

## IMPACT OF OWNERSHIP, COMPETITION, AND MANAGEMENT PRACTICES ON EFFICIENCY OF BANKING SECTOR

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**Abstract:** In the 1990s the financial sector of Pakistan underwent massive reforms. The primary aim of restructuring was to privatize state-owned institutions, abolish entry barriers for new players, and consequently increase the efficiency of the whole system. This study uses an unbalanced panel of 21 commercial banks listed at Pakistan stock exchange throughout 2000 to 2017 from “BankFocus” and “Bloomberg”. This research measures the effect of ownership, competition, and management practices on banks efficiency. The authors found a higher efficiency of private banks in comparison to state-owned counterparts. The empirical analysis suggests that an increase in foreign ownership and institutional ownership impact positively on all measures of efficiency. The relationship between competition and efficiency supports “competition-efficiency hypothesis” and proposes regulatory measures to regulate the market further. Additionally, banks with a higher standard of management practices tend to be more efficient. These findings imply that there is a need to regulate the bigger banks and ease the market entry for foreign and institutional owners, who brings superior managerial standards and hence efficiency.

**Key words:** bank, ownership structure, competition, governance, management practices, efficiency, Data Envelopment Analysis

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### Introduction

Euroregions A wide range of developed, emerging and transition economies have reformed their financial system over the past two decades, with the aim of efficiency, better allocation of resources to different sectors, and increased competitiveness. An efficient financial framework and the reformed legal system play a vital role to enhance economic growth in developing markets (Beck et al., 2005; King and Levine, 1993), while inefficiency and poor legal and financial infrastructure may lead to stagnation (Cull and Xu, 2005). Thus a robust and efficient financial and legal system is needed for developing countries like Pakistan whose economic growth is muddling for the past two decades. An efficient financial structure can help allocate limited financial resources optimally.

The banking sector of Pakistan has been undergoing diverse stages since its inception in 1947 to a recent period. The first two decades involve the development

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of institutions from scratch by the government and the private sector. The next phase marked the nationalization of the privately owned institutions and experimenting with interest-free banking. Nevertheless, government-owned institutions are usually notorious for their inefficiency (Berger et al., 2004), leading to reforms (the 1990s) in the form of privatization, restructuring, financial liberalization, licensing to private banks and improved supervision. This globalization affected the overall ownership structure, competition, and institutional and regularity improvements, which lead to overall efficiency and managerial quality of the banking sector. The ownership structure produces agency problem because largely dispersed shareholders suffer the dilemma of incomplete information. However, implementation of a comprehensive corporate governance framework by management ensures the fair share to all stakeholders.

The first contribution of this research is to test the efficiency of banking sector using four different efficiency ratios (efficiency score calculated using “data envelopment analysis”, asset efficiency ratio, cost efficiency ratio and overhead cost efficiency) under the influence of foreign and institutional ownership. Using a dummy variable approach, the authors have shown the higher efficiency of private banks than state-owned banks. Private Banks tend to have highly productive assets, lower overhead and overall cost. To supplement results, the study also uses real data of foreign and institutional ownership to show similar results. Quantile analysis displays a monotonic increase in efficiency from low foreign or institutional ownership subgroup to high foreign or institutional ownership group. Graphical representation (Figure 1) shows that foreign ownership jumped from 1.85 percent to 7.19 percent in sample period while efficiency from 0.59 to 0.68.

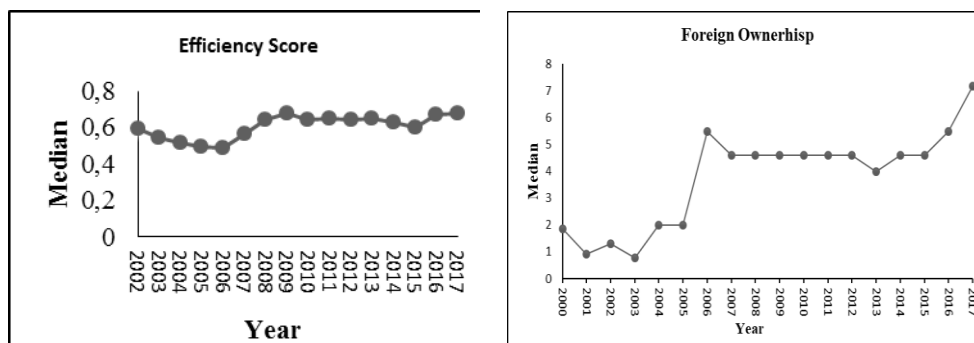


Figure 1. These figures graph the mean of foreign ownership and efficiency score over the sample period

This highly correlated trend between ownership and efficiency suggests an efficiency improvement with the involvement of foreign investors. The second contribution deals with testing of competition and efficiency. Providing an equal playing field is a big challenge for regulators in emerging countries where a small number of banks have high power to dictate their terms. A very high five-firms’

concentration ratio of around 60 percent indicates the presence of highly concentrated banking system. The empirical analysis supports the “competition-efficiency hypothesis”, which suggests a higher efficiency of the competitive banking system as the banks specialize themselves in specific products and services and do not fight with competitors over customers. The competition also seems to decrease costs and contributes to the overall stability and efficiency of institutions. Among other contributions include the use of a variety of efficiency proxies together, as previous research relied either on efficiency ratios or DEA based efficiency scores only. The inclusion of both dummy variables approaches and real ownership data is another addition. While previously different governance proxies are used individually (e.g. board structure and reporting standards) this research uses a governance score from Bloomberg, which includes numerous measures of shareholders rights and management practices. Finally, this study links efficiency with the quality of management, for this purpose, a governance score is formed using shareholders rights, management commitment to corporate governance and management attitude towards corporate social responsibility practices. Perhaps not surprisingly, there is a positive relation of corporate governance score with DEA efficiency score and asset productivity. Regarding cost efficiency, an increase in corporate governance score tends to decrease overhead expense ratio and overall cost ratio. The authors of the study also show that governance score increase from low institutional or foreign ownership quantile to high institutional or foreign ownership quantile. Furthermore, private banks score highly on governance indicators. To sum up the debates, it is implied that foreign and institutional ownership boosts the overall corporate governance of institutions, which subsequently improves the efficiency by increasing productivity and cutting costs.

The rest of the article is organized as follow. Section 2 collects literature around the efficiency and its determinants to formulate a testable hypothesis. Section 3 introduces the key explanatory variables and their calculation methods and sources. Section 4 sheds light on Data Envelopment Analysis (DEA) to calculate efficiency score. Section 5 reports the results of the empirical analysis that includes descriptive statistics of the sample, correlation matrix and regression analysis. Section 6 concludes the study followed by references.

### **Literature Review**

The debate on efficiency is traced back to 1950s when Farrell (1957) decomposed the efficiency into technical and allocative efficiency. Berger (1995) divides the efficiency hypothesis into X-efficiency and scale efficiency. The former advocates increased profitability under reduced costs while the latter assumes higher profitability for bigger banks as they can use their market power to dictate the market. Profitability aspect is previously documented using Pakistani banks (Xu et al., 2018), while this study has exclusively focused on determinants of efficiency.

### *Ownership and Efficiency*

Previous literature on the relationship between ownership and efficiency is contradictory. In developed countries, foreign banks tend to perform poorly (Berger et al., 2000), primarily due to limited knowledge of the local market (Kosmidou et al., 2004). The better performance of domestic banks is in line with home biased in developing countries. However, in emerging markets, foreign banks show higher profitability and efficiency when compared to domestic banks (Berger et al., 2009). A recent study involving 70 countries from developed and developing world found a better performance of domestic banks in four countries, better performance of foreign banks in 11 countries and insignificant results for the rest of sample (Chen and Liao, 2011). Studies in China (Yin et al., 2013), Europe (Fries and Taci, 2005), and 28 developing countries (Berger et al., 2004) found state-owned banks to be less efficient than private banks or foreign banks.

### *Competition and Efficiency*

Numerous hypothesis aims to link the competition and efficiency. Competition-inefficiency hypothesis proposes a lower efficiency of competitive markets because of customer switching (Boot and Schmeits, 2006) and low information sharing among banks (Chan et al., 1986). On the contrary, the competition-efficiency hypothesis suggests an increased efficiency of banks by specializing in specific products and lowers the cost of services. The quite-life hypothesis suggests that managers of monopolistic firms do not feel any competitive pressure and hence neglect the proper cost management, which decreases their efficiency. Empirically, both negative (Tan and Floros, 2018) and positive (Casu and Girardone, 2009) the relationship between competition and efficiency are widely documented in different markets.

### *Managerial Practices and Efficiency*

The study of corporate governance and efficiency of the banking sector is relatively new and face a shortage of empirical evidence. Usually, it is believed that banks who implement pragmatic corporate governance approach tend to be more efficient when compared to those who neglect the importance of corporate governance framework (Caprio et al., 2007; Kamarudin et al., 2018). Recent studies in emerging markets have also highlighted the importance of corporate governance in improving performance and efficiency (Aktan et al., 2018; Kusuma and Ayumardani 2016; Zelenyuk and Zheka, 2006).

### **Data Collection and Sources**

This research focuses on determinants of efficiency in the banking sector of Pakistan from 2000 to 2017. The primary data source is BankFocus to extract bank-specific financial variables for the calculation of efficiency proxies (asset efficiency, cost efficiency, overhead efficiency and efficiency score), competition

(five-firm concentration ratio and market share) and bank controls (size, equity, leverage, tangibility, and loans). Documented literature has relied heavily on individual management characteristics; such as board size, composition, leadership style, committees and ownership (Bulathsinhalage and Pathirawasam, 2017) for managerial practices, while this study uses governance score (governance score is calculated from management, shareholder's rights, and CSR policies) as a proxy of management practices. The secondary data source is Bloomberg, which provides ownership (foreign and institutional ownership) and governance score. After filtering and cleaning data to include only banks listed on the Pakistan Stock Exchange (PSX) we are left with 21 commercial banks including four state-owned banks. A full list of variables and their calculation is provided in Table 1.

**Table 1. Variables and Definitions**

	<b>Variable</b>	<b>Calculation</b>
<b>Efficiency</b>	Assets efficiency (AE)	$[(\text{Interest Income} + \text{Trading Profit} + \text{Investment Income} - \text{Interest Expense}) * 100] / \text{Average Earning Assets}$ A higher percentage return of income generated from earning assets demonstrates higher assets efficiency.
	Cost efficiency (CE)	$(\text{Operating Expenses} / ((\text{Net Interest Income} + \text{Commissions and Fees Earned} + \text{Other Operating Income (Losses)} + \text{Trading Account Profits (Losses)} + \text{Gain/Loss on Investments/Loans} + \text{Other Income (Loss)} - \text{Commissions and Fees Paid}) + \text{Net Revenue} - \text{Net of Commissions Paid}) * 100$ The efficiency ratio measures the costs when compared to revenues, and a lower ratio shows the higher efficiency of a bank.
	Overhead efficiency (OHE)	$(\text{Net Non-Interest Expense} / \text{Net Interest Income}) * 100$ A lower value indicates an overall higher Overhead efficiency ratio.
	Efficiency Score (ES)	Efficiency score is calculated using the DEA method explained in equation 1 through 4. The lower bond is 0 with the lowest efficiency while the highest value of 1 shows the perfectly efficient bank.
<b>Ownership</b>	Foreign Ownership (FO)	Percentage of shares held by foreign investors
	Institutional ownership (IO)	Percentage of shares held by institutional investors
	State	State is a dummy variable which attains a value of "1" when a bank is owned by state and 0 otherwise.
<b>Competition</b>	Concentration (CR-5)	The proportion of the five largest banks asset to total banks assets. A higher value suggests monopolistic arrangements in which few firms are controlling the whole industry.
	Market share (MS)	The relative percentage of each banks asset to total market. A higher value suggests more power to a bank.
<b>Management Practices</b>	Governance Score (GOV)	Management score + Shareholders score + CSR strategy score • Management score: Management's commitment and

		effectiveness towards corporate governance principles.
		<ul style="list-style-type: none"> <li>• Shareholder’s score: Company’s effectiveness towards equal treatment of shareholders and the use of anti-takeover devices.</li> <li>• CSR strategy score: Company’s practices to communicate that it integrates the economic, social and environmental dimensions into its day-to-day decision-making processes.</li> </ul>
<b>Bank controls</b>	Size	Logarithmic value of total assets
	Equity	The proportion of total equity to total assets
	Leverage (LEV)	The proportion of total debt to total asset
	Tangibility (TANG)	The proportion of fixed assets (plant, property, and equipment) to total assets
	Loans	The proportion of total loans to total assets

### Methodology

Traditionally the efficiency studies were confined to only the ratio analysis, which can mislead easily under the pressure of outliers. Hence mathematicians developed better and sophisticated methods such as stochastic frontier analysis (Aigner et al., 1977) and Data Envelopment Analysis (Charnes et al., 1978). The fundamental difference between the two is that the former incorporates parametric while later non-parametric techniques. This research uses multi-input and multi-output production based on DEA methodology that is widely accepted in economic studies to estimate the production frontiers (Grmanová and Ivanová, 2018).

The initial version of DEA assumes a constant return to scale, but Banker et al., (1984) suggested a variable return to scale model because banks may exhibit increasing or decreasing return to scale as they may not be operating at optimal scale due to imperfect competition, or limitations on finance. DEA may not necessarily form a “production frontier”, but rather lead to a “best-practice frontier” (Cook et al., 2014). The DEA uses linear programming to maximize the efficiency of banks or any other entity. Efficiency is calculated as a fraction of weighted outputs to weighted inputs. DEA model allows varying between inputs and outputs to maximize the efficiency scores. Efficiency scores are restricted in the range of 0 to 1. Following, the linear model is employed to calculate efficiency scores:

$$\text{Maximize } E = \sum_{i=1}^n u_i y_i \quad (1)$$

$$\text{Subject to: } \sum_{j=1}^m v_j x_j = 1 \quad (2)$$

$$\sum_{i=1}^n u_i y_i - \sum_{j=1}^m v_j x_j \leq 0 \quad (3)$$

$$u_i \geq 0, v_i \geq 0 \quad (4)$$

“E” is the efficiency of the bank with “n” output coefficients ( $u_i$ ) and “n” output weighting coefficients ( $y_i$ ). Similarly, “ $v_i$ ” and “ $x_i$ ” denote the input coefficients and input weighting coefficients respectively. Inputs include personal expenses, interest expense and fixed assets of banks while outputs comprise of total loans and other earning assets. Equation 1 estimates the efficiency scores while equation 2 eliminates the non-linearity by removing inputs from objective function. Equation 3 ensures that the outputs must not exceed the inputs. This paper runs a multivariate analysis on panel data with following model specification:

$$\text{Efficiency} = \alpha + \beta_1 \text{ownership} + \beta_2 \text{Competition} + \beta_3 \text{Governance} + \beta_4 \text{bank control} + \text{error} \quad (5)$$

Four different models are used, each with different efficiency measure (DEA-efficiency score, asset efficiency, cost efficiency and overhead efficiency) with the same set of independent variables.

### Empirical Analysis

Empirical analysis consists of descriptive statistics, and panel data regression analysis for the considered sample.

#### *Descriptive Statistics*

Table 2 describes the fundamental characteristics of the sample under three different ownership categories. Firstly, the sample is divided into five subgroups based on a percentage of foreign ownership, whereas the FO1 represents firms with the lowest foreign ownership of 0.12 percent that increases towards FO5, which has the highest foreign ownership of 74.17 percent. Perhaps not surprisingly, the firms with high (low) foreign ownership also have high institutional ownership of 14.95 (8.35) percent. Pakistan’s banking sector is highly concentrated, and the top five firms hold about 67 percent of the total banking industry share as shown by the concentration ratio. Note that the governance score of 40.24 in low foreign ownership quantile (FO1) increases monotonically towards high foreign ownership quantile (FO5) and attains a value of 45.91 percent, which implies banks follow high governance standards with a high proportion of foreign owners. Size, leverage, tangibility, and loans do not show noticeable variations. Banks with high foreign ownership tend to issue more loans when compared to low foreign-ownership banks. Lastly, the banks with higher foreign ownership show distinctly higher efficiency values in all cases. The efficiency score (asset efficiency) is 0.51 (3.29) in the low foreign ownership group and rise to 0.66 (6.22 percent) in the high foreign ownership group. Consistently, the overhead efficiency (cost efficiency) is 93.33 percent (81.89 percent) in low foreign ownership and 42.13 percent (48.83 percent) in the high foreign ownership group. Overhead efficiency and cost efficiency are inverse measures.

The second set of comparison is made between state-owned and private banks. With the aim of controlling financial policies, governments maintain specialized



banks (e.g. industrial banks, agricultural banks) and restrict private or foreign ownership. Therefore, private banks attract a higher percentage of foreign (institutional) investors when compared to their state-owned counterparts. Private Banks also show higher governance score of 44.07 when compared to 36.60 in state-owned banks. About banks characteristics, private banks are more equity financed highly levered, use a higher proportion of tangible assets and manage to lend more money to earn interest. As expected the private banks are more efficient on all four measures of efficiency while the state-owned banks are less efficient. In a third contrast, all the banks are divided into quantile based on percentage institutional ownership. IO1 denotes banks with low institutional ownership (0.14 percent) that increase monotonically towards IO5 (46.88 percent).

**Table 2. Descriptive Statistics**

Variables	Foreign ownership					Private vs. state	
	FO1	FO2	FO3	FO4	FO5	Private	State
Foreign ownership	0.12	0.80	3.80	15.42	74.17	25.37	2.40
Institutional ownership	8.35	11.77	8.75	4.11	14.96	13.43	6.52
Concentration	0.66	0.67	0.67	0.67	0.67	0.70	0.70
Market share	0.05	0.04	0.08	0.04	0.05	0.05	0.09
Governance score	40.24	40.74	33.92	33.92	45.91	44.07	36.60
Size	12.46	11.91	12.63	11.65	12.37	12.0	12.44
Equity	0.07	0.07	0.08	0.19	0.07	0.15	0.08
Leverage	0.78	0.71	0.71	0.53	0.69	0.99	0.76
Tangibility	0.02	0.02	0.02	0.02	0.03	0.02	0.01
Loan	0.51	0.53	0.45	0.33	0.53	0.70	0.47
Efficiency score	0.50	0.59	0.56	0.61	0.66	0.63	0.48
Overhead efficiency	93.33	75.84	57.68	48.73	42.13	49.45	65.79
Asset efficiency	3.29	4.67	4.46	5.12	6.23	4.88	2.19
Cost efficiency	81.89	62.85	61.02	54.25	48.83	76.34	59.25
N	59	49	49	44	47	306	72

Variables	Institutional ownership				
	IO1	IO2	IO3	IO4	IO5
Foreign ownership	5.20	3.00	26.33	30.88	12.65
Institutional ownership	0.14	0.96	4.71	11.31	46.88
Concentration	0.62	0.62	0.61	0.61	0.61
Market share	0.03	0.05	0.05	0.07	0.11
Governance score	12.04	32.26	40.35	39.27	42.10
Size	12.56	13.04	13.07	13.49	13.93
Equity	0.10	0.09	0.07	0.08	0.10
Leverage	0.63	0.67	0.71	0.73	0.72
Tangibility	0.02	0.02	0.02	0.02	0.02
Loan	0.33	0.35	0.42	0.41	0.38
Efficiency score	0.41	0.47	0.52	0.58	0.60
Overhead efficiency	67.55	53.84	77.10	66.48	46.98
Asset efficiency	1.37	3.91	3.15	4.31	6.92
Cost efficiency	88.15	64.41	68.59	42.55	41.77
N	43	44	39	34	34



Higher (lower) institutional ownership is linked with higher (lower) foreign ownership. The banks with higher institutional ownership have a higher market share of 11 percent when compared to only 2.70 percent in low institutional ownership quantile. Higher governance score with increasing institutional ownership shows the effect of expertise and interest that established institutions bring with investment. Tangibility and loans also increase with increasing institutional investment. Efficiency score (asset efficiency) has also increased from 0.42 (1.39 percent) in low institutional ownership quantile to 0.60 (6.92 percent) in the high institutional investment group.

Consistently cost efficiency, and overhead efficiency measures show a decreasing (higher efficiency) trend from low institutional ownership to higher institutional ownership. To sum-up the Table 2, it is determined that banks with higher foreign ownership (institutional ownership) are more efficient and better governed when compared to banks with lower foreign ownership (institutional ownership). Additionally, the privately owned banks are more efficient and score highly on governance indicators when compared to state-owned banks, possible due to higher institutional and foreign.

### *Pearson Correlation Matrix*

Table 3 reports the correlation coefficients of key explanatory variables. Foreign and institutional ownership are positively and significantly related to efficiency score and asset efficiency while significantly negative with cost and overhead efficiency. This suggests the higher the proportions of foreign or institutional investors, the higher the efficiency and asset productivity and lower the overall costs and overhead expenses, which are in line with descriptive statistics results. Note that all the efficiency measures are highly correlated with each other hints that they measure the same thing. Bank controls have very low or insignificant correlations coefficients with each other are lowering the chance of any multicollinearity in regression analysis. Governance is positively related to both ownership types.

**Table 3. Pearson Correlation Matrix**

	FO	1	2	3	4	5
<b>1) Institutional</b>	0.20	1				
<b>2) Concentration</b>	-0.01*	0.07*	1			
<b>3) Market share</b>	-0.06	0.56*	0.29*	1		
<b>4) Governance score</b>	0.37*	0.09*	-0.14*	-0.09*	1	
<b>5) Size</b>	0.03	0.39*	-0.38*	0.51*	-0.11	1
<b>6) Equity</b>	-0.01	-0.01	-0.08	-0.26*	0.14	-0.50*
<b>7) Leverage</b>	-0.07	0.09	0.02	0.25*	-0.12	0.43*
<b>8) Tangibility</b>	0.04	-0.01	-0.15*	-0.14*	0.26*	-0.25*
<b>9) Loans</b>	0.08	-0.02	0.15*	0.07*	0.02	0.03
<b>10) Efficiency score</b>	0.02*	0.08*	-0.23*	-0.20*	0.01*	-0.24*
<b>11) Overhead efficiency</b>	-0.02*	-0.17*	0.06*	-0.11*	-0.06*	0.23*
<b>12) Asset efficiency</b>	0.02*	0.07*	-0.03*	0.15*	0.12	-0.07
<b>13) Cost efficiency</b>	-0.11*	-0.13*	0.05	-0.24*	-0.01*	0.34*

	6	7	8	9	10	11	12
1) Institutional							
2) Concentration							
3) Market share							
4) Governance score							
5) Size							
6) Equity	1						
7) Leverage	-	1					
8) Tangibility	0.1	-0.09	1				
9) Loans	0.4	0.50*	0.15*	1			
10) Efficiency score	0.2	-0.16*	-0.43*	0.32*	1		
11) Overhead	-	-0.34*	0.32*	-0.21*	-	1	
12) Asset efficiency	0.4	0.20*	-0.18*	0.37*	0.14*	-	1
13) Cost efficiency	-	-0.08	0.34*	-0.17*	-	0.01*	-0.49*

All the variables are defined in Table 1, and '\*' denote statistical significance at 10 % level or below

### Regression Analysis

Table 4 reports panel data regression results to supplement the descriptive statistics and correlation coefficients. Foreign ownership is positively related to efficiency score and asset efficiency with coefficients of 0.04 and 0.09 respectively. In other words, one percent increase in foreign ownership leads to 0.04 percent increase in efficiency and 0.09 percent increase in asset efficiency. A negative coefficient of foreign ownership with cost efficiency (-0.49) and overhead efficiency (-0.45) suggests a 0.49% decrease in overall cost and 0.45% reduction in overhead costs with one percent increase in foreign ownership.

Table 4 also reports a positive relation efficiency score and asset efficiency with percentage institutional ownership. On average one percent increase in institutional ownerships enhances overall efficiency score by 0.03 percent and asset efficiency by 0.11 percent while a decline of 0.10 percent in overall cost and 0.23 percent in overhead cost. In a nutshell, the increase in foreign and institutional ownership is a significantly related decrease in overhead and overall costs, and increase in asset productivity and overall efficiency.

**Table 4. Multivariate Regression Analysis**

Variables	Efficiency Score	Assets efficiency	Cost efficiency	Overhead efficiency
<b>Intercept</b>	0.30** (1.89)	0.48*** (6.28)	-0.42** (-2.11)	-0.49*** (-3.24)
<b>Foreign ownership</b>	0.04*** (2.99)	0.09*** (4.88)	-0.49** (-2.02)	-0.45*** (-2.30)
<b>Institutional ownership</b>	0.03*** (6.71)	0.11*** (4.06)	-0.10*** (3.10)	-0.23*** (-2.44)
<b>State</b>	-1.77** (-2.11)	-0.65*** (-4.95)	0.87*** (2.66)	0.91*** (3.46)
<b>Concentration</b>	-0.25*** (-3.45)	-0.28*** (-3.93)	0.41*** (3.66)	0.90*** 4.63

<b>Market share</b>	0.01*	0.02***	-0.03	-0.46***
	(1.91)	(2.97)	(-1.06)	(-3.09)
<b>Governance</b>	1.11***	0.13***	-2.26***	-2.35***
	(5.92)	(4.07)	(-4.44)	(-3.58)
<b>Size</b>	1.69***	0.53***	0.21	0.31***
	(3.12)	(5.96)	(1.68)	(3.04)
<b>Equity</b>	0.22	1.27	-0.46**	-0.67***
	(1.41)	(0.59)	(-2.04)	(-2.61)
<b>Leverage</b>	0.67**	1.26	-0.30	-0.66
	(2.01)	(0.59)	(-0.56)	(-1.41)
<b>Tangibility</b>	-0.50	-3.48***	1.15***	0.31***
	(1.22)	(-5.75)	(2.57)	(2.62)
<b>Loans</b>	1.50***	1.91***	-0.13	1.56
	(3.71)	(2.52)	(-1.30)	0.62
<b>Root MSE</b>	0.21	0.11	0.14	0.23
<b>F- Statistics</b>	26.32	74.56	23.82	68.25
<b>R<sup>2</sup></b>	0.66	0.89	0.72	0.71
<b>Adjusted R<sup>2</sup></b>	0.62	0.80	0.65	0.66
<b>N</b>	378	378	378	378

\*\*\*, \*\*, and \* denote statistical significance at 1, 5, and 10 % levels, respectively

Efficiency score shows that state-owned banks are 1.77 percent less efficient than their privately owned counterparts. State-owned bank's assets are also 0.65 percent less productive than private banks. State-owned banks are also less efficient regarding expenses as shown by cost efficiency and overhead efficiency. Regression coefficient suggests a 0.87 percent higher overall cost and 0.91 percent higher overhead expenses.

The evidence of higher efficiency for banks with higher foreign ownership is similar to Chen and Liao (2011), who empirically shows that foreign banks perform better when the host country is less developed when compared to the country of incorporation of the bank. Therefore, host country effect is quite prominent in Pakistan banking sector. Perhaps not surprisingly, lower efficiency of state-owned banks is also consistent with the documented literature (Berger et al., 2004).

The competition also plays a vital role in determining the efficiency of the financial sector. In line with competition-efficiency hypothesis, the authors show that lower competition (high concentration) impacts negatively on efficiency, which suggests easiness of managers in monopolistic markets as there is no threat of existing competitors and new entrants. However, the relative market power of the bank (market share) does not play a significant role in determining efficiency. Therefore, market concentration should be more valued rather than the size of the organization. The similar results are reported by Tan and Floros (2018) in the case of Chinese commercial banks.

Another critical determinant of efficiency is the governance of banks. It is assumed that foreign owners and institutional owners bring better governing and monitoring policies, which cut the unnecessary costs and improve profits. Regression results

are aligned with an assumption as a unit increase in governance score improves the efficiency score by 1.11 and assets productivity by 0.13 percent while decreases the overhead cost by 2.35 percent and overall cost by 2.26 percent. These results of higher efficiency under higher governance are consistent with Zelenyuk and Zheka (2006) in Ukrainian perspective.

Bank specific variables show mixed results as bigger banks have higher efficiency score and asset productivity and lower overhead costs but the overall cost is insignificant. The overhead costs and cost efficiency seems to decrease with higher equity finance and increase with increasing tangible assets. The loan ratio tends to increase efficiency scores and asset efficiency. Note that, the regression models are significant with higher F-statistics and explain a relatively high portion of variations in efficiency.

### Summary

Pakistan's financial industry undertook massive reforms in the 90s, by the privatization of existing state-owned banks with an aim to increase competition, invite foreign owners by easing entry barriers, which had improved the performance and efficiency of whole industry. The ownership structure plays a significant role in improving the efficiency and decreasing the cost because foreign and institutional investors bring the latest techniques of production and enhanced managerial practices.

Additionally, private banks also have higher efficiency than state-owned banks for the same reasons. The authors also find support for "competition-efficiency hypothesis" and recommend a regularization of highly concentrated Pakistani banking industry in which the top 3 banks hold more than 50 percent of market capitalization collectively while about 20 percent individually. Lastly, the standard of managerial competence and practices is another crucial channel, which contributes to improving the efficiency.

The overall results have important policy implications for managers and regulators. Foreign and institutional ownership seems to play an essential role in determining the efficiency of banks. Therefore, policies should be adopted to attract more foreign and institutional investors who bring in managerial competence that enhances efficiency. The authors also show that imperfect competition in markets hampers the overall efficiency of banks. Therefore, financial regulators and anti-collusion authorities should take prompt measures to curb monopolistic practices of organizations and relax entry barriers so that new banks, especially from advanced countries, can participate in the market, which will have a healthy impact on management practices and efficiency of businesses.

The present study findings are based on the banking sector of Pakistan only and should be carefully generalizing to other settings. Although, the study includes a significant number of banks information on managerial practices is not readily available for the whole population. The availability of data is another limitation, which reduces the usable sample. However, with the passing time, the data

collection and documentation of different aspects of management is getting better, which can be used in future research to extend the current research findings.

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## WPLYW PRAWA WŁASNOŚCI, KONKURENCJI I PRAKTYK ZARZĄDZANIA NA WYDAJNOŚĆ SEKTORA BANKOWEGO

**Streszczenie:** W latach 90tych XX wieku sektor finansowy w Pakistanie przeszedł ogromne reformy. Głównym celem restrukturyzacji była prywatyzacja państwowych instytucji, zniesienie barier wejścia dla nowych graczy, a w konsekwencji zwiększenie efektywności całego systemu. W przeprowadzonym badaniu wykorzystano niewyważony panel 21 banków komercyjnych notowanych na giełdzie w Pakistanie w latach 2000-2017 z "BankFocus" i "Bloomberg". Badanie to mierzy wpływ własności, konkurencji i praktyk zarządzania na efektywność banków. Autorzy stwierdzili wyższą efektywność banków prywatnych w porównaniu do państwowych odpowiedników. Analiza empiryczna sugeruje, że wzrost własności zagranicznej i własności instytucjonalnej wpływa pozytywnie na wszystkie miary efektywności. Związek między konkurencją a wydajnością wspiera "hipotezę efektywności konkurencji" i proponuje środki regulacyjne w celu dalszego uregulowania rynku. Ponadto banki o wyższym standardzie praktyk zarządzania wydają się być bardziej wydajne. Ustalenia te sugerują, że istnieje potrzeba regulacji większych banków i ułatwienia wejścia na rynek dla zagranicznych i instytucjonalnych właścicieli, którzy wprowadzają lepsze standardy zarządzania, a tym samym efektywność.

**Słowa kluczowe:** bank, struktura własności, konkurencja, zarządzanie, praktyki zarządzania, efektywność, analiza otoczenia

### 所有权, 竞争和管理规范对银行业效率的影响

**摘要:** 20世纪90年代, 巴基斯坦金融业经历了大规模的改革。重组的主要目的是将国有机构私有化, 消除新参与者的进入障碍, 从而提高整个系统的效率。本研究使用了由“BankFocus”和“Bloomberg”于2000年至2017年在巴基斯坦证券交易所上市的21家商业

银行的不平衡小组。该研究衡量所有权，竞争和管理实践对银行效率的影响。与国有企业相比，作者发现私人银行的效率更高。实证分析表明，外国所有权和机构所有权的增加对所有效率指标产生积极影响。竞争与效率之间的关系支持“竞争效率假说”，并提出了进一步规范市场的监管措施。此外，具有更高管理标准的银行往往更有效率。这些调查结果表明，需要对规模较大的银行进行监管，以及为外国和机构业主提供便利，这些业主可以带来卓越的管理标准，从而提高效率。

**关键词:** 银行, 所有制结构, 竞争, 治理, 管理实践, 效率, 数据包络分析