Eastern Africa Journal of Contemporary Research (EAJCR)

Bank Diversification and Market Valuation: An Analysis of Commercial Banks Listed in Nairobi Securities Exchange, Kenya

Mulwa Jonathan Mwau

Article information:

To cite this article:

Mulwa, J.M. (2020). Bank Diversification and Market Valuation: An Analysis of Commercial Banks Listed in Nairobi Securities Exchange, Kenya. *Eastern Africa Journal of Contemporary Research*, 2(1), 34-47.

For Authors

If you would like to publish your conceptual/theoretical and empirical research articles, case studies and book reviews with EAJCR, please use for authors information about how to write your work and submission guidelines. Please, visit http:// www.eajcr.org/for-authors/

About Eastern Africa Journal of Contemporary Research (EAJCR)

The Eastern Africa Journal of Contemporary Research (EAJCR) is both an online (ISSN: 2663-7367) and print (ISSN: 2663-7359) double-blind peer-reviewed quarterly journal published by the Directorate of Research and Publications of Gretsa University, Kenya.

EAJCR aims at advancing the frontiers of knowledge by publishing contemporary multidisciplinary conceptual/ theoretical and empirical research articles as well as case studies and book reviews.

Bank Diversification and Market Valuation: An Analysis of Commercial Banks Listed in Nairobi Securities Exchange, Kenya

Mulwa Jonathan Mwau
School of Business and Human Resource Development, Rongo University, Kenya
Email: jmwau@yahoo.com

Abstract

The discourse on bank diversification and performance has long been based on accounting measures of performance. However, these measures only present the historical and present outlook of firm performance while ignoring the expected performance and risk assessments placed on such performance by the markets. Additionally, just like any other internal decision, managers can use time discretions over accounting data to minimize their personal and regulatory exposures. In an efficient financial market, it is expected that the market can account for managerial decisions in the market values of the firms. Such decisions include diversification. Agency theory has anticipated this scenario by proposing that diversification destroys value, though empirical evidence on the same is ambiguous. This raises the question of whether the financial market is efficient enough to value the diversification decisions of commercial banks and if so, what the effect of bank diversification on its market value would be. This research analyses the effect of income and asset diversification on the market value of commercial banks listed in the Nairobi Securities Exchange (NSE) over the period 2009 to 2017. The study controls for any possible valuation effects on a firm arising from its market power. Secondary data was obtained from Central Bank of Kenya Supervision Reports and the NSE Investor Handbook and analyzed using a Generalized Linear Model (GLM). The study finds a nonlinear relationship between income and asset diversification and market values which shows that the financial market in Kenya is efficient enough to place a value on the diversification decision of commercial banks. The study results also reveal that firms with more market power as a result of their size were valued more than small firms.

Key Words: Market Value, Income Diversification, Asset Diversification, Commercial Banks

1. Introduction

Diversification has been practiced by commercial banks across the world from the early 1990s occasioned by the deregulation and liberalization of the sector in a number of jurisdictions. For instance, in Europe, the Second Banking Directive of 1989 allowed European commercial banks to pursue functional diversification across activities such as commercial banking, investment banking, insurance and other financial services (Baele et al., 2007) whereas the 1999 Gramm-Leach-Bliley Act in United States of America (USA) allowed American commercial banks to expand into non-interest banking activities (Ebrahim & Hasan, 2008; Elyasiani & Wang, 2012). According to Sanya and Wolfe (2011), this diversification and its consequences can be analyzed from three different perspectives. The first approach is by using risk-return analysis

that result from merger simulations among existing individual banks and firms. The second, and the most popular, is the analysis of actual accounting data from the income statements and balance sheets of functionally diversified banks using cross sectional and/or panel regressions; and lastly by focusing exclusively on stock market reaction to the diversification decisions. Whereas, the first two approaches have been popular among researchers, the same cannot be said for market reaction approach. Additionally, despite their popularity, accounting measures of performance have limitations. Notably, as observed by Baselgu-Pascual et al. (2018), managers are open to using time discretion over accounting measures to minimize regulatory costs. This makes market based measures more robust in gaging organizational performance, a direction that this paper will pursue.

Different motives have been fronted as to why firms pursue diversification including; the synergistic motive, the financial motive advanced in portfolio theory, the market power motive, the resource motive, the agency motive occasioned by managerial discretion, and the cost efficiency motive (Montgomery, 1994; Olo, 2009; Yuliani et al., 2013). However, looking at diversification as a managerial choice, this paper will pursue the agency motive suggested by Montgomery (1994). The separation of ownership and management of corporate entities proposed in agency theory (Jensen & Meckling, 1976) creates a divergence of interest with managers pursuing selfish interests, notably through diversification. This situation is amplified by risk differentials between the agents and shareholders (Jensen, 1986). Whereas, the owners are concerned about non-diversifiable risk, the managers are often concerned about diversifiable risk. For firms with substantial free cash flows, managers are likely to choose investments that optimize profits, and diversification is usually a convenient vehicle for this managerial behavior (Jensen & Meckling, 1976). Indeed, Managers with free cash flows are likely to undertake value destroying or low benefit diversification to grow the size of their business territories, for managerial entrenchment and therefore benefit their personal positions (Jensen, 1986). However, the agency motive of diversification has been linked to value destruction (Goetz et al., 2013) occasioned by managerial entrenchment, empire building and managerial self-efficacy especially for firms with free cash flows (Montgomery, 1994). However, in an efficient financial market, the market players are expected to react to the managerial actions based on their individual evaluations of their expectations about the firm and its return prospects. Consequently, the market will expectedly device a method of instilling corporate discipline on managers through the market valuation of corporate stocks in response to information about managerial actions.

Research has suggested different outcomes as regards the market value of diversification in commercial banks. Proponents of diversification have reported a diversification premium on bank valuation. Notably, while investigating how revenue diversification affected bank value of 380 large listed banks from nine European countries over the period 1996 to 2008, Elsas et al. (2010) reported a direct significant effect of revenue diversification on bank profitability and consequently market

valuations. In Nigeria, Ugwuanyi et al. (2012) investigated the impact of corporate diversification on market value of 18 deposit money banks from 1998 to 2007. Using an OLS model, the study reported a significant positive effect of geographical diversification on bank excess value. However, operational diversification had a significantly negative effect on excess value. Elsewhere in US, and using annual Cumulative Abnormal Return (CAR) to measure market reactions, Ahmed and Iftekar (2008) investigated the market reaction to changes in bank earnings resulting from product diversification into interest and non-interest income among commercial banks from 1993 to 2002. Product diversification was measured using the incomes from interest and non-interest activities. The study reported a more significant direct relation between annual abnormal returns and changes in non-interest income components than it was with interest income component, which results were more relevant for small banks than for large banks.

Sawada (2011) investigated the effects of revenue diversification on performance and riskiness of publicly traded banks in Japan using a sample of 113 banks and bank holding companies (BHCs) from 1999 to 2011. The study reported a direct effect of revenue diversification on franchise value which was more pronounced for BHCs than individual banks. Additionally, revenue diversification was linked to a reduction in bank risk which effect was larger for banks with lower credit risks than their counterparts with higher credit risks. Consequently, the paper concluded that revenue diversification was beneficial to all stakeholders since it could increase franchise value without increasing risks. Similar to Sawada, Baele et al. (2007), investigated whether or not functionally diversified banks have comparative advantage in terms of long-term performance and risk profile over specialized banks using unbalanced panel data from 143 banks from 17 European countries over the period 1989-2004. The study reported that revenue diversification positively affected a banks franchise value. On the down side, diversification increased the systematic risk of banks, with a non-linear and predominantly downward sloping effect on idiosyncratic risk.

Diversification premium has been observed among non-bank companies by Selcuk (2015) who investigated the impact of corporate diversification on firm value using a sample of 1568 firms from nine emerging market economies across the world over the period 2005 to 2010. Diversified firms in emerging markets were noted to be more valued than single segment firms operating in similar industries. Similarly, using a dataset of US firm from 1994 to 2002 to investigate the effect of global diversification, Gande et al. (2009) observed that global diversification enhanced firm value as measured by Tobin's Q.

However, other studies have reported a valuation discount occasioned by bank diversification. For instance, while investigating how the stock market values bank revenue diversification among Vietnamese listed commercial banks, Vo (2017) reported an inverse relationship between bank diversification and stock market valuation. This was similar to the results reported by Guerry and Wallmeier (2017).

Using secondary data on 31846 publicly traded Bank Holding Companies from U.S. for the period 1986 to 2007, Goetz et al. (2013) investigated the influence of geographic asset diversification on market valuation of Banks. The study reported that an increase in geographic diversification reduced BHC valuation and was accompanied by increased internal lending and non-performing loans. This, the authors attributed to monitoring difficulties occasioned to outside investors by diversification and therefore agency problems. Chahine (2007) also reported a negative but week association between diversification and bank valuation among 41 listed gulf commercial banks over the period 2002 to 2004.

Other researchers have reported indifferent results as regards the influence of bank diversification on valuations. For instance, while investigating whether asset and income diversification affected bank valuation among publicly listed banks in 31 OECD countries from 1998 to 2012, Angus and Tatiana (2014) reported that it was difficult to empirically verify the link between bank diversity and valuations, though, on aggregate diversification may benefit the value of small banks than it did for large banks. Similarly, among ASEAN-5, China, Japan and South Korean banking industries and while investigating the effect of bank revenue diversification on value and risk based on stock market data, Natalia et al. (2016) reported that revenue diversification had no effect on bank market value but significantly decreased bank total risk. However, when non-interest income was decomposed, fee income business had a significant positive effect on bank value which effect was more pronounced for large banks.

This divergence in literature raises two lines of thought and which this this paper seeks to verify; first, bank diversification enhances firm performance and therefore in an efficient market, the stock market value; and second, diversification exacerbates agency problems making outside investors unable to exert corporate control and therefore erodes stock market value. To interrogate these thought lines, the paper will investigate how income and asset diversification affects the market value of listed commercial banks in Kenya

2. Theoretical Framework

This study was anchored on the theory of market efficiency. For diversification (being an internal managerial decision) to have any impact on the value of firms, then the markets should have a way of accounting for such information. The first formal attempts to link information to market valuations can be traced back to Paul Samuelson (1965) in his work “proof that anticipated prices fluctuate randomly”. This was later operationalized as efficient market hypothesis (EMH) by Fama in 1970 (Lo, 2004) with further developments leading to what is today known in financial theory as the “Random Walk Theory”. The EMH theory builds on informational efficiency and provides that securities’ prices in the financial markets reflect all available information and that they adjust instantaneously and in an unbiased manner to any new information. Fama (1965) attributed this instantaneous adjustment of prices with new

information to competition. The implication of EMH is that current market prices fully reflect all available information about the value of a firm. However, EMH is based on the assumption of costless trading, static environment and an equilibrium market (Lo, 2005) where rational investors act on their own selfish interest to profit from random information accessible to them. Such assumptions may not really hold in the financial markets where the environment is dynamic and investors make decisions not necessarily based on rationality but out of the influence of others.

Predicated on EMH is the Dumb Agent Theory (DAT) which states that many people making individual buying and selling decisions will better reflect true value than any one individual can. This theory was conceived as the "Dumb Smart Market" by James Surowiecki in 1999. Surowiecki argued that EMH does not mean that markets are always right but are subject to manias and panics because people are always shouting out their picks, which influences the action of other investors. In such markets, investors do not worry much about their own evaluations of markets but what decisions others are making in the market (Surowiecki, 1999). As such market actions are determined by the irrational actions of the masses. Accordingly, the markets would only be truly efficient in the sense of EMH if investors' decisions were made independently of each other. However, the true efficiency as hypothesized by DAT is therefore what the market cares about (Surowiecki, 1999).

Addressing the short comings of EMH, and based on the precincts of evolutionary psychology, is Adaptive Market Hypothesis (AMH) proposed by Lo in 2004. Accordingly, AMH argues that the degree of market efficiency is related to the environmental factors characterizing the market. As such individuals make choices based on heuristics and their best guess as to what might be optimal and consequently learn by receiving positive or negative reinforcements from the outcomes (Lo, 2005). Therefore, as long as the market environment remains stable, people develop heuristics that lead to optimal decisions but such heuristics become unsuitable if the environment changes and the people have to learn and adapt new heuristics. Consequently, in a market characterized by selfish individuals, competition, adaptation, natural selection and environmental conditions, market prices reflect as much information as dictated by the environmental conditions and market participants (Lo, 2005). The AMH theory is considered suitable in this study in view of the nature of banking industry in Kenya which is characterized by numerous opportunities for profit making and competition for limited stocks of the small number of listed banks. As such, market decisions are likely to be made not based on rationality but rather as reactions to movements in individual counters resulting from the actions of corporate buyers.

3. Methodology

Theory of diversification points to a number of avenues through which commercial banks pursue diversification. The most common are income or revenue diversification, asset diversification, geographical diversification, credit diversification and

international diversification (Chriatiansen & Pace, 1994; Gambacorta et al., 2014; Goetze et al., 2013; Lin, 2010; Mulwa et al., 2015). This study concentrates on two domestic diversification channels of income and asset diversification. Diversification was measured using a Herfindhal-Hirschman index (HHI) following Angus and Tatiana (2014), Elsas et al. (2010), Mulwa and Kosgei (2016), and Sawada (2011). HHI captures variations in the various components of income and asset diversification computed as the sum of squared shares of the individual components to total income or assets subtracted from unity to get a value that increases with the degree of diversification (Mulwa & Kosgei, 2016).

Generally, commercial banks diversify their income sources across interest and non interest incomes. Denoting the share of income from interest sources as NII and that from non interest sources as NONII and total income as TI, then income diversification (DIV_{inc}) would thus be computed as:

$$\mathrm{DIV_{inc}} = 1 - \left[\left[\frac{\mathrm{NII}}{\mathrm{TI}}\right]^2 + \left[\frac{\mathrm{NONII}}{\mathrm{TI}}\right]^2\right]$$

Similarly, commercial banks diversify their earning assets across lending and non-lending assets. Denoting Lending assets as LA, Non-lending assets as NLA and Total assets as TA, then asset diversification (DIV_{ass}) would be measured as:

$$\mathrm{DIV_{ass}} = 1 - \left[\left[\frac{\mathrm{LA}}{\mathrm{TA}}\right]^2 + \left[\frac{\mathrm{NLA}}{\mathrm{TA}}\right]^2\right]$$

Following Angus and Tatiana (2014), Hughes et al., (2018), Sawada (2011), and Vo (2017), Bank Market Value was measured using Tobin's Q which is a market-based measure of valuation. Most studies of bank diversification and performance rely on accounting measures of performance (Sanya & Wolfe, 2011). However, a challenge of accounting measures is that they gauge a firm's current profitability and cash flows while ignoring the market expectations of future cash flows as well as the market assessment of risk attached to the cash flows (Hughes et al., 2018). This makes accounting measures of performance more inferior to market based measures. Additionally, Hughes et al. (2018) suggest that market based measures of performance allow for inferences to be made about the differences in investment incentives provided by capital markets to various firms. According to Angus and Tatiana (2014), Tobin's Q is designed to measure the present value of future cash flows divided by the replacement costs of tangible assets and will be measured as:

$$\text{Market Value} = \left[\frac{\text{Market value of equity} + \text{Book value of Debt}}{\text{Book value of assets}}\right]$$

Usually, decisions to diversify income and investment assets of a bank are often intertwined with decisions regarding the size of the firm (Elsas et al., 2010). Ordinarily, the size of a firm denotes its competitive power in the market and therefore its ability

to deploy its resources profitably in the market. Consequently, this study will control for any effect that market power may have on bank valuation by incorporating it in its analysis. Market power (MP) of the individual banks will therefore be proxied by firm size and measured by the natural logarithm of total assets.

This study reviewed the 11 listed firms under the Banking segment of Nairobi Securities Exchange in 2018 (NSE, 2018). The listed banks were: Barclays Bank of Kenya, CFC Stanbic Holdings Ltd, Diamond Trust bank Kenya Ltd., HF Group Ltd, KCB Group Ltd., National Bank of Kenya Ltd., NIC Group Plc., Standard Chartered Bank Ltd., Equity Group Holdings, I&M Holdings Ltd. and The Cooperative Bank of Kenya Ltd. However I&M Holdings Ltd was removed from the sample since it was listed in 2013 and therefore did not have complete data for the study period. Additionally, HF Group was also dropped because of its reliance on real estate investments coupled with the use of Tobin's Q which relies on historical replacement costs of banks assets (Chahine, 2007). As such Tobin's Q would be biased upwards for HF Group due to the significant increase in the real estate prices in Kenya over the study period. The study was carried out on data for a 9-year period from 2009 to 2017 within which period all the banks in the sample were listed except I&M Holdings Ltd which was listed in 2013 (NSE, 2016) and therefore was dropped from the sample.

Secondary panel data on diversification was obtained from the Central Bank of Kenya Bank Supervision reports and individual bank financial statements while data on market capitalization (market value of equity), book value of assets and book value of liabilities was obtained from the Nairobi Securities Exchange Investor Handbooks. Table 1 presents summary statistics of the variables while Table 2 presents correlations among variables.

Table 1: **Descriptive Statistics of Variables**

	Market Value	Income Diversification	Asset Diversification	Market Power
Mean	1.186892	0.382199	0.464142	5.148425
Median	1.160218	0.388231	0.474458	5.175647
Maximum	1.687461	0.493826	0.499982	6.320103
Minimum	0.842904	0.195698	0.381819	3.861950
Std. Dev.	0.184906	0.072787	0.032663	0.553125
Jarque-Bera	6.303625	6.397842	11.82832	1.415108
Probability	0.042775	0.040806	0.002701	0.492848
Observations	81	81	81	81

Source: Research data (2020)

As shown in Table 1, listed commercial banks had an average market value of 1.186892 (Tobin's Q) which points to a market premium on bank value since the score was greater than a unit. The market value was highly dispersed with a standard deviation of 0.184906, a maximum score of 1.687461 and a minimum value of

0.842904 indicating the difference in premium that the market placed on the value of listed banks. On average, the banks were diversified both in income and assets with an average HHI of 0.382199 and 0.464142 for income and asset diversification respectively.

Table 2: Correlation Coefficients

Variable	[1]	[2]	[3]	[4]
[1] Market Value	1			
[2] Income Diversification	-.097	1		
[3] Asset Diversification	-.099	.324**	1	
[4] Market Power	.274*	-.018	.029	1

*. Correlation is significant at the 0.05 level (2-tailed); **. Correlation is significant at the 0.01 level (2-tailed); N=81

Source: Research data (2020)

As shown in Table 2, Market Valuation is not significantly correlated with both income and asset diversification. However, it had a significant positive correlation with market power indicating that the market placed a valuation premium on large commercial banks. Market power was also correlated positively with asset diversification which points to the ability of large banks by place their productive assets across different asset classes. It is worth noting, however, that the correlations among the predictor variables were far below 0.8 which points to the absence of multi-collinearity problem (Field, 2009).

All the variables except Market power were not normally distributed as shown by the Jarque-Bera statistics in Table 1. This can also be confirmed by Shapiro-Wilk test for normality statistics in Table 3 where the p-value for the statistics corresponding to the other variables except Market power is less than the critical value of 0.05 and therefore pointing to non-normal distributions. In this regard, and following Mulwa (2018), a Generalized Linear model (GLM) is preferred because of its ability to allow for response variables that have non-normal distributions (Czado, 2004). A GLM model works by allowing for an arbitrary link function of the response variable to vary linearly with the predicted values (Garrido & Zhou, 2006: 2009). Consequently, to attain the objectives of the study, the following GLM model is approximated:

$$\eta_{i,t} = \beta_0 + \beta_1 DIV_{inc\,i,t} + \beta_2 DIV_{ass\,i,t} + \beta_3 MP_{i,t} + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [Eq.1]$$

Where $\eta_{i,t}$ is a linear predictor determining the expected value of response variable Market Value, $DIV_{inc\ i,t}$, $DIV_{ass\ i,t}$ and $MP_{i,t}$ are Income diversification, Asset diversification and Market power for bank *i* at time *t* and $\varepsilon_{i,t}$ is the random error term. However, as shown in the correlation results in table 2, Market valuation had no significant linear relation with both income and asset diversification. Therefore to account for a possible nonlinear relationship between diversification and market value,

a squared value of the diversification measures will be included in the model as shown in Eq. 2 below:

$$\eta_{i,t} = \beta_0 + \beta_1 DIV_{inc\,i,t} + \beta_2 DIV_{ass\,i,t} + \beta_3 MP_{i,t} + \beta_4 DIV_{inc\,i,t}{}^2 + \beta_5 DIV_{ass\,i,t}{}^2 + \varepsilon_{i,t} \ldots [Eq.2]$$

Where $DIV_{inc}{}^2$ and $DIV_{ass}{}^2$ are the squared values of income and asset diversification respectively, β_0 is the intercept coefficient while $\beta_{i's}$ (for *i* =1-5) are the regression slope coefficients.

Table 3: Shapiro-Wilk Test for Normality

	Statistic	df	Sig.
Market Value	.959	81	.012
Income Diversification	.950	81	.003
Asset Diversification	.882	81	.000
Market Power	.987	81	.610

Source: Research data (2020)

4. Results and Discussions

The objective of this paper was to establish the valuation effects of income and asset diversification among listed commercial bank in Kenya. To achieve this, bank diversification measures and market power were regressed against market value using a GLM model at 5% significance level. This was to establish any linear relationship between diversification and market value. The results are presented in Table 4 and show that there was a weak regression relationship between the predictors and market value as indicated by the non-significant LR statistic (LR statistic = 7.644776, Prob. =0.054>0.05). Nevertheless, the results show there was no significant linear relationship between income and asset diversification and commercial bank market valuations which confirm the sentiments by Angus and Tatiana (2014) that it was difficult to empirically verify the role of bank diversity on valuations. Similar results were reported by Natalia *et al*., (2016) in ASEAN-5, China, Japan and South Korean banking industries that revenue had no effect on bank market value. However, market power had a significant direct effect on bank market valuations (β=0.092149, Prob. =0.0081). This confirms the argument of Natalia *et al*. (2016) and Ahmed and Iftekar (2008) who reported valuation premiums for large banks in the face of diversification.

Table 4: Regression Results for Equation 1

Dependent Variable: Market Value (Tobin's Q)				
Method: Generalized Linear Model (Quadratic Hill Climbing)				
Sample: 2009 2017 (Included Observations: 81)				
Family: Normal (Link: Identity)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
Income Diversification	-0.163222	0.379250	-0.430381	0.6669
Asset Diversification	-0.485831	0.593927	-0.817997	0.4134
Market Power	0.092149	0.034777	2.649673	0.0081
Constant	1.000349	0.288645	3.465674	0.0005
Mean dependent variable	1.186892	S.D. dependent variable		0.184906
Sum squared residual	2.488196	Log likelihood		26.07200
LR statistic	7.644776	Prob. (LR statistic)		0.053953

Source: Research data (2020)

To establish whether there was a non-linear relationship between bank diversification and market valuation, squared values of income diversification and asset diversification were added to the regression model and the results are presented in Table 5. Consequently, the model returned a more significant regression relationship as shown by the LR statistic (LR statistic=37.01138, Prob. 0.000001). Just like in the linear relationship, market power had a direct significant effect on market value of commercial banks. However, when the squared values of diversification measures were added to the model, the earlier negative and insignificant effects of income diversification and asset diversification on market values became significant with asset diversification returning a positive significant effect on market value of commercial banks. This indicates that both income diversification and assets diversification were important predictors of commercial banks' market values.

Notably, income diversification has a U-shaped non-linear effect on market value (β=12.33926, Prob. =0.0000). This shows that market valuation will reduce with income diversification up to some point and then increase as commercial banks further diversify their income sources. This implies that sustained income diversification is beneficial for bank market values. This supports the prescription of agency theory that in the short run, diversification destroys firm value (Goetz *et al*. 2013) but in the long run the market devices a method of instilling corporate discipline on managers through market valuations thereby aligning their interest with those of managers. Similar results were reported by Baele *et al*., (2007) who reported a positive influence of revenue diversification on long term bank franchise value, a non-linear but predominantly downward sloping effect on bank risk.

Asset diversification on the other hand had an inverted a U-shaped non-linear and significant effect on market value of listed commercial banks (β=-43.52285, Prob. =0.0016). As such bank market valuations would increase with an increase in asset diversification up to some point before it starts decreasing. This points to the diversification premiums placed on banks with more assets by the market as argued

by Natalia *et al*., (2016) and Ahmed and Iftekar (2008). Such diversification-valuation inertia could be attributed to the intense competition for the limited bank stocks in the Kenya banking industry coupled with the opportunity for enormous profits characteristic of Kenyan banks over the study period. Similar patterns were anticipated in the Adaptive Market Hypothesis (AMH) where investment decisions are made not based on rationality but on the environmental factors characterizing the market and where market values reflect as much information as dictated by the environmental conditions and market participants (Lo, 2005).

Table 5: Regression Results for Equation 2

Dependent Variable: Market value (Tobin's Q)				
Method: Generalized Linear Model (Quadratic Hill Climbing)				
Sample: 2009 2017 (Included Observations: 81)				
Family: Normal (Link: Identity)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
Income diversification	-8.721079	1.945827	-4.481939	0.0000
Asset diversification	37.78789	12.14918	3.110325	0.0019
Market power	0.102242	0.029168	3.505305	0.0005
Squared Income diversification	12.33926	2.700635	4.569022	0.0000
Squared Asset diversification	-43.52285	13.81600	-3.150177	0.0016
Constant	-5.990397	2.706102	-2.213662	0.0269
Mean dependent variable	1.186892	S.D. dependent variable		0.184906
Sum squared residual	1.831442	Log likelihood		38.41755
LR statistic	37.01138	Prob. (LR statistic)		0.000001

Source: Research data (2020)

5. Conclusions

The purpose of this study was to investigate how the Nairobi Securities Exchange valued the income and asset diversification of listed commercial banks. Based on the findings of the study, it is concluded that the securities market was efficient enough to account for diversification decisions in the market values of the commercial banks. With regard to valuation effects of diversification, the study found a non-linear relationship between asset diversification and market values as income diversification had a U-shaped nonlinear relationship with market valuation. This concurs with the argument in agency theory that diversification destroys value in the short run at least before the market players device a method of instilling corporate discipline among corporate managers (Goetz *et al*., 2013). The study also found an inverted U-shaped relationship between asset diversification and market values which confirms the valuation inertia anticipated in AMH based on environmental factors and heuristics formed by the players in the market (Lo, 2005). Finally, the study established a positive and significant effect of market power on the market values concurring with the observations by Natalia et al., (2016) and Ahmed and Iftekar (2008) who argue that the market places a valuation premium on large banks.

References

Ahmed, E. & Iftekar, H. (2008).The value relevance of product diversification in commercial banks. *Review of Accounting and Finance*, 7(1), 24-37.

Angus, A. & Tatiana, F. (2014). Bank Diversification and Valuation: International Evidence, *National Institute of Economic and Social Research*, Discussion Paper No. 438.

Baele, L., De Jonghe, O. & Vennet, R.V.L. (2007). Does the Stock Market Value Bank Diversification. *Journal of Banking & Finance*, 31, 1999-2023.

Baselgu-Pascual, L., Orden-Olasagasti, O. & Trujillo-Ponce, A. (2018). Toward a More Resilient Financial System: Should Banks be diversified? *Sustainability*, 10, (1903).

Chahine, S. (2007). Activity-based Diversification, Corporate Governance and the Market Valuation of Commercial Banks in the Gulf Commercial Council. *Journal of Management and Governance*, 11(4), 353-382.

Christiansen, W.A. & Pace, D.R. (1994). Relaxing the Glass-Steagall Act: Do Diversification Benefits Exist? *Journal of Financial and Strategic Decisions*, 7(3), 55-62.

Czado, C. (2004). Introduction to GLM's, TU Munchen.

Ebrahim, A., & Hasan, I. (2008). The Value Relevance of Product Diversification in Commercial Banks. *Review of Accounting and Finance*, 7(1), 24-37.

Elsas, R., Hackethal, A. & Holzhauser, M. (2010). The Anatomy of Bank Diversification. *Journal of Banking & Finance*, 34, 1274-1287.

Elyasiani, E., & Wang, Y. (2012). Bank holding company diversification and production efficiency. *Applied Financial Economics*, 22(17), 1409-1428.

Fama, E. (1965). The Behavior of Stock Prices. *Journal of Business*, 38, 34-35.

Field, A. (2009). Discovering statistics using SPSS for windows, (3rd Ed.). London: SAGE Publications.

Gambacorta, L., Scatigna, M. & Yang, J. (2014). Diversification and bank profitability: a nonlinear approach. *Applied Economics Letters*, 21(6), 438-441.

Gande, A., Schenzler, C. & Senbet, L.W. (2009). Valuation Effects of Global Diversification. *Journal of International Business Studies*, 40, 1515-1532.

Garrido, J. & Zhou, J. (2006). Credibility Theory for Generalized Linear and Mixed Models. Technical Report 5/06. Concordia University. Department of Mathematics & Statistics, Montreal.

Garrido, J. & Zhou, J. (2009). Full Credibility with Generalized Linear and Mixed Models. *ASTIN Bulletin*, 39(1), 61-80.

Goetz, R.M., Laeven, L. & Levine, R. (2013). Identifying the Valuation Effects and Agency Costs of Corporate Diversification: Evidence from the Geographic Diversification of U.S. Banks. *The Review of Financial Studies*, 26(7), 1787-1823.

Guerry, N. & Wallmeier, M. (2017). Valuation of Diversified Banks: New Evidence. *Journal of Banking and Finance*, 80, 203-214.

Hughes, J.P., Jagtian, J., Mester, L.J. & Moon, C. (2018). Does Scale Matter in Community Bank Performance? Evidence Obtained by Applying Several New Measures of Performance. *Federal Reserve Bank of Philadelphia*: Working Paper 18(11).

Jensen, C. M. (1986). Agency Costs of Free Cash Flow, Corporate Finance and Takeovers. *American Economic Review*, 76(2), 323-329.

Jensen, C. M. & Meckling, H. W. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3, 305-360.

Lin, S.L. (2010). Bank international diversification on home bias, profitability and risk: Evidence from emerging and industrial countries. *Africa Journal of Business Management*, 4(17), 3817-3836.

Lo, A.W. (2004). The Adaptive Market Hypothesis. *The Journal of Portfolio Management*, 30(5), 15-29.

Lo, A.W. (2005). Reconciling Efficient Markets with Behavioral Finance: The Adaptive Markets Hypothesis. *The Journal of Investment Consulting*, 7(2), 21-44.

Montgomery, C. A. (1994). Corporate Diversification. *Journal of Economic Perspectives*, 8(3), 163-178.

Mulwa, J.M. (2018). Sectoral Credit Diversification, Bank Performance and Monitoring Effectiveness: a cross-country analysis of East African Banking Industries. *Journal of Finance and Investment Analysis*, 7(2), 17-36.

Mulwa, J.M. & Kosgei D. (2016). Commercial Bank Diversification and Financial Performance: The Moderating Role of Risk. *Journal of Finance and Investment Analysis*, 5(2), 31-52.

Mulwa, J.M., Tarus D.K. & Kosgei D. (2015). Commercial Bank Diversification: A theoretical Survey. *International Journal of Research in Management & Business Studies*, 2(1), 45-49.

Natalia, Kurniawan M.R., & Firsty R.R. (2016). Bank Income Diversification from a Stock Market Perspective: Evidence from ASEAN+3. *Indonesian Capital Market Review*, 8, 32-45.

NSE (2016). NSE 2015-16 Investors Handbook. Nairobi Securities Exchange

NSE (2018). NSE 2017-18 Investors Handbook. Nairobi Securities Exchange

Olo, O. (2009). Corporate Diversification and Firm Performance. *Manager: Current Economic Crisis*, 9, 39-51.

Sanya, S. & Wolfe, S. (2011). Can banks in Emerging Economies benefit from Revenue Diversification? *Journal of Financial Services Research*, 40, 79-101.

Sawada, M. (2011). How does the Stock Market value Diversification? Empirical Evidence from Japanese Banks. *Munich Personal RePEc Archive (MPRA)*, 45852.

Selcuk, E.A. (2015). Corporate Diversification and Firm Value: Evidence from Emerging Markets. *International Journal of Emerging Markets*, 10(3), 294-310.

Surowiecki, J. (1999). The Dumb Smart Market. *The Slate Magazine.*

Ugwuanyi, G.O., Ani, W.U., Ugwu, J.N. & Ugwunta, D.O. (2012). Impact of Corporate Diversification on the Market Value of Firms: A study of Deposit Money Banks Nigerian. *European Journal of Business and Management*, 4(8), 47-56.

Vo, X.V. (2017). How does the Stock market Value Bank Diversification? Evidence from Vietnam. *Finance Research Letters*, 22, 101-104.

Yuliani, Hadiwidjojo, D., Sudarma, M., & Solimun (2013). Diversification Linkage Model and Firm Performance: A Literature Review. *International Journal of Business and Behavioral Sciences*, 3(1), 36-42.