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Residential Mortgage Portfolio and Performance of Commercial Banks in Kenya

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Abstract

The purpose of this study was to investigate the relationship between residential mortgage portfolio, product innovation, firm characteristics and performance of commercial banks in Kenya. One of the specific objectives was to establish the effect of the relationship between residential mortgage portfolio and bank performance. The study was guided by the positivism philosophy and principles and adopted correlational descriptive research design. The study collected and utilized panel data from the annual residential mortgage surveys conducted by the central bank of Kenya (CBK) on commercial banks covering a 13-year period from 2006 to 2018. Secondary data was collected from the financial statements of commercial banks and Kenya Bankers Association database. Data was analyzed using descriptive and inferential statistics. Hypotheses were tested through the panel regression models and the Baron and Kenny (1986) approach. The results revealed that residential mortgage portfolio attributes, namely: portfolio quality and mortgage interest return, significantly influence bank performance. The study calls on bank managers to structure their mortgage portfolio quality and interest returns in a way that ensures better performance. Future studies should consider the use of residential mortgage portfolio as a composite variable based on tested methodologies for more insight on bank performance.

Keywords: Residential mortgage portfolio, Portfolio size, Portfolio quality, Mortgage interest return, Commercial banks.

Introduction

The loan portfolio of commercial banks is normally one of the largest assets on their balance sheet and the predominant source of income. Residential mortgage loans typically constitute a large portion of this portfolio and are one of the key assets in determining bank performance (Martins et al., 2014). The share of commercial banks' loan book in residential mortgages has grown in most countries and is high by historical comparison (Kearns & Woods, 2006). The strong growth in residential mortgage loans can be attributed to broadened Mortgage contracts and product innovation, among other factors (Gyntelberg et al., 2007). The volume and quality of mortgage loan portfolio held by banks is influenced by firm characteristics such as size, age and ownership (Haas et al., 2010). Gasper (2015) opines that as banks increase their investment in mortgage loans, any widespread shock that hits the property market can have a material

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impact on their performance. The turbulence observed in international financial systems post 2007 originating from mortgage markets illustrate the close relationship between the real estate sector and soundness of the financial sector (Koetter & Poghosyan, 2008).

Financial institutions hold diversified portfolio of loans in different categories with the objective of generating desired returns to their shareholders and to minimize the risk of default, aligned to the modern portfolio theory (Markowitz, 1952). Bank managers must therefore aim to invest the funds available to the organization in loan portfolios that balance the trade-off between optimum return and minimum risk in order to deliver value to the owners of the business. Agency theory (Jensen & Meckling, 1976) suggests that divorce of ownership and control in a firm often leads to conflict of interests between agents or managers and their principals who are shareholders of the firm. Bank managers, as agents, are involved in decisions on which loan products to invest in and the type of product innovations to undertake in order to maximize returns for their principals, the shareholders.

The mortgage market plays a crucial role in a country's economy due to its linkage with most macroeconomic variables and also as a determinant of stock market and banking sector performance (Kalra et al., 2000). Renaud (2004) posits that when the mortgage market is functioning well, it can act as a stimulant to economic growth and can positively impact the national economy through construction sector employment, efficient real estate development, capital market development, easier labour mobility, lower macroeconomic volatility and more efficient resource allocation. It can also generate a strong influence on investments, savings and consumption choices of households and businesses (Kalra et al., 2000). For individual households, buying a house normally involves a large financial outlay and usually requires long-term mortgage financing (Garriga & Hedlund, 2020). Residential mortgage markets are therefore an important contributor to household wealth accumulation and retirement strategy. Capital required for start-up businesses in many countries come from mortgage finance, since housing assets can be used as collateral for economic investment. Homeowners can also borrow against housing wealth through mortgage equity withdrawals (Chiquier & Lea, 2009).

The paper is anchored on Modern Portfolio Theory (Markowitz,1952). The theory asserts that investors seek to maximize utility and that individuals are risk averse and interested in optimal portfolios. A useful definition of the theory has been provided by Mangram (2013) who suggested that modern portfolio theory

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(MPT) is viewed as an investment framework for selecting asset portfolios by looking at how they contribute to the maximization of expected portfolio returns as well as the simultaneous minimization of portfolio risk. Portfolio management is necessary in lending institutions due to the need to optimize the benefits of diversification and at the same time mitigate the potential negative effects of concentration of risk in one industry, sector or borrower. Banks often pool together a large portfolio of loans with lower perceived risk of default in order to achieve the expected return (Heffernan, 2005). Fikru (2009) posits that commercial banks hold diversified loan portfolios in several categories such as real estate loans, agricultural loans, manufacturing loans, trade loans and personal/household loans. Such loans, being the major source of revenue, drive bank performance, though they are also associated with default and other inherent risks, which may result in non-performing loans.

Residential mortgage loans are usually a volatile component of the bank's loan portfolio and have a high potential to impact commercial bank performance (Davis & Zhu, 2009). Loan portfolio is also a major source of risk for financial institutions and can impact their safety and soundness. The composition of a bank's loan portfolio and its impact on performance is normally a debate between concentration and diversification strategies employed by the firm. Traditional banking theory supports loan portfolio diversification as it reduces the risk of bank failure and results in lower financial intermediation costs (Martins et al., 2014). Corporate finance theory however supports concentration strategy as banks can exploit the benefits of enhanced expertise and monitoring knowledge in a single or few sectors (Atahu, 2014). Concentration in residential mortgage loans by commercial banks, enhanced by use of product innovation, had reached a level that could result in undesirable impact on performance in the event of a significant downturn, as happened during the 2008 financial crisis (Igan & Pinheiro, 2010).

Residential mortgage loans have grown rapidly in the loan book of Kenyan commercial banks in recent years, both in value and number of loans, due to the growth in housing demand. Though this offers enormous opportunity for banks who issue mortgages to grow their loan book and improve their performance, the banking sector is at risk of over exposure to this asset. The ratio of mortgage NPLs to gross mortgage loans has been growing and had risen above the industry ratio by 2018, which demonstrates the increasing credit risk associated with the growth in mortgage loans, hence impact on bank performance. The mortgage industry in Kenya is also dominated by the large commercial banks, with 76.1 percent of the loans being originated by 6 banking institutions in 2018, 5 of which were from the large peer group (CBK

bank annual supervision report, 2018). This may be indicative of high risk for medium and small banks or barriers to entry (Odhiambo, 2015). The housing gap in Kenya is estimated at about 200,000 units per year (Giti et al., 2020). Expanding the mortgage portfolio of financial institutions can significantly contribute to bridging the housing gap that exist in the country. A World Bank survey conducted by Walley (2011) found potential for growth in the residential mortgage market in Kenya to Ksh 800 billion, which is about 13 times the existing size. Such growth could increase the ratio of mortgage debt to GDP from the existing 2.5 percent to 32.5 percent, which compares favorably to South Africa.

Previous studies have put significant attention on the interaction between banking institutions and the mortgage market prior to and post the 2008 mortgage triggered financial crisis. Allen et al. (1995), Martin et al. (2014) and Gasper (2015) confirm the existence of significant and positive relationship between the mortgage loan portfolio and performance of individual banking institutions. Majority of these studies however focus on mature mortgage markets in the US and Europe, and lately Asia, and therefore their results may not directly be applicable in emerging markets in Africa. A number of these studies are also cross country studies based largely on macroeconomic data, with less extant work based on firm level micro-data, and examined variables, time periods and target markets differ greatly.

In Kenya, mainstream academic research appears not to have given much consideration to the role of residential mortgage loan portfolio on the performance of banking institutions. Odhiambo (2015) based his study on a narrow sample of nine commercial banks listed on the NSE and concluded that real estate finance has no effect on the financial performance of commercial banks in Kenya. Abdulrehman & Nyamute (2018) however found a significant relationship between mortgage financing and financial performance of commercial banks in Kenya. Other studies on banking sector in Kenya have looked at the general determinants of financial performance (Ongore & Kusa, 2013) and financial performance from a credit risk perspective (Ogilo, 2012). This study focuses on residential mortgage portfolio and its impact on the performance of commercial banks in Kenya in order to fill the research gap which still exist. This study therefore attempted to resolve the following research question: What is the relationship between residential mortgage portfolio and performance of commercial banks in Kenya?

To address the above research question, the study tested the following null hypothesis:

H1: The relationship between residential mortgage portfolio and performance of commercial banks in Kenya is not significant. As residential mortgage portfolio was a non-composite variable, the following sub-hypotheses were tested:
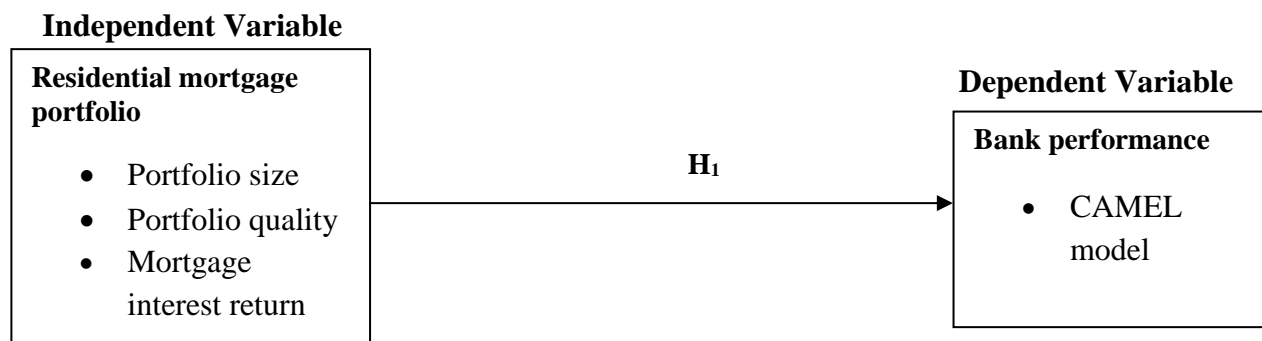
    H_{1a}: The relationship between mortgage portfolio size and performance of commercial banks in Kenya is not significant.

    H_{1b}: The relationship between mortgage portfolio quality and performance of commercial banks in Kenya is not significant.

    H_{1c}: The relationship between mortgage interest return and performance of commercial banks in Kenya is not significant.

The hypothetical relationships were as presented in Figure 1.

Figure 1: Conceptual Model.

Independent Variable

Residential mortgage portfolio
• Portfolio size
• Portfolio quality
• Mortgage interest return

H_1 →

Dependent Variable

Bank performance
• CAMEL model

Source: Author, 2021.

Methodology

Residential mortgage portfolio was divided into three sub-variables: portfolio size (the ratio of outstanding residential mortgage loans to total loans), portfolio quality (residential mortgage non-performing loans as a ratio of gross residential mortgage loans) and mortgage interest return (residential mortgage net interest margin (NIM)). Residential mortgage portfolio attributes were operationalized as non-composite variables in accordance with studies by Chen (2015), Martins et al. (2014), Misra and Aspal, (2013) and Allen et al. (1995). Performance measure was based on a composite CAMEL model, consisting of five attributes

namely capital adequacy, asset quality, management capacity, earnings and liquidity. The composite CAMEL model measure was adopted from Kabir and Dey (2012) and Ondigo (2016).

This was a census study and the focus population was therefore all the licensed banks and mortgage finance companies which were operating in Kenya during the study period. Choice of banking institutions was guided by the fact that they are the main originators of mortgages in the formal sector. The first survey conducted by CBK, in collaboration with the World Bank, collected baseline data on residential mortgages for the period 2006 to 2010, with CBK annual surveys continuing thereafter. This informed the choice of 2006 to 2018, a period of 13 years, as the study period. The study generated descriptive statistics to provide a bird's eye view of the general data applied in the study and panel data diagnostic tests, which included Hausman test to check for model suitability. Pearson's correlation analysis was done to ascertain the degree of the linear relationship among the variables. Panel regression models was applied to determine the nature and magnitude of the relationships between the study variables and to test the relationships that were hypothesized.

The predicting models tested were stated as below:

$$CAM_{it} = \alpha + \beta_1 PS_{it} + \varepsilon_{it}$$

$$CAM_{it} = \alpha + \beta_1 PQ_{it} + \varepsilon_{it}$$

$$CAM_{it} = \alpha + \beta_1 IR_{it} + \varepsilon_{it}$$

Where:

CAM_{it} = Performance of bank i at time t, measured by CAMEL composite ratio of performance that was measured as a geometric mean of the CAMEL attributes

α = Intercept or constant

β_1 = regression coefficients

PS = Portfolio size measured by the ratio of outstanding residential mortgage loans to
  bank total loans

PQ = Portfolio quality, represented by the ratio of non-performing residential
  mortgage loans to gross mortgage loans

IR = Interest return, measured as mortgage net interest margin

ε = The error term that accounts for the unexplained variations

In estimation, the dependent variable was CAMEL whereas the mortgage portfolio dimensions (portfolio size, portfolio quality and portfolio interest return) were used as the independent variables. The model selection statistics were considered and as can be observed (Table 1 below), both random-effects and fixed-effects models were employed in estimating the predicting models. This was based on the Hausman model selection statistics. Model 1 tested sub-hypothesis H_{1a} while model 2 tested sub-hypothesis H_{1b} and model 3 tested sub-hypothesis H_{1c}. The first two models (model 1 and 2) were estimated via random-effects model (Model 1; Hausman Chi2=1.55, Prob>chi2=0.2129; and model 2; Hausman Chi2=0.80, Prob>chi2=0.3716) whereas the third model was estimated via fixed-effects model (Hausman Chi2=4.45, Prob>chi2=0.0350). From the model fitness statistics, the overall model (model 1) was not significant (since overall p-value of 0.4193 was more than 0.05). On the other hand, the overall model(s) (model 2 and 3) were found to be significant (since overall p-values of 0.0000 and 0.0207 respectively were less than 0.05). This meant that the data fitted these models well. The overall R-squared for the three models (model 1; R2=0.0051, model 2; R2=0.0981 and model 3, R2=0.0039) were all small values, however, this is expected mostly in panel data regression (Orayo & Mose, 2016). The findings are as shown in Table 1.

Table 1: Panel Regression Analysis between Residential Mortgage Portfolio and Performance of Commercial Banks

Robust Models	Model 1- (PS & CAMEL)		Model 2- (PQ & CAMEL)		Model 3- (IR & CAMEL)	
Variable						
	β	P-Value	β	P-Value	β	P-Value
Portfolio Size (PS)	0.2886 (0.81)	0.419	-	-	-	-
Portfolio Quality (PQ)	-	-	1.5856 (4.71)	0.000	-	-
Interest Return (IR)	-	-	-	-	0.0556 (2.41)	0.021
Constant	-1.8354 (-40.35)	0.000	-1.8814 (-46.96)	0.000	-2.067 (-24.05)	0.000
Model selection statistics	Hausman Chi2=1.55 Prob>chi2=0.2129		Hausman Chi2=0.80 Prob>chi2=0.3716		Hausman Chi2=4.45 Prob>chi2=0.0350	
Model Fitness statistics	Random-effects GLS regression Number of obs = 369 R-squared: 0.0051 Wald chi2(1) = 0.65 Prob>chi2= 0.4193		Random-effects GLS regression Number of obs = 367 R-squared: 0.0981 Wald chi2(1) = 22.14 Prob>chi2= 0.0000		Fixed-effects (within) regression Number of obs = 344 R-squared: 0.0039 F (1,38) = 5.83 Prob > F= 0.0207	

t-statistic – Values in parenthesis
Source: Research Findings 2021

In testing the first sub-hypothesis, the study assessed the relationship between mortgage portfolio size and performance. As presented in Table 1 above, in the first model (Model 1), the findings show that the positive relationship between mortgage portfolio size and performance of commercial banks is not statistically significant (β= 0.2886, p>0.05). The following is the resulting estimated model:

$$CAM_{it} = \text{-}1.8354 + 0.2886PS_{it}$$

The result infers that a unit increase in mortgage portfolio size leads to a non-significant increase in performance by 28.9 percent, holding other factors constant. Based on the finding, the study failed to reject the first sub-hypothesis (H_{1a}) which stated that *the relationship between mortgage portfolio size and performance of commercial banks in Kenya is not significant.*

To assess the second sub-hypothesis, the study examined the relationship between portfolio quality and performance of commercial banks in Kenya. In the second model (Model 2), the findings show that the positive relationship between mortgage portfolio quality and performance of commercial banks is statistically significant (β= 1.5856, p<0.05). The following is the resulting estimated model;

$$CAM_{it} = \text{-}1.8814 + 1.5856PQ_{it}$$

The finding implies that a unit rise in mortgage portfolio quality leads to a significant increase in performance by 158.5 per cent holding other factors constant. Based on the finding, the study rejected the second sub-hypothesis (H_{1b}), which stated that *the relationship between mortgage portfolio quality and performance of commercial banks in Kenya is not significant.*

Further, to assess the third sub-hypothesis, the study analyzed the relationship between mortgage interest return and performance of commercial banks in Kenya. In the third model (Model 3) the findings show that the positive relationship between mortgage portfolio interest return and performance of commercial banks is statistically significant (β= 0.0556, p<0.05). The following is the resulting estimated model:

$$CAM_{it} = \text{-}2.0666 + 0.0556IR_{it}$$

The finding implies that a percentage rise in mortgage portfolio interest return leads to a significant increase in performance by 5.6 percent, holding other factors constant. Based on the finding, the study rejected the third sub-hypothesis (H_{1c}) which stated that *the relationship between mortgage portfolio interest return and performance of commercial banks in Kenya is not significant.*

Findings and Discussions

The specific objective of the study was to establish the relationship between residentialmortgage portfolio and performance of commercial banks in Kenya. Residential mortgageportfolio affected the performance

of banks through mortgage portfolio size, mortgage portfolio quality and mortgage interest return. The study hypothesized that the relationshipbetween residential mortgage portfolio attributes and performance is not significant.Detailed results are presented in Table 1. The findings showed that mortgage portfolio size has a positive and statistically insignificant relationship with bank performance whereas mortgage portfolio quality and interest return bothhave a positive and statistically significant relationship with performance. This suggests that portfolio size has no impact on the performance of commercial banks in Kenya, whereas improvement in mortgage portfolio quality and mortgage interest return generates a positive and significant impact on bank performance.

On portfolio size, the finding is consistent with a previous research by Odhiambo (2015) who looked at the impact of property on the performance of commercial banks listed on the NSE and concluded that there was no significant impact. The finding however contradicts a study by Abdulrehman & Nyamute (2018) who looked at the effect of mortgage financing on the financial performance of commercial banks in Kenya and established a significant relationship. Studies by Martins et al. (2016) and Allen et al. (1995) established a significant relationship between bank performance and mortgage portfolio size for banks that hold a sizeable portfolio of mortgage loans. In this study, the descriptive statistics established that commercial banks in Kenya hold an average of 9% of their total loans in the form of residential mortgages, which is relatively low compared to more developed markets and may explain the insignificant relationship between mortgage portfolio size and bank performance.

The finding on mortgage portfolio quality implies that improvements in portfolio quality results in better performance for banks. A higher portfolio quality is synonymous with good credit standards and, therefore, higher profitability. Igan and Pinheiro (2010) found a strong link between portfolio quality and performance of banks in a study of the determinants of delinquency on real estate loans and potential impact on banks' performance in the USA. Another possible explanation for the significant effect of mortgage portfolio quality on bank performance is found in Onchomba et al. (2018) who linked this to the risk and its impact on bank income. Accordingly, they state that loan portfolio quality represents the loan portfolio at risk of non-payment by clients and this affects bank income. An increase in loan portfolio quality will lead to an increase in income due to reduced mortgage losses. This has the effect of improving the performance of commercial banks. Hence, the study concluded that higher mortgage portfolio quality may serve to create a circle of positive performance for the banks in the short-run as well as the long-run.

The finding on mortgage interest return is consistent with Misra and Aspal (2013), Memmel (2014) and Abdulrehman & Nyamute (2018) who found a positive and significant relationship between interest income and bank performance. The positive impact of mortgage interest rates on performance suggests that banks in Kenya have mortgage net interest income that is positive.

Conclusions and Recommendations

Based on the first null hypothesis (H_1) test, the study concluded that residential mortgage portfolio significantly affects performance of banks licensed and operating in Kenya. This implies that commercial banks that increase their residential mortgage portfolio are more likely to have better performance. Results of the study also confirmed that, of the components of residential mortgage portfolio, mortgage portfolio quality have the highest contribution to performance of commercial banks followed by mortgage interest return.

Portfolio size have no contribution to bank performance. This finding provides evidence that interest income with respect to the banks' residential mortgage portfolio hold a positive contribution to improving performance of banks. The effect on bank performance is strongest through mortgage portfolio quality, perhaps in part because the non-performing mortgage loans level is observed at an average of 5.4%, with significant increase noted in the latter period of the study. The finding therefore suggests that for improvement in performance of commercial banks to occur, the mortgage portfolio contributions through portfolio quality and interest return should be ensured through sound credit management practices.

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