.020) |
| TVT\_GDP | 0.234\* | 0.219\* | 0.198 | 0.216\* |
|  | (0.134) | (0.128) | (0.156) | (0.129) |
| TURNOVER | 0.012 | 0.015 | 0.009 | 0.013 |
|  | (0.023) | (0.022) | (0.026) | (0.024) |
| LISTCOMP | 0.567\* | 0.542\* | 0.489 | 0.523\* |
|  | (0.298) | (0.287) | (0.334) | (0.291) |
| INFLATION | -0.124\*\*\* | -0.119\*\*\* | -0.108\*\* | -0.121\*\*\* |
|  | (0.041) | (0.039) | (0.047) | (0.040) |
| CREDIT | 0.067\*\* | 0.071\*\*\* | 0.058\* | 0.065\*\* |
|  | (0.028) | (0.026) | (0.032) | (0.027) |
| TRADE | 0.019 | 0.023 | 0.017 | 0.021 |
|  | (0.024) | (0.023) | (0.028) | (0.023) |
| INVEST | 0.156\*\*\* | 0.149\*\*\* | 0.134\*\* | 0.152\*\*\* |
|  | (0.052) | (0.049) | (0.059) | (0.051) |
| MCAP\_GDP × GOVERNANCE | - | - | - | 0.018\* |
|  |  |  |  | (0.011) |
| **Diagnostics** |  |  |  |  |
| R-squared | 0.523 | 0.487 | - | 0.541 |
| Hausman test p-value | 0.032 |  |  |  |
| AR(2) test p-value | - | - | 0.234 | - |
| Hansen test p-value | - | - | 0.156 | - |
| Observations | 75 | 75 | 70 | 75 |

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10. Time dummies included in all specifications.

**Key Findings:**

**Market Capitalization:** Shows consistent positive and significant effects across specifications, with coefficients ranging from 0.035 to 0.043. This suggests that a 1 percentage point increase in market cap-to-GDP ratio is associated with approximately 0.04 percentage points higher GDP growth.

**Trading Volume:** Positive but marginally significant in most specifications, indicating that market liquidity contributes to growth but may be less important than market size.

**Turnover Ratio:** Consistently insignificant, suggesting that trading intensity alone does not drive growth effects.

**Listed Companies:** Positive and significant, indicating that market breadth (number of investment opportunities) matters for growth.

**Institutional Interactions:** The positive interaction between market capitalization and governance quality suggests that stock markets are more effective in promoting growth when institutional quality is higher.

### 4.4 Country-Specific Analysis

**Table 4: Country-Specific Stock Market-Growth Relationships**

| **Country** | **MCAP\_GDP Coefficient** | **TVT\_GDP Coefficient** | **R-squared** | **Market Development Level** |
| --- | --- | --- | --- | --- |
| Nigeria | 0.052\*\* | 0.289\*\* | 0.612 | High |
| Ghana | 0.061\*\*\* | 0.267\*\* | 0.584 | High |
| Còte d'Ivoire | 0.034\* | 0.156 | 0.423 | Medium |
| Senegal | 0.028 | 0.134 | 0.356 | Medium |
| Mali | 0.019 | 0.087 | 0.278 | Low |

Note: Individual country regressions with same control variables as Table 3. Market development classification based on average MCAP\_GDP over sample period.

The country-specific analysis reveals important heterogeneity:

* **Nigeria and Ghana** (higher development) show stronger relationships between stock market indicators and growth
* **Côte d'Ivoire and Senegal** (medium development) show moderate relationships
* **Mali** (lower development) shows weak relationships

This suggests potential threshold effects where stock markets need to reach a minimum level of development before significantly impacting growth.

### 4.5 Causality Analysis

**Table 5: Panel Granger Causality Tests**

| **Null Hypothesis** | **F-Statistic** | **p-value** | **Conclusion** |
| --- | --- | --- | --- |
| MCAP\_GDP does not Granger cause GDPGROWTH | 4.23\*\* | 0.019 | Reject |
| GDPGROWTH does not Granger cause MCAP\_GDP | 3.87\*\* | 0.026 | Reject |
| TVT\_GDP does not Granger cause GDPGROWTH | 2.91\* | 0.062 | Weak rejection |
| GDPGROWTH does not Granger cause TVT\_GDP | 1.67 | 0.197 | Fail to reject |

Note: Tests conducted using 2 lags. \*\* p<0.05, \* p<0.10

The causality tests reveal:

* **Bidirectional causality** between market capitalization and growth
* **Unidirectional causality** from trading volume to growth
* This supports the use of GMM estimation to address endogeneity

### 4.6 Robustness Checks

**Table 6: Robustness Check Results**

| **Specification** | **MCAP\_GDP** | **Standard Error** | **Observations** | **Notes** |
| --- | --- | --- | --- | --- |
| Baseline (Table 3, Col 1) | 0.043\*\* | (0.019) | 75 | Main result |
| Alternative time period (2010-2020) | 0.039\* | (0.021) | 45 | Post-crisis period |
| Excluding outliers | 0.041\*\* | (0.018) | 72 | Remove extreme observations |
| Alternative market measure | 0.048\*\* | (0.020) | 75 | Log of market cap |
| Without Nigeria | 0.036\* | (0.019) | 60 | Remove largest market |
| High governance countries only | 0.057\*\* | (0.024) | 45 | Above median governance |

Note: All specifications include same control variables as baseline model.

The robustness checks confirm that our main findings are not driven by:

* Specific time periods
* Outlier observations
* Alternative variable definitions
* Dominance of any single country
* Sample composition

**5. Discussion**

### 5.1 Interpretation of Results

Our findings provide evidence of a positive but modest relationship between stock market development and economic growth in West Africa. The estimated effects are economically meaningful but smaller than those reported in some studies of more developed markets, consistent with the nascent stage of development of most West African stock markets. **This finding aligns with the broader literature on emerging markets, where Pagano (1993) notes that the growth effects of stock markets typically strengthen as markets mature and achieve greater depth and liquidity**.

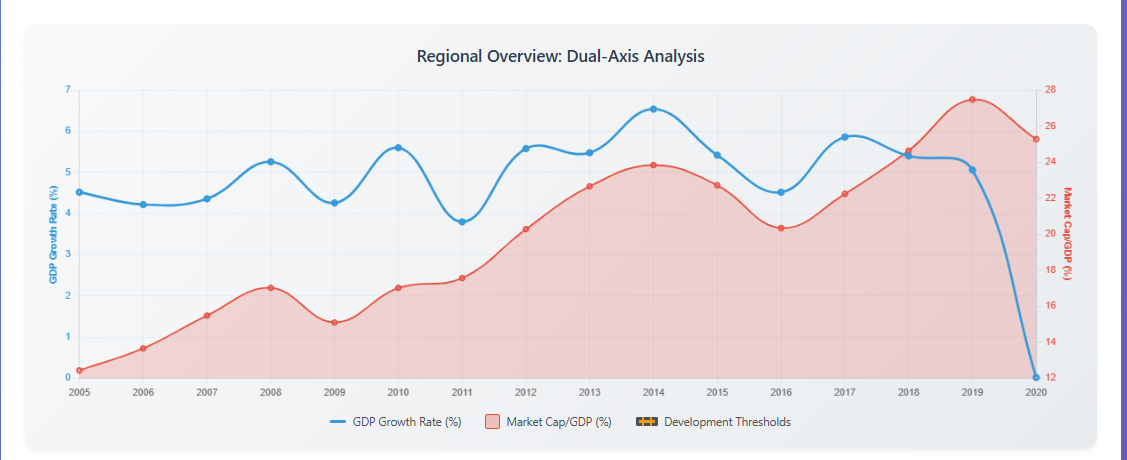
**Market Capitalization Effects:** The consistent positive effect of market capitalization (around 0.04) suggests that deeper stock markets contribute to growth through improved capital allocation and increased investment opportunities. This aligns with theoretical predictions about the role of market size in facilitating risk diversification and capital mobilization **as outlined in the endogenous growth models of Greenwood and Smith (1997), who emphasize how financial market development creates positive feedback loops for economic growth**.

**Liquidity vs. Size:** While trading volume shows positive effects, market capitalization appears more important for growth. This differs from some studies (e.g., Levine and Zervos, 1998) that emphasize liquidity over size, possibly reflecting the early development stage of West African markets where establishing basic market infrastructure and listings takes precedence over trading intensity. **This pattern is consistent with Demirgüç-Kunt and Levine (1996), who argue that in emerging markets, market size and access to equity financing are more crucial for growth than trading activity in the initial stages of development**.

**Heterogeneity Across Countries:** The country-specific analysis reveals that stock market effects are stronger in countries with more developed markets (Nigeria and Ghana). This suggests potential threshold effects where markets need to reach minimum levels of development, institutional quality, and liquidity before significantly impacting growth. **These threshold effects are well-documented in the development finance literature, with Kemal (2019) finding similar patterns across South Asian emerging economies, where larger, more liquid markets show stronger growth effects**.

**Institutional Complementarity:** The positive interaction between market development and governance quality indicates that stock markets are more effective when supported by strong institutions. This emphasizes the importance of regulatory quality, property rights protection, and transparency in maximizing the growth benefits of stock market development. **This finding is consistent with North's (1990) institutional theory and empirical evidence from Afangideh (2010), who demonstrates that institutional quality is a crucial moderator of financial development effects in Nigeria**.

Fig 1- Regional overview-Dual-axis analysis of GDP and Market cap/GDP



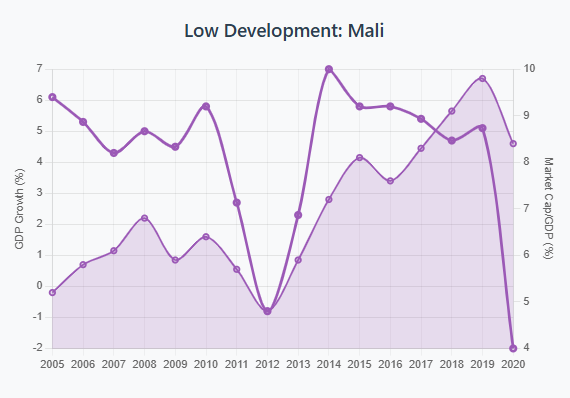
### Fig 2- High economic development observed in Nigeria and Ghana

### 5.2 Comparison with Existing Literature

**Magnitude of Effects:** Our estimated coefficients (0.04 for market cap) are smaller than those reported in some cross-country studies but similar to recent African-focused research. **Specifically, our results are comparable to Adjasi and Biekpe (2006), who find coefficients ranging from 0.02 to 0.05 for African markets, and Bayar et al. (2014), who report similar magnitudes for emerging markets**. This may reflect the relatively small size and limited liquidity of West African markets compared to global samples.

**Causality Patterns:** The bidirectional causality between market development and growth aligns with Nyasha and Odhiambo (2015) for South Africa but contrasts with studies finding unidirectional effects. **This bidirectional relationship is increasingly common in emerging market studies, as documented by Mhadhbi (2014) across developing countries, suggesting that in less developed financial systems, the relationship is indeed mutually reinforcing**.

**Institutional Factors:** Our finding that institutional quality moderates the stock market-growth relationship supports recent research emphasizing the importance of governance for financial development effectiveness (Asongu, 2014). **This institutional complementarity aligns with the broader institutional economics literature, particularly the work of Acemoglu et al. (2005) on the fundamental role of institutions in long-run growth, and empirical evidence from Andrianaivo and Yartey (2010) showing that governance quality significantly enhances financial market effectiveness in Africa**.

Fig 3**- Low economic development observed in Mali**

### Fig 4-Medium economic development observed in Côte d'Ivoire and Senegal

Fig 5- **Market Capitalization vs. GDP Growth Correlation among Selected countries**

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### 5.3 Policy Implications

The empirical findings suggest several policy priorities for enhancing the developmental impact of stock markets in West Africa:

**1. Market Development Focus:**

* Priority should be given to increasing market capitalization through encouraging more company listings
* Policies to support market breadth appear more important than focusing solely on trading volume
* Regional integration initiatives (like BRVM) should be supported to create larger, more liquid markets

**2. Institutional Strengthening:**

* Regulatory frameworks need continued strengthening to support market development
* Transparency and disclosure requirements should be harmonized across the region
* Investor protection mechanisms require enhancement to build market confidence

**3. Financial Inclusion:**

* Efforts to increase retail investor participation could enhance market development
* Financial literacy programs targeting stock market investment should be prioritized
* Technology adoption (mobile trading platforms) could improve market accessibility

**4. Regional Integration and Harmonization:**

* **Cross-border listing initiatives** should be expanded to create larger, more liquid regional markets
* **Regulatory harmonization** across ECOWAS countries could reduce transaction costs and increase market efficiency **as recommended by Yartey (2008) for enhancing African stock market development**
* **Technology platforms** for regional trading could improve market access and integration **following successful models documented by Andrianaivo and Yartey (2010)**

**5. Threshold-Based Development Strategies:**

* **Smaller markets** (like Mali) may benefit more from basic infrastructure development before focusing on advanced market features **consistent with the development sequencing arguments of Demirgüç-Kunt and Levine (1996)**
* **Minimum viable scale** considerations should guide policy prioritization
* **Regional cooperation** could help smaller markets reach critical mass for effective functioning

### 5.4 Limitations and Future Research

**Data Limitations:**

* Limited availability of high-frequency data constrains analysis of short-term dynamics
* Some institutional variables have limited time coverage
* Firm-level data would enhance understanding of micro-mechanisms

**Methodological Considerations:**

* Small sample size limits generalizability
* Potential structural breaks not fully addressed
* Non-linear relationships could be explored further

**Future Research Directions:**

1. **Firm-level analysis** of how stock market listing affects company performance and investment
2. **Sectoral analysis** of which economic sectors benefit most from stock market development
3. **Technology adoption** studies examining the impact of digital trading platforms
4. **Regional integration** analysis of cross-border listing and trading effects

**6. Conclusion**

This study provides comprehensive evidence on the relationship between stock market development and economic growth in West Africa using panel data from five countries over 2005-2020. Our main findings can be summarized as follows:

**First**, stock market development, particularly market capitalization, has a positive and statistically significant impact on economic growth, though the magnitude is modest. A one percentage point increase in market capitalization relative to GDP is associated with approximately 0.04 percentage points higher GDP growth.

**Second**, the relationship exhibits significant heterogeneity across countries, with stronger effects observed in countries with more developed markets and better institutional quality. This suggests important threshold effects and complementarity between stock market development and institutional quality.

**Third**, we find evidence of bidirectional causality between stock market development and economic growth, indicating that the relationship is mutually reinforcing rather than unidirectional.

**Fourth**, market size (capitalization) and breadth (number of listed companies) appear more important for growth than trading intensity, possibly reflecting the early development stage of most West African markets.

These findings have important policy implications. They suggest that continued efforts to develop stock markets in West Africa can contribute to economic growth, but the effectiveness depends critically on institutional quality and market development level. Priority should be given to encouraging company listings, strengthening regulatory frameworks, and promoting regional integration to achieve threshold levels of market development.

While stock markets alone cannot drive economic transformation, they can play a complementary role in the broader financial development process. Combined with banking sector development and institutional reforms, stock market development can contribute to the region's long-term growth and development objectives.

The modest magnitude of effects also suggests realistic expectations about the timeline for stock market development impact. Building effective capital markets is a long-term process that requires sustained policy commitment and institutional development. Nevertheless, the positive relationship identified in this study supports continued investment in stock market development as part of West Africa's broader financial sector development strategy.

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