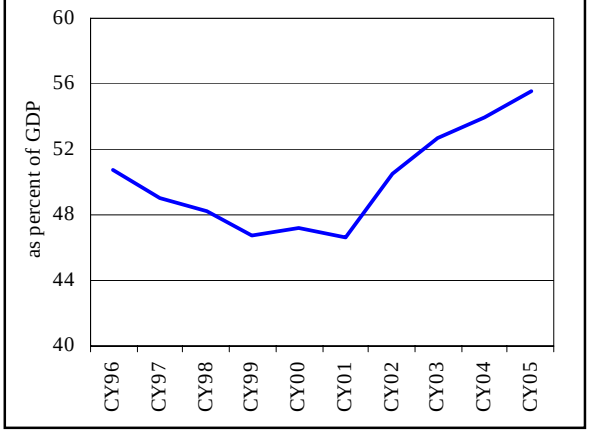
3 Performance of the Banking Sector

3.1 Overview

Benefiting from the ongoing reform process and strengthening of macroeconomic fundamentals, Pakistan's banking system witnessed visible improvements in the size, structure, outreach and financial health during CY01-CY05. Assets of the banking sector registered almost a three-fold increase to reach at Rs 3.7 trillion in CY05, up from Rs 1.8 trillion in CY00; showing a robust average annual growth rate (AAGR) of 15.2 percent that outpaced the growth in nominal GDP during the period under review.[1] As a result, the banking sector's assets to GDP ratio jumped from 47.2 percent in CY00 to 55.6 percent in CY05; which was in sharp contrast from the declining trend in banks' assets to GDP ratio during the second half of the 1990s (see **Figure 3.1**).

Figure 3.1: Assets of the Banking Sector



During CY01-CY05, a significant share in the aggregate assets of the banking sector has shifted from public sector to private sector and asset concentration within the banking sector has declined substantially. These improvements were made possible largely by the privatization of the state-owned banks and the efforts made for consolidation of the weak financial institutions. This changing structure has far-reaching implications for the performance of the banking system. An empirical investigation suggests that the privatization has significantly contributed in improving profitability of privatized banks, though it has made no significant impact in reducing the intermediation spread. The assets concentration has been found as an important determinant of the intermediation spread; implying that improvement in the concentration during the last five years has played a significant role in improving efficiency of the banking sector.

In addition, banks have also witnessed considerable changes in the assets and liability structure during the last five years; including: (a) earning assets constituted a substantially larger part of banks' total assets during CY01-CY05, compared to the second half of the 1990s; (b) Since CY03, it was an upsurge in banks' advances that maintained the earning assets ratio at a higher level; while the share of investment declined substantially; (c) banks' advance and investment portfolios diversified significantly;[2] (d) the share of bank borrowings in total liabilities declined, as it was the sharp growth in banks deposits and capital that financed the strong asset growth; and (e) the share of fixed-term deposits of six-month and above has witnessed a substantial decline.

These structural changes have strong implications for the financial health and performance of the banking sector. Although the banks have witnessed a substantial rise in profitability and improvement in capital adequacy ratios; the changing financial structure has also increased the risk exposure of the banking sector, especially in the wake of monetary tightening since Q4-FY04. For instance, the rising

[1] The strong asset growth during CY01-CY05 was well supported by a robust 16.2 percent average annual growth in bank deposits.

[2] In contrast from past practices, during this period banks have extended a significantly larger credit to consumers, agriculture, SME, and project financing to corporate sector. Similarly, banks have invested relatively more in equity and private sector debt markets; as a result, the share of government securities in banks' investment has declined significantly.

share of advances in total assets, due to strong credit growth, has raised credit risk of the banking system. However, banks have effectively managed the risk so far. This is evident from improved asset quality as seen from continuing declining trend in NPLs both in absolute and as a ratio of advances and capital.

The strong growth in banks credit has also deteriorated banks' liquidity indicators considerably from CY03 onward. This can be seen in sharp increase in advances to deposit ratio and decline in liquid assets to total assets ratio during this period. Moreover, the fall in the share of longer-tenor fixed deposits has also led to an emergence of maturity mismatch in banks' balance sheets as the incremental advances and investment had a relative longer maturity compared with the incremental bank deposits during the period. In order to address theses liquidity risks and sustain growth momentum, it is essential for banks to put more efforts for mobilizing deposit, especially of longer-tenor.

In this regard, the measures taken by the SBP are expected to force banks to improve upon liquidity risk. Specifically, the recent increase in cash reserve requirements (CRR) on short term deposits and the decline in CRR on longer tenor deposits would also create incentives for banks to mobilize the longer tenor deposits.[3] This measure would not only improve the maturity profile of banks' liabilities but will also increase the sensitiveness of bank deposits to interest rates and would thus help in narrowing down the interest rate spread.[4] Specifically, the empirical estimates suggest that the interest rate spread has a negative relationship with the share of time deposits to the total bank deposits. It is important to note that the interest rate spread of the banking sector, after showing a declining trend during CY01-CY04, registered a sharp increase to reach at 5.0 percent in CY05 against 3.5 percent in the previous year.

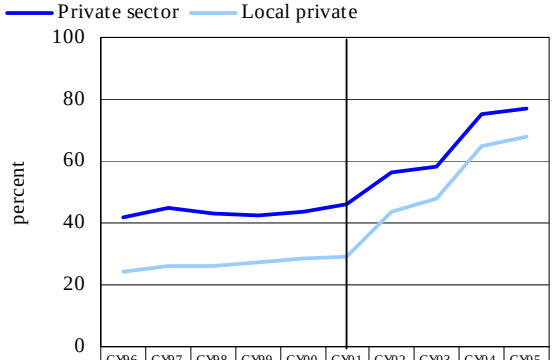
3.2 Structural Changes in Banking Sector—Causes and Implications

This section is designed to (a) highlight the major structural changes in the banking business in Pakistan during CY01-CY05; (b) identify main causes of these changes; and (c) analyze possible implications on the soundness, profitability and efficiency of the banking industry.

3.2.1 Changes in Ownership Structure

During CY01-CY05, the banking sector has witnessed a rapid transfer of ownership from public to private sector. Specifically, the share of private sector banks in aggregate assets of the banking industry surged from below 44 percent in CY00 to above 77 percent in CY05 (see **Figure 3.2**).[5] The entire increase in the private sector ownership was due to a gain in share by the Local Private Banks (LPBs). In fact, LPBs was the only banking sub-group that registered an increase in share during the period under review.

Figure 3.2: Share of Private Sector in Banks' Assets



	CY96	CY97	CY98	CY99	CY00	CY01	CY02	CY03	CY04	CY05
Private sector	41.5	44.7	43.0	42.4	43.9	45.8	56.1	58.3	75.1	77.1
Local private	24.0	26.0	26.1	27.1	28.4	29.1	43.5	47.7	65.1	67.8

[3] Likewise, the increased minimum capital requirements by the central bank would not only help in improving the capital adequacy of banks against uncertainties; but would also aid in lengthening the maturity profile of banks' liabilities.
[4] It is important to note that there is no unique definition of interest rate spread. For example, the difference between banks weighted average lending and deposits rates, though widely being used, is the narrowest definition to proxy the intermediation spread or efficiency of a banking system. Here, we have computed interest rate spread as a wedge between interest rate earned on interest earning assets and interest rate paid on interest bearing liabilities.
[5] Excluding specialized banks, private sector owned around 80 percent of total assets.

Privatization of two large state-owned banks, and mergers of some NBFIs and foreign banks' operations with LPBs were the prime reasons for this massive turnaround in the share of the local private sector. In addition, the LPBs registered a relatively faster expansion in business activities than the other groups. While the increased capital requirement forced these banks to enhance their size, the conducive macroeconomic environment and the supportive financial sector policies have helped LPBs to register a strong growth. In case of the latter, the liberalized branch licensing policy, introduced in 2002, led to a rapid expansion in branch network by LPBs.[6] During December 2001 to December 2005, in all 788 new branches were opened; of which 708 belonged to the LPBs.

However, it should be noted that the foreign banks that have registered a continuous decline in assets' share in local banking industry in previous years, have developed interest in expanding their business. This is reflected in a number of foreign banks taking interest in taking over the businesses of local private banks and entry of foreign banks in Islamic banking industry. Indeed this is the outcome of improved overall macroeconomic performance of the country, substantial increase in the banking sector profitability in recent years and increased capital requirements by SBP.

Impact of Privatization on Profitability and Efficiency

Generally, privatization of banks is expected to improve soundness and efficiency of the banking sector by improving growth, financial health and efficiency of the privatized banks. Comparing the performance of state-owned banks before and after privatization could be the simplest way to check this hypothesis. However this approach could provide highly biased results; as improvement or deterioration suggested by this method could be an outcome of some other factors that might have affected the overall banking industry performance and not just the privatized banks.

In order to overcome this problem, while analyzing the privatization's impact on Pakistan's banking industry; the difference of difference approach has been used.[7] The basic idea is to compare performance of state-owned banks with the other banks in both pre and post privatization period. The following equation has been estimated by pooling the data of commercial banks for a sample period of CY92 to CY05.

$$I_{it} = \alpha + \delta_0 ntlz + \delta_1 ntlz * pvtz + \varepsilon_{it} \qquad (1)$$

Where I_{it} represents the two performance indicators used here, i.e. before tax Return on Assets (ROA) and intermediation (interest rate) spread for i^{th} bank in time period t.[8] The two indicators have been regressed on a dummy variable, i.e. *Nltz*, with value equal to 1 if a bank is or was a state-owned bank. The coefficient δ_0 shows the relative performance of state-owned banks with respect to the remaining banks. δ_0 is expected to have a negative value in the equation of ROA and positive value in case of the intermediation spread. In addition an interaction dummy, i.e. *Nltz*Pvtz* has been included as regressor and its coefficient δ_1 shows the impact of privatization on relative performance of privatized banks and should be interpreted in conjunction with δ_0. The expected value of δ_1 is positive in case of ROA, showing an improvement in relatively profitability of state-owned banks in post privatization period.

Table 3.1: Impact of Privatization--Estimation Results

Variable	ROA		Interest rate spread	
	Coeff.	P-value	Coeff.	P-value
Constant	1.72	0.00	3.65	0.00
Nltz	-1.43	0.00	0.80	0.04
Nltz*Pvtz	1.36	0.03	0.18	0.80

[6] For details on the Branch Licensing Policy see **Chapter 2**.

[7] The difference-of-difference approach computes a statistic of interest for a control group (in our case state-owned banks that have been privatized) before and after a change to gauge the impact of that change (in our case is privatization).

[8] The intermediation or interest rate spread is defined as a wedge between interest rate earned on interest earning assets and interest rate paid on interest bearing liabilities.

While a negative value of δ_1, in the spread's equation, represents efficiency gains due to privatizations.

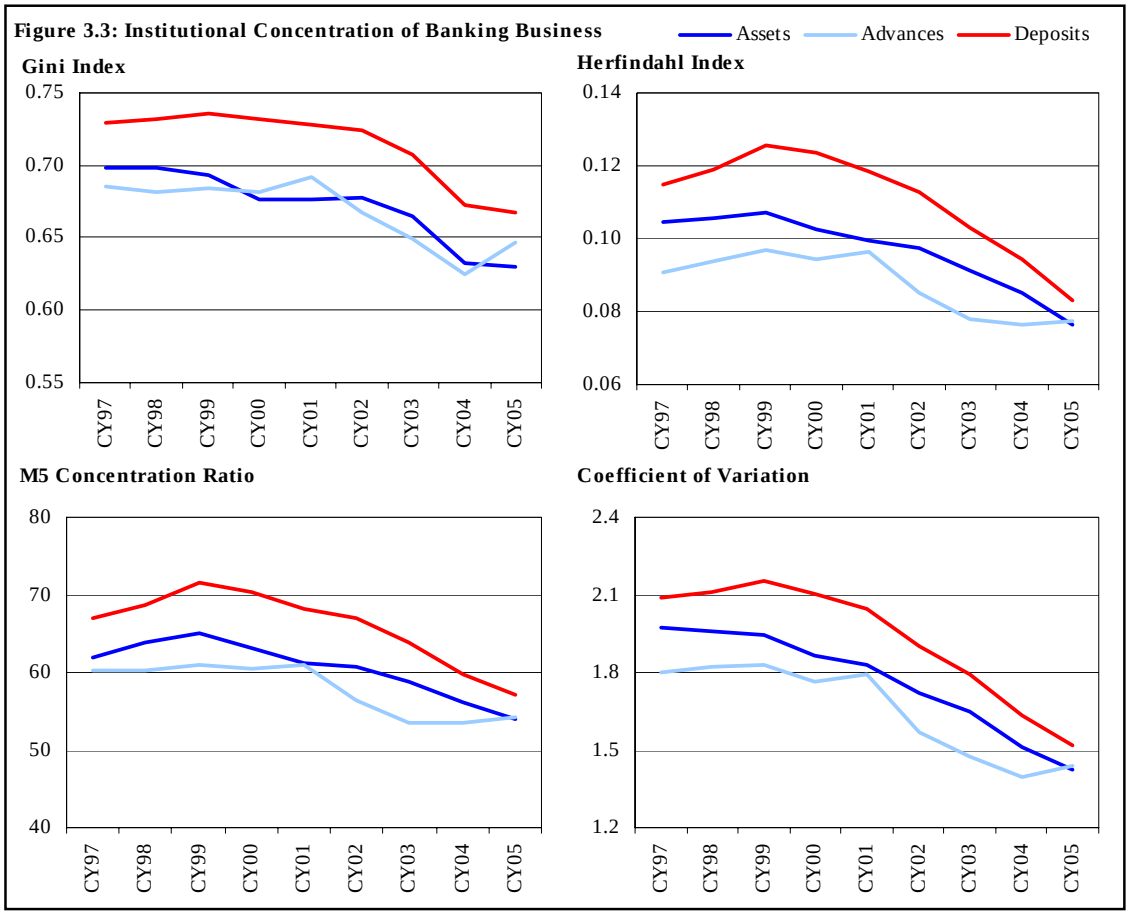
Table 3.1 summarizes the coefficients obtained by estimating equation 1 for the two performance indicators. The results suggest that privatization has significantly improved the profitability of the privatized banks; however, its impact on the interest rate spread is not statistically significant.

In the ROA equation, the estimated value of δ_0 at -1.43 shows that average ROA of the state-owned banks was 1.43 percent less than the average of remaining banks in the total sample period (including both pre and post-privatization). However, this difference in the profitability ratio squeezed to only 0.07 percent (i.e. $\delta_0 + \delta_1$ = -1.43+1.36) for privatized banks in the post-privatization period.

Results from regression analysis of interest rate spread shows that during the sample period, on average, the state-owned banks charged 80 bases points higher spread than the rest of the banks; the difference is statistically significant. Value of δ_1 at 0.18 shows that the spread of privatized banks has increased after privatization by 18 basis points, however, statistically it is not different from zero. This suggests that privatization has no impact on the interest rate spread.

3.2.2 Concentration of the Banking Sector

The improvement (or fall) in institutional concentration of the banking business in Pakistan was another significant and welcome change during the last five years. This can be seen by declining



trends in commonly used indicators for concentration including Gini coefficient, Herfindahl index, M-concentration ratios, and co-efficient of variation,[9] in banks' assets, advances, and deposits (see **Figure 3.3**). Improvement on this front was primarily an outcome of the efforts made for consolidation of weak financial institutions. In particular, increased minimum paid-up capital requirement has forced banks to either expand their size or merge with other institutions.

The fall in concentration would have far-reaching implications in strengthening the competitive business environment for banks. For instance, by now private banks have a large number of branches, spreading in all the major cities in the country, and therefore, relatively better placed to serve corporates operating at the national level. In the past, such corporates had little option but to do business with nationalized and privatized banks; the only sub-groups that had nation-wide branch network at that time. Similarly, with the presence of private and foreign banks in small urban centers; the quality of services available in these areas has improved substantially. This has helped in increasing the deepening of financial services in the country.[10] Moreover, as expected, the improved concentration has played an important role in enhancing the efficiency of the banking sector.[11]

Nevertheless, despite a significant improvement during the last five years, the banking business is still highly concentrated in a few big institutions. For instance, the top five banks (out of total 39 banks) held more than 50 percent in the assets, advance and deposits of the banking sector. All the four indicators suggest that the concentration is higher in case of bank's deposits than advances.

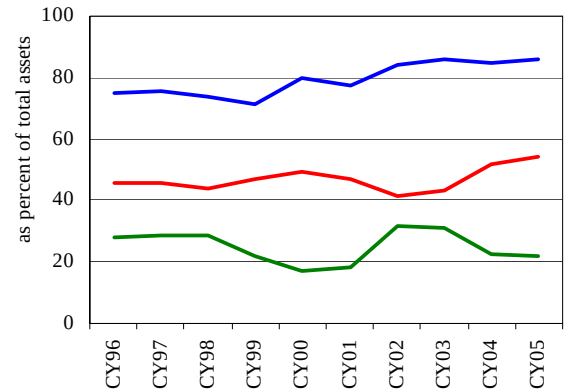
3.2.3 Changes in Financial Structure

The strong growth of the banking sector during the last five years was also accompanied by compositional changes in banks' assets and liabilities structure.

Composition of Bank' Assets

On assets side, *earning assets* constituted a significantly larger proportion of total assets, i.e. 83.6 percent, on average during CY01-CY05, compared to 75.1 percent in the second-half of the 1990s. While initially, a relatively faster growth in banks' investments, especially in the government securities, has pushed up the share of earning assets; from CY03 onward it was the surge in banks advances that kept the earning asset to total asset ratio at the higher level (see **Figure 3.4**). On the other hand, the share of investment in total assets has declined significantly from 31.5 percent in CY02 to 21.9 percent in CY05.

Figure 3.4: Assets Composition of Banking Sector



[9] For definition and details of these indicators see **Box 3.1**.
[10] Deepening of financial sector has been discussed in details in **Chapter 8**.
[11] An empirical exercise for investigating the determinants of banks interest rates spread, a widely used indicator for efficiency, suggests that decline in concentration ratio helps in lowering the spread (see **Section 3.4**).

Box 3.1: Measures of Degree of Concentration in a Banking Industry

In the following, we have described the five commonly used indicators to measure degree of concentration in an industry. As discussed in the main text, we have computed (four of) these indicators to analyze the trend in concentration with in the banking sector assets, advances and deposits.

1. Lorenz Curve: Lorenz curve (developed by Max O. Lorenz) is generally used to describe inequality in income or size. The Lorenz curve is basically a function of the cumulative proportion of ordered individuals (in our case is banks) mapped onto the corresponding cumulative proportion of their size. If all banks are of the same size, the Lorenz curve is a straight diagonal line (of 45^o degree) called the line of equality. If there is any inequality in size, then the Lorenz curve falls below the line of equality. Larger is the difference between the Lorenz curve and the line of equality, higher is the degree of inequality or concentration; and vice versa.[1]

2. Gini-coefficient: Gini-coefficient is a summary statistic of the Lorenz curve and is computed by taking the ratio of the area between the Lorenz curve and absolute equality line to the entire (triangular) area below the absolute equality line. It can be used to indicate how the distribution of income or concentration has changed within a country or industry over a period of time, thus it is possible to see if inequality is increasing or decreasing. Dasgupta et al. (1973) has proposed the following formula for estimation. [2]

$$Gini = \frac{2}{\mu n^2}\sum_{i=1}^{n} i X_i - \frac{n+1}{n}$$

In the context of the banking sector, μ is the mean of asset (advance or deposits) shares, n is the number of observations in ascending order, and Xi is cumulative share of bank i. Gini coefficient ranges between zero and one (both inclusive), value of zero reflects that all banks are equal in size, while value of one indicates complete inequality.

3. Herfindahl Index: Herfindahl Index, another measure of concentration, is obtained by summing the squared market-share of banks in the industry. Herfindahl index is a better indicator of market concentration compared to the Gini coefficient as it also takes into account the number of banks while measuring the degree of concentration. Mathematically, it can be defined as

$$H = \sum_{i}^{n} \alpha_i^2$$; where α_i is the market share of bank *i*.

Decreases in the Herfindahl index generally indicate decline in concentration and vice versa. The value of the Herfindahl index ranges between 1/n and 1; reaching its lowest value 1/n when all banks in a market are of equal size, and reaching unity in the case of monopoly (i.e., there is a single bank in the banking sector).

4. M-Concentration Ratios: M-concentration ratios indicate the market share of a M-biggest participants in the industry. Here in this chapter, we have computed M5-concentration ratio for banking sector assets, advance and deposits, which measures the relative importance of top five banks in Pakistan's banking industry. The declining M-ratio suggests improvement (or decline) in concentration.

5. Coefficient of Variation: Here coefficient of variation measures the degree of dispersion in the indicator of interest (here banks assets, advance and deposits) across different banks at a given point in time. It is defined as the ratio of the standard deviation (SD) to the mean:

Coefficient of Variation = SD / Mean

A higher value of coefficient of variation represents a higher degree of concentration.

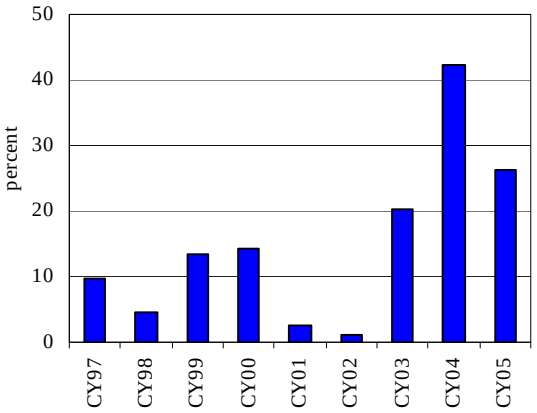
[1] Although, we have not drawn the Lorenz curves for the banking industry, this is defined here as it helps in defining the Gini-coefficient.

[2] For details, please see Dasgupta Partha, Amartya Sen and Davis Starrett (1973), "Notes on Measurement of Income Inequality" Journal of Economic Theory, Vol. 6, p 180-77.

In the post September 11, 2001 scenario banks were flushed with liquidity. While the phenomenal improvement in external accounts and booming business activities have led to a strong growth in banks deposits; it was an easy monetary policy stance by SBP that left the interbank market comfortably liquid. As a result, interest rates started falling sharply and reached to historic low level

by the end of FY03. Banks, in this declining interest rate scenario, were eager to park available liquidity sooner than later. In fact, the funds available at banks disposal were well in excess of normal credit demand from banking sector. Banks have invested heavily in the government papers, in particular in longer-term securities; while trying to expand their credit base by exploring underserved market segments. Unlike the general banking practices in the past, banks aggressively entered into consumer, agriculture, SME and long-term project financing that has led to a sharp growth in bank advances from CY03 onward (see **Figure 3.5**). In addition, the strong economic growth has also raised the demand for traditional bank credit for working capital and fixed investment. However, banks have witnessed a significant decline in concentration of loan portfolio.[12] This changing composition of assets suggests that average maturity of banks' assets has increased during the last five years.

Figure 3.5: Growth in Banks' Advances



Another, noteworthy development during the period under review was the increased diversification of banks' investment portfolios. Specifically, the concentration of banks investment in the government securities has declined from 82.7 percent in CY03 to 73.9 percent in CY05, as investment in *shares* and the private sector debt instruments increased during this period.

The increased share of earning assets, with a relatively higher proportion in advances, and diversification of advances and investment has strong positive implications for the profitability of the banking sector. As not only a larger asset-base is in earning category, but also parked in relatively high yielding avenues. This can be supported with the fact that advances, in general, generate higher interest income as compared to returns from investment in government securities.

Composition of Banks Liabilities

The strong growth in the banking sector assets, during CY00-CY05, was primarily financed by sharp rise in bank deposits and capital base.[13] In fact, on average, growth in both deposits and capital was significantly higher than growth in banks assets. This can be seen by increased deposits and capital ratios with banks assets during the period under review (see **Table 3.2**). As a result, banks' reliance on the borrowings has declined substantially; as in CY05 banks have funded 9.2 percent of total assets through borrowings; against 14.8 percent in CY00.

Table 3.2: Funding of Banks' Assets

percent

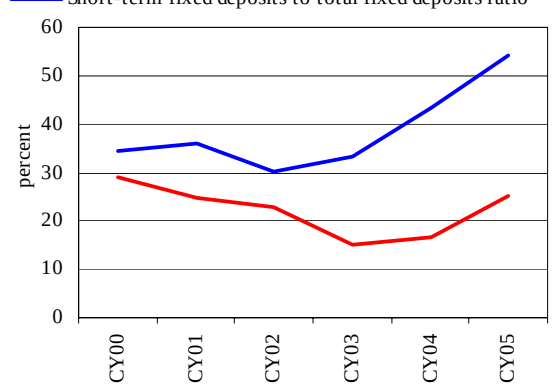
Ratio	CY00	CY01	CY02	CY03	CY04	CY05
Deposits to total assets	74.2	75.9	75.5	77.2	78.6	77.4
Capital to total assets	4.5	3.8	4.8	5.5	6.7	7.9
Borrowing to total assets	14.8	13.8	12.5	11.8	9.4	9.2

[12] For details see **Chapter 8.**

[13] While improvement in Pakistan's external accounts and economic growth has led to a strong growth in bank deposits from CY02 onward, the increased minimum paid-up capital requirements; surged in profitability; and substantial capital gains have driven the strong growth in the capital base of the banking sector.

In addition, banks have also witnessed visible changes in the underlying structure of deposits during the last five years. Share of fixed-term deposits in total deposits has declined from 29.1 percent in CY00 to only 15.0 percent in CY03 (see **Figure 3.6**). Since than the share of fixed deposit has partially recovered to reach at 25.3 percent in CY05, however, the increase was attributed to sharp rise in short-term fixed deposits; i.e. fixed deposits for less than 6-month. Specifically, in CY05 the short-term fixed deposits comprised of 54.3 percent of total fixed deposit; against only 33.2 percent in CY03.

Figure 3.6: Composition of Banks' Deposits



Implications of the Changed Financial Structure

Changes in assets and liabilities composition have some important implications for profitability, risk exposure, soundness and efficiency of the banking sector. On assets side, a combination of higher earning assets to total assets ratio; larger share of advances; and diversification of advances and investment towards high yielding avenues (such as credit to consumers, agriculture, SME, project financing, etc. and investment in equity and corporate debt markets) has positive implications for profitability of the banking sector. Similarly on the liability side, increased share of current deposits, decline in average maturity of term-deposits, and lower reliance on borrowings have important role in increasing the banks profits by reducing the interest expense of the banking sector.

Ironically, these changes in financial structure have also raised the risk exposure of the banking sector. While the phenomenal surge in advances, with a relatively larger exposure towards high-risk cliental (such as agriculture, SME and household sector), has exposed the banking sector to higher credit risk; the increased maturity mismatches, i.e., higher average maturity of assets than liabilities, have raised liquidity risk. In fact, the ongoing tightening of monetary policy not only augmented the credit and liquidity risk, but also increased the banks exposure towards market risk. Having said this, so far the banking sector has effectively coped with the increased risk exposure. While non-performing assets registered a downward trend from CY01 onward; banks witnessed a strong growth in capital, which stemmed from substantial improvement in profitability and increase in minimum-paid capital requirement. As discussed in the following section, together these factors have improved the soundness of the banking sector.

3.3 Financial Performance of Banking Sector[14]

The strong growth together with structural changes has improved the financial health of the banking industry manifold. Compared to the position in CY00, banks were relatively better capitalized in CY05, as Capital to Risk Weighted Assets (CRWA) ratio at 11.3 percent in CY05 was higher than 9.7 percent in CY00 and minimum requirement of 8.0 percent (see **Table 3.3**). The encouraging aspect of the persistent improvement in CRWA is that the share of the core capital has recorded a tremendous growth during the last three years and surpassed the overall required risk-based capital.[15] Moreover the number of undercapitalized banks reduced from 5 (with a market share of 12 percent) in CY00 to

[14] This section briefly summarized financial performance of the banking sector during CY01-CY05. An in-depth analysis on the banking sector soundness and risk assessment has been provided in SBP publication on "Banking System Review 2005".
[15] Core capital comprises fully paid up capital, balance in share premium account, reserve for issue of bonus shares, general reserves as disclosed on the balance sheet and un-appropriated / un-remitted profit.

2 in CY05 having market share of less than one percent. Higher capital adequacy ratio is even more impressive as this was accompanied by substantial improvement in banks assets quality.

Table 3.3: Financial Performance of the Banking Sector

percent

Ratios	CY98	CY99	CY00	CY01	CY02	CY03	CY04	CY05
CRWA	10.7	10.8	9.7	8.7	11.4	8.5	10.5	11.3
Net NPLs to capital	92.6	149.8	131.3	150.5	85.5	54.4	29.2	14.3
Gross NPLs to gross advances	22.8	25.9	23.5	23.4	21.8	17.0	11.6	8.3
Net NPLs to net advances	11.1	15.3	12.2	12.1	9.9	6.9	3.8	2.1
Provisions to NPLs	58.6	48.6	55.0	54.7	60.6	63.9	70.4	76.7
Earning asset to total assets	73.5	71.4	80.2	77.6	84.1	85.7	84.6	85.9
Non-interest expense to total assets	3.4	3.3	3.1	3.0	2.9	2.7	2.4	2.4
Intermediation cost*	3.3	3.5	3.4	3.2	3.2	2.7	2.7	2.7
Operating expense to income	106.0	89.9	91.2	87.4	80.7	64.9	60.5	51.2
Total expenses to total income	102.3	96.1	97.4	99.4	89.5	73.8	69.0	65.3
Net interest income to total assets	2.8	2.4	2.7	3.4	3.3	3.1	2.9	4.2
ROA -- before tax	-0.3	0.4	0.3	0.1	0.9	1.8	1.9	2.8
ROA -- after tax	-0.1	-0.2	-0.2	-0.5	0.1	1.0	1.2	1.9
Interest rate spread	5.4	5.0	4.7	5.1	4.5	3.8	3.5	5.0
Loans to deposits	56.6	62.0	66.2	61.7	54.9	56.4	65.8	70.2
Loans to deposits –adjusted for EFS	45.4	49.2	60.4	58.3	52.2	52.5	61.5	66.4
Liquid assets to total assets	38.8	34.5	35.5	38.1	46.7	45.1	36.6	33.7

*: Computed by taking ratio of administrative expense to average deposits and borrowings.

Source: SBP

Banks' Non-performing Loans (NPLs), both in gross and net terms,[16] have witnessed continuous declining trend since CY01; showing improved market discipline and loan appraisal standards of banks.[17] As the banking sector has registered a strong growth in advances, NPLs to advances ratios saw a sharp decline in CY01-CY05 (see **Table 3.3**). This together with increased share of earning assets in total assets, declined in intermediation cost, and cut in tax rates on banking sector has led to phenomenal improvement in profitability of the banking sector. After registering losses during CY98-CY01, banks witnessed an uptrend in profitability and ROA (after tax) has reached to 1.9 percent in CY05. It may be important to note that increase in banks profitability during CY05 was largely driven from higher interest rate spread, while the intermediation cost ratio almost remain at the previous year's level.

On the downside risk, however, the rising loans to deposit ratio during CY04 and more importantly in CY05 may have increased the liquidity risk of the banking system. The liquid assets to total assets ratio has already declined to 33.7 percent from 45.1 percent at end CY03. The local private banks, in particular, have been lending aggressively and registered a steep rise of 12.6 percentage points in loans to deposit ratio in CY03-CY05. Indeed, the deterioration in liquidity indicators might impede the financing activities by these banks. Nevertheless, since the banking industry business in Pakistan is now being characterized by aggressive but healthy competition; it is expected that banks would make strenuous efforts to enlarge their deposit base by offering attractive returns to their customers.

[16] Net NPLs = gross NPLs - provisioning against advances.

[17] While the gross NPLs declined from Rs 244.1 billion in CY01 to Rs 177.3 billion in CY05; the net NPLs fell from Rs 110.5 billion to Rs 41.3 billion in the same period.

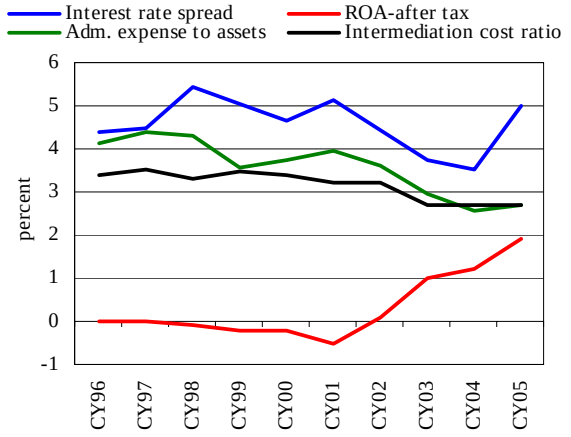
Not only these efforts would likely to improve the liquidity position in these banks but will also be helpful in bringing down the banking spread that was on a rising trend during CY05.

In this regard, SBP has already incentivized the banks to mobilize longer-term deposits. As mentioned earlier, in order to encourage banks to mobilize fixed term deposits of 6 month and above tenor, the SBP has adopted differential ratios for the calculation of cash reserve requirements-CRR. Specifically, the SBP has prescribed a lower CRR for fixed deposits with over 6 months tenor and a higher CRR for the remaining deposits including, current, savings and fixed deposits with maturity less than six months.

3.4 Efficiency of Banking Sector

Interest rate spread, a wedge between interest rate earned on interest earning assets and interest rate paid on interest bearing liabilities, is a widely used indicator of the banking sector efficiency.[18] A lower value of the interest rate spread is generally being considered to represent a more efficient banking system. However, it is important to note that trend in intermediation spread *alone* does not fully explain changes in efficiency; one should also consider other indicators such as profitability, soundness, etc, to gauge any improvement in efficiency of the banking sector. Thus, it may be desirable to analyze intermediation spread in relation to administrative cost and profitability of the banking sector. While the higher administrative cost represents the low operational efficiency of the banking sector, the higher profitability may indicate the low degree of competition among banks (i.e., low level of allocative efficiency). Thus, gains in efficiency entail improvement in both, operational as well as allocative efficiency.

Figure 3.7: Efficiency of the Banking Sector



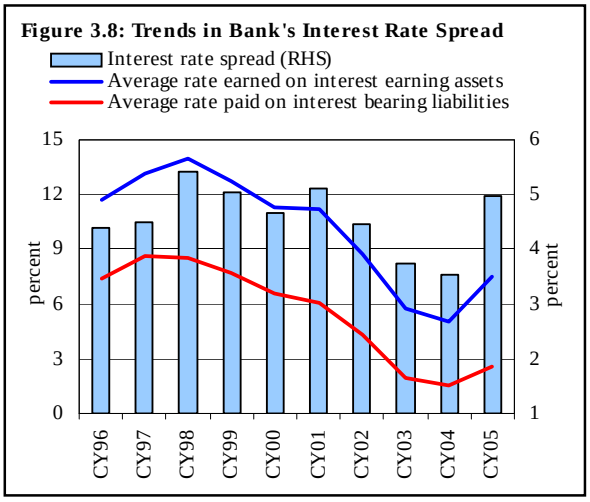
As discussed earlier, the banking system in Pakistan witnessed a substantial improvement in profitability and soundness during CY01-CY05. Encouragingly, during CY01-CY04 improvement in financial health was accompanied by declining interest rate spread. However, in CY05, while ROA continued to increase, interest rates spread rose sharply by 1.5 percentage points to reach level same as in CY01 (see **Figure 3.7**).[19] While analyzing the surge in the interest rate spread in CY05, following two points are important to note: first, the increase in the spread was not explained by a rising intermediation cost of the banking sector in CY05, as both administrative expense to total asset and intermediation cost ratios remained almost at previous year's level (see **Figure 3.7**); second, the increased spread is reflected in higher profitability of the banking sector, as ROA (after tax) improved from 1.2 percent in CY04 to 1.9 percent in CY05. Thus, while banks have maintained their operational efficiency, a lack of competition enabled them to translate large interest rate spread to higher profitability. Further

[18] It is important to note that there is no unique definition of interest rate spread. For example, the difference between banks weighted average lending and deposits rates, though widely being used, is the narrowest definition to proxy the intermediation spread or efficiency of a banking system.

[19] Although banks' intermediation spread during CY05 was at 5 percent (which is close to 5.1 percent spread witnessed in CY01); the ROA during CY05 was 1.9 percent, which is in sharp contrast to significant losses realized by banks during CY01. Similarly, banking sector was enjoying a considerably better financial health in CY05 compared to CY01.

analysis suggests that the low level of competition is prevalent in deposit mobilization activities, whereas banks' lending activities have experienced rising competition during CY01-CY05.

Figure 3.8: Trends in Bank's Interest Rate Spread



In CY05, the increase in the interest rate spread stemmed from higher increase in interest rate earned on interest-earning-assets than interest rate paid on interest-bearing-liabilities (see **Figure 3.8**); the rising trend in both the rates was an outcome of monetary tightening by SBP since Q4-FY04. In fact, the weak transmission of monetary policy to bank deposit rates and the changing financial structure of the banking sector have played an important role in increasing the interest rate spread in CY05.[20] Specifically, an empirical analysis suggests that in Pakistan, changes in 6-month T-bills rates have limited impact on bank deposit rates (i.e. 100 basis points increase in 6-month T-bill rates will raise deposit rates by 44 basis points only) with a transmission-lag of ten-months. On the

Box 3.2: Transmission Mechanism of Interest Rate to Weighted Average Lending and Deposits Rates

In order to understand the positive relationship between bank interest rate spread and benchmark interest rate, it is interesting to investigate that to what extent and how fast changes in the benchmark interest rates transmit to banks lending and deposit rates. In this regard, an empirical investigation is conducted here by applying auto-regressive distributed lag econometric technique[1] on benchmark 6-month T-bills cut-off rates (as benchmark or policy rates), Weighted Average Lending Rates (WALR) and Weighted Average Deposit Rates (WADR) from July 1999 to June 2006. The results are summarized in **Table B.3.2.1**. Where column 2 reports short-term or instantaneous effect of 1 percentage point increase in 6-month T-bills, column 3 shows the full or long-run impact the change; column 4 reports the results of a test on long-run coefficient, with null hypotheses that the change in benchmark rates fully transmit to bank lending and deposit rates, and the last column shows the approximate time to complete the transmission.

The results suggest that a 100 basis points (bps) increase in the 6-m T-bills rate tends to increase WALR by almost 20 bps instantaneously. The long-term coefficient of WALR reflects is equal to 1 in statistical-terms, which shows that changes in the benchmark interest rate fully transmit to bank lending rate and it takes about 5 months to complete the pass-through. On the other hand, both instantaneous and long-term co-efficient of WADR is considerably low. The latter at 0.44 is significantly different from 1 suggesting that monetary policy transmission is far from complete in case of banks deposits rates. In specific terms, a 100 bps change in 6-m T-bills cut-off increases the WADR by only 44 bps and it takes around 10.1 months to complete this transmission.

Table B.3.2.1: Transmission of Interest Rate to WALR and WADR

	Short-run Coeff.	Long-run Coeff.	LR Coeff.= 1	Approx. time
WALR	0.198	0.987	Accepted	5.0
	(6.021)	*(8.752)*	*(0.014*)*	
WADR	0.044	0.444	Rejected	10.1
	(6.893)	*6.587*	*(68.273*)*	

Figures in Italic are significant t-statistics

* Significant Chi-Square Statistics

[1] For details see Pesaran, M. Hasem and Yongcheol Shin (1999). "An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis". Econometrics and Economic Theory in the 20th Century: The Ranger Frisch Centennial Symposium. Cambridge, Cambridge University Press. Also available at: www.econ.cam.ac.uk/faculty/pesaran/ADL.pdf

[20] For details on causative factors of rising spread in recent past see SBP 2nd Quarterly Report for FY06 on "The State of Pakistan's Economy.

other hand, the monetary policy changes fully diffuse to bank lending rates and take only five months to complete the transmission mechanism (see **Box 3.2**). Following are some of the possible reasons for varying response to monetary policy shock by deposit and lending rates:

- A significantly larger portion of bank deposits falls in current account category; the share of such deposits increased from 24.0 percent in CY01 to 27.4 percent in CY05. Thus, the share of deposits which are insensitive to interest rate changes has increased.
- Fixed-term deposits, especially of longer tenor constitute a small portion of total deposits. During CY01-CY05, the share of fixed-term deposits of 6 month and above tenor in total banks deposits has declined from 15.7 percent to 11.5 percent. A falling share of term deposits also depresses the overall deposit rates of the banking sector and reduces the sensitivity of deposit rate to benchmark rates.
- While the institutional concentration of deposits registered improvement during the period under review, it is still very high, for instance at the end of CY05, the largest five banks share above 57 percent in total banks deposits. This high concentration of deposits possibly reflects low level of competition among banks for deposit mobilization.
- Since February 2004, SBP has made it compulsory for banks to benchmark interest rates on all lending to corporate clients with Karachi Interbank Offer Rate (KIBOR). This benchmarking transmits monetary policy signals to lending rates more effectively. This is also reflected in increased competition among banks in their lending activities. In fact, dispersion in lending rates has been declining at a faster rate following the introduction of this benchmarking (see **Box 3.3**). Such benchmarking is not required for bank deposit rates, which partly explains relatively weak transmission channel of monetary policy to deposit rates.

Box 3.3: Competition among Banks in Setting Lending and Deposit Rates

As mentioned in the main text that besides operational efficiency (or low intermediation cost), competition among banks plays a vital role in determining the overall efficiency of the banking sector. It is, therefore, important to analyze if the competition among banks has improved over time or not; especially as institutional concentration of the banking sector has improved during the last five years (see **Section 3.2.2**).[1] In this regard, an important variable to observe is dispersion of lending and deposit rates across different banks; all else equal, a declining value of the dispersion suggests a relatively higher competition in the banking sector.

Table B.3.3.1: Determinants of Dispersion in Banks' Price Variables

Dependent variable: Standard deviation of banks price variable

	Deposits rates		Lending rates	
	Coeff.	**Prob.**	**Coeff.**	**Prob.**
Constant	-0.07	0.34	1.91	0.00
Trend	0.00	0.17	-0.02	0.04
6-m T-bills cut-offs	0.02	0.01	0.00	0.88
Trend*D_{KIBOR}	-	-	-0.03	0.00
Lag dependent variable	0.86	0.00	0.25	0.09
Adjusted R-squared		0.95		0.83
DW statistics		1.87		2.20

Applying the ordinary least squire method, on monthly data from June 2001 to December 2005, two regression equations are estimated; one for standard deviation of lending rates across different banks and the other for deposits rates. In each equation, trend, 6 month T-bills rates and lag dependent variables are used as regressors. As, since February 2004, SBP has made it compulsory for banks to benchmark all the lending rates for corporate clients with Karachi Interbank Offer Rate (KIBOR), a condition is also tested if this policy measure has played a role in narrowing the price differential (i.e., differential in lending rates) across different banks. For this purpose, an interaction dummy of KIBOR with trend variable is introduced as an explanatory variable in the equation for lending rates.[2,3] Results are summarized in **Table B.3.3.1**.

The results suggest that dispersion in lending rates across different banks has depicted a significant declining trend implying that banks lending activity has become more competitive over time. Specifically, controlling for other factors (i.e. changes in 6-month T-bills rates and impact of the KIBOR as benchmark for corporate sector lending rates), the standard deviation of lending rates declined at the rate of 2 bps per month (or 24 basis points per annum) during the period under review. Policy measure of introducing KIBOR as benchmark for corporate lending rates has significantly reduced the dispersion in lending rates across different banks. In quantitative terms, since the introduction of this policy, standard deviation in lending rates have declined at a faster rate; i.e., 6 bps per month. It is encouraging to note that the downward trend in the dispersion of banks lending rates was independent of changes in the 6-month T-bills rates; as co-efficient of 6-month T-bills rates is not statistically different from zero.

On the other hand, standard deviation of deposit rate has not registered a significant downward trend and a positive relationship is found between the dispersion in bank deposits rates and 6-month T-bills interest rates. These findings suggest that competition among banks in deposit mobilization activity has either not improved during the period under review; or at least not reflective in the deposits rates across different banks. However, it is possible that banks may be competing with each other (such as better quality of services, better features of deposit schemes, etc) to generate more deposits on non-price variables.

[1] This is because a low or declining concentration ratio is generally associated with high or improving competition in an industry; as the low concentration reflects lower power of individual players (here banks) in setting prices.
[2] Values for KIBOR Dummy are assumed 1 for period February 2004 onward and otherwise zero.
[3] The interaction dummy was also tested in the equation of deposit rates, but statistically it was not significantly different from zero.

3.4.1 Determinants of Banks' Interest Rate Spread

The magnitude of interest rate spread generally depends on three broad factors:[21] (i) bank specific characteristics, such as administrative and other operating expenses, extent of non-performing loans, earnings from non-core activities, composition of assets and liabilities, etc.; (ii) banking industry specific characteristics, for instance structure and the level of competition in the banking sector, reserve requirement, tax burden on banks, etc; and (iii) macroeconomic indicators, including economic growth, interest rate, inflation, etc. Mathematically, the function of the spread can be expressed as follows:

$$Spread_{it} = f\,(Bank\ specific\ indicators_{it},\ Industry\ specific\ indicators_{t},\ Macroeconomic\ indicators_{t}) + \varepsilon_{i,t}$$

Where $Spread_{it}$ is the wedge between average interest earned on *advances* and *investment* and average interest *paid* on deposits and *borrowings* of i^{th} bank at time t. The bank specific characteristics are generally related with size and operational policies of a bank, which are allowed to vary from bank to bank in the estimated equation of the spread. On the other hand, industry specific characteristics and macroeconomic variables are allowed to vary only across time, as they represent a common operating environment for the entire banking sector.

The equation has been estimated by applying fixed-effect panel technique on the data of 28 banks pooled over the period of 1996-2005.[22,23] The expected sign and its explanation for variables used in the best fitted equation has been reported in **Table 3.4**, while the estimation results are summarized in **Table 3.5**.[24]

All the coefficients in the estimated equation depict the expected signs. Among the bank-specific characteristics, increase in *administrative cost to total assets* and *provisioning to NPLs* ratios tends to increase the spread. In magnitude the former has a larger impact; as one percentage point increase in administrative cost to total assets ratio pushes the interest rate spread up by 31 basis points, while the same one percentage rise in provisioning to NPLs ratio increases the spread by only 6 basis point.

[21] For reference see the following studies: Demirguc-Kunt, A., and H. Huizinga (1999): "Determinants of commercial bank interest margins and profitability: some international evidence", *World Bank Economic Review,* 13, 379-408.
Ho, T. S. Y., and A. Saunders (1981): "The determinants of bank interest margins: theory and empirical evidence", *Journal of Financial and Quantitative Analysis*, 16, 581-600.
Angbazo, L. (1997): "Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking", *Journal of Banking and Finance*, 21, 55-87
[22] While estimating the equation, some small banks showing erratic behavior either in the spread or the exogenous bank specific indicators have been excluded. The banks that are included represent above 90 percent of the aggregate size (assets) of the banking sector.
[23] All the bank- and industry-specific variables have been estimated using data from banks' annual audited accounts.
[24] Although we have estimated several models, the results are reported of the best-fitted model. In our analysis, we found that variables such as equity to asset ratio, earning assets to reserve requirement, tax burden, inflation, etc. are statistically insignificant.

The *non-interest income to total income* and *time deposits to total deposits* ratios, on the other hand, show a negative relationship with the interest rate spread.

Table 3.4: Determinants of Banks' Interest Rate Spread and their Expected Impact

Indicators	Expected Sign	Rationale
Bank's Specific Indicators		
Administrative expenses to assets ratio	Positive	The higher administrative expenses are over head expenditure and banks tend to transfer these expenditures to their clients both by charging higher interest on their advances and paying lower return to their depositors. Therefore, higher administrative expenses to assets ratio tends to widen the interest rate spread and vice versa.
Loan provisioning to advances ratio	Positive	In the presence of increased credit risk, banks tend to charge more on the advances, and therefore, it is expected that higher loan provisioning to NPLs is associated with higher spread and vice versa.
Non-core business revenues to total revenues	Negative	Revenues from the non-core business activities (such as fee, commission and revenues from foreign exchange transactions) cover part of the administrative and provisioning expenses, therefore, it is expected that revenue from the non-core business activities to be inversely related with interest rate spread.
Time deposits to total deposits	Negative	The relationship between time deposits to total deposits and spread is expected to be negative. As the higher proportion of the time deposits in total deposit mobilization means that average interest on banking liabilities is high as banks are paying higher interest rate to depositors on their fixed deposits.
Industry Specific Indicator		
Level of competition (Herfindahl index)	Positive	Competition within the banking industry is one of the most important variables in determining the efficiency of the banking sector. As higher concentration of banking business in a few banks (means higher value of HH-index) generally represents lower degree of competition among banks. HH-index is, therefore, expected to have a positive sign in the spread's equation.
Macroeconomic Indicators		
Real GDP growth	Positive	As the high real GDP growth generally increases the supply of deposits and demand for advances, it, therefore, allows banks to charge a relatively higher spread.
6-m-T-bill rate	Positive	In Pakistan , the pass-through changes in benchmark interest rates to bank lending rates is larger in magnitude and relatively quicker than that on bank deposits rates (for details see **Box 3.2**). Thus, whenever, benchmark interest rates increase it increases the interest rate spread. Moreover, similar studies on other countries' data also found a positive relationship between benchmark interest rates and the banks' interest rate spread.[1] Its magnitude, however, depends on (i) the anticipation of interest rate changes (ii) interest rate pass through to interest liabilities and earning assets (iii) the extent of loans extended on floating interest rate, and (iv) the risk of having an adverse selection problem in case of borrowers.

[1] For reference see (1) Hannan, T. H., and A. N. Berger (1991), "The rigidity of prices: evidence from the banking industry". *American Economic Review*, 81, 938-945.
(2) Cottarelli, C., and A. Kourelis (1994), "Financial structure, bank lending rates and the transmission mechanism of monetary policy" *IMF Staff Papers,* 41, 587-623.

Institutional concentration within the banking sector is another important variable that determines the level of the interest rate spread in Pakistan. In specific terms, one percentage point fall in Herfindahl index value (showing decline in the banking sector concentration) improves the spread by 36 basis points.

A positive relationship was found between the spread and the benchmark interest rates implying that the spread tends to increase with the tightening of monetary policy and vice versa. This is consistent with the finding of the weak transmission of monetary policy changes on bank deposits rates. In quantitative terms, 100 bps increases in 6-month T-bills rate raises the spread by 22 bps.

3.5 Conclusion

The visible improvements in the country's macroeconomic performance together with structural changes in the banking industry have improved the financial health of the banking industry manifold. While the diversification of advances and investment towards high yielding avenues (such as credit to consumers, agriculture, SME, project financing, etc. and investment in equity and corporate debt markets) has positive implications for profitability of the banking sector; the decline in average maturity of deposit base, has important role in increasing profitability by reducing the interest expense of the banking sector.

Table 3.5: Estimates of Fixed Effect Model for Interest Rate Spread

Dependent variable: Interest Rate Spread

	Coefficients	t-stats
Constant	-1.925	-1.031
Bank specific characteristics		
Administrative expense to total assets	0.311**	2.253
Provisioning to NPLs ratio	0.006***	3.053
Non-core revenue to total revenue	-0.062***	-4.096
Time deposits to total deposits ratio	-0.007	-0.944
Industry specific indicators		
Herfindahl concentration index	0.358**	2.137
Macroeconomic indicators		
Interest rate	0.218***	3.522
Real GDP growth	0.080***	2.639
Lag of interest rate spread	0.101*	1.790
Adjusted R-squared	0.89	
DW-statistic	1.92	
Prob (F-statistic)	0.00	
Included observations	10	
Cross-sections included	28	
Total pool (unbalanced) observations	280	

*** Significant at 1 percent, ** significant at 5 percent and * significant at 10 percent.

Nevertheless, these changes in financial structure have also increased the risk exposure of the banking sector in the shape of rising maturity mismatches and emerging liquidity constraints. Although the increased capital requirements would help in addressing both the concerns somewhat; still there is a need for banks to concentrate on innovating the liability products and mobilize longer tenor deposits. This will not only help in mitigating the emerging risks in the banking industry; but will also encourage the mobilization of financial savings in the economy and narrowing down the presently high banking spread. The SBP has already taken necessary measures in this regard by incentivizing the mobilization of long term fixed deposits through applying a lower cash reserve requirement on these deposits.