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Residential Mortgage Default Risk and Market Returns of Public Mortgage Originator Firms in Kenya

Abstract
The mortgage market plays a vital role in the development of the real estate sector. The mortgage industry in Kenya has experienced tremendous growth since the year 2000. Despite this growth, Kenya's mortgage debt to GDP ratio is still relatively low when compared to other economies like South Africa. Default risk has been revealed as one of the risks that significantly impacts on the profitability of mortgagees. However, literature is inconclusive with reference to the relationship between default risk and the market returns of mortgage firms. Consequently, this study sought to determine the extent to which residential mortgage default risk influences the market returns of publicly listed mortgage firms in Kenya. Default risk in this case was measured using the non-performing loans ratio: the ratio of non-performing residential mortgage loans to total residential mortgage loans and advances. The study adopted descriptive and quantitative forms of research design. A census was conducted on the eleven NSE listed mortgage originating firms. A panel data regression model was utilized to draw inference from the secondary data collected. Descriptive statistical findings revealed a mean of 0.0796 with a standard deviation of 0.04219 for residential mortgage default risk. Inferential statistics revealed an R square value of 0.2794 between residential mortgage default risk and market returns of publicly listed mortgage originators. In addition, there was significant effect between default risk and the market returns of public mortgage originators. Consequently, mortgagees should develop strategies of reducing non-performing loans. For instance, mortgage firms can improve their credit rating

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systems.

Keywords: Mortgage Financing, Real Estate, Market Returns, Default Risk

Subject: Marketing, Economics

1. Introduction

Venturing in real estate development, be it residential or commercial – requires a huge amount of capital investment (Long, 2011). According to Sirota (2004), mortgage financing is one of the financing options that can be utilized by investors venturing into real estate development. Mortgage financing comes with high risk implications for both the mortgagee and the economy (Sirota, 2004; Long, 2011). For the economy, Lang and Jagtiani (2010), identified the housing market crisis particularly in the mortgage market in the US as the main onset cause of the 2007-2008 global financial crisis. Similarly, Acharya and Richardson (2009) argue that mortgage risk is one of the major factors that significantly contributed to the global financial crises in 2007. According to Shiller (2012), the 2007 financial crisis in the US can be traced back to the mortgage origination process. This suggests that there are various risks that arise during the mortgage origination process. In the same vein, Demyanyk and Hemert (2011) argue that for six consecutive years before the global financial crisis the quality of mortgage loans deteriorated. They attributed this to poor vetting mechanisms – poor mortgage origination processes – by mortgage originators. For the mortgagee, Barth (2009) notes that mortgagees whose borrowers default face the following risks: loss of the principal, interest, and higher collection costs.

According to Cusatis and Thomas (2005), mortgagees have a number of options when it comes to closed mortgage loans. For instance, they can securitize the mortgage by issuing debt with the mortgage payment as collateral, they can keep them in their portfolio, or they can sell the loans to a third party. However, Taff (2003) argues that mortgage firms which face the highest risk are those that maintain mortgage portfolios till they mature. This is attributed to the fact that the risk of default by mortgagors is not transferred to a third party.

Default risk is also referred to as credit risk (Apostolik & Donohue, 2015). It is the likelihood that a borrower will not be able to meet their payment obligations when they fall due. According to Apostolik and Donohue (2015), creditors and lenders are exposed to credit risk on every form of credit extension. Mortgage originators whose borrowers default face the following risks: loss of the principal, interest, and higher collection costs. According to Barth (2009), mortgage risk encompasses the risk from the mortgage origination stage to when the mortgage is fully settled by the mortgagor.

There are a number of conflicting theories that explore the concept of credit risk management. For instance, application of the title theory by

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mortgage originators can be applied to significantly manage default risk. However, mortgage originators default risk cannot be significantly reduced through the application of the lien theory. In addition, mortgage securitization is a tool that can also be used to manage credit risk. Despite the applicability of these theories, industry performance of mortgage originators is still adversely affected by default risk. Empirical literature is similarly inconclusive with reference to managing default risk. For instance, Wu, Li and Hong (2017) carried out a study whose findings revealed that default risk significantly influences the financial performance of financial institutions. However, a study by Kithinji (2010) gave contrary findings. In addition, literature is inconclusive with reference to the relationship between default risk and market returns.

Kenyan mortgage originators hold the mortgages they sell to borrowers in their portfolio (Mwaniki, 2017). However, various mortgage originators in the Kenyan market are in talks with the Capital Markets Authority (CMA) and the Nairobi Securities Exchange (NSE) to introduce mortgage-backed securities in Kenya's capital market (Mwaniki, 2017). For this reason, they face more risks in addition to mortgage origination risks. One of additional risks mortgage firms encounter is default risk. For instance, Housing Finance Group Limited reported a figure of Ksh. 5 billion for non-performing loans in the financial year ending 2015 (Wasuna, 2016). Similarly, Njiraini and Anyanzwa (2018) identify increase real estate loan defaulting and mortgage defaults as one of the main contributors to high non-performing within commercial banks and financial institutions in Kenya. It is against this backdrop that this study sought to find out the extent to which residential mortgage default risk influences the market returns of publicly listed mortgage originating firms in Kenya.

This study is likely to be of significance to the following stakeholders: theoretical literature, empirical literature, mortgage originators, and investors. For theoretical literature, the study is likely to reveal the applicability of title and lien theory to the mortgage industry in Kenya. Subsequently, theoretical modeling relating to mortgage financing can be enhanced and developed. In addition, the existing body of knowledge and literature has been enhanced since the study bridges the empirical gap relating to the relationship between default risk and market returns of mortgage firms. The study findings are also likely to motivate mortgage firms to better manage their default risk in order to improve their market returns. Furthermore, investors can utilize the study findings to make better and more informed investment decisions relating to mortgage firms.

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II. Literature Review and Hypothesis

The title theory was propagated from the lawful interpretation of contracts as developed by Williamson Evers and Murray Rothbard. The title theory states that the borrower (mortgagor) transfers title of a property to the lender (mortgagee) who holds title to the property until the mortgage is paid off; at which time title passes to the borrower (Karp & Klayman, 2003). The financier holds title to the property as a collateral and the title is only transferred to the borrower when he/she clears all payments due. However, title of the property remains with the borrower of the mortgage – according to the lien theory. However, the mortgage becomes a lien on the property. In this case, it becomes difficult for the lender to foreclose the property because it does not hold the title to the property (Karp & Klayman, 2003).

Bhattarai (2016) carried out a study in Nepal which sought to determine the influence of credit risk on the financial performance of commercial banks. The study adopted a descriptive and causal comparative form of research design. The study sampled Nepalese banks for the period between 2010 and 2015. The study used the regression model to analyze the financial statements from 14 banks. The findings revealed that non-performing loan ratio has a negative influence of the financial performance of banks.

Similarly, Davis and Zhu (2009) conducted a study that sought to determine the relationship between commercial property prices and bank performance. The study sourced its data from various banks in industrialized economies. The findings revealed that there is a positive relationship between these two variables. However, the findings of the study revealed that there was a negative relationship between commercial property price and bad loan ratios and net interest margin.

Mayer, Pence and Sherlund (2009) conducted a study which sought to identify the factors that cause a rise in rates of mortgage defaults. The study identified the following as the causes of rise in mortgage default: poor underwriting standards, decline in property prices, and rise in loan-to-value ratios. Mayer *et al.* (2009) argue that poor underwriting standards are the major cause of rise in mortgage default rate. Consequently, they argue that when mortgage firms implement proper underwriting standards mortgage default rates should decline significantly.

Similarly, Wu, Li and Hong (2017) conducted a study which sought to determine causes of defaults among home mortgages. The study identified the following as the factors which cause default among home mortgage borrowers: terms of lending contract, characteristics of the borrowers, and macroeconomic factors. Wu *et al.* (2017) argue that mortgage lenders need to

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adopt effective credit risk management techniques in order to effectively manage their default rate which can adversely affect their profitability.

Ntiamoah *et al*. (2014) carried out a study which sought to determine the influence of default loan rate on financial institution financial performance. The study adopted by a quantitative and qualitative research design. The study sourced its data from various microfinance institutions in the Republic of Ghana. Correlation and regression models were utilized to draw inference from the data collected. The study findings revealed a significant positive correlation between profitability and loan default rate.

Alshatti (2015) conducted a study to determine the influence of credit risk management on the financial performance of Jordanian banks. The study sourced its data from 13 Jordanian banks. The study sourced for panel data from the financial statement reports 2005-2013 of 13 Jordanian banks. A panel regression model was utilized to draw inference from the data collected. The findings of the study revealed that there is a positive relationship between credit risk indicators of non-performing loans on bank profitability. Alshatti (2015) argues that financial institutions should enhance their credit risk management abilities in order to increase their financial performance.

Canepa and Khaled (2018) conducted a study in a number of countries whose main objective was to identify the relationship between various housing market variables and credit risk. The study identified the following as some of the determinants of credit risk in housing markets: house or real estate prices, financial liberalization, regulations in the property market, and macroeconomic variables. Canepa and Khaled (2018) argue that decline in property prices has the effect of reducing the quality of banks' assets which in turn affect their lending capacity. In addition, decline in property prices has the effect of lowering the value or quality of securities held by financial institutions in terms of real estate. In addition, financial liberalization of the mortgage industry significantly affects both the credit risk of financial institutions and the housing market (Canepa & Khaled, 2018). For instance, financial liberalization within the mortgage industry could result in increased competition, new risky opportunities for mortgage firms, and poor vetting mechanisms for clientele. Regulations in the real estate market in terms of government policy can have adverse effects on real estate and mortgage financing, all of which can result in increase in non-performing loans by financial institutions and mortgage firms. According to Canepa and Khaled (2018), expansionary and contractionary business cycles within an economy significantly influence the real estate sector which in turn affects non-performing loans within financial institutions.

In Kenya, Muriithi, Waweru and Muturi (2016) conducted a study which sought to examine the influence of default risk on the performance of banks. Credit risk was measured by loan loss provision, asset quality, capital

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to risk weighted assets, and loan and advance ratios. The study derived its data from 43 registered banks. According to Muriithi *et al.* (2016), default risk has a negative effect on bank financial performance. The study recommended that banks should adopt thorough credit analysis and have clearly outlined credit policies in order to manage non-performing loans.

Kauna (2016) carried out a study in Kenya which sought to determine the influence of credit risk management on bank financial performance. The study noted that default risk was one of the major precipitates of financial institution failure. The study obtained financial statements from 39 commercial banks for the period 2011-2015. Data was analyzed using a regression model. Findings revealed a positive relationship between credit risk monitoring and credit risk identification and bank financial performance. According to Kauna (2016), banks can significantly enhance their financial performance by managing credit risk.

Muguchia (2012) carried out a study which sought to examine the influence of flexible interest rate on the growth of mortgage financing in Kenya. The study collected its data from 26 commercial banks and HFCK. The study findings identified non-performing loans as one of the factors which negatively influenced mortgage financing.

However, various studies contradict this findings. Kithinji (2010) carried out a study in Kenya which sought to determine the influence of credit risk management on the financial performance of Kenyan banks. The study sourced its data from banks for the period ranging 2004 and 2008. A regression model was utilized to draw inference from the data collected. The findings of this study revealed that there was no significant relationship between the level of non-performing loans and bank profitability.

On the contrary, Kipyegon and Matanda (2019) conducted a study in Kenya which sought to determine the relationship between mortgage uptake and volatility of interest rates. The study adopted a descriptive form of research design. The target population for the study was 44 commercial banks. The study utilized both primary and secondary data collection techniques to source for data. The findings revealed that mortgage uptake is significantly influenced by inflation rate, loan demand, and gross domestic product. However, findings revealed that credit risk has an insignificant effect on mortgage uptake.

Empirical literature focuses on the influence of default risk on the financial performance of financial institutions. However, literature is inconclusive with reference to the relationship between default risk and market return. Consequently, the H_{01} for the study was: Residential mortgage default

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risk has no significant effect on market returns of publicly listed mortgage originators in Kenya.

III. Methodology

The study adopted a descriptive form of research design. A quantitative research approach was further utilized. The target population for the study was the eleven NSE listed mortgage originating firms. These were selected because they form the majority share of Kenya's mortgage market. The eleven mortgage originating firms listed at the NSE were: Barclays Bank Limited, The Co-operative Bank of Kenya Limited, Diamond Trust Bank Kenya Limited, HF Group Limited, I&M Holdings Limited, KCB Group Limited, National Bank of Kenya Limited, NIC Bank Limited, CFC Stanbic Holding Limited, and Standard Chartered Bank Kenya Limited. A census was conducted on the target population. Secondary data was utilized to validate the study's research hypothesis. Secondary data for the period 2007 to 2017 was sourced from: CBK bank supervision reports, and the NSE. A panel data regression model was utilized to draw inference from the data collected. The statistical software STATA and SPSS were utilized for statistical analysis.

Default risk in this case was measured using: the non-performing loans ratio. The non-performing loans ratio was measured as the ratio of non-performing residential mortgage loans to total residential mortgage loans and advances.

$$Non-Performing\ Loans\ Ratio = \frac{Non-Performing\ Residential\ Mortgage\ Loans}{Total\ Residential\ Mortgage\ Loans\ and\ Advances}$$

Below is the representation of the model for the study:

$$Y_i = \beta_0 + \beta_1 X_{1,t} + \varepsilon_i$$

β_1, represent the specific beta coefficient. X_1 represents default risk. ε_i represents the error term in the model. β_0 represents the constant while Y_i represents market returns. Stock market return refers to the returns that stockholders generate out of securities they hold in the stock market (Johnson, 2014). Knight and Bertoneche (2000) argue that stock market return can be measured in terms of dividends and gains made from changes in stock market prices. In this case, stock market return was measured from stock market prices. Market return was measured using the ratio displayed below.

$$Market\ Return = \frac{Ending\ Price - Starting\ Price}{Starting\ Price}$$

The study carried out two diagnostic tests: the Hausman Specification Test and the normality test. The Hausman specification test was carried out to determine which of the two panel data regression models – Random Effect

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Model (REM) or Fixed Effects Model (FEM) to use. The normality test was carried out to determine if the data for the study variables had a normal distribution. The results from the two diagnostic tests would determine if the assumptions of panel data regression model were satisfied.

IV. Findings and Discussions

Table 1: Descriptive Statistics

	N	Mean	Std. Deviation	Coefficient of Variation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Default Ratio	121	.0796	.04219	53.00251	.828	.220	.019	.437
Expected Market Return	121	.0905	.04198	46.38674	.484	.220	.659	.437
Valid N (listwise)	119							

From the findings presented in Table 1, the mean for residential mortgage default risk for the eleven NSE listed mortgage originating firms was 0.0796 with a standard deviation of 0.04219. This suggests that the average residential mortgage default risk for mortgage loans for publicly listed mortgage originators stands at 7.96%. Table 1 further reveals the average for market return for the eleven firms was 0.0905 with a standard deviation of 0.04198. This suggests that the average market return for publicly listed mortgage originators is 9.05%. In addition, the standard deviation results - 0.04219 – suggest that the variation of residential mortgage default risk among public mortgage originators is not overly dispersed. Thus, residential mortgage default risk is a major concern to all publicly listed mortgage originators. Similarly, the standard deviation results for the variation of market return among public mortgage originators - .04198 – is not overly dispersed.

Table 1 further presents the skewness of the residential mortgage default risk and market return frequency distributions as 0.828 and 0.484 respectively. Deep (2006) argues that symmetric distributions (normally distributed) have a skewness of zero. This suggests that the frequency distribution for default risk and market return does not significantly deviate away from a normal distribution. Findings presented in Table 1 further reveals a coefficient of variation and kurtosis of 53.00251 and .019 respectively. In addition, the findings further revealed a coefficient of variation of 46.38674 for the market returns of public listed mortgage originators in Kenya.

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Table 2: Test of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Default Risk	.229	121	.501	.898	121	.079
Market Return	.227	121	.067	.884	121	.064

Table 2 presents the results for the test of normality for the data collected. Gray (2016) argues that a sig. value of more than 0.05 for the Kolmogorov-Smirnov test signifies normality in a distribution. Thus, the study variables – default risk and market return – had a sig value of more than .05 which suggests that the two study variables were normally distributed. In this light, a panel data regression model could be utilized to analyze the secondary data collected. This is based on the fact that the data collected satisfied the normality assumption in a panel data regression model. In addition, the study carried out a Hausman Specification Test. Based on the results from the test, the Random Effect Panel Model (REM) was utilized.

Table 3: Panel Model Modelling for the effect of Default Ratio on Market Return

```
------------------------------------------------------------------------------
Random-effects GLS regression                   Number of obs      =       121
Group variable: panels                          Number of groups   =        11

R-sq:  within  = 0.2488                         Obs per group: min =        11
                                                              avg =      11.0
       overall = 0.2794                                       max =        11

                                                Wald chi2(1)       =     40.06
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0078
------------------------------------------------------------------------------
MarketReturn |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
DefaultRatio |  -.4852519   .0766681    -6.33   0.000     .3349851    .6355186
       _cons |   .4789169   .1011164     4.74   0.000     .2807324    .6771015
-------------+----------------------------------------------------------------
                             sigma_u |  .31404091
                             sigma_e |  .18972361
                 rho |  .73261091   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Table 3 above presents the bivariate regression results on the effect of residential mortgage default risk on the market returns of publicly listed mortgage originators. The findings reveal an R square value of 0.2794 between residential mortgage default risk and market returns of publicly listed mortgage originators. This suggests that 27.94% of variation in market returns for publicly listed mortgage originators is explained by residential mortgage default risk. Table 3 further presents the beta coefficient with reference to the effect of residential mortgage default risk on market returns of publicly listed mortgage originators. The findings reveal a beta coefficient of -0.4852519. This implies that a unit change in residential mortgage default risk will cause a decrease of -0.4852519 in market returns for public mortgage originators.

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Table 3 further reveals a significance value of .000 which is less than .05. This suggests that residential mortgage default risk has a significant effect on the market returns of publicly listed mortgage originators. Thus, we reject the study's null hypothesis (H_{01}) – Residential mortgage default risk has no significant effect on market returns of publicly listed mortgage originators in Kenya. Consequently, we accept the alternative hypothesis which states that residential mortgage default risk has a significant effect on the market returns of public mortgage originators.

From the findings of the study, residential mortgage default risk has a significant effect on the market returns of publicly listed mortgage originators. Similarly, Onchomba, Njeru and Memba (2018), conducted a study whose findings revealed that real estate loans have a positive impact on bank profitability. However, this relationship is significantly impacted by the rate of default risk. Similarly, Ajayi (1992) carried out a study in Nigeria whose findings revealed that default risk significantly influences the financial performance of mortgage firms. The study further revealed the following as some of the factors that influence default risk: borrower's age, market value of property, monthly repayment amounts, annual income of borrower, and loan to value ratio. In China, Isanzu (2017) conducted a study on China's five largest banks for a period between 2008 and 2014. The study sought to determine the influence of default risk on bank financial performance. Credit risk was measured using: loan impaired charges, impaired loan reserve, capital adequacy ratio, and nonperforming loans. The study utilized a balanced panel data regression model to draw inference from the data collected. The findings revealed that non-performing loans significantly impact of bank financial performance. Similarly, findings are proposed by Noor and Abdalla (2014) who argues that credit risk significantly influences firm financial performance.

Conclusion

Existing literature focuses on the relationship between default risk and the financial performance of financial institutions. Empirical literature – Bhattarai (2016), Wu *et al*. (2017), Isanzu (2017), Ajayi (1992), Muriithi *et al.* (2016), and Njeru and Memba (2018) reveals that default risk has a significant negative influence on the financial performance of financial institutions. However, literature has been inconclusive with reference to the relationship between default risk and market returns for mortgage firms. Consequently, the overall objective of this study was to determine the relationship between default risk and market returns for publicly listed mortgage originators in Kenya.

From the findings of the study, it was evident that residential mortgage default risk has a significant effect on the market returns of publicly listed mortgage firms. In addition, the relationship between default risk and market

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return had a negative beta coefficient. This implies that default risk negatively influences the market returns for public mortgage firms in Kenya. As a result, mortgage originators should develop strategies of reducing their non-performing loans in order to buffer against variations in their market returns. For instance, mortgage firms can improve their credit rating systems to only offer mortgage products to clients with good credit ratings. In addition, mortgage firms can implement the recommendations of the title theory. Mortgage firms can further securitize their assets and pass the risk to third parties.

The findings of the study can be regarded as limiting based on the fact that the study sample does not constitute of all the mortgage originators within the Kenyan market. The study only sampled publicly listed financial institutions offering residential mortgages. However, there are other mortgage originating firms that offer residential mortgages which are not listed at the NSE. The study recommends the following area for further studies: effectiveness of credit risk management strategies adopted by mortgage firms.

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