Market Structure and Bank Pricing Behavior: Fresh Evidence from Pakistan

Fiza Qureshi* Abdul Ghafoor ** Habib Hussain Khan***

*Institute of Business Administration (IBA), University of Sindh, Jamshoro & Faculty of Business and Accountancy University of Malaya, Malaysia
**Faculty of Business and Accountancy University of Malaya, Malaysia
***Faculty of Management Sciences, International Islamic University, Islamabad & Faculty of Business and Accountancy University of Malaya, Malaysia

Abstract

Whether concentrated banking industries allow banks to exercise monopoly power through anti-competitive pricing is a pertinent question from the perspective of anti-trust policies. We explore this question in context of banking industry in Pakistan. We assess the pricing behavior of banks through three alternative measures – banks' lending rates, banks' deposit rates and banks' net interest margins. Panel data analysis techniques – i.e. fixed effect (FE) and generalized method of moments (GMM) – are applied to bank level data over the period 1999-2014. The results show that higher level of bank concentration is related to lower deposit rates, higher loan rates and higher net interest margins. These results are robust across alternative measures of concentration, estimation techniques and time horizons. These findings have important implications for antitrust policies.

Keywords: Bank Concentration, Loan Rate, Deposit Rate, Net Interest Margin

JEL: G01; G21; G28

Introduction

Banking industry in Pakistan has experienced a noticeable change in its market structure since Asian and Global Financial Crises. Unlike most other countries–where banking industry has moved towards more concentrated market structure –the banking industry in Pakistan has witnessed a decline in level of concentration (increase in level of competition). Table 1 highlight this aspect of banking industry in Pakistan over the period 1999-2014. For instance, five bank concentration ratio decreased from 0.92 in 1999 to 0.60 in 2014. A similar trend can be observed in other concentration measures. Several studies in banking and finance show that the market structure of banking industry is related to banks' own performance and other aspects of the economy.[1] There are two prominent views about bank concentration i.e. the monopoly view and the efficiency view. The monopoly view predicts that higher concentration implies lower level of competition,

[1] Bank performance include bank profitability and cost efficiency while other economic aspects are financial stability (Fu, Lin, & Molyneux, 2014), growth of manufacturing sectors (Khan, Ahmad, & Gee, 2016b) and transmission of monetary policy (Khan, Ahmad, & Gee, 2016a).

therefore, banks that hold more market share can collude and charge higher loan rates, pay less deposit rates and earn monopoly profits (Smirlock, 1985; Berger, 1995; Amidu, 2013; Mirzaei, Moore, & Liu, 2013). On the contrary, efficiency view suggests that concentrated markets allow large banks to exploit managerial, technological and scale efficiencies, and as a result banks earn higher profits (Demsetz, 1973; Peltzman, 1977; Homma, Tsutsui, & Uchida, 2014). Both these views have contradictory but important implications for antitrust policies. For example, if monopoly view is valid then anti-concentration policies are favorable. However, if efficiency view is accurate then anti-concentration policies may seize the opportunities for banks to exploit efficiencies.

Table 1: *Market Structure of Banking Industry in Pakistan over 1999-2014*

Ind.	1999	2001	2003	2005	2007	2009	2011	2013	2014
CR5	0.92	0.94	0.88	0.85	0.91	0.92	1.00	0.59	0.60
CR3	0.70	0.74	0.65	0.62	0.73	0.75	0.95	0.43	0.43
HHI	0.27	0.28	0.23	0.19	0.19	0.20	0.28	0.14	0.14
BI	-0.06	-0.16	-0.10	-0.11	-0.13	-0.12	-0.04	-0.17	-0.19
LI	0.03	0.05	0.30	0.30	0.16	0.04	0.07	0.08	0.08

Note: The table reports the indicators of bank market structure in Pakistan over the period 1999-2014. CR5 = five bank concentration ratio, CR3 = three bank concentration ratio, HHI-Herfindahl-Hirschman Index, BI = Boone Indicator, LI= Lerner Index. Source: Global Financial Development Database (GFDD), World Bank.

Although, there is a vast literature on the role of bank concentration/competition, the findings are not conclusive [see Osborne & Wendel (1978), Heggestad (1979) and Gilbert (1984)]. Accordingly, it becomes very difficult to build a decisive stance as to what form of bank market structure is favorable. Moreover, there are only handful of studies in context of Pakistan that test the traditional hypotheses in structure-performance relationship using a traditional framework [see Arby (2003), Bhatti and Hussain (2010) and Talpur, Shah, Pathan, and Halepoto (2016) among others]. The traditional hypotheses include the structure conduct performance (SCP) hypothesis, the efficient structure (ES) hypothesis, the relative market power (RMP) hypothesis and the quite life (QL) hypothesis. Nevertheless, there is a great debate among researchers with respect to the appropriateness of traditional framework to validate these theories. For instance, Demsetz (1973), Tirole (1988) and Homma et al. (2014) describe how the traditional framework is inconsistent for validating these hypotheses in structure-performance relationship. Consequently, the findings of current studies are of little use for policy making.

This study departs from the traditional framework and relates bank concentration directly to the pricing behavior of the banks. In doing so, the study answers a very relevant question from the perspective of desirability/undesirability of bank concentration i.e. does bank concentration

allow banks to exercise monopoly power through anti-competitive pricing in Pakistan? The study employs panel data analysis techniques – i.e. fixed effect (FE) and generalized method of moments (GMM) – to bank level data over the period 1999-2014. We measure the bank market structure through five bank concentration ratio (CR5) and Herfindahl Hirschman Index (HHI) while banks' pricing strategy is estimated using lending rates, deposit rates and net interest margins. The results indicate that bank concentration is related to lower deposit rates, higher loan rates and higher net interest margins. The policy implications of the study are that the reduction in level of concentration in Pakistan after Asian and Global financial crises is a healthy sign for the economy. However, there are concerns related to the financial stability as most of the nations have purposefully favored the concentrated market structure for their banking sectors.

The study contributes to finance literature in general and to the structure-performance relationship in particular in different ways. First, this study uses a different approach – in comparison to the traditional framework – to test whether concentrated banking industries allow the large banks to exercise monopoly power. The traditional SCP framework identifies the existence of monopoly pricing by relating bank concentration and profitability. It assumes that a positive relationship between concentration and profitability is evidence of monopoly view. However, traditional framework has been criticized for its inability to logically explain the role of monopoly pricing in concentration-profitability relationship.[2] This study relates the bank concentration to banks' pricing behavior – as represented by bank lending rate, deposit rate and net interest margin – to see if bank concentration is related to monopoly pricing. This is a more direct test of the monopoly view in structure-performance nexus. Second, the study applies this new approach in context of Pakistan where banking industry is moving towards a more competitive market structure since Asian and Global financial crises.

The rest of this paper is structured as follows. Section 2 deals with literature in general and in Pakistani context. Section 3 is dedicated to discussion of methodology that includes the empirical model and variables of the study. Section 4 provides the empirical findings along with discussion on estimation results. Finally, Section 5 concludes the study along with discussion of policy implications.

Literature Review

The literature on banking market structure is huge and covers its relationship with different aspects of bank performance, and related aspects of the economy i.e. financial system's stability, the growth of manufacturing

[2] See Demsetz (1973), Tirole (1988) and Homma et al. (2014) for critical review of traditional framework.

sectors, and the transmission of monetary policy. The key feature of literature in this domain is that the empirical evidence on role of bank market structure is far from being conclusive. This study considers the literature on the relationship between concentration and bank performance with special focus on methodological approaches. The literature review is divided into two parts: first part deals with general literature while, second part discusses the studies conducted in Pakistani context.

General Literature

The traditional framework of the SCP paradigm suggests that large banks in concentrated banking industries collude to charge higher prices and earn higher profits, thus there is a positive relationship between concentration and profitability. Following this framework, earlier studies regress profitability measures on bank concentration to test if concentrated markets allow banks to charge higher prices.[3] However, a positive relationship between concentration and profitability is not a sufficient condition to imply that banks in concentrated market collude. For instance, Demsetz (1973) argues that other variables such as cost efficiency and/or product quality can be driving the relationship between concentration and profitability. Furthermore, Tirole (1988) also argues that the causal relationship from concentration to anti-competitive pricing and then to the profitability cannot be identified by simply regressing profitability on concentration.

Several other studies – i.e. Zhang, Jiang, Qu, and Wang (2013), Mirzaei et al. (2013) and Amidu (2013) – control the efficiency concern by including direct measures of cost efficiency in the estimation model.[4] However, except for explicitly controlling the cost efficiency, this approach is not different from the traditional framework and suffers from same problems as discussed in Demsetz (1973) and Tirole (1988). Further developments in new empirical industrial organization (NEIO) gave rise to new measures of competition that allowed researchers to test for competition-profitability relationship. These studies include Calem and Carlino (1991), Shaffer and DiSalvo (1994), De Bandt and Davis (2000), Bikker and Haaf (2002), Coccorese (2009) and Turk Ariss (2010). Nonetheless, the establishment of a

[3] Some of these studies are Graddy (1980), Gale and Branch (1982), Smirlock, Gilligan, and Marshall (1984), Smirlock (1985), Rhoades (1985) , Smirlock, Gilligan, and Marshall (1986) , Shepherd (1986), Evanoff and Fortier (1988), Martin (1988) , Berger and Hannan (1989), Bourke (1989), Molyneux and Thornton (1992) and Lloyd-Williams, Molyneux, and Thornton (1994), Christopoulos, Lolos, and Tsionas (2002) and Koutsomanoli-Filippaki, Mamatzakis, and Staikouras (2009).

[4] Some of the earlier studies that add cost efficiency to the traditional framework to control for efficiency concerns include Berger (1995), Molyneux and Forbes (1995), Goldberg and Rai (1996), Berger and Hannan (1997), Park and Weber (2006) and Tregenna (2009).

relationship between competition (the new measures) and profitability again does not tell anything about the question of monopoly pricing i.e. whether concentrated banking industries allow banks to collude and charge higher prices. In the next section, we review some of the studies conducted in this domain in Pakistani context.

Studies in Pakistani Context

There are handful of studies on banking market structure and profitability relationship in context of Pakistan. These studies too, like the general literature, employ the traditional framework and identify the linkage between bank concentration and profitability measures. For example, Arby (2003) provides first evidence on the role of banking market structure in Pakistan. Analyzing the bank level data over the period 1990-1999, Arby (2003) concludes that the banking industry in Pakistan is highly concentrated (less competitive) and that the concentration is positively related to bank profitability. Similarly, Bhatti and Hussain (2010) and Talpur et al. (2016) analyze the banking industry in Pakistan in context of the SCP hypothesis and conclude that bank concentration is positively related with profitability. As discussed in previous section, these studies follow the traditional framework which fails to identify if the relationship between concentration and profitability is explained by monopoly pricing.

Few other studies – i.e. Khan and Riazuddin (2009), Hussain (2014) and Saeed and Sameer (2015) –examine the market structure related issues in context of Pakistan. For instance, Khan and Riazuddin (2009) calculate Panzar-Rosse statistics to analyze the competitive structure of Pakistani banking industry over the period 1997-2007 and conclude that banking sector in Pakistan exhibits monopolistically competitive market structure over this period. However, their study departs from SCP literature as they do not relate bank profitability with market structure. Similarly, Hussain (2014) examines the impact of bank concentration (along with other determinants) on net interest margins and finds that higher bank concentration leads to higher net interest margins. This in our view is a more direct evidence in favor of the SCP hypothesis. However, Hussain (2014) does not use bank lending and deposit rates to verify this relationship as we do in our study. Moreover, Saeed and Sameer (2015) find that higher level of bank concentration adds to the financial constraints of small and medium enterprises (SMEs), but it has favorable effect on financial constraints of opaque firms.[5]

[5] Several other studies have been conducted in context of Pakistani banking sector but they are not directly related to the subject matter we cover in this study. These studies include Khawaja and Din (2007), Di Patti and Hardy (2005), Javaid (2011) and Gul, Irshad, and Zaman (2011) among others.

In this study, we address the issues with traditional framework and answer the research question by relating bank concentration to lending rates, deposit rates and net interest margin. Our study departs from the traditional framework in that we relate bank concentration directly to the pricing behavior of banks. In doing so, the study answers a very relevant question from the perspective of desirability/undesirability of bank concentration i.e. does bank concentration allow banks to exercise monopoly power through anti-competitive pricing in Pakistan?

Methodology

The aim of this study is to examine if bank concentration leads to monopoly pricing. In order to, achieve this objective, we separately regress banks' lending rates, deposit rates and net interest margin on measures of bank concentration.

Empirical Model

Following equations are constructed to analyze the impact of bank concentration on banks' pricing behavior which is represented by lending rates, deposit rates, and net interest margins. The rationale for using these rates to assess pricing behavior is explained in the next section.

$$LR_{i,t} = \omega_0 + \omega_1 BCI_{t-1} + \lambda_m \sum_{m=1}^{n} X_{m,i,t} + \tau_k \sum_{k=1}^{l} Z_{k,t} + \varepsilon_{i,t} \ldots (1)$$

$$DR_{i,t} = \omega_0 + \omega_1 BCI_{t-1} + \lambda_m \sum_{m=1}^{n} X_{m,i,t} + \tau_k \sum_{k=1}^{l} Z_{k,t} + \varepsilon_{i,t} \ldots (2)$$

$$NIM_{i,t} = \omega_0 + \omega_1 BCI_{t-1} + \lambda_m \sum_{m=1}^{n} X_{m,i,t} + \tau_k \sum_{k=1}^{l} Z_{k,t} + \varepsilon_{i,t} \ldots (3)$$

Where, $LR_{i,t}$, $DR_{i,t}$ and $NIM_{i,t}$ respectively refer to lending rates, deposit rates, and net interest margins for bank "*i*" at time "*t*"; BCI_{t-1} is bank concentration index for time "t-1"; $\sum_{m=1}^{n} X_{m,i,t}$ is vector of bank specific variables; $\sum_{k=1}^{l} Z_{k,t}$ is vector of macroeconomic variables; and $\varepsilon_{i,t}$ is the random error term.

Main Variables of the Study

We assess banks' pricing behavior with the help of banks' lending rates, deposit rates, and net interest margins following Berger and Hannan (1989), Goldberg and Rai (1996) and Brewer and Jackson (2006). In response to the criticism on use of traditional framework for identifying the monopoly effect of bank concentration, Berger and Hannan (1989), and Brewer and Jackson (2006) argue that if bank concentration promotes anti-competitive pricing, then the banks in concentrated industries should pay lower deposit

rates. However, Homma et al. (2014) argue that banks may not increase the deposit rates to attract more finance but they may increase their lending rates. We capture both these possibilities by using lending and deposit rates. Similarly, Goldberg and Rai (1996) argue that banks' ability to charge high loan rates and pay lower deposit rates is represented by net interest margins. For instance, if banks set lending and deposit rate anti-competitively, their net interest margins will be higher. Accordingly, we also use net interest margins as a measure of banks' pricing behavior. For concentration measures, we use two concentration indices i.e. five bank concentration (CR5) and Herfindahl-Hirschman Index (HHI). The CR5 is calculated as the ratio of total assets held by five largest banks in a country to the total assets of all banks in that country in a particular year. The HHI is calculated as the sum of squared market shares of all the banks in a country in a particular year. The higher values of both CR5 and HHI indicate higher level of concentration (lower level of competition).

Other Variables

In addition to the main explanatory variable i.e. bank concentration, we follow earlier studies – i.e. Berger and Hannan (1989), Goldberg and Rai (1996) and Brewer and Jackson (2006) – to use several bank level and country level variables to account for cross sectional variations (in lending rates, deposit rates and net interest margins) attributable to micro and macro environment. Bank level variables include size, capitalization, liquidity, loan/deposit ratio and overheads. For country level variables, we use gross money supply, domestic product, inflation, and interest rate. Moreover, few binary variables have also been included in the estimation model to represent merger activity, bank ownership and financial crisis.

Sample and Data

We analyze the relationship between bank concentration and pricing behavior using annual data for commercial banks from Pakistan over the period 1999-2014.[6] Data on bank level variable is collected from BankScope, and that on macroeconomic variables from Global Financial Development Database (GFDD), World Bank. Definition and sources of these variables are presented in Table 2 below. We apply fixed effect model by least square dummy variable (LSDV) technique as main estimation technique. However, for robustness purpose, we also apply two-step system generalized method of moments (GMM) with small sample adjustment and corrected standard errors.

Table 2: Variables, Definitions and Sources

Variables	Definition	Source
CR5	Total assets held by five largest banks in a country to the total assets of all banks in	World Bank

[6] Sample includes 24 commercial banks.

	that country.	
HHI	Sum of squared market shares of all the banks in a country.	BankScope
Bank Lending Rate	The ratio of interest income to interest earning assets.	BankScope
Bank Deposit Rate	The ratio interest expenses to interest bearing liabilities.	BankScope
Net Interest Margin	The difference between the interest income generated by banks and the amount of interest paid out to their lenders divided by interest earning assets.	BankScope
Bank Size	Natural log of total assets	BankScope
Bank Capitalization	Ratio of equity to total assets	BankScope
Bank Liquidity	Ratio of liquid assets to total assets	BankScope
Loan/Deposit Ratio	Ratio of total loans to total deposits	BankScope
Bank Overhead	The ratio of overheads to total assets	BankScope
Money Supply	Narrow money (M1) as a percentage of GDP	World Bank
GDP Growth	Inflation adjusted annual growth rate for GDP	World Bank
Inflation	Inflation based on consumer price index	World Bank
Interest Rate	Real interest rate	World Bank
Merger	A dummy variable that equals 1 for merged banks and 0 otherwise.	BankScope
Public Bank	A dummy variable that equals 1 for public banks and 0 otherwise.	BankScope
Foreign Bank	A dummy variable that equals 1 for foreign banks and 0 otherwise.	BankScope
Financial Crisis	A dummy variable that equals 1 for years corresponding to Global financial crisis i.e. 2008, 2009, and 0 otherwise.	BankScope

Note: The table shows the variables of the study, their definition and sources.

Empirical Findings

Descriptive and Correlation

Table 3 reports the descriptive statistics for variables of this study. The measures of bank concentration i.e. CR5 and HHI, are of particular interest to this study. The average values of CR5 and HHI are 0.858 and 0.215 respectively, implying that banking industry in Pakistan is on average concentrated. Although, from Table 1 (Section 1), we noticed a decrease in CR5 and HHI from 0.92 and 0.27 in 1999 to 0.60 and 0.14 in 2014, the banking industry in Pakistan is still considered as highly concentrated – 60% of the total assets of the banking sector are held by five large banks. The average statistics for concentration ratios are roughly equivalent to earlier studies conducted in Pakistan i.e. Hussain (2014), Saeed and Sameer (2015), and Talpur et al. (2016). Table 4 reports the correlation coefficients among the

variables. The important consideration from correlation analysis is that explanatory variables are not highly correlated to create multicollinearity problem. In Table 4, most of the correlations are less than 0.30, so there is no issue of multicollinearity. However, some of the correlations are high and can be problematic. For highly correlated explanatory variables, we follow Bikker, Shaffer, and Spierdijk (2012), and run a regression between two correlated variables and use the residuals of dependent variable.

Discussion and Analysis

The estimation results of Equation 1, 2 and 3 are reported in panels A, B and C of Table 5. The concentration measures are CR5 (columns 1, 3 and 5) and HHI (columns 2, 4 and 6). Results are estimated by fixed effect model through least square dummy variable (LSDV) technique with robust standard errors. The coefficients on both CR5 and HHI are significantly positive in panel A, where the bank lending rate is the dependent variable, implying that higher level of bank concentration is related to higher lending rates. On the other hand, the coefficients on CR5 and HHI are significantly negative in panel B, where the bank deposit rate is the dependent variable, suggesting that higher level of bank concentration is related to lower deposit rates. Intuitively, the coefficients on CR5 and HHI for net interest margin in panel C are significant with positive sign confirming the anti-competitive role of bank concentration for banks' pricing behavior. The findings are in line with some of earlier studies i.e. Berger & Hannan (1989) and Brewer and Jackson (2006) that use lending and deposit rates, and net interest margins in their analyses. These findings imply that higher level of bank concentration enables the banks to behave anti-competitively while paying deposit rates and/or charging loan rates.

The coefficients on control variables are mostly significant with logically explainable signs. For instance, bank size is positively related to lending rates and net interest margins but negatively related to bank deposit rates. The positive relationship between bank size and net interest margin can either be explained by the efficiency concerns or market power. However, the negative coefficient on deposit rates and the positive coefficient on lending rates indicate that large banks are able to exercise market power to have higher net interest margins. The coefficients on dummy variables for bank ownership (public and foreign banks) indicate that public banks charge lower lending rates, pay lower deposit rates and have lower net interest margins in comparison to private and foreign banks. On the other hand, behavior of foreign banks is not significantly different from rest of the banks. Significantly negative coefficients on dummy variable for financial crisis imply that lending rates, deposit rates and net interest margins have been lower during the crisis period i.e. 2008-2009.

Robustness Check

In previous section, we found consistent results in favor of monopoly view of concentration using alternative measures of bank concentration and banks' pricing behavior. However, we perform certain robustness checks – i.e. accounting for endogeneity, bank size and financial crisis – to assure consistency of these findings.

Dealing with Endogeneity

Literature suggests that market structure, banks' conduct and performance are endogenously determined i.e. see Martin (2002). Therefore, controlling for endogeneity is important to reveal true relationship between bank concentration and banks' pricing behavior. We follow a method outlined in Roodman (2009) and apply the Two-step System Generalized Method of Moments (GMM) developed by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998), with corrected standard errors (Windmeijer, 2005) and small sample adjustments. The estimation results from two-step GMM are reported in Table 6. The concentration measures are CR5 (columns 1, 3 and 5) and HHI (columns 2, 4 and 6). The results are qualitatively similar to those reported in Table 5. Thus, our findings that bank concentration leads to anti-competitive pricing holds after controlling for endogeneity concerns.

Table 3: *Descriptive Statistics*

Variable	Mean	Median	S.D	Min	Max
Five Bank Concentration Ratio (CR5)	0.858	0.913	0.137	0.589	1.000
Herfindahl-Hirschman Index (HHI)	0.215	0.205	0.050	0.140	0.280
Bank Lending Rate	0.107	0.114	0.028	0.065	0.145
Bank Deposit Rate	0.048	0.047	0.029	0.015	0.087
Net Interest Margin	0.040	0.038	0.012	0.029	0.081
Bank Size	10.63	10.72	0.218	10.30	10.90
Bank Capitalization	0.079	0.090	0.024	0.038	0.105
Bank Liquidity	0.168	0.157	0.037	0.124	0.239
GDP Growth	0.094	0.065	0.080	-0.027	0.273
Inflation	0.083	0.076	0.048	0.025	0.203

Note: The table reports the values on mean, median, standard deviation, minimum and maximum for each variable of the study.

Table 4: *Correlation Matrix*

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**
(1) CR5	1.000													
(2) HHI	0.817	1.000												
(3) Bank Lending Rate	0.142	0.305	1.000											
(4) Bank Deposit Rate	-0.294	-0.421	0.165	1.000										
(5) Net Interest Margin	0.163	0.286	0.337	-0.376	1.000									
(6) Bank Size	0.192	0.720	0.105	0.272	0.420	1.000								
(7) Bank Capitalization	-0.247	-0.303	0.248	0.256	0.291	0.246	1.000							
(8) Bank Liquidity	0.289	0.362	-0.526	-0.280	-0.245	-0.246	-0.367	1.000						
(9) Loan/Deposit Ratio	0.189	0.285	-0.211	-0.390	-0.395	-0.474	-0.204	0.330	1.000					
(10) Bank Overhead	-0.299	-0.304	0.529	0.312	0.251	0.366	0.249	-0.284	-0.112	1.000				
(11) Money Supply	0.098	-0.204	-0.462	-0.292	-0.070	-0.140	-0.056	0.281	0.339	-0.194	1.000			
(12) GDP Growth	0.178	-0.033	-0.080	-0.141	-0.162	0.098	0.169	0.037	0.247	-0.227	0.277	1.000		
(13) Inflation	0.241	-0.207	0.522	0.460	0.031	0.297	0.275	-0.194	0.343	0.265	0.296	0.123	1.000	
(14) Real Interest Rate	-0.288	-0.165	-0.188	-0.100	0.344	-0.069	-0.225	0.033	-0.248	0.199	0.009	-0.252	-0.208	1.000

Note: The table reports pair-wise correlations among variables of the study

Table 5: *Concentration and Pricing Behavior (Fixed Effect Model)*

Variables	Panel A: Lending Rate		Panel B: Deposit Rate		Panel C: Net Interest Margin	
	(1)	(2)	(3)	(4)	(5)	(6)
Concentration (t-1)	0.231***	0.198***	-0.217***	-0.158***	0.129***	0.133**
	(0.047)	(0.039)	(0.038)	(0.027)	(0.021)	(0.041)
Bank Size	0.110**	0.087**	-0.096**	-0.174***	0.157**	0.161**
	(0.047)	(0.038)	(0.046)	(0.054)	(0.077)	(0.079)
Bank Capitalization	0.007	0.021*	0.042**	0.016	0.017*	0.039
	(0.057)	(0.011)	(0.019)	(0.053)	(0.009)	(0.088)
Bank Liquidity	-0.170**	-0.147**	0.130*	0.102**	0.114**	0.132**
	(0.078)	(0.060)	(0.066)	(0.048)	(0.053)	(0.057)
Loan/Deposit Ratio	0.021	0.017	0.013	0.019	0.016	0.022
	(0.066)	(0.028)	(0.095)	(0.066)	(0.027)	(0.074)
Bank Overhead	-0.005	0.003	0.006**	-0.012	0.013	0.014*
	(0.079)	(0.056)	(0.003)	(0.080)	(0.053)	(0.008)
Money Supply	0.016	0.012	0.025	0.106	0.102	0.104
	(0.044)	(0.070)	(0.094)	(0.041)	(0.069)	(0.095)
GDP Growth	-0.035*	-0.048*	-0.050**	0.041	0.052*	0.047*
	(0.019)	(0.027)	(0.023)	(0.052)	(0.027)	(0.024)
Inflation	-0.019**	-0.013*	-0.060	0.008	0.012*	0.014
	(0.008)	(0.007)	(0.082)	(0.033)	(0.007)	(0.121)
Interest Rate	0.034**	0.033*	0.038*	0.075	-0.077**	-0.076*
	(0.015)	(0.018)	(0.020)	(0.070)	(0.037)	(0.039)
Merger	0.017*	0.016**	0.015*	-0.023*	0.026**	0.029**
	(0.009)	(0.007)	(0.008)	(0.012)	(0.010)	(0.014)
Public Bank	-0.014**	-0.013*	-0.018*	-0.017**	-0.019**	-0.016*
	(0.005)	(0.007)	(0.010)	(0.008)	(0.008)	(0.009)
Foreign Bank	0.161	0.172*	0.135	0.158*	0.139	0.185
	(0.150)	(0.089)	(0.142)	(0.081)	(0.122)	(0.116)
Financial Crisis	-0.118**	-0.121*	-0.161*	-0.124**	-0.129**	-0.127**
	(0.057)	(0.062)	(0.083)	(0.061)	(0.059)	(0.054)
Adj. R-squared	0.672	0.736	0.695	0.715	0.688	0.724
Time Dummy	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table reports the estimation results from fixed effect model based on Equation 1, 2, and 3. The dependent variables are lending rate, deposit rate and net interest margin in Panel A, B and C respectively. The results from CR5 are reported in column 1, 3, and 5, while column 2, 4 and 6 report the results from HHI. Results are estimated using fixed effect model by least square dummy variable (LSDV) technique. Robust standard errors reported in parenthesis under each coefficient. Subscripts "***" "**" and "*" respectively indicate the significance of coefficients at 1%, 5% and 10% level.

Table 6: *Bank Concentration and Pricing Strategy (GMM)*

Variables	Panel A: Lending Rate		Panel B: Deposit Rate		Panel B: Net Interest Margin	
	(1)	(2)	(3)	(4)	(5)	(6)
Concentration (t-1)	0.195**	0.166**	-0.212**	-0.182**	0.240**	0.154**
	(0.088)	(0.069)	(0.092)	(0.075)	(0.114)	(0.071)
Bank Size	0.027**	0.024**	-0.029**	-0.019*	0.021**	0.023*
	(0.013)	(0.011)	(0.013)	(0.010)	(0.009)	(0.012)
Bank Capitalization	0.065***	0.054***	0.044***	0.079**	0.075**	0.071**
	(0.021)	(0.016)	(0.013)	(0.038)	(0.035)	(0.029)
Bank Liquidity	0.052**	0.061**	0.065***	0.057*	0.055**	0.049**
	(0.023)	(0.028)	(0.025)	(0.029)	(0.022)	(0.019)
Loan/Deposit Ratio	-0.269**	-0.213**	-0.232**	-0.249**	-0.209**	-0.205**
	(0.129)	(0.101)	(0.109)	(0.119)	(0.098)	(0.094)
Bank Overhead	0.012	-0.011*	-0.013	0.012	-0.017	-0.015*
	(0.08)	(0.006)	(0.049)	(0.011)	(0.021)	(0.008)
Money Supply	0.024*	0.026**	0.021*	0.029*	0.028***	0.023**
	(0.013)	(0.011)	(0.012)	(0.015)	(0.009)	(0.011)
GDP Growth	0.037**	0.034**	0.032***	0.036**	0.035*	0.030***
	(0.015)	(0.013)	(0.010)	(0.016)	(0.018)	(0.009)
Inflation	0.024**	0.020**	0.020**	0.023**	0.029**	0.028**
	(0.011)	(0.009)	(0.008)	(0.010)	(0.013)	(0.012)
Interest Rate	0.009**	0.012*	0.011**	0.008*	0.009*	0.010***
	(0.004)	(0.007)	(0.004)	(0.005)	(0.005)	(0.003)
Merger	0.020**	0.018**	-0.015***	-0.019*	0.019**	0.015**
	(0.008)	(0.007)	(0.004)	(0.010)	(0.007)	(0.006)
Public Bank	-0.082**	-0.087**	-0.079**	-0.094**	-0.092**	-0.096**
	(0.039)	(0.042)	(0.035)	(0.044)	(0.041)	(0.046)
Foreign Bank	0.063**	0.039**	0.055**	0.056***	0.059**	0.061***
	(0.027)	(0.017)	(0.024)	(0.014)	(0.028)	(0.019)
Financial Crisis	-0.128**	-0.132**	-0.126**	-0.152**	-0.131**	-0.145**
	(0.053)	(0.062)	(0.058)	(0.069)	(0.059)	(0.071)
Time Dummy	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)	0.032	0.018	0.022	0.013	0.029	0.008
AR(2)	0.135	0.134	0.187	0.082	0.151	0.121
Sargan/Hensen	0.225	0.271	0.181	0.232	0.209	0.227
No. of Instruments	129	129	129	131	131	131
No. of Groups	173	173	173	173	173	173

Note: The Table reports the estimation results from two-step system GMM with corrected standard errors and small sample adjustment. The dependent variables are lending rate, deposit rate and net interest margin in Panel A, B and C respectively. The results from CR5 are reported in column 1, 3, and 5, while column 2, 4 and 6 report the results from HHI. The corrected standard errors are reported in parenthesis under each coefficient. The probability values of AR (1), AR (2) and Sargan/Hansen test suggest that GMM is correctly specified and instruments are exogenous. Subscripts "***" "**" and "*" respectively indicate the significance of coefficients at 1%, 5% and 10% level

Banks' Size and Concentration-Pricing Relationship

The monopoly view of concentration predicts that large banks in concentrated markets collude and charge higher prices. In previous

section, we explicitly control for bank size and find evidence in favor of monopoly view. In this section, we analyze the interactive role of banks' absolute size and banks' relative size in concentration-pricing behavior relationship. We introduce two interaction terms i.e. absolute bank size and concentration, and relative bank size (market share) and concentration. The estimation results are reported in Table 7. The concentration measures are CR5 (columns 1, 3 and 5) and HHI (columns 2, 4 and 6). The coefficients on interaction terms are significantly positive suggesting that anti-competitive behavior on part of larger banks is higher than smaller banks. However, important for our study are the coefficients on bank concentration which are still significant with directions of the relationships similar to those found in Table 5. Thus our findings are robust across banks of different sizes.

Table 7: *Banks' Size and Concentration-Pricing Relationship*

Variables	Panel A: Lending Rate		Panel B: Deposit Rate		Panel B: Net Interest Margin	
	(1)	(2)	(3)	(4)	(5)	(6)
Bank Concentration (t-1)	-0.217***	0.233***	-0.209***	-0.273**	0.285***	0.261**
	(0.057)	(0.068)	(0.081)	(0.131)	(0.071)	(0.113)
Concentration X Bank Size	0.016**	0.014**	-0.019**	-0.011*	0.017**	0.013*
	(0.007)	(0.005)	(0.008)	(0.006)	(0.007)	(0.007)
Concentration X Market Share	0.073***	0.061***	-0.052***	-0.068**	0.065**	0.071*
	(0.023)	(0.019)	(0.016)	(0.031)	(0.029)	(0.032)
Loan/Deposit Ratio	-0.258**	-0.235**	-0.254**	-0.261**	-0.227**	-0.231**
	(0.124)	(0.113)	(0.121)	(0.129)	(0.108)	(0.111)
Bank Overhead	0.019*	-0.023	-0.028	0.018	0.026	0.017*
	(0.010)	(0.017)	(0.049)	(0.021)	(0.034)	(0.009)
Money Supply	0.021*	0.023**	0.017*	0.026*	0.025***	0.020**
	(0.012)	(0.011)	(0.009)	(0.014)	(0.006)	(0.008)
GDP Growth	0.031**	0.028**	0.026***	0.030**	0.029*	0.025***
	(0.014)	(0.012)	(0.008)	(0.014)	(0.015)	(0.009)
Inflation	0.022**	0.017**	0.019**	0.026**	0.028**	0.024**
	(0.009)	(0.007)	(0.009)	(0.011)	(0.013)	(0.010)
Term Interest Rate	0.014**	0.018*	0.016**	0.012*	0.013*	0.015***
	(0.006)	(0.008)	(0.007)	(0.007)	(0.007)	(0.004)
Merger	-0.029**	-0.026**	-0.023***	-0.027*	-0.025**	-0.020**
	(0.013)	(0.011)	(0.007)	(0.014)	(0.011)	(0.009)
Public Bank	-0.127**	-0.113**	-0.109**	-0.134**	-0.125**	-0.139**
	(0.058)	(0.055)	(0.051)	(0.065)	(0.60)	(0.068)
Foreign Bank	0.072**	0.058**	0.074**	0.083**	0.079**	0.083**
	(0.035)	(0.027)	(0.036)	(0.041)	(0.038)	(0.039)
Financial Crisis	-0.137**	-0.129**	-0.134**	-0.166**	-0.146**	-0.149**
	(0.067)	(0.064)	(0.059)	(0.079)	(0.072)	(0.074)
Adjusted R-squared	0.612	0.711	0.664	0.701	0.618	0.789
Temporal Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: The Table reports the estimation results from fixed effect model based on Equation 1, 2, and 3. The dependent variables are lending rate, deposit rate and net interest margin in Panel A, B and C respectively. The results from CR5 are reported in column 1, 3, and 5, while column 2, 4 and 6 report the results from HHI. Results are estimated using fixed effect model by least square dummy variable (LSDV) technique. Robust standard errors are reported in parenthesis under each coefficient. Subscripts "***" "**" and "*" respectively indicate the significance of coefficients at 1%, 5% and 10% level.

Global Financial Crisis and Concentration-Pricing Relationship

The estimation results reported in Table 5 are obtained by controlling any temporal fluctuations through introduction of time dummies. Therefore, it is unlikely that our main findings are driven by random events such as financial crisis over time. However, we check the consistency of our findings by splitting the sample into two time periods i.e. pre-financial crisis period (1999-2007) and post-financial crisis period (2010-2014). The division of the sample is based on the coefficients on temporal dummies. The coefficients on temporal dummies are not reported in the article to conserve the space. However, they are significant with negative sings for 2008 and 2009. The estimation results are reported in Table 8. The dependent variables are lending rate (columns 1 and 4), deposit rate (columns 2 and 5) and net interest margin (columns 3 and 6), whereas the main explanatory variable is CR5.[7] These results are qualitatively similar to our main findings. Thus, even after splitting the sample in pre and post crisis period, our findings remain same i.e. bank concentration leads to anti-competitive pricing.

Table 8: *Financial Crisis and Concentration-Pricing Relationship*

Dependent Variables are Lending Rates, Deposit Rates and Net Interest Margin						
Variables	Panel A: Sample 2000-2007			Panel B: Sample 2010-2014		
	(1)	(2)	(3)	(4)	(5)	(6)
Concentration (t-1)	0.102**	-0.114*	0.098**	0.151**	-0.164*	0.149**
	(0.041)	(0.059)	(0.038)	(0.063)	(0.084)	(0.059)
Bank Size	0.051**	-0.056**	0.068***	0.059*	-0.053**	0.049**
	(0.024)	(0.027)	(0.032)	(0.031)	(0.026)	(0.021)
Bank Capitalization	-0.236**	-0.213**	-0.232**	-0.259**	-0.219**	-0.228**
	(0.114)	(0.102)	(0.115)	(0.127)	(0.109)	(0.113)
Loan/Deposit Ratio	0.027*	-0.034	-0.039	0.023*	0.037	0.025*
	(0.014)	(0.024)	(0.042)	(0.012)	(0.032)	(0.013)
Bank Overhead	0.019*	0.022**	0.016	0.024*	0.025***	0.018**
	(0.010)	(0.009)	(0.011)	(0.013)	(0.008)	(0.008)
Money Supply	0.028**	0.025**	0.023***	0.027**	0.026*	0.021***
	(0.015)	(0.013)	(0.010)	(0.016)	(0.018)	(0.009)
GDP Growth	0.019**	0.015**	0.014**	0.017**	0.024**	0.022**
	(0.009)	(0.007)	(0.006)	(0.008)	(0.011)	(0.010)
Inflation	0.013**	0.015*	0.017**	0.011*	0.012*	0.015***
	(0.006)	(0.007)	(0.008)	(0.005)	(0.005)	(0.005)
Interest Rate	-0.023**	-0.015**	-0.017***	-0.024*	-0.021**	-0.019**
	(0.011)	(0.007)	(0.005)	(0.013)	(0.010)	(0.009)
Merger	0.093**	0.098**	0.088**	0.115**	0.101**	0.104**
	(0.045)	(0.048)	(0.043)	(0.055)	(0.049)	(0.050)
Public Bank	-0.067**	-0.058**	-0.063**	-0.051**	-0.065**	-0.059**
	(0.033)	(0.027)	(0.031)	(0.024)	(0.032)	(0.029)
Foreign Bank	0.124**	0.127**	0.122**	0.148**	0.125**	0.141**
	(0.059)	(0.063)	(0.057)	(0.071)	(0.061)	(0.068)

[7] Although we estimate results using both concentration measures i.e. CR5 and HHI, we do not report the results from HHI for brevity concerns. The findings with HHI are qualitatively similar to those reported in Table 5.

Adj. R-squared	0.628	0.766	0.653	0.752	0.632	0.748

Note: The Table reports the estimation results from fixed effect model based on Equation 1, 2, and 3 in pre and post financial crisis period. The dependent variables are lending rate (columns 1and 4), deposit rate (columns 2 and 5) and net interest margin (columns 3 and 6). The concentration measure is CR5. Results are estimated using fixed effect model by least square dummy variable (LSDV) technique. Robust standard errors are reported in parenthesis under each coefficient. Subscripts "***" "**" and "*" respectively indicate the significance of coefficients at 1%, 5% and 10% level.

Conclusion and Policy Implications

Banking industry in Pakistan has experienced a decrease in level of concentration after Asian and Global financial crises. The literature on implications of bank concentration is inconclusive and divided. The monopoly view of concentration i.e. SCP hypothesis, suggests that concentrated banking sectors promote collusion/monopoly pricing. In contrast, the efficiency view predicts that concentrated banking sectors encourage banks to exploit scale and technological efficiencies. However, the traditional framework, that is normally employed to analyze these views, has been deemed inappropriate. As a result, the policy implications based on traditional framework can be misleading.

In this study, we analyze whether banks in concentrated industries exercise monopoly power through anticompetitive prices in context of Pakistan. We follow a different approach in comparison to the traditional framework and relate bank concentration directly to the pricing behavior of banks in Pakistan. We employ three alternative measures – banks' lending rates, banks' deposit rates and banks' net interest margins – to assess the pricing behavior of banks. We apply fixed effect (FE) and generalized method of moments (GMM) to bank level data over the period 1999-2014. The results indicate that bank concentration is positively related to net interest margins and lending rates, and negatively related to deposit rates. These results support the monopoly view that banks in concentrated industries charge higher prices out of their market power. The findings are consistent for alternative measures of concentration, estimation techniques and different time horizons.

These findings imply that the move towards less concentrated banking industry in Pakistan is favorable for depositors and borrowers. However, the regulatory authorities may have to look at the role of bank market structure for financial stability before finalizing such a policy. In the aftermath of Global financial crisis, most of the countries have deliberately promoted consolidations in the banking sectors. Therefore, any policy related to banking market structure must also be analyzed for its impact on the stability of the financial system.

References

Amidu, M. (2013). The effects of the structure of banking market and funding strategy on risk and return. *International Review of Financial Analysis, 28*, 143-155.

Arby, M. F. (2003). Structure and performance of commercial banks in pakistan. *Journal of Institute of Bankers Pakistan, 70*(4), Retrieved from: https://mpra.ub.uni-muenchen.de/4983/.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. *The review of economic studies, 58*(2), 277-297.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics, 68*(1), 29-51.

Berger, A. N. (1995). The profit-structure relationship in banking--tests of market-power and efficient-structure hypotheses. *Journal of money, credit and Banking, 27*(2), 404-431.

Berger, A. N., & Hannan, T. H. (1989). The price-concentration relationship in banking. *The review of Economics and Statistics, 71*(2), 291-299.

Berger, A. N., & Hannan, T. H. (1997). Using efficiency measures to distinguish among alternative explanations of the structure-performance relationship in banking. *Managerial Finance, 23*(1), 6-31.

Bhatti, G. A., & Hussain, H. (2010). Evidence on structure conduct performance hypothesis in pakistani commercial banks. *International Journal of Business and Management, 5*(9), 174-187.

Bikker, J. A., & Haaf, K. (2002). Competition, concentration and their relationship: An empirical analysis of the banking industry. *Journal of Banking & Finance, 26*(11), 2191-2214.

Bikker, J. A., Shaffer, S., & Spierdijk, L. (2012). Assessing competition with the panzar-rosse model: The role of scale, costs, and equilibrium. *Review of Economics and Statistics, 94*(4), 1025-1044.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115-143.

Bourke, P. (1989). Concentration and other determinants of bank profitability in europe, north america and australia. *Journal of Banking & Finance, 13*(1), 65-79.

Brewer, E., & Jackson, W. E. (2006). A note on the "risk-adjusted" price–concentration relationship in banking. *Journal of Banking & Finance, 30*(3), 1041-1054.

Calem, P. S., & Carlino, G. A. (1991). The concentration/conduct relationship in bank deposit markets. *The review of Economics and Statistics, 73*(2), 268-276.

Christopoulos, D. K., Lolos, S. E., & Tsionas, E. G. (2002). Efficiency of the greek banking system in view of the emu: A heteroscedastic stochastic frontier approach. *Journal of Policy Modeling, 24*(9), 813-829.

Coccorese, P. (2009). Market power in local banking monopolies. *Journal of Banking & Finance, 33*(7), 1196-1210.

De Bandt, O., & Davis, E. P. (2000). Competition, contestability and market structure in european banking sectors on the eve of emu. *Journal of Banking & Finance, 24*(6), 1045-1066.

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

Di Patti, E. B., & Hardy, D. C. (2005). Financial sector liberalization, bank privatization, and efficiency: Evidence from pakistan. *Journal of Banking & Finance, 29*(8), 2381-2406.

Evanoff, D. D., & Fortier, D. L. (1988). Reevaluation of the structure-conduct-performance paradigm in banking. *Journal of Financial Services Research, 1*(3), 277-294.

Fu, X. M., Lin, Y. R., & Molyneux, P. (2014). Bank competition and financial stability in asia pacific. *Journal of Banking & Finance, 38*, 64-77.

Gale, B. T., & Branch, B. S. (1982). Concentration versus market share: Which determines performance and why does it matter. *Antitrust Bull., 27*, 83 Retrieved from: http://heinonline.org/HOL/LandingPage?handle=hein.journals/antibull27&div=85&id=&page=. .

Gilbert, R. A. (1984). Bank market structure and competition: A survey. *Journal of money, credit and Banking, 16*(4), 617-645. doi: 10.2307/1992096

Goldberg, L. G., & Rai, A. (1996). The structure-performance relationship for european banking. *Journal of Banking & Finance, 20*(4), 745-771.

Graddy, D. B. (1980). The measurement of market structure and its influence on bank prices and profitability. *Nebraska Journal of Economics and Business, 19*(3), 41-54.

Gul, S., Irshad, F., & Zaman, K. (2011). Factors affecting bank profitability in pakistan. *The Romanian Economic Journal, 39*(14), 61-89.

Heggestad, A. A. (1979). Market structure, competition, and performance in financial industries: A survey of banking studies. *A survey of banking studies in F. R. Edwards (Ed.), Issues in financial regulation, New York: McGraw-Hill*, 449-490.

Homma, T., Tsutsui, Y., & Uchida, H. (2014). Firm growth and efficiency in the banking industry: A new test of the efficient structure hypothesis. *Journal of Banking & Finance, 40*, 143-153.

Hussain, I. (2014). Banking industry concentration and net interest margins (nims) in pakistan. *Journal of Business Economics and Management, 15*(2), 384-402.

Javaid, S. (2011). *Determinants of bank profitability in pakistan: Internal factor analysis.*

Khan, H. H., Ahmad, R. B., & Gee, C. S. (2016a). Bank competition and monetary policy transmission through the bank lending channel: Evidence from asean. *International Review of Economics & Finance, 44*, 19-39.

Khan, H. H., Ahmad, R. B., & Gee, C. S. (2016b). Market structure, financial dependence and industrial growth: Evidence from the banking industry in emerging asian economies. *PloS one, 11*(8). doi: https://doi.org/10.1371/journal.pone.0160452

Khan, M.-u.-H., & Riazuddin, R. (2009). Concentration and competition in banking sector of pakistan: Empirical evidence. *State Bank of Pakistan*, Retrieved from: http://www.sbp.org.pk/repec/sbp/wpaper/wp28.pdf.

Khawaja, M. I., & Din, M.-u. (2007). Determinants of interest spread in pakistan. *The Pakistan Development Review*, 129-143.

Koutsomanoli-Filippaki, A., Mamatzakis, E., & Staikouras, C. (2009). Structural reforms and banking efficiency in the new eu states. *Journal of Policy Modeling, 31*(1), 17-21.

Lloyd-Williams, D. M., Molyneux, P., & Thornton, J. (1994). Market structure and performance in spanish banking. *Journal of Banking & Finance, 18*(3), 433-443.

Martin, S. (1988). Market power and/or efficiency? *The review of Economics and Statistics*, 331-335.

Martin, S. (2002). *Advanced industrial economics* (Second ed.). Black-Well, Oxford.

Mirzaei, A., Moore, T., & Liu, G. (2013). Does market structure matter on banks' profitability and stability? Emerging vs. Advanced economies. *Journal of Banking & Finance, 37*(8), 2920-2937.

Molyneux, P., & Forbes, W. (1995). Market structure and performance in european banking. *Applied Economics, 27*(2), 155-159.

Molyneux, P., & Thornton, J. (1992). Determinants of european bank profitability: A note. *Journal of Banking & Finance, 16*(6), 1173-1178.

Osborne, D. K., & Wendel, J. (1978). A criticism of the traditional analysis of banking competition. *Federal Reserve Bank of Dallas, Working Paper No. 7801*, Retrieved from: http://dallasfed.org/assets/documents/research/papers/1978/wp7801.pdf.

Park, K. H., & Weber, W. L. (2006). Profitability of korean banks: Test of market structure versus efficient structure. *Journal of Economics and Business, 58*(3), 222-239.

Peltzman, S. (1977). The gains and losses from industrial concentration. *Journal of Law and Economics, 20*(2), 229-263.

Rhoades, S. A. (1985). Market share as a source of market power: Implications and some evidence. *Journal of Economics and Business, 37*(4), 343-363.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system gmm in stata. *Stata Journal, 9*(1), 86-136.

Saeed, A., & Sameer, M. (2015). Financial constraints, bank concentration and smes: Evidence from pakistan. *Studies in Economics and Finance, 32*(4), 503-524.

Shaffer, S., & DiSalvo, J. (1994). Conduct in a banking duopoly. *Journal of Banking & Finance, 18*(6), 1063-1082.

Shepherd, W. G. (1986). Tobin's q and the structure-performance relationship: Comment. *The American Economic Review, 76*(5), 1205-1210.

Smirlock, M. (1985). Evidence on the (non) relationship between concentration and profitability in banking. *Journal of money, credit and Banking, 17*(1), 69-83.

Smirlock, M., Gilligan, T., & Marshall, W. (1984). Tobin's q and the structure-performance relationship. *The American Economic Review, 74*(5), 1051-1060.

Smirlock, M., Gilligan, T., & Marshall, W. (1986). Tobin's q and the structure-performance relationship: Reply. *The American Economic Review, 76*(5), 1211-1213.

Talpur, A. B., Shah, P., Pathan, P. A., & Halepoto, J. A. (2016). Structure conduct performance (scp) paradigm in pakistan banking sector: A conceptual framework and performance of the first woman bank under scp model. *The Women-Annual Research Journal of Gender Studies, 8*(8).

Tirole, J. (1988). *The theory of industrial organization*. Cambridge, Mass: MIT press.

Tregenna, F. (2009). The fat years: The structure and profitability of the us banking sector in the pre-crisis period. *Cambridge Journal of Economics, 33*(4), 609-632.

Turk Ariss, R. (2010). On the implications of market power in banking: Evidence from developing countries. *Journal of Banking & Finance, 34*(4), 765-775.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step gmm estimators. *Journal of Econometrics, 126*(1), 25-51.

Zhang, J., Jiang, C., Qu, B., & Wang, P. (2013). Market concentration, risk-taking, and bank performance: Evidence from emerging economies. *International Review of Financial Analysis, 30*, 149-157.