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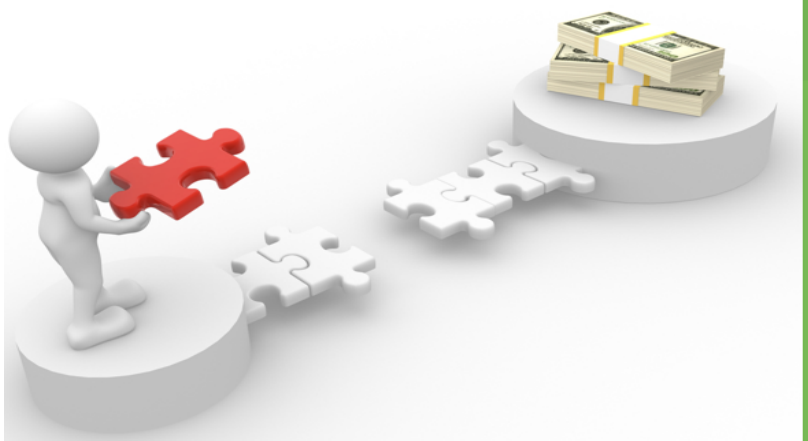

MODELS OF FINANCIAL STABILITY AND THE INTERMEDIATION PUZZLE

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ABSTRACT

This study examined the effect of financial intermediation on financial stability in Nigerian financial market. The aim of the study was to investigate and analyze the puzzle on finance and growth, as well as growth and finance. Financial development and real Gross Domestic Product can be modeled as the function of narrow money supply, broad money supply, market capitalization, monetary aggregate, net domestic credit and total savings. Ordinary least square (OLS) method of cointegration, Augmented Dickey Fuller (ADF) unit root test, Granger causality test and Vector Error Correction Model (VECM) was used.

The findings proved that narrow money supply and market capitalization have negative impact on financial sector development while broad money supply; monetary aggregate, net domestic credit and total savings have positive impact on financial sector development. Market capitalization and narrow money supply have negative impact on real gross domestic products while total savings; net domestic products, monetary aggregates and broad money supply have positive impact on real gross domestic products.

The cointegration test shows the presence of long run relationship, the unit root test found stationarity at first difference. From the findings, the study concludes that there is presence of intermediation puzzle between finance and growth, as well as between growth and finance. Hence, adequate policy is recommended in harmonizing the divergences.

Keywords: Financial Stability, Intermediation Puzzle, Narrow Money Supply, Market, Real GDP, Capitalization

INTRODUCTION

The financial market is the transmission channel for monetary policy. The institutions intermediate between the surplus and the deficit economic unit and bridge the financial disequilibrium that exist among the economic agents and boost the allocation efficiency of the economy (Ezirim, 2005). It helps the accomplishment of monetary policy goals and enhances functionality of the payment system in Nigeria. In Nigeria the financial market contains the banking institutions, the non-banking institutions and the regulatory bodies. The attainment of macroeconomic goals of full employment, price stability, economic growth and external balance depend on its stable and developing financial sector. An effective and stable financial sector is the key to establishing a broader deeper economy based on the division of labor, through enhancing, allocating and monetary capital. Apart from maximal shareholders wealth, one of the objectives of financial market regulation is to establish stable financial sector that will boost the allocation efficiency of savings and investment can be done. Therefore, financial sector stability is a requirement for macroeconomic stability and growth.

Financial market stability is a multifaceted term that occurs across a multitude of visible and measurable characteristics. It can be thought of in terms of the financial system's ability to facilitate both an efficient allocation of economic resources both spatially and especially intertemporally and the effectiveness of other economic processes such as wealth accumulation, economic growth, and ultimately social prosperity, to assess, price, allocate, manage financial risks and to maintain its ability to perform key functions even when affected by external shocks or by a buildup of imbalances primarily through self-corrective mechanisms. History reveals that they are intimately tied to the cyclic character of the economic activities. Economic cycles, whether short, medium or long-termed consist of two phases growth and recession. International monetary fund (IMF, 1998) reports reveled qualitative measures to assess financial system stability. It can be measured in capital agency, earning, liquidity and financial sector deepening.

Financial stability is determined by the monetary environment, as proposed by the classical economist, macroeconomic variables as recommended by the Keynesian economist and the asset-pricing channel as argued by Kindlebeger (1978). Scholars have classified the puzzle of financial intermediation and economic growth in terms of causation with respect to five alternative hypotheses: no causal relationship, demand following supply, a negative causal link between finance and growth, and independence (David *et al,* 2012).

Finance and economics experts feel that a well-structured financial intermediation function has an effect on the economy's overall performance in

terms of aggregate output. For example, efficient lending and investment operations by deposit money banks would stimulate economic growth by mobilizing excess funds and savings from surplus economic actors, pooling resources and preparing them for productive allocation in the economy (Ezirim *et al.,* 2012).

Additionally, it will stimulate investment by finding and financing viable business prospects, mobilizing savings, enabling risk diversification and trading ledging, and facilitating the trade of products and services. These functions result in more efficient resource allocation, rapid capital accumulation or capital formation, which are necessary conditions for economic progress (Nwanyamou, 2011).

Baggehot (1873), Schumpeter (1911), and Lewis (1913) all made empirical discoveries about the relationship between deposit money institutions' intermediation functions and economic growth (1956). Divergences in scholars' views on the relationship between finance and economic growth date all the way back to the inability of classical monetary policy to restore equilibrium and alleviate the Great Depression of the 1930s, which gave birth to Keynesians' theories of government intervention through fiscal policy.

Scholars in the twenty-first century have expanded on this, resulting in five hypotheses about finance and economic growth: no causal relationship, demand-following, supply lending, negative causal link, and independent. However, the equivocal and contentious findings have sparked renewed interest in the deposit money banks-economic growth nexus in emerging countries (Agbugba & Isukul, 2020).

LITERATURE REVIEW

Financial Market Stability

A growing number of publications have examined the relationship between monetary policy and bank risk-taking behavior, establishing a link to financial stability.

Monetary policy loosening can encourage banks to take on additional risk on both the asset and liability side. On the asset side, banks can pursue yield (Rajan, 2005), increasing their exposure to risky assets. On the finance side, loose monetary policy creates incentives for firms to increase their use of short-term debt. According to Stein (2013) and Adrian and Shin (2010), rising policy rates are related with a drop in short-term liabilities. Recent research demonstrates the risk-taking channel, in which monetary policy impacts not only the quantity but also the quality of lending. The risk-taking impacts are highly dependent on the quantity of bank capital, with larger capital levels reducing incentives to compromise credit quality (Uzah & Agbugba, 2021).

Jiménez *et al.* (2012) demonstrated, using extensive credit registration data from Spain, that lower the interest rate results in increased risk taking and loan to riskier enterprises, with the effect being bigger at banks with lower capital. Dell' Ariccia *et al.* (2013) examined this channel in the United States to discover the correlation between loan risk and bank capital. More so, Paligorova and Santos (2012) examined loan spreads on syndicated loans in USA and discovered that necessary spreads for more risky borrowers to less risky borrowers are smaller during periods of loose monetary policy which are stronger for institutions with a high-risk tolerance. Maddaloni and Peydro (2011) discovered that low interest rate results in lower lending criteria in the USA and the Eurozone, exacerbates when rates are low for an extended period, implying laxness in monitoring with an increase in securitization activity.

Altunabas *et al.* (2010) demonstrates that prolonged periods of unusually low interest rates result in a steeper increase in banks' projected default probabilities, corresponding with increased risk- taking. Drechsler *et al.* (2014) model monetary policy's effects on financial institutions by examining how it affects external finance spread that bank pay for leverage activities. Monetary policy loosening results in lower leverage costs for banks, which encourages risk-taking thereby reducing risk premia. They demonstrate that the bank's external financing spread (funds rate – Tbill rate) moves in lockstep with the fed funds rate. By manipulating this spread, monetary policy can be interpreted as affecting bank leverage.

Financial Intermediation

The critical role of financial institutions, particularly banks, in promoting economic growth has been extensively studied in the literature (Nwaeze *et al.,* 2014). Numerous economists have argued that banks' role of intermediation enables them to connect various sectors of the economy, while also encouraging high levels of specialization, expertise, economies of scale, and fostering an environment conducive to the implementation of various government economic policies. For example, Schumpeter (1912), as mentioned in Zakaria (2008), claimed that financial intermediation via the banking system is critical for economic development because it affects savings allocation, hence enhancing productivity, technological advancement, and economic growth rate. He recognized the critical role of efficient savings in accomplishing desired objectives through the identification and backing of entrepreneurs. Thus, one of financial institutions' functions is to act as an intermediary between the surplus and deficit sectors of the economy. Credit availability facilitates the fulfillment of this purpose and is also critical for economic growth (Nwaeze *et al.,* 2014).

Finance is required by a variety of organizations, individuals, and other economic entities for a variety of goals. To supply the necessary financing, a variety of financial institutions provide financial services. These are referred to as financial institutions. Commercial banks are just one type of financial organization that

provides financial services. They are primarily involved in financial intermediation, which entails transferring cash from the surplus unit of the economy to the deficit unit, thereby converting bank deposits into loans or credits. According to the preceding thesis, financial intermediaries may have a natural tendency to alter the composition of savings in a way that favors capital formation. Intermediacies, on the other hand, will likely to enhance growth if the composition of savings has an effect on real growth rates. The approach here significantly relies on the contributions of the "endogenous growth" literature, as typified by Romer (1986) and Lucas (1988). Among the several discoveries contained in this literature is the observation that savings behavior will generally affect equilibrium growth rates. In particular, to the degree that intermediaries encourage capital investment, they tend to boost growth rates.

Financial Intermediation Puzzle

1. Supply Side of Financial Intermediation Clarified

The supply side of the financial intermediation function corresponds to a typical financial institution's funding function. According to finance theory, the financing function of a business is responsible for obtaining and/or raising funds from various sources in the most cost-effective and time-efficient manner possible to enable the business to achieve its objectives. Thus, four factors are critical in a firm's financing function: alternative sources, cost implications, time efficiency, and the firm's objective criterion, such as maximizing of owners' wealth. Efficiency in the financing function is achieved when the business unit obtains cash from convenient sources that ensure cost and time effectiveness (Ezirim, 1996). This is referred to as the supply side of the intermediation function of the institution. The climax of a typical depository institution's fund mobilization efforts is its overall portfolio of various sorts of deposits (alternative sources of funds) generated by the financial intermediary (Ezirim, 1999, 2003). The financial markets facilitate the mobilization of funds through institutional and non-institutional arrangements, mechanisms, and facilities.

Theoretical Framework

Financial Crises as disturbing Factors of a Stable Real Sphere

This is because contemporary neoclassical models, which are predicated on the premise of efficient financial markets and rational expectations, are unsuitable for explaining financial crises. In these frameworks, an average economic agent acts on fundamentals, is fully educated about those fundamentals, and all asset prices reflect those fundamentals. Fundamental changes quickly result in new equilibrium pricing with no room for speculation. Systemic crises have no place in this worldview. The same is true for General Equilibrium Models in the manner of Léon Walras, which are incapable of including money in any meaningful way in their models. The natural rate of interest is the rate of interest on the real

neoclassical sphere when it is in equilibrium. It is the interest rate that would be obtained if the neoclassical capital market existed, as well as savings, and in the Classical paradigm, the "natural" price was the long-run equilibrium price, as opposed to the market price, which swings around the natural price.

Minsky Theory of Financial Stability

Payment obligations are derived from an economic unit's incurred debt liabilities. These commitments are minimal in nature and must be met on preset dates. Simultaneously, it anticipates that incoming cash flows will be sufficient to meet those commitments. On the other hand, cash flows are uncertain and are subject to market conditions, among other factors. Minsky distinguishes three sorts of economic units based on their income-debt relationships: hedging, speculative, and ultra-speculative/Ponzi units. A hedge unit generates enough predicted cash flows to meet all future payment obligations (interest and principal) when they arise. A hedge fund frequently has a large proportion of equity financing. A speculative unit anticipates cash receipts sufficient to meet interest payments but not sufficient to repay principal. Only in the long run are the anticipated cash flows sufficient to repay the lenders in full.

Until then, it must refinance its debt. A Ponzi unit's incoming cash flows are not even expected to meet interest payments in any given month. Only during the last periods are substantial cash flows expected to enable for repayment. Until then, interest payments must be capitalized on the balance sheet. As a result, it must roll over the principal and secure new funding to cover the accrued interest (Minsky, 1982). A financial system is said to be robust if minor changes in cash flows, capitalization rates, or payment obligations do not impair the ability of the majority of units to meet their financial obligations.

Empirical Review

Levine *et al.* (2000) transformed the face of the argument on the relationship between financial intermediation and economic growth. This study tries to establish the impact of the endogenous component of financial intermediation on economic growth. A robust methodology, which comprises two models and two estimating methodologies, was applied. The first model, which defines economic growth as function of finance variables and a vector of economic growth drivers, was estimated using the pure cross-sectional estimating technique. The second model is a dynamic panel model and is estimated using the Generalized Methods of Moments (GMM). Both tests confirm the considerable positive impact of the endogenous components of financial intermediation on economic growth. They, however, emphasized that countries with high priority for creditors' protection, strong determination to enforce contracts, and unambiguous accounting standards had the potential for a developed financial intermediation.

McCaig and Stengos (2005) incorporated new instrumental variables with a goal to demonstrating a strong empirical relationship between financial intermediation and economic development. The study employs a cross-country comparison of 71 nations during the period 1960 to 1995. A linear regression model, which describes economic growth as a function of financial intermediation and a series of conditioning factors, was evaluated using the Generalized Method of Moments (GMM).

While the instrumental variable presented comprised; religious composition, years of independence, latitude, settler mortality, and ethnic fractionalization, three conditioning variables were also employed. These include; simple sets (initial GDP, and level of education), the policy set (simple set, government size, inflation, black market premium, and ethnic diversity), and the full set (simple set, policy set, number of revolution/coups, number of assassinations per 1000 inhabitants, and trade openness). This study also supports the concept that a positive relationship exists between financial intermediation and economic growth. However, it emphasized that this will be true if financial intermediation is measured by liquid liabilities and private credit as a ratio of GDP, whereas it will be weaker if it is measured using the Commercial-Central Bank ratio.

Hao (2006) tries to establish the relationship between financial intermediation and economic growth, utilizing a country-specific data from China. The study focused on the post-1978 reform period, employing provincial data (28 Provinces) for the period 1985 to 1999. The study employed the use of linear model, which expresses economic growth as a function lagged economic growth, financial development indicators (banks, savings, and loan-budget ratio), as well as a set of traditional growth determinants (population growth, education, and infrastructural development) (population growth, education, and infrastructural development). The study uses the one-step parameter estimates for the Generalized Method of Moments (GMM) estimation and finds that financial intermediation has a causal effect and positive impact on growth through the channels of house-holds' savings mobilization and the substitution of loans for state budget appropriations. However, the analysis finds that bank, as an indication of financial development, is significant but inversely associated to growth. This was due to the inefficiencies in loan distribution and the self-financing ability of the governments of the various provinces.

Romeo-Avila (2007) also confirms the positive impact of finance on growth. He analyzes the relationship between finance and growth, with emphasis on the effect of financial deregulation and banking law harmonization on economic growth in the European Union. The study proves that financial intermediation influences positively on economic growth through three channels.

Deidda (2006) studied micro-based study and uses the inter-temporal method to illustrate the theoretical logic of the impact of financial intermediation on economic growth. It presupposes a transition from period 1 (financial autarky) to the period 2, which is the period when financial intermediation is attained. Although this study is theoretical in nature, the General Equilibrium Analysis was employed and it concludes that the growth effect of costly financial development is equivocal when regime switch is connected with the adoption of more capital-intensive technology.

There is no empirical work on this effect yet. Odhiambo (2008) proves very valuable in this regard. The study developed a simple table, which summarizes past empirical investigations on the causal relationship between finance and economic growth. Several studies, however, have been undertaken since then to further expand the knowledge of the causal relationship between finance and economic growth.

While Liang and Teng (2006), Odhiambo (2008), Coccorese (2008), and Odhiambo (2011) emphasize that economic growth granger caused financial development, whereas the rest including: Abu-Bader and Abu-Qarn (2008), Wolde-Rufael (2009), Kar, Nazlioglu and Agir (2011), and Bangake and Eggoh (2011) argue otherwise. As a matter of fact, Odhiambo (2008) tries to analyze the dynamic causality relationship between financial depth and economic growth in Kenya. The study focuses on the period, 1969 to 2005, and included savings as an intermitting variable. To fulfill this aim, this study employed two econometric methodologies; the dynamic tri-variate granger causality test and the error correction model (ECM Modeling) (ECM Modeling). This analysis concludes that one-way direction causality, from economic growth to finance, occurs in Kenya. In other words, finance plays a minimal part in the realization of economic growth in Kenya. Wolde-Rufael (2009) is of a contrasting opinion. Using a different econometric technique, the Quad-variate Vector Autoregressive (VAR) framework using data from 1966 to 2005, it indicates that two-way directional causality exists in Kenya.

Abu-Bader and Abu-Qarn (2008) tries to analyze the causal relationship between financial development and economic growth. The study focuses on Egypt for the period, 1960 to 2001. Using the trivariate VAR model, this study concludes that two-way directional causality exists in Egypt. In other words, money fosters growth, while economic progress induces financial development. Odhiambo (2011) believes that economic growth granger generates financial development in South Africa. The study attempted to analyze the dynamic causal relationship between financial development, economic growth, and poverty reduction. Using a trivariate causality model and the ECM modeling to examine the data

collected from 1960 to 2006, it shows that the notion of finance-led growth does not hold in South Africa.

Gries *et al.* (2009) intended to test for the causality between financial depth, trade openness, and economic progress. This study focuses on 16 sub-Saharan African nations, using annual time series observations. For the goal of establishing the causal links, the Hsiao-Granger approach, the Vector Auto-Regression (VAR), and the Vector Error Correction Model (VECM) were utilized. This analysis offers minimal support for the idea of finance-led growth. It, nevertheless, recommends that the adoption of a more balanced policy approach may alleviate financial system weaknesses among the Sub-Saharan Countries.

Kar *et al.* (2011) focused on emerging nations and also developed new metrics of financial development with a goal to establishing the causal relationship between financial development and economic growth. Using countries which compose the Middle East and North Africa (MENA) during the period 1980 to 2007, the analysis applies a simple linear model. This model defines economic growth as a result of financial development. Six new indicators of financial development were introduced and they include: the ratio of narrow money to income, ratio of broad money to income, ratio of quasi money to income, ratio of deposit money bank liabilities to income, ratio of domestic credit to income, and ratio of private sector credit to income.

On the other side, the real income was utilized as a proxy for economic growth. The Granger Causality test was utilized to establish the causal relationship between financial development and economic growth. The study concludes that the direction of causality is bi-directional, but it is country or financial development indicator specific. This study, however, reveals that a strong correlation may exist between financial development and the real sector.

Bangake and Eggoh (2011) further supported the concept of an existing two-way directional causation between financial development and economic growth among developing nations. This study focused on seventy-one countries, which included eighteen emerging countries, for the period 1960 to 2004. The study carried out its empirical analysis utilizing both the Panel Cointegration tests and the Panel cointegration estimation. It proves that both financial development and economic growth have influence on one another, but recommends that a long-run policy strategy may prove helpful among the emerging countries. Hassan *et al.* (2011) focused primarily on the low- and middle-income nations from 1980 to 2007.

This study comprises 168 countries, which are classified by geographic regions, and uses the panel estimation techniques; a strong long-run linkage between financial development and economic growth, and two-directional causality exist

between financial development and economic growth among the Sub-Saharan African countries, the East Asian countries, and the Pacific countries. Shoil *et al.* (2011) further investigated long run and short-run dynamic correlations between KSE100 index and five macroeconomic factors. They employed Johansen cointegration approach and VECM in order to study the long-run and short-run correlations. The study employed monthly data for assessing KSE100 index.

The results demonstrated that in the long-run, there was a positive influence of inflation, GDP growth and exchange rate on KSE100 index, while money supply and three months treasury bills rate had negative impact on the stock returns. The VECM indicated that it takes more than four months to adjust disequilibrium of the prior period. Results of variance decompositions disclosed that inflation, among the macroeconomic factors, accounted most variance of forecast inaccuracy.

Herve, *et al.* (2011) studies the influence of macroeconomic variables on stock prices movement in Cote d'Ivoire using quarterly data covering the period of 1999:1 to 2007:4. They applied Johansen's multivariate cointegration test methodologies and Vector autoregressive model (VAR) (VAR). Macroeconomic variables included industrial production index (IPI), consumer price index (CPI), domestic interest rate (IR), real exchange rate (EXR) and real money supply (M2) (M2).

The study discovered that there is cointegration between macroeconomic variables and Stock prices in Cote d'Ivoire indicating long-run link. The results of Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) reveal that out of five macroeconomic variables examined; only consumer price index (CPI) and domestic interest rate (IR) are the primary predictors of the stock price fluctuations in Cote d'Ivoire.

Hsing (2011) employed generalized autoregressive conditional heteroskedasticity and evaluated the effect of macroeconomic variables on the stock market for Czech Republic. The macroeconomic variables were real gross domestic product, government borrowing, money supply, the inflation rate, CZK/USD exchange rate, and government deficit. Stock market index is positively related to real GDP and the German and US stock market index is negatively influenced by government borrowing, GDP, the domestic real interest rate, the CZK/USD exchange rate, the expected inflation rate and the euro area government bond yield and exhibits, a quadratic relationship with the ratio of money supply and GDP.

Khan *et al.* (2011) applied vector autoregressive (VAR) model and evaluated the impact of macroeconomic variables on stock returns, utilizing monthly data range from June 2004 to December 2009. Independent variables were exchange rate, inflation, Treasury bills rate, Money Supply and Interest rate, and dependent

variable was Stock returns. They found that all the variables except money supply have a substantial impact on stock return.

Hasanzadah and Kiavand (2012) evaluated the effects of macroeconomic variables such as gross domestic product, nominal effective exchange rate, money supply, gold coin price, and investment in housing sector on stock market index in Iran. They employed cointegration and vector error correction model (VECM) and found that Iran's stock market index is positively influenced by the growth rate of GDP, the money supply, and negatively affected by the gold price, the private sector investment in housing sector and the nominal effective exchange rate.

Our study is an upgrade on this research as we take a different study area and theoretical approach. Anayochukwu (2012) explore the shock of the stock market returns on foreign portfolio investment in Nigerian adopting Granger causality test and multiple linear regression analysis. His study indicated that foreign portfolio investment has a positive and large shock on the stock market returns whereas inflation rate has positive but negligible shock on stock returns. The example of causality test result revealed that there is a unidirectional causation going from stock returns to foreign portfolio investment in the economy, which in turn will increase stock returns in Nigeria.

Berk and Aydogen (2012) evaluated the effects of crude oil price changes on the Turkish stock market returns. They applied vector autoregression (VAR) model employing Daily observations of Istanbul Stock Exchange National Index (ISE-100) returns and Brent crude oil prices. They also evaluated the association between stock market returns and oil prices under global liquidity Conditions by integrating a Chicago Board of Exchange's (CBOE) S&P 500 market volatility index (VIX), liquidity proxy variable, into the model. Their investigation indicated that Variance decomposition test results suggest a little empirical evidence that crude oil price shocks have been reasonably assessed in the Turkish stock market.

Relatively, it was global liquidity forms that were discovered to report for the highest amount of variation in the stock market results. Ochieng and Oriwo (2012) studied the association between macroeconomic variables (such as Treasury bill rate, inflation rate, lending interest rate) and stock market performance using regression model over the period of 2008 to 2012. Their findings demonstrated a negative association between TBR and NASI while inflation has a weak positive relationship with the NASI.

Osisanwa and Atanda (2012) evaluated the determinants of the stock market returns in Nigeria by utilizing the OLS methodology using annual data for the period between 1984 and 2010. Their factors were consumer price index, exchange rate, wide money, interest rate and real per capital income. The data

showed that exchange rate, interest rate, money supply and prior stock return levels are the key predictors of stock returns in Nigeria. Critical analysis of this study demonstrates that the method utilized for the analysis is not popular and commonly used.

In time series analysis, the ordinary least squares regression findings could produce a misleading regression if the time series are non-stationary. Again, consumer price index is not reliable index for inflation; this is because the index measures the price of fixed representative basket and does not reflect the price of investment.

Hussain *et al.* (2012) employed augmented dickey-fuller (ADF) and Kwiatkowski-Phillips-shin (KPSS) unit root test, Johanson co-integration test, vector correction model (VECM) and Granger causality test to investigate the impact of macroeconomic variables such as exchange rate, foreign exchange reserve, industrial production index, interest rate, import, money supply, wholesale price index and export on stock price using monthly data range from January 2001 to December 2010.

FER, IR, M, and WPI revealed a positive and significance association between stock prices whereas ER and X indicated a negative and significant relationship with stock prices. The initial error correction term was considerable and demonstrated short term modifications towards the equilibrium path. The result of Granger causality indicated the WPI and MS had bi-directional relation, while FER, ER, and M have unidirectional relationship with the stock price but IR, IPI, and X showed not any causal association. The key problem of this study is that no theoretical bases have been established to prove a link between stock price index/return and macroeconomic variables. This issue will be addressed through our study.

Osamwonyi, *et al.* (2012) examined the link between macroeconomic variables and the stock market index in Nigeria using vector error correction model (VECM) for the period 1975-2005. The macroeconomic variables were interest rates, inflation rates, exchange rates, fiscal deposit, gross domestic product, and money supply. They found that macroeconomic variables influence the stock market in Nigeria. More so, Kuwornu (2012) analyzed the effect of macroeconomic conditions on the Ghanaian stock market returns using monthly data from January 1992 to December, 2008. Macroeconomic variables considered in this analysis include 91-day Treasury bill rate (proxy for interest rate), crude oil price, consumer price index (proxy for inflation) and currency rate. The study employed the Johansen Multivariate Cointegration Procedure thereby implying that cointegration occurred between them on a long-run link.

Aduda *et al.* (2012) explore the factors of development in the Nairobi Stock Exchange over the period 2005-2009. Their variables were private capital flows, banking sector development, stock market liquidity, income level, investment and savings, macroeconomic stability, institutional quality. Regression analysis accounted no link between macroeconomic stability and stock market development, private capital flows and inflation. Results revealed that bureaucratic quality, Institutional quality represented by law and order, corruption index and democratic accountability are major predictors of the stock market development since they promote the viability of foreign finance.

Bhanu (2013) studied the impact of selected macroeconomic variables on stock, gold, silver returns by using linear regression technique and monthly data. The variables he stated included inflation, gross domestic product, IIP, and money supply. He showed that an average 55 percent to 64 percent of the sub-period indicate positive returns for stocks, gold, and silver. Stock returns are heavily influenced by inflation, GDP, USS-INR and JPY-INR. Gold returns are highly controlled by money supply, and lastly silver returns are significantly influenced by money and EUR-INR. Dos Santos *et al.* (2013) suggested to explore the association between the Brazilian stock market and macroeconomic factors, by utilizing a Vector Error Correction model (VEC) (VEC). The factors were exchange rate, interest rate, industrial production, and consumer price index. They demonstrated that Ibovespa responds negatively to impulses in the interest rate difference, the variations in the Selic rate and the exchange rate, and positively to the price index IPCA.

In addition, a key conclusion collected from the decomposition analysis of the variance demonstrated that the interest rate differential, which reflects the perception of risk by the foreign investor, explains a large variation in the Ibovespa index in the timeframe. Ibrahim and Agbaje (2013) also explore the long-run correlations and dynamic interactions between inflation and stock returns in Nigeria using monthly data from January 1997 to 2010. The analytical method of Autoregressive Distributed Lag (ARDL) bound test as presented by Pesaran (1997); and Pesaran *et al.* (2001) indicates that there is the subsistence of a long-run link between inflation and stock returns.

Ishaku, *et al*. (2013) explore the existence of causation between stock returns and macroeconomic factors in Ghana using monthly data. Their factors were interest rate, money supply, exchange rate, foreign direct investment, and consumer price index. They apply Vector error correction model (VECM) and analysis demonstrates that a strong long-run association exists between stock returns, money supply, Foreign Direct Investment (FDI) and inflation. In the short-run, a considerable relationship exists between the stock market returns and

macroeconomic fundamentals such as inflation, interest rate and money supply. In the short-run, the relationship between FDI and stock returns is merely invented.

Lastly, a causal link extending from exchange rate, inflation to stock returns has been established. Then also, a causal link running from interest rate and FDI, stock returns to the money supply, has also been disclosed. Attari and Saffar (2013) study the relationship between economic conditions and the stock market by applying the Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) (EGARCH). The macroeconomic factors include gross domestic product, inflation, and interest rate. The monthly data of the indicators for the period is from December 1991 to August 2012 is utilized for analysis. They observed that macroeconomic variables had significant influence on the stock prices. The stock prices have tremendous shock on the economy of the country and are regarded as the best indications for future prognosis of the market and economy as well.

Haroon *et al.* (2013) studied the impact of macroeconomic variables on share price behaviour of Karachi stock exchange from July 2001 to June 2010 using correlation and regression technique. The macroeconomic indicators were Treasury bill rate, sensitive price index (proxy for inflation), wholesale price index, and consumer price index. Their investigation demonstrated that there was a substantial association between macroeconomic variables and KSE 100 price index. The gap generated by this study is in the use of CPI as a measure of inflation and the method of analysis. And these limitations are handled in our research by our technique and choice of variables.

RESEARCH METHODOLOGY

The data for this study were secondary data sourced from the Central Bank of Nigeria (CBN) statistical

Model Specification

In attempting to investigate the relationship between macroeconomic variables and financial market stability the study employed the following models

$$FD = f(M1, M2, MKT, MOG, NDC, TS) \quad 1$$

Transforming equation 1 above to econometrics method, we have

$$FD = \beta 0 + \beta_1 M1 + \beta_2 M2 + \beta_3 MKT + \beta_4 MOG + \beta_5 NDC + \beta_6 TS + \mu t \quad 2$$

$$RGDP = f(M1, M2, MKT, MOG, NDC, TS) \quad 3$$

Transforming equation 1 above to econometrics method, we have the following:

$$RGDP = \beta 0 + \beta_1 M1 + \beta_2 M2 + \beta_3 MKT + \beta_4 MOG + \beta_5 NDC + \beta_6 TS + \mu t \quad 4$$

Where:

FD = Financial Market Development
RGDP = Real Gross Domestic Product measure for economic growth
M1 = Narrow Money Supply
M2 = Broad Money Supply
MOG = Monetary Aggregate
NDC = Net Domestic Credit
TS = Total Savings
μt = Error term

Estimation Techniques

i. Stationarity Test:

Time series data were assumed to be non-stationary and this implies that the result obtained from Ordinary Least Square (OLS) may be misleading (Suleman and Azeeze, 2012). It is therefore necessary to test the stationarity of the variables using the Augmented Dickey Fuller 1979 test to both level and first difference. The ADF test constructs a parameter correction for higher order correlation by assuming that the times series follows an auto regressive process. Mathematically expressed as:

$$\Delta y_t = c + \beta_t + a y_{t-1} + \sum_{t-i}^{k} \gamma_j \Delta y_{t-j} + \varepsilon_t \quad \ldots\ldots 5$$

$$\Delta y_t = c + a y_{t-1} + \sum_{t-i}^{k} \gamma_j \Delta y_{t-j} + \varepsilon_t \quad \ldots\ldots 6$$

Equation 1 is used to test for the null hypotheses of non-stationarity of unit root against trend stationarity alternative in Y_t

Where:
y refers to the examined time series.
Equation 2 tests the null hypotheses of a unit root against a mean stationarity alternative.

ii. Johansen Cointegration Test

The cointegration test established whether a long-run equilibrium relationship existed among the variables. It is generally accepted that to establish a cointegration, the likelihood ratio must be greater than the Mackinnon critical values. The model can be stated as:

$$\Delta X_t = \mu + \Psi_1 \Delta X_{t-1} + \Psi_2 \Delta X_{t2} + \ldots + \Psi_{p-1} \Delta X_t - p + 1 \quad \ldots\ldots 7$$

Where μ is a constant term;

ΔX_t Represents the first cointegrating differences

iii. Granger Causality

To determine the direction of causality between the variables, the study employed the standard Granger causality test (Granger, 1969). The test is based on Vector Error Correction Model (VECM) which suggests that while the past can cause or predict the future, the future cannot predict or cause the past.

$$Y_t = \alpha_o + \sum_{i=1}^{n} \alpha_1^{y} Y_{t-1} \sum_{i=1}^{n} X_{a1} X\mu \quad \text{.....8}$$

and

$$X_t = \beta_o + \sum_{i=1}^{n} {}_{\beta 1}^{y} Y_{t-1} \sum_{i=1}^{n} X_{\beta 1} XY_t \quad \text{.....9}$$

iv. Vector Error Correction Model

Co-integration is a prerequisite for the error correction mechanism. Since co-integration has been established, it is pertinent to proceed to the error correction model. The VECM is of this form:

$$\Delta y_t = \alpha\beta y_{t-1} + \sum_{i=1}^{j=1} \Gamma_j \Delta y_{t-1} + \pi + \varsigma_t, t = 1,....,T \quad \text{.....10}$$

Where Y_t is a vector of indigenous variables in the model. a is the parameter which measures the speed of adjustment through which the variables adjust to the long run values and the β is the vectors which estimates the long run cointegrating relationship among the variables in the model. π is the draft parameter and is the matrix of the parameters associated with the exogenous variables and the stochastic error term.

SECTION V: RESULTS AND DISCUSSION

As presented in Table 1, the relationship between financial intermediation variables and development proved that the dynamic relationship is positive as the regression constant is positive with the coefficient of 0.68%.

Table 1: Static Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M1	-0.951013	1.015445	-0.936548	0.3602
M2	1.425600	1.260332	1.131131	0.2714
MKT	-0.028393	0.755737	-0.037570	0.9704

MOG	0.137053	0.041406	3.309992	0.0035
NDC	0.006814	0.113305	0.060140	0.9526
TS	0.600107	1.488568	0.403144	0.6911
C	-12.91665	94.07955	-0.137295	0.8922
R-squared	0.683874	Mean dependent var		57.65815
Adjusted R-squared	0.589037	S.D. dependent var		48.96920
S.E. of regression	31.39240	Akaike info criterion		9.949422
Sum squared resid	19709.65	Schwarz criterion		10.28538
Log likelihood	-127.3172	Hannan-Quinn criter.		10.04932
F-statistic	7.211001	Durbin-Watson stat		1.132287
Prob(F-statistic)	0.000335			

Source: Extracts from E-view print out and Author's computation

From Table 1, the values for R^2 and the adjusted R^2 implied that the independent variables can explain 68.3% and 58.9% explained variation on the dependent variable while the remaining 31.7% and 41.1% are explained by exogenous variables not captured in the regression models. The F-Statistics and F=Probability justify that the model is significant and validates the large explained variation from R^2 the adjusted R^2. However, the Durbin Watson statistics of 1.132 is lower than the lower band of 2.372, but greater than the upper band of 1.978; and therefore, implies that there is the presence of serial autocorrelation among the variables. The β coefficient of the independent variables proved that narrow money supply and market capitalization have negative impact on financial sector development while broad money supply, monetary aggregate, net domestic credit and total savings have positive impact on financial sector development.

Table 2: Stationarity Test

M1		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.338907	0.0019
Test critical values:	1% level	-2.669359	
	5% level	-1.956406	
	10% level	-1.608495	
M2		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.601996	0.0000
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	

MKT		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.246630	0.0000
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	
MOG		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.465699	0.0000
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	
NDC		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		4.068874	0.9999
Test critical values:	1% level	-2.656915	
	5% level	-1.954414	
	10% level	-1.609329	
TS		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.670869	0.0000
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	
FD		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.442231	0.0000
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	

Source: Extracts from E-view print out and Author's computation

From the Table 2, the unit root test results at first difference shows that all the variables are stationary at first difference; this implies the rejection of null hypothesis of non-stationarity in favour of the alternate for stationarity. The above table also implies that the variables are co integrated in the order or 1(1). This allows us to test for co integration using the Johansen co-integration test for trace statistics and maximum Eigen value.

Table 3: Pair Wise Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
M1 does not Granger Cause FD	25	0.71251	0.5024
FD does not Granger Cause M1		0.39154	0.6811
M2 does not Granger Cause FD	25	1.36939	0.2771
FD does not Granger Cause M2		1.06939	0.3620
MKT does not Granger Cause FD	25	2.64234	0.0959
FD does not Granger Cause MKT		0.30686	0.7392
MOG does not Granger Cause FD	25	2.58394	0.1004
FD does not Granger Cause MOG		1.17343	0.3297
NDC does not Granger Cause FD	25	0.66445	0.5256
FD does not Granger Cause NDC		0.19996	0.8204
TS does not Granger Cause FD	25	0.79872	0.4637
FD does not Granger Cause TS		1.02680	0.3763

Source: Extracts from E-view print out and Author's computation

As presented in Table 3, the variable in Model 1 indicates that there is no causal relationship between the variables.

Table 4: Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.947253	205.8207	125.6154	0.0000
At most 1 *	0.865956	132.2645	95.75366	0.0000
At most 2 *	0.757907	82.02491	69.81889	0.0039
At most 3	0.564850	46.56403	47.85613	0.0658
At most 4	0.482716	25.76239	29.79707	0.1360
At most 5	0.306555	9.283318	15.49471	0.3398
At most 6	0.005236	0.131235	3.841466	0.7171

Source: Extracts from E-view print out and Author's computation

More so, the maximum Eigen validates the three statistics with two cointegrating equations in each of the models. The implication is that there is the presence of long run relationship among the variables.

Table 5: Vector Error Correction Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	8.842918	5.140481	1.720251	0.1237
D(FD(-1))	1.371078	0.414044	3.311432	0.0107
D(M1(-2))	-0.596617	0.595339	-1.002147	0.3456
D(M1(-3))	-0.537157	0.544734	-0.986092	0.3530
D(M2(-1))	0.281990	0.322856	0.873423	0.4079
D(M2(-2))	1.668405	0.784633	2.126352	0.0662
D(M2(-3))	1.221715	0.596556	2.047947	0.0747
D(MKT(-1))	-3.888998	0.939560	-4.139171	0.0033
D(MKT(-2))	-0.547439	1.320516	-0.414564	0.6894
D(MOG(-2))	-0.093891	0.175677	-0.534453	0.6076
D(NDC(-2))	-0.041844	0.060826	-0.687934	0.5109
D(NDC(-3))	-0.060803	0.065769	-0.924492	0.3823
D(TS(-1))	-2.986823	0.979001	-3.050888	0.0158
D(TS(-2))	0.446980	1.219531	0.366518	0.7235
ECM(-1)	-0.088448	0.354016	-0.249841	0.8090
R-squared	0.893980	Mean dependent var		9.987826
Adjusted R-squared	0.708445	S.D. dependent var		27.53915
S.E. of regression	14.87000	Akaike info criterion		8.484864
Sum squared resid	1768.936	Schwarz criterion		9.225404
Log likelihood	-82.57594	Hannan-Quinn criter.		8.671108
F-statistic	4.818385	Durbin-Watson stat		1.307170
Prob(F-statistic)	0.015675			

Source: Extracts from E-view print out and Author's computation

Having examined the short-run dynamic relationship existing between financial intimidation puzzle and financial stability, as indicated in Table 5, the objective of Parsimonious error correction result is intended to validate the relationship that exists among the variables in the long-run. As indicated in the results, the speed of adjustment is 8.8% annually, while the explained variation is 89.3%.

Table 6: Model II Ordinary Least Square Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TS	0.024967	0.123853	0.201582	0.8423
NDC	0.000554	0.009427	0.058790	0.9537
MOG	0.013376	0.003445	3.882685	0.0009
MKT	-0.127877	0.062879	-2.033683	0.0555
M2	0.091390	0.104863	0.871516	0.3938

M1	-0.040096	0.084488	-0.474571	0.6402
C	14.95257	7.827693	1.910215	0.0706
R-squared	0.615158	Mean dependent var		15.38889
Adjusted R-squared	0.499705	S.D. dependent var		3.692751
S.E. of regression	2.611939	Akaike info criterion		4.976477
Sum squared resid	136.4445	Schwarz criterion		5.312434
Log likelihood	-60.18244	Hannan-Quinn criter.		5.076375
F-statistic	5.328226	Durbin-Watson stat		1.395837
Prob(F-statistic)	0.001993			

Source: Extracts from E-view print out and Author's computation

As presented in Table 6, the relationship between financial intermediation variables and economic growth proved that the dynamic relationship is positive as the regression constant is positive with the coefficient of 0.61%. However, the R^2 and the adjusted R^2 proved that the independent variables can explain 61.5% and 49.9% explained variation on the dependent variable, while the remaining 38.5% and 50.1% are explained by exogenous variables not captured in the regression models. The F-Statistics and F-Probability justify that the model is significant and validates the largely explained variation from R^2 the adjusted R^2. However, the Durbin Watson Statistics of 1.395 is lower than the lower band of 2.372, but greater than the upper band of 1.978. Therefore, there is the presence of serial autocorrelation among the variables. The β coefficient of the independent variables proved that market capitalization and narrow money supply has negative relationship with the dependent variable while total savings, net domestic credit, monetary aggregate and broad money supply have positive relationship with growth of the economy.

Table 7: Unit Root Test

	M1	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.322004	0.0025
Test critical values:	1% level	-3.724070	
	5% level	-2.986225	
	10% level	-2.632604	
	M2	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.601996	0.0000
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	
	MKT	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.206797	0.0000

Test critical values:	1% level	-2.669359	
	5% level	-1.956406	
	10% level	-1.608495	
	MOG	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.465699	0.0000
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	
	NDC	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.758869	0.0000
Test critical values:	1% level	-2.669359	
	5% level	-1.956406	
	10% level	-1.608495	
	TS	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.923723	0.0004
Test critical values:	1% level	-2.656915	
	5% level	-1.954414	
	10% level	-1.609329	
	RGDP	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.442231	0.0000
Test critical values:	1% level	-2.660720	
	5% level	-1.955020	
	10% level	-1.609070	

Source: Extracts from E-view print out and Author's computation

As shown in Table 7, the unit root test at first difference indicates that all the variables are stationary at first difference; this implies the rejection of null hypothesis of non-stationarity in favour of the alternate for stationarity. The above table also implies that the variables are co integrated in the order or 1(1). This allows us to test for co integration using the Johansen co-integration test for trace statistics and maximum Eigen value.

Table 8: Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
TS does not Granger Cause RGDP	25	3.95343	0.0357
RGDP does not Granger Cause TS		0.31324	0.7346

NDC does not Granger Cause RGDP	25	0.70052	0.5081
RGDP does not Granger Cause NDC		1.28497	0.2985
MOG does not Granger Cause RGDP	25	4.47042	0.0248
RGDP does not Granger Cause MOG		0.94026	0.4071
MKT does not Granger Cause RGDP	25	1.98521	0.1635
RGDP does not Granger Cause MKT		0.81881	0.4552
M2 does not Granger Cause RGDP	25	4.25199	0.0289
RGDP does not Granger Cause M2		0.09681	0.9081
M1 does not Granger Cause RGDP	25	2.37040	0.1192
RGDP does not Granger Cause M1		0.26252	0.7717

Source: Extracts from E-view print out and Author's computation

From the Table 8, the results indicate that there is unidirectional relationship between monetary aggregate and real gross domestic product, as well as between broad money supply and real gross domestic product while other variables have no causal relationship.

Table 9: Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value
None *	0.947243	208.3800	125.6154
At most 1 *	0.875972	134.8287	95.75366
At most 2 *	0.764943	82.64756	69.81889
At most 3	0.526622	46.44940	47.85613
At most 4	0.486973	27.75287	29.79707
At most 5	0.350438	11.06721	15.49471
At most 6	0.011169	0.280799	3.841466

Source: Extracts from E-view print out and Author's computation

Again, as indicated in Table 9, the maximum Eigen validates the three statistics with two cointegrating equations in each of the models. The implication is that there is the presence of long-run relationship among the variables.

Table 10: Vector Error Correction Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.292644	0.638727	-0.458167	0.6661
D(RGDP(-1))	0.397763	0.279000	1.425675	0.2133
D(TS(-1))	0.298818	0.174063	1.716726	0.1467
D(TS(-2))	-0.044696	0.132793	-0.336586	0.7501
D(TS(-3))	-0.052805	0.112270	-0.470336	0.6579
D(NDC(-1))	-0.028401	0.010439	-2.720637	0.0417
D(NDC(-2))	-0.020484	0.010045	-2.039294	0.0970
D(NDC(-3))	-0.017917	0.007240	-2.474820	0.0562
D(MOG(-1))	0.026629	0.010715	2.485258	0.0555
D(MKT(-1))	0.258961	0.125847	2.057751	0.0947
D(MKT(-2))	-0.010301	0.143354	-0.071857	0.9455
D(MKT(-3))	-0.293219	0.147332	-1.990199	0.1032
D(M2(-1))	0.013287	0.092342	0.143894	0.8912
D(M2(-2))	-0.211680	0.116169	-1.822175	0.1281
D(M2(-3))	-0.035771	0.061401	-0.582577	0.5855
D(M1(-1))	0.060710	0.076002	0.798792	0.4607
D(M1(-2))	0.085323	0.079691	1.070675	0.3333
ECM(-1)	-0.124894	0.253696	-0.492298	0.6434
R-squared	0.897976	Mean dependent var		0.326087
Adjusted R-squared	0.551095	S.D. dependent var		2.546337
S.E. of regression	1.706055	Akaike info criterion		3.945406
Sum squared resid	14.55312	Schwarz criterion		4.834053
Log likelihood	-27.37216	Hannan-Quinn criter.		4.168898
F-statistic	2.588716	Durbin-Watson stat		2.733196
Prob(F-statistic)	0.148683			

Source: Extracts from E-view print out and Author's computation

Having examined the short-run dynamic relationship existing between financial intimidation puzzle and financial stability. The objective of Parsimonious error correction result is to validate the relationship that exists among the variable in the long-run. The speed of adjustment is 12.4% annually while the explained variation is 89.7%.

Conclusion and Recommendations

From the findings, we conclude that financial intermediation puzzle significantly affects Nigerian financial market stability. We therefore make the following recommendations:

i. The regulatory authorities should make policies touching on harmonizing financial intermediation puzzle in achieving financial stability and economic growth in Nigeria.
ii. The financial market should be reformed and the operational efficiency deepened to leverage the challenges in the financial market, so as to achieve financial stability.
iii. The monetary policy and the macroeconomic policy should be integrated with objective of achieving financial stability.
iv. The money market and the capital market institution should be properly managed to achieve financial stability through financial intermediation

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