The Relationship between Risk, Capital and Efficiency- An Analysis of the Indian Banking Sector

Abstract

The present study aims to assess the underlying impact of risk and regulatory compliances on efficiency of the Indian banking system for the period over 2010-2013. It assesses the causal effect of default, liquidity, market and asset risks along with capitalization in terms of BASEL norms with respect to technical, scale and cost efficiencies following DEA, SFA methodologies along with Tobit Panel regression and GMM estimation as robustness test. Findings of the study exhibit that Indian banks are largely affected by liquidity and asset risks instead of default and market risks. Findings of the present study have potential implications for policy makers and researchers in this field as the results identified for liquidity and asset risks depict as a major shortfall for Indian banks to attain efficiency.

Keywords: Bank Risk, Efficiency, Capital Adequacy, DEA, SFA, India

1. Introduction

In recent years, the Indian banking sector has become increasingly liberalized, competitive and deregulated with respect to various products and services. This progressive financial integration has enhanced competition and highlighted the importance of improved efficiency of financial institutions. However, several authors have argued that this increase in competition could lead at least in the short term to incentives for greater bank risk-taking (Danthineet al., 1999; Hellman et al., 2000).

Regulators have therefore tried to counterbalance these incentives by giving capital adequacy a more prominent role in the banking regulatory process.The general trend is to introduce competition in banking and to check risk-taking with capital requirements and appropriate supervision (Vives, 2000). In this sense, due to both regulatory and market pressures, most Indian banks have had boost their capitalization level.Sharma and Sharma (2015) assess the direct impact of financial turmoil on efficiency of the Indian banking sector. They conclude that Indian banks sustain their efficiency levels even during the crisis period and they remain immune to systematic risk of the subprime crisis due to the cautious supervisory role played by the Reserve bank of India. They say that this is due to the adoption of higher capital adequacy requirements in the Basel II accords.

Four main hypotheses have been put forward in the literature to explain the relationship between bank risk, capital and efficiency. According to Berger and De Young (1997) and Williams (2004), the ‘‘bad management” hypothesis says that banks operating with low levels of efficiency have higher costs largely due to inadequate credit monitoring and inefficient control of operating expenses (which is reflected in lower cost efficiency almost immediately). A ‘‘cost skimping” hypothesis is proposed by Berger and De Young (1997), in which there is a trade-off between short-term cost efficiency and future risk-taking due to moral hazard considerations. In such cases, banks appear to be more cost efficient as they devote fewer resources to credit screening and monitoring. Berger and De Young (1997) also put forward a ‘‘bad luck” hypothesis according to which external exogenous events (unexpected shocks) can precipitate increases in problem loans for banks, unrelated to managers’ skills or their risk-taking appetite. These increases in risk result in additional costs and managerial effort. Thus, under this hypothesis, we expect increases in bank risk to precede falls in cost and revenue efficiency. Finally, a ‘moral hazard’ hypothesis has been suggested by Jeitschko and Jeung (2005), according to which bank managers have incentives to take on more risk particularly when the level of bank capital is low (or banks are more inefficient). Better capitalized banks, in contrast, may have less moral hazard incentives and therefore be more likely to adopt cost reducing practices (shareholders may be more active in controlling bank costs or capital allocation). Moreover, the recent credit crisis has highlighted the need for understanding of the

determinants of bank risk in an environment of enhanced bank efficiency and lower bank capital (Festic´ et al., 2011).

Another important dimension relates to whether the relationship between capital, riskand efficiency varies for banks with different ownership structures. Theseminal work by Jensen and Meckling (1976), Fama (1980) and Fama and Jensen (1983)suggests that a lack of capital market discipline for firms weakens owners' control overmanagement, making management freer to pursue its own agenda, thus providingit with fewer incentives to be efficient. Given that public banks have statedsocial and/or economic development objectives, one may expect them to have differentperformance and risk-taking features compared with their private sector and foreign counterparts, whose main aim is profit maximization. The aforementioned literature provides littleguidance as to whether efficiency differences between various types of banks have anyinfluence on their capital strength and risk profile.

The above review highlights the fact that there is a significant dearth of work on the interrelationship between risk, capital and efficiency for the Indian banking sector. Most of the work on this aspect relates to developed countries. However, it is important to take cognizance of this inter-relationship as India is an important emerging market economy (EME) and one of the fastest growing major economies in the world. It also exhibits a diverse array of bank ownership forms. State owned banks dominate the banking sector with 72.1% market share while new private banks which started operations in the 1990s have a market share of 16% (Gandhi, 2015). Foreign banks and old private banks have market shares of 7.2% and 4.9% respectively.

The paper's novelty lies in that we examine causality (using lagged independent variables in Tobit regression and using GMM for robustness). In this way it is an improvement over existing studies for India. Second, most studies use ROA to compute z-score as a measure of risk. But that is an accounting view of risk while we look at balance sheet risks – default, asset, market and liquidity, arguably more relevant for banking. Finally, we use both Stochastic Frontier Analysis (SFA) and Data Envelopment Analysis (DEA) to calculate efficiency scores and hence our work is more complete.

2. Literature Review

Altunbas et al (2007) analyze the relationship between capital, risk and efficiency for a large sample of European banks between 1992 and 2000. In contrast to the established US evidence they do not find a positive relationship betweeninefficiency and bank risk-taking. Inefficient European banks appear to holdmore capital and take on less risk. Empirical evidence is found showing thepositive relationship

between risk on the level of capital (and liquidity), possibly indicating regulators' preference for capital as a mean of restricting risk-taking activities. They also find evidence that the financial strength of the corporate sectorhas a positive influence in reducing bank risk-taking and capital levels. There are no major differences in the relationships between capital, risk and efficiency for commercial and savings banks although there are for co-operative banks. In the case of co-operative banks they do find that capital levels are inversely related to risks and inefficient banks hold lower levels of capital. Some of these relationships also vary depending on whether banks are among the most or least efficient operators.

Berger et al. (2008) suggest that the most common findings for developing nations are that on average, foreign banks are more efficient than or approximately equally efficient to private domestic banks.Both groups are typically found to be significantly more efficient on average than state-owned banks, but there arevariations on all of these findings. Some research using data from the transition nations of EasternEurope finds foreign banks to be the most efficient on average, followed by private domestic banks, and then stateownedbanks (Bonin et al., 2005). However, anotherstudy of transition nations finds mixed result that foreignbanks are more cost efficient, but less profit efficientthan both private domestic and state-owned banks (Yildirim and Philippatos, 2007). A study using 28 developing nations from various regions finds foreign banks to have the highest profit efficiency, followed by private domestic banks, and then state-owned banks (Berger et al., 2004).

For cost efficiency, private domestic banks rank higher than foreign banks, but both are still much more efficient than state-owned banks. Two studies using Argentine data (prior to the crisis in 2002) find roughly equal efficiency for foreign and private domestic banks, and that both are more efficient on average than state-owned banks (Delfino, 2003; Berger et al., 2005). A study of Pakistani data finds foreign banks are more profit efficient than private domestic banks and state-owned banks, but all of these groups have similar average cost efficiency (Bonaccorsi di Patti and Hardy, 2005).

Bonin et al. (2005) observe that the relationship between bank performance and ownership is also examined inseveral recent papers that estimate bank efficiency in a single country. For Hungary from 1993 to 1998, Hasan and Marton (2003) use stochastic frontier analysis (SFA) and find that relatively more efficient foreign banks created an environment that forced the entire banking system to become more efficient. For Polish banks from 1997 to 2000, Nikiel and Opiela (2002) use a different efficiency estimation method, the distribution-free approach, and find that foreign banks servicing foreigners and business customers are more cost-efficient but less profit-efficient thanother banks in Poland. For Croatia in 1994 and 1995, Kraft and Tirtiroglu (1998) use SFA and show that new banks are less efficient but more profitable than both old privatized banks and state banks. For Croatia from 1995 to 2000,

JemricandVujcic (2002) uses data envelopment analysis (DEA) and finds that foreign banks and new banks are more efficient. From these single-country studies, a positive relationship between foreign ownership and bank performance emerges.

Focusing on the impact of financial crisis on risk taking practices and efficiency of different ownership groups of banks, Laeven (1999) uses Data Envelopment Analysis (DEA) to assess the inefficiency of banks in Indonesia, Korea, Malaysia, the Philippines and Thailand in the pre-crisis period of 1992-96. He introduces a risk taking measure along with efficiency estimation and concludes that foreign banks take least amount of risk while family owned banks take on the most risk relative to their peer groups in the East Asian region. He also assesses restructuring of banks post the Asian crisis in 1997 and concludes excessive credit growth in restructured banks.

Along the lines of the relationship between prudential and regulatory activities and bank efficiency,Barth et al (2002) suggest a negative impact of direct government and supervision of bank activities from a database of 107 countries. However, they indicate that regulations to empower banks and accurate information disclosure act best in the development of an efficient banking system. Sharma and Sharma (2015) find Indian banks, specifically state owned and Indian private banks to be immune from the global subprime crisis due to supervision and regulation of bank activities. They followed DEA based MPI in Indian banking sector for the period of 2000-2010 and assessed the direct impact of crisis and volatile macro-economic conditions on the productivity of banks.

Fiordelisi et al. (2011) assess the inter-temporal relationship between bank efficiency, capital and risk in a sample of European commercial banks employing several definitions of efficiency, risk and capital and using the Granger-causality methodology in a panel data framework. Their results suggest that lower bank efficiency with respect to costs and revenues Granger-causes higher bank risk and that increases in bank capital precede cost efficiency improvements. They also find that more efficient banks eventually become better capitalized and that higher capital levels tend to have a positive effect on efficiency levels. Kwan and Eisenbeis (1997) use a simultaneous equation framework to test hypotheses about the interrelationships among bank interest rate and credit risk-taking, capitalization, and operating efficiency. A positive effect of inefficiency on risk-taking is found which supports the moral hazard hypothesis that poor performers are more vulnerable to risk-taking than high performance banking organizations. A positive effect of inefficiency on the level of capital is attributable to regulatory pressure on underperforming institutions. At the same time, firms with more capital are found to operate more efficiently than less well-capitalized banking organizations. A U-shaped relationship is detected between inefficiency and loan growth, indicating that operating efficiency improves at a decreasing rate as loan

growth rate increases. This supports the hypothesis that entrenched managers who pursue a growth objective to enhance their own wealth tend to operate inefficiently. To understand the impact of bank's risk taking practices on their financial statements and stock prices, Sensarma and Jayadev (2009) evaluate the impact of risk management practices of Indian banks on their stock prices for the period 1999-2006 following ratioand multivariate analyses.They observe that sound risk management behavior is often rewarded by better share performance and wealth to shareholders.

Focusing specifically on non-performing loans, Berger and Humphrey (1992), Barr and Siems (1994) and Wheelock and Wilson (1995) find that banks approaching failure tend to have low cost efficiency and experience high ratios of problem loans and failing banks tend to be located far from the best practice frontiers. In addition, even among banks that do not fail, Kwan and Eisenbeis (1994), Resti (1997) and Barr et al. (2002) find a negative relationship between problem loans and efficiency. Berg et al. (1993) include loan losses as an indicator of the quality of loan evaluations in a DEA study of Norwegian bank productivity. Havrylchyk (2003) reveals that foreign owned banks in Poland displayed higher efficiency than domestic banks, which is attributed to higher loan portfolio quality. The higher efficiency of the foreign banks is supported by their superior knowledge of risk management systems, which allows them keep the risks of their loan portfolios in check and hence not get burdened by high non-performing loans. In their studies on the determinants of Italian banks efficiency, Girardone et al. (2004) employed the Fourier-Flexible Stochastic Cost Frontier and follow the intermediation approach to investigate the Italian banking industry for the period of 1993-1996 using unbalanced panel data. They find that inefficiencies are positively correlated with the level of non-performing loans in banks' balance sheets. Drake and Hall (2003) in their investigation on Japanese banks using a DEA approach report that when risk factors are excluded, potential economies of scale may be overestimated, which is in line with Altunbas et al (2000). They also find that the mean pure technical efficiency level of all banks increases significantly from 78.1 to 89.4 after controlling for problem loans, while the mean score for scale efficiency only improves marginally from 92.8 to 96.6. They suggest that pure technical efficiency is much more sensitive when risk factors are excluded compared to scale efficiency estimates.

Hughes et al. (2000) focus on relationship between risk, capital and the scale of economies and scale efficiency of banks using US data. They conclude that increased and inefficient risk taking behaviors banks lead to smaller scale of economies and distort scale efficiency of banks. Tan and Floros (2013) assess the relationship between bank efficiency, risk and capital for a sample of Chinese commercial banks employing three efficiency indexes and four risk indicators under a three stageleast square method in a panel data framework. The empirical evidence suggests that there is a positive and significant relation-ship between risk (loan-loss provision as a fraction to total loansor LLPTL) and efficiency in

Chinese banking industry, while the relationship between risk (Z-score) and level of capitalization is negative and significant. Boyd and Nicolo (2005) studied the existing literature on bank's risk taking behavior and competition and found that increased completion in the banking sector lead to bank to choose more risk portfolios in a rational manner. They conclude that in a concentrated market banks opt to become more risk due to moral hazard.

There are also some studies that analyze how ownership affects efficiency for Indian banks. Saha and Ravishankar (2000) analyze the performance of Indian banks using the DEA approach. They examine the performance of 25 public sector banks over the period 1992-1995. The analysis is done in two stages. In the first stage, efficiency is measured as a ratio of certain outputs to inputs. Number of branches, number of employees, establishment expenses and non-establishment expenses are taken as inputs. Deposits, advances, investments, spread, total income, interest income, non-interest income and working funds are considered measures of outputs. In the second stage, DEA is used on the same data to determine the efficiency frontier. Their findings indicate that efficiency of public sector banks improves over the sample time period. Das, Nag and Ray (2004) empirically estimate and analyze various efficiency scores of Indian banks during 1997-2003 using DEA. It is observed that Indian banks are not very different in terms of input or output oriented technical efficiency and cost efficiency. However, they differ sharply in respect of revenue and profit efficiencies. Bank size, ownership, and listing on the stock exchange are some of the factors that are found to have a positive impact on the average profit efficiency and to some extent revenue efficiency scores. Finally, the authors observe that the median efficiency scores of Indian banks in general and of bigger banks in particular have improved considerably during the post-reform period.

Chakrabarti and Chawla (2005) apply Data Envelopment Analysis to evaluate the relative efficiency of Indian banks during 1990-2002. Their results suggest that from a value perspective, foreign banks are considerably more efficient than all other bank groups, followed by domestic private banks. From a quantity perspective however, private banks seem to be doing the best while foreign banks are the worst performers. This seems to reflect the general policy of foreign banks to "cherry-pick" more profitable businesses rather than offer banking services to a wider section. Public sector banks in comparison lag behind their private counterparts in performance. Roy (2014) suggests that technical efficiency and scale efficiency of foreign banks increases manifold over pre-Basel, Basel I and Basel II periods. Private sector banks show marginal variation across the three eras in case of both efficiencies. However, in case of SBI and its associates as well as nationalized banks, there is a significant decrease in the technical efficiency scores with the major cause of such inefficiency being improper size allocation. The problem of improper size and resource allocation remains an area of concern for banks across all the four ownership structures.

In light of the above review, we find that there is a significant lack of systematic empirical research for the Indian banking sector regarding the relationship between capital, efficiency and risk across various ownership forms. Therefore, we attempt to look at this issue across three bank groups-private, public and foreign.

3. Data and Methodology

We analyze data for all three groups of scheduled commercial banks (SCBs) in India- public, private and foreign for the period 2010-2014 for whom data is available. Following the literature, we include four measures of bank risk (asset, default, market and liquidity), four measures of bank efficiency (technical, pure technical, scale and cost efficiency) and other bank specific and macroeconomic controls. These variables are further defined in Table 1.

Empirical studies mostly employ parametric or nonparametric frontier techniques to measure the efficiency of firms relative to an estimated best-practice frontier that represents the optimal utilization of resources. The parametric approach usually involves econometric estimation of a pre-specified stochastic production, cost or profit function. We estimate technical efficiency scores using DEA and cost efficiency scores using SFA. Following Sensarma (2006), we adopt the cost frontier model of Battese and Coelli (1995) to estimate cost efficiency. To estimate it, we follow total cost (labour and capital but do not include interest expenses) as the dependent variable whereas the output vector includes demand deposits, savings deposits, term deposits, investments and advances and the input vector includes prices of labor and capital.

In contrast, nonparametric Data Envelopment Analysis (DEA) approach does not necessitate the specification of a particular functional form of the frontier. Instead, the frontier is constructed through a piecewise linear combination of the actual input–output correspondence set that envelops the data of all the firms in the sample. Hence, efficiency measurement is not contaminated by a possible misspecification of the functional form.DEA identifies the units/banks that achieve the best results. Therefore, DEA allows for the examination of best performers and their best practices, giving the efficiency score for each bank. This is important for this particular study where financial institutions are aggregated and hence it is important to know how each different form of financial institution performs. The DEA solution is unique for each decision making unit (DMU)/ bank under investigation, which allows a direct comparison to be made against a peer or a combination of peers.

Following Das and Ghosh (2006), we employ the value-added approach to calculate efficiency scores. This approach identifies those balance sheet categories (assets or liabilities) as outputs that contribute to

the bank value added, i.e., business associated with the consumption of real resources (Berger et al, 1987). The major categories of produced deposits (demand, term and savings), investments and loans are viewed as outputs because they are responsible for the significant proportion of value added. Capital and personnel expenses are viewed as inputs (Table 2).

We follow a three stage systematic assessment of our research question. In the first stage we estimate the efficiency scores following DEA and SFA. Then to investigate the interrelationship between risk, capital and efficiency, we follow Tobit Panel regression. We employ Tobit regression for panel data since the efficiency scores are capped between 0 and 1. The Tobit model, also called a censored regression model, is designed to estimate linear relationships between variables when there is either left- or right-censoring in the dependent variable (also known as censoring from below and above, respectively). Censoring from above takes place when cases with a value at or above some threshold, all take on the value of that threshold, so that the true value might be equal to the threshold, but it might also be higher. In the case of censoring from below, values those that fall at or below some threshold are censored.

The econometric specification is as below:

$$TE_{i,t} = f\left(Risk_{i,t-1}, Capitalization_{i,t-1}, Oship_{i,t}, Z_{i,t}\right) + e_{i,t} \quad \text{(Eqn. 1)}$$

Where Risk is a vector of default, liquidity, asset and market risks; TE denotes input oriented technical efficiency score of a bank using DEA; Capitalization is Basel II capital adequacy ratios and Z is a vector of control variables- ROA, Size and GDP growth. The ownership dummy is introduced to bring out differences between foreign, private and public sector banks. The variables are lagged by one period. The study also follows GMM estimation to conduct robustness tests and addresses the issues of endogeneity.

4. Empirical Findings

We now report the results of our Tobit panel data regression as specified in Equation 1(Table 3).We find that only default risk is positively and significantly associated with technical efficiency. It has a coefficient of 0.904 and is significant at the 1% level. Amongst the control variables, both size and GDP growth exhibit a positive relationship with technical efficiency. With respect to ownership dummies, we find that private sector banks have lower technical efficiency than foreign banks. Results of Tobit panel regression show a negative and significant association between liquidity, asset risk and efficiency of Indian banks. ROA, bank size and GDP growth exhibit a positive and significant association with efficiency measures. Interestingly public and private bank ownership dummies exhibit a negative and significant impact on efficiency. This depicts that public and private banks are not well efficient banking groups. Market risk and regulatory requirements in terms of BASEL capital adequacy ratio are found to be insignificant with efficiency measures.

Further, robustness analysis using GMM estimation confirms similar results and liquidity risk is found to have a negative and significant association with efficiency (Table 4). These findings exhibit that Indian banks are largely affected by liquidity and asset risks instead of default and market risks.

5. Conclusions and Policy Recommendations

In this study we assess relationship between various measures of risk, efficiency and capital for the Indian commercial banking industry. Findings of the present study have potential implications for policy makers and researchers in this field as the results identified for liquidity and asset risks depict as a major shortfall for Indian banks to attain efficiency. Asset risk is a vital link to understand the interrelationship between risk, capital and efficiency. While higher provisions help to absorb losses in a better fashion, making such banks less prone to bankruptcy, in case of India where provisioning is pro-cyclical, the ratio is a backward looking indicator of the quality of assets on a bank's books. Therefore, a higher value of the ratio would indicate inferior asset quality, i.e. higher asset risk leads to lower efficiency levels. In this context policy makers may consider these findings to understand stability of the banking system.

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Table 1- Definitions of Variables

Variable	Definition
Risk Variables	
Default Risk	*Default risk* is measured by the ratio of gross non-performing assets (NPAs) to gross advances. A high value of the ratio indicates a higher proportion of problem loans in a bank's overall portfolio and increased exposure to credit risk.
Asset Risk	*Asset risk* is measured by the ratio of loan loss provisions to total assets. While higher provisions help to absorb losses in a better fashion, making such banks less prone to bankruptcy, but in case of India where provisioning is pro-cyclical, the ratio is a backward looking indicator of the quality of assets on a bank's books. Therefore, a higher value of the ratio would indicate inferior asset quality, i.e. higher asset risk.
Market Risk	*Market risk* is measured by the ratio of interbank borrowings to total borrowings. A high value of this ratio for a bank indicates that it relies more on interbank borrowings and faces higher risk arising from movements in interest rates. Interbank markets are vital for banks' liquidity management when interbank markets function smoothly in normal time. However, in crisis periods, overreliance on interbank borrowing can lead to liquidity problems.
Basel CAR	Capital to Risk weighted asset ratio as per BASEL norms. It is measured as the ratio of eligible capital (Tier1 and Tier 2) and risk weighted ratio. Minimum ratio requirement as per regulator ensures banks have enough capital cushions to absorb losses and remain solvent.
Liquidity Risk	*Liquidity risk* is the risk that a bank faces from insufficient liquidity in order to meet its liabilities as and when they fall due. It is measured by the liquidity buffer or the ratio of liquid assets to

	total assets. The higher the ratio, the lower is the liquidity risk a bank faces.
Efficiency Variable	
Technical Efficiency	The technical efficiency of a bank refers to its success/failure in transforming inputs into outputs. It is a relative concept since its measurement requires a standard of performance against which the success/failure of the firm is assessed.
Cost Efficiency	How efficiently bank is minimising its total cost utilizing given set of inputs and output.
Bank-specific Controls	
Return on Assets	Return on Assets (ROA) reflects the ability of a bank's management to generate profits from its assets. It is calculated as the ratio of Profit during the year to Total Assets.
Size	Size is an important characteristic of a bank in trying to understand what scale of operations may help in managing risk better. It is measured by the log of total assets.
Macroeconomic Control	
GDP Growth Rate	It is measured by annual growth rate of real GDP. High levels of GDP growth occurring during an upswing of business cycle might engender good business opportunities for banks.

Table 2-Variables Employed for DEA Analysis

Approach	Input Variables	Output Variables
Value Added Approach	x1= Capital related Operating Expenses x2= Employee Expenses	y1= Demand Deposits y2= Savings Deposits y3= Term Deposits y4= Investments y5= Advances

Table 3: Efficiency, Risk and Capitalization (Default Risk, Liquidity Risk, Asset Risk, Market Risk)- Tobit Panel Data Regression

	Efficiency	Efficiency	Efficiency	Efficiency
	(1)	(2)	(3)	(4)
Default Risk Lag	0.904(0.361)***			
Liquidity Risk Lag		-0.341(0.242)		
Asset Risk Lag			-0.196(0.178)	
Market Risk Lag				-0.065 (0.122)
Basel Capital Adequacy Ratio	0.000 (0.003)	0.001 (0.003)	0.000 (0.003)	0.001 (0.003)
Control Variables				
ROA	-0.340 (0.528)	-0.281(0.537)	-0.225(0.538)	-0.257 (0.542)
Size	0.079(0.041)**	0.091(0.042)**	0.089(0.042)**	0.085(0.044)**
GDP Growth	0.223(0.010)***	0.223(0.010)***	0.222(0.010)***	0.223(0.010)***
Public Sector Banks Dummy	-0.080(0.063)	-0.097(0.064)	-0.098(0.065)	-0.093(0.065)
Private Sector Banks Dummy	-0.074 (0.056)	-0.104(0.057)*	-0.100(0.051)*	-0.096(0.057)*
Intercept	-1.594(0.310)	-1.602(0.316)	-1.599(0.318)	-1.587(0.330)
LR chi-square	201.52***	197.29***	196.53***	195.61***

Notes: *** $p< 0.01$, ** $p< 0.05$, * $p< 0.1$. Figures in parentheses are standard error.

Table 4: Efficiency, Risk and Capitalization (Default Risk, Liquidity Risk, Asset Risk, Market Risk)- GMM estimation

	Efficiency	Efficiency	Efficiency	Efficiency
	(1)	(2)	(3)	(4)
Default Risk Lag			0.899(0.452)***	
Liquidity Risk Lag	-0.3025(0.140)**			
Asset Risk Lag				-0.156(0.0314)***
Market Risk Lag		-0.032(0.115)		
Basel Capital Adequacy Ratio	0.001(0.002)	0.001(0.002)	0.001(0.002)	0.001(0.002)
ROA	-0.426(0.765)	-0.390(0.791)	-0.471(0.819)	-0.451(0.729)
Size	0.041(0.037)	0.040(0.038)	0.038(0.033)	0.035(0.033)
GDP Growth	0.207(0.009)***	0.285(0.008)***	0.212(0.007)***	0.305(0.009)***
Intercept	-1.24424(0.278)**	-1.259(0.282)**	-1.277(0.271)**	-1.242(0.268)***

Notes: *** $p< 0.01$, ** $p< 0.05$, * $p< 0.1$. Figures in parentheses are standard error.