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The Effectiveness of Government Mandated Disclosure Reform

Sakshi Raj
ssakshi@uno.edu

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The Effectiveness of Government Mandated Disclosure Reform

A Dissertation

Submitted to the Graduate Faculty of the
University of New Orleans
in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy
in
Financial Economics

by

Sakshi Raj

B.S. Tilka Manjhi Bhagalpur University, 2008

December, 2018

*Dedicated to my son Rishan and
his grandparents Indu Kumari & Upendra Narayan Singh.*

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ABSTRACT

The higher the level of information asymmetry between a firm and its investors, the higher is the firm's reluctance to raise money externally, potentially leading to investment distortions. An improved disclosure system reduces information asymmetry and therefore, lessens the adverse selection effects of external financing, thereby moderating investment inefficiencies. In this paper, we examine the impact of potentially improved transparency stemming from stricter disclosure requirements (*Clause 49*) on financing and investment decisions of Indian firms. The results show that reliance of Indian firms on internal financing in the pre-reform period gives way to greater use of external financing in the post-reform period, and alleviation in financial constraints. While expanded funding sources do not seem to improve investment unambiguously, firms that suffered under-investment prior to the reform show a significant improvement in investment post-reform. Firms also increase their financial slack making it possible for them to engage in acquisitions within India as well as abroad.

Keywords: Disclosure, Information Asymmetry, Financing, Investment, Efficiency

1. Introduction

“When managers have access to unlimited discretionary resources, investment converges to the efficient level. However, when managers are resource-constrained, there will be too little investment, because there are frictions associated with raising finance externally.” Stein (2003)¹

Information asymmetry between a firm’s managers and capital providers exists because managers have access to superior information that they cannot reveal for proprietary reasons to the fund suppliers. Major frictions accompanying information asymmetry between managers and investors are adverse selection (Myers and Majluf, 1984) and agency problem (Jensen and Meckling, 1976). These frictions lead to distorted financing and investment decisions. If investors believe that managers can exploit private information to issue overpriced securities, acting rationally, they either ration capital (Myers and Majluf, 1984; Miller and Rock, 1985) or increase financing cost (Lambert et. al, 2007). An inevitable outcome of the asymmetry problem is the firm’s reluctance to issue external funding and consequent over-reliance on internal financing, which in turn increases sensitivity of investment to cash flows, potentially leading to underinvestment. Mitigation of information asymmetry curbs adverse selection (Leuz and Verrechia, 2000), decreases cost of capital (Lambert et.al. 2007; Francis et al. 2005), increases stock liquidity (Amihud and Mendelson 1986), and enhances investment efficiency (Biddle, Hilary and Verdi, 2009).

One conduit to increase the availability of firm information to the public is improved disclosure of financial information. Adequate and timely disclosure allows investors to evaluate firm performance, lessens the information risk borne by them, attracts higher premium and

¹Excerpts taken from page # 114-115 of Stein, Jeremy C. "Agency, information and corporate investment." *Handbook of the Economics of Finance*. Vol. 1. Elsevier, 2003. 111-165.

enhances firm value (Barry and Brown, 1985; Diamond and Verrecchia, 1991; Botosan, 1997; Lobo and Zhou, 2001). By fostering transparency, disclosure of financial information leads to a decrease in the contracting costs of adverse selection, thereby improving a firm's financing and investment decisions.

Despite the benefits of transparency, however, managers may be reluctant to voluntarily disclose information as the increased scrutiny and discipline by the markets may impede their desire to promote self-interest (Coffee, 1984). In addition, managers might selectively increase disclosure in short term while raising capital (Cheng and Lo, 2006; Clinton et al., 2014), or they might purposely try to withhold any negative information in disclosing value relevant information (Graham et al., 2005; Kothari et al., 2009). Such problems are exacerbated in emerging markets, such as India, where the intervention by regulatory bodies becomes necessary to force managers to disclose.

The *Clause 49* reforms undertaken by India in 2000 provide a unique opportunity to study the effect of enhanced disclosure requirements on financing and investment decisions of Indian firms. *Clause 49* is a series of reforms introduced by the Securities and Exchange Board of India (SEBI) to impose stricter and more comprehensive disclosure requirements on Indian firms.² In this paper, we study the impact of the *Clause 49* reforms on the financing decisions, financial constraints, investment decisions, and firm performance. Extant research on the impact of *Clause 49* reforms document a reduction in beta risk of Indian stocks (Bhattacharya and Rao, 2005), and an increase in firm value in the post-reform period (Balasubramanian, Black, and Khanna, 2010;

² In addition to requiring fuller disclosure, the provisions of *Clause 49* include other improvements in corporate governance such as the role and composition of boards, independence of directors and greater role for audit committees.

Dharmapala and Khanna, 2013). We contribute to this line of literature by focusing on whether the reforms affect financing and investment decisions of Indian firms, and whether the improved disclosure alleviates financial constraints for the firms.

Our sample includes 1280 publicly trading Indian firms during the period 1996 to 2008 (18,900 firm years). Consistent with our expectation, we find that the reforms increase financing for firms that did not have access to other capital markets. This result persists after controlling for endogeneities and self-selection bias inherent in the financing of these firms. Further, the increase in external financing is related to the degree of information asymmetry of the firms in the pre-reform period – firms that suffer higher information asymmetry prior to the reform show a greater increase in external financing after the reform. Complying firms also show alleviation in present and expected future financial constraints, and the effect is more pronounced for domestic firms confined to the Indian capital markets relative to cross-listed firms with access to foreign capital markets. While not all firms increase their long-term investment levels post-reform, firms that suffer under-investment pre-reform show a significant increase in their long-term investment post-reform. Firms increase their total investment (long-term + short-term) post-reform, predominantly through increases in cash holdings. Firm performance also improves post-reform, with increased investment driving the performance improvement in financially constrained firms that suffer under-investment prior to the reform. Finally, acquisition patterns suggest that the post reform period coincides with a concurrent increase in internal and external acquisitions by Indian firms. We conjecture that perhaps firms increase their financial slack to facilitate acquisitions. Our results suggest that the mandatory disclosure reforms were at least partially effective in improving transparency, alleviating financial constraints, improving capital access, and increasing investment in Indian markets.

The results of the study emphasize the importance of government-mandated reforms in emerging stock markets, such as India, where only a few firms resort to voluntary disclosures in their efforts to raise funds in domestic markets. Domestic firms confined only to the Indian capital markets seem to respond positively to well-regulated mandates. Our results provide support for the efficacy of mandatory disclosure reforms, especially in markets that suffer information opacity.

2. ***Clause 49 Reforms***

The Indian capital market was considered to be opaque and not conducive to growth until 1990. The liberalization of Indian economy in 1991 resulted in steady economic growth forcing Indian firms to seek capital to finance expansions. Until then, firms relied on government financial agencies who provided both debt and equity for their funding requirements (Balasubramanian, Black, and Khanna, 2010). Bhattacharya and Rao (2005) suggest that capital market and corporate governance reforms seemed to be the only feasible solution to reduce opacity of business environment in India. They argue that family business dominated the economic landscape and these businesses had no incentive to disclose information voluntarily as they could rely on their extensive internal capital for investment opportunities. Additionally, long delays in judicial proceedings restricted the capability of intermediaries in bridging the information gap. It fell to the Indian government to then mandate disclosure and best governance practices in order to foster and support economic growth.

India began the process of creating a transparent, efficient, and fair corporate environment with the setup of the Cadbury Committee of the Financial Reporting Council in 1991. The committee investigated the accountability of the Board of Directors (BoD) to shareholders and recommended improving the internal financial controls of the system (Cadbury Report, 1992). A couple of recommendations were developed and proposed between 1991 and 2000; however, only

a few companies adopted them which did not significantly change the existing practices by Indian companies. Later, the Kumar Mangalam Birla Committee was set up by Securities and Exchange Board of India (SEBI). This committee recommended new mandates on corporate governance which SEBI incorporated in its Listing Agreement contained in *Clause 49* in 2000, henceforth *Clause 49*.

Although *Clause 49* was introduced in 2000, a unique feature of this clause is that it was implemented in phases over next 3 years for different group of companies. The largest group of firms (BSE Group A) were required to comply to the mandate by March 2001, then medium sized firms (with equity capital less than ₹10 crore and greater than 3 cr.) by March 2002, and finally small sized firm (with paid up equity capital greater than 3 cr.) by March 2003. Firms with less than ₹3 cr. in paid up equity capital were not required to comply with the rules. Appendix 1 shows the main events and dates of the different reform mandates of *Clause 49*.

The changes focused on including a section on corporate governance in the annual report, improving the quality and quantity of disclosure (disclosing all relevant information related to dividend, listing, market price, performance relative to indices, distribution, etc.) to shareholders, formation of shareholders' grievance committee, incorporating "management discussion and analysis" section in the annual report, increasing the role and composition of boards as well as audit committee, and enhancing the responsibility and independence of BoD. Firms with a paid-up capital greater than ₹30 million were required to comply with the covenants or face a penalty for non-compliance. The main covenants of *Clause 49* are set out in Appendix 3.

Initially the penalty for non-compliance was delisting of the firm, however later, this was revised to impose severe financial penalties on directors for non-compliance. Monetary penalties were also introduced in the amendments to *Clause 49*. However, there is little information

regarding enforcement of these reforms (Sanan and Yadav, 2011). Sanan and Yadav (2011) construct a Corporate Governance Transparency and Disclosure Score (CGS) for each firm, which shows only a moderate level of disclosure by Indian firms. This emphasized the need of strong enforcement of the *Clause 49* mandates and covenants.

Several amendments to the *Clause 49* were undertaken in 2004 that reinforce the original intent of protecting the interests of investors through enhanced governance practices and disclosures. Major changes include improving quality of financial disclosures (including those relating to related party transactions and proceeds from public/rights/preferential issues, requiring CEO/CFO certification of financial statements, improving disclosures to shareholders, better defining of independent directors, strengthening the responsibilities of audit committees, and requiring boards to adopt formal code of conduct. Enactments of above changes were deferred until January 2006 due to industry resistance to accept such comprehensive reforms.

3. Impact of *Clause 49* on Financing, Constraints, Investment, and Value

Enhanced disclosure of financial data results in lowering of information asymmetry or boosting the “corporate transparency”, where corporate transparency is defined by Bushman et.al. (2001) as the availability of firm specific information to outsiders. There is plenty of evidence to suggest that proper disclosure decreases costs of financing (Healy and Palepu, 2001; Verrechia, 2001), lowers a firm's bid-ask spread, improves analysts' coverage and stock liquidity (Welker, 1995; Healy et al,1999). Further, disclosure enables shareholder to monitor managers thereby improving project selection and reducing cost of financing.

3.1. Reduced information asymmetry and financing decisions

Adverse selection problem (Myers and Majluf, 1984) results when managers have private information unknown to investors. In anticipation of managers exploiting private information to issue overpriced securities, investors either ration capital (Myers and Majluf, 1984; Miller and Rock, 1985) or increase financing cost (Lambert et. al, 2007). An inevitable consequence is that managers are reluctant to raise external funding and, thus, depend heavily on internal source of funds.

On the other hand, disclosure enables shareholders to monitor managers, thereby improving project selection and reducing cost of financing (Healy and Palepu, 2001; Verrechia, 2001). Consistent with the argument, Botosan (1997) documents a negative relation between a firm's level of voluntary disclosure and its cost of equity capital. Sengupta (1998) finds that good quality financial disclosure reduces the lender's' perception of default risk and hence reduces the cost of debt. To sum, higher disclosure results in reduced information asymmetry which in turn acts as a mechanism for reduction in cost of external financing (Balakrishnan et. al, 2014).

Given the nature of business environment, Indian firms are expected to rely more heavily on internal financing (than external financing) in the pre-reform period. Higher disclosure because of rule change is expected to mitigate adverse selection problem and improve information environment. The reform should lower the contracting costs of adverse selection in the post-reform period relative to that of the pre-reform period, which, in turn, should facilitate greater use of external financing post-reform. Thus, we hypothesize

Hypothesis 1A: Indian firms will increase their external financing in the post-reform period relative to the pre-reform period.

Hypothesis 1B: The ratio of internal to external capital would decrease in the post-reform period relative to the pre-reform period.

3.2. Reduced information asymmetry and financial constraints

In frictionless capital markets, investment decisions of a firm should be a function of firm's investment opportunities and be independent of the firm's financing decisions. In presence of friction, investment decisions become dependent upon the availability of internal funds. As a result, managers adopt/change financial policies to ensure sufficient financing for important investments. Under such a scenario, effect of incremental cash flow on firms' investment and cash holdings should be higher (Erel et. al. 2013). Fazzari, Hubbard and Petersen (1988) and others have documented a robust relation between a firm's cash flows and its investments.

In the same vein, Almeida, Campello, and Weisbach (2004) suggest that firms facing financial constraints will choose to allocate additional cash flows to increase their investments both today and, in the future, implying that the fraction of cash retained by a firm from incremental cash flows reflects management's own view on whether the firm is likely to face financial constraints in the future. Investment sensitivity of cash flow measures the effect of constraints on today's investment, while the cash sensitivity to cash flow reflects management's assessment of future constraints (Erel et. al., 2013).

In the context of Indian firms, we expect a positive relation between incremental cash flow on firms' investment and cash holdings in the pre-reform period. The reform should relax financial constraints facing Indian firms in the post-reform period. The sensitivity should decrease in the post- reform period as more funds become available to firms owing to increased transparency. Hence, we predict the following:

Hypothesis 2: Sensitivity of cash to cash flow and sensitivity of investment to cash flow should decline in the post reform period relative to the pre-reform period.

3.3. Reduced information asymmetry and investment decisions

Investment is considered efficient at the optimal level where firm's value is maximized. Information asymmetry leads to costly financing which in turn deters managers from taking up some projects that would have been accepted if the information asymmetry and resulting cost of capital was lower. There is a growing literature providing evidence that improved financial reporting positively affects firms' investment opportunity schedule (Hope and Thomas, 2008; Biddle et al., 2009; Beatty et al., 2010; and Cheng et al. 2013) as projects that were rejected in the past because of higher cost of capital have now become acceptable on account of lower hurdle rates.

In the context of *Clause 49*, we expect firms to pass up investment opportunities due to costly external financing stemming from adverse selection. *Clause 49* brings in stricter disclosure rules which reduces information asymmetry and encourages external fund suppliers to supply funds at a lower cost than they might have demanded in the pre-clause period. Investments in the post clause period, are expected to be stimulated because of cheaper funding opportunities. Thus, we hypothesize,

Hypothesis 3A: Investment level will increase significantly in post-reform period as compared to pre-reform period.

Hypothesis 3B: Cash level will decrease significantly in post-reform period as compared to pre-reform period.

3.4. *Reduced information asymmetry and firm performance*

Finally, to complete the picture, we show and expect investment efficiency attributed to more stringent (and more rigorously monitored) disclosure requirements should lead to better market performance of Indian firms. This question though, has already been taken up by Dharmapala and Khanna (2013) where they provide evidence of an increase in firm value due to the rule change. We provide an incremental contribution by looking at whether the improved performance is as result of increase in investment efficiency.

Hypothesis 4: Performance improvement positively related to investment improvement.

4. Data, sample, and variables

4.1. *Main sample and Subsamples*

We obtain data via ProwessIQ from Centre for Monitoring Indian Economy (CMIE) database. CMIE is Mumbai based research organization that provides financial performance of 48,977 companies. Both accounting and market data are extracted from the CMIE database. Cross listing data are retrieved from London Stock exchange, Luxembourg stock exchange and website www.topforeignstocks.com.

The initial sample comprises of listed Indian firms covering 1996 through 2008 with 18,900 firm-year observations. We exclude the financial firms that operate with NIC code 64, 65 and 66 and consist of commercial banks, insurance companies, diversified financial services, and brokerage houses. We start the sample period from 1996 because of missing variables prior to 1995. We define 1996- 2000 as the pre-clause period, 2001-2005 as the transition period (as the provisions of the reform could not be fully implemented due to industry resistance to accept comprehensive reforms), and 2006-2008 as the post-clause period. Post 2008 data is not included

because of two reasons: 1) we attempt to avoid distortions in the accounting and financial data caused by the onset of financial crisis that began at the end of 2008³, and 2) starting April 2011, Indian firms are required to present their financial data in accordance with revised schedule VI disclosure format of Companies' Act, 1956, making it mandatory for companies to broadly classify their assets and liabilities into 'Current' and 'Non-current' categories. Such detailed information was not available for the years prior to 2011, making it difficult to compare post-2011 period with the pre-2011 period.

For robustness checks, we divide the full sample in finer subsamples. First subdivision is based on whether the firm is listed on Indian exchanges only or it is cross-listed (i.e., domestic as well as foreign exchanges). We call the first group *cross-listed* or *CL* and second group as *non-cross-listed* or *NCL*. We have 1,115 *NCL* and 31 *CL* firms in our sample. Cross listing data is retrieved from London Stock Exchange, Luxembourg Stock Exchange and website topforeignstocks.com. Second, *NCL firms* are further subdivided in 3 groups: 1) firms with paid up share⁴ capital of Rs. 100 million and above, or net-worth of Rs. 250 million or more at any time in the history of the company, as on January 1, 2000 are termed as *NCL-Large*⁵; 2) firms having a paid-up share capital of Rs. 30 million and above (but below Rs. 100 million) are defined as *NCL-Small*; and 3) the firms not fulfilling the criteria for the above two *NCL* groups are defined as group of *Excluded firms* or *EF* group.⁶

³ The global financial crisis seemed to hit Indian market in the last quarter of 2008 (Kumar et al 2009). Our sample period from 2006-2008 is expected to be not affected by the crisis.

⁴ Paid-up share capital: This data includes paid-up values of equity shares that have been subscribed and allotted. It does not include amount that a company over and above its face value if it issues security at a premium. That amount is reflected via Security Premium reserves. We sum paid-up share capital and security premium reserves to get book value of equity capital.

⁵ INR-USD conversion rate for March 31, 2000 was 43.62

1 crore=10 million

₹10 crore =₹100 million=\$4362 million

⁶ These *EF* firms happen to be the smallest firms in our sample when sorted on paid-up equity capital.

Table 1 : Distribution of Sample

Distribution of a sample of 1260 firms over the period 1996-2008. These firms are divided into groups based on their conformity to *Clause 49*. Firms with paid up share capital of more than Rs. 30 million are subjected to the rule change and are defined as conforming firms while the ones that are waived from conforming are excluded firms (*EF firms*). Conforming firms are then further divided into cross listed firms (*CL firms*) and domestically listed (*NCL Firms*). Further, conforming domestically listed firms (*NCL Firms*) are divided into groups based on their size. Firms with a paid-up share capital of Rs. 30 million and above are defined as *NCL_Small firms*, while firms with paid up share capital of Rs. 100 million and above, or net-worth of Rs. 250 million or more at any time during the sample period are termed as *NCL_Large firms*. All firm level data for accounting variables is obtained from CMIE-Prowess database. List of cross listed firms is retrieved from London Stock exchange, Luxembourg stock exchange and website topforeignstocks.com.

	# of Firms	# of Firm-Year Obs.
Total	1260	18900
Conforming Firms	1146	17190
Domestically Listed Firms	1115	16725
NCL Small Firms	481	7215
NCL Large Firms	634	9510
Cross Listed Firms	31	465
Non-Conforming Firms	114	1710

4.2. Variables

Measures of Capital:

For all the firms and the sub group of firms in our sample, we classify the financing channels in following categories:

- 1) $TBorrEq$ = It is the sum of equity capital and borrowing deflated by total assets. It represents total external financing for any firm. Equity capital is the sum of paid up share capital and

security premium reserves where paid up equity capital is the face value of shares subscribed to by the common shareholders and security premium reserves accounts for any premium paid over the face value. Borrowing is the sum of debt from all sources including banks, financial institution, corporate and individuals and others. CMIE Prowess database provides detail information on possible sources of borrowing. We expect $TBorrEq$ to increase in the post-reform period.

- 2) $TBondEq$ = It is the sum of equity capital and bonds deflated by total assets. It represents funding from market. Though bonds are very small part of the total lending from external sources, this variable has the higher probability of being affected by the rule change. Out of the constituents of total external financing, we assume that funds⁷ raised from capital market would be subjected to more information asymmetry as compared to other components of borrowing⁸. For example, borrowings from banks and financial institution generally require information via private channels and as such are less likely to be affected by the *Clause 49*⁹. Indeed, we expect $TBondEq$ to witness a greater impact of *Clause 49* as compared to $TBorrEq$.
- 3) $RE/ExtFin$ = It is the ratio of total internal financing sourced from retained earnings to total external financing i.e $TBorrEq$. The ratio is expected to gauge the relative change in internal financing as compared to external financing. We expect this ratio to decline in the post reform period.

⁷ Borrowing from market is the outstanding value of funds raised by a company through issue of debentures and bonds.

⁸ There are alternate channels of borrowing (Allen et.al, 2012, not to directly affected by *Clause 49*, hence not taken up in the analysis.

⁹ For more detail on break up borrowing, read *Love, Inessa, and Maria Soledad Martinez Peria. Firm Financing in India: Recent Trends and Patterns. Vol. 3476. World Bank Publications, 2005.*

They suggest that among different financing sources of financing, “Bank borrowing” represents the largest category (averaged 47% of total borrowing), “borrowing financial institution” averaged 22% of Total, “Borrowing from corporations” averaged over 9%. On the other hand, public borrowing and foreign borrowing are relatively small fractions of total borrowing, averaging less than 1 and 5 percent of total borrowing, respectively.

Measures of Investment:

- 1) *Capex*= It is the investment in fixed assets and measured as change in gross fixed asset (GFA) plus sale of PPE divided by total assets (TA)

$Capex = [GFA_t - GFA_{t-1} + Sale\ PPE_t] / TA_t$. It denotes long -term investment of a firm.

- 2) *Investment*= It is the investment in total assets and measured as change in total asset plus sale of PPE normalized to total assets in t-1.

$Investment = [TA_t - TA_{t-1}] / TA_{t-1}$. It denotes investment in both current assets and fixed assets of a firm.

- 3) *CapexRD*= It is the investment in fixed assets and research and development of a firm. It is measured as change in gross fixed assets plus R&D expenses in the year t plus sale of PPE in year t normalized to total assets in t-1.

$CapexRD = [GFA_t - GFA_{t-1} + Sale\ PPE_t + R\&D_t] / TA_t$. It denotes both long -term investment and current investment of a firm.

Measures of Financial Slack:

- 4) *Cash* = Cash and cash equivalents of a firm is used to represent short term liquidity of a firm.

It is deflated to total assets.

Measures of Performance:

- 1) *ROA* = Return on assets is used to proxy for market performance of the firm.
- 2) *TobinQ* = Tobin's Q is used as another proxy for growth in market. It is measured as total assets plus market value of equity minus book value of equity divided by total assets.

Control variables:

- 1) *Size* = It is defined as the log of total assets.

- 2) *CashFlow* = It is proxy of liquidity of the firms and is defined as the sum of profit after tax and depreciation and amortization deflated to total assets of the firm.
- 3) *EBDITA* = It is the profit before depreciation interest and taxes deflated by total assets.
- 4) *Salesgrowth* = It is the change in sales from year to t-1 to t as a percent of sales in year t-1. It is proxied for investment opportunities of a firm.
- 5) *M_B* = Another proxy for investment opportunities is the market to book ratio of a firm. It is defined as the ratio market capitalization to book value of equity.
- 6) *STDROA* = The measure of volatility in earning is given by this variable. *STDROA* is obtained from 5 years rolling standard deviation for variable Profits before depreciation, interest and taxes and amortization.
- 7) *GDP* = It is the annual growth in gross domestic product in India. The data is obtained from the World Bank website. It is a proxy used to control for macro-economic changes in India.
- 8) *InterestRate* = Another proxy to control for macro-economic changes is given by prime lending rate in India

Reform Period:

- 1) *TD* = Set to 1 for post period (2006-2008) and 0 for pre-period (1996-2000).

Sub-Samples:

- 1) *Classdummy* = It is an indicator variable set to 0 for stand-alone firms, 1 for IBG firms and 2 for state-owned firms.
- 2) *CL_NCL* = Set to 1 for *NCL firms* and 0 for *CL firms*.
- 3) *CL_NCLLarge* = Set to 1 for *NCL-Large firms* and 0 for *CL firms*.

- 4) *Large_Small* = Set to 1 for *NCL-Small firms* and 0 for *NCL-Large firms*.
- 5) *NA_NCLSmall* = Set to 1 for *NCL-Small firms* and 0 for *EF firms*.
- 6) *FCdummy* = 1 for financially constraint and 0 for less constraint firms
- 7) *Invdummy* = 1 for firms that showed under-investment using Richardson's measure in the pre-period and 0 for firms that over-invested in the pre period

5. Results

5.1. Summary statistics

We compare the summary statistics of sample and sub samples in this section. We divided the sample into industry following Mukherjee (2013). Table 2 shows that approx. 4% of the firms are agriculture based, more than 80% are manufacturing based heavy industries and approx. 15% of our sample are service based industries. There is a huge variation in the size of sample based on total assets. 39% of the sample have total assets of less than Rs. 500 million, 50% have TA in between Rs. 500 million to Rs. 10,000 million and the remaining 11% have total assets in excess to Rs. 10,000 million.

Further, Table 2 reports that firms in the NCL firms are younger and smaller as compared to the CL group of firms. The mean age of CL firms are 50 years while that of NCL firms are 28 years. EF firms belong in the lowest size group.

Table 2: Summary Statistics

This table provides summary statistics for the sample. The dataset comprises 18,900 firm year observation from 1260 firms covering the period from 1996-2008. The summary includes distribution of total assets of the firms and their industry classification. The firms are classified using *national industry classification* (NIC)-2008 issued by *Ministry of Statistics and Programme Implementation, Government of India*.

table 2 continued

Distribution of Assets (in rupees million):

Total Assets	Freq.	Percent
Less than 500	7,365	38.97
Between 500 and 10, 000	9,452	50.01
More than 10,000	2,083	11.02
Total	18,900	100

Industry Classification:

Industry	Frequency	Percent
Agriculture	735	3.89
Manufacturing	15,330	81.11
Service	2,835	15
Total	18,900	100

5.2. *Financing*

Hypothesis 1 asserts that, in an opaque market, managers attempt to void external financing and rely more heavily on internal sources of financing. We use the following steps to test the hypothesis.

Higher disclosure is expected to mitigate adverse selection problem and improve information environment. Increase in transparency and information availability is likely to reduce the contracting cost between firms and investors which in turn, would allow managers to have increased access to capital.

5.2.1. *Univariate analysis*

We compare the level of financing of the sample firms in the pre-reform and post reform period. We expect the measures of financing to increase in post reform period. Table 3 presents

summary statistics in both pre-period and post-period. The difference test shows whether the increase is significantly different from zero.

Table 3 : Financing Descriptive

This table presents the univariate results for the financing variables in the pre-reform and post-reform period. We have three measures of financial variables: 1) *TBorrEq* is total external financing measured as a sum of total equity capital and total borrowings by firms, 2) *TBondEq* is the market-based financing measured as a sum of total equity capital and public borrowings (bonds) by firms, 3) *RE/TBorrEq* is measured as a ratio of internal to external financing measures as *Retained earnings (RE)* divide by *TBorrEq*. All firm level data is obtained from CMIE-Prowess database. List of cross listed firms is retrieved from London Stock exchange, Luxembourg stock exchange and website topforeignstocks.com.

Panel A denotes all firms as a sample. Panel B summarizes *Cross-Listed (CL)* firms in the sample, Panel C denotes domestic firms subjected to *Clause 49 (NCL)* firms. Panel D and E are *NCL_Large and NCL_Small* group of firms. Panel F denotes firms that are waived from *Clause 49 (NA)* firms. Data with suffix “Pre” denotes value in the Pre-reform period (1996-2000) while those with suffix “Post” denotes data value in post reform period (2006-2008). We assess the difference in means using the mean difference test and median using Wilcoxon-Mann-Whitney test. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

	Mean				Median		
	Pre	Post	Diff	P-Value	Pre	Post	P-Value
Panel A: All Firms							
EqTA	0.261	0.231	-0.030	0.000	0.218	0.159	0.0000
BorrTA	0.391	0.408	0.018	0.002	0.379	0.348	0.0000
TBorrEq	0.653	0.646	-0.007	0.352	0.625	0.548	0.0000
TBondEq	0.287	0.246	-0.042	0.000	0.252	0.168	0.0000
Ratio	0.054	0.108	0.053	0.000	0.042	0.095	0.0000
Panel B: CL Firms							
EqTA	0.205	0.127	-0.078	0.000	0.201	0.117	0.0000
BorrTA	0.350	0.262	-0.088	0.000	0.377	0.248	0.0000
TBorrEq	0.554	0.389	-0.165	0.000	0.579	0.378	0.0000
TBondEq	0.275	0.150	-0.125	0.000	0.281	0.140	0.0000
Ratio	0.089	0.353	0.264	0.000	0.036	0.195	0.0000

table 3 continued

Panel C: NCL Firms

EqTA	0.274	0.245	-0.029	0.000	0.232	0.171	0.0000
BorrTA	0.393	0.419	0.026	0.000	0.383	0.357	0.0012
TBorrEq	0.668	0.672	0.004	0.610	0.642	0.564	0.0000
TBondEq	0.301	0.261	-0.040	0.000	0.264	0.182	0.0000
Ratio	0.057	0.093	0.036	0.000	0.041	0.093	0.0000

Panel D: NCL_Large Firms

EqTA	0.217	0.203	-0.014	0.011	0.183	0.140	0.0000
BorrTA	0.402	0.414	0.012	0.112	0.397	0.360	0.0000
TBorrEq	0.620	0.624	0.004	0.684	0.598	0.528	0.0000
TBondEq	0.257	0.225	-0.032	0.000	0.227	0.152	0.0000
Ratio	0.072	0.130	0.058	0.000	0.040	0.098	0.0000

Panel E: NCL_Small Firms

EqTA	0.349	0.301	-0.048	0.000	0.301	0.222	0.0000
BorrTA	0.382	0.426	0.044	0.000	0.356	0.355	0.5668
TBorrEq	0.732	0.736	0.004	0.751	0.693	0.616	0.0000
TBondEq	0.357	0.308	-0.049	0.000	0.311	0.229	0.0000
Ratio	0.039	0.045	0.006	0.592	0.042	0.085	0.0000

Panel E: EF Firms

EqTA	0.153	0.122	-0.032	0.002	0.104	0.082	0.0000
BorrTA	0.377	0.340	-0.036	0.043	0.344	0.310	0.0629
TBorrEq	0.537	0.462	-0.075	0.001	0.476	0.444	0.0026
TBondEq	0.159	0.123	-0.036	0.001	0.109	0.082	0.0000
Ratio	0.014	0.186	0.172	0.000	0.050	0.104	0.0000

The result in Table 3 shows the mean value of measures of financing for all firms and sub group of firms. Comparing it across time, we find that *TBorrEq* (total external financing) does not change for the NCL firms (large or small). The result implies that during the pre-period when opacity prevailed, it is likely that firms predominantly relied on some channels of external borrowing (i.e., borrowing from banks and financial institutions). However, in the post period, an

increase in transparency changed the relative cost of different components of capital and opened more funding channels for the firms. So, firms can change the optimal blend of capital if they do not require to increase the level of capital just because they will have more choices in the post-period relative to the pre-period.

Before jumping to any conclusion, we evaluate the effect of increased transparency on firms' means of financing through regression controlling statistically for other factors in the next section. After all, we cannot base our findings solely on univariate results.

5.2.2. *Fixed effects estimation*

We estimate multivariate models predicting firms financing decision likely to be associated with change in information environment due to *Clause 49*. Estimating the following specification, we evaluate whether and how our measures of financing changes for domestic (*NCL*) firms when the rule is strictly implemented:

$$Y = \alpha_0 + \alpha_1 TD + \beta_i X_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

TD takes on value equal to 1 for period 2006-2008 and 0 for 1996-2000. The value of *TD* is chosen as such to allow us to strictly compare the difference between the timeline when *Clause 49* was non-existent to the point when it was strictly enforced. It is said that no enforcement is as good as no rule. The strict enforcement of these rules came into effect from January 2006, allowing firms to strategize their position according to the changed rule and adjust to it. This enables us to get a clearer picture of how *Clause 49* affected Indian firms. Controlling for other factors, the positive and significant coefficient of *TD* represents an increase in *Y* in the post period due to the rule change.

Further, we include a group dummy (*GD*) for sub sample of firms and an interaction term of the *GD* with *TD* that allows us to predict and compare the change for one group of firms with other. In terms of the level asymmetry from the lowest to highest in the pre-reform period, we rank $CL < NCL_Large < NCL_Small < NA$. We hypothesize that the lower the asymmetry, the lower is the expected impact of the reform in the post-reform period. We choose four group dummies each of which is set to 1 if firm belongs to a subset of higher level of information asymmetry and it is set to 0 if firms belong to subset of lower information asymmetry level. The definition of all group dummies is included in Appendix 1. Models including GDs are explained below.

We believe that firms listed on similar or better stock exchanges than India would need to comply with even stricter disclosure requirements. As such, *Clause 49* would not cause much change to their disclosure practices. We use *CL_NCL* (*CL_NCLLarge*) as group dummy set to 1 for *NCL firms* (*NCL-Large firms*) and 0 for *CL firms*. The regression model using this dummy is shown in equation (2) and (3). It helps us analyze the effect of *Clause 49* and document the changes from pre-reform to post reform period across *NCL-Large/NCL* and *CL* firms. Equation (4) models the comparison between *NCL-Large* and *NCL-Small* firms. We expect smaller firms to be information asymmetric in the pre-period and hence expect larger effects of transparency on such firms with respect to large-sized firms. We choose the dummy *Large_Small* to be 1 for *NCL-Small firms* and 0 for *NCL_Large* firms. A similar comparison can be done on treated group of firms that were subject to *Clause 49* (*NCL firms*) and control groups of firms that were not subject to the rule change (*EF firms*). Equation (5) allows us to analyze the effect of *Clause 49* and document the changes from pre-reform to post reform across firms subjected to *Clause 49* and firms waived from the same.

In terms of the level asymmetry from the lowest to highest in the pre-reform period, we rank $CL < NCL_Large < NCL_Small < EF$. We hypothesize that the lower the asymmetry, the lower is the expected impact of the reform in the post-reform period. So, we expect *NCL firms* (both *NCL_Large* and *NCL_Small*) to resort to financing behavior as depicted in Hypotheses 1 and 2. We do not make any prediction about the financing behavior of *EF firms* or *CL firms*, except that their after-reform behavior is not likely to be different from their behavior in the pre-reform period.

The basic empirical model testing the hypothesis is as per the following:

$$Y = \alpha_0 + \alpha_1 TD + \alpha_2 NA_NCL + \alpha_3 (NA_NCL * TD) + \beta X_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

$$Y = \alpha_0 + \alpha_1 TD + \alpha_2 CL_NCLLarge + \alpha_3 (CL_NCLLarge * TD) + \beta X_{it} + \mu_i + \varepsilon_{it} \quad (3)$$

$$Y = \alpha_0 + \alpha_1 TD + \alpha_2 Large_Small + \alpha_3 (Large_Small * TD) + \beta X_{it} + \mu_i + \varepsilon_{it} \quad (4)$$

$$Y = \alpha_0 + \alpha_1 TD + \alpha_2 EF_NCLSmall + \alpha_3 (EF_NCLSmall * TD) + \beta X_{it} + \mu_i + \varepsilon_{it} \quad (5)$$

The above models are fixed effect regressions using industry fixed effects to control for the differences in other characteristics between the sample and control groups. Y is the firms' sources of financing. TD is the dummy variable, set to 1 in the post reform period and 0 in the pre-reform period. The term μ_i denotes industry fixed effect and ε_{it} is the error term. The coefficient α_1 will capture the effect of transparency on financing variable (Y) by comparing the average change over time i.e pre-clause to post-clause for the control group¹⁰. Sum of coefficients ($\alpha_1 + \alpha_3$) will capture similar difference (pre to post) in Y for the treatment group. The coefficient α_3 of the interaction term will capture the effect on Y by comparing the average change over time in the treatment group as compared to control group.

10 Coefficient α_1 in equation 2(5) captures difference for CL(EF) firms. Likewise, coefficient $\alpha_1 + \alpha_3$ in equation 2(5) captures difference for NCL-Large (NCL-Small) firms.

X_{it} is the vector of control variables and ε_{it} is the error term in models represented by equations 1 through 5. In the basic specification, the model includes the following variables. To control for changes at the firm-level, *capital expenditure* is used as a measure of gross-investment, *log of total assets* to control for firm's size, *Cash flow from operations* is controlled for as a measure of liquidity and *Sales growth* to control for firms' growth opportunities. Alternatively, *Earnings before depreciation interest and taxes* is used instead of Cash flows and *Market -to-Book ratio* is used instead of *Sales Growth*.¹¹ To control for changes in the risk associated with firm's stock over time, a measure of volatility in earnings (*STDROA*) is included. An indicator variable, *Classdummy* is used to control for whether firm belong to an Indian Business Group (IBG) or a stand-alone firm. *Classdummy* is set to 1 for firms in Indian Business Groups and 0 for stand-alone firms. The regression model also includes *GDP* and *Interest rates* to control for macro-economic changes. To control for any differences in raising finances over boom period in India and to capture any industry-specific effect on financing decisions, we include industry dummies in the analysis.

The result for fixed effect regression is shown in Table 4 and discussed below. Panel A shows results for all firms, panel B(C) compares the level of financing between NCL(NCL-Large) and CL firms, panel D compares between NCL-Large and NCL-Small firms. In each panel, there are three columns where column 1, 2 and 3 illustrates results for *TBorrEq*, *TBondEq* and *RE/Exfin* respectively¹².

¹¹ Results for alternate specifications are not shown in the paper for the brevity of the paper. The result remains the same as of basic specification shown in the paper.

¹² We also perform one regression comparing entire NCL firms against CL (as equation 4) firms and another comparing NCL firms against EF firms (as equation 5). Results for equation 4 is similar to equation 2 while that of equation 5 is similar to equation 3 respectively.

Table 4 : Estimating level of financing

The table represents results for level of financing measures using Fixed effects regression model. The sample includes 1280 firms across the years 1996-2008. There are 4 panels in this table. Panel A presents all firms as a sample; panel B compares *CL firms to NCL firms*; Panel C compares *CL firms to NCL_Large firms*; Panel D compares *NCL_Large firms to NCL_Small firms*. There are 3 columns in all these panels. The dependent financial variables (1) *TBorrEq* defined as external financing from all possible sources and measured as sum of borrowing and equity is shown in column 1, (2) *TBondEq* defined as market based financing and measured as sum of public borrowing and equity is shown in column 2, and (3) *RE/TBorrEq* defined as ratio of internal financing to external financing and measured as *Retained Earnings* over *TBorrEq* is shown in column 3 respectively.

TD is the dummy variable with value 1 in post clause period (2006-2008) and 0 in the pre-clause period (1996-2000). *CL_NCLLarge(CL_NCL)* is the indicator variable with value 1 for *NCL_Large firms(NCL)* and 0 for *CL firms*. *Large_Small* is the indicator variable set to 1 for *NCL-Small firms* and 0 for *NCL_Large firms*. *NA_NCLSmall* is the dummy with value 1 for *NCL-Small firms* and 0 for *EF firms*. *Interaction* term shown in all columns captures the effect on *Y* by comparing the average change over time in the *treatment firm* as compared to *the control firms*. Other control variables are explained below.

Classdummy is an indicator variable with value equal to 1 for firms belonging to Indian Business groups and 0 for stand-alone firms. *Size* is measured as log of total assets, *Capex* is the gross investment measured as change in gross fixed asset plus assets sales deflated by total assets. *Cash Flow* is sum of profit after tax and depreciation of the firm deflated by total assets. *Salesgrowth* change in sales from year (t-1) to t divided by sales in year (t-1). *STDROA* is obtained from 5 years rolling standard deviation for variable Profits before depreciation, interest and taxes. *Interest Rate* is the annual prime lending rate in India and *GDP* is the growth rate in gross domestic product for Indian economy, both data fetched from World Bank. All firm level data is obtained from CMIE-Prowess database. Standard errors are shown in parentheses. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

table 4 continued

Panel A: Fixed effects for all firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0623*** (0.00864)	0.00773* (0.00467)	0.00345 (0.00871)
Size	-0.0618*** (0.00329)	-0.0485*** (0.00178)	0.0422*** (0.00331)
Capex	-0.184*** (0.0461)	-0.214*** (0.0249)	0.284*** (0.0466)
Cash Flow	-0.708*** (0.0290)	-0.149*** (0.0157)	0.592*** (0.0287)
Sales Growth	-0.0163 (0.0104)	0.000993 (0.00560)	0.0147 (0.0104)
STDROA	0.0000165*** (0.00000337)	0.0000149*** (0.00000182)	-0.0000121*** (0.00000336)
GDP	0.00213 (0.00210)	0.000470 (0.00113)	-0.00396* (0.00211)
Interest Rate	-0.00329 (0.00597)	-0.00255 (0.00322)	-0.00285 (0.00600)
Class Type	-0.0120 (0.0101)	0.00615 (0.00543)	-0.0586*** (0.0102)
Constant	0.994*** (0.0913)	0.594*** (0.0493)	-0.193** (0.0918)
Industry Fixed Effect	Yes	Yes	Yes
Observations	7166	7166	6852
Adjusted R^2	0.2373	0.2222	0.1462

table 4 continued

Panel B: Fixed effects CL Vs. NCL firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	-0.145*** (0.0508)	-0.136*** (0.0266)	0.199*** (0.0502)
CL_NCL	-0.187*** (0.0354)	-0.190*** (0.0185)	0.193*** (0.0354)
TD*CL_NCL	0.229*** (0.0513)	0.159*** (0.0268)	-0.221*** (0.0508)
Size	-0.0840*** (0.00365)	-0.0687*** (0.00191)	0.0567*** (0.00359)
Capex	-0.178*** (0.0478)	-0.204*** (0.0250)	0.241*** (0.0475)
CashFlow	-0.687*** (0.0294)	-0.139*** (0.0154)	0.558*** (0.0285)
Salesgrowth	-0.0266** (0.0112)	-0.00345 (0.00585)	0.0310*** (0.0109)
STDROA	0.0000202*** (0.00000362)	0.0000162*** (0.00000190)	-0.0000142*** (0.00000352)
GDP	0.00219 (0.00218)	0.000532 (0.00114)	-0.00395* (0.00214)
InterestRate	-0.00297 (0.00621)	-0.000739 (0.00325)	-0.00171 (0.00611)
ClassType	0.0157 (0.0108)	0.0325*** (0.00568)	-0.0780*** (0.0107)
Constant	1.408*** (0.104)	0.936*** (0.0546)	-0.494*** (0.103)
Industry Fixed Effect	Yes	Yes	Yes
Observations	6491	6491	6215
Adjusted R^2	0.2679	0.2978	0.1653

table 4 continued

Panel C: Fixed effects CL Vs. NCL-Large firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	-0.125*** (0.0472)	-0.118*** (0.0258)	0.187*** (0.0500)
CL_NCLLarge	-0.148*** (0.0342)	-0.128*** (0.0187)	0.145*** (0.0367)
TD*CL_NCLLarge	0.207*** (0.0481)	0.133*** (0.0263)	-0.186*** (0.0509)
Size	-0.0820*** (0.00517)	-0.0509*** (0.00282)	0.0536*** (0.00545)
Capex	-0.169*** (0.0575)	-0.198*** (0.0314)	0.181*** (0.0617)
CashFlow	-0.742*** (0.0345)	-0.182*** (0.0188)	0.598*** (0.0358)
Salesgrowth	-0.0174 (0.0148)	0.00440 (0.00807)	0.0477*** (0.0156)
STDROA	0.0000159*** (0.00000351)	0.00000947*** (0.00000192)	-0.0000124*** (0.00000365)
GDP	0.000779 (0.00266)	0.000677 (0.00145)	-0.00338 (0.00280)
InterestRate	-0.00250 (0.00750)	0.00197 (0.00410)	-0.00245 (0.00791)
ClassType	-0.0351*** (0.0135)	0.0144* (0.00735)	-0.0601*** (0.0142)
Constant	1.400*** (0.127)	0.713*** (0.0690)	-0.372*** (0.134)
Industry Fixed Effect	Yes	Yes	Yes
Observations	3741	3741	3568
Adjusted R^2	0.2957	0.2140	0.1756

table 4 continued

Panel D: Fixed effects NCL Large Vs. NCL Small firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0862*** (0.0121)	0.0269*** (0.00622)	-0.00295 (0.0121)
Large_Small	-0.168*** (0.0145)	-0.106*** (0.00747)	0.0980*** (0.0146)
TD*Large_Small	0.0262 (0.0171)	0.00993 (0.00881)	-0.0611*** (0.0171)
Size	-0.130*** (0.00465)	-0.1000*** (0.00239)	0.0754*** (0.00461)
Capex	-0.136*** (0.0482)	-0.172*** (0.0248)	0.239*** (0.0483)
CashFlow	-0.691*** (0.0293)	-0.144*** (0.0151)	0.559*** (0.0287)
Salesgrowth	-0.0243** (0.0111)	-0.00226 (0.00573)	0.0298*** (0.0110)
STDROA	0.000131*** (0.0000110)	0.0000962*** (0.00000566)	-0.0000479*** (0.0000108)
GDP	0.00208 (0.00220)	0.000446 (0.00113)	-0.00363* (0.00218)
InterestRate	-0.00514 (0.00627)	-0.00169 (0.00323)	-0.000331 (0.00623)
ClassType	-0.00471 (0.0110)	0.0199*** (0.00568)	-0.0698*** (0.0111)
Constant	1.614*** (0.1000)	1.002*** (0.0514)	-0.482*** (0.0995)
Industry Fixed Effect	Yes	Yes	Yes
Observations	6298	6298	6034
Adjusted R^2	0.2915	0.3460	0.1737

table 4 continued

Panel E: Fixed effects NCL-Small Vs. EF firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0959*** (0.0260)	0.0871*** (0.0116)	0.0916*** (0.0273)
NA_NCLSmall	0.247*** (0.0201)	0.227*** (0.00897)	-0.0336 (0.0212)
TD*NA_NCLSmall	0.00689 (0.0283)	-0.0466*** (0.0126)	-0.143*** (0.0297)
Size	-0.193*** (0.00712)	-0.161*** (0.00318)	0.101*** (0.00739)
Capex	-0.0297 (0.0671)	-0.0799*** (0.0300)	0.328*** (0.0696)
CashFlow	-0.650*** (0.0449)	-0.109*** (0.0201)	0.582*** (0.0460)
Salesgrowth	-0.0188 (0.0133)	-0.00424 (0.00594)	-0.00794 (0.0137)
STDROA	0.00143*** (0.000102)	0.000918*** (0.0000457)	-0.000820*** (0.000105)
GDP	0.00332 (0.00294)	-0.0000741 (0.00131)	-0.00407 (0.00306)
InterestRate	0.00231 (0.00846)	0.000196 (0.00379)	-0.00210 (0.00881)
ClassType	0.00166 (0.0147)	-0.00250 (0.00656)	-0.0529*** (0.0155)
Constant	1.333*** (0.131)	0.964*** (0.0584)	-0.528*** (0.136)
Industry Fixed Effect	Yes	Yes	Yes
Observations	3425	3425	3284
Adjusted R^2	0.3456	0.5635	0.1818

Consistent with the hypothesis, column 1 in panel A shows that *TBorrEq* is positive and significant for all firms. It implies that there is a significant increase in the total external financing of firms measured as a percentage of total assets. The result is significant at 1% level of significance. Column 1 in panel B depicts that *TBorrEq* increases significantly for non-cross-listed firms while it decreases for cross listed firms when compared from pre-clause period to post clause period.¹³ This is consistent with our hypothesis that after-reform behavior for cross listed firms is not expected to be different from their behavior in the pre-reform period. However, it is the coefficient of the interaction term α_3 that is of particular interest to us. It denotes the difference over time in the average difference of financing measure in the two group of firms. A positive and significant interaction term implies that the increase in total external financing for *NCL firms* from pre to post is significantly higher than that for *CL firms*.

Column 2 in each panel illustrates results for market based external financing *TBondEq*. Panel A shows that *TBondEq* increases significantly for all firms. Panel B/C shows that *TBondEq* increases for *NCL/NCL-Large* firm¹⁴ respectively while it decreases for *CL* firms. The interaction term is positive and significant indicating an increase in *TBondEq* for *NCL/NCL-Large* firms with respect to *CL* firms in the post period.

Column 3 in each panel represents regression for financing measure *RE/Exfin*. Panel B shows that the ratio of internal to external financing decreases for *NCL* firms¹⁵ in the post reform period. It suggests that internal financing (numerator) increases (since external financing is increasing), causing *RE/Exfin* to decrease. The interaction term in panels B and C is negative and

¹³Column 1 in Panel B: $\alpha_1 = -0.125$ (significant) and Coefficient $\alpha_1 + \alpha_3 = 0.207 - 0.125 = 0.082$ (significant). Significance of sum of coefficient is tested using t-test.

¹⁴ Column 2 in Panel B: $\alpha_1 = -0.118$ (significant) and Coefficient $\alpha_1 + \alpha_3 = 0.133 - 0.118 = 0.015$ (significant). Significance of sum of coefficient is tested using t-test.

¹⁵ Sum of coefficients: $\alpha_1 + \alpha_3 = 0.199 - 0.221 = -0.22$ (negative and significant)

significant showing a relative decrease in the RE/Exfin of *NCL/NCL_Large* firms as compared to *CL firms*. Panel D demonstrates that the ratio of internal to external financing decreases for both NCL-Small and NCL-Large firms in the post reform period. However, as information asymmetry is expected to be higher in smaller firms and hence we expect the increase in external funding to be higher relative to internal funding. Consistent with our hypothesis, we find that NCL-Small firms subject to reform increased their external capital more relative to internal capital. The change was higher for NCL-Small firms, relative to NCL_Large firms.

Analysing the control variables in all panels of Table 4, the result further indicates that bigger firms have less *TBondEq* and *TBorrEq* but higher *Ratio*. Firms incurring high capital expenditure have less external capital and more retained earnings. Firms with high volatility in internal cash flows raise more external funding and retains less. Industry characteristics and macroeconomic variables like GDP growth and prime lending rate do not impact external financing raised by firms. Thus, we conclude that higher disclosure mandated through *Clause 49* does translate into higher external financing for firms subjected to the rule change.

The results are robust to alternate proxy for liquidity and sales growth of firms. For each column in each panel of Table 4, we find similar results after replacing *CashFlow* (cash flow from operations) with *EBDITA* (operating income) and sales growth with *M_B* (market to book ratio). Operating income is the firms' sales minus total operating cost, before depreciation and amortization, and is measured relative to total assets of the firm. Market to book ratio is the ratio of market value of equity to book value of equity. All our results remain unchanged with these proxies. We find that *TBorrEq*, *TBondEq* increases more for *NCL firms* as compared to *CL firms* while *Ratio* decreases more for *NCL firms* as compared to *CL firms*.

Further, we use Tobit model instead of fixed effect to account for the fact that the dependent variable is truncated and thus OLS may be mis-specified. We cannot have financing variable less than 0 or greater than 100 because of the scaled dependent variables. The results we get including Tobit model is qualitatively similar to the fixed effect regression result.

To conclude, it follows that there is an increasing reliance on total external financing among domestic listed Indian firms relative to the cross-listed firms in the post reform period.

Table 5 : Estimating level of financing

The table represents results for level of financing measures using Tobit model. The variables being scaled variables are truncated at 0 at the lower limit and at 1 at the higher level. The sample includes 1280 firms across the years 1996-2008. There are 4 panels in this table. Panel A presents all firms as a sample; panel B compares *CL firms to NCL firms*; Panel C compares *CL firms to NCL_Large firms*; Panel D compares *NCL_Large firms to NCL_Small firms*. There are 3 columns in all these panels. The dependent financial variables (1) *TBorrEq* defined as external financing from all possible sources and measured as sum of borrowing and equity is shown in column 1, (2) *TBondEq* defined as market based financing and measured as sum of public borrowing and equity is shown in column 2, and (3) *RE/TBorrEq* defined as ratio of internal financing to external financing and measured as *Retained Earnings* over *TBorrEq* is shown in column 3 respectively.

TD is the dummy variable with value 1 in post clause period (2006-2008) and 0 in the pre-clause period (1996-2000). *CL_NCLLarge(CL_NCL)* is the indicator variable with value 1 for *NCL_Large firms(NCL)* and 0 for *CL firms*. *Large_Small* is the indicator variable set to 1 for *NCL_Small firms* and 0 for *NCL_Large firms*. *NA_NCLSmall* is the dummy with value 1 for *NCL_Small firms* and 0 for *EF firms*. *Interaction* term shown in all columns captures the effect on *Y* by comparing the average change over time in the *treatment firm* as compared to *the control firms*. Other control variables are explained below.

Classdummy is an indicator variable with value equal to 1 for firms belonging to Indian Business groups and 0 for stand-alone firms. *Size* is measured as log of total assets, *Capex* is the gross investment measured as change in gross fixed asset plus assets sales deflated by total assets. *Cash Flow* is sum of profit after tax and depreciation of the firm deflated by total assets. *Salesgrowth* change in sales from year (t-1) to t divided by sales in year (t-1). *STDROA* is obtained from 5 years rolling standard deviation for variable Profits before depreciation, interest and taxes. *Interest Rate* is the annual prime lending rate in India and *GDP* is the growth rate in gross domestic product for Indian economy, both data fetched from World Bank. All firm level data is obtained from CMIE-Prowess database. Standard errors are shown in parentheses. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

table 5 continued

Panel A: Fixed effects for all firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0623*** (0.00861)	0.00773* (0.00465)	0.0705*** (0.00771)
Size	-0.0618*** (0.00328)	-0.0485*** (0.00177)	0.0203*** (0.00292)
Capex	-0.184*** (0.0459)	-0.214*** (0.0248)	0.117*** (0.0409)
CashFlow	-0.708*** (0.0289)	-0.149*** (0.0156)	0.828*** (0.0370)
Salesgrowth	-0.0163 (0.0103)	0.000993 (0.00558)	-0.00808 (0.00982)
STDROA	0.0000165*** (0.00000335)	0.0000149*** (0.00000181)	-0.00000883*** (0.00000285)
GDP	0.00213 (0.00209)	0.000470 (0.00113)	-0.00267 (0.00184)
InterestRate	-0.00329 (0.00594)	-0.00255 (0.00321)	0.00236 (0.00525)
ClassType	-0.0120 (0.0100)	0.00615 (0.00541)	-0.0321*** (0.00895)
Constant	0.994*** (0.0909)	0.594*** (0.0491)	-0.160** (0.0806)
Industry Fixed Effect	Yes	Yes	Yes
Observations	7166	7166	6852
Pseudo R^2	0.2973	-0.8298	0.2412

table 5 continued

Panel B: Fixed effects CL Vs. NCL firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	-0.145*** (0.0505)	-0.136*** (0.0264)	0.202*** (0.0433)
CL_NCL	-0.187*** (0.0352)	-0.190*** (0.0184)	0.135*** (0.0308)
TD*CL_NCL	0.229*** (0.0510)	0.159*** (0.0267)	-0.147*** (0.0437)
Size	-0.0840*** (0.00363)	-0.0687*** (0.00190)	0.0315*** (0.00321)
Capex	-0.178*** (0.0476)	-0.204*** (0.0249)	0.0725* (0.0418)
CashFlow	-0.687*** (0.0292)	-0.139*** (0.0153)	0.785*** (0.0371)
Salesgrowth	-0.0266** (0.0111)	-0.00345 (0.00582)	0.00357 (0.0105)
STDROA	0.0000202*** (0.00000361)	0.0000162*** (0.00000189)	-0.0000103*** (0.00000300)
GDP	0.00219 (0.00217)	0.000532 (0.00114)	-0.00253 (0.00188)
InterestRate	-0.00297 (0.00618)	-0.000739 (0.00324)	0.00351 (0.00537)
ClassType	0.0157 (0.0108)	0.0325*** (0.00565)	-0.0464*** (0.00950)
Constant	1.408*** (0.104)	0.936*** (0.0543)	-0.395*** (0.0908)
Industry Fixed Effect	Yes	Yes	Yes
Observations	6491	6491	6215
Pseudo R^2	0.3354	-1.2341	0.2700

table 5 continued

Panel C: Fixed effects CL Vs. NCL-Large firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	-0.125*** (0.0469)	-0.118*** (0.0256)	0.192*** (0.0444)
CL_NCLLarge	-0.148*** (0.0339)	-0.128*** (0.0185)	0.0991*** (0.0329)
TD*CL_NCLLarge	0.207*** (0.0478)	0.133*** (0.0261)	-0.127*** (0.0453)
Size	-0.0820*** (0.00513)	-0.0509*** (0.00280)	0.0272*** (0.00502)
Capex	-0.169*** (0.0571)	-0.198*** (0.0312)	0.0465 (0.0555)
CashFlow	-0.742*** (0.0342)	-0.182*** (0.0187)	1.022*** (0.0570)
Salesgrowth	-0.0174 (0.0147)	0.00440 (0.00801)	0.00836 (0.0151)
STDROA	0.0000159*** (0.00000348)	0.00000947*** (0.00000190)	-0.0000100*** (0.00000321)
GDP	0.000779 (0.00264)	0.000677 (0.00144)	-0.00252 (0.00251)
InterestRate	-0.00250 (0.00745)	0.00197 (0.00407)	0.000973 (0.00710)
ClassType	-0.0351*** (0.0134)	0.0144** (0.00729)	-0.0424*** (0.0129)
Constant	1.400*** (0.126)	0.713*** (0.0685)	-0.260** (0.121)
Industry Fixed Effect	Yes	Yes	Yes
Observations	3741	3741	3568
Pseudo R^2	0.4318	-0.5357	0.3224

table 5 continued

Panel D: Fixed effects NCL Large Vs. NCL Small firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0862*** (0.0120)	0.0269*** (0.00619)	0.0667*** (0.0107)
Large_Small	-0.168*** (0.0145)	-0.106*** (0.00744)	0.0395*** (0.0131)
TD*Large_Small	0.0262 (0.0170)	0.00993 (0.00876)	-0.0353** (0.0151)
Size	-0.130*** (0.00463)	-0.1000*** (0.00238)	0.0387*** (0.00419)
Capex	-0.136*** (0.0479)	-0.172*** (0.0246)	0.0803* (0.0426)
CashFlow	-0.691*** (0.0291)	-0.144*** (0.0150)	0.790*** (0.0379)
Salesgrowth	-0.0243** (0.0111)	-0.00226 (0.00570)	0.00318 (0.0106)
STDROA	0.000131*** (0.0000110)	0.0000962*** (0.00000563)	-0.0000223** (0.00000927)
GDP	0.00208 (0.00219)	0.000446 (0.00113)	-0.00233 (0.00192)
InterestRate	-0.00514 (0.00624)	-0.00169 (0.00321)	0.00408 (0.00549)
ClassType	-0.00471 (0.0110)	0.0199*** (0.00565)	-0.0458*** (0.00981)
Constant	1.614*** (0.0995)	1.002*** (0.0512)	-0.332*** (0.0885)
Industry Fixed Effect	Yes	Yes	Yes
Observations	6298	6298	6034
Pseudo R^2	0.3630	-1.5842	0.2722

table 5 continued

Panel E: Fixed effects NCL-Small Vs. EF firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0959*** (0.0258)	0.0871*** (0.0115)	0.107*** (0.0230)
NA_NCLSmall	0.247*** (0.0199)	0.227*** (0.00890)	-0.0560*** (0.0180)
TD*NA_NCLSmall	0.00689 (0.0280)	-0.0466*** (0.0125)	-0.0638** (0.0250)
Size	-0.193*** (0.00706)	-0.161*** (0.00316)	0.0539*** (0.00658)
Capex	-0.0297 (0.0666)	-0.0799*** (0.0298)	0.175*** (0.0597)
CashFlow	-0.650*** (0.0445)	-0.109*** (0.0199)	0.694*** (0.0491)
Salesgrowth	-0.0188 (0.0132)	-0.00424 (0.00589)	-0.0186 (0.0127)
STDROA	0.00143*** (0.000101)	0.000918*** (0.0000453)	-0.000449*** (0.0000884)
GDP	0.00332 (0.00291)	-0.0000741 (0.00130)	-0.00256 (0.00261)
InterestRate	0.00231 (0.00839)	0.000196 (0.00375)	0.00381 (0.00755)
ClassType	0.00166 (0.0145)	-0.00250 (0.00651)	-0.0269** (0.0133)
Constant	1.333*** (0.129)	0.964*** (0.0579)	-0.347*** (0.117)
Industry Fixed Effect	Yes	Yes	Yes
Observations	3425	3425	3284
Pseudo R^2	0.4321	-4.6022	0.2713

5.2.3. Controlling for endogeneity and self-selection

The potential endogeneity in our analysis lies in the fact that both capital and investment could be affected by same firm-specific and economy-wide variables, and so they may not remain truly exogenous to each other. Hence, OLS estimates may not be reliable. To control for endogeneity that could arise due to bidirectional causality, we estimate a 2-stage least square (2SLS) estimation. Another potential bias the sample is likely to suffer from is “self-selection”. The literature on investment argues that high investment firms are the ones that raise high capital. If this bias exists, then the increase in financing documented in earlier section may be partly driven by the self-selection of high investment firms raising higher capital. The 2SLS estimation does control for generic endogeneity that arises from simultaneous determination of capital and investment, however, it still does not address the self-selection bias. For this, we incorporate a 2-stage Heckman correction model in our analysis.

We estimate the two stages of 2SLS and Heckman estimation following Alhenawi and Krishnaswami (2015). For both 2SLS and Heckman estimation, first stage is a fixed effect regression of investment in year prior to the year of the capital analysis. The difference lies in 2nd stage equation. The predicted value of investment from the first stage regression is used as a control in the second-stage regression of 2SLS estimation. The second stage regression in Heckman correction analysis controls the biases for the self-selection by including inverse mills ratio from stage 1.

The specification of first equation is:

$$\begin{aligned} Capex_{it-1} = & \alpha_0 + \alpha_1 TD + \alpha_2 CashFlow_{it-1} + \alpha_3 Size_{it-1} + \alpha_4 Salesgrowth_{it-1} + \\ & \alpha_5 Classtype_{it} + \alpha_6 InterestRate_{it-1} + \alpha_7 GDP_{it-1} + \alpha_8 TborrEq_{it-1} + \mu_i + \varepsilon_{it} \end{aligned}$$

Table 6 : First stage estimation for 2 SLS/Heckman correction using fixed effects

This table represents first stage fixed effect regression of 2SLS/Heckman correction for predicting capital expenditure in the years prior to raising capital. The sample includes 1260 firms over the period 2006-2008 obtained from CMIE-Prowess database. The dependent variable is *capital expenditures* in the year (t-1) in Panel A. Column 1 represents OLS results while column 2 represents results for logit regression with Capex as dependent variable. *TD* is the dummy variable with value 1 in post clause period (1996-1998) and 0 in the pre-clause period (1996-2000). *Size* is measured as log of total assets in the year (t-1). *Cash Flow* is sum of profit after tax and depreciation of the firm in the year (t-1). *Salesgrowth* change in sales from year (t-1) to t divided by sales in year (t-1). *Classdummy* is the dummy with value equal to 1 for Indian Business groups and 0 for stand-alone firms. *TBorrEq* is the total funds raised from external market in the year t-1. *GDP* is the growth rate in gross domestic product for Indian economy in the year (t-1) data fetched from World Bank. Standard errors are shown in parentheses. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

Panel A: First Stage OLS regression for capital expenditure in the prior year.

	<u>Fixed Effects</u>	<u>Tobit</u>
	Capex	Capex
TD	-0.0204*** (0.0000)	-0.582 (0.523)
CashFlow	0.0144 (0.0612)	0.470 (0.462)
Size	0.00977*** (0.0000)	0.400*** (0.119)
Salesgrowth	0.0327*** (0.0000)	0.307 (0.196)
ClassType	-0.0120*** (0.0000)	0.722** (0.341)
GDP	0.00203 (0.0516)	0.199* (0.116)
TBorrEq	-0.0132*** (0.0000)	-1.516*** (0.194)
Constant	-0.00236 (0.8321)	2.292* (1.377)
Industry Fixed Effect	Yes	Yes
Observations	6718	6160
Adjusted R ²	0.0823	0.2711

The estimation for capex is controlled for firm specific variables a (total external capital, size, sales-growth, cashflow), industry specific (IBG or standalone) and economy-wide variables (GDP and Interest Rate). The term μ_i denotes industry fixed effect and ε_{it} is the error term.

The result from first stage indicates that bigger firms with high growth opportunities and are likely to incur higher capital expenditure. Firms generating high cash flows are likely to invest more. Stand-alone firms are likely to have higher capital expenditure as compared to firms belonging to Indian Business group. Large sized firms in terms of total assets and firms with high investment opportunities end up investing higher in the post period. Industry characteristics and macroeconomic variables like GDP growth positively affect the chances of investment. However, inconsistent with the extant literature on the endogeneity biases, firms with high amount of external financing are likely to have less capital expenditure.

We now study the factors that affect the financing decisions of a manager using pooled OLS regression in stage 2. The predicted value of investment from the first stage regression is used as a control in the second-stage regression of 2SLS estimation.

Column 1 in each panel illustrates results for *TBorrEq*. Positive and significant value of TD in panel A illustrates that total external financing increases for all firms in the post period. Panel B (C) indicates that *TBorrEq* increases significantly for *NCL* (*NCL-Large firms*) while it decreases significantly for *CL firms*. Positive and significant interaction term proves result to be consistent with the hypothesis. The results further indicate that low investment firms are the ones raising more funds externally. Bigger firms with and high liquidity in terms of cash flow from operations, raise less external capital and retain more. Stand-alone firms seem to be raising more and retaining more too as compared to IBG firms.

Table 7 : Second stage 2SLS regression

Second Stage OLS regression for change in measures of financing from pre to post period. Fitted value represents the predicted value from first stage OLS regression in stage 1 and is used as control for capital expenditure. The table has 5 panels representing and comparing different sub-group of firms. There are three columns in each panel showing results for *TBorrEq*, *TBondEq* and *Ratio* respectively. Panel A represents entire sample; financing measures are compared across *CL* and *NCL* firms in panel B, *CL* and *NCL_Large* in panel C, *NCL_Large* Vs. *NCL-Small* in panel D and *EF* Vs. *NCL_Small* in panel E.

TD is the dummy variable with value 1 in post clause period (2006-2008) and 0 in the pre-clause period (1996-2000). *CL_NCLLarge(CL_NCL)* is the indicator variable with value 1 for *NCL_Large* firms(*NCL*) and 0 for *CL* firms. *Large_Small* is the indicator variable set to 1 for *NCL-Small* firms and 0 for *NCL_Large* firms. *NA_NCLSmall* is the dummy with value 1 for *NCL-Small* firms and 0 for *EF* firms. *Interaction* term shown in all columns captures the effect on *Y* by comparing the average change over time in the *treatment* firm as compared to *the control* firms. Other control variables are explained below. *Size* is measured as log of total assets. *Cash Flow* is sum of profit after tax and depreciation of the firm. *EBDITA* is the profits before depreciation, interest and taxes. *Salesgrowth* change in sales from year (t-1) to t divided by sales in year (t-1). *M_B* is market to book ratio. *Classdummy* is the dummy with value equal to 1 for Indian Business groups and 0 for stand-alone firms. *GDP* is the growth rate in gross domestic product for Indian economy, both data fetched from World Bank. Standard errors are shown in parentheses. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

table 7 continued

Panel A: Regression result for All firms as sample

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0354*** (0.00964)	-0.00409 (0.00511)	0.0217** (0.00958)
Fitted values	-3.031*** (0.205)	-1.379*** (0.109)	2.647*** (0.203)
Size	-0.0371*** (0.00402)	-0.0394*** (0.00213)	0.0224*** (0.00399)
CashFlow	-0.713*** (0.0305)	-0.144*** (0.0162)	0.598*** (0.0298)
STDROA	0.0000133*** (0.00000347)	0.0000153*** (0.00000184)	-0.00000892*** (0.00000341)
InterestRate	0.00555 (0.00753)	0.00109 (0.00400)	-0.00105 (0.00744)
GDP	-0.00472* (0.00251)	-0.00254* (0.00133)	0.00430* (0.00248)
ClassType	-0.0438*** (0.0108)	-0.0109* (0.00575)	-0.0260** (0.0108)
Constant	1.116*** (0.108)	0.636*** (0.0574)	-0.303*** (0.107)
Observations	6451	6451	6179
Adjusted R^2	0.1967	0.1978	0.1344

table 7 continued

Panel B: CL Vs. NCL firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	-0.142** (0.0567)	-0.136*** (0.0292)	0.197*** (0.0557)
CL_NCL	-0.182*** (0.0410)	-0.213*** (0.0211)	0.182*** (0.0405)
TD*CL_NCL	0.197*** (0.0574)	0.147*** (0.0295)	-0.199*** (0.0563)
Fitted values	-3.162*** (0.213)	-1.426*** (0.109)	2.622*** (0.208)
Size	-0.0598*** (0.00437)	-0.0597*** (0.00225)	0.0365*** (0.00427)
CashFlow	-0.692*** (0.0308)	-0.137*** (0.0158)	0.569*** (0.0296)
STDROA	0.0000171*** (0.00000369)	0.0000158*** (0.00000189)	-0.0000107*** (0.00000355)
InterestRate	0.00692 (0.00779)	0.00294 (0.00400)	-0.00123 (0.00757)
GDP	-0.00484* (0.00260)	-0.00262** (0.00133)	0.00399 (0.00253)
ClassType	-0.0154 (0.0115)	0.0171*** (0.00593)	-0.0478*** (0.0113)
Constant	1.448*** (0.120)	0.966*** (0.0619)	-0.562*** (0.117)
Observations	5856	5856	5617
Adjusted R^2	0.2387	0.2845	0.1529

table 7 continued

Panel C: CL Vs. NCL-Large firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	-0.126** (0.0544)	-0.125*** (0.0288)	0.191*** (0.0561)
CL_NCLLarge	-0.161*** (0.0404)	-0.160*** (0.0214)	0.156*** (0.0420)
TD*CL_NCLLarge	0.186*** (0.0555)	0.131*** (0.0294)	-0.170*** (0.0573)
Fitted values	-2.406*** (0.274)	-1.340*** (0.145)	2.437*** (0.283)
Size	-0.0660*** (0.00621)	-0.0437*** (0.00329)	0.0362*** (0.00638)
CashFlow	-0.758*** (0.0376)	-0.178*** (0.0199)	0.617*** (0.0381)
STDROA	0.0000147*** (0.00000360)	0.0000107*** (0.00000191)	-0.00000943*** (0.00000365)
InterestRate	0.0104 (0.0100)	0.00425 (0.00530)	-0.00545 (0.0102)
GDP	-0.00237 (0.00333)	-0.00209 (0.00176)	0.00255 (0.00342)
ClassType	-0.0654*** (0.0147)	-0.00522 (0.00776)	-0.0248 (0.0151)
Constant	1.432*** (0.154)	0.805*** (0.0815)	-0.505*** (0.158)
Observations	3295	3295	3147
Adjusted R^2	0.2366	0.1732	0.1517

table 7 continued

Panel D: NCL-Large Vs. NCL-Small firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0598*** (0.0134)	0.0198*** (0.00675)	0.0168 (0.0133)
Large_Small	-0.185*** (0.0163)	-0.113*** (0.00821)	0.112*** (0.0162)
TD*Large_Small	0.0236 (0.0188)	0.00257 (0.00948)	-0.0582*** (0.0187)
Fitted values	-3.079*** (0.215)	-1.329*** (0.108)	2.603*** (0.213)
Size	-0.110*** (0.00542)	-0.0944*** (0.00273)	0.0581*** (0.00535)
CashFlow	-0.692*** (0.0306)	-0.139*** (0.0154)	0.569*** (0.0298)
STDROA	0.000129*** (0.0000115)	0.0000983*** (0.00000580)	-0.0000525*** (0.0000112)
InterestRate	0.00715 (0.00781)	0.00337 (0.00394)	-0.00140 (0.00770)
GDP	-0.00425 (0.00261)	-0.00217* (0.00131)	0.00390 (0.00257)
ClassType	-0.0383*** (0.0116)	0.00425 (0.00587)	-0.0357*** (0.0116)
Constant	1.667*** (0.115)	1.017*** (0.0580)	-0.570*** (0.113)
Observations	5690	5690	5460
Adjusted R^2	0.2674	0.3394	0.1602

table 7 continued

Panel E: NCL-Small Vs. EF firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0847*** (0.0283)	0.0841*** (0.0126)	0.0913*** (0.0299)
NA_NCLSmall	0.284*** (0.0225)	0.239*** (0.00996)	-0.0477** (0.0239)
TD*NA_NCLSmall	-0.00901 (0.0308)	-0.0521*** (0.0137)	-0.128*** (0.0325)
Fitted values	-3.183*** (0.275)	-0.944*** (0.122)	2.607*** (0.286)
Size	-0.162*** (0.00783)	-0.154*** (0.00347)	0.0862*** (0.00814)
CashFlow	-0.664*** (0.0452)	-0.112*** (0.0200)	0.598*** (0.0465)
STDROA	0.00133*** (0.0000966)	0.000871*** (0.0000428)	-0.000774*** (0.0000994)
InterestRate	0.00664 (0.0101)	0.00381 (0.00446)	0.00121 (0.0105)
GDP	-0.00613* (0.00337)	-0.00223 (0.00149)	0.00520 (0.00351)
ClassType	-0.0116 (0.0149)	-0.00817 (0.00662)	-0.0312** (0.0157)
Constant	1.486*** (0.147)	0.952*** (0.0651)	-0.597*** (0.153)
Observations	3156	3156	3032
Adjusted R^2	0.3254	0.5560	0.1652

The second stage regression in Heckman correction analysis controls the biases for the self-selection by including inverse mills ratio from stage 1. Table 8 present the results of this model. The significantly positive value of the inverse mills ratio in the second equation suggest endogeneity between capital and investment. Total external financing as measured by *TBorrEq* is shown in column 1 of each panel. Positive and significant values of TD in panel A and that of interaction terms in panels B and C indicates that external financing increases even after controlling for endogeneity. We find that results are qualitatively similar even after controlling for the endogeneity of investment and capital, and the self-selection of high-investment firms in the high-capital sub-sample.

Table 8 : Second Stage Heckman Correction

This table presents HECKMAN second OLS regression of the pooled financial variables in the post *Clause 49* period. The dependent variables are measures of financing *TBorrEq* in panel A, *TBondEq* in panel B and *Ratio* in panel C respectively. In each panel, column 1 represents entire sample; financing measures are compared across *CL and NCL firms* in column 2, *CL and NCL_Large* in column 3, *NCL_Large Vs. NCL-Small* in column 4 and *EF Vs. NCL_Small* in column 5.

TD is the dummy variable with value 1 in post clause period (2006-2008) and 0 in the pre-clause period (1996-2000). *CL_NCLLarge(CL_NCL)* is the indicator variable with value 1 for *NCL_Large firms(NCL)* and 0 for *CL firms*. *Large_Small* is the indicator variable set to 1 for *NCL-Small firms* and 0 for *NCL_Large firms*. *NA_NCLSmall* is the dummy with value 1 for *NCL-Small firms* and 0 for *EF firms*. *Interaction* term shown in all columns captures the effect on *Y* by comparing the average change over time in the *treatment firm* as compared to *the control firms*. Other control variables are explained below. *Classdummy* is the dummy with value equal to 1 for Indian Business groups and 0 for stand-alone firms. *Size* is measured as log of total assets. *Cash Flow* is sum of profit after tax and depreciation of the firm. *EBDITA* is the profits before depreciation, interest and taxes. *Salesgrowth* change in sales from year (t-1) to t divided by sales in year (t-1). *M_B* is market to book ratio. *STDROA* is obtained from 5 years rolling standard deviation for variable Profits before depreciation, interest and taxes. *Interest Rate* is the annual prime lending rate in India and *GDP* is the growth rate in gross domestic product for Indian economy, both data sets fetched from World Bank. *Inverse Mills* represents the Inverse Mills Ratio generated from first stage model in column 1 of Table 8. All firm level data are from CMIE-Prowess database. Standard errors are shown in parentheses. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

table 8 continued

Panel A: Second stage Heckman Correction Results for All firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0347*** (0.00902)	0.000828 (0.00500)	0.0105 (0.00956)
Size	-0.0505*** (0.00350)	-0.0540*** (0.00194)	0.0385*** (0.00371)
CashFlow	-0.831*** (0.0287)	-0.198*** (0.0159)	0.664*** (0.0299)
STDROA	0.0000253*** (0.00000600)	0.0000328*** (0.00000332)	-0.0000115* (0.00000649)
InterestRate	-0.00365 (0.00559)	-0.00264 (0.00310)	0.00644 (0.00591)
ClassType	-0.0282*** (0.0103)	0.00458 (0.00571)	-0.0508*** (0.0109)
InverseMills	2.175*** (0.0622)	0.725*** (0.0345)	-1.168*** (0.0645)
Constant	1.073*** (0.0734)	0.657*** (0.0407)	-0.278*** (0.0776)
Observations	5913	5913	5665
Adjusted R^2	0.3156	0.2576	0.1567

table 8 continued

Panel B: Second stage Heckman Correction Results for CL Vs. NCL firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	-0.166*** (0.0632)	-0.205*** (0.0337)	0.137** (0.0655)
CL_NCL	-0.141*** (0.0446)	-0.207*** (0.0238)	0.163*** (0.0469)
TD*CL_NCL	0.219*** (0.0637)	0.219*** (0.0340)	-0.150** (0.0661)
Size	-0.0763*** (0.00383)	-0.0747*** (0.00204)	0.0548*** (0.00396)
CashFlow	-0.804*** (0.0289)	-0.180*** (0.0154)	0.627*** (0.0295)
STDROA	0.0000374*** (0.00000654)	0.0000392*** (0.00000349)	-0.0000145** (0.00000681)
InterestRate	-0.00325 (0.00583)	-0.00118 (0.00311)	0.00684 (0.00602)
ClassType	0.00826 (0.0111)	0.0345*** (0.00590)	-0.0807*** (0.0115)
InverseMills	2.066*** (0.0645)	0.657*** (0.0344)	-1.089*** (0.0655)
Constant	1.382*** (0.0902)	0.983*** (0.0481)	-0.539*** (0.0935)
Observations	5359	5359	5142
Adjusted R^2	0.3449	0.3368	0.1745

table 8 continued

Panel C: Second stage Heckman Correction Results for CL Vs. NCL-Large firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	-0.145 ^{**} (0.0587)	-0.173 ^{***} (0.0326)	0.127 [*] (0.0654)
CL_NCLLarge	-0.108 ^{**} (0.0423)	-0.151 ^{***} (0.0235)	0.121 ^{**} (0.0478)
TD*CL_NCLLarge	0.179 ^{***} (0.0597)	0.174 ^{***} (0.0331)	-0.101 (0.0665)
Size	-0.0686 ^{***} (0.00568)	-0.0538 ^{***} (0.00315)	0.0454 ^{***} (0.00632)
CashFlow	-0.809 ^{***} (0.0340)	-0.201 ^{***} (0.0189)	0.646 ^{***} (0.0373)
STDROA	0.0000289 ^{***} (0.00000632)	0.0000247 ^{***} (0.00000351)	-0.00000905 (0.00000708)
InterestRate	-0.00378 (0.00726)	-0.00154 (0.00403)	0.00667 (0.00808)
ClassType	-0.0388 ^{***} (0.0138)	0.0151 ^{**} (0.00764)	-0.0646 ^{***} (0.0154)
InverseMills	6.817 ^{***} (0.256)	2.446 ^{***} (0.142)	-3.400 ^{***} (0.279)
Constant	1.364 ^{***} (0.111)	0.812 ^{***} (0.0616)	-0.465 ^{***} (0.123)
Observations	2975	2975	2838
Adjusted R^2	0.3765	0.2463	0.1747

table 8 continued

Panel D: Second stage Heckman Correction Results for NCL_Large Vs. NCL-Small firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0657*** (0.0128)	0.0247*** (0.00671)	0.00711 (0.0134)
Large_Small	-0.156*** (0.0159)	-0.107*** (0.00835)	0.0968*** (0.0167)
TD*Large_Small	0.00666 (0.0183)	0.000930 (0.00958)	-0.0584*** (0.0191)
Size	-0.115*** (0.00480)	-0.103*** (0.00252)	0.0708*** (0.00500)
CashFlow	-0.793*** (0.0288)	-0.174*** (0.0151)	0.624*** (0.0297)
STDROA	0.000103*** (0.0000108)	0.0000909*** (0.00000569)	-0.0000383*** (0.0000112)
InterestRate	-0.00290 (0.00586)	-0.000517 (0.00308)	0.00665 (0.00612)
ClassType	-0.0156 (0.0112)	0.0190*** (0.00589)	-0.0693*** (0.0118)
InverseMills	1.987*** (0.0643)	0.599*** (0.0338)	-1.050*** (0.0661)
Constant	1.569*** (0.0810)	1.004*** (0.0425)	-0.526*** (0.0845)
Observations	5241	5241	5031
Adjusted R^2	0.3632	0.3756	0.1793

table 8 continued

Panel E: Second stage Heckman Correction Results for NCL-Small Vs. EF firms

	(1)	(2)	(3)
	TBorrEq	TBondEq	RE/TBorrEq
TD	0.0757*** (0.0265)	0.0842*** (0.0128)	0.0954*** (0.0305)
NA_NCLSmall	0.264*** (0.0212)	0.229*** (0.0102)	-0.0341 (0.0244)
TD*NA_NCLSmall	-0.00764 (0.0290)	-0.0491*** (0.0140)	-0.144*** (0.0333)
Size	-0.141*** (0.00684)	-0.152*** (0.00329)	0.0836*** (0.00775)
CashFlow	-0.828*** (0.0427)	-0.174*** (0.0205)	0.696*** (0.0478)
STDROA	0.000946*** (0.0000920)	0.000779*** (0.0000443)	-0.000545*** (0.000103)
InterestRate	-0.000806 (0.00737)	0.00175 (0.00355)	0.00604 (0.00837)
ClassType	-0.00958 (0.0139)	-0.00186 (0.00667)	-0.0410*** (0.0159)
InverseMills	1.710*** (0.0608)	0.399*** (0.0292)	-0.928*** (0.0679)
Constant	1.251*** (0.1000)	0.907*** (0.0481)	-0.459*** (0.114)
Observations	2938	2938	2827
Adjusted R^2	0.4445	0.5743	0.1917

To sum, firms subject to reform increase total external financing and market-based financing in the post period. The increase in external financing is greater as compared to cross-listed firms. We argue that information transparency is higher for cross-listed firms that had to comply with disclosure requirements on other exchanges. So, Clause-49 reform did not affect them as much. Firms subject to reform increased their external capital relative to internal capital.

The change was higher for firms listed only domestically, relative to cross listed firms. Overall, our results suggest the reforms were most effective in relieving information asymmetry and increasing financing for firms that did not have access to other capital markets.

5.3. *Financial constraints*

Hypothesis 2 asserts that, in an opaque market environment, cash to cash-flow sensitivity and investment to cash-flow sensitivity is high. This is because firms are more dependent on internally generated cash flows for their investment. We predict that a decrease in information asymmetry would lower the cost of external financing which in turn, would reduce the financial constraints of a firm in the post reform period.

5.3.1. *The sensitivity of cash to cash flow*

To evaluate whether *Clause 49* was effective in mitigating financial constraints, we adopt series of test following Erel et.al. (2013). First, we test for sensitivities of cash with cash-flow. Almeida, Campello and Weisbach (2004) suggest that managers save cash from incremental cash flow if they believe to face financial constraints. We estimate cash to cash flow sensitivity is using the following model:

$$Cash_{it} = \alpha_0 + \alpha_1 TD + \alpha_2 CF + \alpha_3 TD * CF + \beta X_{it} + \mu_i + \varepsilon_{it}$$

$$Cash_{it} = \alpha_0 + \alpha_1 GD + \alpha_2 CF + \alpha_3 CF * TD + \alpha_4 CF * TD * GD + \beta X_{it} + \mu_i + \varepsilon_{it}$$

Here, dependent variable is the cash holdings while independent variable includes an interaction term of cash flow and *TD*. Group dummies comparing different group of firms and are defined in Appendix 1. A negative coefficient of interaction term *TD * CF* will suggest that sensitivity declines for CL firm in the post reform period while sum of coefficients of both interaction terms if turns out to be negative will suggest that sensitivity declines for conforming firms in the post

reform period. A negative coefficient for interaction term $TD * CF * GD$ suggests two-way difference that sensitivity decline more for *NCL firms* as compared to *CL or EF* group of firms.

5.3.2. *The sensitivity of investment to cash flow*

We estimate investment to cash flow sensitivity with the following specification:

$$Y_{it} = \alpha_0 + \alpha_1 TD + \alpha_2 CF + \alpha_3 TD * CF + \beta X_{it} + \mu_i + \varepsilon_{it}$$

$$Y_{it} = \alpha_0 + \alpha_1 GD + \alpha_2 CF + \alpha_3 CF * TD + \alpha_4 CF * TD * GD + \beta X_{it} + \mu_i + \varepsilon_{it}$$

The specification for investment to cash flow sensitivity has different measures of investment as dependent variable; TD, cashflow, group-dummy and interaction terms as independent variable and is controlled for other factors. There are four group dummies and are defined in Appendix 1. Results would be inferred in the same fashion as described in the previous section. A negative coefficient of interaction term $TD * CF * GD$ will suggest that investment to cash flow sensitivity declines more for conforming firms as compared to cross-listed or excluded firms.

X_{it} in the models for ICF and CCF is the vector of control variables, μ_i is industry fixed effects used to control changes at industry level and ε_{it} is the error term. In the basic specification, the model includes the following control variables. To control for changes at the firm-level, *log of total assets* is used to control for firm's size, *Cash flow from operations* is controlled for as a measure of liquidity and *Sales growth* is used to control for firms' growth opportunities. Alternatively, *Earnings before depreciation interest and taxes* is used instead of *Cash flows*; *Market -to-Book ratio* is used instead of *Sales Growth*.¹⁶

¹⁶ Results for alternate specifications are not shown in the paper for the brevity of the paper. The result remains the same as of basic specification shown in the paper.

Table 9 : Investment-Cash Flow sensitivity (ICF)

Regression results for Investment-Cash Flow sensitivity (ICF) for 1260 firms over the period 1996-2008. Measures of investment are a) *Capex* as investment in fixed assets shown in column 1; b) *Investment* as investment in total assets shown in column 2; c) *CapexRD* as investment in fixed assets and R&D shown in column 3. Regression results for Cash-Cash Flow sensitivity (ICF) for same sample is shown in column 4 of this table. *TD* is the dummy variable with value 1 in post clause period (2006-2008) and 0 in the pre-clause period (1996-2000). *Cash Flow* is sum of profit after tax and depreciation of the firm. *TD*CashFlow* is the interaction term. *Size* is measured as log of total assets. *Salesgrowth* change in sales from year (t-1) to t divided by sales in year (t-1). *Classdummy* is the dummy with value equal to 1 for Indian Business groups and 0 for stand-alone firms. *Interest Rate* is the annual prime lending rate in India and *GDP* is the growth rate in gross domestic product for Indian economy, both data fetched from World Bank. All firm level data are from CMIE-Prowess database. Standard errors are shown in parentheses. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

	Capex	Investment	CapexRD	Cash
TD	-0.00219 (0.00236)	0.0895*** (0.00640)	-0.00119 (0.00430)	0.0126*** (0.00126)
TD*CashFlow	-0.0374** (0.0151)	-0.200*** (0.0410)	-0.107*** (0.0368)	-0.0281*** (0.00811)
CashFlow	0.0621*** (0.0125)	0.328*** (0.0337)	0.105*** (0.0270)	0.0437*** (0.00673)
Size	0.0109*** (0.000778)	0.0366*** (0.00211)	0.00854*** (0.00124)	0.00182*** (0.000416)
Salesgrowth	0.0294*** (0.00236)	0.147*** (0.00640)	0.0389*** (0.00477)	0.00311** (0.00129)
ClassType	-0.0129*** (0.00252)	-0.0392*** (0.00682)	-0.00671* (0.00402)	0.00254* (0.00135)
GDP	0.00100* (0.000522)	0.00401*** (0.00141)	0.000390 (0.000811)	0.000507* (0.000278)
InterestRate	0.00718*** (0.00146)	0.0166*** (0.00396)	0.00682*** (0.00227)	-0.000855 (0.000778)
Constant	-0.110*** (0.0225)	-0.385*** (0.0610)	-0.122*** (0.0357)	0.0203* (0.0120)
Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	7837	7837	2474	7591
Adjusted R ²	0.0787	0.1926	0.0979	0.0854

A dummy variable is used to control for whether firm belong to an Indian Business Group (IBG) or a stand-alone firm. *Classdummy* is used with value equal to 1 for Indian Business groups and 0 for stand-alone firms. Regression model also includes *GDP* and *Interest rates* to control for macro-economic changes. The result for both ICF and CCF sensitivities is shown in Table 9. Panel A of the table is discussed below in detail.

Significant and positive coefficient of *Cash Flow* in Table 9 suggest the presence of present and expected future financial constraints in Indian firms. Column 1 in table 9 represents ICF sensitivity for all firms. A negative coefficient of interaction term *TD*CashFlow* suggests that sensitivity of investment to cash flow decreases for all firms in the post period. Column 1 in panels B and C compares ICF sensitivities of *NCL/NCL-Large firms* relative to *CL firms*. Coefficient of interaction term (TD* Cashflow) is negative and significant which means CCF decreases for *CL firms*. Sum of coefficient of interaction terms is negative and significant which suggests that ICF decreases for *NCL-Large firms* in the post period. However, the two-way difference as evident from table suggests no relative difference between ICF sensitivities of *NCL-Large/NCL and CL firms*. It is evident from other columns that ICF sensitivity decreases across all other sub-groups.

We check robustness of our result using different measures of investment. While column 1 shows investment in fixed asset, we show investment in total assets (*Investment*) in column 2 and investment in fixed assets plus R&D (*CapexRD*) as measure of investment in column 3. The sensitivity of *CapexRD* to cash flow decreases across all firms and NCL firms (both Large and small). The sensitivity of Investment to cash flow decreases for all firms and NCL-Large firms; the sensitivity does not change for NCL Small firms or CL firms.

Column 4 shows cash to cash flow sensitivity (CCF) to be decreasing for *NCL and NCL-Large* firms. *NCLs* experience greater decrease in cash flow sensitivity than the *CL* group as

evident from coefficient of $TD * CashFlow * Group$ -dummy in panels B and C respectively. The sensitivity of Cash to cash flow decreases for all firms and NCL-Large firms; the sensitivity does not change for NCL Small firms.

Overall, results provide evidence that firms subject to rule change witness a decrease in both ICF and CCF sensitivities from pre to post period. It implies that firms subjected to *Clause 49* show an alleviation of present and expected future financial constraints. The effect is more pronounced for domestic firms relative to cross-listed firms for future constraints. Their reliance of investment and financial slack on cash flow is relaxed post-reform. They seem to have a stronger capital safety net in post-reform.

In the next section we see whether firms utilize the marginal increase in external capital and a stronger capital safety net by investing in positive NPV projects.

5.4. *Investment*

Investment is considered efficient at the optimal level where firm's value is maximized. If there are financial constraints, then a firm will have to choose among projects, they cannot take up all of them. We expect to see an increase in level of investment with enhanced information environment.

Univariate results are shown in Table 10. Three different measures (*Capex*, *Investment*, and *CapexRD*) of investment are used and compare from pre to post period of *Clause 49*. It is evident from the table that investment in fixed assets (*Capex*) decreases while investment in total assets (*Investment*) increases in the post period. We refrain from jumping to any conclusion without performing a multivariate OLS regression.

Table 10 : Summary Statistics for Investment Decisions and Performance of firms

This table presents summary statistics for accounting variables pertaining to firms' investment and performance. The measures of investment are: a) *Capex*: It denotes the long-term investment and is measured as the change in gross fixed asset plus net asset sales deflated by total assets; b) *Investment*: It is the total investment inclusive of both long term and current assets and is measured as change in total assets deflated by total assets in prior year; c) *CapexRD*: It is the investment in fixed assets and R&D. Measures of firms' performance are a) ROA: is return on assets measured as PAT over total assets; b) Tobin's Q: It is measured as total assets plus market value of equity minus book value of equity divided by total assets.

Cash is the total cash and cash equivalent of a firm deflated by total assets. All variables are sourced from CMIE-Prowess database. We assess the differences in means using the mean difference test and medians using the Wilcoxon-Mann-Whitney test. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	Mean				Median		
	Pre	Post	Diff	P-Value	Pre	Post	P-Value
Panel A: All Firms							
Cash	0.029	0.045	0.016	0.000	0.019	0.023	0.0000
CapexTA	0.075	0.068	-0.007	0.000	0.041	0.039	0.0000
Investment	0.111	0.220	0.109	0.000	0.068	0.151	0.0000
CapexRD	0.079	0.072	-0.006	0.023	0.0517	0.053	0.3913
ROA	0.022	0.040	0.018	0.000	0.029	0.039	0.0000
TobinQ	0.982	1.441	0.459	0.000	0.861	1.156	0.0000
Panel B: CL Firms							
Cash	0.040	0.080	0.040	0.000	0.024	0.058	0.0000
CapexTA	0.092	0.063	-0.029	0.008	0.069	0.044	0.0072
Investment	0.121	0.204	0.083	0.001	0.097	0.185	0.0000
CapexRD	0.094	0.064	-0.030	0.017	0.075	0.050	0.0326
ROA	0.047	0.085	0.038	0.000	0.049	0.087	0.0000
TobinQ	1.291	2.079	0.788	0.000	1.008	1.789	0.0000

table 10 continued

Panel C: NCL Firms

Cash	0.028	0.044	0.016	0.000	0.018	0.023	0.0000
CapexTA	0.077	0.069	-0.008	0.000	0.042	0.040	0.0003
Investment	0.112	0.219	0.107	0.000	0.067	0.150	0.0000
CapexRD	0.0797	0.0730	-0.0067	0.0327	0.051	0.053	0.2953
ROA	0.021	0.038	0.017	0.000	0.029	0.038	0.0000
TobinQ	0.972	1.424	0.452	0.000	0.852	1.141	0.0000

Panel D: NCL_Large Firms

Cash	0.030	0.049	0.020	0.000	0.019	0.025	0.0000
CapexTA	0.082	0.071	-0.011	0.000	0.049	0.043	0.0000
Investment	0.133	0.218	0.085	0.000	0.083	0.158	0.0000
CapexRD	0.0831	0.0742	-0.0089	0.0129	0.0565	0.0552	0.0448
ROA	0.031	0.041	0.010	0.000	0.036	0.043	0.0000
TobinQ	1.062	1.543	0.481	0.000	0.886	1.220	0.0000

Panel E: NCL_Small Firms

Cash	0.026	0.037	0.011	0.000	0.017	0.021	0.0000
CapexTA	0.070	0.066	-0.004	0.202	0.032	0.035	0.7561
Investment	0.084	0.220	0.136	0.000	0.049	0.138	0.0000
CapexRD	0.0689	0.0692	0.0002	0.9730	0.0379	0.0483	0.1562
ROA	0.009	0.035	0.026	0.000	0.018	0.033	0.0000
TobinQ	0.852	1.256	0.404	0.000	0.806	1.064	0.0000

Panel E: EF Firms

Cash	0.032	0.040	0.008	0.023	0.023	0.022	0.5477
CapexTA	0.057	0.064	0.007	0.231	0.030	0.038	0.1789
Investment	0.096	0.238	0.142	0.000	0.065	0.152	0.0000
CapexRD	0.0621	0.0733	0.0112	0.2945	0.0373	0.0583	0.0264
ROA	0.025	0.044	0.019	0.001	0.029	0.039	0.0004
TobinQ	0.992	1.406	0.414	0.000	0.917	1.166	0.0000

5.4.1. Level of investment

We estimate the level of investment with the following specification:

$$Y_{it} = \alpha_0 + \alpha_1 TD + \beta X_{it} + \varepsilon_{it}$$

$$Y_{it} = \alpha_0 + \alpha_1 TD + \alpha_2 GD + \alpha_3 TD * GD + \beta X_{it} + \mu_i + \varepsilon_{it}$$

Column 1 in each panel of table 11 presents evidence for decrease in *Capex*. The coefficient of TD is negative and significant in each of these panels while the sum of coefficients of TD and interaction term is negative and significant as shown in panels B and C. It suggests that *Capex* decreases significantly for all firms as a sample, and individually as *CL firms as well as NCL/NCL-Large firms*. Sum of coefficient is insignificant in panel D suggesting that there is no change in *Capex* for *NCL_Small* firms. Coefficient of TD is not significant in panel E suggesting that *Capex* remains unchanged for *EF firms* in post reform period. Combining results from columns 4 and 5 implies that larger firms decrease their investment in fixed assets while small firms retain their earlier investment level. This is consistent with the findings of Guha-Khasnobis and Bhaduri (2000) which document capital efficiency in the post liberalization period. They find evidence that investment did not go up during 1992-1995 and conclude that capital raised from the market may have been diverted towards speculated financial investment by most firms.

Further, we measure investment in fixed assets and R&D (*CapexRD*) as shown in columns 2 of each panel in table 11. We find this measure of investment behaves similar to *Capex*. Investment in fixed assets (*Capex*) or (*Capex+RD*) decreases across all firms, and NCL or NCL-Large firms. It does not change for NCL-Small or EF firms.

Then, we measured investment in total assets (*Investment*) to account for decision to invest in both current and fixed assets. The result is shown in columns 3 of each panel in table 11. To our

surprise, investment in total assets (*Investment*) increases across all firms, and NCL (both large and small firms); even for EF firms. It does not change for CL firms. It implies that investment in current assets increases for all sub-group of firms irrespective of the fact whether they conform to *Clause 49* or not. Also, small firms invest more than large firms (both in current and fixed assets). This suggest that investment decision is not affected by *Clause 49* rather the investment decision lies somewhere else to where we expected it to be.

While in the regression of level of investment as dependent variable, Table 11 indicates a positive association of investment with size, liquidity, and high growth opportunities. A major finding is that stand-alone firms in India invest more relative to firms belonging to Indian Business group. High GDP growth and prime lending rate also have positive effect on investment decisions.

Table 11 : The effect of rule change on investment level and cash hoarding of firms

Regression results for level of investment and cash is shown for all sample and different sub-group of samples. There are panels in this table. Panel A represents results for all firms while panel B compares the level of investment and cash between CL and NCL-Large firms. Each of these panels have 4 columns numbered 1-4 that show regression result for *Capex*, *Investment*, *CapexRD* and *Cash* as dependent variable respectively. *Capex* is measures as change in fixed assets deflated by total assets; *Investment* is measured as change in total assets divided by total assets in the year (t-1). *CapexRD* is the sum of Capex and R&D expenses deflated by total assets while *Cash* is cash and cash equivalent of any firm.

TD is the dummy variable with value 1 in post clause period (2006-2008) and 0 in the pre-clause period (1996-2000). *CL_NCL* is the indicator variable with value 1 for *NCL firms* and 0 for *CL firms*. *Interaction* term shown in all columns captures the effect on *Y* by comparing the average change over time in the *treatment firm* as compared to *the control firms*. Other control variables are defined below.

Classdummy is the dummy with value equal to 1 for Indian Business groups and 0 for stand-alone firms. *Size* is measured as log of total assets. *Cash Flow* is sum of profit after tax and depreciation of the firm. *Salesgrowth* change in sales from year (t-1) to t divided by sales in year (t-1). *Interest Rate* is the annual prime lending rate in India and *GDP* is the growth rate in gross domestic product for Indian economy, both data sets fetched from World Bank. All firm level data are from CMIE-Prowess database. Standard errors are shown in parentheses. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

Panel A: Level of investment and cash for all firms

	(1)	(2)	(3)	(4)
	Capex	Investment	CapexRD	Cash
TD	-0.00695*** (0.00215)	0.0723*** (0.00583)	-0.0111*** (0.00343)	0.0113*** (0.00115)
CashFlow	0.0375*** (0.00721)	0.195*** (0.0196)	0.0499*** (0.0188)	0.0245*** (0.00384)
Size	0.0109*** (0.000780)	0.0365*** (0.00211)	0.00842*** (0.00125)	0.00182*** (0.000416)
Salesgrowth	0.0308*** (0.00235)	0.152*** (0.00638)	0.0402*** (0.00477)	0.00339*** (0.00128)
ClassType	-0.0128*** (0.00252)	-0.0382*** (0.00684)	-0.00573 (0.00402)	0.00266** (0.00135)
GDP	-0.000292 (0.000453)	0.000972 (0.00123)	-0.000828 (0.000707)	0.000652*** (0.000241)
Constant	-0.00603 (0.00866)	-0.140*** (0.0235)	-0.0195 (0.0157)	0.00943** (0.00459)
Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	7837	7837	2474	7591
Adjusted R^2	0.0753	0.1884	0.0918	0.0840

table 11 continued

Panel B: Comparing level of investment and cash between NCL-Large and CL firms

	(1)	(2)	(3)	(4)
	Capex	Investment	CapexRD	Cash
TD	-0.0309** (0.0130)	0.0401 (0.0349)	-0.0305** (0.0137)	0.0253*** (0.00720)
CL_NCLLarge	0.0155 (0.00969)	0.105*** (0.0261)	0.0105 (0.0107)	-0.00333 (0.00541)
TD*CL_NCLLarge	0.0191 (0.0132)	0.00380 (0.0356)	0.0169 (0.0141)	-0.0124* (0.00736)
CashFlow	0.0434*** (0.00980)	0.196*** (0.0264)	0.0504** (0.0230)	0.0293*** (0.00551)
Size	0.0121*** (0.00138)	0.0463*** (0.00373)	0.00940*** (0.00200)	0.00177** (0.000784)
Salesgrowth	0.0289*** (0.00374)	0.150*** (0.0101)	0.0341*** (0.00546)	0.00421* (0.00218)
ClassType	-0.0180*** (0.00375)	-0.0513*** (0.0101)	-0.00338 (0.00555)	0.000435 (0.00211)
GDP	-0.000845 (0.000648)	0.000787 (0.00175)	-0.000875 (0.000854)	0.000923** (0.000364)
Constant	-0.0294 (0.0189)	-0.298*** (0.0508)	-0.0465* (0.0277)	0.0128 (0.0106)
Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	3926	3926	1693	3798
Adjusted R^2	0.0798	0.1734	0.0958	0.1065

table 11 continued

Panel C: Comparing level of investment and cash between NCL-Large and NCL-Small firms

	(1)	(2)	(3)	(4)
	Capex	Investment	CapexRD	Cash
TD	-0.0142*** (0.00310)	0.0331*** (0.00829)	-0.0144*** (0.00436)	0.0130*** (0.00160)
CL_NCLLarge	0.00490 (0.00357)	0.0491*** (0.00952)	-0.00380 (0.00622)	0.000401 (0.00185)
TD*CL_NCLLarge	0.0103** (0.00433)	0.0449*** (0.0116)	0.0102 (0.00752)	-0.00396* (0.00223)
CashFlow	0.0374*** (0.00767)	0.195*** (0.0205)	0.0349* (0.0199)	0.0274*** (0.00397)
Size	0.0141*** (0.00108)	0.0574*** (0.00287)	0.0108*** (0.00182)	0.00197*** (0.000559)
Salesgrowth	0.0314*** (0.00254)	0.162*** (0.00679)	0.0372*** (0.00495)	0.00319** (0.00135)
ClassType	-0.0141*** (0.00283)	-0.0422*** (0.00757)	-0.00781* (0.00451)	0.00186 (0.00147)
GDP	-0.000120 (0.000484)	0.00196 (0.00129)	-0.000552 (0.000756)	0.000689*** (0.000250)
Constant	-0.0300*** (0.0112)	-0.305*** (0.0300)	-0.0431** (0.0202)	0.00321 (0.00582)
Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	6927	6927	2167	6708
Adjusted R^2	0.0813	0.2181	0.0933	0.0861

A point to note here is that if *Clause 49* helps easing financial constraint and increases level of capital in the post period as evident from previous results, then we should see an increase in long term investment of firms. The fact that we do not see an increase in Capex rather investment in current assets seem to be increasing in post -period, we test and estimate level of cash holdings in the pre-period and post-period.

5.4.2. *Level of cash holdings*

We estimate cash level using similar specification as that of investment level with measure of cash and cash equivalent used as dependent variable instead. The results are shown in column 4 of each panel in table 11.

It is evident from the table that *Cash* increases for all firms in the post period. Coefficient of TD is positive and significant in column 4 of all panels of table 11. It suggests *CL firms and NCL-Large firms* increases cash hoarding in the post period. Sum of co-efficient for TD and interaction terms in all these columns are positive and significant suggesting an increase in cash hoarding for *NCL, NCL-Large and NCL-Small firms*.

The result further indicates that bigger firms with high liquidity in terms of operating cash flow, increases cash in the post reform period. Accumulating cash decision does not vary with firms' affiliation as stand-alone or Indian Business group. Industry characteristics and macroeconomic variables like GDP growth positively impact the decision to hoard cash by firms. To sum, cash hoarding increases for all firms and all sub-group of firms irrespective of their conformity and sizes.

5.4.3. *Do constrained firms benefit more from Clause 49?*

We test this question for funds raised, investment level and cash hoarding. We use KZ index as a measure of financial constraint. It is computed using the equation:

$$KZ = -1.0019 * \text{CashFlow/PPE} + .2826 * \text{Tobin's } Q + 3.139 * \text{Borrowing/NetWorth} - 39.367 * \text{Total Dividend/PPE} - 1.314 * \text{Cash/PPE}$$

KZ Index is estimated for each firm in each year between 1996 and 2000 and averaged over the 5 years in pre-period. This measure is used to categorize firms into more constrained and

less constrained. *FC* is the indicator variable set to 1 whose KZ exceeds median KZ of all firms and 0 otherwise. We use the following empirical model to see whether the highly constrained/high info asymmetric firms are the ones that benefit more from *Clause 49*:

$$Y_{it} = \alpha_0 + \alpha_1 FC + \alpha_2 FC * TD + \beta X_{it} + \mu_i + \varepsilon_{it}$$

Columns 1-4 in Table 12 show levels of investment in fixed assets (*Capex*), investment in total assets (*Investment*), total external financing (*TBorrEq*) and financial slack (*Cash*) respectively. Sum of coefficient of TD and TD*FC is negative and significant in column 1 and positive in columns 2, 3 and 4. It suggests that more constrained firms decrease their investment in fixed assets and increase their investment in current assets, raise funds externally and hoard more cash in the post period. Co-efficient of TD in all column illustrates that less constraint firms' behavior is same as more constraint firms. However, more constrained firms increase more slack as compared to less constrained firms in the post period as shown in column 4.

Table 12 : Characteristics for firms those were constrained in the pre-period

Fixed effects regression for firms those were constrained in the pre-reform period. The dependent variables are investment in current assets and total assets (*Capex*, *Investment*), total external financing (*TBorrEq*) and financial slack (*Cash*) shown in columns 1-4. *FC* is the indicator variable set to 1 for financially high constrained firms and 0 for less constraint firms. We use KZ index as a measure of financial constraint. It is computed using the equation:

$$KZ = -1.0019 * CashFlow/PPE + .2826 * Tobin's Q + 3.139 * Total Borrowing/NetWorth - 39.367 * Total Dividend/PPE - 1.314 * Cash/PPE$$

KZ Index is estimated for each firm in each year between 1996 and 2000 and averaged over the 5 years pre-period. This measure is used to categorize firms into more constrained and less constrained. *FC* = 1 for firms whose KZ exceeds median KZ of all firms; 0 otherwise. *TD* is the dummy variable with value 1 in post clause period (2006-2008) and 0 in the pre-clause period (1996-2000). *Size* is measured as log of total assets. *Cash Flow* is sum of profit after tax and depreciation of the firm. *Salesgrowth* change in sales from year (t-1) to t divided by sales in year (t-1). *GDP* is the growth rate in gross domestic product for Indian economy, both data sets fetched from World Bank. All firm level data are from CMIE-Prowess database. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

table 12 continued

	(1) Capex	(2) Investment	(3) TBorrEq	(4) Cash
TD*FCdummy	-0.00226 (0.00293)	0.0360*** (0.00787)	0.104*** (0.00921)	0.00352** (0.00167)
CashFlow	0.0442*** (0.0124)	0.363*** (0.0334)	-1.111*** (0.0391)	0.0689*** (0.00712)
Size	0.00554*** (0.000744)	0.0210*** (0.00201)	-0.0426*** (0.00235)	0.00372*** (0.000427)
Salesgrowth	0.0507*** (0.00364)	0.242*** (0.00978)	-0.00545 (0.0114)	0.00273 (0.00209)
GDP	-0.00120** (0.000507)	0.00292** (0.00136)	0.000520 (0.00160)	0.00143*** (0.000289)
Constant	0.0165 (0.0102)	-0.0756*** (0.0275)	0.897*** (0.0322)	-0.0103* (0.00584)
Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	5731	5766	5766	5695
Adjusted R^2	0.0818	0.1827	0.2389	0.0929

table 12 continued

	(1)	(2)	(3)	(4)
	Capex	Investment	TBorrEq	Cash
TD	-0.00699** (0.00335)	0.0661*** (0.00898)	0.0544*** (0.0105)	0.00793*** (0.00190)
FCdummy	0.0102*** (0.00322)	-0.00672 (0.00861)	0.0942*** (0.0101)	-0.0136*** (0.00182)
TDFCdummy	-0.00303 (0.00459)	-0.00625 (0.0123)	0.0135 (0.0144)	0.00566** (0.00260)
CashFlow	0.0510*** (0.0125)	0.352*** (0.0335)	-1.062*** (0.0392)	0.0599*** (0.00711)
Size	0.00538*** (0.000768)	0.0192*** (0.00206)	-0.0480*** (0.00241)	0.00399*** (0.000437)
Salesgrowth	0.0512*** (0.00363)	0.238*** (0.00973)	-0.00716 (0.0114)	0.00202 (0.00207)
GDP	-0.000854* (0.000514)	0.000839 (0.00138)	0.000150 (0.00161)	0.000999*** (0.000291)
Constant	0.0153 (0.0102)	-0.0694** (0.0273)	0.896*** (0.0319)	-0.00867 (0.00578)
Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	5731	5766	5766	5695
Adjusted R ²	0.0857	0.1932	0.2503	0.1132

5.4.4. Characteristics of under-invested firms

Investment is considered efficient at the optimal level where firm's value is maximized. In absence of market friction, a firm is supposed to be investing efficiently if it takes up all and only positive net present value (NPV) projects (Modigliani and Miller, 1958). Thus, investment inefficiency can be considered as any deviation from the optimal investment decisions; overinvestment (higher than optimal) or underinvestment (lower than optimal).

To compute investment efficiencies before and after *Clause 49*; we start with calculating expected investment level for sample firms closely following Richardson (2006). Total investment (I_{total}) in each firm year is measured as capital expenditure scaled by total assets. New investment (I_{new}) in any given year is the difference between investment required for maintenance (proxied by depreciation and amortization) and total investment.

$$I_{total,t} = CAPEX_t$$

$$I_{maintenance,t} = Depreciation_t + Amortization_t$$

$$I_{new,t} = I_{total,t} - I_{maintenance,t}$$

New Investment $I_{new,t}$ is decomposed into expected investment expenditure and underinvestment (overinvestment). We model new investment as a function of growth opportunities measured by sales growth and other firms' fundamentals. The new investment expenditure in the prior year is included to capture other firm characteristics not included in the model. We also include industry fixed effects to capture the variation at the firm level.

$$I^*_{new,t} = \alpha_0 + \alpha_1 I_{new,t-1} + \alpha_2 CashFlow_{it-1} + \alpha_3 Size_{it-1} + \alpha_4 Salesgrowth_{it-1} \\ + \alpha_5 Classtype_{it} + \alpha_6 GDP_{it-1} + \alpha_7 TborrEq_{it-1} + \mu_i + \varepsilon_{it}$$

$$Residual = I_{new,t} - \text{Fitted value of } I^*_{new,t}$$

The estimated residual from equation of $I^*_{new,t}$ captures deviation from expected level of investment. Positive residual suggests overinvestment while negative residual identifies firms as underinvested.

Underinvested firms are more likely to benefit from *Clause 49* as increased availability of external capital provides a safety net, allowing under-invested firms to increase investment levels (and reduce financial slack) in the post-reform period. On partitioning the firms as over-invested firms and under-invested firms in the pre-period, we expect to see a significant increase in the investment of under-invested firms and a decrease in over-invested firms in the after-period signifying the reduction in investment inefficiency in the post reform period.

To categorize firms into underinvested and overinvested firms, residual value for each firm in each year between 1996 and 2000 is averaged over the 5 years in the pre-period. A dummy variable *Invdummy* is set to 1 if the mean residual thus computed is less than equal to zero and set to 0 otherwise.

$Invdummy = 1$ if Mean Residual ≤ 0 (underinvested firms in pre-period)

$Invdummy = 0$ if Mean Residual > 0 (Over invested firms in pre-period)

A quick look at the statistics of *Invdummy* shows that about 67% of the sample underinvested and 33% of overinvested in the pre-reform years. We model the following equation to test the transition of under-invested firms from pre to post period.

$$Y_{it} = \alpha_0 + \alpha_1 TD + \alpha_2 Invdummy + \alpha_3 TD * Invdummy + \beta X_{it} + \mu_i + \varepsilon_{it}$$

We use three different measures of investment as dependent variable for above regression. Columns 1-4 show levels of investment in fixed assets (*Capex*), investment in total assets (*Investment*), total external financing (*TBorrEq*) and financial slack (*Cash*) respectively. Sum of coefficient of TD and TD*FC is positive and significant in all columns. Results show that

underinvested firms marginally increase their *investment in fixed assets (Capex)* in the post reform period. They witness no change in *CapexRD* while they show an increase in *Investment and Cash*. Co-efficient of TD in columns 1 through 4 illustrates that overinvested firms decreased their *Capex* and *CapexRD* significantly and show no change in investment in fixed assets (*Investment*). Both under and over invested firms increase their slack in the post period.

Table 13 : Level of Investment and cash hoarding for Under-Invested firms

Regression results for level of investment and cash is shown for under-invested firms in the pre-period. We use Richardson’s model to determine under-invested firms. New investment I_{new} is estimated using the following equation. Actual investment (I_{new}) is calculated as Capex minus Depreciation and amortization. The residual value ($I_{new} - \text{Fitted } I_{new}$) for each firm in each year between 1996 and 2000 is averaged over the 5 years pre-period. This measure is used to categorize firms into underinvested and overinvested firms. Mean error less than equal to zero are under-invested firms and vice-versa.

$$I_{new} = \alpha_0 + \alpha_1 I_{new_{it-1}} + \alpha_2 CashFlow_{it-1} + \alpha_3 Size_{it-1} + \alpha_4 Salesgrowth_{it-1} + \alpha_5 Classtype_{it} + \alpha_6 GDP_{it-1} + \alpha_7 TborrEq_{it-1} + \mu_i + \varepsilon_{it}$$

Columns 1-4 show regression result for *Capex*, *Investment*, *CapexRD* and *Cash* as dependent variable respectively. *Capex* is measures as change in fixed assets deflated by total assets; *Investment* is measured as change in total assets divided by total assets in the year (t-1). *CapexRD* is the sum of Capex and R&D expenses deflated by total assets while *Cash* is cash and cash equivalent of any firm. *TD* is the dummy variable with value 1 in post clause period (2006-2008) and 0 in the pre-clause period (1996-2000). *Invdummy* is the dummy variable set to 1 for under-invested firms and 0 for over-invested firms. *Classdummy* is the dummy with value equal to 1 for Indian Business groups and 0 for stand-alone firms. *Size* is measured as log of total assets. *Cash Flow* is sum of profit after tax and depreciation of the firm. *Salesgrowth* change in sales from year (t-1) to t divided by sales in year (t-1). *GDP* is the growth rate in gross domestic product for Indian economy, both data sets fetched from World Bank. All firm level data are from CMIE-Prowess database. Standard errors are shown in parentheses. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

table 13 continued

	(1)	(2)	(3)	(4)
	Capex	Investment	CapexRD	Cash
TD	-0.0386*** (0.00323)	0.0133 (0.00893)	-0.0365*** (0.00508)	0.0106*** (0.00177)
Invdummy	-0.0582*** (0.00267)	-0.101*** (0.00738)	-0.0472*** (0.00427)	0.000628 (0.00148)
TD*Invdummy	0.0530*** (0.00401)	0.0985*** (0.0111)	0.0431*** (0.00630)	0.00111 (0.00220)
CashFlow	0.0306*** (0.00701)	0.184*** (0.0193)	0.0318* (0.0184)	0.0246*** (0.00384)
Size	0.0103*** (0.000760)	0.0356*** (0.00210)	0.00841*** (0.00122)	0.00186*** (0.000418)
Salesgrowth	0.0289*** (0.00228)	0.149*** (0.00631)	0.0393*** (0.00466)	0.00342*** (0.00128)
ClassType	-0.0142*** (0.00245)	-0.0408*** (0.00676)	-0.0104*** (0.00395)	0.00266** (0.00135)
GDP	-0.000287 (0.000439)	0.000984 (0.00121)	-0.000783 (0.000690)	0.000652*** (0.000241)
Constant	0.0375*** (0.00865)	-0.0652*** (0.0239)	0.0186 (0.0158)	0.00867* (0.00473)
Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	7837	7837	2474	7591
Adjusted R^2	0.1284	0.2074	0.1347	0.0839

5.5. Firm performance

In this section, we estimate the incremental contribution of increase in investment towards increasing performance of firms in the post period. The improved investment efficiency attributed to more stringent (and more rigorously monitored) disclosure requirements is expected to lead to better market performance of Indian firms. We test if there was a positive market response to the implementation of *Clause 49*. We document that ROA and Tobin's Q as a measure of market performance increases over the years which is indicative of improved dissemination of firm level information in the capital market and overall increase in the market efficiency. Further we test if there is any improvement, how much of that can be contributed towards increase in investment. We interacted the terms TD and *Invdummy* to account for underinvested firms in the regression model and reperform the analysis.

$$Tobin'sQ = \alpha_0 + \alpha_1TD + \beta_iX_{it} + \mu_i + \varepsilon_{it}$$

$$Tobin'sQ = \alpha_0 + \alpha_1TD + \alpha_2Invdummy + \alpha_3TD * Invdummy + \beta_iX_{it} + \mu_i + \varepsilon_{it}$$

We use two measures of performance as dependent variable for above regression. Columns 1 shows Tobin's Q (*TobinQ*) and column 2 represents return on assets (ROA) respectively. Panel A denotes results for all firms in the sample. Co-efficient of TD is positive and significant in columns. It implies that performance of firms improved in the post period.

Result from panel B signifies whether the improved performance can be allocated to improvement in investment efficiency of the firms. *Invdummy* is the category variable set to 1 for under-invested firms and 0 for over-invested firms. Sum of coefficient of TD and TD**Invdummy* represents changes in performance of under-invested firms while co-efficient of TD represents over-invested firms respectively. Negative coefficient of TD in column 2 suggests that return on assets decreases for over-invested firms in the post-period. The sum of co-efficient as shown in

Table 14 : Performance of firms

Regression results for performance of firms is shown for all firms in Panel A and for under-invested firms in panel B. Dependent variables are Tobin's Q shown in column A and ROA (return on assets) shown in column B respectively. *TD* is the dummy variable with value 1 in post clause period (2006-2008) and 0 in the pre-clause period (1996-2000). *Capex* is the investment in fixed asset deflated by total assets. *Size* is measured as log of total assets. *Cash Flow* is sum of profit after tax and depreciation of the firm. *GDP* is the growth rate in gross domestic product for Indian economy, both data fetched from World Bank. *Classdummy* is the dummy with value equal to 1 for Indian Business groups and 0 for stand-alone firms. *Invdummy* is the dummy variable set to 1 for under-invested firms and 0 for over-invested firms. All firm level data are from CMIE-Prowess database. Standard errors are shown in parentheses. The symbol ***, **, and * denote statistical significance at 1%, 5% and 10% respectively.

Panel A: Performance for all firms		
	(1)	(3)
	Tobin's Q	ROA
TD	0.376*** (0.0156)	0.0145*** (0.00152)
Capex	-0.156** (0.0717)	0.0484*** (0.00704)
Size	0.0863*** (0.00430)	0.00500*** (0.000416)
CashFlow	0.289*** (0.0408)	0.278*** (0.00365)
InterestRate	0.0206*** (0.00587)	0.00665*** (0.000576)
GDP	0.0275*** (0.00325)	0.000980*** (0.000319)
Constant	0.00765 (0.104)	-0.122*** (0.0100)
Industry Fixed Effect	Yes	Yes
Observations	8508	9967
Adjusted R ²	0.2230	0.4163

table 14 continued

Panel B: Performance for Under-invested firms

	(1)	(2)
	Tobin's Q	ROA
TD	0.372*** (0.0240)	-0.00345* (0.00201)
Invdummy	0.0148 (0.0198)	-0.0150*** (0.00166)
TD*Invdummy	0.0467 (0.0297)	0.0179*** (0.00249)
CashFlow	0.0305 (0.0570)	0.429*** (0.00435)
Size	0.0690*** (0.00573)	0.00412*** (0.000471)
Salesgrowth	0.0841*** (0.0181)	0.0184*** (0.00142)
ClassType	0.0675*** (0.0183)	0.000224 (0.00152)
GDP	0.0220*** (0.00324)	-0.000483* (0.000272)
Constant	0.279*** (0.0682)	-0.00438 (0.00536)
Industry Fixed Effect	Yes	Yes
Observations	6732	7837
Adjusted R^2	0.2529	0.6084

Table 14 is positive and significant in both columns. It suggests that both Tobin's Q and ROA increases for under invested firms in the post period. Thus, we conclude that performance of underinvested firms in the pre-period contributes positively to the improved performance.

5.6. *A deeper look at cash*

It is evident from the results so far that *Clause 49* seems to alleviate info asymmetry leading to marginal increase in capital raising for firms; but more importantly, it relieves financial constraints by creating a stronger "capital safety net" for firms. We document an increase in external capital even after controlling for the self-selection and endogeneity. Further, we find that investment in fixed assets decreases but that in total assets increases. Investment in total assets include investment in fixed assets plus investment in current assets. To confirm our finding, we compare for level of cash hoardings by firm in the two periods. We find that cash level increases in the post -period. It implies that firms seem to be accumulating slack (cash) instead of increasing investment. In fact, the pre-emptive motive for cash suggests that with transparency improvement firms should reduce slack.

We try to find rationale for why firms increase their holdings in current assets, while their investments in capital expenditure goes down. This conclusion raises an immediate question: if the reforms had the ability to raise external financing, why had not it result in increasing firms' investment? The firms were not only able to access more external financing in India, there are also evidence that firms were gaining access to capital from outside shareholders, especially foreign investors (Dharmapala and Khanna, 2013). The rest of the section explores this additional consequence of the reform. If this increase in capital does not result in an increase in investment, rather add up to an increase in cash then it indicates another kind of agency problem. This agency may emanate from lack of investment opportunities. The findings of this paper suggest two things. First, either managers are not investing in projects due to unavailability of positive NPV projects or second, managers are hoarding cash for some other reason not known to us.

5.6.1. Mergers and acquisitions

Government-mandated disclosure requirement in the form of *Clause 49* does not translate into improved investment level. Perhaps firms are hoarding cash (instead of investing) because they want to grow through outside acquisitions. We find out what happens to mergers pre vs. post, especially for the sub sample of non-investing firms. Following is our finding:

The first wave of mergers coincides with 1990-1995 and is known as era of consolidation. The second wave happens during 1995-2000 period. Beena (2004) suggest that second phase of M&A activities was marked when multinational enterprises started strengthening their position in the Indian market. This phase was mostly dominated by merger of firms belonging to same business group in similar product and was primarily done to guard against a takeover. Beena (2004) could not find any significant evidence of efficiency-related factors influencing M&As that happened in India during late nineties.

The third wave of M&As happens post 2001. The number of mergers increases while and the value of acquisition grew manifold. Indian companies not only expanded in India but started venturing abroad and made major foreign acquisition during this period. Huge cash reserves, enhanced competitiveness, booming Indian market, increasing interest rates, and few regulatory changes during this period enabled top players to plan for foreign acquisition. IT services and electronics and high technology industries accounted for more than half of cross-border transactions post-2000 (*"India goes global", 2006, Accenture report*). The graph of mergers in different industries is shown in picture below.

Picture 1: Sector-wise and Year -wise M&A activity from 2001-2007

S. No	Industry	Year							2001-2007	Share (%)
		2001	2002	2003	2004	2005	2006	2007		
1	Food, Tobacco & Beverages	105	90	82	70	58	72	46	523	6.4
2	Textiles	48	59	60	61	65	56	36	385	4.7
3	Chemicals, Plastics, Drugs, Fertilisers, Cosmetics, Petroleum products, Tyres and tubes	177	179	152	159	144	115	122	1048	12.8
4	Non Metallic mineral products	18	36	26	24	35	46	42	227	2.8
5	Metals & Metal Products	27	54	56	44	45	43	31	300	3.7
6	Machinery (Electrical & Non Electrical)	49	102	67	41	88	89	69	505	6.1
7	Automobiles & Automobile Ancillaries	40	36	45	36	40	33	37	267	3.2
8	Miscellaneous Manufacturing	34	44	27	33	28	25	36	227	2.8
19	Diversified	18	9	10	8	6	4	3	58	0.7
10	Mining	5	5	7	10	10	24	9	70	0.9
11	Electricity	11	13	16	9	10	13	8	80	1.0
12	Financial Services	171	227	160	106	209	191	154	1218	14.8
13	Other services	186	324	281	279	212	213	219	1714	20.9
	Total	1200	1325	1107	1003	1194	1322	1068	8219	100

Source: Bhalla, Priya. "Determinants of mergers and acquisitions of firms in the Indian financial sector: An empirical analysis." *IUP Journal of Business Strategy* 8.3 (2011): 7.

The third wave of M&A in India coincides with our post reform period as well. The number of M&As were highest in the year 2006. Diverse M&A activities show an increasing trend while the ones belonging to same business group decreases during this period (Pandya, 2017). Diverse M&A activities increases and the one belonging to same business group decreases during this period (Pandya, 2017).

Acquisition patterns suggest that the post reform period coincides with a concurrent increase in internal and external acquisitions by Indian firms. We conjecture that perhaps firms hoard cash to facilitate acquisitions.

6. Conclusion

We study the impact of the *Clause 49* disclosure reform on financing decisions, financial constraints, investment decisions, and firm performance of Indian firms. If the disclosure reform

improved information transparency, we would expect to see an increase in firms' external financing, and an increase in their reliance on external financing relative to internal financing. We find evidence consistent with this expectation. Measures of external financing increase significantly and the ratio of internal to external financing decreases significantly in the period after the reform. Moreover, these effects are more pronounced in firms with access to only domestic markets relative to firms cross-listed in foreign markets, suggesting that the alleviation of adverse selection costs is especially valuable for firms confined to one market. The results are robust to a variety of specifications and corrections for endogeneity and self-selection biases. Overall, the results suggest that firms modify both the level of capital and the blend of capital in response to the reform.

We also study whether the reforms alleviate financial constraints by creating a capital safety net for firms. Following Erel, Jiang, and Weisbach (2015), we study whether the sensitivity of investment to cash flow and the sensitivity of cash to cash flow decline after the reforms. We find a significant decline in these sensitivities post-reform for domestic firms relative to firms excluded from reform compliance, as well as firms cross-listed on foreign exchanges. Our results are consistent with the reforms relieving financial constraints by creating a stronger capital safety net for firms.

Further, we investigate whether the increase in capital leads to higher investment by firms. We find that the expanded funding does not seem to improve investment unambiguously, rather, only firms that suffered under-investment prior to the reform show a significant improvement in investment post-reform. Counter to our expectations, we document an increase in financial slack across all firms. Acquisition patterns suggest that the post reform period coincides with a concurrent increase in internal and external acquisitions by Indian firms, suggesting that perhaps

the increase in financial slack is intended to facilitate acquisitions. Finally, firm performance increases after the reforms with the performance being related to investment increase for firms that suffer from under-investment prior to the reform.

Overall, our results suggest that *Clause 49* reforms improve the efficiency of capital markets in India by increasing external capital market access to firms, alleviating financial constraints, increasing their capital safety net, and improving investment in firms that suffer under-investment prior to the reforms.

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Appendices

Appendix 1: Variables

Measures of Capital:

$$\text{TBorrEq} = (\text{Equity} + \text{Borrowing})/\text{TA}$$

$$\text{TBondEq} = (\text{Equity} + \text{Bonds})/\text{TA}$$

$$\text{RE} = \text{Retained earnings}/\text{TA}$$

$$\text{Ratio of RE/ExtFin} = \text{RE}/\text{TBorrEq}$$

Measures of Investment:

$$\text{Capex} = [\text{GFA}(t) - \text{GFA}(t-1) + \text{Sale PPE}(t)] / \text{TA}(t).$$

$$\text{Investment} = [\text{TA}(t) - \text{TA}(t-1)] / \text{TA}(t-1)$$

$$\text{CapexRD} = [\text{GFA}(t) - \text{GFA}(t-1) + \text{Sale PPE}(t) + \text{R\&D}(t)] / \text{TA}(t)$$

Measures of Financial Slack:

$$\text{Cash} = \text{Cash and cash equivalents}/\text{TA}$$

Measures of Performance:

$$\text{Tobin's Q} = (\text{TA} + \text{Market value of Equity} - \text{Book value of Equity})/\text{TA}$$

$$\text{ROA} = \text{PAT}/\text{TA}$$

Control Variables:

$$\text{Size} = \log(\text{TA})$$

$$\text{Cashflow} = (\text{PAT} + \text{DA})/\text{TA}$$

$$\text{EBDITA} = \text{EBDITA}/\text{TA}$$

$$\text{Sales Growth} = [\text{Sales}(t) - \text{Sales}(t-1)] / \text{Sales}(t-1)$$

$$\text{M_B} = \text{Market Value of equity}/\text{Book value of equity}$$

$$\text{STDROA} = 5 \text{ years rolling standard deviation of EBDITA}$$

$$\text{GDP} = \text{Growth rate of GDP in India in year } t$$

$$\text{Interest Rate} = \text{Prime lending rate in India in year } t$$

Appendix 2: Time-Period and Sub-Sample Proxies

Reform Period:

TD: 1 for Post-reform period (2006-2008) and 0 for Pre-reform (1996-2000).

Sub-samples:

CL_NCL: 1 for NCL firms and 0 for CL firms.

CL_NCLLarge: 1 for NCL-large firms and 0 for CL firms

Large_Small: 1 for NCL-Small firms and 0 for NCL-Large firms

NA_NCLSmall: 1 for NCL-Small firms and 0 for EF firms

Classdummy= 1 for firms belonging to IBG and 0 for stand-alone firms

FCdummy= 1 for financially constrained and 0 for less constrained firms

Invdummy = 1 for firms that showed Under-investment using Richardson measure in the pre-period and 0 for firms that over-invested in the pre-period

Appendix 3: Tightened disclosure and corporate governance in India

Timeline of Events

Year	Announcement
1991	Cadbury Committee under chairmanship of Sir Adrian Cadbury
1992	Codes of best practices
1996	Confederation of Indian Industry (CII) task force set up
1998	Voluntary codes of corporate governance by CII taskforce
1999	Kumar Mangalam Birla Committee set up by SEBI
2000	Implementation of <i>Clause 49</i>
2001	Narayan Murthy committee and Irani committee set up by Ministry of Corporate Affairs
2002	Naresh Chandra committee set up by SEBI
2004	Amendments in <i>Clause 49</i> announced to be implemented from 2005
2005	Implementation of "Amendments in <i>Clause 49</i> " deferred
2006	"Amendments in <i>Clause 49</i> " to be implemented from January 1,2006
2008	Changes in Company's Bill
	The revised schedule VI to the Companies Act, 1956 in accordance with IFRS requirements requires companies to present financial statements in the new disclosure format. ¹⁷
2011	
2012	Issue of Voluntary guidelines based on Adi Godrej Committee
2013	Enactment of Revised Companies' Act
2014	Revised <i>Clause 49</i> to align provisions with Companies' Act 2013

¹⁷ As per the new schedule, companies are required to segregate their assets and liabilities into current and non-current portions. Hence, data on non-current assets and liabilities is available in Prowess only from March 2011 onwards.

Main Covenants of Clause 49

Clause 49 mandates were to be implemented by:

- All entities seeking listing for the first time, at the time of listing.
- All entities included either in Group 'A' of the BSE or in S&P CNX Nifty index as on January 1, 2000. The deadline was March 31, 2001.
- All listed entities with paid up share capital of Rs. 10 Crore and above, or net worth of Rs. 25 crores, deadline being March 31, 2002.
- All the listed entities with paid up share capital of Rs.3 crore and above, deadline being March 31, 2003.

Provisions of Clause 49

1. Board of Directors: Composition and category of directors and promoters (including non-executive director, independent directors, nominee directors). Details of their holdings as a lender or equity investor to the company. Attendance of director at the BoD meetings and meeting details; details of other Board committee he/she is member of. All pecuniary relations or transactions of the non-executive director to be disclosed in the annual report. Independent directors should not have any pecuniary relation with the company (other than remuneration) that could affect the independence judgement of the director.
2. Audit Committee: Clause49 also provides clarification on power of audit committee. Companies are directed to include the following information in their annual report: brief description of terms of reference; composition, name of members; details of meeting and attendance held during the year.
3. Remuneration of directors: Companies to form a remuneration committee and its description, including the composition of members, terms of reference, attendance and remuneration policy

to be incorporated in the corporate governance section of the annual report. Further, following disclosures on remuneration of directors to be disclosed: a) elements of remuneration package of individual directors summarized under major groups, such as salary, benefits, bonuses, stock options, pension etc. (b) Details of fixed component and performance linked incentives, along with the performance criteria. (c) Service contracts, notice period, severance fees. d) stock options.

4. Management: This Management Discussion and Analysis should include discussion on the following matters and should form part of the annual report: Industry structure and developments, opportunities and threats, segment-wise or product-wise performance, outlook, risks and concerns, internal control systems and their adequacy, discussion on financial performance with respect to operational performance. Companies were asked to disclose all material financial and commercial transactions to the board e.g. dealing in company shares, shareholding of management and their relatives etc.
5. Shareholders: General shareholders' information to be disclosed in the annual report e.g. financial calendar, date of book closure, dividend payment date, listing on stock exchange, stock code, market price data, performance in comparison to indices, share transfer system, distribution of shareholding, dematerialization of shares and liquidity, outstanding GDRs/ADRs/warrants or convertible instruments etc. A shareholder committee to be formed to address shareholders' grievances; number of shareholders' complaints received, resolved and pending to be disclosed in the annual report.
6. There shall be a separate section on corporate governance in the Annual Report of company, with a detailed compliance report including penalties, strictures on the companies by stock exchange or SEBI, any matter related to capital market in the last 3 years.

7. Summary of transactions with related party including details of individual transaction which are not at an arm's length shall be placed before the audit committee.

Amendments to Clause 49

The first amendment was made in 2004 to improve quality of financial disclosure to assess and disclose business risks. Further, new sections, 23A-O, were inserted in the Securities Contracts Regulation Act 1956 that imposed significant penalties on companies for non-compliance (Dharmapala and Khanna, 2013). The deadline for compliance with the amendments was set to be April 1, 2005, and then moved to Dec. 31, 2005 as many firms were still not in a state of preparedness to be fully compliant.

The following revisions were included in the amendment:

1. Principle of financial statement if treated differently from the prescribed accounting standard shall be disclosed with explanation.
2. Risk Management: Company should form Risk management committee. The company needs to lay down procedures to inform board members about the risk assessment and minimization procedure.
3. Money raised from public issue and uses of funds shall be disclosed to the audit committee on a quarterly basis. On annual basis, the company shall prepare a statement of funds utilized for purposes other than those stated in the offer document and place it before the audit committee.
4. Following points were added in the section of remuneration disclosure: The company were asked to disclose the number of shares and convertible instruments held by non-executive directors in the annual report. Non-executive directors shall be required to disclose their shareholding (both own or held by / for other persons on a beneficial basis) in the listed company in which they are proposed to be appointed as directors, prior to their appointment.

These details should be disclosed in the notice to the general meeting called for appointment of such director.

5. Shareholders: Quarterly results and presentations to analysts to be put on company's website. Shareholder/Investor grievance committee has to be formed to look into the redressal of shareholders' complaints.
6. CEO/CFO certification: CEO/CFO and managing director should certify to the board that they have reviewed financial statements and the cash flow statement for the year and that to the best of their knowledge and belief.
7. The companies are asked to submit a quarterly compliance report to the stock exchanges within 15 days from the close of quarter duly signed by compliance officer or CEO of the company.

Vita

Sakshi Raj was born in Vaishali, India in 1984. She received her bachelor's degree in Electronics and Communication engineering from Tilka Manjhi Bhagalpur University, India in 2008. In 2012, she received post graduate diploma in Global Business Operations from University of Delhi, India.

Sakshi moved to United States for her PhD degree in fall 2015. She attended the doctoral program at department of Economics and Finance, University of New Orleans. She was the recipient of "Toussiant Hocevar Memorial Award" in 2018 for her outstanding performance during the program. She received her PhD in Financial Economics in December 2018.