

DOES EFFICIENCY CONTRIBUTE TO MARKET VALUATION OF BANKS? EVIDENCE FROM TURKISH BANKING SYSTEM

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ABSTRACT

Purpose- Operational efficiency is one of the strategic concerns for bank management. The aim of our study is to investigate the effect of operational efficiency on banks' market valuation.

Methodology- We empirically examine the way in which the financial market evaluates different efficiency measures of banks, using a panel data of listed banks at Borsa Istanbul for the years 2010 – 2017. We employ three different efficiency measures as proxies. Those are i) operating expenses compared to total net income, ii) total net income per branch, and iii) total net income per employee.

Findings- We find that cost efficiency, interest income as return on equity (ROE) and loan loss provisions (LLPs) are found to be statistically significant drivers of market valuation of banks. We use risk-weighted assets to total assets as a measure for risk-taking behavior of banks. The results suggest tentative findings for risk-taking behavior of banks. The findings also suggest that bank size and non-interest income as ROE do not significantly influence bank market valuation.

Conclusion- We conclude that operating expenses compared to total net income as an efficiency measure is a determinant of market valuation of banks while income per branch and income per employee as efficiency measures are not related to market valuation of banks. Thus, we recommend bank managers boost net interest income while avoiding credit losses, and drop off operating costs compared to revenue in order to maximize bank's market valuation.

Keywords: Bank efficiency, bank management, market value, panel data, Turkish banking system

JEL Codes: G20, G21, G32

1. INTRODUCTION

Operational efficiency is one of the strategic concerns for bank management. The main goal of this research is to investigate the influence of banks' operational efficiency measures on bank valuation. The operational efficiency of a bank can be evaluated from different angles, such as profitability, return on equity, operating expenses relative to income, employee productivity and branch productivity. We employ different efficiency ratios in order to determine which measure best explains the value creation in this study. We focus mainly on the relationship between efficiency variables and market value of banks. Furthermore, we analyze the relationship between other bank specific variables such as size and risk behavior of banks and the market valuation.

The market to book ratio is a commonly used measure of value of banks. Market to book ratio is a market-based measure of bank performance. It compares the market value to book value of a bank and evaluates current market value of a bank relative to its book value. There is a huge literature on bank market valuation and bank performance. Studies usually use market to book ratio, Tobin's q, shareholder value or economic value added as a proxy for market valuation. As well as changes in macroeconomic conditions, bank specific variables such like banks' business size, diversification of banking activities, cost and profit efficiency are the most investigated effects on market valuation of banks.

Ferretti at al. (2018) investigated the decreasing market value of European banks after the global financial crisis. They evaluated the effect of performance measures, risk indicators and bank business size on bank market valuation. The results of the study show that profitability is positively related to the bank's market value. On the other hand, risk has a negative influence on the bank's market value. Market to book ratio is negatively related to bank size according to the results of the study. There are also other studies that investigated the relation between

bank size and market value of banks. Demircug-Kunt and Huizinga (2013) examined the banking data of 34 countries from 1991 to 2008 and found that market value of banks is positively associated with the absolute size of its assets. Minton et al. (2017) examined the market value of large banks using data of US banks over the period between 1987 and 2006. They used Tobin's q and market to book ratio as the valuation measures of banks. Minton et al. (2017), similarly to Ferretti et al. (2018), found that large banks are not valued more highly and the valuation of large banks decreases with size. Using a sample of US bank holding companies from 2001 to 2015, Avramidis et al. (2018) analyzed the relationship between size and bank's market to book value. The results of the study reveal that there is an inverse U-shaped relation between bank size and market valuation.

Many researches show that diversification of banking activities influences the market valuations. Leaven and Levine (2007) examined the relation between diversity of activities and Tobin's q by using the sample of 34 countries from 1991 to 2008. Calomiris and Nissim (2014) investigate whether the various bank activities influence their market valuation by using a sample of US banking holding companies during 2000 and 2011. They use deposits, loans and components of income and expense as proxies for the bank activities and bank attributes. Both Leaven and Levine (2007) and Calomiris and Nissim (2014) find that diversity of activities conducted by banks influences their market valuations. Differently from their findings, Ferretti et al. (2018) found that business mix elements of banks do not have significant effect on market valuation.

Sawada (2013) examines the effect of revenue diversification of banks on Tobin's q of banks using data on the Japanese banking sector. Revenue diversification is measured by non-interest income share. The study concludes that revenue diversification positively affects bank market value. Vo (2017) investigates the stock market values of banks and diversification of activities using a data set of Vietnamese listed banks for the period of 2006 and 2014. Results of the study show a negative relation between bank diversification and stock market valuation of banks.

LLPs have gained attention of researchers for decades and there is a large literature in the area (Ahmed et al., 1999; Anandarajan et al. 2007; Shawtari et al., 2015). According to most studies, there is positive relationship between LLPs and banks' stock price, hence market value. Beaver et al. (1997) and Liu et al. (1997) find that LLPs are positively associated to banks' stock price. Accordingly, increased LLPs constitutes good news, and signal that the bank enough to absorb future potential losses (Lobo, 2017). Furthermore, Calomiris and Nissim (2014) report that LLPs are positively related to market to book ratios of US banks after the great financial crisis period.

Many researchers investigate the influence of cost efficiency and profit efficiency on market valuation of banks. Fiordelisi and Molyneux (2010) examine the determinants of shareholder value measured by economic value added. Using a large sample of European banks from 1998 to 2010, they analyze the various bank-specific, industry-specific and macroeconomic variables. They find that cost efficiency improvements have a positive relationship with shareholder value. Credit losses, market and liquidity risk and leverage have influence on bank performance. There is a positive relationship between credit losses and shareholder value. This relation implies that larger business volume causes higher unexpected losses with lower credit quality. Fu et al. (2014) investigated the relationship between market value and efficiency using a large sample of banks in 14 Asia-Pacific economies between 2003 and 2010. They found that the shareholder value is positively associated to improvements in both cost and profit efficiency. They also found that bank size, credit losses, and market risk have effect on bank performance. Radic (2015) investigated the shareholder value efficiency and its determinants using a data set of Japanese banks over the period from 1999 to 2011. Results reveal that cost efficiency gains, credit risk, and bank size are significant factors that influence the shareholder value of banks. Burke and Wieland (2017) investigated the relation between cash flow of banks and share prices. They found that operating cash flows of banks are positively related to their share prices. Profitability, capital adequacy, and credit risk are the important bank characteristics that affect banks' cash flows.

The rest of the paper is structured as follows. The next section explains the used data and the descriptive statistics. Section 3 describes the econometric methodology. Section 4 presents the results of the econometric analysis and the last section concludes.

2. DATA AND DESCRIPTIVE STATISTICS

The data in this study are obtained from the Banks Association of Turkey and Borsa İstanbul web sites. Bank-level data are calculated by using annual financial statements. The stock price data are obtained from Borsa İstanbul. We analyze the data from 2010 to 2017 in the research. We do not use unlisted banks' data since their share prices are not available. The data set is composed of nine banks and these banks' assets account for 74% of the Turkey's total banking system at the end of 2017. The data set does not have any missing values in the mentioned period; therefore, we obtain a balanced panel data.

Table 1 presents the definitions of dependent variable and explanatory variables, and their expected signs.

Table 1: Definitions of Variables

Variables	Symbol	Definition	Expected Impact
Market to Book Value	MB	Market price over equity book value	Dep. Var.
Bank size	TA	Natural log of total assets	+/-
Risk weights	RWA	Risk weighted assets over total assets	-
Return on equity	ROE_int	Net interest income over equity book value	+
Return on equity	ROE_n.int	Net non interest income over equity book value	+
Loan loss provisions	LLP	Loan loss provisions over equity book value	+
Cost efficiency	OPEXR	Total operating expenses over net int. and net non int. income	-
Personnel efficiency	EMP	Net int. and net non int. income over number of employees	+
Branch efficiency	BRA	Net int. and net non int. income over number of branch	+

Table 2 presents mean values of dependent and explanatory variables through years. The table exhibits the market to book values and ROE of Turkish Listed Banks from 2010 to 2017. We observe a decreasing trend in market to book value of banks despite a relatively stable ROE trend in recent years.

Table 2: Descriptive Statistics (Mean Values of Variables)

year	MB	TA, mio TL	RWA/TA	ROE_int	ROE_n.int	LLP	Cost eff.	Personnel eff., mio TL	Branch eff., mio TL
2010	1.86	62,609	0.84	0.44	0.11	-0.10	-0.51	0.15	2.73
2011	1.27	75,304	0.89	0.36	0.12	-0.08	-0.54	0.14	2.49
2012	1.40	91,873	0.86	0.43	0.12	-0.13	-0.49	0.16	2.83
2013	1.03	104,406	0.99	0.37	0.10	-0.11	-0.53	0.15	2.53
2014	1.08	128,846	0.91	0.39	0.12	-0.11	-0.53	0.14	2.53
2015	0.86	146,983	0.92	0.39	0.11	-0.12	-0.53	0.13	2.32
2016	0.86	172,253	0.94	0.39	0.10	-0.13	-0.49	0.20	3.54
2017	0.88	199,120	0.91	0.42	0.11	-0.12	-0.44	0.25	4.67

3. ECONOMETRIC ANALYSIS

We use three econometric models to examine the effect of efficiency measures on market value of banks.

$$MB_{i,t} = \beta_0 + \beta_1 TA_{i,t} + \beta_2 RWA_{i,t} + \beta_3 ROE_int_{i,t} + \beta_4 ROE_n.int_{i,t} + \beta_5 LLP_{i,t} + \beta_6 OPEXR_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$MB_{i,t} = \beta_0 + \beta_1 TA_{i,t} + \beta_2 RWA_{i,t} + \beta_3 ROE_int + \beta_4 ROE_n.int_{i,t} + \beta_5 LLP_{i,t} + \beta_6 EMP_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$MB_{i,t} = \beta_0 + \beta_1 TA_{i,t} + \beta_2 RWA_{i,t} + \beta_3 ROE_int + \beta_4 ROE_n.int_{i,t} + \beta_5 LLP_{i,t} + \beta_6 BRA_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where i and t express the individual bank-observation and time dimension, respectively. Market to book value is the dependent variable in all of the three models. We use market capitalization over equity book value (MB) as a proxy for market valuation of banks (Avramidis et al., 2018; Calomiris and Nissim, 2014; Demircuc-Kunt and Huizinga, 2013; Ferriti et. al, 2018; Fu et al., 2014). Explanatory variables are total assets (Demircuc-Kunt and Huizinga, 2013; Ferriti et. al, 2018; Fiordelisi and Molyneux, 2010; Laeven and Levine, 2007), risk weighted assets, ROE (Vo, 2017), LLP (Calomiris and Nissim, 2014) and operational efficiency ratios, which are commonly used by bank managers.

We use the natural logarithm of total assets as a proxy for bank size. Larger banks have advantages to benefit from the market power and the diversification of revenues. Larger banks also can easily access to market capital. However, the effect of size can turn to be negative for extremely large banks due to diseconomies of scale. Therefore, expected sign of the bank size is ambiguous.

We employ risk-weighted assets relative to total assets as a proxy for risk. We expect negative relation between risk-weighted assets and market value of banks. Because retail loans have higher risk weights than securities, banks with a high RWA are more retail-oriented (Cheng and Mevis, 2018). High risk may associate with high profitability, but also with high loss.

We use ROE to measure the profitability of banks. We use two measures, which are net interest income over equity book value (ROE_int) and net non-interest income over equity book value (ROE_n.int). The value of a bank will increase as the profitability of a bank increases. Thus, we expect a positive relation between ROE and market value of banks.

We add LLPs to the model to examine the relationship between LLPs and the market valuation. We expect a positive relationship between loan loss provisions and bank valuation as the prior research results suggest positive relationship.

In order to assess the effect of operational efficiency, we include three efficiency measures, which are commonly used by bank managers and researchers separately to the model. We use total operating expenses over net interest and net non-interest income to measure cost efficiency. Net interest and net non-interest income divided number of employees proxies for personnel efficiency, and net interest and net non-interest income divided by number of branches shows branch efficiency. We expect that market value of banks is negatively associated with cost efficiency, and positively associated with personnel and branch efficiency.

4. THE ESTIMATION RESULTS

The models are estimated using panel data estimation technique. We apply Hausman specification test in order to decide whether fixed effects models or random effects models are to be preferred. The tests suggest that random effects models are appropriate for the three models. We applied Breusch and Pagan Lagrangian multiplier test and Modified BNF-Durbin-Watson test and Baltagi-Wu's LBI test in order to detect heteroscedasticity and autocorrelation problems in the models. The tests show that there are heteroskedasticity and autocorrelation problems in the models. Therefore, we use robust and clustered standard errors for the random-effects estimates.

Table 3 shows the results of the estimations. According to results, ROE, which is measured by net interest income, is highly significant in the three models. We report a positive relation between ROE and market valuation of banks as we expected. The other statistically significant variable is LLPs. The results suggest that LLPs are positively related to market to book value. When we assess efficiency variables in the

models, only cost efficiency is found to be statistically significant. Cost efficiency, which is measured by operating expenses over net income, is negatively associated to market to book value of banks. Less expenses relative to net income are associated with greater market value to investors. This result is in line with our expectations. Personnel efficiency and branch efficiency, which are frequently used by bank managers, are not statistically significant for market valuation of banks.

Table 3: Regression Results

Variables	Model 1		Model 2		Model 3	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
cons	1.530*	2.48	1.15	1.6	1.088	1.51
TA	-0.174	-0.24	-0.056	-0.05	-0.111	-0.09
RWA	-1.249**	-2.47	-0.791	-1.11	-0.742	-1.05
ROE_int	3.575***	4.01	2.858***	3.17	2.837***	3.21
ROE_n.int	-0.511	-0.12	1.611	0.55	1.925	0.7
LLP	5.506***	4.7	5.78***	5.7	5.778***	5.6
OPEXR	-1.646***	-3.63				
EMP			0.003	0.02		
BRA					-0.009	-0.05
Observations	63		63		63	
R-sq within	0.3405		0.2489		0.2409	
R-sq between	0.0791		0.3092		0.3527	
R-sq overall	0.1976		0.2718		0.2826	

***, ** and * indicate statistical significance at the 0.1%, 1% and 5%, respectively.

5. CONCLUSION

We aim to evaluate the effect of efficiency measures on market value of banks in this study. We examine the relation between market to book value and cost efficiency, personnel efficiency and branch efficiency. The results suggest that cost efficiency has a positive effect on market value of banks. Less expenses relative to net income are associated with greater market value of banks. In other words, increases in operating costs relative to net income reduce the market to book value of banks in Turkish banking system. However, we report that personnel efficiency, which is measured by net income per employee, and branch efficiency, which is measured by net income per branch, are not related to market value of banks.

ROE and LLPs are the significant value drivers. Accordingly, as the profitability of banks increases, the market value of banks rises. LLPs have positive effect on market valuation. These results support the prior researches.

We conclude that cost efficiency is a determinant of market valuation of banks while income per branch and income per employee as efficiency measures are not related to market valuation of banks. Thus, we recommend bank managers boost net interest income while avoiding credit losses, and drop off operating costs compared to revenue in order to maximize bank's market valuation.

REFERENCES

- Ahmed, A. S., Takeda, C., & Thomas, S. (1999). Bank loan loss provisions: a re-examination of capital management, earnings management and signalling effects. *Journal of Accounting and Economics*, 28, 1-25.
- Anandarajan, A., Hasan, I., & McCarthy, C. (2007). Use of loan loss provisions for capital, earnings management and signalling by Australian banks, *Accounting & Finance*, 47(3), 357-379.
- Avramidis, P., Cabolis, C., & Serfes, K. (2018). Bank size and market value: the role of direct monitoring and delegation costs. *Journal of Banking & Finance*, 93, 127-138.
- Beaver, W. H., Ryan, S. G., & Wahlen, J. M. (1997). When is "bad news" viewed as "good news"? *Financial Analysts Journal*, 53(1), 45-54.
- Burke, Q. L., & Wieland, M. M. (2017). Value relevance of banks' cash flows from operations. *Advances in accounting*, 39, 60-78.
- Calomiris, C. W., & Nissim, D. (2014). Crisis-related shifts in the market valuation of banking activities. *Journal of Financial Intermediation*, 23(3), 400-435.

- Cheng, G., & Dirk, M. (2018). What happened to profitability? Shocks, challenges and perspectives for euro area banks. *The European Journal of Finance*, 25(1), 54-78.
- Demirgüç-Kunt, A., & Huizinga, H. (2013). Are banks too big to fail or too big to save? International evidence from equity prices and CDS spreads. *Journal of Banking & Finance*, 37(3), 875-894.
- Ferretti, R., Gallo, G., Landi, A., & Venturelli, V. (2018). Market-book ratios of European banks: What does explain the structural fall? CEFIN Working Papers, No 65.
- Fiordelisi, F., & Molyneux, P. (2010). The determinants of shareholder value in European banking. *Journal of Banking & Finance*, 34(6), 1189-1200.
- Fu, X. M., Lin, Y. R., & Molyneux, P. (2014). Bank efficiency and shareholder value in Asia Pacific. *Journal of international financial markets, institutions and money*, 33, 200-222.
- Laeven, L., & Levine, R. (2007). Is there a diversification discount in financial conglomerates? *Journal of Financial Economics*, 85(2), 331-367.
- Liu, C., Ryan, S., & Wahlen, J. (1997). Differential valuation implications of loan loss provisions across banks and fiscal quarters. *The Accounting Review*. 72(1), 133-146.
- Lobo, G. J. (2017). Accounting research in banking: A review. *China Journal of Accounting Research*, 10(1), 1-7.
- Minton, B. A., Stulz, R. M., & Taboada, A. G. (2017). Are larger banks valued more highly? (No. w23212). National Bureau of Economic Research.
- Radić, N. (2015). Shareholder value creation in Japanese banking. *Journal of Banking & Finance*, 52, 199-207.
- Sawada, M. (2013). How does the stock market value bank diversification? Empirical evidence from Japanese banks. *Pacific-Basin Finance Journal*, 25, 40-61.
- Shawtari, F. A., Saiti, B., Abdul Razak, S. H., & Ariff, M. (2015). The impact of efficiency on discretionary loans/finance loss provision: a comparative study of Islamic and conventional banks. *Borsa Istanbul Review*, 15(4), 272-282.
- Vo, X. V. (2017). How does the stock market value bank diversification? Evidence from Vietnam. *Finance Research Letters*, 22, 101-104.