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Influence of Information Asymmetry, Illiquidity and Transaction Cost on Asset Price in the Nigerian Exchange Limited

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Abstract

Financial frictions are resistances to the well-functioning of stock exchanges, and accordingly, cause asset prices to deviate from their fundamentals or intrinsic (long-run or equilibrium value.). Against this backdrop, this paper investigates whether information asymmetry, liquidity constraints and transaction cost of trading influence asset prices, utilizing evidence from the Nigerian Exchange Limited (NGX), for the period 1988-2022, and robust econometric GMM estimation approach. The empirical findings revealed that information asymmetry and illiquidity have significant negative impacts on asset prices. Transaction cost, on the other hand is positively related to asset pricing, an indication that investors are more concerned with the marginal expected return on investment even at a higher cost of investment transaction. We further find evidence that externally generated and transmitted shocks, proxied by economic vulnerability dummy is negatively and significantly associated with asset prices. In view of the forgoing findings, the study recommends the creation of financial investment environment that supports the enforcement of contracts through the reduction of the costs of transaction and information acquisition, as well as good corporate governance. Robust shocks-mitigating measures, including economic resilient policy responses to address external vulnerabilities and uncertainties as well as strong regulatory and institutional mechanisms to make the operations of the financial market efficient and stable for global competitiveness are also imperative.

Keywords: Financial frictions, Information asymmetry, Illiquidity, Transaction cost, GMM

Introduction

The impact of various financial market frictions, such as information asymmetry, illiquidity and trading transaction costs in the financial trading processes is receiving increased empirical attention in the economics and finance literature. The increased impetus is motivated by significant advance in macro and micro-quantitative models of financial frictions, as well as dynamic innovations that have facilitated the study of frictions in a more rigorous manner. Trading frictions in financial markets are important determinant of asset prices, as well as their equilibrium or intrinsic values. The importance of trading frictions and their impact on the efficiency of financial market, particularly asset pricing is replete in many studies (see Chordia, Roll & Subrahmanyam, 2011). For instance, non-synchronous trading, bid-ask spread, transaction costs, tax, and illiquidity constitutes various financial frictions. In the literature, there are five primary categories of market frictions, transaction costs, taxes and regulations, asset indivisibility, non-traded assets and agency and information constraints (Minovich, 2012). (Degennard & Roboti, 2007; Olbrys & Majewska, 2014). Financial frictions disrupt the trading process and affect asset prices. While complete

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and efficiency is unarguably unattainable, the existence of market frictions may nevertheless, exacerbate the already persisting inefficiencies. With the nature of financial market in Nigeria and other developing countries, with substantial market imperfections, highly unorganized, spatially fragmented, extremely segmented, dualistic, narrow, shallow and invariably externally dependent, financial disruptions may obviate long-run policy objective and precipitate financial markets bubbles and crises if not addressed as majority of these economies also suffer from financial repression due to structural challenges, poor macroeconomic policy environment and weak institutions (Iyoha, 2004; Ozekhome, 2022). Without doubt, a friction-ridden financial system can hardly allocate resources efficiently, causing resource misallocation in the system. For developing countries, particularly, like Nigeria, financial frictions, structural rigidities and institutional weakness, as well as concentrated financial system not only affect asset prices but constrain optimal monetary policy and public policy effectiveness (Beck et al., 2000; Levine et al., 2000; Mishra et al., 2014; Abuka, et al, 2019). Thus, the effectiveness of monetary policy (monetary policy transmission) is constrained by frictions. In reality, episodic long term movements in asset prices due to financial disruptions tend to induce a super-exponential volatility in the stock market with amplified consequences on economic and financial sectors in a self-reinforcing cycle (Ozekhome, 2023a).

Given the recent economic upheaval in the international financial and macroeconomic environment, it has become very critical to stakeholders investors, fund managers, academics, regulators and policy makers to have a good understanding of the behaviour and dynamics of financial markets, particularly asset prices than was hitherto conceived. The most remarkable development that necessitated this was the strong and unanticipated volatility in the price of equity, bond, currency and real estate markets. In particular, the recent performance of equities markets has thrown many financial market experts, analysts and investors in quandary and disbelief. In the light of this, an understanding of the impact of financial frictions (resistances) on asset prices occasioned by domestic and international economic and market vulnerabilities is important.

Accordingly, this study is relevant from the perspective of adducing empirical evidence that could inform policies and strategies necessary to stabilize and make the Nigerian stock and capital exchanges work effectively efficiently, and remain internationally competitive in the global financial architecture.

Statement of Problem

Financial market frictions impact greatly on the efficient and stable functional of financial markets, particularly, stock markets. In the literature (see Bougheas & Favley, 2010; Mnovich, 2012; Matvos et al, 2017), resistances in efficient-functioning of a system can cause the system to perform sub-optimally. Financial frictions, therefore, resist the well-functioning of financial markets and constrain its traditional role of financial intermediation. Such resistances in the smooth and well-functioning of the financial system can also result to underdevelopment and constrains the much needed economic growth policy objective. Different studies have examined financial market frictions (see Minovic, 2012; Olbrys, & Majewska, 2014; Matvos, et al., 2017). Nevertheless, these studies failed to adopt disaggregated approach. These studies also failed used econometric techniques that efficiently address endoegeineity and reverse causation issues that are prevalent with asset pricing model.

None of the studies also accounted for the effect of externally-induced and transmitted shocks, in the modelling of previous financial friction-asset price modelling, given the far-reaching consequences it had on the global stock markets, in terms of investment supply and demand slumps. In addition, the differing methodologies adopted in the literature have so far led to mixed and inconsistent findings. In Nigeria, studies on the impact of financial market frictions are few and not current. Given the fact vulnerabilities and shocks in the external environment for which the Nigeria economy is not immune to, an empirical re-examination of the impact of financial frictions-asset price nexus is accordingly, important. Aside the introductory section, Section 2 presents a review of the literature, on market frictions. Section 3 contains the methodology, data, and estimation technique. The empirical results and analysis are presented in section 4, and section 5 concludes the paper, with some policy perspective.

Literature Review

Conceptual Issues

Financial market frictions are resistances that distort the efficient allocation of resources (financial resources) among economic agents. Frictions market frictions are imperfections that obstruct the market trading process. Taxes and transaction costs are common and obvious examples of market frictions as they irrefutably affect virtually every transaction (Poyry, 2012). Lippman and McCall (1986), posits that friction may be any factor that impedes the duration it takes to trade a given amount of an asset (at the optimum price). Thus, a frictionless market is one in which all costs and restraints associated with transactions are

non-existence. In the real world situation, there is no perfect market. However, the degree of frictions faced by each financial system or economy differs across countries or regions. Country or regional differences in the magnitude of frictions, therefore, influence the level of resource allocation and growth (Ozekhome, 2022). Firms and economic agents face stronger constraints to their investment and cash flow management and growth, due to the level of existing financial underdevelopment and financial frictions (Kaboski, 2021).

Firms and economic agents in climes with greater degree of financial frictions face greater borrowing costs and illiquidity than firms with unhindered access to capital markets. The existence of financial market frictions leads to a situation where input choices vary significantly and systematically across firms in ways that are unconnected to their productive efficiency (Gilchrist, Sim & Zakrajesk, 2011). Financial development, entrepreneurial spirit and investment may therefore, be constrained due to high degree of financial market frictions. The existence of financial market frictions results to a situation where a market participant may be vulnerable to greater or less risk than might otherwise be preferred by the economic agent (Degennard & Robotti, 2007).

Theoretical Literature

Efficient Market Hypothesis (EMH)

The literature on financial market frictions is greatly hinged on the efficient market hypothesis (EMH) (Fama, 1970). The EMH is classified into three interrelated versions (weak, semi-strong and strong forms). The weak form EMH posits that at any given moment, stock prices represented all the historical information available, and that no economic agent//market participant can consistently make abnormal profit or earn abnormal/excess returns on stocks by relying on such information, except by chance (see Fama, 1970; Fama, 1991). Semi-strong efficient market forbids the investors from gaining extra return by using available public information. Semi-strong form implies that no public information is essentially strange, and as such, cannot be capitalized on by market participants to earn abnormal returns. Thus, in the semi-strong form, current information is fully available to everyone, as market prices already reflect all current available information. The strong form of market efficiency posits that prices fully reflect all public and private (insider) information. Thus, in the strong form of efficiency, investors are unable to make abnormal return even with earlier access to insider information.

Theory of Asymmetric information

The theory of asymmetric information was developed independently by Akerlof (1971), Spence (1973) and Stiglitz (1977). It posits that lopsided information between buyers and sellers, a market friction could result to inefficient and suboptimal outcomes as low standard goods (lemons) could be traded at the detriment of the unsuspecting party to the transaction with unequal information. Such lopsided information-bargaining position could cause asset prices to deviate from their fundamental or intrinsic long-run equilibrium value ((Hoguet, 2005; Li, 2008). In line with theory, the possession of some privileged information by economic agents, will enable them earn excess or abnormal return on stocks, as they capitalize on such information to exploit the other party to the transaction. In the financial markets (loan markets), asymmetric information takes place when one party to a financial transaction (i.e. the borrower) has substantial information concerning the transaction with respect to the risks and returns associated with the transaction than the lender, thus, providing opportunity for borrower to exploit the lender, Two fundamental issues are connected with asymmetric information; moral hazard and adverse selection (Mishkin, 1977; Okorie et al, 2020).

Adverse selection takes place prior to the financial transaction (loan deal) when the party that will probably produce the undesirable outcome (adverse) outcome such as non-payment of loan succeeds in having the loan approved. The result of this, is that, going forward, credit-worthy and honest borrowers may find it extremely difficult to get loan approvals from such financial institutions as they become wary in granting loans, thus hampering efficient allocation of resources and financial intermediation, with the end result or lower investment and growth (Ozekhome, 2022). Moral hazard, on its part, is an asymmetric information problem that takes place after the execution of the financial transaction (i.e. disbursement of the loan). It occurs when the lender becomes vulnerable to the risky behaviour of the borrower, such that lender's probability of getting the loan granted paid becomes low, thus translating to significant balance sheet financial losses to the lender. Even in situation where there is considerable knowledge about the activities and intensions of the borrower, there could still be the problem of moral hazard on account of the exorbitant enforcement costs that the lender will have to bear. Whereas in monopolistic and oligopolistic financial environment, some operating banks could charge higher rates of interest on fresh loans to recoup the previously sustained losses, the associated high cost of loanable funds (i.e. borrowing cost/interest rate) would significantly reduce borrowing, in addition to high defaulting rate on loans on the part of unreliable borrowers. The combination of these occurrences leads to further problems of moral hazard and adverse

selection. Following this, financial institutions and other intermediaries that are risk-averse could pull out their funds from the lending market, and refuse to lend at the detriment of investment, thereby exacerbating financial frictions (Okorie et al, 2020, Ozekhome, 2022).

Another theory that connects financial frictions with asset prices is the agency theory developed by Ross (1973) and Mitnick (1975a, b), with the institutional theory of agency specifically attributed to Mitnick (1973, 1975b). The theory posits that agency problems, unequal information and exorbitant contracts enforcement costs can create financial frictions as credit rationing in the financial markets (Keeton, 1979; Stiglitz & Weiss, 1981; Mishkin, 1995). Accordingly, financial markets and institutions should create a favourable environment that supports the enforcement of contracts through the reduction of the costs of transaction and information acquisition, as well as ensure good corporate governance.

Empirical Literature

Shiller (2003) assesses the impact of market frictions in the context of the EMH. He concludes that the efficient functioning of stock market is hinged on, amongst others on unimpeded (unconstrained) information. Matvos. Amihud, Mendelson and Pedersen (2005), using evidence from a sample of European and the US financial markets, find that liquidity constraints (illiquidity) and information asymmetry constrain the efficient functioning of markets.

Li (2008) examine the independent and dominant effects of the levels of liquidity, information asymmetry and the departure in the attitudes of the assets returns in an emerging China's stock market, He used Ammihud's (2002), liquidity measure, termed as illiquidity, amongst others to measure financial market frictions and Generalised Method of Moments (GMM) estimation technique. The findings revealed that financial frictions causes deviation in asset prices. Foellmi and Oeschim (2008) investigates the link between market imperfections and trade, using data from a sample of developed and developing countries. The findings show that the extent of disruptions in financial transactions is caused by the intensity of market frictions.

Antras and Caballero (2009) investigate the impact of financial fictions in capital flows in Spain. They introduced financial frictions into a model of capital flows. The evidence based on a series of econometric approaches show that financial frictions affect the efficient functioning of international trade and

international capital movement. Bougheas and Favley (2010) introduced financial frictions in a two sector-model of international trade, with heterogeneous agents. The degree of specialization and exchange in the economy is made to be a function of the quality of financial institutions, in terms of efficient functioning. The empirical findings show evidence that underdeveloped financial markets prevent an economy from specializing in sectors where finance is important. In addition, capital mobility takes place in the presence of developed and good-functioning financial institutions, that enable their economies to develop sectors that are financially-dependent.

A study by the IMF (2016) on the role of financial development to economic diversification finds evidence that credit- constraints in the financial sector, which are financial frictions, significantly limit the allocation of financial resources to critical production sectors in an economy, and consequently limit economic diversification. The study concludes that developing countries' economy are less diversified due to a host of factors, that include financial market frictions, and thus, the inability of the financial system to efficient channel diversification-oriented resources to the real sector of developing countries''

Matvos, Seru and Silva (2017) investigate the impact of financial market frictions on economic and financial diversification. Use the diversification index for different set of firms over the period 1980 -2012, the results show that diversified publicly traded firms have greater capacity of expensing their scope of operations in high external capital market frictions situations, such as the great economic and financial recession.

Kaboski (2021) examines the link between financial market frictions, financial market development and macroeconomic development. He develops an endogenous framework in which financial development is incorporated into a standard growth model, and accounted for frictions by modelling constraints into the financial development model. The results show that financial market frictions slow the rate of financial development and economic growth.

A study by African Trade Finance Survey Report of the African Development Bank Group (AfDBG) (2021), show that constrained global financial conditions, in the form of financial frictions, caused by the coronavirus pandemic resulted a colossal outflow of trade and investment finance from Africa, exceeding

$5 billion in the first quarter of 2020, with about $3.1 billion out of South-Africa. This colossal outflow of finance, according to the findings, led to over 15% trade and investment decline in Africa.

In a recent study, Ozekhome (2023a) finds that economic vulnerability has a negative and significant impact on asset prices, as it causes speculative, unwholesome, irrational and unrealistic expectational behaviours on the part of market participants. In a similar study, Ozekhome (2023b) examined the effect of credit and financial constraints caused by externally generated and transmitted shocks like the COVID-19 and other uncertainties, on African trade and investment. The findings revealed that ecogenously- generated shocks and other global uncertainties result to significant decline in investment in the African market.

Gap(s) in Literature

Established on the above reviewed literature, there is palpable evidence that the impact of financial market frictions on asset prices has not been fully explored in Nigeria. In particular, most of the known studies (see Easley et al., 2002; Li, 2008; Minovich, 2012; IMF, 2016) approached the subject matter from an aggregative frictional-asset based model as opposed to a highly decomposition or disaggregated model. In addition, none of the exiting pertinent studies has incorporated the effect economic vulnerability i.e.- externally generated and transmitted shocks due to global uncertainties and shocks proliferation, e.g the recent COVID-19 in the modelling of financial friction-asset price nexus. The recognition of these obvious gaps is the motivation for this study in the light of the compelling needs of advance in literature and policy.

Methodology and Empirical Strategy

Theoretical framework and Model Specification

The theoretical basis of this study is the Fama's (1970) efficient market theory, in which a market is considered efficient according to given set of information if there is no ability to make abnormal profit (or excess returns) with trading based on this information. By implication, it is not possible to make abnormal return based on the already available public information. The intuition is based on notion that investors have rational expectations and that market efficiently aggregate information, such that equilibrium price of the asset involves all publicly available information (Hoguet, 2005). Nevertheless, symmetry of information is not possible across markets (Minovic, 2015).

Assume a market model in which trading takes place as recurring interactions between risk-neutral competitive creators of markets, with two kinds of traders: informed and uninformed, for an inter-temporal utility asset. On the basis of held assumption hinged on correct value of assets, market makers set the buying and selling prices. If private information about the market event appears to informed traders, it arrives according the rate ŋ, to unenlightened customers, it arrives arrive at a rate φ_b, and to uninformed sellers , at the rate φ_s. If no information exists about an event, the received rates of uninformed buyers and sellers remain unaffected. The function of the credibility of the total number of purchases and sales is:

$$L\big((B,S)|\theta\big) = \alpha(1-t)e^{-(ŋ+\varphi_b+\varphi_s)}\frac{(ŋ+\varphi_b)^B+(\varphi_s)^S}{B!S!} + \alpha l e^{-(ŋ+\varphi_b+\varphi_s)}\frac{(ŋ+\varphi_s)^S+(\varphi_b)^B}{B!S!} + (1-$$

$$\alpha)e^{-(ŋ+\varphi_b+\varphi_s)}\frac{(\varphi_b)^B(\varphi_s)^S}{B!S!} \tag{1}$$

Where (B, S) characterize the total number of purchases and sales, with $\theta = (ŋ, \varphi_b, \varphi_s, \alpha, l)$, denoting a vector of parameters. A fundamental assumption here is that market transactions are independent, with the credibility function for trading being iidentically distributed variables in the model (Easley et al., 2002).

$$L(\theta|M) = \prod_{t=1}^{T} L(\theta|(B_t, S_t)) \tag{2}$$

where M = $((B_t, S_t), \dots, (B_T, S_T))$ signifies a collection of data (Yan & Zhang, 2006). The probability of informed trading, or measure of information asymmetry is $PIT = \frac{\alpha ŋ}{\alpha ŋ + \varphi_b + \varphi_s}$

(3)

where $\alpha ŋ + \varphi_b + \varphi_s$ is the arrival/entry rate (speed) for all orders, and $\alpha ŋ$ receiving/entry rates for orders based on information. The quotient signified by equation (3) is a portion of the order due to informed traders, or the probability that the opening trade is based on information (Easley et al., 2002). That is to say, this measure is a description of the percentage of trading based on private information of all observed trading. The greater the value of these measures, the greater would be the degree of information asymmetry, and by implication, the lower liquidity (Li, 2008; Minovic, 2015). By adapting Yan and Zhang (2006) and subsequently Minovic (2015), and maximizing the credibility function signified by equation (2) according to the parameters θ obtained, the evaluation of the structural parameters based on numerical maximization of the likelihood function captured is obtained.

$$L((B,S)_{t=1}^T|\theta) = \sum_{t=1}^{T}[-\varphi_b - \varphi_s + M_t(Inx_b - inx_t) + B_t \ln(\eta + \varphi_b) + S_t \ln(\eta + \varphi_s] +$$

$$+ \sum_{t=1}^{T} ln[\alpha(1-t)\,e^{-\eta x_s S_t - M_t x_b - M_t} + \alpha\delta e^{-\eta x_b B_t - M_t x_s - M_t(1-\alpha)} x_s^{S_t - M_t} x_b^{B_t - M_t}]$$

Where $M_t = (\min(B_t, S_t) + \max(B_t, S_t))/2$, $\qquad x_s = \frac{\varphi_s}{\eta + \varphi_s}$ and $x_b = \frac{\varphi_b}{\eta + \varphi_b}$ (4)

Utilizing the above factorization is important as it raises the degree of efficiency, as well as lowers the truncation error associated with large number of buying and selling activities (Yan & Zhang, 2006). Modifying the Yang and Zhou (2006) approach, and considering the independent and dominant effects of liquidity, information asymmetry and attitudinal variation of assets, the effects of illiquidity (ILLIQ), information asymmetry (ASYM) (information disruptions /distortions) and transaction cost (TRC) are examined in a frictions-asset regression model to determine which variable has a dominant effect. In order to capture the effect of the internationally generated and transmitted shocks in the global economy, occasioned by the recent pandemic and other economic uncertainties on asset prices, an external vulnerability dummy, referred here as economic vulnerability dummy (EVD) is included in the modelling.

The inclusion of this variable is both intuitive and novel; an advance in the modelling of the subject matter, particularly as regard, economic realities of the time and recurring economic uncertainties that negatively affect stocks, which no previous study has accounted for. The rationale is that externally generated and transmitted shocks/.uncertainty like the COVID-19 may have caused a significant credit and financial constraint (i.e financial friction) in the global stock exchanges, and hence, the Nigerian stock exchange. For instance, the African Trade Finance Survey Report of the African Development Bank Group (AfDBG) (2021), show that constrained global financial conditions caused by the coronavirus pandemic resulted to a massive outflow of trade and investment finance from Africa, exceeding $5 billion in the first quarter of 2020, with about $3.1 billion out of South-Africa. This colossal outflow of trade finance, translates to about 15% investment decline in Africa (Ozekhome, 2023b). Incorporating this, into the modelling structure, the expanded model for the friction-asset price model in Nigeria is captured as:

$$ASI_t^i = \beta_{o,t} + \beta 1 ASI_{i,t-1} + \beta_2 ASY_{i,t} + \beta_3\,ILLIQ_{i,t} + \beta_4 TRC_{i,t} + \beta_5 EVD_{i,t}$$
$$+ \varepsilon_{i,t} \ (5)$$

where ASI = Asset price, measured here, as the All Share Index and $ASI_{i,t-1}$ = one lagged asset price (ASI)

ASY = information asymmetry- measured as delay in the ability of asset returns to respond instantaneously to new information

$ILLIQ$ = illiquidity- measured as the inverse of liquidity

TRC = transaction costs – measured as debt financing costs (ie. borrowing costs) (see Gilchrist, et al. (2011) and Olbrys and Majewska (2014). Accordingly, assets with higher levels of liquidity, lower transaction costs and lower degree of information asymmetry, or lower levels of differences in attitudes would have a tendency to have significantly lower excess returns. By this, the degree of explanatory power of liquidity in the asset price model reflects through information asymmetry alone or the differences in opinion (see Easley, et al., 2002; Li, 2008; Minovic, 2015).

Sources of Data

Annual time series data covering the period 1988-2022, (using the All Share Nigerian Index) to capture asset price period. The choice of the period, particularly the base year (1988) is informed by the fact it marks the full liberalization of the Nigerian Exchange Limited (NGX) the financial liberalization programme as well as the strengthening of prudential regulations. The data are obtained from the Nigerian Exchange Limited (NGX) and the Securities and Exchange Commission websites.

Estimation Method

The methodology adopted in investigating the impact of financial frictions on asset prices is the Generalized Method of Moments (GMM), since the utilization of OLS will provide biased and inconsistent parameter estimates as some of the variables be endogenously correlated with each other; a common characteristic of asset pricing modelling. The inter-temporal optimization condition thus, implies that the choice of instruments is critical in providing reliable estimates. Accordingly, the GMM, which selects instruments based on the moment conditions of the probability distribution, is preferred to other Instrumental Variable (IV) estimators like the Two Stage Least Squares (2SLS). For instance, the 2SLS instruments forego any optimization decision implied in the model. In addition, based on its ability to address the problems of heteroscedasticity, endogenity, omission bias, measurement error and reverse causality, the GMM is preferred (Arelano & Bover, 1995; Blundell and Bond, 1998) In order to have robust estimates, the characteristics of the variables using preliminary

statistical tools such as descriptive statistics are carried out. This is to understand the gloss of the variables as well as their underlying characteristics before the main analysis involving the asset price model is analysed. The GMM developed by Hansen (1982) is an estimation procedure that requires estimators to be derived from called moment conditions. A moment condition is a statement involving the data and parameters in the form

$$g(\theta_0) = E[f(wt, zt, \theta_0)] = 0 \tag{6}$$

where $g(\theta_0)$ is the *moment condition,* θ is a vector of parameters to be estimated; $f(\cdot)$ is an R dimensional vector of (non-linear) functions; w_t represents the independent variables; and z_t denotes the instruments in the model. Following, Nielson (2005), it is impossible to calculate the expectation derived in equation (6) for a given sample. Hence, the empirical counterpart of the moment condition is estimated as:

$$g_T(\theta) = \frac{1}{T} \sum_{t-1}^{T} f(w_t, z_t, \theta) \tag{7}$$

The GMM estimator is used to derive the estimator, $\hat{\theta}_{MM}$, being the solution to $g_T(\hat{\theta}_{MM}) = 0$. Hansen (1982)'s GMM fundamental idea is to minimize a quadratic form of the objective function J_T given by:

$$J_T = g_T(\theta)' \, W \, g_T(\theta) \tag{8}$$

Where $g_T(\theta)$ is a set of *moment conditions,* and W is a matrix of arbitrary weight for the instruments. The GMM estimator $\hat{\theta}$ is given by

$$\hat{\theta} = arg \min_{\theta} J_T = arg \min_{\theta} g_T(\theta)' W g_T(\theta) \tag{9}$$

For the system to be identified, it should be noted that there must be at least as many moment conditions $[g_T(\theta)]$ as parameters (θ). Hansen (1982) shows that the estimator in equation (9) above is not only consistent but also asymptotically efficient, if the weighting matrix W^{-1} is chosen. W^{-1} is the inverse of asymptotic covariance matrix, which is optimal as it yields θ with the smallest asymptotic variance.

Theoretically, the covariance matrix W is given by:

$$W = \sum_{j=-\infty}^{\infty} E\left[g_t(\theta)g'_{t-j}(\theta)\right] \tag{10}$$

Where: j is the lag length and $g'_{t-j}(\theta)$ is the moment estimates obtained from lagged variables

Empirical Results and Discussion

Descriptive Statistics

Table 1 shows the summary statistics of the variables used for the baseline empirical estimation. The mean ASI is 17,980.2, and median and standard deviation of 17,012.3, and 154.4, respectively. Thus, asset price has been characterized by extremely divergent values, as well as instability over the period, with the index moving from very high to very low values .The disruptive forces in the market, persistent economic vulnerability and exogenously generated and transmitted shocks from the international economic environment may have caused this. Information asymmetry, illiquidity (inverse of liquidity) and transaction costs have men values of -0.082, 0.065, and 35.3, respectively. Invariably, information asymmetry, liquidity constraints and transaction costs act as resistances to the well-functioning of the stock exchange. This may have induced the pronounced divergence and instability that characterized the market.

Table 1: Descriptive Statistics

	Mean	Median	Max.	Min.	Std. Dev.
ASI	179960.2	17,012.3	57,983.1	162.7	153..4
ASY	-0.082	-0.731	-1.162	-0.175	1.73
ILLIQ	0.065	0.061	1.017	-0.051	1.8
TC	35.3	29.,6	50.23	18.7	8.33

Source: Authors' computation

GMM Results

The GMM results showing the responses of asset price to underlying market frictions (i.e. information asymmetry, illiquidity and transaction costs), as well as economic vulnerability variable is reported in Table 2.

The adjusted R^2 of 0.872 shows that roughly 87.2% of the net systematic changes in the dependent variable (ASI) is explained by all the combine financial friction variables (i.e. information asymmetry, illiquidity and trade costs) and the external vulnerability variable. By implication, all the explanatory variables of the model are thus, relevant factors explaining asset prices in the Nigerian stock exchange. The predictive capacity of the model is thus robust.

Table 2: financial Frictions- Asset Price Model: GMM Estimates

	Coefficient	t-Stat.
ASI(-1)	0.006	0.582
ASY	-0.175***	-3.120
ILLIQ	-0.082**	-2.213
TC	0.071*	1.206
EVD	1.080***	3.110
Diagnostics		
Adjusted $R^2 = 0.872$		
Post-Diagnostics		
p-value of Sargan's test	0.69	
Hansen-J-Stat	4.52 (0.53)	
AR (1)	-3.15 (0.03)***	
AR(2)	-0.65 (0.55)	

Note *, **, ***, denotes statistical significance at the 10%, 5% and 1% significance levels, respectively.
 Source: Authors' computation.

One lagged asset price (ASI), is positively related to current asset price but fails the significance test at the 5% level. Invariably, past realizations (performance) of asset price has no significant impact on current and future price of assets in the market. Information asymmetry is negatively related to asset price, in line with theory and evidence and significant at the 1% level. This implies that the higher the degree of imperfections in the market in terms of lopsided information, the lower the asset price, since such imperfections as scarce, hoarded or privilege information could be used to distort the market to the detriment of others. Unequal information could also induce episodic events, bubble and other short-term destabilizing speculative and expectational behaviours in the market. It also creates room for market abuse such as market manipulation, sharp abuse and broker's conflict. The result is consistent with the findings of Minovic (2012), IMF, (2016) and Kaboski (2021). A 1% increase in information asymmetry is associated a 0.18% reduction in asset price.

Illiquidity (captured by the inverse of financial liquidity) is negatively related to asset price, in line with the asset pricing theory, and significant at the 5% level. By implication, market illiquidity has a deteriorating impact on asset price in Nigeria. Liquidity is the ease and speed at which economic agents can buy and sell securities. With a liquid market, the initial investors do not lose access to their savings for the duration of the investment project because they can easily, quickly, and cheaply, sell their stake in the company. Thus, more liquid markets have the capacity to ease investment in the long-term and become more potentially profitable, thereby improving the allocation of capital, as well as enhancing prospects for long term growth (Yartey, 2008). The more liquid the stock market, the larger the amount of savings that are channelled through the stock market. The liquidity constraints in the market may have diminished the long-term investment and efficient channelling of savings into the market in recent times, particularly during the COVID-19 period. The finding supports previous evidence of Amihud et al (2005), and Li (2008), Minovic (2012) and Olbrys, and Majewska (2014). A 1% rise in market illiquidity leads to a reduction in asset price by 0.08%.

The coefficient of transaction costs is at variance with economic theory, and achieves statistical significance at the 10% level. The observed contrary sign may be due to the fact that rational investors in the stock market do not really consider the cost of transaction in trading or in brokering of contracts but the expected return from investment. As such, even under high transaction cost regime, forward-looking rational investors would still increase their investment in want of expected higher returns, in line with the marginal efficiency theory of investment. The finding is consistent with the finding of Ozekhome (2023a) and at variance with the findings of Foellmi, and Oeschlin (2008).

Economic vulnerability dummy (EVD), which shows the magnitude of the impact of externally generated and transmitted shocks occasioned by COVID-19 pandemic and other uncertainties is negatively related to asset price and significant at the 1% level. Thus, exogenously produced and transmitted shocks like the pandemic scourge and other economic uncertainties have had outright destabilizing impact on the performance of stocks in Nigeria. This finding is in sync with Ozekhome (2023b). A 1% increase in the externally-induced and transmitted shocks is associated with 1.08% decline in asset price in the Nigerian stock exchange. The findings, overall, show clear evidence that financial market frictions impact negatively and significantly on asset prices through the channels of credit misallocation, low degree of resource and investment mobilization and weak financial intermediation.

The post diagnostic tests for the robustness and validity of the results obtained show a p-value of Sargan's test of 0.69, and a Hansen-J statistic of 4.52 (0.53). Thus, the null hypothesis of no over-identification restrictions for the GMM cannot be rejected, leading to the assumption of no endogeneity bias in the modelling. The model is, thus well-specified, appropriate and robust. The exogeneity choice of the levels, including the differenced instruments is likewise satisfied by the empirical evidence, as the null hypothesis of no serial correlation at order one in the first-difference errors, but a failure to reject same at order two {with AR (1) = -3.15 (0.03)*** and AR (2) = -0.65 (0.55)} is confirmed the post-estimation results. The estimated model is therefore consistent and fit and robust for policy formulation and implementation purposes.

Conclusion

The impact of financial frictions on the efficient and optimal functioning of financial markets, particularly the stock market cannot be over-emphasized. Financial market frictions distort asset prices, and prevent the market from operating at a well-functioning level, required to drive rapid economic growth. In addition, financial market frictions slow entrepreneurial spirit, technological drive and innovation, since to a large extent, are driven by efficient resource allocation and credit intermediation.

In view of the foregoing empirical findings of this study, government and policy makers should strive to remove structural rigidities from the economy and financial system, to make it efficiently-functioning. These may include the reduction of trading or transaction cost in the Nigerian Exchange limited (NGX), by providing strong trading digital technologies in the floor of the exchange. The SEC also has a critical role to play in making sure all market information are properly disseminated and not hidden or hoarded to any agent's. As such, information relating to stock prices should be properly displayed on the Stock exchange window. Eliminating liquidity constraints through measures that easily converts stocks or shares to liquid form is also another critical way of mitigating financial frictions. Adoption of result-oriented innovation and technology in marketing trading, transaction to mitigate the rigidities and complexities associated with transactions in the market, as well as signals early warning signal-detecting technology system are important to guaranteeing early adjustment to sudden news in order to guarantee an internationally competitive stock market. Strong institutional capacity and regulatory framework, as well as shocks-mitigating resilient policies are also important to ensuring credible, stable, and well-functioning financial markets in Nigeria.

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