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**Value Relevance of Accounting information on Return and  
Risk - Evidence from Indian Banks**

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## **Value Relevance of Accounting information on Return and Risk - Evidence from Indian Banks**

### **Abstract**

This study examines the value relevance of quarterly accounting information on return and risk for a sample of 39 listed banks during 2008-15.

The results of a panel data analysis results show that equity prices negatively react to an increase in NPAs reported by banks and positively to a rise in reported accounting returns. Our results also suggest that there are considerable differences in the market reactions of public and private sector banks to accounting published information. In spite of higher accounting returns reported by private sector banks, the market assigns more importance to risk-related information resulting in low equity prices. On further investigation, we also see that this relationship considerably varies with reference to ownership of banks.

**Keywords:** Value relevance, NPA, Loan loss Provision, Ownership

## 1 Introduction

Value relevance refers to the ability of financial statements (FS) to predict equity market values (W. H. Beaver, Ryan, & Wahlen, 1997; Liu & Ryan, 1995; Liu, Ryan, & Wahlen, 1997; Wahlen, 1994). It is important to understand value relevance as market prices of assets react to value-relevant accounting information released to the market (Ariff & Cheng, 2011).

Bank equity is sensitive to “earnings risk” arising through possible defaults on loans and potential variability in growth & profitability. Accounting information on return and risk such as Return on assets (ROA), Non-Performing Assets (NPA) and Loan Loss Provisions (LLP) are relevant to reflect portfolio decisions made by bankers many quarters earlier (Morgan & Stiroh, 2001), relevant to assess credit quality (W. H. Beaver et al., 1997; Knaup & Wagner, 2012; Liu & Ryan, 1995) and significantly explains market value (William Beaver & Engel, 1996; Morgan & Stiroh, 2001; Ozsoz, Rengifo, & Akinkunmi, 2014).

In spite of a significant body of evidence on the link between accounting information and market prices, there is very little empirical evidence for India that analyses the value relevance hypothesis. Also, there is no robust empirical evidence based on quarterly data.

There are number of reasons because of which We believe value relevance of accounting information be an interesting perspective to be examined for India. Firstly, the policy makers in India perceive that the changes in bank stock indices are associated with changes in balance sheet and profitability growth of banks (RBI, June 2011). As, Indian bank stocks tend to underperform when their asset quality deteriorates.

Secondly, the regulatory changes in the banking sector makes testing of value relevance hypothesis interesting. For example, before 2008, the asset quality of Indian banks was growing on a temporal basis, consequent to implementation of Prudential Guidelines (RBI, December 2013). After the global financial crisis in 2008-09, the RBI effected several changes to the prudential norms like postponing the recognition of losses on certain sector-specific loans.

Thirdly, the differences in accounting based return and risk performances across different ownership groups provide an interesting perspective while examining value relevance. The PSBs have slight cost and profit advantages over private sector banks related to their lower cost of funds (Altunbas, Evans, & Molyneux, 2001). Several PSBs in India have seen a sharp increase in their NPAs and plunging profits. The NPA of private sector banks in India has improved since 2008.

However, within private sector, many of the old banks have reported a rise in profits despite an increase in the proportion of net NPAs particularly because of the higher return on their advances. Fourthly, the information content of bank's security prices also gets affected by the monitoring under different ownership structures (Auvray & Brossard, 2012; Tirole, 2010). This effect is stronger due to the market discipline causing subsequent differences in the performances across various ownership groups. For example, the lack of capital market discipline in public ownership, may indicate that management in PSBs experiences a lower intensity of environmental pressure and, therefore, may operate less efficiently than privately owned banks (Altunbas et al., 2001).

There have been significant differences in market based performances across different ownership groups. Private sector banks in general enjoy higher valuation as they are efficient with higher return ratios and well-capitalized to grow at a healthy pace compared to public sector banks which follows lazy banking – poor asset quality, low profitability and capital starved.

Fifthly, a comprehensive and reliable banking database for an extended time span is available for Indian banks. The time-series and cross-sectional variation in the data makes it amenable to rigorous statistical analysis. Additionally, the time period of the study, beginning 2008, coincides with the inception of global financial crisis. As a result, it permits us to clearly ascertain the impact of financial crisis on the value relevance of Indian banks. These findings might provide useful leads to other emerging market banks to examine the impact of accounting information on bank market performance across different ownership groups.

Finally, the accounting information should have a direct relationship with the market equity prices. As the valuation gap between the public and private sector banks is almost twice its last ten year average and is in line with a sharp deterioration in asset quality of public sector banks<sup>1</sup>.

The emerging market economies include many PSBs, such that, in these contexts, the consequence of ownership for the value relevance is a major, yet unexamined proposition. The dissertation address this issue, using bank-level quarterly data to assess value relevance of accounting information on return & risk in an Indian context.

The rest of the study is organized as follows: Section 2 reviews the related literature on value relevance of accounting information. Research question and hypothesis formulation are presented in Section 3. Section 4 discusses the Methodology, data & Summary Statistics. The relationship

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<sup>1</sup> Tewary, D. (2015). Procyclicality of Banking Sector: Macro Financial Linkage. SPA Theme Report.

between accounting information and market prices is investigated in Section 5. Section 6 concludes this study.

## **2 Literature Review**

The financial statement is one of the best sources of accounting information and an essential part of disclosure by companies. It helps investor to analyze investment opportunities. The accounting statements provide data about the financial position of the company, its operational results, and any changes of control in the company and cash flow.

This means the accounting amount should be connected with some measure of value, e.g., share prices. If the amount considerably increases the power of the estimating equation to explain equity value, then it must be important and measured with at least some reliability (Holthausen & Watts, 2001). Value relevance is a statistical association between financial information and prices or returns particularly over a long window (Francis & Schipper, 1999).

Bank equity values are influenced by all the factors that impact both the entire stock market and factors unique to the banking industry (Brewer & Lee, 1986). Asset quality is particularly an important factor for bank equity values because banks assume both credit (William Beaver, Eger, Ryan, & Wolfson, 1989; Brewer & Lee, 1986) and interest rate risk exposure on most of their assets (Brewer & Lee, 1986). Thus, accounting information on asset quality like loan loss provisions (LLP), loan charge-offs, and non-performing loans are jointly useful in assessing credit quality and loan default risk (W. H. Beaver et al., 1997).

The value relevance of non-performing assets has been widely discussed in literature. Comparing to the other information on asset quality, NPA is relatively less discretionary. The bad news about loan default is largely pre-empted by more timely changes in nonperforming loans (Liu & Ryan, 1995). The increase in NPA also cause the B-M ratio (William Beaver et al., 1989) and equity volatility (Neuberger, 1991) to rise.

Another accounting information on asset quality that affect bank equity values is Loan loss provisions. LLP reflects the management's estimates of the probability with which loan principal will not be paid (Liu & Ryan, 1995). There are a number of contemporary theories on how LLP affects firm value.

Under the positive relationship, Madura and McDaniel (1989) argued a tax implication of LLP announcements. After a loan loss provision announcement, there is no significant new information about the quality of the existing loans. However, LLP announcements convey to the market that the banks are likely to start writing off the loans sooner than formerly contemplated by investors and will discontinue paying taxes on accounting profits that are unlikely to be ever realized as economic benefits. Perhaps, announcements could indicate that the banks will start to recover excess tax previously paid because of the over statement of profit for tax purposes which implies investors reassess their projection of the banks' operational cash flows, the tax benefits of the economic losses are suspected to be realized earlier due to the probable earlier write-offs signalled through the increased LLP. This increases the present value of the operational cash flows and implies an increase in stock price.

An increase in loan loss provision also sends a signal that a bank is unwilling to lower interest rate, extend principal payments, or make other loan concessions to delinquent borrowers. This apparent hardening of the lender's bargaining position can signify a strengthening in the borrower's credit or collateral quality further raising the stock price (Docking, Hirschey, & Jones, 1997; Madura & McDaniel, 1989). With an announcement of loan loss provision, the market might interpret management recognition of asset quality problems as an indication that the management is committed to address the problems and is constructively handling loan default risk issues (Elliott, Hanna, & Shaw, 1991; Grammatikos & Saunders, 1990; Griffin & Wallach, 1991; Madura & McDaniel, 1989; Musumeci & Sinkey, 1990).

When bank income increases, it makes sense to inventory some of its LLP (LLP are observable actions that are associated with other, less observable management actions that improve credit-risk management and loan pricing) – the notion of saving for a rainy day. When income decreases, the inventory can be reduced to cover actual loan losses. The management thus perceives the earnings power of the bank to be sufficiently strong to absorb future potential losses by increasing current LLPs (William Beaver et al., 1989; W. H. Beaver et al., 1997; Wahlen, 1994).

Under the negative relationship between loan loss provisions and market price, it has been argued that if there is informational inefficiency about problem loans, analysts will not know the full extent to which intrinsic values of assets have declined. So, with any LLP announcement, there should be a fall in stock price; because of information asymmetry prior to announcements (not because of LLP announcement) (Grammatikos & Saunders, 1990; Madura & McDaniel, 1989). An increase in loan loss provision provides a signal of a decrease in loan quality indicating poor

management of the bank's loan portfolio or ineptness on the part of loan officers. This further foreshadows increase in future asset write-downs and suggests increase in risk concerning future collections of principal and interest payments, and revaluation of loan portfolios by investors. All these will be followed by a falling stock price (Docking et al., 1997; Madura & Zarruk, 1992).

The rising loan loss provisions also indicate a bank's decreasing future lending capacity and make it impossible for the bank to fund previously anticipated positive NPV projects, LLP announcements if any will create an opportunity cost that could engender a negative stock market reaction (Docking et al., 1997; Madura & Zarruk, 1992). With provisioning of loan losses or subsequent write down, capital adequacy has to be ensured to penetrate a regulatory threshold. Thus, LLP could precipitate (and/or signal) stepped up regulatory activity, which would entail costly constraints on the bank's activities leading to fall in stock prices (Grammatikos & Saunders, 1990; Musumeci & Sinkey, 1990).

It is possible that LLP has no significant effect on market prices. If there is informational efficiency in loan and stock market, analysts and investors are aware of the full extent to which intrinsic values have declined and will find the LLP increase to be imminent. This implies there is no new information, as some or all of the positive and negative effects described above offset each other (Docking et al., 1997; Madura & McDaniel, 1989; Musumeci & Sinkey, 1990).

We have discussed how an accounting information on asset quality like NPA and LLP, affect bank equity value. We will further detail the relevance of accounting information on earnings or returns. The accounting information on earning is a good indicator of the present and continuing ability to generate favourable cash flows (FASB, 1978, ix) because of its matching and timing attributes (Bepari, Rahman, & Taher Mollik, 2013; Dechow, 1994). This makes earnings more important since they are used as a summary measure of firm performance by a wide range of users (Habib, 2008) for example, by investors and creditors (Dechow, 1994).

In the banking literature, performance is measured typically by Return on assets (ROA) (Akhigbe & McNulty, 2003; Arshadi & Lawrence, 1987; Allen N Berger & Mester, 2003; DeYoung, Hasan, & Kirchhoff, 1998; Gorton & Schmid, 1999; Hirschey, 1999; Nippani & Green, 2002; To & Tripe, 2002). This measure of ROA accurately reflects the performance of a bank (Bhaumik & Dimova, 2004). It also takes into account the cost of acquiring low quality assets because of both the provisioning made necessary for assets that must be written off and the cost of capital.

There have been several other earning measures such as earnings from noninterest banking activities (Ebrahim & Hasan, 2008), standard deviation of ROA (Agusman, Monroe, Gasbarro, & Zumwalt, 2008), net income to total assets (Mansur, Zangeneh, & Zitz, 1993), net income after loan loss provision (Elnahass, Izzeldin, & Abdelsalam, 2014), change in earnings (Gosnell, Heuson, & Lamy, 1995), earning components (Jaggi & Zhao, 2002), and earnings variability (Rosenberg & Perry, 1981), which were found value relevant as per the existing literature.

Along with accounting information on accounting return and risk, there are several other characteristics to which bank equity is sensitive. For example bank equity values are sensitive to the level of book capital relative to total assets. Increase in capital also decreases a bank's exposure to extreme market shocks and signal creditworthiness (De Jonghe, 2008). From a regulator's viewpoint, it is advisable that banks with a relatively risky portfolio, i.e. with a high credit risk, keep a relatively high level of buffer capital. Otherwise, these banks' capital would probably drop under the minimum capital ratio, which could result in a credit crisis (Brewer & Lee, 1986; Lindquist, 2004). A greater risk-sensitive capital adequacy regulation may decrease banks' willingness to take risk (Lindquist, 2004).

Jahankhani and Lynge (1980) has associated coefficient of variation of deposits, i.e. standard deviation of total deposits divided by the mean of total deposits during 1972-76 with the market based measure of systematic risk and total risk using a set of US banks, while Mansur et al. (1993) has examined the same relationship during January 1986 to September 1990. Although hypothetically, deposit withdrawals can always be complemented by bank borrowing; actually, borrowing is only a limited source for banks in an insufficient liquidity situation. Further, borrowings are usually short-term liabilities and therefore augment the imbalance in the maturities of the two sides of the balance sheet. With deposit withdrawals, a higher risk is then generated which is added to the serious liquidity situation of the bank (Talmor, 1980).

Kim, Chen, and Nance (1992) examine the information content of Leverage (debt divided by total assets) and argued that an increase in leverage (debt divided by total assets) will increase market based risk. The loans to deposit ratio is argued to be positively related to total and systematic risk as higher the loan to deposit ratio, lower are the holdings of liquid and cash assets and thus the more exposed the bank is to possible liquidity problems (Jahankhani & Lynge, 1980). Jahankhani and Lynge (1980) have argued a negative relationship between this liquidity and market based risk measures. Liquidity as measured by the ratio of cash and due from treasury securities to total assets is an ability to absorb net cash outflows that occur for any reason. The



greater this ratio, the greater the bank's ability to absorb cash drains in the short run and thus lower is the risk of illiquidity.

There is an inverse relationship between dividend pay-out and market based total risk measures. Firms are reluctant to decrease dividends once a certain level has been established. Firms with a higher degree of earnings variability will probably distribute a lower percentage of earnings than more stable firms (Jahankhani & Lynge, 1980).

Size is argued to be an important factor for bank equity investor. On one side, increase in size of the bank raise its economies of scale which reduces its costs to further increase its ability to diversify. On the other side, banks with increased size are also too big to fail. It is also argued that, small sized and well-capitalized banks are equipped to tolerate large unfavourable economic conditions (De Jonghe, 2008).

Bank equity values are sensitive to movements in interest rates because banks typically fail to match the interest sensitivity of their assets and their liabilities. As a result, movements in interest rates affect the market value of each side of the bank's balance sheet and both its net worth and stock values (Brewer & Lee, 1986). Sinkey and Greenawalt (1991) argue that banks charging higher interest rates are those that later have higher levels of problem loans. Following the above works, Knaup and Wagner (2012) use interest from loans to explain their market indicator of credit risk and Ozsoz et al. (2014) associate net interest margin to bank's equity.

Diversification is value relevant as it benefit shareholders by providing a financial supermarket to customers who demand multiple products (Allen N. Berger, Hasan, & Zhou, 2010), by creating economies of scope (Drucker & Puri, 2009). Diversification also helps in leveraging managerial skills across products (Iskandar-Datta & McLaughlin, 2005), reducing shocks to NIM (Lin, Chung, Hsieh, & Wu, 2012), decreasing costs of screening (Boyd & Prescott, 1986; Diamond, 1984; Ramakrishnan & Thakor, 1984) and reducing expected costs of financial distress by lowering risks (Boot & Schmeits, 2000).

On the other side, with diversification, diseconomies of scope arise through weak monitoring incentives and a risky loan portfolio when diversifying into additional industries and sectors as downturn of one of them may lead the bank to bankruptcy (Acharya, Hasan, & Saunders, 2006; Dell'Ariccia, Friedman, & Marquez, 1999; Gehrig, 1998; Hayden, Porath, & Westernhagen, 2007; Marquez, 2002; Shaffer, 1998; Tabak, Fazio, & Cajueiro, 2011; Winton, 1999). Banks through

diversification may not obtain benefits of expertise in specific sectors or group of sectors (Acharya et al., 2006; P. G. Berger & Ofek, 1995; Denis, Denis, & Sarin, 1997; Jensen, 1986; Klein & Saidenberg, 1998; Servaes, 1996).

The accounting information related to Cash has been significant discussed in value relevance literature. Cash makes it possible for the company to sustain, it is not influenced by measurement discretions and errors; and can be used to predict firms' future dividends and estimate loan repayment capacity (Lee, 1974). Cash flow from operations (CFO) furnishes information on solvency and liquidity of firms, and it is a traditional accounting measure used to determine credit and bankruptcy risks of firms (Previts, Bricker, Robinson, & Young, 1994). Further, as the financial health of a firm declines, financial analysts give more importance to CFO than earnings (DeFond & Hung, 2003). For this reason, the value relevance of CFO may increase when a firm's financial health deteriorates (DeFond & Hung, 2003). Funds and cash flow betas provide considerable incremental explanatory power in describing the variability in market betas (Ismail & Moon, 1989).

Earnings per share has been argued to explain the equity prices (Brown & Kennelly, 1972; Mohan & John, 2011; Ou & Penman, 1989). Mohan and John (2011) investigate the value relevance of accounting information in India with reference to A Group Banks during 2006-10. The study finds that book value per share and earnings per share have a positive and statistically significant relationship with market price per share.

Global financial crisis is also believed to be an important variable to explain market prices (Hacihasanoglu, Simga-Mugan, & Soytaş, 2012; Ozsoz et al., 2014). Asset held in trading is also one important importation as risks inherent to trading, and the uncertainty (i.e., opacity) should affect the equity prices (Morgan & Stiroh, 2001). Anandarajan, Francis, Hasan, and John (2011) argued that information related to disclosure, accounting practices, corporate and legal environment also affect market prices of banks.

In spite of a significant body of evidence on the link between accounting information and market prices, there is very little empirical evidence for India that analyses the value relevance hypothesis (Charumathi & Suraj, 2012; Dawar, 2012; Jaspal & Kiranpreet, 2014; Mohan & John, 2011; Mulenga, 2015; Padmini & Narasimhan, 2012; A. K. Sharma, Kumar, & Singh, 2012; M. Sharma, 2014). Also, there is no robust empirical evidence based on quarterly data.

The discussion on review of existing literature reveals that while the value relevance hypothesis has been extensively researched in developed markets like USA, the research on Indian markets is limited in terms of number of studies as well as scope. In due course of time, the banking sector has changed much owing to the regulatory changes after the Basel Capital Accord and the impact of the global financial crisis (GFC). However, the review of available literature reveals that there are many gaps in the research on value relevance hypothesis in Indian context. These research gaps provide scope for a comprehensive study on value relevance in Indian banking. A detailed discussion on the research gaps is presented in Section 3.

### **3 Research Questions and Hypothesis Development**

As discussed in Section 1, the present study attempts to examine the relationship between accounting information and market prices. If the accounting number predicts equity market values (W. H. Beaver et al., 1997; Liu & Ryan, 1995; Liu et al., 1997; Wahlen, 1994), it becomes value relevant. Accounting information on return & risk such as ROA, NPA and LLP reflect prior portfolio decisions, credit quality, and explains market values of banks (W. H. Beaver et al., 1997; Liu & Ryan, 1995; Morgan & Stiroh, 2001).

ROA is a standard measure of accounting based measure of performance (Barnett, Greve, & Park, 1994; Mehra, 1996; Reger, Duhaime, & Stimpert, 1992). On one side, ROA reflects an increase in the cushion available to absorb losses from bank operations or defaults on assets (Brewer & Lee, 1986; Jagtiani, Kaufman, & Lemieux, 2000); while on the other side, it reflects higher rates charged on riskier loans (Knaup & Wagner, 2012; Morgan & Stiroh, 2001). Bank equity values are expected to be affected by this accounting based measure of return.

Bank equity values are expected to be affected by default risk on loan portfolios (William Beaver et al., 1989). Readily obtainable information about the quality of banks' loan portfolios is critical for bank shareholders and debtors as it enables them to evaluate the performance of bank managers and to assess better the risks to which banks are exposed. To obtain proxies of loan quality, investor typically relies on accounting data such as for instance, NPAs or LLP (Knaup & Wagner, 2012). Therefore, LLP and NPA because of the different natures, are collectively valuable in evaluating credit quality and loan default risk (W. H. Beaver et al., 1997).

The information on NPA as an accounting based measure of risk is value relevant as the bad news about loan default is largely pre-empted by more timely changes in NPAs (Liu & Ryan, 1995).

There are some contemporary theories on how LLP as an accounting based measure of risk affects firm value. LLP can positively affect the firm value as when bank income increases, it makes reason to record part of it as LLP (LLP are noticeable actions that connect with other, less prominent management activities that increase credit-risk management and loan pricing); the idea of preserving for a rainy day. When income is down, the provisions can be drawn down to cover actual loan losses. When income is declining, the inventory can be reduced to meet real loan losses. Management, therefore, observes the earnings power of the bank to be adequately large to consume potential future losses by raising contemporary LLPs (William Beaver et al., 1989; W. H. Beaver et al., 1997; Wahlen, 1994). With an announcement of loan loss provision, the market might interpret management recognition of asset quality problems as an indication that the management is resolved to address the issues and is dealing constructively with loan default risk problems (Elliott et al., 1991; Grammatikos & Saunders, 1990; Griffin & Wallach, 1991; Madura & McDaniel, 1989; Musumeci & Sinkey, 1990).

Under the negative relationship between loan loss provisions and market price, it has been argued that if there is informational inefficiency about problem loans, analysts will not know the full extent to which intrinsic values of assets have declined. So, with any LLP announcement there should be a fall in stock price; because of information asymmetry prior to announcements (not because of LLP announcement) (Grammatikos & Saunders, 1990; Madura & McDaniel, 1989). An increase in loan loss provision also gives provides a signal of a decrease in loan quality indicating poor management of the bank's loan portfolio or ineptness on the part of loan officers. This further foreshadows an increase in future asset write-downs and/or suggests an increase in risk concerning future collections of principal and interest payments, revaluation of loan portfolios by investors. All these will be followed by a falling stock price (Docking et al., 1997; Madura & Zarruk, 1992).

The rising loan loss provisions also indicate bank's decreasing future lending capacity and make it impossible for the bank to fund previously anticipated positive NPV projects. LLP announcements if any will create an opportunity cost that could engender a negative stock market reaction (Docking et al., 1997; Madura & Zarruk, 1992). It is possible that LLP has no significant effect on market prices. If there is informational efficiency in loan and stock market,

analysts and investors will know the full extent to which intrinsic values have declined and will find LLP increase imminent. This implies there is no new information, as some or all of the positive and adverse effects described here offset each other (Docking et al., 1997; Madura & McDaniel, 1989; Musumeci & Sinkey, 1990).

From the literature review presented in Section 2, it can be found that research relating to value relevance in Indian markets is very much limited. Based on the detailed review of literature, the following research gaps have been identified. Most of the existing literature is based on examining either the accounting based performances or the market based performances. As far as value relevance is concerned, there is no robust empirical work which examines the value relevance of information on accounting based return and risk. Unlike developed markets, the emerging market economy like India include many state-owned banks, such that, in this context, the consequence of ownership for the value relevance is a major, yet unexamined proposition.

In light of the above discussion, We form our first hypothesis:

**H1: Market contains information on accounting reported return and credit risk information**

$$\text{Capital market measures} = f(\text{ROA, NPA, LLP}) \quad \dots (1)$$

## **4 Data and Methodology**

### **4.1 Model Specification**

Indeed, bank equity values are receptive to all the factors that influence the overall stock market as well as to factors unique to the banking industry (Brewer & Lee, 1986). Since this study deals with the value relevance of accounting information, it is reasonable to adopt the viewpoint of the equity investor. This study uses equity returns cumulated from beginning of the quarter to one day after the earnings announcement date for each bank (termed SHR) as a measure of market return.

ROA for each bank is used for measuring accounting information on return. Change in gross non-performing assets to advances from previous to current quarter (termed NPA), loan loss provisions divided by non-performing assets (termed LLP) for each bank is used for measuring accounting information on risk.

In line with previous literature (Brown & Kennelly, 1972; De Jonghe, 2008; Knaup & Wagner, 2012; Lindquist, 2004; Ozsoz et al., 2014; Sawada, 2013), size, net interest margin, capital adequacy ratio, proportion of revenue in corporate banking, retail banking and earning per share are control variables.

Log of market value of equity (termed SIZE) controls for cost differences due to scale of economies and the greater ability of banks to diversify. The sensitivity of bank equity values to movements in interest rates is controlled by using difference between total interest income and interest expense divided by total Income (termed NIM). The banks' capacity to bear losses and avoid crises is controlled by using capital adequacy ratio (termed CAR). The proportion of revenue a bank generates by focusing on corporate and retail business segment (termed CB and RB) controls the expectations made by investors based on the loan composition. Earnings per share controls monetary value of earnings per outstanding share of common stock for a bank (termed  $EPS_t$ ).

The resulting equation is

$$SHR_{it} = \alpha_0 + \alpha_1 ROA_{it} + \alpha_2 NPA_{it} + \alpha_3 LLP_{it} + \alpha_4 WB_{it} + \alpha_5 RB_{it} + \alpha_6 NIM_{it} + \alpha_7 CAR_{it} + \alpha_8 EPS_{i,t} + \alpha_9 SIZE_{it} + \varepsilon_{i,t} \quad \dots \text{ (I)}$$

If ROA indicates an increase in cushion to absorb losses and loan default risk, We should see a positive coefficient of ROA in model I. If an increase in ROA indicates higher rates on riskier loans which are more likely to default, we should see a negative coefficient of ROA and NPA in model I. If management perceives the earnings power of the bank to be sufficiently strong to absorb future potential losses by increasing current LLPs, We should see a positive coefficient of LLP in model I.

If investments form expectations on the basis of loan composition, then we should have significant coefficients of WB, RB and TB business segments. If higher interest rates indicate higher performance, then we should see a positive coefficient of NIM in model I. If higher capital levels improve banks' capacity to bear losses and avoid crises, then we should see a positive coefficient of CAR in model I. If market reacts positively on increase in monetary value of earnings per outstanding share of common stock, then we should see a positive coefficient of EPS in model I. If increase in size leads to scale economies and the greater ability of banks to diversify, then we should see a positive coefficient of SIZE in model I.

## 4.2 Data

The bank-level quarterly data has been developed from CMIE. The data on business segments (corporate, retail and treasury revenue) has been hand collected from DION INSIGHT. This data pertains to the period 2008 to 2015 for 39 listed banks. The sample is first divided into public and private sector groups. Private sector group is then divided into new private and old private sector banks. Thus, We covered 25 public sector banks, 9 old private sector banks and 6 new private sector banks, resulting in 1131 bank-quarter observations.

Summary statistics of the variables used in the regression model are reported in Table 1 and the following can be observed: First, interestingly, old private banks are much smaller, on average, than the new private and public sector banks even though they have existed in India much longer than them. Second, new private banks are better capitalized than other domestic banks. This could imply either that new private banks are in a better position to take risk, or that they are more risk averse.

Third, the proportion of revenue by way of entire investment portfolio is highest across new private sector banks and the proportion of corporate banking revenue is highest across public sector banks. Fourth, the ratio of loan loss provisions to gross non-performing loans of new private banks (0.21) and state-owned banks (0.12) is higher than that of old private banks (2.11).

Fifth, the ROA is much higher in new private banks, on average, than the old private and public sector banks. Finally, the ratio of gross non-performing loans to advances of public sector banks

**Table-1**  
**Summary statistics by bank ownership, 2008 Q4-2015 Q4.**

<b>Bank characteristics</b>	<b>All banks</b>	<b>Public</b>	<b>Private</b>	<b>Old private</b>	<b>New private</b>
<b>Return on assets (%)</b>					
Mean	0.8279	0.78607	0.90479	0.75977	1.22006
Std. dev.	0.67634	0.47496	0.93606	0.88919	0.88681
<b>Non-Performing assets ratio (Gross NPA/Total Advances) %</b>					
Mean	2.76572	2.97019	2.4036	2.56985	2.15684
Std. dev.	1.6475	1.56033	1.73522	1.32883	2.1271
<b>Loan loss provisions ratio (LLP/Gross NPA)</b>					
Mean	0.13443	0.12302	0.1553	0.10854	0.21193
Std. dev.	0.13301	0.09561	0.18091	0.07992	0.24523
<b>% of revenue in corporate banking</b>					
Mean	40.28	44.81	32.44	31.76	33.63
Std. dev.	0.11676	0.08841	0.11841	0.08614	0.14918
<b>% of revenue in retail banking</b>					
Mean	33.97	30.41	40.12	44.26	33.70
Std. dev.	0.12038	0.08665	0.14366	0.09034	0.17423
<b>% of revenue in treasury banking</b>					
Mean	24.06	22.78	26.28	23.20	30.98
Std. dev.	0.0796	0.06139	0.10012	0.03951	0.13416
<b>% of revenue in other banking</b>					
Mean	1.693	1.99	1.17	0.78	1.69
Std. dev.	0.02712	0.031	0.0174	0.0091	0.02349



<b>% of income in net interest margin</b>					
Mean	6.15	5.30	7.68	7.75	8.11
Std. dev.	0.07062	0.06344	0.07972	0.07826	0.07686
<b>Capital adequacy (%)</b>					
Mean	13.008	12.1561	14.5163	13.8999	15.2791
Std. dev.	2.02617	1.11231	2.37275	2.30808	2.06835
<b>Earnings per share (Rs.)</b>					
Mean	24.4472	31.2431	12.6298	11.1821	15.0385
Std. dev.	25.4735	28.5642	11.801	11.595	11.0087
<b>Market value of equity (Million Rs)</b>					
Mean	183683	134809	268670	71678.1	526727
Std. dev.	361213	286592	451153	145529	572404
<b>Number of banks</b>	39	25	14	9	6

Source: Compiled from CMIE PROWESS

(2.97) and old private banks (2.56), a reasonable proxy for the risk appetite of the banks, is much higher than that of new private banks (2.15). Based on the above summary statistics, it can be argued that the deterioration in balance-sheet quality of Indian banks has impacted their earnings growth and profitability.

## 5 Analysis of Results

The regression results for Model I are presented in Table 2. The coefficient of accounting risk ( $NPA_t$ ) is negative and significant at all levels of significance under all ownership types. This provides strong evidence that market penalizes after any increase in accounting reported non-performing assets.

The coefficient of  $LLP_t$  is positive and significant at 1% level under the estimation of model 1 with all banks. This provides evidence that market reacts positively to increase in LLP. A plausible explanation for this is that the management perceives the earnings power of the bank to be sufficiently high to absorb potential future losses by increasing current LLPs.

The coefficient of  $ROA_t$  is positive and significant at 1% significance level under an estimation of model 1 with all banks. This provides evidence that market price reacts positively to any contemporaneous increase in accounting returns.

We next report the impact of accounting return and risk reported by the different types of banks on market prices. The coefficients of  $ROA_t$ ,  $NPA_t$  and  $LLP_t$  are negative and significant at 5% significance level under an estimation of model 3 with private sector banks. This provides evidence that in spite of higher accounting returns, market assigns more importance to the information on accounting reported risk that lowers equity price.

However, We do not have similar evidence for public sector banks where the coefficient of  $LLP_t$  is insignificant, and  $ROA_t$  is positive and significant at 1% significance level under an estimation of model 2. A plausible explanation for this is that there is informational efficiency in loan and stock market, analysts and investors know the full extent to which intrinsic values have declined and will find LLP increase imminent. However, market price reacts positively to any contemporaneous increase in accounting returns.

The coefficient of  $NPA_t$  and  $LLP_t$  are negatively significant at 1% significance level, and the coefficient of  $ROA_t$  is positively significant under an estimation of model 4 with old private

sector banks. This provides evidence that on one side, information on accounting reported risk lowers equity price while on the other hand the market is rewarding for higher accounting return on these risky assets.

However, We do not have similar evidence for new private sector banks where the coefficient of  $LLP_t$  is positively significant at 1% significance level, and the coefficient of  $ROA_t$  is negatively significant under an estimation of model 5. A plausible explanation for this is as follows: Though the management resolves to address the loan default risk problems; the market is penalizing for higher accounting return on those risky assets.

**Table 2**  
**Bank-level regressions using panel data**

	<b>Dependent Variable: Market Return</b>				
	<b>All banks (1)</b>	<b>Public (2)</b>	<b>Private (3)</b>	<b>Old private (4)</b>	<b>New private (5)</b>
<b>Constant</b>	-0.5809*** (0.0817)	-0.6046*** (0.1419)	-0.3098*** (0.0393)	-0.3624*** (0.1017)	0.0989*** (0.0049)
<b>Return on assets</b>	0.0093*** (0.0020)	0.0589*** (0.0024)	-0.0028** (0.0013)	0.0114*** (0.0021)	-0.0478*** (0.0013)
<b>Non-performing assets</b>	-0.0691*** (0.0008)	-0.0744*** (0.0013)	-0.0547*** (0.0008)	-0.1016*** (0.0009)	-0.0301*** (0.0014)
<b>Loan loss provisions</b>	0.0124*** (0.0048)	0.0045 (0.0046)	-0.0237*** (0.0046)	-0.2325*** (0.0073)	0.0713*** (0.0015)
<b>Corporate banking</b>	-0.0272 (0.0200)	-0.0795*** (0.0115)	0.0265* (0.0160)	-0.0718** (0.0299)	0.2362*** (0.0098)
<b>Retail banking</b>	0.0915*** (0.0224)	-0.0562*** (0.0165)	0.1914*** (0.0219)	0.2316*** (0.0291)	-0.0899*** (0.0135)
<b>Earnings per share</b>	-0.0005*** (0.0001)	-0.0005*** (0.0001)	0.0001 (0.0002)	-0.0006 (0.0005)	-0.0041*** (0.0002)
<b>Net interest margin</b>	0.4560*** (0.0207)	0.4455*** (0.0128)	0.2496*** (0.0210)	0.1954*** (0.0368)	0.1044*** (0.0181)
<b>Capital adequacy ratio</b>	-0.0041*** (0.0007)	-0.0055*** (0.0008)	0.0003 (0.0004)	-0.0041*** (0.0004)	-0.0047*** (0.0005)
<b>Size</b>	0.0581*** (0.0078)	0.0641*** (0.0142)	0.0255*** (0.0036)	0.0395*** (0.0104)	0.0102*** (0.0010)

<b>Time Effects</b>	Yes	Yes	Yes	Yes	Yes
<b>Fixed Effects</b>	No	No	No	No	No
<b>Random Effects</b>	Yes	Yes	Yes	Yes	Yes
<b>R-Square</b>	9%	12%	5%	12%	5%
<b>Number of Banks</b>	39	25	14	9	6
<b>Time Series Length (Quarters)</b>	29	29	29	29	29

Note: \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ , robust standard errors are in parentheses

## 6 Conclusions

There is a relatively large literature on the value relevance of accounting information. However, much of this literature is in the context of the United States, Europe and other developed economies, where the banks are almost entirely in the private sector. The emerging market economies, in contrast, have their fair share of state-owned banks, such that, in these contexts, the implications of ownership for the value relevance remains an important, yet largely unexplored, question. We address this issue, using bank-level data from India.

By applying a panel data analysis, the results show that equity stock prices negatively react to an increase in NPAs reported by banks and positively to a rise in reported accounting returns. The results also plausibly indicate that banks by increasing their LLP signals to the market that their earning power should be sufficiently high to absorb potential future losses.

Our results also suggest that there are considerable differences in the market reactions of public and private sector banks to accounting reported information. In spite of higher accounting returns reported by private sector banks, market assigns more importance to the information on accounting reported risk that subsequently lowers equity price. On further investigation, We see this relationship to be considerably strong in the case of old private sector banks.

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