Do Mergers and Acquisitions Impact Bank Lending Behavior in Kenya?

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Abstract

This paper examines the impact of bank merger and acquisitions (M&As) on lending behavior by commercial banks. We employ a dataset of 31 sample Kenyan commercial banks over the period 2003 to 2015. Further we employ panel data models as well as difference-in-differences (DID) to explain the effects of mergers on loan pricing behavior and credit supply. The empirical analysis document evidence to the effect that bank M&As lowers lending rates besides increasing loan supply. These results imply that merged banks can obtain synergy gains and can pass these gains to their customers in form of reduced lending rates and increased credit availability. However, regulators need to carefully balance between the efficiency gains of M&As vis-à-vis the possible costs of increased market power that results from the merger activities.

1.0 Introduction

Commercial banks have a fundamental role in the economic development of a country. Particularly, banks facilitate the flow of credit from surplus-fund sectors to fund-deficient sectors. This intermediation role facilitates investment which then leads to increased economic growth. Consequently, changes in bank lending behavior can have far reaching multiplier effects in the economy. Banks alter their lending decisions in response to changing bank market structure. One of the issues that can potentially trigger changes in banking market structure is bank mergers and acquisitions (M&As). Bank M&As may either increase market concentration thereby increasing monopoly tendencies, or alternatively result in efficiency benefits for the consolidated banks. Overall, whether bank mergers increase welfare of society is an empirical question.

Beyond understanding whether M&As are beneficial or not, policy makers are often keen to understand whether bank mergers' benefits are social or private. For example, do merger effects benefit only the participating banks or some benefits are passed to borrowers? The consequences of bank consolidations on borrower welfare have often been examined from two perspectives: loan pricing and loan availability. The link between M&As and bank lending outcomes rests on two opposing hypotheses: the structure-conduct-performance (SCP) hypothesis and the efficient-structure-performance (ESP). The SCP hypothesis argues that merged banks who gain overall market power may collude and use their dominance to set unfavorable prices for borrowers. Thus, the resulting concentration after mergers adversely affect borrower welfare. The ESP hypothesis on the other hand posits that the concentration that results after the M&A process would increase overall efficiency which will allow the merged banks to price their services more competitively thereby benefiting borrowers.

Empirical studies examining the effects of M&As on bank lending prices and volumes yield mixed results. For example, on the impact of bank consolidations on loan prices, some studies find that lending rates increase for merged banks (see (Focarelli & Panetta, 2003); (Garmaise & Moskowitz, 2006); (Ashton & Pham, 2007) while other studies find that lending rates decline for merged banks (Kahn, Pennacchi, & Sopranzetti, 2000); Sapienza, 2002; Park and Pennacchi, 2008; Montoriol-Garriga, 2008). Further, other studies find that bank consolidations have no significant effect on loan prices (see, Berger & Udell, 1995; Berger & Humphrey, 1997; Fuentes & de Miguel, 1999). Ashton and Pham (2007) argue that possibly differences in banking market structure may largely explain the mixed results of bank merger effects. Studies on the impact of bank mergers on loan availability also appears less conclusive. Some studies find that bank mergers negatively affect availability of loans especially to small business borrowers (see for example, Sapienza, 2002; Ahrendsen, Dixon, & Luo, 2003; Degryse, Masschelein, & Mitchell, 2004; Francis, Hasan, & Wang, 2008; Montoriol-Garriga, 2008). There are however, other studies which show that bank mergers have a positive significant impact on loan availability (see for example, Berger, Bonime, Goldberg, & White, 2004; Marsch, Schmieder, & Forster, 2007).

The significance of commercial banks in any economy, the emerging trend towards large banks, and the inconclusive nature of the evidence regarding the effects of M&As on bank lending behavior provides us the motivation to examine whether merged banks have different lending behavior from those which do not engage in the M &A process in Kenya. Despite the high level of M&A activity in the Kenyan banking industry, relatively little published research has been conducted in this area. This study seeks to examine whether merged banks have different lending behavior from those which are not involved in the M&A process. Specifically, the study seeks answers to two research questions:

- Do banks that consolidate offer lower loan rates relative to those which do not consolidate?
- Do banks that consolidate offer increased loan volumes relative to those which do not consolidate?

An empirical understanding of whether efficiency (synergy) benefits are passed through to borrowers after bank mergers has substantial regulatory significance to both those banks wishing to consolidate and the regulators (such as Central Bank and the competition authority) of such change. Indeed, the emphasis on the pass-through of efficiency gains to customers, rather than efficiency gains alone, is consistent with social equity concerns which often underpins competition law in many economies.

2.0 Literature review

This section reviews literature on how bank consolidations affect the lending decisions of merged banks. Studies examining the price effects of bank M&As touch on three aspects: the effects of the mergers on deposit interest rates, on lending prices, on bank loan spreads, and credit availability.

2.1 Lending prices

Studies which examine the effects of bank mergers on loan interest rates tend to yield mixed results.(Ashton & Pham, 2007) note that different empirical findings may exist for many reasons, including differences in the market structure of the banking market under consideration. (Park & Pennacchi, 2008) show that if large multimarket banks have a significant funding advantage which is not offset by a loan operating cost disadvantage, their retail loan prices will be lower than those of their smaller rival banks, in particular, in highly concentrated markets. Using US data from large multimarket banks between 1994 and 2005, they also present the empirical evidence to support the model's prediction. This result indicates that the greater market share of large banks tends to

increase the competitiveness of small business lending. The reduction in loan interest rates is consistent with the findings of (Berger et al., 2004)

In contrast, (Garmaise & Moskowitz, 2006) find that bank mergers have a substantial impact on the higher local market concentration which leads to an increase in loan prices. This adverse effect consequently contributes to a lowering of development and investment rates, a decline in real estate prices and greater household poverty. In Italy, (Sapienza, 2002) examined the effects of bank mergers on loan contracts. She finds that when markets are overlapping and the market shares of target banks are small, banks involved in M&As tend to lower their loan prices. This is because these banks can obtain efficiency gains from product and service diversification and can pass these benefits on to their borrowers in terms of lower lending rates. In Spain, (Fuentes & de Miguel, 1999) analyze the effects of bank consolidations on bank interest rates. Their results demonstrate that, from a short-term to medium-term perspective, bank mergers have no significant effect on loan pricing behavior. They suggest that this is because the impact of merger operations may take more time to develop.

2.2 Bank loan availability

(Francis et al., 2008) analyze the impact of bank consolidations on the formation of new businesses and conclude that, overall, merged banks make less credit available to new businesses. Some studies, however, have found no significant impact of bank M&As on credit availability. For example, (Berger & Udell, 1995) and (Berger et al., 2004) analyze the impact of bank mergers on small business lending using US banking data find that although merged banks tend to lower their small lending, this reduction is offset by the increase in credits offered by non-merging banks or by new entrants. In addition, Craig and Hardee (2007) apply information at the individual firm level in the US to judge how banking consolidation has affected small business credit; they show that, while larger banks are found to be less likely to offer credit to small borrowers, non-banking institutions are found to make up for this reluctance.

Studies of the effects of bank mergers on loan interest rate remain inconclusive**.** According to (Focarelli & Panetta, 2003) these mixed results may result from the fact that M&As in the short

run lead to unfavourable prices to consumers, but in the long run, if banks succeed in reducing costs, efficiency gains from M&As prevail over the market power effects, so that consumers benefit. Thus, studies restricted to a short post-M&A period may fail to estimate the efficiency gains and as a consequence overestimate the adverse price changes.

3.0 Methodology

3.1 **Theoretical framework**

To examine the impact of M&A on bank lending behavior we set up our framework based on the seminal work of Monti (1972) and Klein (1971) (hereafter simply referred as MK model). In its simplest form, the MK model assumes a monopolistic bank faced with a downward sloping demand for loans $L(r_L)$ and an upward sloping supply of deposits $D(r_D)$. In this case, L and D represents the volume of loans and deposits respectively, while r_L and r_D denote lending rate and deposit rate respectively. It will however be convenient to work with the inverse functions $r_L(L)$ and $r_L(D)$. For simplicity, the MK model assumes that the costs of managing deposits and loans is constant (denoted as $C(D, L)$) for our representative bank. The final assumption of this model is that the typical bank takes a net position in an interbank market (whose equilibrium rate is simply denoted as r). The objective function of this monopolistic bank is to choose L and D such that it maximizes the following profit function;

$$\pi = \pi(D, L) = (r_L(L) - r)L + (r - r_D(D))D - C(D, L) \quad (1)$$

Model (1) however, is not realistic since in practice one bank cannot control the banking industry. Instead, we reinterpret model (1) and cast it as Cournot competitive model of N finite banks (indexed by $n = 1, \cdots, N$). Accordingly, the objective function of bank n can be written as follows;

$$\max_{D_n, L_n}\{(r_L(L_n + \sum_{m \neq n} L_m^*) - r)L_n + (r - r_D(D_n + \sum_{m \neq n} D_m^*))D_n - C(D_n, L_n) \quad (2)$$

In equilibrium each bank sets $D_n^* = D^*/N$ and $L_n^* = \frac{L^*}{N}$. Importantly, the first order conditions can be expressed as;

$$\frac{r_L^* - r - mc_L}{r_L^*} = \frac{1}{Ne_L(r_L^*)} \quad (3)$$

and

$$\frac{r - r_D^* - mc_L}{r_D^*} = \frac{1}{Ne_D(r_D^*)} \quad (4)$$

Where e_L and e_D are the demand elasticity of loans and supply elasticity of deposits. Rearranging equation (3), the optimal lending rate can be represented as follows;

$$r_L^* = \frac{r+mc_L}{1-\frac{1}{Ne_L}} \quad (5)$$

Equation (5) indicates that optimal lending rate increases with interbank market rate and marginal intermediation costs while it decreases with loan demand elasticity and number of banks. Additionally, the lending rate also depends on the characteristics of bank deposits reflected by the reserve requirement, which is a percentage of total deposits. The MK model has over time been modified to include some risks that influence the lending behavior of banks. Two of the important risks that seem to prominently influence bank lending decisions are liquidity risks (Prisman, Slovin, and Sushka,1986) and default risk (Fuentes and Sastre, 1998; Corvoiser and Gropp, 2001).

3.2 Empirical Model

The MK model examined in section 3.1 suggests that the lending rate (r_{it}) depends importantly on: market rate (r_t), intermediation costs ($cost_{it}$), loan demand elasticity (which can be proxied by economic growth, GDP_t), market structure (number of banks, $conc_{it}$), default risk ($defrisk_{it}$), and liquidity risk ($liqrisk_{it}$). Accordingly, the lending rate model can be specified as follows;

$$r_{it} = \beta_0 + \beta_1 r_t + \beta_2 Cost_{it} + \beta_3 GDP_{it} + \beta_4 Conc_{it} + \beta_5 Defrisk_{it} + \beta_3 Liqrisk_{it} + \varepsilon_{it} \quad (6)$$

Since our main interest lies in examining the impact of mergers and acquisitions on bank behavior, one easy approach of achieving this is to introduce a merger dummy to model (6). Merge is a dummy (MDUMMY) variable which takes a value of 1 for all years after M& A process and 0 otherwise. Thus, incorporating the merger dummy implies that the following model is estimated;

$$r_{it} = \beta_0 + \beta_1 MDUMMY_{it} + \beta_2 DEPRATIO_{it} + \beta_3 TBRATE_t + \beta_4 CIR_{it} + \beta_5 GDP_t + \beta_6 NPL_{it} + \beta_7 Liqrisk_{it} + Year_t + u_i + \varepsilon_{it} \quad (7)$$

$$logLoans_{it} = \beta_0 + \beta_1 MDUMMY_{it} + \beta_2 DEPRATIO_{it} + \beta_3 TBRATE_t + \beta_4 CIR_{it} + \beta_5 GDP_t + \beta_6 NPL_{it} + \beta_7 Liqrisk_{it} + Year_t + u_i + \varepsilon_{it} \quad (8)$$

Where r_{it} and $logLoans_{it}$ represents the banks outcome of interest, that is, the lending interest rate and loan availability of bank i at time t respectively. More specifically, the lending rate is

constructed as an average loan rate obtained by dividing the bank's interest revenue divided by total amount of issued loans plus the total amount of other earning assets. The credit availability is simply the volume of loans issued by bank i at time t. The short-term market rate in this study is proxied by the annualized 3-month Treasury bill rate (TBRATE). CIR_{it} represents the cost-to-income ratio of bank i at time t . This variable is used to proxy for the marginal intermediation cost of loans. GDP_t is the annual GDP growth rate, and is used to proxy for the demand elasticity of loans. NPL_{it} represents default risk measured as the ratio of total non-performing loans to the total portfolio loans. $Liqrisk_{it}$ is a proxy for liquidity risk and is measured as the ratio of the net loan to the total deposit and short-term borrowing. $MDUMMY_{it}$ represents the merge effects and is a dummy variable which take a value of 1 in the year of merger and 0 otherwise. The u_i represents bank-specific effects, while $Year_t$ is the year dummy to capture any possible trend and finally, ε_{it} represents white noise error term.

3.3 Data

This study utilizes annual sample data from commercial banks over the period 2003 to 2015. Particularly, the data used in this study can be grouped into two; first are the macroeconomic indicators (GDP and 3-month Treasury bill rates) sourced from the Kenya National Bureau of Statistics (KNBS) and Central Bank of Kenya (CBK) respectively. Second, are bank characteristics data sourced from individual banks and it provides annual income and balance sheet data. Lastly, the M&A activity information is sourced from the Central Bank of Kenya's bank supervision reports. Although the estimation population for this study is the entire set of banks in Kenya, the final sample consists of 31 commercial banks. This sample is dictated by the availability of bank level accounting data. Over this sample period, about 7 banks engaged in the M&A process (see Table A1 in the appendix).

3.4 Estimation Techniques and Issues

Although we can ignore the panel data structure and proceed to run a pooled ordinary least squares (POLS), the resulting model will likely be inefficient. Accordingly, it is often important to conduct a poolability test to ascertain whether the sample data can be assumed to be coming from a common pool. In the event that heterogeneity effects are found, the two competing alternative models are the fixed effects and random effects. The standard procedure of separating these two

competing models is the Hausman comparison test. The general panel data model assumes the specifications shown in equation (7) and (8).

An important point to note however, is that, the panel approach solely focuses on individual effects of the banks that have engaged in a merger or acquisition process over the sample period. However, it will also be interesting to examine whether banks involved in the merger process exhibit different pre- and post-merger lending behavior compared to banks which do not engage in the M&A process. For this purpose, and indeed for testing the robustness of the panel approach, we also employ the Difference-in-difference (DID) estimation strategy.

The DID framework is popular as a tool of evaluating the impact of a policy (treatment effect). The approach is simple and intuitive. Moreover, it is able to deal with any endogeneity problem that may be associated with many of the parametric approaches often used in econometrics. In the context of the present study, the treatment effect is the M&A process. Accordingly, we can specify the regression version of the DID as follows;

$$r_{it} = \alpha_0 + \alpha_1 M_i + \alpha_2 T_i + \delta(M_i . T_i) \quad + \beta_2 DEPRATIO_{it} + \beta_3 TBRATE_t + \beta_4 CIR_{it} + \beta_5 GDP_t + NPL_{it} + \beta_7 Liqrisk_{it} + Year_t + u_i + \varepsilon_{it} \quad (10)$$

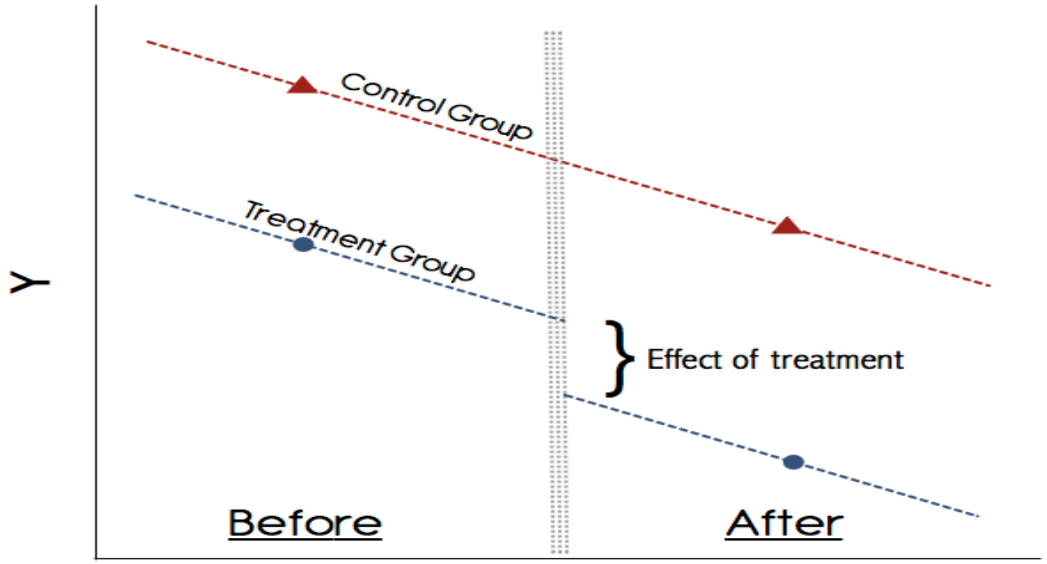
$$logLoans_{it} = \alpha_0 + \alpha_1 M_i + \alpha_2 T_i + \delta(M_i . T_i) \quad + \beta_2 DEPRATIO_{it} + \beta_3 TBRATE_t + \beta_4 CIR_{it} + \beta_5 GDP_t + NPL_{it} + \beta_7 Liqrisk_{it} + Year_t + u_i + \varepsilon_{it} \quad (11)$$

In model (10) and (11), r_{it} and $logLoans_{it}$ are the dependent variables and just like in the panel framework they represent loan prices and loan availability respectively. M_i is a dummy (=1 if involved in M&A, 0 otherwise). If we let $t = 1$ denote the post-merger period and $t = 0$ denote the pre-merger period, then T_i is a dummy taking a value of 1 if $t = 1$ and 0 if $t = 0$. The parameter that is of much interest in model (9) is δ. This parameter represents the true treatment effect (this is the parameter when T is 1-representing post-merger period- and M is 1-the bank executes a merger).

The first step in employing the DID approach is to divide the population of interest into two groups: One group that is to be intervened by a policy, this group is often referred to as the treatment group, the other group which does not participate in the intervention is referred as the control group. In this study, the treatment group consists of banks that merge while the control group are all the banks which do not merge over the considered period. We carefully sample the treatment group such that only banks that retain their identity after the merger process are considered. This is important given that the main goal of DID is to compare the difference between the two groups before the merger and after the merger. Thus, if for example two banks merge into a completely new entity, then it might not be possible to obtain the historical information to necessitate the comparison envisaged in DID.

The second step involves estimating the treatment effects which can be expounded using Figure 1 below. In the figure, the red line represents the path of the outcome (such as average loan rate) for the control group (non-merging banks). On the other hand, the blue line represents the outcome of the treatment group. The idea of the DID estimator is that we measure the difference in our outcome of interest (Y in the figure) between the two groups before the treatment, and then measure the outcome difference after the treatment. Finally, relying on the parallel trend assumption, we can then infer that the change in the differences in the two periods accounts for the effect of the treatment.

Figure 1: A graphical representation of the DID estimator model



The DID estimator requires the researcher to identify the treatment period. However, in the context of our study, there is no uniform treatment period. That is, different banks engaged in M&A process at different times. To address this challenge, we select a period, just before majority of the banks in the treatment group engaged in the M&A. Considering the information on the M&A among the Kenyan banks, we note that 7 out of 9 possible M&As which occurred between 2003 and 2015 occurred after 2007. This observation motivates us to select the period 2003 to 2007 as the pre-merger period and 2008-2015 to be the post-merger period. Thus, for example, our YDUMMY takes the value 0 before 2008 and 1 after 2008.

4.0 Empirical results and discussion

4.1 Descriptive statistics

Table 1: Overall summary statistics

Variable	Obs.	Mean	Std. Dev.	Minimum	Maximum
Average loan interest (%)	363	17.27	4.59	4.26	34.88
Total deposits to total assets ratio	363	0.78	0.07	0.46	0.92
Cost-to-income ratio	363	0.42	0.14	0.13	0.96
Non-perming loans (%)	363	7.38	7.11	0.00	40.04
Loan to total deposit ratio	363	0.71	0.16	0.21	0.98
GDP growth rate (%)	363	5.27	1.78	1.50	8.40
Annualized 3-month TB rate (%)	363	36.28	12.41	12.37	61.67

Table 2: Sample means of variables: 2007 as the pre-merger period and 2015 as the post-merger period.

	2007		2015	
Variable	**Merged banks**	**Non-merged banks**	**Merged banks**	**Non-merged banks**
Average loan interest (%)	13.11	16.33	16.12	18.53
Total deposits to total assets ratio	0.76	0.81	0.79	0.78
Cost-to-income ratio	0.51	0.45	0.48	0.39
Non-perfoming loans (%)	12.05	8.94	7.42	6.07
Loan to total deposit ratio	0.68	0.65	0.70	0.74
Total loans advances (Kes. Billions)	12.17	13.24	49.23	36.28
Total Assets (Kes. Billions)	23.38	24.13	84.35	61.29
Total deposits (Kes. Billions)	17.54	19.25	65.82	46.38

4.2 Panel Data Regressions

In order to fit a panel regression model, we test several preliminary hypotheses geared towards identifying the appropriate model. The first of these prior tests is the poolability test which checks for the presence of bank specific tests. Table 3 presents two alternative poolability tests; one tests for fixed heterogeneity effects, while the other examines whether random heterogeneity effects exists in our sample data. The results derived from the two tests for both loan price and loan

availability model indicate that we can reject the null hypothesis of no bank specific effects at any conventional significance level. Additionally, Table 3 also reveals that the null hypothesis of no time effects is rejected at any conventional significance level. Importantly, the presence of bank specific effects imply that we can not pool the data and run the ordinary least squares.

Having established the existence of bank heterogeneity effects, the next important step was to determine whether fixed effects or random effects model appropriately characterize these heterogeneity effects. The standard procedure of selecting between these two competing models is the Hausman specification test. Particularly, the null hypothesis tested in Hausman, is that, the unobserved heterogeneity effects are independently distributed of the regressors. If this holds, then, random effects model is preferred to fixed effects. Thus, the Hausman null hypothesis can be simply restated as; the random effects model is appropriate. Interestingly, Table 3 yields mixed conclusions. That is, whereas the loan price model rejects the random effect model (Panel A), the loan availability model concludes that the random effects model better captures the bank specific effects in our sample. In our analysis, the random effect model seems attractive since our main variable of interest in this study, the bank merger dummy, is well dealt with in this model than in the alternative fixed effect model.

Table 3: Results of panel data hypothesis tests.

Panel A: Loan price model			
	Null hypothesis	**Statistic**	**Decision**
Poolability test	Ho: No fixed effects	F = 11 (0.000)	Reject Ho
Poolability test	Ho: No random effects	χ^2= 12(0.000)	Reject Ho
Time effects	Ho: No time effects	F = 20 (0.000)	Reject Ho
Hausman test	Ho: Random effects model is consistent	χ^2 = 37 (0.000)	Reject Ho
Panel B: Loan availability model			
Poolability test	Ho: No fixed effects	F=63 (0.000)	Reject Ho
Poolability test	Ho: No random effects	χ^2 =23(0.000)	Reject Ho
Time effects	Ho: No time effects	F = 59(0.000)	Reject Ho
Hausman test	Ho: Random effects model is consistent	χ^2 =19 (0.177)	Not Reject Ho

Table 4 presents the results of the impact of bank M&A on lending rate and credit availability when the random effects approach to panel regression is employed. Several key results are worth noting. Focusing on the loan pricing model (Model 1), the table shows a negative coefficient of the merger dummy and which is statistically significant at 5 percent significance level. In other words, bank M&As reduce the average lending rates and that merged banks tend to set their lending rates lower than the non-merging banks. This finding is consistent to several earlier studies (see (Kahn et al., 2000); (Sapienza, 2002); (Erel, 2006). For example, (Erel, 2006) argues that M&As results in synergy gains that are passed to borrowers in form of reduced loan rates.

Another notable result from the loan price model is that the coefficient of deposit to total assets ratio turns out positive and statistically significant at 5 percent significance level. This implies that elevated levels of deposits reduce lending rates. A plausible explanation is that a bank with higher level of reserves faces less risk of deposit withdrawal (liquidity risk). Consequently, it does not need to highly price this (liquidity) risk and hence does not need to set higher loan prices.

Additionally, the loans price model shows that, the 3-month Treasury bill rate (which is often used as a benchmark for pricing many financial assets) bears a positive and significant coefficient. The increase in market rate implies an elevated market risk. Particularly, increase in market rate implies not only higher interest income on its assets but also higher interest expense on its liabilities. However, whereas assets tend to have a long-term horizon, liabilities tend to have shorter maturities. This implies that interest received is likely to fall short of interest paid in an environment of increased market rates. This can squeeze the bank's profits and as a way of protecting its profit position a bank is likely to raise its lending rate when market risk increases. Other variables, that have positive effects on the average lending rates are GDP growth and default risk (as measured by NPLs). Surprisingly, the cost to income, which is expected to have a positive influence on loan rates turns out negative but is not statistically significant.

Turning to the loan availability model, Table 4 demonstrates that; first, the merger effect (Merger dummy) is significant and positive. This means that, controlling for macroeconomic conditions, bank characteristics and time effect, M&As significantly increase credit availability. Further, similar to the loan price model, the deposit to asset ratio appears to be a significant determinant of

credit availability. However, in contrast to the loan pricing model, the loan availability model (Model 2), the cost of intermediation seems important in determining the amount of credit provided. Specifically, the coefficient of the cost-to-income ratio (CIR) bears a highly significant negative sign. Thus, increase in marginal costs of intermediation leads banks to scale down credit.

Table 4: Panel regression results

	Model 1	Model 2
Variables	Loan price	Loan availability
Merger dummy	-0.013*	0.306**
	(0.007)	(0.131)
Deposit/asset ratio (DEPRATIO)	-0.098**	2.032***
	(0.045)	(0.384)
Treasury bill rate (TBRATE)	0.094**	-1.174***
	(0.044)	(0.287)
Cost-to-income ratio (CIR)	-0.035	-0.892***
	(0.014)	(0.304)
GDP growth (GDP)	0.015***	0.654***
	(0.004)	(0.057)
Non-performing loans (NPL)	0.094**	-0.397
	(0.041)	(0.494)
Loan/deposit ratio (LIQRISK)	-0.205	2.035
	(0.030)	(0.537)
Constant	0.302***	11.141***
	(0.053)	(0.434)
Observations	341	341
R-squared	0.647	0.221
Number of banks	31	31
Bank effects	YES	YES
Time effects	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3 Difference-in difference Regressions

Table 5 presents the results of the DID estimator for the impact of M&As on average loan rates and loan availability respectively (standard errors appear in brackets under the coefficient estimates). The results regarding many of the variables are qualitatively similar to those found in the random effects analysis and hence to conserve space we do not discuss them further and instead we focus on the merger effect as demonstrated by the DID estimator.

The merger effect, as shown by the loan price model 2, is negative as expected but is not statistically insignificant. Although weak, this finding suggests that banks engaging in M&A activities tend to charge lower lending rates compared to the non-emerging banks. The DID analysis further shows that on average the set of merged banks sets its loan interest rates 2.75 percent lower than that of the non-merging banks. This is shown by the negative significant coefficient on the merger index (MDUMMY). In addition, in the absence of M&As, banks seem to have increased their lending rates with the passage of time (over the sample period, 2003-2015). This is suggested by the positive and highly significant coefficient on year dummy (YDUMMY) variable.

Turning to the loan availability model, the DID coefficient bears the expected positive sign but similar to the loan price model, it is statistically insignificant. Indeed, the only pronounced effect in this model (besides some control variables) is the time effect. That is, deposits for all banks (merged and non-merged) have significantly increased with the passage of time (YDUMMY).

Overall, the DID estimator only shows weak evidence of the merger effect. One plausible explanation for this could be the few observations utilized in the estimation. Moreover, the parallel trend assumption upon which the DID estimator is built may not hold rendering the DID estimator insignificant.

Table 5: DID regression results: Impact of M&A on bank lending behavior

	Loan price		Loan availability	
	(1)	(2)	(3)	(4)
Variables	Model 1	Model 2	Model 1	Model 2
YDUMMY	0.0220***	0.0278***	0.990***	0.565***
	(0.00689)	(0.00503)	(0.164)	(0.193)
MDUMMY	-0.0322*	-0.0298***	0.109	0.205
	(0.0163)	(0.00980)	(0.519)	(0.521)
DID	0.00809	-0.00254	0.298	0.321
	(0.00811)	(0.00690)	(0.214)	(0.394)
Deposit/asset ratio		-0.0406		0.304
		(0.0445)		(1.694)
3-month Treasury Bill rate		0.154***		1.176***
		(0.0144)		(0.389)
Cost-to-income ratio		-0.0120		0.842
		(0.0123)		(1.016)
GDP growth		0.00248***		0.0920***
		(0.000758)		(0.0216)
Non-performing loans		0.122**		-6.511***
		(0.0502)		(1.786)
Liquidity risk		-0.209***		2.612**
		(0.0266)		(1.132)
Constant	0.163***	0.268***	15.57***	12.95***
	(0.0104)	(0.0532)	(0.301)	(1.921)
Observations	328	328	328	328
R-squared	0.132	0.534	0.138	0.318

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5.0 Conclusion and Policy Implications

There has been calls for consolidation in the Kenyan banking sector due to the fact that Kenya has more banks compared to the number of banks in much larger economies. Nigeria and South Africa have 21 and 31 lenders respectively, compared to Kenya's financial sector consisting of 41 commercial banks. In addition the Kenyan financial sector consists of many small banks, where

20 small banks control just 8.7 per cent of the banking business, eight big banks control 65 per cent of the banking business, and 11 medium-sized banks have a 25 per cent market share.
However, few empirical studies have robustly examined the impact of mergers on the lending rates and credit availability in Kenya. To close this gap this study examines the impact of M&As on bank lending behavior with a special focus on Kenyan commercial banks over the period 2003 to 2015.

The study finds that several control variables such as market risk, default risk, liquidity risk and macroeconomic conditions drive the loan pricing behavior and credit availability. Further, in line with the main objective of this study, we find evidence suggesting that bank mergers have a significant impact on bank lending behavior

Specifically, banks that have engaged in M&As tend to adjust downwards their lending rates when compared to those that do not merge. Moreover, credit availability significantly increases for merged banks compared to their peers. Plausibly, there are synergy gains associated with M&As that are passed to borrowers in form of lower average loans and increased availability of loans.

Now, although the empirical evidence documented in this study imply that borrowers benefit from M&As, the impact of the M&As on market structure dynamics need to be examined. This is because, if the M&A result in banks with increased market power, such powerful banks may exercise in adverse monopoly tendencies. Hence, some borrowers may benefit from, while others may be harmed by bank M&As. Thus, public policy on bank mergers need to closely conduct a cost-benefit analysis with the aim of protecting vulnerable consumers.

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Appendix

Table A1: Sample Bank mergers and Acquisitions in Kenya, 1994-2017.

Mergers

Institution	Merged With	New Institution	Merger Date
Transnational Finance Ltd	Transnational Bank Ltd	Transnational Bank Ltd	28.11.1994
Ken Baroda Finance Ltd	Bank of Baroda (K) Ltd	Bank of Baroda (K) Ltd	02.12.1994
Mercantile Finance Ltd	Ambank Ltd	Ambank Ltd	15.01.1996
Delphis Finance Ltd	Delphis Bank Ltd	Delphis Bank Ltd	17.01.1996
CBA Financial Services	Commercial Bank of Africa ltd	Commercial Bank of Africa ltd	26.01.1996
Trust Finance Ltd	Trust Bank (K) Ltd	Trust Bank (K) Ltd	07.01.1997
Guardian Bank Ltd	First National Finance Bank Ltd	Guardian Bank Ltd	24.11.1998
Diamond Trust Bank (K) Ltd	Premier Savings & Finance Ltd	Diamond Trust Bank (K) Ltd	12.02.1999
National Bank of Kenya Ltd	Kenya National Capital Corp	National Bank of Kenya Ltd	24.05.1999
Standard Chartered Bank (K) Ltd	Standard Chartered Financial Service	Standard Chartered Bank (K) Ltd	17.11.1999
Barclays Bank of Kenya Ltd	Barclays Merchant Finance Ltd	Barclays Bank of Kenya Ltd	22.11.1999
Habib A.G. Zurich	Habib Africa Bank Ltd	Habib Bank A.G. Zurich	30.11.1999
Kenya Commercial Bank	Kenya Commercial Finance Co	Kenya Commercial Bank Ltd	21.03.2001

Citibank NA	ABN Amro Bank Ltd	Citibank NA	16.10.2001
Biashara Bank Ltd	Investment & Mortgage Bank Ltd	Investment & Mortgage Bank Ltd	01.12.2002
First American Bank ltd	Commercial Bank of Africa ltd	Commercial Bank of Africa ltd	01.07.2005
Equatorial Commercial Bank Ltd	Southern Credit Banking Corporation Ltd	Equatorial Commercial Bank Ltd	01.06.2010
Acquisitions			
Credit Agricole Indosuez (K) Ltd	Bank of Africa Kenya Ltd	Bank of Africa Bank Ltd	30.04.2004
EABS Bank Ltd	Ecobank Kenya Ltd	Ecobank Bank Ltd	16.06.2008
Fina Bank Ltd	Guaranty Trust Bank Plc	Guaranty Trust Bank (Kenya) Ltd	08.11.2013
K-Rep Bank Ltd	Centum Ltd	K-Rep Bank Ltd	29.10.2014
Equatorial Commercial Bank Ltd	Mwalimu Sacco Society Ltd	Equatorial Commercial Bank Ltd	31.12.2014
Giro Commercial Bank Ltd	I&M Bank Ltd	I&M Bank Ltd	13.02.2017
Fidelity Commercial Bank Ltd	SBM Bank Kenya Ltd	SBM Bank Kenya Ltd	10.05.2017
Habib Bank Kenya Ltd	Diamond Trust Bank Kenya Ltd	Diamond Trust Bank Kenya Ltd	01.08.2017