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Full Length Research Paper

Towards determination of interest spread of commercial banks: Empirical evidences from Pakistan

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This study employs panel data models to examine bank-specific determinants of interest rate spread of a sample of 14 out of 22 commercial banks in Pakistan for the period of 2000 to 2008. Rising administrative costs, nonperforming loans and soaring return on assets (ROA) significantly cause an increase in the spread of interest rate. Results of this study are similar to Doliente (2003), Claeys and Vennet (2004), and Idrees (2007) in finding the factors affecting interest margin. The study endorses findings of Horvath (2009) that the most efficient banking structure persists and sustains with minimum possible interest margins in competitive environment of free market economies. The study, though finds increasing competition in the banking industry, this competition is imperfect in Pakistan. The study finds significant difference in their management style. The Hausman (1978) and redundant fixed effects tests support fixed effects model. High interest spread may lead to institutional inefficiency of the financial system of the country.

Key words: Pakistan, interest margin, bank-specific factors, panel data models.

INTRODUCTION

Banking sector of an economy plays a vital role in the economic growth and development of a country through vital monetary policy. Banks facilitate trade and commerce by providing safe keeping of cash, means of making payments through accounts of their clients, finance in terms of loans, overdraft and discounting bills. They also furnish their clients with appropriate advice on financial matters related to the local as well international markets. Commercial banks are considered as profit seeking institutions. They accept deposits, provide convenient means of payments, and lend money to their customers in addition to many other services. In return for these services, banks receive different charges and interest. Banks do pay interest on various deposits. Interest spread, in simple words, is the difference between the interest charged and paid by the banks. Historically, interest charged by the banks on their loans has always exceeded their payments in terms of interest on clients' deposits.

Studies (Larry et al., 1998) reveal pro-cyclical role of interest spread. Interest rate spread also provides information about the risk of default, particularly when investment decisions are less flexible in the economy (Kwark, 2002). Studies (Doliente, 2003; Claeys and Vennet, 2004; Idrees, 2007) have explored various determinants of rising interest margin of banks. These determinants can be classified as macroeconomic, industry-specific and bank-specific factors. In Pakistan, bank-specific factors such as administrative costs, non performing loans, non interest income, liquidity ratio, market share of banks and return on asset have been of significant importance.

From amongst the bank-specific factors as determinants of interest margin, studies have singled out high operating cost, non performing loans, and banks' efforts to enjoy high return on assets (ROA). The scope of this study is to explore only bank specific factors as determinants of interest margin of the commercial banks for the period of 2000 to 2008 for the reasons described in the paragraphs to follow.

JEL classifications: C5, E4, G2.

During the period of 2000 to 2008, focus of the Pakistani banks remained on the consumer-oriented loans, leasing and financial activities. On account of robust financial sector growth during the period of 2000 to 2008, restructuring, mergers and competition of banks continued. This study confines its scope to exploring bank-specific factors only, because of less committal attitude of banks towards real sector of the economy. Use of panel data methodology, one of the most efficient econometric methods, distinguishes this study from Doliente (2003), Claeys and Vennet (2004), and Idrees (2007). Further inquisitive and motivation behind this study is the fact that technology in banking services has led important role in reducing their cost of doing business but the extra earnings of the banks have never been passed on to their creditors (depositors and clients).

This study employs the data from balance sheets and annual reports of the sample of 14 commercial banks on the format of Fungacova and Poghosyan (2008) and Beck and Hesse (2009). Horvath (2009) recommends that the most efficient banking structure can persist and sustain with minimum possible interest margins in the competitive environment of free market economies. Cartelization and imperfect competition in banking industry also contributes to the rising interest margins. This study also explores role of banks as an emerging cartel. Findings of the study shall not only be an academic contribution, but it would also help financial managers of the economy in taking further measures to ensure efficient and competitive financial structure by breaking cartelized financial market.

High interest spread in Pakistan can also be due to the high discount rate on the pattern of Ugandan banking system over the period from 1999 to 2005. Beck and Hesse (2009) revealed these factors. State Bank of Pakistan, despite change of three governors during the last three years, seems reluctant to reduce bank rate which can function as an expansionary monetary policy to boost real sector of the economy. Expansionary monetary policy might be one of the remedial measures to bring the economy of Pakistan out of existing severe recessionary situation. Given unproven gap between real sector of the economy and financial institutions, this study focuses on bank-specific determinants of interest spread.

A stable, efficient and business friendly financial system not only reduces uncertainty, cost of transactions and improves overall economic efficiency through efficient allocation of resources, but also brings real sector closer to the monetary sector of the economy. Therefore, understanding of these determinants is important in order to objectively improve banking efficiency and achieve the target of financial deepening. This study is likely to fill academic deficit in the area of banking and finance. It explores nature of competition in the banking industry. One of the objectives of this study is to explore differential of management style in the commercial banks of Pakistan. Panel data econometric models are quite appropriate for the appraisal of this objective by comparison of intercept terms.

An overview of the banking structure in Pakistan

Structure of the banking sector in Pakistan follows the hierarchy from State Bank of Pakistan as the regulator of the commercial banks functioning in the country. State Bank is responsible for monitoring scheduled banks' statistics. The compiled data are disseminated in the form of publication for the interested users. The data are also placed on the State Bank's website (www.sbp.org.pk). The bank follows quarterly as well as biannually reporting system effective from June 1982.

In the light of the International Standard Industrial Classification (ISIC) – Rev.3.1 of the United Nations Statistics, Division the State Bank of Pakistan applies various attributes to the classification of financial institutions such as Government, Non-Financial Public Sector Enterprises, Non-Bank Financial Institutions, Private Sector Business, Trust Funds and Non-Profit Organization, personal, and others.

All the scheduled banks operating in Pakistan are classified into three main groups for presentation of statistical data viz. public sector banks, domestic private banks, and foreign banks. The public sector banks are further divided into public sector commercial banks and specialized banks. In terms of Section 37 (2) of the State Bank of Pakistan Act – 1956, banks operating in Pakistan with capital and reserve of an aggregate value not less than Rs.1 billion (Rs. 1.5 billion by 31st December 2004, Rs. 2 billion by 31st December 2005, Rs. 3 billion by 31st December 2006, Rs. 4 billion by 31st December 2007 and Rs. 5 billion by 31st December 2008) and conducting their affairs in a manner not detrimental to the interest of their depositors have been declared as scheduled banks. The banks incorporated in Pakistan of shares/capital controlled by the government units are referred to Public sector banks.

The scheduled banks in Pakistan are mainly involved in the activities of deposits mobilization through a branch network; extending credit, mostly concentrated in short term collateralized lending such as trade financing and overdraft, together with a range of financial services provided to the clients. With the liberalization of banking rules and laws, commercial banks are now increasingly being allowed to undertake related activities short of investment banking or underwriting, portfolio investment, securities market operations, specialized financing, and related services. Specialized banks are development finance institutions established to provide credit facilities, assistance, and advice to clients in a designated sector or in a designated line of credit; for example, agriculture sector, industrial sector, housing sector, SME sector, etc. These institutions perform lending function, but may not engage in routine commercial banking activities; are

Table 1. Scheduled banks' offices by nationality.

As on 30th June	Pakistani banks		Foreign banks		Total	
	No. of banks	No. of branches	No. of banks	No. of branches	No. of banks	No. of branches
1951	5	97	27	104	32	201
1952	5	113	26	99	31	212
1953	5	135	27	83	32	218
1954	5	160	27	86	32	246
1955	5	163	27	88	32	251
1956	6	177	26	84	32	261
1957	6	197	21	78	27	275
1958	7	232	19	75	26	307
1959	8	296	19	73	27	369
1960	10	358	19	72	29	430
1961	10	507	18	73	28	580
1962	12	639	21	74	33	713
1963	16	883	21	74	37	957
1964	15	1,226	21	72	36	1,298
1965	16	1,521	20	70	36	1,591
1966	16	1,895	20	72	36	1,967
1967	16	2,208	20	77	36	2,285
1968	15	2,460	20	76	35	2,536
1969	15	2,767	20	75	35	2,842
1970	17	3,095	19	75	35	3,170
1971	17	3,344	18	74	35	3,418
1972	17	2,528	17	72	34	2,600
1973	17	3,123	17	36	34	3,195
1974	14	3,839	17	36	31	3,875
1975	8	5,030	17	36	25	5,066
1976	8	5,690	17	36	25	5,726
1977	9	6,701	18	36	27	6,737
1978	9	7,038	20	39	29	7,077
1979	9	6,701	24	48	33	6,960
1980	9	7,038	24	55	33	7,076
1981	9	7,309	24	56	33	7,365
1982	9	7,318	25	57	34	7,375
1983	9	7,276	26	59	35	7,335
1984	9	7,129	26	60	35	7,189
1985	9	7,059	26	61	35	7,120
1986	9	7,035	25	62	34	7,097
1987	9	7,100	26	63	35	7,163
1988	9	7,141	28	65	37	7,206
1989	9	7,188	25	66	34	7,254
1990	10	7,337	26	67	36	7,404
1991	10	7,489	26	68	36	7,557
1992	18	7,590	28	71	46	7,661
1993	20	7,681	27	71	47	7,752
1994	21	7,734	26	74	47	7,808
1995	25	8,326	25	74	50	8,400
1996	25	8,523	28	83	53	8,606
1997	25	8,597	27	85	52	8,682
1998	25	8,049	2 1*	81*	46	8,130
1999	25	7,973	21	85	46	8,058
2000	25	7,871	19	78	44	7,949

Table 1. Contd.

2001	24	7,272	19	80	43	7,352
2002#	25	6,878	24	88	49	6,966
2003	24	6,834	22	82	46	6,916
2004	28	6,803	17	79	45	6,882

Source: State Bank of Pakistan (www.sbp.gov.pk). * Excludes 6 Indian Banks (Vested in custodian of enemy property since September, 1965 war) up to 2001. # Reporting Banks/Branches with effect from June 2002.

Table 2. Scheduled banks and their reporting branches as on 30 June, 2004.

No.	Pakistani banks	No. of branches	No.	Foreign banks	No. of branches
1	Allied Bank of Pakistan	737	1	ABN Amro Bank NV	7
2	Askari Commercial Bank Ltd.	58	2	Al-Barka Islamic Bank BSC	6
3	Bank Al-Falah Ltd.	68	3	American Express Bank Ltd.	4
4	Bank Al-Habib Ltd.	71	4	Citi Bank NA	8
5	Bolan Bank Ltd.	51	5	Deutsche Bank AE	2
6	Crescent Commercial Bank Ltd.	6	6	Habib Bank AG Zurich	14
7	Dawood Bank Ltd.	1	7	Oman International Bank SAOG	2
8	Faysal Bank Ltd.	40	8	Rupali Bank Ltd.	1
9	First Women Bank Ltd.	39	9	Standard Chartered Bank Ltd.	23
10	Habib Bank Ltd.	1,424	10	The Bank of Tokyo-Mitsubishi Ltd.	1
11	Industrial Development Bank of Pakistan (IDBP)	20	11	The Hong Kong Shanghi Banking Corporation Ltd.	2
12	KASB Bank Ltd.	22			
13	Metropolitan Bank Ltd.	42		Indian banks*	
14	Meezan Bank Ltd.	10	12	State Bank of India	2
15	Muslim Commercial Bank Ltd.	955	13	The Bank of India Ltd.	1
16	National Bank of Pakistan	1,185	14	The Central Bank Of India	3
17	NDLC-IFIC Bank Ltd. (NIB)	4	15	The Oriental Bank Of Commerce Ltd.	1
18	PICIC Commercial Bank Ltd.	67	16	The Punjab National Bank	1
19	Prime Commercial Bank Ltd.	45	17	The United Commercial Bank	1
20	Punjab Provincial Co-operative Bank Ltd.	159			
21	Saudi Pak Commercial Bank Ltd.	28			
22	Soneri Bank Ltd.	45			
23	The Bank of Khyber	30			
24	The Bank of Punjab	242			
25	Trust commercial Bank Ltd.	4			
26	Union Bank Ltd.	44			
27	United Bank Ltd.	1,061			
28	Zarai Taraqiati Bank Ltd. (ZTBL)	345			
	Total	6,803		Total	79

Source: State Bank of Pakistan, (www.sbp.gov.pk); * Indian Banks –Vested in the custodian of enemy property since September 1965.

established, organized, and chartered under special legislative acts instead of being chartered as a bank under the banking law.

Historical details about the banks given in the Tables 1 and 2 are indicative of progress made in the financial sector of Pakistan since 1950s. Just after independence in 1947, Pakistan did not have any financial structure of its own. Even Central Bank of the Country was established in 1948, one year after independence. Many banks have now merged together in Pakistan on account of capital required by the State Bank of Pakistan. Currently, there are 22 banks operating in the country.

The 14 banks included in this study did have their balanced data set which is an appropriate requirement of the panel data models. That is why only 14 banks have been considered for this study.

SURVEY OF LITERATURE

Studies have revealed various determinants of interest rate spread. In an extended study of 80 countries for the period of 1988 to 1995, Kunt and Huizinga (1998) address determinants of commercial bank interest margins with a view to explore efficiency and profitability of the financial institutions. They employ bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, nature of financial structure, and several underlying legal and institutional indicators. The study finds higher operating costs as responsible for higher spreads.

In addition to the interest rate volatility on account of macroeconomic instability, government restrictions on the banks are responsible for increasing net interest margins. According to Saunders and Schumacher (2000), regulatory framework, market structure, and a risk premium are the main sources of increasing net profit margins. The regulatory components as per this study are in the form of interest-rate restrictions on deposits, reserve requirements and capital-to-asset ratios. The higher the number of restrictions, the higher the monopoly power of the banks to escalate net profit margins. Similar determinants of net interest margins were employed by Keane and Fountas (2002) for the Irish Economy. This study additionally highlights the role of technology, market concentration, and credit risk in the determination of interest margins. Despite the leading role of technology in banking services in reducing their cost of business, the extra earnings of the banks are not passed on to the depositors.

Using the two step regression model on four Southeast Asian Economies, Doliente (2003) employed bank specific factors as determinants of net interest margins of banks for 1994 to 2001. The study uses information about collateral, operating expenses, loan quality, capital requirements, liquidity and interest rate volatility. Non-competitive structure of banking system is responsible for increasing net interest spread in the region.

Employing the sample of 2279 banks from 36 Western and Eastern European countries over the years 1994 to 2001, Claeys and Vennet (2004) investigated the determinants of bank interest margins through panel data estimation technique. They considered degree of concentration, real short term interest rate, degree of operational efficiency, capital adequacy, market share, proportion of demand and savings deposits in total deposits and the degree of bank and enterprise. The results revealed that the concentration, operational efficiency, capital adequacy and risk behavior are important determinants of margins in both West and East. Maudos and Guevara (2004) also examined similar determinants of net interest spread for the three European banks of Germany, France, the United Kingdom, Italy and Spain for the period of 1993 to 2000 using a panel of 15,888 observations.

Idrees (2007) on 25 Pakistani commercial banks and Norris and Floerkemeier (2007) on commercial banks of Armenia employed rising inflation, growth of GDP besides other factors as determinants of interest spread. This rising interest margin discourages savings and investments, and also at the same time, it raises concerns over the efficiency of banks. Norris and Floerkemeier (2007) employed additional factors such as capital adequacy, ROA, liquidity, foreign bank participation and competition in the banking sector. Crowley (2007) examined interest rate spread in English speaking African countries. The researcher had focused on the causes and implications of interest rate spread from the period of 1975 to 2004 which have been ignored by the previous studies. The scope of the study is similar to one analyzed earlier. The findings of Grenade (2007) related to commercial banks of the Eastern Caribbean Currency Union (ECCU), is also similar to these studies. Tennant and Folawewo (2007) focused their analysis of interest spread for 33 middle and low income countries. In addition to the variables mentioned earlier, this study considered exchange rate volatility, Treasury bill rate, and discount rate as determinants of interest spread and positive effects on the interest spread.

Benjamin et al. (2009) apply multi-resolution decomposition in order to test if the Brazilian yield spread has informational content in the prediction of inflation. The study investigates the effect of implementation of inflation targeting regime over this relation. The results suggest that the predictive power of the spread varies across time patterns. Inasmuch, the results indicate that the implementation of the inflation target regime was a sine qua non condition for a substantial increase in the predictive power of inflation.

Hakan et al. (2004) analyze the effect of different types of inflation uncertainty on a set of interest rate spreads for the UK economy. According to the study, three types of inflation uncertainty such as structural uncertainty, impulse uncertainty, and steady-state inflation uncertainty are defined and derived by using a time-varying parameter model with a GARCH specification. The study finds that both the structural and steady-state inflation uncertainties increase interest rate spreads, while the empirical evidence for the impulse uncertainty is not conclusive.

According to Philip and Liliana (2000), many countries in Latin America eliminated interest rate ceilings, reduced reserve requirements, and stopped direct credit controls during the 1990s. These market-oriented reforms have encouraged financial deepening, thereby producing considerable economic benefits to the countries.

Nevertheless, the persistence of high interest rate spreads has been a disquieting outcome of the reforms. The writers explore determinants of bank spreads in a systematic way for Argentina, Bolivia, Chile, Colombia, Mexico, Peru, and Uruguay during the mid-1990s. Their findings reveal high operating costs raising spreads as do high levels of non-performing loans, although the size of these effects differs across the countries.

Additionally, reserve requirements in a number of countries still act as a tax on banks that gets translated into a higher spread. Beyond bank specific variables, uncertainty in the macroeconomic environment facing banks appears to increase interest spreads. The combination of these microeconomic and macroeconomic factors is a cause for concern in Latin America. As spreads widen, the cost of using the financial system becomes prohibitive to some potential borrowers. The study also suggests that bank capital requirements may not prevent excessive risk taking by banks when bank spreads are high. Using international comparisons and a unique bank-level dataset on the Ugandan banking system over the period 1999 to 2005, Thorsten and Heiko (2009) explore the factors behind consistently high interest rate spreads and margins. International comparisons reveal that the small size of Ugandan banks, persistently high T-Bill rates and institutional deficiencies explain large proportions of the high Ugandan interest rate margins. The Ugandan bank panel confirms the importance of macroeconomic factors, such as high inflation, high T-Bill rates and exchange rate appreciation. The study also finds evidence for the small market place and high costs of doing business explaining persistently high spreads and margins; smaller banks and banks targeting the low end of the market incur higher costs and therefore higher margins. Spreads and margins also vary significantly with the sectoral loan portfolio composition of banks.

Almost all of the studies employ secondary data set. No study related to Pakistani commercial banks was found to have used panel data models. Annual data set were used which caused loss of degree of freedom for accounting many determinants of the interest spread into their regression models. The present study considers most of the determinants of interest spread from previous studies and employs panel data models on the pattern of Hawtrey and Liang (2007). However, the writer is highly motivated from Fungacova and Poghosyan (2008) and Beck and Hesse (2009) to extract the data from balance sheets and annual reports of the commercial banks. From the efficiency perspective of the banks, the author is highly convinced by the recommendations of Horvath (2009) that the most efficient banking structure persists and sustains with minimum possible interest margins in competitive environment of free market economies. Idrees (2007) studies the Pakistani Commercial banks by employing macroeconomic factors. In Pakistan, there is gap between the monetary and the real sector of the economy. This divide between the real and monetary sector reduces significance of Idrees's (2007) study and raises need for studying bank-specific factors as determinants of interest spread of commercial banks in Pakistan. Importance of this study can be viewed in the context of bank-specific factors, independent of other factors because during the last couple of years the lending trend of commercial banks has been more tilted towards consumer durables than production sector of the economy.

Another contribution of this study is the test of contestability parameter 'E' which measures significance of competition in the banking sector of the country. This study also tests level of competition among the financial institutions in Pakistan. This may be considered as one of the most significant contributions of the study.

METHODOLOGY

Significance of panel data models

Financial institutions have their own dimensions and dynamics which are different from the other business corporations. The internal determinants of banks' management are not homogenous. On account of heterogeneity of management, there is possibility of confronting biased results for the time series data. Panel data models being more efficient methodology control the chance of biased results by providing more degree of freedom on pooling the data (Asteriou, 2006). The models are used in the following three specifications:

(a) Common constants;
(b) Allowing for fixed effects, and
(c) Allowing for random effects.

Under the assumption of common constants, the data set of all the entities included in the model as cross-sections are considered identical. All the banks considered in this study have identical intercepts. The fixed effects models assume different constants for all the banks and financial institutions included in this study. This is tantamount the case where management style of all the institutions is not the same. Usually, dummy variables may not be included in the fixed effects models as independent variables because of less or no variation in their values. Differential management style of various banks is explored from the significance of intercept terms of these models. The model in its simplified form is shown thus:

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + \ldots + \mu_{it}$$

In this model, '*i*' takes the value from 1 to 14 representing 14 banks, the cross-sectional units; and 't' ranges from 2000 to 2008. Y is ex post spread of interest for each bank and X represent factors affecting this ex post interest spread. In addition to the entity fixed effect models, this study also employs time-fixed effects models assuming that the value of dependant variable y_{it} although changes over time but not necessarily across the cross-section. In short, the fixed effects model assumes that each financial institution differs in its intercept term (management style) whereas the random effects model assumes that each institution differs in its error term representing the random factors affecting institutions. In the time fixed effects models, intercepts are allowed to vary over time but remain the same across the banking entities. The model can be written as follows:

$$y_{it} = \alpha + \beta x_{it} + \lambda_t + v_{it}$$

Table 3. Banks, their branches and ATM outlets.

Bank	Branches	ATM outlets
Allied Bank Of Pakistan (ABL)	737	45
Askari Commercial Bank Limited (ABCL)	58	43
Al-Habib Bank Limited (AHB)	71	43
Bank Alfalah Limited (BAL)	70	22
First Women Bank Limited (FWBL)	39	---
Faysal Bank Limited (FBL)	40	13
Habib Bank Limited (HBL)	1424	113
Habib Metropolitan Bank (HMB)	42	15
Muslim Commercial Bank (MCB)	955	215
National Bank Of Pakistan (NBP)	1185	42
Soneri Bank (SB)	45	29
The Bank Of Khyber (BOK)	30	---
The Bank Of Punjab (BOP)	242	5
United Bank Limited (UBL)	44	54

Source: State Bank of Pakistan (www.sbp.gov.pk); --- Information is not available.

Time-variant intercept λ_t take different values over time but remains the same by cross-sections of the financial institutions. Government regulations have been affecting financial institutions over time. The banks are equally affected by the policy of the State Bank of Pakistan representing government of Pakistan. For this reason, the time-fixed effects models have been considered in this study.

In the random effects models, the constant term of each bank takes the effect from random or stochastic term (u). As compared to the fixed effects models, it ensures more variability due to the randomness of the error terms (u). Although every bank has to follow the instructions of the State Bank of Pakistan yet their policies differ in many ways. Random effects model in the vector of Y and X can be written as follows:

$$Y_{it} = \alpha + \beta x_{it} + \omega_{it}$$

Where $\omega_{it} = \varepsilon_i + v_{it}$; the error term follows *i.i.d (identically independently distributed)*.

Interbank dependence due to mutual flows of funds among the financial institutions may cause collinearity of the variables. Transformation of the models through GLS removes this problem. For these reasons, the panel data models are considered more flexible and provide a better substitute methodology for financial time-series.

The criterion of Hausman test is applied in making choice between the fixed effects and random effects models. Hausman (1978) test based on the hypothesis of no correlation assumes both OLS and GLS to be consistent but OLS is inefficient, for the alternative hypothesis OLS is consistent and GLS is not.

For the panel data model of the banks the Hausman test investigates whether random effects estimation could be almost as good as the estimation of fixed effects. Hausman statistic is a measure of the distance between fixed effects and the random effects estimators.

Variables and data

Interest rate spread is the dependant variable. Ex post spread in lieu of interest rate spread has been considered for this study which was calculated using the following formula:

$$EX = \frac{Interest\ Earned - Interest\ Paid}{Average\ Assets} X\,100$$

EX is ex post spread.

Bank-specific variables include market share (M = A bank's deposits as percentage of total industry deposits), liquidity (L = liquid assets as percentage of total assets), administrative expenses (AC = administrative expenses as percentage of total assets), nonperforming loans as percentage of net advances (NP), net interest income as percent of total income (NI) and return on assets after payment of tax as percentage of average assets (ROA).

This study employs the data from balance sheets and annual reports of the sample of 14 commercial banks on the format of Fungacova and Poghosyan (2008) and Beck and Hesse (2009). Sample selected is true representative of the total 22 banks of Pakistan. Availability of balanced data for the entire period of 2000 to 2008 was the considered criterion for the selection of a bank. It is pertinent to mention that the merger of the financial institutions has been set in because of increasing requirement of capital by the State Bank of Pakistan. Market significance of the banks functioning in Pakistan can be viewed from Table 3.

RESULTS AND ANALYSIS

The study estimates panel data models in three categories such as pooled data (common constant), fixed effects and random effects models. Empirical analysis of the study is not confined to the testing of the three models in the family of panel data models. In order to arrive at the best of the three models, this study applies redundant fixed effects tests and the Hausman (1978) test. Empirical findings are summarized in Tables 1 to 7.

Results in Table 4 are from the pooled regression of all the 14 banks with the options of 'No weights', 'Cross-section Weights', and 'Period weights'. Cross-section weights were used to control heteroskedasticity across

Table 4. Poole regression results of 14 banks.

Variable	No. Weights (LS)	Cross-section weights (EGLS)	Period weights (EGLS)
Intercept	0.011650*	0.008273*	0.006968*
Market share (M)	0.015566	0.005898	0.011398
Liquidity (L)	0.012669	0.030192	0.023560
Administrative cost (AC)	0.730281*	0.892196*	0.829218*
Nonperforming loans (NP)	0.080033*	0.049719*	0.068847*
Non interest income (NI)	-0.001730*	-0.001592*	-0.001546*
Return on asset (ROA)	0.406973*	0.378310*	0.537951*
R^2	0.485	0.834	0.828

*Significant at 1% and less than 1%; ** Significant at 5% and less than 5%.

the cross sectional entities (banks). Period weights control heteroskedasticity over the time period of 2000 to 2008. All the coefficients have got positive sign except NI which carries negative sign. The pooled regression assumes identical intercepts for all the banks and for the entire time period of 9 years from 2000 through 2008. Management style is assumed homogenous for the entire group of cross-sections. Although this is an inappropriate assumption, the results point to general causal relationship of the dependant variable (EX) and the bank-specific factors. Market share of the bank in terms of deposits and proportion of liquid assets do not have significant effect on the ex post interest for the representative sample of 14 banks during the period of this study. The administrative cost, non performing loans, and return on assets have shown quite significant and positive effect on the interest rate spread. The results are not different from expectations. It has become norm and general practice that affluent people get huge amounts of loans from the commercial banks, declare their default and get loans written off from the banks by their influence. A comprehensive report on loan waivers was published in the national daily newspapers of Pakistan on 12 July 2009. In the recent past, an outstanding amount of 100 billion rupees against the most affluent personalities was written off by the banks under the influence of the affluent class. Still, many of the political and prominent personalities are facing the court cases in the apex courts of Pakistan. Empirical results reveal that the banks are compelled to raise and then maintain their high interest spread on account of nonperforming loans, rising administrative costs for which banks have to strive for high returns on assets. So, the affluent borrowers benefit from bank loans at the cost of small and medium level savers and depositors who are unable to receive their equitable share in banks' earnings.

Applying cross-section weights and period weights (EGLS), overall significance of the model slightly improves but coefficient of determination (R^2) improves significantly. Explanatory power of the model improves with the application of EGLS. Nevertheless, explanatory variables still retain their significance for the determination of interest rate spread as discussed earlier. In all the three pooled regression models intercept term is highly significant with positive sign. That clearly reveals significance of some internal factors of the banks other than explanatory variables included in this model affecting the interest spread of Pakistani financial sector. These internal factors may include management style of different banks, employment of senior officials at lucrative pay-package in the financial institutions and extravagancy of bank expenses which need to be explored by further studies. That also proves significant difference in the management style of all the 14 banks.

Pooled data model assumes common constant for all the cross-sections of 14 banks which does not seem an appropriate assumption. Unrealistic assumption of the common constants makes the way to testing fixed effects model. Empirical findings of the fixed effects model with three specifications are presented in the Table 5. These results with controlled heteroskedasticity are slightly better than the common constants model. The model with bank-fixed and period-fixed effects explores concealed time-specific and bank-specific heterogeneity. Non-interest income and banks' liquidity remain statistically irrelevant in the determination of interest spread of the commercial banks. Rests of the factors such as administrative costs, non-performing loans, and returns on assets of the banks have statistically significant positive effect on the interest margin. Redundant fixed effects tests prove fixed effects model better than the common constants model.

Testing market equilibrium

During the last 30 years in general, and for the period from 2000 to 2008, Pakistani commercial banks have gone through a considerable structural change on account of pro-services sector policy of the government. Additionally, competition of banks, their mergers, new financial regulations and induction of new technology into the financial sector brought about significant change in banking industry. Number of banks increased during the

Table 5. Results of the fixed effects of 14 banks.

Variable	No. weights (LS)	Cross-section weights (EGLS)	Period weights (EGLS)
Intercept	0.030811*	0.024872*	0.028372*
Market share (M)	-0.108568**	-0.092093*	-0.104066*
Liquidity (L)	0.019877	0.034262***	0.036545
Administrative cost (AC)	0.170668	0.363546*	0.231786**
Nonperforming loans (NP)	0.063658	0.058985*	0.048382**
Non interest income (NI)	-0.000606**	-0.000449	-0.000565
Return on asset (ROA)	0.290785*	0.257088*	0.283939*
R^2	0.646	0.904	0.923

*Significant at less than 1%, ** significant at less than 5%, *** significant at less than 10%.

Table 6. Tests of banking market equilibrium.

Variable	2000-2008	2000-2006	2000-2004
Intercept	0.02779* (5.65)	0.024729* (5.188)	0.022135* (4.156)
Market Share (M)	-0.115606** (-2.22)	-0.083968*** (-1.75)	-0.065744 (-0.878)
Liquidity (L)	0.033769 (1.0066)	0.047704*** (1.813)	0.035131 (1.415)
Administrative Cost (AC)	0.279986** (1.97)	0.211177*** (1.445)	0.348609*** (1.416)
Nonperforming Loans (NP)	0.05899*** (1.89)	0.060621** (1.978)	0.017070 (0.489)
Non interest Income (NI)	-0.000740 (-1.42)	-0.000595 (-1.382)	7.51E-06 (0.017)
Return on Asset (ROA)	0.315002* (4.208)	0.314326* (4.866)	0.135269** (1.997)
R^2	0.6319	0.6784	0.607
H_0: E = 0, χ^2 [value of E]	9.0341* [0.57]	7.9877* [0.54]	5.3027** [0.470]

*Significant at less than 1%, ** significant at less than 5%, *** significant at less than 10%.

earlier 2000s targeting only consumer-specific businesses. This was the period when property-related investment activities were on boom fan fared by the speculators with the support of financial institutions which openly offered credit facilities to the investors. Most of the bank branches are big-bank-centric as listed in Tables 1, 2 and 3. The move to creating competition, in reality, has created imperfect competition with cartelized market of the economy of Pakistan. Using the fixed effects model, this study explores competition in the financial sector of the economy.

Results are presented in Table 6. In this table, 'E' is contestability parameter which is sum of the elasticities (the coefficients of independent variables). The value of 'E' ranges between '0' and '1' indicating the extent of competition in the banking sector of the country. Statistical significance of contestability is tested by the chi-squared statistic. Null hypothesis of E = 0 is the unproven statement of 'no competition' among commercial banks. Rejection of the null hypothesis with empirical evidence proves existence of competition and contestability among the financial institutions in Pakistan. The value of 'E' is 0.57 which is less than 1 but it is statistically significant at 1% level of significance. The number reveals an increasing competition among the financial institutions. Further deliberation of the contestability has been tested for three sub-samples and the empirical evidence is presented in Table 6. Results reveal changing trend of contestability in the financial sector of the country for the period of 2000 to 2008. The value of 'E' is an equilibrium test for the sample of 14 banks representing banking sector of Pakistan. Null hypothesis of equilibrium is rejected at 1% level of significance for the period of 2000 to 2008. Competition in the financial sector of Pakistan seems to have improved for the period under consideration of this study because the value of 'E' has gradually improved.

Results are further reiterated when redundant test of restrictions on the coefficients are applied. The value of 'E' slides up from 0.470 in the period 2000 to 2004 to 0.57 in 2000 to 2008. Null hypothesis of imperfect competition and non-contestability is rejected for all the three sub-samples. Increasing competition in the financial sector is confirmed from empirical results. In this rising competition the study could not find significance of non-interest income of the banks in affecting the interest spread of banks for the period of 2000 to 2008. Null hypothesis in the fixed effects model of homo-genous management is also significantly rejected once again at 1% level of significance. As a result, bank heterogeneity

Table 7. Results of the cross-section random effects of 14 banks.

Variable	No. weights (LS)	Period-fixed (EGLS)	Period-random (EGLS)
Intercept	0.013909*	0.016773*	0.014929*
Market share (M)	0.014090	0.017089	0.013065
Liquidity (L)	0.017409	0.007144	0.018046
Administrative cost (AC)	0.615239*	0.515252*	0.569331*
Nonperforming loans (NP)	0.076890*	0.077480*	0.076329*
Non interest Income (NI)	-0.001586*	-0.001397*	-0.001521*
Return on asset (ROA)	0.392219*	0.363799*	0.384347*
F-Statistic	14.944*	8.5227*	13.968*
Effects specification			
Cross-section random S.D/Rho (probability)	0.002289 (0.0759)	0.002558 (0.1116)	0.002558 (0.1107)
Period random S.D/Rho (probability)	….	….	0.000707 (0.0084)
Idiosyncratic random S.D/Rho (probability)	0.007988 (0.9241)	0.007217 (0.8884)	0.007217 (0.8809)

*Significant at less than 1%, ** significant at less than 5%, *** significant at less than 10%.

in terms of internal factors related to management is reiterated. The competition in the financial sector is imperfect. Increasing competition among the banks can be clearly attributed to the differential management style of the banks. This was the period when banks were employing consultants and advisors on the pay-package of millions of rupees per month.

Coefficient of the market share has negative sign indicating that small banks are in relatively more profitable situation in terms of interest spread than the big banks. In other words, profitability of big banks with large number of branches decreases in terms of interest spread as per empirical findings of the study. Opening more branches and setting more ATM machines indeed incurs more cost to the banks. However, inverse relationship of market share and interest margin could not be proved with statistical significance.

Random effects model

These models are also known as error components model. As mentioned earlier, random effects models propose different intercept terms for each bank. In other words, random effects models do consider constants of each cross-section as a random parameter. In this study the variability of parameter of each bank comes from the random error term included in the model. As compared to the fixed effects models this model estimate less number of parameters. So, the random effects models cover the large variation in the individual effects which is theoretically better than the fixed effects model. Yet to come out of indifference between the random effects and the fixed effects models, Hausman (1978) test was applied. The Hausman (1978) test significantly supports empirical findings of the fixed effects model.

Empirical findings of the random effects model have been presented in Table 7. Cross-section random effects with period fixed and period random options along with diagnostic test were considered.

Most of the results endorse what has already been explained in the earlier paragraphs related to the fixed effects model. Administrative costs, non-performing loans and return on asset (ROA) have once again revealed significance with 1% level of significance. All of these bank specific factors play a vital role in raising the interest margin of Pakistani commercial banks under discussion of this study. Cross–section fixed and time fixed effects prove that Pakistani financial institutions have not only undergone significant changes and their management style has got now diversified structure but also their management has significantly changed over time through competition in terms of better pay-package, as discussed earlier. Attractive pay package in the financial institutions com-pelled other services sector to revise their remuneration in order to retain skilled and experienced manpower. Mobility of labour within the financial institutions and services sector was on the increase during the period considered for this study. Changing mobility of labour in the Pakistani services sector is appropriate for empirical appraisal of the wage efficiency macroeconomic models in Pakistan.

Choice between the random effects and fixed effects

Correlated, random effects Hausman (1978) test makes analysts to choosing between random effects and fixed effects in the class of panel data models. Results of the Hausman test employed in this study significantly support fixed effects model with the value of chi-squared 23.52 at probability of 0.0006 which is less than 1% level of

significance. Redundant fixed effects tests also prove significance of the fixed effects model as compared to the common constant model with the test statistic of 4.65 at less than 1% of significance.

CONCLUSIONS AND POLICY RECOMMENDATIONS

This study employs panel data models to examine bank-specific determinants of interest rate spread of a sample of 14 out of 22 commercial banks in Pakistan for the period of 2000 to 2008. Rising administrative costs, nonperforming loans and escalating return on assets (ROA) significantly cause an increase in the spread of interest rate. Results of this study are similar to Doliente (2003), Claeys and Vennet (2004), and Idrees (2007) in finding the factors affecting interest margin. The study endorses findings of Horvath (2009) that the most efficient banking structure persists and sustains with minimum possible interest margins in competitive environment of free market economies.

The study, though finds increasing competition in the banking industry but this competition is imperfect in Pakistan. The study finds significant difference in their management style. The Hausman (1978) and redundant fixed effects tests support fixed effects model as compared to the common constants and random effects in the class of panel data models. Significance of the fixed effects model might be attributed to the balanced data panels. High interest spread may lead to institutional inefficiency of the financial system of the country.

During the period from 2000 to 2008, focus of the banks' policy had been consumer loans instead of real sector of the economy. Consumer banking accrues short term gains to the financial institutions and consumers loans involve relatively less risk of default than the real sector credit policy. The banks were also engaged in the subprime loans but most of the borrowers belonged to the middle income groups who are relatively more trustworthy in returning their loans under the arrangement of joint ownership of pledged assets funded by the banks. Management style of various financial institutions was found significantly different from one another. Contestability in the financial sector has increased during the period of 2000 to 2008. Internal factors of diversified management style of the commercial banks, other than bank-specific factors included in this study, need to be explored by further studies.

This study could not establish long term causal relationship of bank-specific factors and the interest margin on account of data constraints. However, understanding of the sustainable link between real sector and the monetary sector of Pakistan is perhaps not possible without empirical analysis of long term trends. Interestingly, number of banks has been on the decrease despite increasing bank branches and banks' ATM outlets. Banks look reluctant in sharing their super-normal profits with their creditors. Yielding supernormal profits by the financial institutions is supported by imperfect and cartelized structure of the financial sector of Pakistan which acquired its strength during the period of 2000 to 2008.

In spite of significant growth, the financial sector of country failed to enhance and augment productive capacity of the economy. The study therefore, recommends banks to reduce their administrative expenses, extend their core business activities with real sector of the economy through prudent credit policy. Interest spread can be decreased by controlling overhead expenditures, non performing loans and prudent financial regulations in Pakistan. Immediate reduction in the interest margin might be a difficult decision for financial sector, as it demands sacrifices in the short run, but the policy of low interest margin might produce multiplier effect on real output and help in achieving long term sustainability of the financial sector through consistent demand for credit by the real sector growth.

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