Market structure-performance hypothesis in Kenyan banking industry

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Abstract

Purpose – The purpose of this paper is to test market structure-performance hypothesis in banking industry in Kenya. Specifically, the structure-conduct-performance (SCP) and market efficiency hypotheses were examined to determine how market concentration and efficiency affect bank performance in Kenya.
Design/methodology/approach – The study used secondary data of 44 commercial banks operating from 2000 to 2009. Three proxies to measure bank performance were used while market concentration and market share were used as proxies for market structure. Market concentration was measured using two concentration measures; the concentration ratio of the four largest banks (CR_4) and Herfindahl-Hirschman Index, while market share was used as a proxy for efficiency. The study made use of generalized least square regression method.
Findings – The empirical results confirm that market efficiency hypothesis is a predictor of firm performance in the banking sector in Kenya and rejects the traditional SCP hypothesis. Thus, the results support the view that efficient banks maximize profitability.
Practical implications – The study provides insights into the role of efficiency in enhancing profitability in commercial banks in Kenya. It has managerial implication that profitable banks ought to be efficient and dispels the notion of collusive behavior as a precursor for profitability.
Originality/value – The paper fills an important gap in the extant literature by proving insights into what determines bank profitability in banking sector in Kenya. Although this area is rich in research, little work has been conducted in the developing economies and in particular no study in the knowledge has addressed this critical issue in Kenya.

Keywords Kenya, Banks, Efficiency, Performance, Market structure
Paper type Research paper

1. Introduction

Over the past two decades the performance of banks has attracted considerable attention of practitioners, regulators and scholars because of the significant role it plays in the economy. They are the primary mechanisms of transmission of monetary policy and play a critical role in the supply of money (Mugume, 2010). The importance of banks is more pronounced in developing economies because financial markets are usually underdeveloped, and so banks are the major providers of finance for majority of firms and also acts as the main depository of savings (Arun and Turner, 2002).

The study of bank performance has generated two streams of research: the structure-conduct-performance (SCP) and efficient market hypothesis. However, the results are mixed. Moreover, most of these studies have been carried out in developed countries (see e.g. Burke and Rhoades, 1985; Smirlock, 1985; Whalen, 1986;

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Smirlock and Brown, 1986; Hannan, 1979; Shaffer, 1982). Even for the few researches done in developing economies, there are variations in the banking sector among countries, especially as regards the regulatory framework.

Although studies have been carried out in this area, Eden (2002) emphasized the importance of replication studies especially those utilizing different samples in moving the theory forward. In support of this argument, Agle *et al.* (2006) observed that realization of the same hypothesized relationship among same theoretical constructs, but utilizing different samples strengthens the theoretical relationships. In the Kenyan context, there is no formal study on market structure and performance of banking sector. Applying the two market-power (MP) paradigms; the SCP and the efficiency hypothesis, this study investigated relationship between market structure and the performance of commercial banks in Kenya.

1.1 The banking sector in Kenya

The banking sector has undergone rapid transformation in the recent past driven by the forces of globalization, liberalization and the advent of technology which have influenced both its structure and the nature of competition in the industry. The Kenyan banking system is no exception, and has undergone significant structural transformation since the late 1980s and the early 1990s following the Structural Adjustments Programs sponsored by the International Monetary Fund and World Bank. Prior to these adjustments, the financial system was highly controlled by the government through exchange rate controls, credit controls and interest rate controls. Similarly, the government had controlling interest in large commercial banks, thus affecting the structure of the industry.

Financial sector reforms therefore, led to liberalization, privatization and removal of credit ceilings, exchange rate controls, as well as interest rate controls. This opened the industry to greater competition by the entry of new private banks and more liberal entry of foreign banks owing to liberalized licensing requirements. According to Central Bank of Kenya (CBK) Bank Supervision Report (2009), there are 44 commercial banks operating in Kenya with several branches spread across the country. In the years after financial liberalization, the banking sector has witnessed improved performance as reflected by higher interest rate margins. For example, the average growth of net interest margins (NIM) of the banking industry in Kenya grew by 1.62 percent in the years 2005-2009 (Central Bank of Kenya, 2005-2009) (see Figure 1).

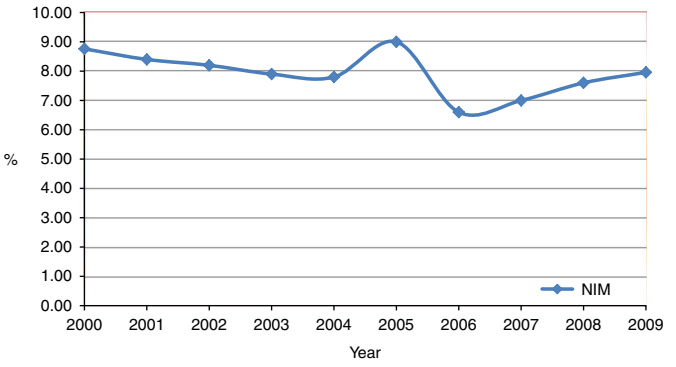


Figure 1.
Net interest margins in Kenya

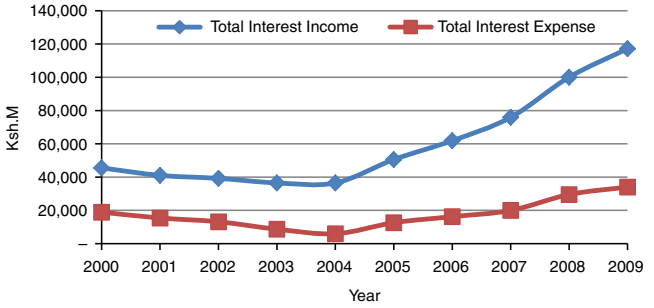
Source: CBK bank supervision annual report (2000-2009)

Moreover, the average lending and deposit rate during the period 2006-2010 were 14 and 4 percent, respectively (see Figure 2 for absolute data for total interest incomes and expenses during the period 2000-2009). In comparison to other countries, Financial sector assessment program indicated NIM of 9.1 percent in Kenya as compared to average NIM in sub-Saharan African countries at 8.1 percent (Thorsten and Michael, 2004).

The Kenyan banking system is characterized by heavy reliance on information and communication technology; for instance, commercial banks depend on internet banking, mobile phone banking and agency banking to conduct operations. Kenya is the first country in the world to use mobile money transfer commonly referred to as M-Pesa (Ngugi *et al.*, 2010). M-Pesa is derived from a combination of two words, "M" for "Mobile" and "Pesa," a Swahili word for cash thus "Mobile cash money" service allows a mobile user to transfer money to another person, pay bills, pay school fees, purchase goods among others using mobile phone. This concept together with agency banking has allowed the unbanked population to access financial services. Thus use of technology has increases the intensity of competition among banks particularly based on the ability and willingness to adopt and market the new technology. This in itself reduces concentration because even small banks with willingness to adopt money transfer-related technology would spur intense competition. Therefore, it is against this background that the concentration in the sector has witnessed a marked decline (see Table I).

2. Theory and hypotheses

Studies on bank performance started in early 1990s with the application of the two industrial organizations models: the MP and efficiency structure (ES) paradigms (Athanasoglou *et al.*, 2008). The MP hypothesis also called SCP hypothesis (Bain, 1956) posits that the performance of banks are influenced by the market structure of the industry and so a concentrated structure is conducive to the use of MP in ways that may enhance banks' performance. Reason attributed to this behavior is the possibility



Source: CBK bank supervision annual report (2000-2009)

Figure 2.
Interest incomes and expenses

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CR_4	56.27	55.44	55.33	54.15	54.28	50.61	48.50	46.65	44.69	42.53
HH1	1,018	968	979	953	925	814	775	763	752	688

Table I.
Concentration results based on CR_4 and HHI index

of collusion in setting prices. The ES hypothesis (Demsetz, 1973) proposes an alternative explanation for the positive relationship between concentration and profitability arguing that efficient banks obtain greater profitability and as a consequence, the market becomes more concentrated. Thus the causality runs from individual banks' efficiency to their market share and profitability.

The MP theory posits that the more concentrated the market, the less the degree of competition (Tregenna, 2009) and the higher the economic rent (Samad, 2008). According to Atemnkeng and Nzongang (2006), high degree of concentration is inextricably associated with high levels of profits to the detriment of efficiency and effectiveness of the financial system due to decreased competition. Gilbert (1984) observed that banks in highly concentrated markets earn monopoly rents, as they tend to collude in setting prices.

The theory that concentration leads to higher profitability has been challenged by efficiency theorists. The efficiency school of thought believes that if a firm enjoys a high degree of efficiency than its competitors, the firm can maximize profits and increase its market share. Thus higher profit is generated by firms that are more efficient and not those that are more concentrated. The efficiency school has tested the hypothesis using two approaches: direct measures of efficiency and indirect measures of efficiency (market share), and both approaches have yielded similar results (see e.g. Maudos, 1998, for a detailed review).

2.1 Market structure-performance relationship

The SCP and EH models have been tested extensively in the banking industry, with most of the research focussing on the USA and, more recently, the European Union. The results, however, appear mixed and there is no conclusive evidence to indicate the superiority of one model over the other (e.g. Gilbert, 1984; Goddard *et al.*, 2001). Berger (1995) argues that existing market structure models may be mis-specified due to omitted variables and those models of bank profitability.

Smirlock (1985) studied a MP paradigm using over 2,700 US banks and found no relationship between market concentration and profitability, but found a relationship between bank market share and profitability. Smirlock's (1985) argument is that any concentration evident is just an outcome of more profitable firms obtaining a larger market share, and any apparent relationship between market concentration and profitability would be spurious if market share is not properly considered. Critiquing the SCP literature, he notes that few studies within that paradigm have found a consistently strong and positive relationship between concentration and profitability. In support of his findings, Smirlock (1985) argues that a bank with a higher market share may have higher quality products, which allows them to charge higher prices and earn higher profits. Indeed, for banks to have larger market share, they need to be efficient than its competitors and as a result maximize its profitability.

Berger *et al.* (2004) noted that US banks in more concentrated local markets tend to have pricing structures consistent with the exercise of MP under the SCP hypothesis, but that when banks' market shares were included in the regression equation, there were no longer strong relationships between concentration and profitability. In another study, Yonjil and Miller (2006) investigated bank concentration and performance in USA (on a state-by-state basis) and the results suggest that bank concentration leads to bank profitability, supporting the market-power theory. The study examined the evidence of the relationship between several measures of bank concentration at the state level and the average performance of banks within that state and found a robust

positive correlation between bank concentration in a state and the average return on equity (ROE). Moreover, the linkage runs from increasing bank concentration to increasing bank profitability, and not the reverse implying that the MP, rather than the ES, hypotheses holds for the US banking industry during the last quarter of the twentieth century.

Guerrero *et al.* (2005) studied the Mexican banking industry focussing on 19 banks for the period 1997-2003 and did not find evidence of both the SCP and ES models. The authors used a balanced panel of banks which does not take into consideration merger and acquisition effects. They also estimated stochastic frontiers to obtain bank efficiency measures and they did not find evidence of a positive relationship between profitability and scale efficiency.

Study in Latin America banking industry (Georgios *et al.*, 2009) tested the MP (SCP) and ES hypotheses for a sample of over 2,500 bank observations in nine Latin American countries during the period 1997-2005. The finding produce evidence supporting the ES hypotheses, particularly robust for the largest banking markets in the region, namely Brazil, Argentina and Chile.

In European banking industry, Beck *et al.* (2000) analyzed the relationship between market structure and bank performance for 364 banks operating in eight Central and Eastern European Countries for the period 1998-2001 and rejected the SCP hypothesis. Molyneux and Forbes (1995) tested the SCP paradigm for banks in 18 European countries and found empirical support for the traditional SCP paradigm concluding that the degree of concentration has an effect on the level of competition and hence on banks profitability within the industry.

In investigating the relationship between degree of concentration and performance in Greece banking sector, the findings of Móré and Nagy (2003) in Central and Eastern Europe does not confirm the SCP hypothesis. The market concentration was found to have no positive correlation with either the NIM or return on assets (ROA) implying that in a more concentrated market, banks did not earn higher profits by means of colluding with other banks to apply higher margins and so their results provided support for the efficiency hypothesis. In the reviewed period, dominant banks in the region earned extra profits and caused a welfare loss by exploiting their pricing advantage arising from relative MP and by behaving in a manner that limited competition.

Furthermore, the results proved that cost and risk levels and the size of reserve requirements have been incorporated into pricing decisions. It appears to be the case that higher operating costs being passed on to customers in the form of wider net interest rate margins. Similarly, a higher lending risk and a higher opportunity cost of holding reserves were also associated with higher NIM in the period under review. Hence, the study concluded that there appears to be a close negative correlation between the relative size of the banking sector and pricing, as well as profitability. In Australian banking sector, Sathye (2005) tested the two competing hypotheses of market structure and performance; namely, the SCP hypothesis and the efficiency hypothesis and rejected the efficiency hypothesis, however, there is lack of strong evidence to reject the SCP hypothesis.

Some of the studies made with respect to banking sector in emerging markets also reveal mixed results. The empirical results of Al-Obaidan (2008) conducted in Gulf countries reveals that concentration need not be considered as a reflection of the collusive behavior of banks, but a consequence of the superior efficiency of bank firms. The results suggests some banks are more efficient than others, and as a result,

earn higher profits and consequently gain a higher market share, a phenomenon that produces higher concentration. The empirical result of the study confirms the efficiency hypothesis and supports the view that restricting internal and/or external growth affects the economic efficiency of commercial banks. Seelanatha (2010) conducted a study in Sri Lanka and found no support for the traditional SCP but found support for efficiency-performance relationship.

In South Africa, Okeahalam (2001) found support for structure-conduct hypothesis. Similarly, Atemnkeng and Nzongang (2006) point out that there is a positive relationship between market structure and banks profitability within the institutional context of the banking system in Cameroon with respect to the SCP hypothesis. The overall result of the study indicates that bank size, loan-deposit ratio and devaluation directly contribute to a banks' profit rate whereas the loan-asset ratio and operation expenses inversely affects banks' profitability. Recent study in Tunisian banking sector (Mensi and Zouari, 2010) found no support for SCP hypothesis, and so reject any possibility of MP exertion at the expense of consumers. Chirwa (2001) investigated the relationship between market structure and performance in Malawian banking industry using regression analysis of commercial banks' profitability. The study examined the two competing hypotheses, whether collusion or efficiency is the more important determinants of commercial banks' profitability and the result provides evidence in favor of the traditional SCP (collusion) hypothesis and rejected the efficient market hypothesis.

In Uganda, using the computed efficiency scores from the stochastic frontier, Mugume (2010) analyzed the relationship between market structure and profitability in Ugandan banks and tested two hypotheses: the MP hypothesis and the ES hypothesis. The results indicate that concentration is positively related to higher bank returns, which lend some support for the MP theory and strong relationship between higher efficiency and bank performance. Based on the extant literature, it is apparent that there is no consensus on the hypothesis and so we formulated the following propositions to guide this study:

H1. Market concentration has no relationship with bank performance.

H2. Market efficiency has a positive and significant relationship with bank performance.

3. Methods and data

The study used panel data to test the proposed model. The panel data were preferred due to its appropriateness to analyze the data drawn from the all the 44 commercial banks over a period of ten years from 2000 to 2009. Generalized least squares (GLS) was used in the study and was preferred to OLS because it assigns equal weight to each observation from different size of banks (small, medium and large) and capable of producing estimators that are best, linear, unbiased and efficient (BLUE).

3.1 Measurement of variables

Dependent variable: three different indicators of bank performance were used; ROA, ROE and NIM. Independent variables: the concentration ratio is the percentage of market share owned by the largest m banks in an industry, where m is the largest four banks in the industry. The concentration ratio is expressed as:

$$CR_m = s_1 + s_2 + s_3 + \cdots + s_m,$$

where s_i = market share of the ith bank.

No concentration ($CR_4 = 0$ percent) means perfect competition where largest *i*th banks in the industry would not have any significant market share while total concentration ($CR_4 = 100$ percent) indicates an extremely concentrated market, i.e., pure monopoly. Low-concentration ranges from 0 to 50 percent, medium concentration ranges from 50 to 80 percent, while 80-100 percent indicates extreme concentration such as oligopoly and/or monopoly market.

Herfindahl-Hirschman Index (HHI) is the sum of squares of market shares of total assets, deposits or loans of banks in a given market and it reflects the market differentiation degree and the monopoly level. The HHI scores range from 0 – for perfectly competitive industry to 10,000 (100 sq) for a pure monopoly. HHI measure is given by:

$$\mathrm{HHI} = \sum_{i=1}^{n} (sk)_i^2$$

where *ski* is the share computed by using the percentage of assets of bank *i*; and *n* is the number of banks in the sector. Market concentration was measured using the four largest banks' concentration ratio (CR_4) and HHI to measure competitiveness of the banking industry in Kenya. The concentration index "CONC" was used to test the traditional SCP hypothesis, while consistent with Smirlock *et al.* (1984), Molyneux *et al.* (1994) and Molyneux and Forbes (1995), market share was used to test efficiency hypothesis. Control variables: loan loss provision was measured using loan loss to total loans, capital ratio was measure using equity to total assets, total deposits was measured using accounting value of total deposits, operating expenses was measured using total operating expenses to total assets, and yearly gross domestic product (GDP) was used to measure growth.

3.2 Model estimation

The paper follows the general approach set out in Smirlock (1985), Molyneux *et al.* (1994) and Molyneux and Forbes (1995). These studies assert that the correct approach in testing competing hypotheses was to take both the market share and concentration measures into account at the same time. In this regard, we adopt the general model in the form:

$$\pi = \alpha + \beta_1 CONC + \beta_2 MS + \alpha' X \tag{1}$$

where π is a measure of firm performance (ROA, ROE, NIM), *CONC* is a measure of concentration measure, *MS* is the market share of the firm and α is a vector of additional control variables that are firm and market specific and have been found to affect bank profitability.

The specification of Model (1) is as follows:

$$\pi_{it} = \alpha + \beta_1 CONC_{it} + \beta_2 MS_{it} + \beta_3 LLP_{it} + \beta_4 CR_{it} + \beta_5 TD_{it} + \beta_6 OPE_{it} + \beta_7 GDP_{it} + \varepsilon_{it} \tag{2}$$

where π_{it} is profitability (measured as ROA, ROE and NIM); $CONC_{it}$ is concentration index to test the SCP hypothesis and MS_{it} is market share to test the efficiency hypothesis, LLP_{it} is loan loss provision ratio; CR_{it} is capital ratio, equity to total assets; TD_{it} represents accounting value of total deposit; OPE_{it} represents operating expense,

total operating expenses to total assets; GDP_{it} is the yearly GDP growth; α: is a constant parameter; β_1-β_7 are coefficient parameters; ε_{it} is error term; i stands for the cross-section identifier and t denotes the time identifier.

Prior to testing the model, several tests were performed; first, multicolliniarity problem was checked by computing variance inflation factors (VIFs) for all independent variables. VIFs greater than ten indicate a problem of multicollinearity (see Gujarati, 2004). However, the results were less than ten and so multicollinearity was not a problem in this study. Second, we also tested for serial correlation using Durbin Watson test (1.91) and was not found to be problematic. And third, we tested the data for normality using Kolmogorov-Smirnorf test and we found the data to be normally distributed.

4. Results

Table I shows the concentration indices according to the four largest banks (CR_4) and HHI. The CR_4 concentration ratio was constant until year 2004 while it had been continuously decreased starting from the year 2004 onwards. On the other hand, HHI decreased during the entire period. It is commonly accepted that Herfindahl indices scores range from 0 for perfectly competitive industry to 10,000 (100 sq) for a pure monopoly. Hence, the range for this indicator that runs from 752 to 1,018 suggests that Kenya's banking sector is neither perfectly competitive nor pure monopoly, rather characterized as non-concentrated.

Similarly, CR_4 concentration measure ranges from 0 to 100 percent for perfectly competitive industry to pure monopoly, respectively. Low-concentration indices ranging from 0 to 50 percent indicates perfect competition to oligopoly while medium concentration ranges from 50 to 80 percent. Toward this end, the CR_4 concentration ratio ranging from 51 to 56 percent during the period 2000-2005 shows medium concentration of Kenyan banking sector while it starts declining from 2006 becoming low concentration.

4.1 Descriptive statistics

Table II presents summary statistics of variables used in regression analysis of market structure-performance relationship of Kenyan commercial banks. The mean, standard deviation, maximum and minimum values of the CR_4 concentration ratio and HHI

Table II.
Descriptive statistics

	CR_4				HHI			
Variable (%)	Mean	SD	Max.	Min.	Mean	SD	Max.	Min.
Return on assets	1.42	3.83	13.92	−24.01	1.42	3.83	13.92	−24.01
Return on equity	−24.13	707.09	234.82	−14,779.52	−24.13	707.09	234.82	−14,779.52
Net interest margin	5.36	2.59	13.71	−0.04	5.36	2.59	13.71	−0.04
Concentration ratio	50.845	4.73357	56.27	42.53	863.5	111.2744	1,018	688
Market share	2.27	3.82	20.19	0.00	2.27	3.82	20.19	0.00
Loan loss provision	7.67	10.52	81.24	−1.86	7.67	10.52	81.24	−1.86
Capital ratio	16.31	12.93	88.05	−11.94	16.31	12.93	88.05	−11.94
Total deposit (Kshs)	13,044	23,635	169,213	–	13,044	23,635	169,213	–
Operating expense ratio	5.16	3.13	19.09	0.00	5.59	3.13	19.09	0.00
GDP growth	3.63	2.25	7.01	0.55	3.63	2.25	7.01	0.55

concentration index show that there is small variability and less monopoly power of Kenyan banking sector. Similarly, statistical values for market share and other control variables suggest relative stability of Kenyan banks during the period.

4.2 Empirical results

Regression was run using three dependent variables to measure performance of banks; ROA, ROE and NIM. Similarly, two different measures of concentration were used to measure market concentration, i.e. the four largest banks (CR_4) and HHI. The results for all the three dependent variables and the two concentration measures based on GLS method are presented separately in Tables III and IV.

Using the interpretation of Smirlock (1985), if β_1 for the concentration measure is statistically greater than zero and β_2 for market share is zero, the collusion hypothesis holds, while if β_1 is zero and β_2 is statistically greater than zero, the ES hypothesis prevails. Results in Tables III and IV, show negative coefficients of market concentration using both CH_4 and HHI concentration measures and not statistically significant on all measures of performance. However, the coefficient of market share is positive and significant for all measures of performance and using both concentration measures. In other words, the results find concentration measure to be insignificant and not different from zero, whereas efficiency measure was found to have a positive and significant effect on firm performance (i.e. positive and significantly different from zero). Thus the study finds support for the efficiency hypothesis.

The results for the control variables were also found to be consistent with theory for instance; the loan loss provision is expected to have a negative effect on bank performance measures (ROA and ROE) and a positive relation with the NIM. However, whereas we agree with the results for ROA and ROE, the negative coefficient with respect to NIM goes against the theoretical expectation and is difficult to explain.

Variables	ROA	ROE	NIM
Constant	3.4431	26.6674	2.8512
	(4.3154)*	(1.4687)	(4.0569)*
Concentration ratio (CR_4)	−0.0292	−0.1981	−0.0067
	(−1.9420)	(−0.5901)	(−0.5171)
Market share	0.1780	1.8190	0.0772
	(5.0220)*	(2.9727)**	(2.8812)**
Loan loss provision ratio	−0.097	−1.1415	−0.0355
	(−7.8668)*	(−5.5182)*	(−3.6730)*
Capital ratio	0.0715	0.4298	0.0347
	(6.7052)*	(2.4748)**	(4.9573)*
Total deposit	1.17E-05	5.95E-05	2.69E-06
	(1.9372)	(0.6031)	(0.5853)
Operating expense ratio	−0.1994	−2.1084	0.4810
	(−5.3886)*	(−2.9668)**	(14.685)*
GDP growth	0.0013	0.6655	−0.0574
	(0.0484)	(1.2500)	(−2.5463)**
Observations	440	440	440
R^2	0.6391	0.3249	0.8833

Notes: *$p < 0.01$; **$p < 0.05$

Table III. Regression results of ROA, ROE and NIM using CR_4 concentration measure

Variables	ROA	ROE	NIM
Constant	3.0187	23.7239	2.6995
	(4.6246)*	(1.5953)	(4.6976)*
Concentration ratio (HH1)	−0.0012	−0.0077	−0.0002
	(−1.7295)	(−0.5055)	(−0.3636)
Market share	0.1747	1.8041	0.0750
	(4.9256)*	(2.9513)**	(2.8067)**
Loan loss provision ratio	−0.0970	−1.1434	−0.0358
	(−7.8613)*	(−5.4790)*	(−3.6991)*
Capital ratio	0.0713	0.4264	0.0347
	(6.6723)*	(2.4556)**	(4.9568)*
Total deposit	1.23E-05	6.41E-05	3.08E-06
	(2.0524)**	(0.6532)	(0.6727)
Operating expense ratio	−0.1997	−2.1035	0.4812
	(5.3868)*	(−2.9375)**	(14.6881)*
GDP growth	−0.0088	0.5753	−0.0587
	(−0.3135)	(0.9706)	(−2.4037)**
Observations	440	440	440
R^2	0.6377	0.3218	0.8835

Notes: *t*-Values in parenthesis. *$p < 0.01$; **$p < 0.05$

Table IV.
Regression results of ROA, ROE and NIM using HHI concentration measure

The coefficients of capital ratio have a positive relationship with all performance measures under both concentration measures, implying that capitalized banks perform better (see Tables III and IV). Similarly, we find highly capitalized banks to have wider NIM. Total deposit also has positive relationship with bank performance measures. The results are consistent as the coefficient of total deposit is positive for all bank performance measures and under both concentration measures. Total operational expenses ratio show a negative and significant relationship with performance measures of ROA and ROE and positively correlated to NIM. Consistent with the expectation, the results show negative coefficients with respect to performance measures as explained by ROA and ROE and positively related to the NIM. The results are consistent with extant literature that as operating expenses increase, firm performance decline. Similarly, as expected, operating expense ratio has a positive relationship with NIM because research show that a small increase in operating expenses triggers more increases in NIM (Tarus and Chekol, 2012).

GDP growth was used as a proxy to measure the impact of macro-economic factors in the study. This variable is expected to have a positive effect on a bank performance in terms of ROA and ROE and negative relationship with NIM. The results were found to be consistent for concentration measure of CH_4 which depicted positive coefficient for performance measures of ROA and ROE and negatively correlated with NIM. However, regression results based on HHI depicted this variable to have negative relationship with ROA while still consistent for ROE and NIM. More importantly, using both concentration measures GDP is negatively and significantly related with NIM which supports existing theory that increase in economic growth would cause the NIM to decline. Reasons attributed to this are that growth in GDP would present investment opportunities and also guarantee high return thus reduce credit risk which goes in to the determination of NIM (Maudos and Fernandez de Guevara, 2004).

5. Discussion and conclusion

The findings of the study revealed that that there is no strong evidence to support the SCP hypothesis in Kenyan banking sector as coefficients for market concentration measured by both HHI and CR_4 concentration indices were found to be negatively related to bank performance and statistically insignificant. In contrast, the findings with respect to efficiency hypothesis depicted that the coefficient of market share under both concentration measures were found to be positively related to bank performance and statistically significant. Thus based on the results, we argue that more efficient firms are more likely to be profitable because such firms have lower costs and consequently will gain a higher market share.

The findings with regard to the control variables were generally found consistent with what is expected in the literature except in few cases. The coefficient of loan loss provision relative to total loans is expected to have a negative effect on ROA and ROE and negative relationship to NIM. With regard to capital ratio, results of the specification indicated that Kenyan commercial banks are better capitalized as coefficient of capital relative to total asset is positive and significant for all performance measures and under the two concentration measures.

Similarly, the findings with respect to market potential (expressed in terms of total deposits) indicated that Kenyan commercial banks generate higher profits and provide new opportunities as coefficient of the variable is positively related to all the performance measures.

Consistent with literature, the findings of operating expenses ratio indicated that the coefficient of operational expense is negative and significant. These results are consistent with the findings of Ali Abdula (1994), that the cost of rendering services to customers in a bank erodes the profit of the bank. Similarly, the findings depicted that operating expense ratio is positively related to NIM at 1 percent level of significance. Unlike other control variables discussed above, the findings with respect to GDP growth was found to have mixed results and lack some consistency for the two concentration measures.

In view of the research question, we conclude that market structure variables explained by market share was found to have major influence on performance of Kenyan commercial banks. We failed to confirm the SCP hypothesis in Kenyan banking sector, as market concentration (measured by the two common concentration measures) was found to have insignificant relationship with firm performance. However, our results confirm efficiency hypothesis. This implies that Kenyan commercial banks do not earn higher profits by means of colluding with other banks to apply higher margins; rather, the efficiency of the banks presents an opportunity to earn higher profits. Hence, the findings are consistent with previous studies such as Burger (1995), Al-Obaidan (2008), Chortareas *et al.* (2011) and Seelanatha (2010), as empirical investigations of the study in terms of bank performance and concentration regressions show results disfavoring the SCP hypothesis and does support the possibility of efficiency in their operations.

Our research is not without any limitations. First, we used market share as a proxy to measure efficiency. Although this measure has been widely used in previous research, some commentators have leveled criticism that it is an indirect measure and that direct measures are preferred (Maudos, 1998). We suggest that future research especially in the study context utilize direct measures of efficiency. Second, we used a smaller sample size owing to the size of banking industry in Kenya. These small samples may compromise the efficiency of parameter estimates and so the results should be interpreted and used with caution.

References

Agle, B.R., Sonnenfeld, J.A. and Srinivasan, D. (2006), "Does CEO charisma matter? An empirical analysis of the relationship among organizational performance, environmental uncertainty, and top team perception of CEO charisma", *Academy of Management Journal*, Vol. 49 No. 1, pp. 161-174.

Al-Obaidan, A. (2008), "Market structure concentration and performance in the commercial banking industry of emerging markets", *European Journal of Economics, Finance and Administrative Sciences*, Vol. 12, pp. 110-114.

Ali Abdula, J.Y. (1994), "An empirical analysis of commercial banks performance in Bahiran", *Saving and Development*, Vol. 18 No. 3, pp. 15-24.

Arun, T. and Turner, J. (2002), "Financial sector reforms in developing countries: the Indian experience", *World Economy*, Vol. 25 No. 3, pp. 429-445.

Atemnkeng, J. and Nzongang, J. (2006), "Market structure and profitability performance in the banking industry of CFA countries", working paper, The Case of Commercial Banks in Cameroon, available at: www.jsd.africa.com (accessed August 4, 2011).

Athanasoglou, P.P., Brissimis, S.N. and Delis, M.D. (2008), "Bank-specific, industry specific and macroeconomic determinants of bank profitability", *Journal of International Financial Markets, Institutions and Money*, Vol. 18 No. 2, pp. 121-136.

Bain, J. (1956), *Barriers to New Competition*, Harvard University Press, Cambridge, MA.

Beck, T., Demirguc-Kunt, A. and Levine, R. (2000), "A new database on financial development and structure", *World Bank Economic Review*, Vol. 14 No. 3, pp. 597-605.

Berger, A.N. (1995), "The profit-structure relationship in banking – tests of market-power and efficient-structure hypotheses", *Journal of Money, Credit and Banking*, Vol. 27 No. 2, pp. 404-431.

Berger, A.N., Demirguc, K.A., Levine, R. and Haubrich, J.G. (2004), "Bank concentration and competition: an evolution in the making", *Journal of Money, Credit and Banking*, Vol. 36 No. 3, pp. 433-451.

Burke, J. and Rhoades, S. (1985), "Profits, potential competition and 'Contestability' in highly Concentrated Banking Markets", unpublished manuscript, Board of Governors of the Federal Reserve System.

Central Bank of Kenya (2005-2009), "Bank supervision annual report", Central Bank of Kenya, Nairobi.

Chirwa, E.W. (2001), "Market structure, liberalization and performance in the Malawian banking industry", Research Paper No. 108, African Economic Research Consortium, Nairobi.

Chortareas, G.E., Garza-Garcia, J.G. and Girardone, C.C. (2011), "Banking sector performance in Latin America: market power versus efficiency", *Review of Development Economics*, Vol. 15 No. 2, pp. 307-325.

Demsetz, H. (1973), "Industry structure, market rivalry, and public policy", *Journal of Law and Economics*, Vol. 16, pp. 1-9.

Eden, D. (2002), "Replication, meta-analysis, scientific progress, and AMJ's publication policy", *Academy of Management Journal*, Vol. 45, pp. 841-846.

Georgios, E.C., Jesus, G.G. and Claudia, G. (2009), "Banking sector performance in Latin America: market power versus efficiency", *Review of Development Economics*, Vol. 15 No. 2, pp. 307-325.

Gilbert, R.A. (1984), "Bank market structure and competition: a survey", *Journal of Money, Credit, and Banking*, Vol. 16, pp. 617-645.

Goddard, J., Molyneux, P. and Wilson, J. (2001), *European Banking: Efficiency, Technology and Growth*, John Wiley and Sons, Chichester.

Guerrero, R., Sepulveda, E. and Villalpando, M. (2005), "Profitability, concentration and efficiency in the Mexican banking industry", study presented at the Latin American and Caribbean Economic Association Annual Conference.

Gujarati, D.N. (2004), *Basic Econometrics*, 4th ed., McGraw Hill, New York, NY.

Hannan, T. (1979), "Limit pricing and the banking industry", *Journal of Money, Credit and Banking*, Vol. XI No. 4, pp. 438-446.

Maudos, J. (1998), "Market structure and performance in Spanish banking using a direct measure of efficiency", *Applied Financial Economics*, Vol. 8 No. 2, pp. 191-200.

Maudos, J. and Fernandez de Guevara, F. (2004), "Factors explaining the interest margin in the banking sectors of the European union", *Journal of Banking and Finance*, Vol. 28 No. 9, pp. 2259-2281.

Mensi, S. and Zouari, A. (2010), "Efficient structure versus market power, theories and empirical evidence", *International Journal of Economics and Finance*, Vol. 2 No. 4, pp. 156-159.

Molyneux, P. and Forbes, W. (1995), "Market structure and performance in European banking", *Applied Economics*, Vol. 27 No. 2, pp. 155-159.

Molyneux, P., Lloyd-Williams, D.M. and Thornton, J. (1994), "Market structure and performance in Spanish banking", *Journal of Banking and Finance*, Vol. 18, pp. 433-444.

Móré, C. and Nagy, M. (2003), "Relationship between market structure and bank performance", MNB working paper, Empirical evidence for Central and Eastern Europe, MNB.

Mugume, A. (2010), "Market structure and performance in Uganda's banking industry", Makerere University, Kampala, AERC research paper, Nairobi.

Ngugi, B., Pelowski, M. and Ogembo, J.G. (2010), "M-Pesa: a case study of the critical early adopters' role in the rapid adoption of mobile money banking in Kenya", *The Electronic Journal of Information Systems in Developing Countries*, Vol. 43 No. 3, pp. 1-16.

Okeahalam, C.C. (2001), "Structure and conduct in the commercial banking sector of South Africa", paper presented at the Trade and Industrial Policy (TIPS), Annual Forum, Johannesburg.

Samad, A. (2008), "Market structure, conduct and performance: evidence from Bangladesh banking industry", *Journal of Asian Economics*, Vol. 19 No. 2, pp. 181-193.

Sathye, M. (2005), "Market structure and performance in Australian banking", *Review of Accounting and Finance*, Vol. 4 No. 2, pp. 107-122.

Seelanatha, L. (2010), "Market structure, efficiency and performance of banking industry in Sri Lanka", *Banks and Bank Systems*, Vol. 5 No. 1, pp. 20-31.

Shaffer, S. (1982), "A non-structural test for competition in financial markets", *Proceeding of Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago, Washington, DC, Vol. 12*, pp. 225-243.

Smirlock, M. (1985), "Evidence on the (non) relationship between concentration and Profitability", *Journal of Money, Credit and Banking*, Vol. 17 No. 1, pp. 69-83.

Smirlock, M. and Brown, D. (1986), "Collusion, efficiency and pricing behavior: evidence from the banking industry", *Economic Inquiry*, Vol. XXIV No. 1, pp. 85-96.

Smirlock, M., Gilligan, T. and Marshal, W. (1984), "Tobin's *Q* and the structure-performance relationship", *American Economic Review*, Vol. 74 No. 5, pp. 1050-1060.

Tarus, D.K. and Chekol, Y.B. (2012), "Determinants of net interest margin in Kenyan commercial banks", *Journal on GSTF Business Review*, Vol. 2 No. 1, pp. 26-31.

Thorsten, B. and Michael, F. (2004), "Structural issues in the Kenyan financial system: improving competition and access", World Bank Policy Research Working Paper No. 3363, World Bank.

Tregenna, F. (2009), "The fat years: the structure and profitability of the US banking sector in the pre-crisis period", *Cambridge Journal of Economics*, Vol. 33 No. 10, pp. 609-663.

Whalen, G. (1986), "Competition and bank profitability: recent evidence", Economic Commentary, Federal Reserve Bank of Cleveland, Cleveland, OH.

Further reading

Maniatis, P. (2006), "Market concentration and industry profitability: the case of Greek banking (1997-2004)", *International Business & Economics Research Journal*, Vol. 5 No. 10, pp. 39-48.

Shepherd, W. (1982), "Economies of scale and monopoly profits", in Craven, J.V. (Ed.), *Industrial Organization, Antitrust, and Public Policy*, Kulwer Nihoff, Boston, MA.

Tregenna, F. (2006), "An empirical investigation of the effects of concentration on probability among US banks", Munich Personal Repec Archive Paper No. 13731, Munich.

Yongil, J. and Stephen, M.M. (2006), *Market Definition, Concentration, and Bank Performance*, University of Connecticut, Storrs, CT.

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