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The effect of revenue diversification on bank profitability and stability during the COVID -19 Pandemic: Evidence from Kenya

Rogers Ochenge[1]

Abstract

This paper uses annual data from Kenyan banks over the 2010-2020 period to empirically analyze the link between diversification (non-interest income) and bank performance. Using dynamic panel regressions, the study finds that banks which diversify (functionally) their sources of revenues tend to be more profitable and financially stable. Importantly, the study finds that reliance on non-interest revenue sources acts as an economically important shock absorber in times of declining profits such as witnessed in the ongoing COVID-19 pandemic. From a policy perspective, these results encourage banks to leverage on new technologies to create non-traditional products whose operating marginal costs are small. This also calls for regulators to remain open to such innovations.

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1.0 Introduction

In the last twenty years, the banking sector (globally) has remarkably changed. Particularly, during this period many banks have turned themselves from simple intermediaries into financial conglomerates. Every bank now seems keen to pursue functional diversification across activities such as lending, investment banking, real estate, insurance among others. This development has raised a thriving debate on whether functionally diversified banks have a comparative advantage over their specialized ones.

The proponents of diversification cite several potential advantages that may accrue to functionally diversified banks. Baele et al.(2007) argue that diversification lowers operating costs through economies of scope. Particularly, the sharing of inputs such as labor, technology and information across many business lines results in substantial cost savings and other synergistic advantages. For example, the information gathered from the lending business can be used to efficiently provide other financial products such as insurance and security underwriting. Further, the information obtained through investment banking can be used to improve loan origination and credit risk management. Saunders (1994) also suggest that functional diversification has potential to foster corporate governance through the takeover market. More specifically, if cross-activity mergers are allowed, then a manager will have incentives to operate efficiently to avoid being merged or acquired by a well performing unit. Cornett et al. (2002) argue that diversification is beneficial from a risk perspective as the different lines of business of a functionally diversified bank may be lowly correlated.

In contrast, the opponents of bank income diversification argue that diversification has costs. First, diversification potentially exacerbates agency problems between insiders and outsiders, between business divisions, and between the business units and their customers (through conflicts of interest) (Baele et al.2007). For example, a bank manager may pursue diversification to further personal interests even when diversification would reduce the franchise value of the bank. Second, diversification results in multiple business lines which increases the regulatory

costs associated to multiple supervision (Baele et al. 2007). Thirdly, DeYoung and Roland (2001) argue that since regulators do not require banks to hold capital against fee-intensive products, banks may be incentivized to engage in excessive financial leverage, a situation that is likely to increase earnings' volatility and increase the likelihood of a systemic crisis.

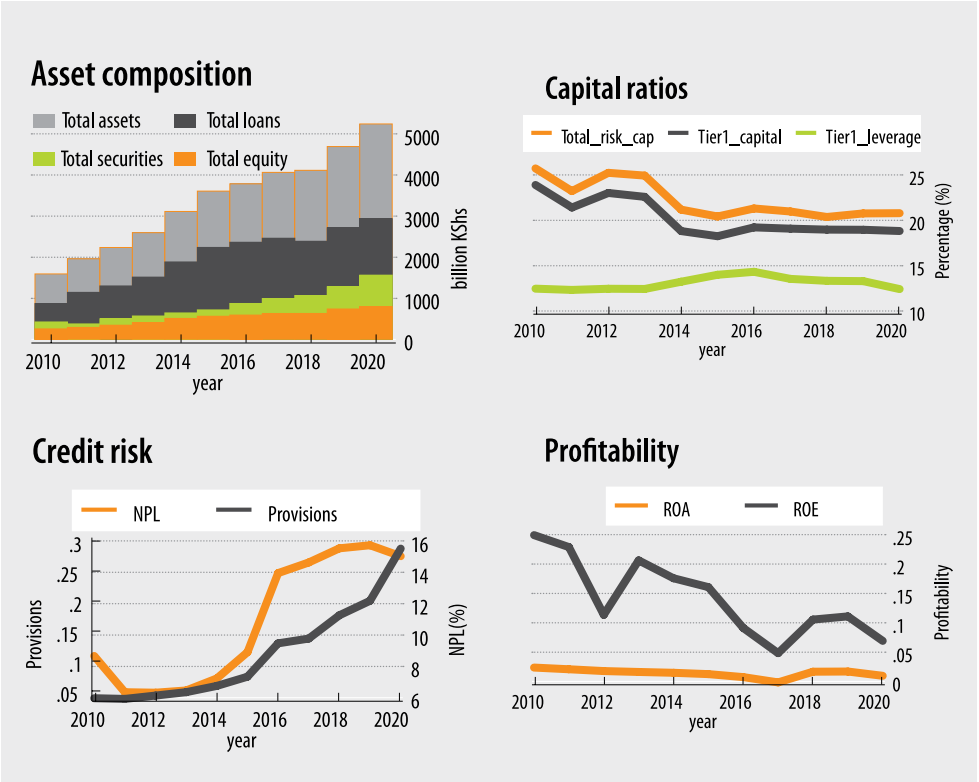
Thus, theoretically, it is unclear whether the benefits of functional diversification outweigh the costs. Interestingly, empirical literature also appears inconclusive. For instance, several studies support the risk-reducing diversification hypothesis (see for instance Chiorazzo et al., 2008; DeYoung & Torna, 2013 Meslier et al., 2014; Edirisuriya et al., 2015; Köhler, 2015; Nisar et al., 2018; Li et al., 2021), whereas several other studies conclude that by diversifying, banks venture into uncharted waters losing out in the end (see Stiroh, 2004a; Stiroh, 2004b; Mercieca et al., 2007; Berger et al., 2010).

This study revisits this debate by focusing on a market that has not been rigorously examined. That is, the Kenyan commercial banking market. Additionally, the study examines the relation between diversification, profitability, and stability in the context of the economic crisis brought on by the COVID-19 pandemic. The ongoing pandemic has dampened economic activity in Kenya and in many economies across the world. The banking industry in Kenya has also been severely affected by the pandemic. For example, many Kenyan banks have experienced a sharp increase in the impaired loans. Banks have also had to aggressively provide for future loan losses given the severe uncertainty occasioned by the pandemic. It is therefore important to examine whether functionally diversified banks have had any comparative advantage over their specialized peers.

1.2 State of banking in Kenya (2010-2020)

The Kenyan banking sector has grown considerably in the last two decades as witnessed by the growth in assets (**Figure 1**). There is a notable increase in investments in government securities in 2020, plausibly, reflecting the flight to quality by banks in the face of the pandemic. There was also a slight improvement in the bank's loan book in 2020. Regarding capital, Kenyan banks are still well capitalized, and the pandemic did not largely affect the regulatory capital positions of the sampled banks.

Figure 1: The state of banking industry in Kenya (2010-2020)



Bank profitability seems to be on a downward trend since 2015. Although, profitability seems to have improved in 2019, the pandemic appears to have depressed it. Regarding credit risk, Kenyan banks seems to have aggressively provided for doubtful loans in 2020. The Covid-19 occasioned an unprecedented uncertainty that plausibly prompted banks to re-examine the quality of their assets. It is also worth noting that, the pandemic presented the first major test for the newly introduced international financial reporting standard for expected credit loss provisioning (IFRS 9). Specifically, the onset of the pandemic saw banks increase the loss provisions by about 44 % of the 2019 levels (See **Table 1**). This

saw a marginal increase in both the cost of credit risk (provisions/loans) as well as the NPL coverage (provisions/NPL) level. It is, however, worth noting that the average NPL ratio dropped marginally during the ongoing pandemic. Plausibly, the massive loan restructuring that banks conducted averted possible increases in NPL in the face of job losses and muted economic activity occasioned by the pandemic. As these restructuring measures are reversed, we may expect NPLs to increase.

Table 1: Evolution of loans, provisions and NPLs (2010-2020)

	Loans	Loss provisions	NPL	prov/Loans	NPL Coverage
Year	Growth (%)	Growth (%)	(%)	(%)	(%)
2010	21.15	3.37	8.95	5.84	72.92
2011	31.54	-2.87	6.61	4.65	80.60
2012	13.63	13.96	6.58	4.43	79.93
2013	10.33	6.60	6.88	4.22	68.70
2014	24.51	20.82	7.68	4.35	63.98
2015	25.35	31.40	9.19	4.42	57.92
2016	5.55	72.30	14.30	6.32	56.29
2017	0.70	-1.30	15.42	7.12	51.41
2018	-1.35	33.71	15.12	8.70	63.71
2019	11.72	11.05	14.76	8.88	67.10
2020	8.98	44.20	14.24	8.98	68.82

Given the substantial growth in loan loss provisions in 2020, it would be insightful to explore the structural differences in loan loss provisioning across banks. In this spirit, I conduct a cluster analysis of 30 sample Kenyan commercial banks. Figure 2 presents the results of a hierarchical cluster analysis. The cluster dendrogram (**Figure 2**) shows that Kenyan banks can easily be classified into 5 groups based on their provisioning (cost of risk) values during the year 2020 (when the Covid 19 crisis started in Kenya). Notably, the classification tree identifies one outlier (bank 4) which appears to have a distinct pattern of cost of risk (provisioning).

Figure 2: Cluster analysis based on the cost of credit risk (provisions/loans) of Kenyan commercial banks.

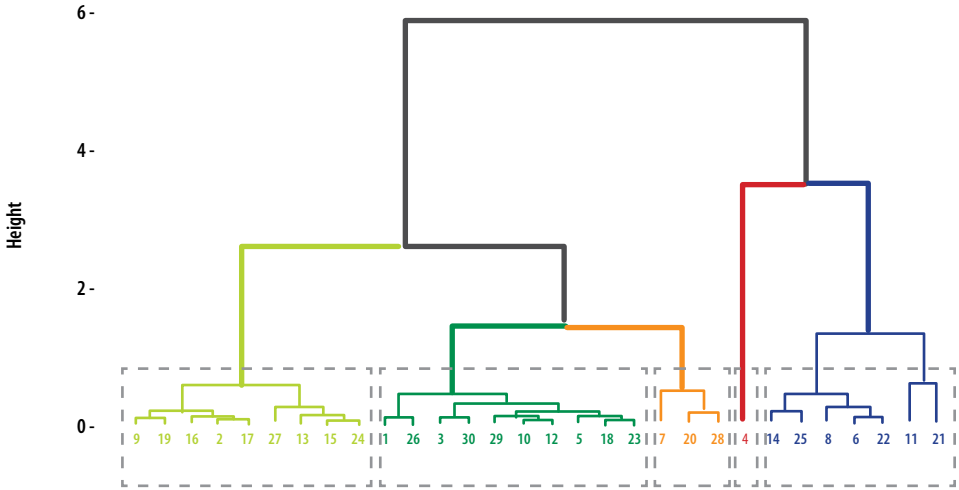


Figure 2 is obtained by conducting a cluster analysis of 30 Kenyan banks based on their loan loss provisioning behavior in 2020 The clustering procedure used was the agglomerative hierarchical clustering with Euclidean distance as the dissimilarity measure (single linkage).

Based on the clustered analysis above, **Table 2** presents the evolution of credit risk, asset growth, risk aversion, operational efficiency, and profitability of the identified bank clusters over a four-year period, 2017 to 2020. Table 2 indicates that cluster 4 banks (with an average asset size of KShs.49 billion) registered the highest average cost of risk over 4-year period (at 21.4%). This is almost three times the cost of risk of cluster 1 banks (with asset size of KShs.202 billion). It thus appears that smaller banks tend to experience a relatively higher cost of credit. It is, however, worth noting that the size effect of the cost of risk is not monotonic. For example, cluster 3 banks with an average asset size of about KShs.38 billion has a cost of risk of about 7.5 % which is comparable to that of cluster 1 consisting of large banks. From a

policy perspective, this finding implies that cluster analysis can provide an alternative to the often peer group analysis (largely based on size), implemented by supervisory authorities in their off-site surveillance.

Moreover, the size-peer-group approach does not look appropriate across many other indicators (risk-aversion, efficiency, and profitability) presented in **Table 2.**

Table 2: Clustered analysis of bank performance indictors (2017-2020).

		CoR	NPL	Bad debts	Total assets	LTD	ETA	Efficiency	ROE
		(%)	(%)	(Mns KShs)	(Bns KShs)	(%)	(%)	(%)	(%)
Cluster 1	2017	6.9	16.6	1490.3	167.2	99.2	15.0	9.8	8.8
	2018	7.3	13.9	1111.9	194.8	85.3	14.6	7.8	14.5
	2019	7.6	13.7	1677.8	213.5	84.7	14.2	7.8	13.2
	2020	8.9	15.0	4337.8	233.7	79.9	13.6	7.9	6.8
	Average	**7.7**	**14.8**	**2154.4**	**202.3**	**87.3**	**14.4**	**8.3**	**10.8**
Cluster 2	2017	4.0	7.7	762.6	84.8	81.3	18.1	8.7	14.6
	2018	5.1	8.7	497.1	99.5	73.1	17.6	8.2	13.8
	2019	6.0	10.1	221.9	107.2	66.8	17.6	8.1	14.0
	2020	6.3	10.0	1001.4	119.7	66.0	16.9	7.9	10.7
	Average	**5.3**	**9.1**	**620.7**	**102.8**	**71.8**	**17.6**	**8.2**	**13.2**
Cluster 3	2017	8.7	21.2	74.7	38.0	77.9	21.1	10.0	10.8
	2018	10.7	22.2	205.4	34.0	71.7	20.8	10.1	6.7
	2019	7.7	16.2	32.2	38.2	77.5	18.1	8.9	13.8
	2020	3.1	5.8	-134.8	42.9	58.8	16.4	8.3	11.5
	Average	**7.5**	**16.4**	**44.4**	**38.3**	**71.5**	**19.1**	**9.3**	**10.7**
Cluster 4	2017	12.7	28.5	-312.5	55.1	97.3	15.0	9.5	
	2018	18.2	33.3	-66.2	51.3	72.6	12.1	8.6	1.5
	2019	28.4	37.4	2715.1	45.3	64.1	10.6	15.7	-63.9
	2020	26.4	36.0	202.2	45.9	70.0	11.8	9.1	-8.9
	Average	**21.4**	**33.8**	**634.6**	**49.4**	**76.0**	**12.4**	**10.7**	**-23.8**

		CoR	NPL	Bad debts	Total assets	LTD	ETA	Efficiency	ROE
		(%)	(%)	(Mns KShs)	(Bns KShs)	(%)	(%)	(%)	(%)
Cluster 5	2017	8.8	17.9	1235.3	155,18	88.1	14.1	8.4	6.8
	2018	13.5	21.0	455.5	159.9	88.2	12.9	9.9	4.0
	2019	12.1	22.2	1299.0	205.1	91.6	16.8	9.7	14.2
	2020	13.8	22.2	6179.2	236.8	87.5	15.2	9.7	3.2
	Average	12.0	20.8	2292.3	200.6	88.8	14.7	9.4	7.1

This table represents the evolution of credit risk, bank risk aversion, operational efficiency, and profitability for a sample of 30 banks over the period 2017-2020. CoR denotes cost of risk and is measured as the ratio of loan-loss provisions to gross loans, NPL denotes non-performing loans (defined as the ratio of total non-performing loans to total loans), bad debts represents the amounts of loans that are considered irrecoverable, LTD refers to the loan-to-deposits ratio, ETA denotes the equity-to-assets ratio and measures the risk aversion of a bank, Efficiency represents the ratio of operating costs to total assets, and ROE denotes the return on equity (measuring bank profitability).

2.0 Literature Review

Empirical literature on the effect of revenue diversification on bank performance is at best mixed. For instance, although conventional wisdom from portfolio theory would suggest that diversification into non-traditional sources of bank revenue would yield higher and stable revenue for banks, Stiroh (2004a) and Stiroh (2004b) finds that a shift to non-interest income sources increases bank risk and lowers risk-adjusted profits for a sample of U.S banks over the period 1984-2001. Thus, his findings suggest that diversification does not confer a bank some obvious diversification benefit.

DeYoung and Torna (2013) examine the link between income diversification and bank failure for several U.S banks during the 2008 financial crisis. The authors find that certain non-traditional business lines (such as venture capital, investment banking and asset securitization) tend to increase the likelihood of bank failure. In contrast, non-traditional business lines, such as securities brokerage and insurance sales lower the probability of bank failure.

Generally, most U.S studies on this issue tend to conclude that revenue diversification makes banking business unstable and does not necessarily increase risk-adjusted profits. An exception, is the study by Li et al. (2021) which find positive diversification effect for the U.S banking industry during the ongoing Covid-19 pandemic. Specifically, the authors find that non-interest income sources boost bank returns and reduce risk. Since these results are inconsistent to several prior studies, they attribute the results to either unique factors associated to the Covid-19 crisis or the effect of fintech on the U.S banking industry.

Outside U.S, nearly all the studies on the role of diversification on bank performance conclude that diversification is beneficial to banks. Chiorazzo et al. (2008) find a positive association between diversification and risk-adjusted profits for the Italian banking industry. Importantly, the diversification effect is found to be stronger for large banks. Further, the source of diversification is found to be less important.

Meslier et al. (2014) finds a beneficial diversification effect on performance of Philippine banks. Their findings also indicate that foreign banks operating in Philippines have an upper hand in diversification compared to their local counterparts. Nisar et al. (2018) Analyze a large panel of banks from South Asian countries and find that a shift to non-interest income has a positive effect on risk-adjusted profits. Ammar & Boughrara (2019) also finds a positive effect of revenue diversification for a sample of banks from the Middle East and North Africa (MENA) region.

3.0 Methodology

3.1 Model Specification

This study examines the relationship between revenue diversification and bank performance by estimating the following model:

$$PERF_{it}=\alpha_0+PERF_{it-1}+\alpha_2 INCDIV_{it}+\alpha_3 Z+c_i+\lambda_t+\epsilon_{it} \ldots\ldots\ldots (1)$$

Where $PERF$ denotes bank performance: Profitability (ROA, ROE) and stability (ZSCORE, SDROA, SDROE). $INCDIV$ denotes, diversification and is measured by the share of non-interest income in total operating income of a given bank. Z is a vector of control variables: bank size ($SIZE$), deposits to assets ratio ($DEPOSITS$), equity to assets ratio ($EQUITY$), and liquidity (LIQ). In the controls I also include an interactive term, $Covid*Div$, to examine whether more diversified banks had an advantage over more focused banks during the ongoing covid crisis. The c_i, λ_t and ϵ_{it} are bank effects, time effects and a white noise disturbance term respectively. **Table 3** provides summary information on variables definition and construction.

Table 3: Variable description

Group	Variable	Symbol	Proxy
Profitability measures	Return on assets	ROA	Net profits/total assets
	Return on equity	ROE	Net profits/total equity
Stability measures	Distance to default	ZSCORE	(ROA + ETA)/SDROA
	Standard deviation of ROA	SDROA	Sd (ROA)
	Standard deviation of ROE	SDROE	Sd (ROE)
Diversification measure	Income diversification	INCDIV	non-interest income/total operating income
Control variables	Bank size	SIZE	Natural logarithm of total bank assets.
	Bank capitalization	EQUITY	Equity/total assets
	Deposits to assets	DEPOSITS	Deposits/total assets
	Loans to assets	LOANS	Loans/total assets
	Loan loss provisions	LLP	Loan loss provisions/total loans
	COVID-19 crisis	COVID	A dummy variable taking a value of 1 in 2020 and 0 otherwise.

3.2 Estimation procedure

The first step in in estimating models (1) consists of removing the bank heterogeneity effects (by taking the first difference. However, this differencing induces endogeneity in the lagged dependent variable. Accordingly, neither OLS nor fixed/random effects can yield consistent and efficient parameters. To deal with this endogeneity issue, I employ the generalized method of moments (GMM) approach in the style of Arellano and Bond (1991). In the GMM approach, an endogenous regressor is instrumented by its lagged values either in levels or in first difference. I test the validity and strength of the instruments using the Sargan test of overidentifying restrictions. The Sargan test considers the null hypothesis that the instruments are valid (exogeneous). Failure to reject this null points to valid instruments.

3.3 Data

Bank level data is constructed from individual bank financial reports provided by the Kenya Bankers Association (KBA). The sample includes all commercial banks with complete data over the period 2010 to 2020. After filtering the sample by particularly dropping missing data for the variables of interest I am left with unbalanced panel data for 30 banks (out of the possible 42 banks). The sample thus covers about 74 percent of the total commercial banks in Kenya.

4.0 Empirical Results

4.1 Descriptive statistics

Table 4 presents the summary statistics. The table indicates that over the sample period Kenyan banks experienced positive returns. Specifically, the mean ROA was 2.8% while ROE was 18.2%. There are however instances when some banks experienced negative returns. Regarding diversification, the average income diversification stood at about 40.8%.

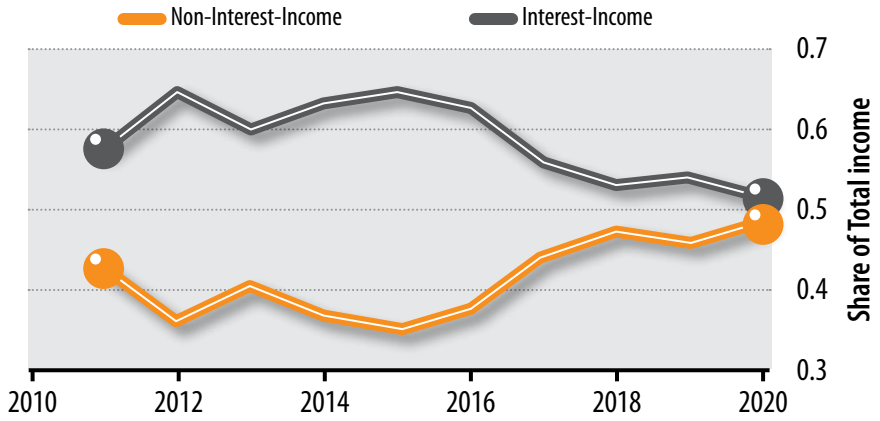
The pairwise correlation coefficients for the key variables are presented in Table A1 (in the appendix). The largest coefficient occurs between ROA and ROE, and between SDROA and ZSCORE which is not surprising given the construction of these measures. The rest of the coefficients are less 0.80 which implies that multicollinearity will not be a concern in subsequent regression models.

Table 4: Summary statistics

	N	Mean	Std. Dev.	Min	Max
ROA	242	0.028	0.020	-0.039	0.070
ROE	242	0.182	0.127	-0.246	0.443
SDROA	242	0.006	0.005	0.000	0.028
SDROE	242	0.038	0.045	0.000	0.458
ZSCORE	242	3.880	1.040	1.575	7.182
INCDIV	242	0.408	0.145	0.081	0.768
SIZE	242	10.990	1.287	8.449	13.341
EQUITY	242	0.155	0.034	0.072	0.249
DEPOSITS	242	0.741	0.061	0.551	0.868
LLP	242	0.050	0.035	0.002	0.182
LOANS	242	0.569	0.133	0.245	0.823

Notes: This table presents the distribution of the key variables used in this study. The observations are obtained from a sample of 30 Kenyan commercial banks over the period 2010 to 2020. ***ROA*** and ***ROE*** denotes return to assets and equity respectively, ***SDROA*** and ***SDROE*** denotes the standard deviations of ***ROA*** and ***ROE*** respectively. ***ZSCORE*** is computed as ratio of ***ROA(ROE)*** plus the equity/asset ratio divided by standard deviation of ***ROA(ROE)***. ***ZSCORE*** measures how far a bank is from default. ***INCDIV*** defines the ratio of non-interest income to total operating income. ***SIZE*** is the natural logarithm of total assets. ***LOANS*** is the ratio of loans to assets, ***EQUITY*** is the ratio ot total equity to assets, ***DEPOSITS*** is the deposit to asset ratio and ***LLP*** is the ratio of loan loss provisions to total loans.

Figure 3: Trend of Interest/non-interest income (2010 - 2020)



To shed more light on the dynamics of bank revenue diversification, **Figure 3** presents the yearly evolution of interest/non-interest income for a sample of Kenyan banks over the period 2010-2020. **Figure 3** reveals that, after 2016, interest income has been declining while non-interest income has been on the rise. The fall in interest income can be plausibly linked to the introduction of interest rate capping that came into force in September 2016. The interest rate capping was repealed in 2019.

To gain further insights on the role of diversification on bank performance, particularly, during the Covid-19 crisis period, **Table 5** presents the results of a simple univariate analysis which compares the profitability and stability for banks sorted according to their levels of non-interest income. Particularly, I first divide the sample banks into four quintiles based on their non-interest income level. Then I compute the mean of performance measures (ROA/ROE, SDROA/SDROE, and ZSCORE) for each non-interest income quintile group. Finally, I perform a t-test of the difference between the top and bottom quintile for each performance measure.

Further **Table 5** shows that the mean ROA/ROE for the top quintile is 2.3% (13%) compared to 0.4% (2.9%) for the bottom quintile. The difference between the means for both ROA and ROE are significantly different from zero at 5 percent significance level. Regarding stability, the mean standard deviation of ROA (ROE) for top quintile is 0.4% (2.5%) compared to 0.5% (3.3%) for the bottom quintile. This implies that the risk of more diversified banks is slightly lower than for

Table 5: Comparison of profitability and stability on quintiles based on the ratio of noninterest income to net operating income (*SHNOII*) for Kenyan sample commercial banks for the year 2020

	Bottom	Second	Third	Top	Diff (H-L)	t-Statistic
Profitability						
ROA	0.004	0.007	0.015	0.023	0.019**	2.63
ROE	0.029	0.041	0.097	0.130	0.102**	2.58
Stability						
SDROA	0.005	0.013	0.017	0.004	-0.009	0.61
SD ROE	0.033	0.063	0.127	0.025	-0.008	0.74
SD ROE	3.673	2.903	2.388	3.831	0.157	0.37

For each quintile the table reports the mean value of profitability (ROA/ROE) and stability (SDROA, SDROE, & ZSCORE). The number of banks in each quintile ranges between 7 and 8. The statistical significance is at 1%, 5%, and 10% and is denoted by ***, **, and * respectively.

less diversified banks. Turning on to the ZSCORE, the results indicate that the distance to default for sampled banks slightly increases with diversification. Overall, the univariate analysis indicate more diversified banks were more profitable and stable compared to their less diversified peers. It is, however, worth noting that the diversification effect on stability appears statistically weak at all conventional significance levels. Further, since there are several factors that may potentially influence bank profitability and stability, it is important to consider a multivariate model that accommodates such factors. This is the focus of the next section.

4.2 Regression results.

Table 6 displays the dynamic panel regression estimation results on the effect of bank revenue diversification on profitability and stability. **Table 6** reveal several observations that are worth noting. First, profitability and stability measures appear quite persistent. This result reinforces the use of dynamic GMM regressions to control for possible endogeneity in the proposed relationships.

Second, the relationship between diversification (INCDIV) and profitability (ROA/ROE) is positive and statistically significant (at 1 percent significance level). This implies that, overall, Kenyan banks which derive a larger share of their operating income from non-interest sources experience higher profitability. However, it is observed that the effect of diversification on bank profitability during the Covid-19 pandemic (the coefficient on the interaction between Covid and diversification) though positive, it is not statistically significant.

Third, **Table 6** reveals that diversification bears a negative relationship with standard deviation of ROA/ROE and a positive relationship with distance-to-default. Overall, these results appear consistent with the hypothesis that diversification enhances stability of Kenyan banks. The interaction of covid and diversification is not statistically significant.

Regarding the results of control variables, most of the estimated coefficients bear the expected signs. For example, with respect to bank size (ASSETS), the results indicate that large banks are comparatively profitable and stable (negative coefficient on SDROE) relative to small banks. This outcome implies that there exist economies of scale among Kenyan banks. The results further reveal that higher equity ratios are associated to higher profitability and stability measures, suggesting that better capitalized banks tend to be more profitable and stable compared to low capitalized banks. DEPOSITS are found to have a positive relationship with ROA/ROE and ZSCORE suggesting that higher customer deposits improve profitability and stability.

Table 6: Effect of diversification on profitability and stability: Difference GMM results.

	(1)	(2)	(3)	(4)	(5)
	ROA	ROE	ZSCORE	SDROA	SDROE
ROA (-1)	0.449**				
	(0.213)				
ROE (-1)		0.370*			
		(0.203)			
ZSCORE (-1)			0.104*		
			(0.098)		
SDROA (-1)				0.213*	
				(0.099)	
SDROE (-1)					0.035
					(0.096)
INCDIV	0.086***	0.510***	6.880**	-0.025*	-0.167*
	(0.025)	(0.180)	(2.855)	(0.014)	(0.095)

	(1)	(2)	(3)	(4)	(5)
	ROA	ROE	ZSCORE	SDROA	SDROE
COVID x INCDIV	0.000	0.035	-2.146	0.007	0.052
	(0.017)	(0.114)	(2.077)	(0.010)	(0.069)
LOANS	0.012	0.013	1.004	-0.001	0.037
	(0.016)	(0.108)	(2.006)	(0.010)	(0.066)
ASSETS		0.089*			-0.040
		(0.047)			(0.029)
EQUITY	0.107**		10.875*	-0.022	
	(0.050)		(6.388)	(0.031)	
DEPOSITS	0.055**	0.330**	0.608	-0.013	-0.157*
	(0.022)	(0.149)	(2.763)	(0.013)	(0.091)
LLP	-0.174***	-0.886***	-0.993	-0.013	-0.217
	(0.035)	(0.248)	(4.321)	(0.020)	(0.149)
Observations	155	155	155	155	155
Number of banks	30	30	30	30	30
Time effects	Yes	Yes	Yes	Yes	Yes
Bank effects	Yes	Yes	Yes	Yes	Yes
Arellano AR(2)	0.164	0.811	0.616	0.994	0.889
Sargan test	0.651	0.983	0.777	0.356	0.593

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

This table reports the estimation results where the profitability measure (ROA/ROE) and risk measures (SDROA/SDROE & distance to default- ZSCORE) are regressed on non-interest income (a measure of diversification) and some control variables (which include assets, loans, equity, deposits, and bad loans). The wiendmeijer-corrected standard errors appear in parentheses. The sample spans 2010-2020 for 30 Kenyan banks.

5.0 Conclusions and policy implications

This paper uses a sample of 30 commercial banks operating in Kenya over the 2010-2020 period to examine the relation between bank profitability and risk and the use of non-interest income sources. Employing a dynamic panel technique, the study finds that noninterest income is positively related to profitability but inversely related to risk. Importantly, these results hold during the economic crisis occasioned by the ongoing COVID-19 pandemic (albeit the relation appears weak). Overall, these results are consistent with the hypothesis that diversified banks tend to have a comparative advantage over their focused (less diversified) peers.

The results of this paper have one key policy implication. Since this study shows that revenue diversification results in higher and stable profits, banks should be encouraged to leverage on new technologies to create non-traditional products whose operating marginal costs are small. This also calls for regulators to remain open to such innovations.

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Appendix

Table A1: Pairwise correlations

Variables	(ROA)	(ROE)	(SDROA)	(SDROE)	(ZSCORE)	(INCDIV)	(SIZE)	(EQUITY)	(DEPOSITS)	(LLP)	(LOANS)
ROA	1.00										
ROE	0.94	1.00									
SDROA	-0.24	-0.29	1.00								
SDROE	-0.36	-0.36	0.64	1.00							
ZSCORE	0.37	0.36	-0.83	-0.54	1.00						
INCDIV	0.34	0.28	0.05	-0.03	0.02	1.00					
SIZE	0.49	0.51	-0.13	-0.11	0.18	0.17	1.00				
EQUITY	0.28	0.01	0.10	-0.05	0.17	0.17	-0.09	1.00			
DEPOSITS	0.01	0.05	-0.04	-0.02	0.02	0.11	-0.07	-0.14	1.00		
LLP	-0.53	-0.55	0.04	0.16	-0.14	-0.05	0.01	-0.08	0.02	1.00	
LOANS	-0.20	-0.18	-0.03	0.08	0.03	-0.79	0.06	-0.03	-0.15	0.15	1.00

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