

Uncovered Equity “Disparity” in Asian Emerging Markets

Ana-Maria Fuertes, Kate Phylaktis, and Cheng Yan¹

“The increasing size and equity content of current capital flows has not yet inspired a new financial market paradigm for exchange rate theory, in which exchange rates, equity market returns, and capital flows are jointly determined.”

Hau and Rey, (2006)²

1. Introduction

If a country’s equity market is expected to appreciate (e.g., when MSCI announced that it would include 226 China large-cap A shares to the MSCI Emerging Markets Index in June 2017), should we expect its currency to appreciate or depreciate? This question matters to international equity investors, policymakers and academics. An investor holding foreign equities is exposed to exchange rate fluctuations by nature. Policymakers care about this relation as valuation changes-- induced by foreign exchange and equity returns--generate significant swings in international investment positions. However, little is known about the relation between foreign exchange rates (hereafter FX) and international equity returns.

Consider a US portfolio manager with money invested in Japan. When the Japanese stock market rises relative to the US, the manager is overweight with Japanese equities and, to return to a neutral position and decrease the additional exchange rate exposure, sells Japanese stock and then sells the Japanese yen proceeds for US dollars. The sale of yen for dollars causes the yen to depreciate

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² Hau, H. and H., Rey (2006). Exchange rates, equity prices and capital flows. *Review of Financial Studies* 19, 273–317.

at the same time that the Japanese stock market is outperforming. This is called uncovered equity parity (UEP) condition (e.g. Hau and Rey 2006). UEP is relevant for at least two reasons. On the one hand, it asserts that foreign net equity flows drive FX returns, which have been notoriously difficult to predict using other macro-economic variables. On the other hand, from the perspective of international portfolio management, it is also important for global investors, as investments in foreign equity markets inevitably involve investing in FX.

The evidence is however not supportive for emerging markets (EMs), known as the failure of UEP in EMs (Kim, 2011)³, as most (if not all) studies find a positive rather than a negative correlation between EM equity and FX returns (Kim, 2011; Cho, et al., 2016⁴; Cenedese, et al., 2015⁵). The reasons for this are unclear. We innovatively conjecture and formally test whether it is because the foreign investors in aggregate buy (rather than sell) more local equity when the EM equity market appreciates (return-chasing hypothesis).

2. Our Study

This paper makes two contributions to the literature.⁶ First, it analyses the dynamics of foreign equity markets, FX markets, and capital flows using an unbalanced panel of daily data for eight East Asian emerging markets (EMs) from 1996 to 2013 which includes the recorded trades of all foreign investors in the six EMs, paired with daily closing prices of the Bombay Stock Exchange (BSE) Sensitive 30 Index in India (SENSEX), National Stock Exchange (NSE) CNX Nifty 500 Index in India (NIFTY50), Jakarta JSX Composite Index in Indonesia, the Kospi and Kosdaq Indices in Korea, the PSE Composite Index in the Philippines, the TWSE/TAIEX Index in Taiwan, and the Bangkok SET Index in Thailand. These data enable more accurate inferences on UEP in EMs than the monthly/quarterly bilateral flows used in prior studies.

Second, after confirming the evidence against UEP in EMs documented by Kim (2011) and Cho

³ Kim, H (2011). The risk adjusted uncovered equity parity. *Journal of International Money and Finance* 30, 1491-1505.

⁴ Cho, J. W., Choi, J. H., Kim, T., and W., Kim (2016). Flight-to-quality and correlation between currency and stock returns, *Journal of Banking and Finance* 62, 191–212.

⁵ Cenedese, G., Payne, R., Sarno, L., and G. Valente (2015). What do stock markets tell us about exchange rates? *Review of Finance* 31, 1-36.

⁶ Fuertes, A.-M., Phylaktis, K., and C. Yan (2016). Uncovered equity “disparity” in emerging markets. Cass Emerging Markets Group Working Paper EMG-01-2016. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3205055

et al. (2016)--we do find that local EM equity return improvements go hand-in-hand with currency appreciation which suggests that the relationship is instead positive. We assess the mechanisms leading to what we call the uncovered equity “disparity” in EMs.

3. Results

The first mechanism towards UEP requires that, in line with the notion of portfolio rebalancing, foreign equity investors rebalance away from (toward) countries whose equity/FX markets have recently appreciated (depreciated). The evidence from our paper challenges this mechanism for UEP as a contemporaneous or lead-lag relationship between EM equity returns and net investment flows of US investors into EM equity. We find that net equity flows respond positively to both current and past local-currency equity returns. Net equity flows are oblivious to past FX returns, echoing the results of Curcuru et al. (2014) for U.S. equity investors, which suggests that foreign equity investors in EMs mainly use exchange rate as a vehicle.

Motivated by these findings, we investigate whether foreign investors in EMs predominantly pursue return-chasing strategies. We formally test whether equity flows of foreign investors in EMs are driven by high EM expected equity returns. Decomposing the current returns into the expected and unexpected components, we find that there is a significantly positive relation between the expected component and current flows but a much weaker positive relation with the unexpected component, which formally endorses the return-chasing hypothesis.

The second mechanism towards UEP implies that a decrease in net equity flows comes hand-in-hand with domestic currency depreciation. We provide favorable evidence of this mechanism, namely, the contemporaneous relation between FX returns and net equity flows is significant and positive. Therefore, in the context of the Hau and Rey (2006) theoretical framework, altogether the findings of this study indicate that the UEP failure in EMs can be ascribed to the absence of the first mechanism--the evidence that foreign investors increase their equity holdings in those EMs that have recently outperformed and is aligned with return-chasing (as opposed to portfolio rebalancing) strategies. This finding rationalizes the uncovered equity “disparity” in EMs as Figure 1 illustrates. The relationships represented in the top graph of the figure (dotted lines) summarize the two prevailing mechanisms according to the Hau and Rey (2006) theoretical model and the UEP prediction. The bottom part of the figure (continuous lines) illustrates the mechanisms documented empirically in our paper.

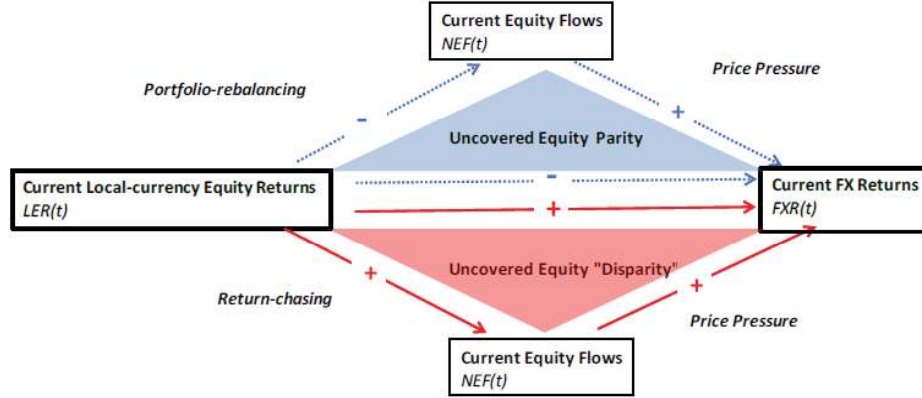


Figure I: Uncovered Equity (Dis)Parity. *The figure plots the mechanisms towards (and away from) the Uncovered Equity Parity prediction according to the Hau and Rey (2006) theoretical framework.*

Our daily data allows us to explore other aspects of the failure of the UEP in EMs, and compare our explanation to existing explanations in the literature. Our results hold after we control for the global equity volatility. We also find that the uncovered equity “disparity” is time-varying and asymmetric. On the one hand, we find an upward time trend in the correlations between local-currency equity and FX returns in our six EMs using moving correlations, which aligns well with the return-chasing hypothesis but is at odds with Kim (2011)’s risk-based explanation which implies that there should be a downward time trend in these correlations given the fact that EMs are gradually integrated into the global financial system. On the other hand, as borne out also by the dynamic correlation analysis, the “disparity” is magnified in periods of economic downturn--such as during the Global Financial Crisis in late 2000s which suggests that flight-to-quality may have played some role in these periods. Our return-chasing explanation requires neither the presence of a global equity volatility factor (Cenedese et al., 2015) nor flight-to-quality behavior (Cho et al., 2016).

4. Conclusion

The portfolio-rebalancing theoretical framework of Hau and Rey (2006) enables the UEP hypothesis that local currency equity returns and FX returns are negatively related. The empirical evidence thus far has not been supportive of UEP in EMs. Using daily data on net equity flows, local-currency

equity returns and FX returns for six Asian emerging markets (EMs) covering more than 13 years up to 2013, we confirm the UEP failure in EMs and investigate the underlying mechanisms to provide an explanation.

We find evidence against the first mechanism underlying the UEP prediction in two respects. First, foreign EM equity investors in aggregate do not respond to FX movements, suggesting that they mainly use EM currencies as a necessary vehicle to invest in EM equities. Second, foreign EM equity investors on the whole pursue return-chasing strategies which lead to a positive correlation between the local-currency equity returns and FX returns. But we find strong support for the second mechanism underlying the UEP: there is evidence of a strong contemporaneous positive relation between net equity flows and FX returns. Our results hold after we control for global equity volatility. We also find that the failure of UEP in EMs is time-varying and asymmetric as it magnifies in economic downturns and financial crisis.

Our findings have important implications. With regard to foreign equity flows, policymakers should not just monitor equity or FX markets, but also the interconnections between these two markets and capital flows. The current turmoil in the equity and FX markets in EMs, which have been accompanied by huge capital outflows from the EMs is a reminder of the importance of examining their dynamics jointly. Although our data set is richer than typical data sets of prior UEP studies, it is still limited in that we only have flows of all the recorded trades of foreign investors, but do not have information about the nationalities of each foreign investor. As a result, we can only reveal the overall effects of the foreign investors in our sample markets, but are not able to distinguish the potential different effects of different nationalities. A practical implication for EM equity market participants is that they may want to pay more attention to FX hedging strategies since foreign currency movements do not offset local-currency equity returns but rather represent an additional risk factor exposure for FPIs.

T.V. Analyst Recommendations and Investor Activity

V. Ravi Anshuman, Prachi Deuskar, Krishnamurthy V. Subramanian and Ramabhadran S.
Thirumalai¹

1. Introduction

If sophisticated investors observe an increased buying activity in a particular stock, what should they do? Should they be contrarian and trade against the crowd? The answer to this question depends upon the sophisticated investors' assessment of the reasons why others are buying. They would be wary of selling the stock, if they believe that the other investors are buying based on good news about the stock. On the other hand, if the sophisticated investors can identify an event that causes only temporary price fluctuations, they would be reasonably sure that trading during such an event is unlikely to be driven by information. Then, they can be contrarians without a concern about being on the wrong side of the information.

Prior research, mainly from the U.S, has shown that stock prices tend to move only temporarily following media recommendations and revert to their original level very quickly. Thus, media recommendations could be an event where sophisticated investors do not have to worry about trades being driven by information. Following analyst recommendations from a TV programme, we first examine if the stock price movements are indeed temporary. Then, we go on to analyze the activity of different types of investors following the recommendations.

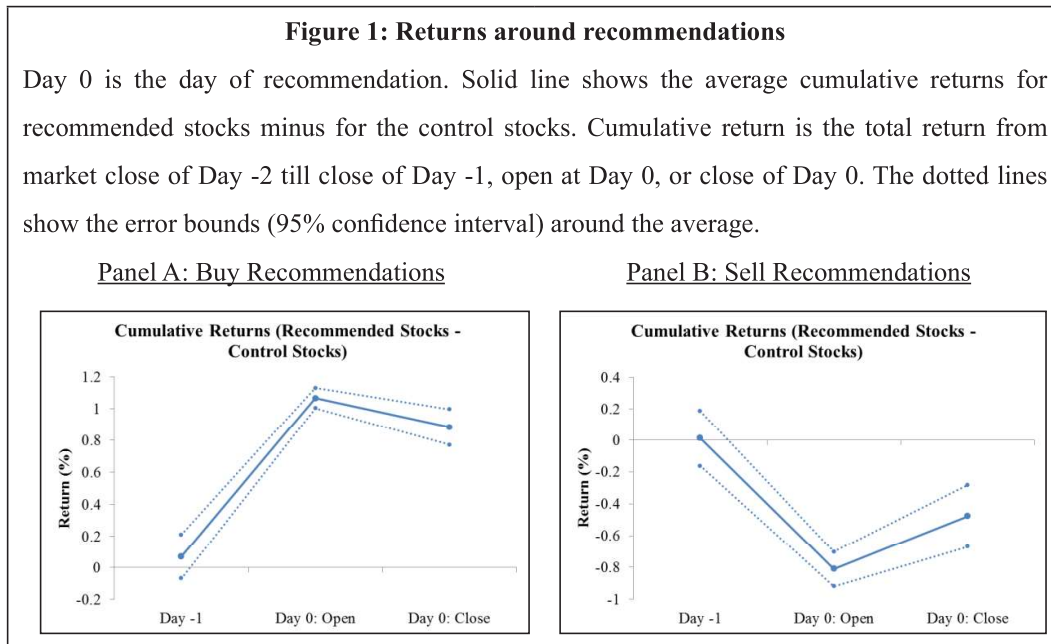
2. Price patterns around TV analyst recommendations

We look at “Buy” and “Sell” recommendations for different stocks made by analysts on a TV programme called “CNBC Awaaz Stock 20/20” from July 2009 to June 2010. We compare the

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recommended stocks to a set of control stocks--similar stocks which do not get recommended on that particular day. We choose control stocks using propensity score matching based on characteristics that explain which stocks are likely to be recommended, characteristics such as past returns, volume and market capitalization. Figure 1 below plots the comparative cumulative returns of recommended stocks vs control stocks around the day of the recommendation.

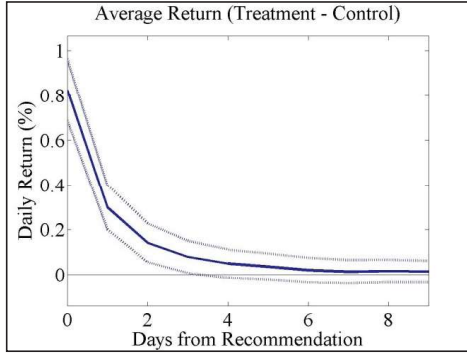


The recommendations are made before trading opens for the day. When the trading opens, a stock with a buy recommendation is up 100 basis points and a stock with a sell recommendation is down 82 basis points. However, prices start reverting the same day. Stocks recommended as a “Buy” fall by 17 basis points and stocks recommended as “Sell” rise by 30 basis points from open to close on the day of recommendation. The pattern of reversal continues and the entire announcement effect disappears within about a week as can be seen from Figure 2 below. This pattern confirms that the analyst recommendations do not result in a lasting effect on the prices and are hence not driven by information.

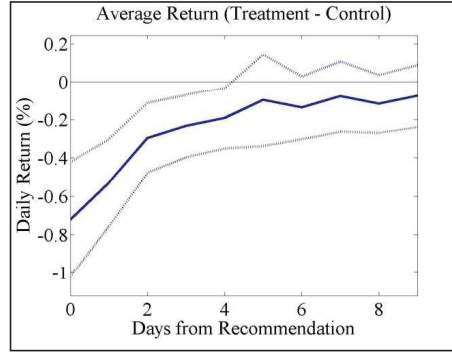
Figure 2: Returns around recommendations

Day 0 is the day of recommendation. Solid line shows the average cumulative returns for recommended stocks minus for the control stocks. The dotted lines show the error bounds (95% confidence interval) around the average.

Panel A: Buy Recommendations



Panel B: Sell Recommendations

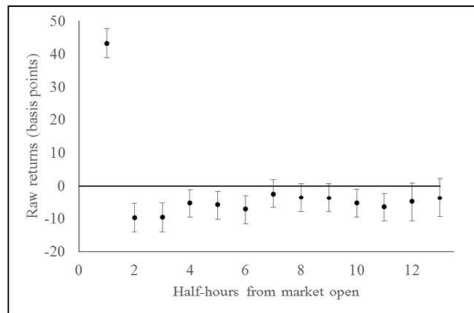


We dig deeper into what happens on the recommendation day. Figure 3 shows the intraday price patterns, again for recommended stocks relative to control stocks.

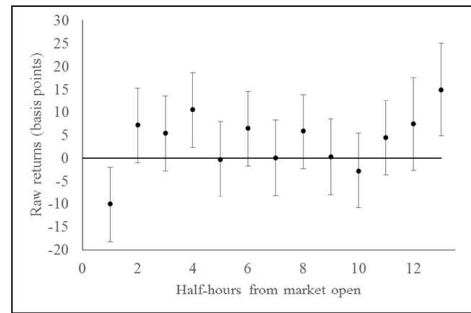
Figure 3: Intraday returns on the recommendation day

Solid circle shows the average returns for recommended stocks minus for the control stocks for half-hour periods. The line shows the error bounds (95% confidence interval) around the average.

Panel A: Buy Recommendations



Panel B: Sell Recommendations

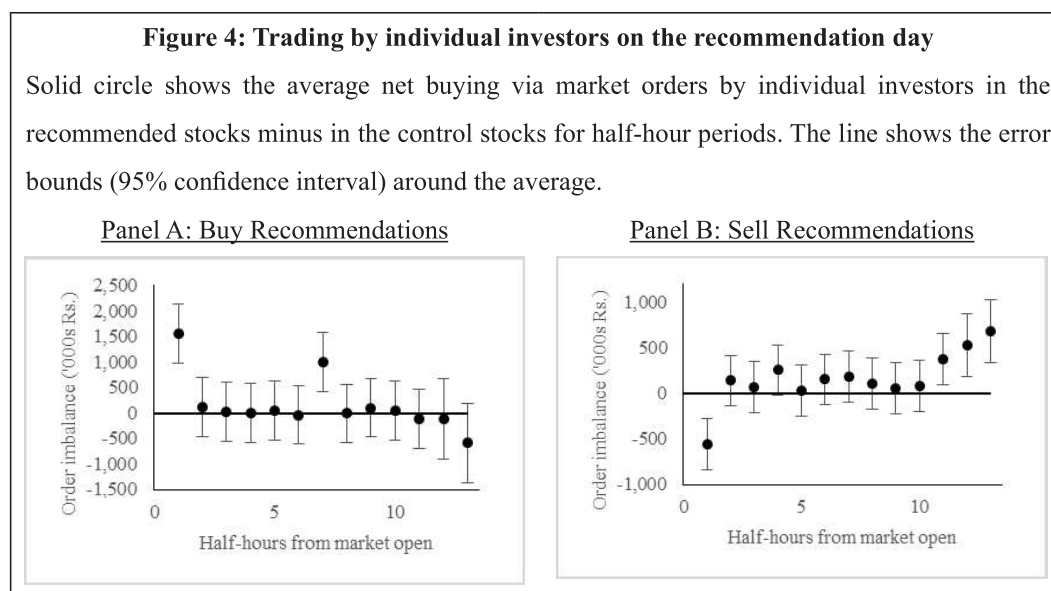


For buy recommendations, after having already opened higher than previous day's close, stocks increase further in the first half hour. Then for the rest of the day, the returns are negative, contributing to the reversal from open to close. Likewise, for sell recommendations, the stock has negative returns in the first half hour and zero or positive returns for the rest of the day.

Given the very quick and complete reversal of the announcement effect that begins on the day of the recommendation itself, those following the recommendations at the opening prices would lose money. Thus, if sophisticated investors observed trading in the direction of the recommendations, they can be reasonably sure that such trading is not driven by superior information. Then they can be contrarians and trade against those following the recommendations. So who is buying the “Buy”s and selling the “Sell”s?

3. Trading in response to recommendations

Figure 4 shows the pattern of trading by individual investors on the day of the recommendation. They aggressively trade in the direction of recommendation during the first half-hour of trading. Their trading is likely to put price pressure and resulting in the patterns seen in Figure 3.



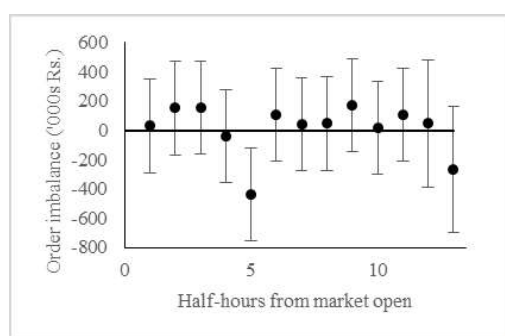
So who are taking contrarian positions against the individual investors? In general, institutional investors are considered sophisticated. Proprietary traders, who follow closely the patterns of prices, volumes and past trading activity, are also likely to be sophisticated. Figures 5 and 6 show the trading patterns of institutional investors and proprietary traders. For “Sell” recommendations, both the institutions and proprietary traders take contrarian positions, by buying significant quantities of the recommended stocks in the first half-hour as the individuals are selling. For “Buy” recommendations, only proprietary traders are active in the first half-hour. The institutions do not take significant contrarian positions.

The different response of institutions and proprietary traders to a profitable strategy following buy recommendation is a result of different constraints they face. Responding to a buy recommendation using a contrarian strategy involves selling or short selling the stock. Institutional investors face greater short sale constraints than proprietary traders. The Securities and Exchange Board of India (SEBI) allows institutions to take short positions, but it does not allow them to square-off intra-day

Figure 5: Trading by institutional investors on the recommendation day

Solid circle shows the average net buying via market orders by institutional investors in the recommended stocks minus in the control stocks for half-hour periods. The line shows the error bounds (95% confidence interval) around the average.

Panel A: Buy Recommendations



Panel B: Sell Recommendations

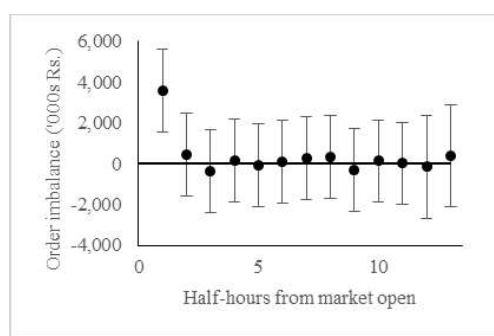
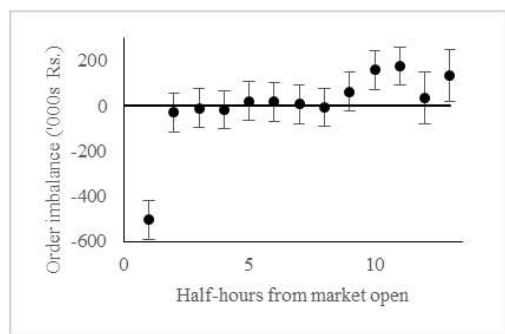


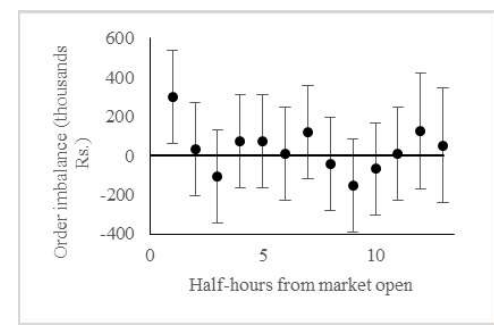
Figure 6: Trading by proprietary traders on the recommendation day

Solid circle shows the average net buying via market orders by proprietary traders in the recommended stocks minus in the control stocks for half-hour periods. The line shows the error bounds (95% confidence interval) around the average.

Panel A: Buy Recommendations



Panel B: Sell Recommendations



positions.² Squaring a short position by the end of the day is easier than carrying it overnight because the former does not require borrowing a stock. Thus, proprietary traders, who can square off positions by the end of the day, are likely to find it easier to short the stock. Therefore, it is not surprising that proprietary traders play a more active role in responding to buy recommendations as compared to institutional investors.

We further investigate if the most aggressive contrarian institutions and proprietary traders – i.e. those with the largest contrarian positions within each category – make money. Institutions are active only following sell recommendations and the most aggressive among them make more money than the least aggressive ones. Interestingly, even though proprietary traders are active following both buy and sell recommendations, they make money only following the buy recommendations when the institutions are not trading. It seems that they are outcompeted by the institutions following “sell” recommendations, who on average take positions that are 10 times larger than that of proprietary traders (Figures 5 and 6).

4. Conclusion

This study establishes that:

- i. On getting a recommendation by a TV analyst, there is a temporary jump in the stock price-up for “Buy” and down for “Sell” recommendations. Almost immediately the prices start reverting and the entire effect disappears within a week.
- ii. Even though it is unprofitable to do so, individual investors act on the recommendation. They buy the stocks with a “buy” recommendation at inflated prices. They sell the stocks with a “sell” recommendation at deflated prices.
- iii. Institutional investors and proprietary traders, being sophisticated, seem to pick on the pattern of price reaction followed by complete reversal. They trade in the opposite direction of the recommendation. But the institutional investors’ ability to sell or buy recommendations is hampered by greater short sale constraints.
- iv. Institutional investors take contrarian positions following “sell” recommendations and make significant profits. Even though proprietary traders take contrarian positions following both “buy” and “sell” recommendations, they make significant profits only for “buy” recommendations i.e. when there is no competition from the institutional investors.

² See Annexure I to SEBI circular MRD/DoP/SE/Dep/Cir- 14 /2007 dated December 20, 2007 for details.

The Role of Insider Trading in the Market Reaction to News Releases: Evidence from an Emerging Market

Francois Brochet, Paul Lee, and Suraj Srinivasan ¹

1. Introduction

Insider trading has long been viewed as one of the major impediments to the proper functioning of capital markets. It is alleged to be particularly severe in some emerging markets, including India. This is, in part, because governance standards remain looser in those markets. Furthermore, even if securities regulation has converged towards more stringent global norms, enforcement continues to vary across jurisdictions. Like all regulators around the world, the Securities and Exchange Board of India (SEBI) faces financial and human capital resource constraints in detecting and prosecuting cases of insider trading. One of the ways in which regulators such as SEBI attempt to police insider trading is by requiring corporate insiders (i.e., promoters and directors) to report their trades in a timely fashion. SEBI then disseminates information about those trades to the public at large. The rationale for those disclosure requirements is threefold. First, promoters necessarily have continuous access to non-public information about the firms they own and operate, and therefore have the most opportunities for insider trading. Second, it is believed that requiring insiders to disclose their trades will temper their temptation to trade on non-public information. Third, investors wish to be informed about corporate insiders' transactions in a timely fashion, should those transactions reflect the insiders' sentiment about whether the shares are under- or overvalued.

We examine whether Indian insiders report trades that precede significant material news. The primary question we seek to answer is whether promoters and directors of publicly listed Indian companies engage in insider trading in plain sight. There are reasons to expect why this would be the case. Numerous studies document patterns of informed insider trading by U.S. executives and directors. That is, some of their disclosed trades precede significant price movements in their

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own companies' stock. Insofar as enforcement by the U.S. Securities and Exchange Commission against insider trading is among the highest in the world, it is reasonable to extrapolate that Indian promoters and directors face lower penalties for insider trading. Indeed, insider trading is considered as a civil crime in India, whereas it is subject to criminal penalties in the US. So far, the largest penalty for insider trading in India has been Rupees 3 Million--most penalties being significantly smaller. Therefore, one extreme view is that Indian insiders can trade with impunity. However, using the same argument, it is possible that promoters and directors would appear not to trade in a self-serving manner. That is, if they fail to report some or most of their trades due to insufficient enforcement, then the trades that outsiders observe may seem innocuous. Said differently, reported transactions may only be the tip of the iceberg if corporate insiders can trade through other accounts. Thus, it remains an open question whether we can learn about Indian promoters and directors' propensity to engage in informed trading from their disclosed trades.

2. Institutional Background

Disclosure requirements for insider transactions date back to 1992 SEBI ([Prohibition of] Insider Trading) Regulations, 1992. In 2015, revisions were made to address some perceived inadequacies with the 1992 Regulations.² Under the current disclosure requirements, promoters, employees, and directors are required to report to the company the number of securities acquired or disposed of within two trading days of such transaction if the value of the securities traded over a calendar quarter aggregates to a traded value in excess of one million rupees.³ The company then must notify the particulars of such activities to the stock exchange within two trading days of the receipt of the disclosure.

Also relevant to our study are the disclosure requirements for financial results. Those should be submitted to the stock exchange within 45 days of end of each quarter, and 60 days from the end of the financial year for the annual audited financial statements. The annual report should be submitted

² It should be noted, though, that our sample ends in 2014.

³ Continual Disclosures in the Reporting Requirements for transaction in Securities according to the SEBI rules:

- a. Every promoter, employee and director of every company shall disclose to the company the number of such securities acquired or disposed of within two trading days of such transaction if the value of the securities traded, whether in one transaction or a series of transactions over any calendar quarter, aggregates to a traded value in excess of ten lakh rupees or such other value as may be specified;
- b. Every company shall notify the particulars of such trading to the stock exchange on which the securities are listed within two trading days of receipt of the disclosure or from becoming aware of such information.

to the stock exchange within 21 working days of it being approved and adopted in the annual general meeting.

3. Analyses

Our main data source is Prowess from which we obtain detailed information on disclosed insider trades, identities of individual traders and other financial data. Our sample period goes from 2006 to 2014.

We examine the trading behavior of corporate insiders in three settings. First, we aggregate trades reported by all insiders in the same firm and the same year. We net the number of shares purchased against those sold to create a ‘net purchase ratio’. The ratio measures how ‘bullish’ insiders are on the stock as inferred from their reported trades. We measure firm performance in two ways:

- (i) We compute market-adjusted stock returns by subtracting the average return on the National Stock Exchange from that of the individual stock during the same period.
- (ii) We compute changes in return on assets as the difference between operating income divided by total assets at the end and the beginning of the year.

If, collectively, promoters and directors have private information and trade on it, then the higher the ratio, the higher the firm’s future performance. On average, we find that this is the case. When a firm’s insiders are net sellers during a year, the average market-adjusted stock return in the following year is -6.83%. In contrast, in firm-years where insiders only buy stock, the following year’s market-adjusted return is 1.80%. Interestingly, however, insiders do not appear to buy (sell) more shares before accounting performance improves (worsens). Indeed, return on assets drops by 1.02% on average when they are net sellers, and by 1.06% when they are net buyers. Hence, it is more likely that they buy relatively more (fewer) shares when their stock is undervalued (overvalued) for other reasons than near-term fundamentals.

We further split the sample based on several firm characteristics to understand where insiders’ apparent information advantage may come from. First, we use firms’ market capitalization and their book-to-market value of equity ratio. We find that net insider purchases predict next year’s stock returns more strongly in small- and mid-size firms, and those with medium to high book-to-market ratios, i.e., firms that are more likely to be mispriced and undervalued. Second, we examine whether firms’ ownership structure matters in explaining insider-trading behavior. We find that insiders’

propensity to buy relatively more shares ahead of good news is driven by non-conglomerate and non-government affiliated companies. To the extent that those firms are subject to lower scrutiny (especially from the government for non-government-affiliated companies), this suggests that insiders respond to such scrutiny by trading more cautiously. Third, we find that insider trades exhibit the strongest association with future stock returns in firms with lower foreign institutional ownership and higher promoter ownership. Those are firms where information asymmetry between insiders and outsiders is likely most severe and thus outsiders attach more importance to trades of insiders in these firms as compared to other firms.

Our next set of tests looks more specifically at insider trades that may be reported during especially information-sensitive windows, namely, before earnings and merger-and-acquisition announcements. We choose earnings announcements because they are salient, anticipated events that typically convey significant news. Recent stories suggest that traders have gained insider information on major Indian corporations' earnings prior to their official release, including through private networks within online platforms such as WhatsApp.⁴ We also focus on earnings releases because several jurisdictions around the world ban corporate insiders from trading in the weeks leading up to those announcements (see, e.g., Australia, Hong Kong, or the UK). Our analyses are similar to the ones described above, except that we only look at insider trades that occur between the end of the fiscal year and the announcement of the annual financial results. Several patterns emerge. First, corporate insiders are less likely to report trading during that window relative to other periods during the fiscal year. Assuming that they are not dissimulating other trades, this suggests that they refrain from trading ahead of sensitive information events. Second, we find that when insiders buy shares ahead of earnings releases, the market reacts more positively on average, but it does not react to the earnings news per se (i.e., the difference between the reported earnings and those reported the prior year), presumably because good news has already been incorporated in the price. Furthermore, this result holds for bad news (i.e., earnings decreases). One way to interpret this result is that some insiders buy shares ahead of disappointing news, and the market interprets the signal more favorably. In contrast, insiders do not appear to sell shares ahead of bad news. Lastly, when we examine M&A announcements, we find no evidence of corporate insiders of either the acquirer or the target making profitable trades shortly before the announcements.

⁴ See, e.g., <https://www.reuters.com/article/us-india-whatsapp-probe/indias-sebi-asks-for-trading-data-as-it-probes-whatsapp-messages-source-idUSKBN1DL16C>.

4. Takeaways

Altogether, what are the practical implications of our results? From the patterns of stock returns following insider trades, we can say that corporate insiders make, on average, profitable trades in India in plain sight. However, given the magnitude of the returns, one may be hard pressed to argue that insiders trade on material news. Furthermore, we find little evidence that they trade based on foreknowledge of imminent and sensitive information. Hence, on the surface, the SEBI regulation appears to be effective in policing promoters and directors' trading behavior.

However, significant caveats apply. We only observe trades that are reported. It may very well be that the same people, using different accounts or relatives, engage in unreported and illegal insider trading. Insider trading is notoriously hard to detect for researchers and exchange regulators. Future studies should attempt to examine trading volume in stocks and derivatives ahead of earnings releases and other sensitive information events to gauge whether insider trading is pervasive in India as many suspect and see in which types of firms it arises most systematically.

Stock Market Trading in the Aftermath of an Accounting Scandal

Renuka Sane ¹

1. Introduction

Research on investor participation in financial markets shows that investors' personal experiences play a disproportionate role in shaping their risk appetite and consequently their trading decisions (Kaustia and Knupfer, 2008; Malmendier and Nagel, 2011; Malmendier and Nagel, 2016; Anagol, Balasubramaniam, and Ramadorai, 2015; Andersen, Hanspal, and Nielsen, 2016). Investors react to major shocks (such as the 2008 financial crisis) through a change in risk perceptions that affects trading decisions (Dorn and Weber, 2013; Hoffmann, Post, and Pennings, 2013).

However, we do not have adequate evidence on how a “firm-specific governance” shock affects investment behaviour, especially of small investors in emerging economies--generally characterised by low participation, low financial literacy, and a larger trust deficit.² Behavioural biases such as too much trading, overconfidence, trading on attention-grabbing stocks or a disposition effect which is the tendency of investors to sell shares whose price has increased, while keeping assets that have dropped in value (Odean, 1998; Barber and Odean, 2000; Barber and Odean, 2001; Barber and Odean, 2008) may get exacerbated for such investors in the event of a firm specific governance shock.

Studying firm-specific shock is important for three reasons. First, a firm-specific shock is unanticipated even for the household which is most skilled in trading in the stock market. Second, when the shock is on account of “poor governance”, it forces investors to pay attention to governance issues. And third, it creates an environment where investors may extrapolate their experience--if one firm had poor governance standards, might other similarly placed firms be the same?

¹ Renuka Sane is an Associate Professor at the National Institute of Public Finance and Policy (NIPFP). I thank Vimal Balasubramaniam, Jayesh Mehta, Tarun Ramadorai, Ajay Shah, K. V. Subramaniam, Susan Thomas, Harsh Vardhan, participants of the IGIDR Emerging Markets Conference, 2016, NSE- NYU conference, 2016, for useful comments. Anurag Dutt provided excellent research assistance. I thank the NSE-NYU Initiative on financial markets for funding support, and Finance Research Group, IGIDR for access to data.

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² The World Values Survey evidence shows that low income countries have lower levels of trust capital.

2. Research Question

In this paper, I use a remarkable natural experiment to obtain evidence about fraud revelation and stock market participation. I ask, if investors with direct exposure to firm-specific fraud are more likely to cash out of the stock market than investors with no direct exposure to fraud? Whether this behaviour is restricted to the stock in question, or is there an effect on other stocks? How does this behaviour vary with degree of exposure, experience in markets, and proximity to the epicenter of the fraud? I also ask if the reaction to fraud is an immediate response or continues to persist over long horizons?

I narrow my attention to a single event, the biggest, and most unexpected accounting fraud in the Indian stock market, also known as the “Enron of India”. On 7 January 2009, the chairman of one of the most successful IT companies, Satyam, confessed that he had manipulated the accounts of the firm by US\$1.47 billion. The inability of auditors to discover this fraud signifies a governance failure. Investors in Satyam are said to have lost almost Rs.136 billion (US\$2 billion) over the next month. While Satyam had been in the news in the previous month over its acquisition of two real-estate companies (Maytas Properties and Maytas Infrastructure), the scale of the accounting fraud was entirely unexpected, and a complete surprise (Wharton, 2009).

Data

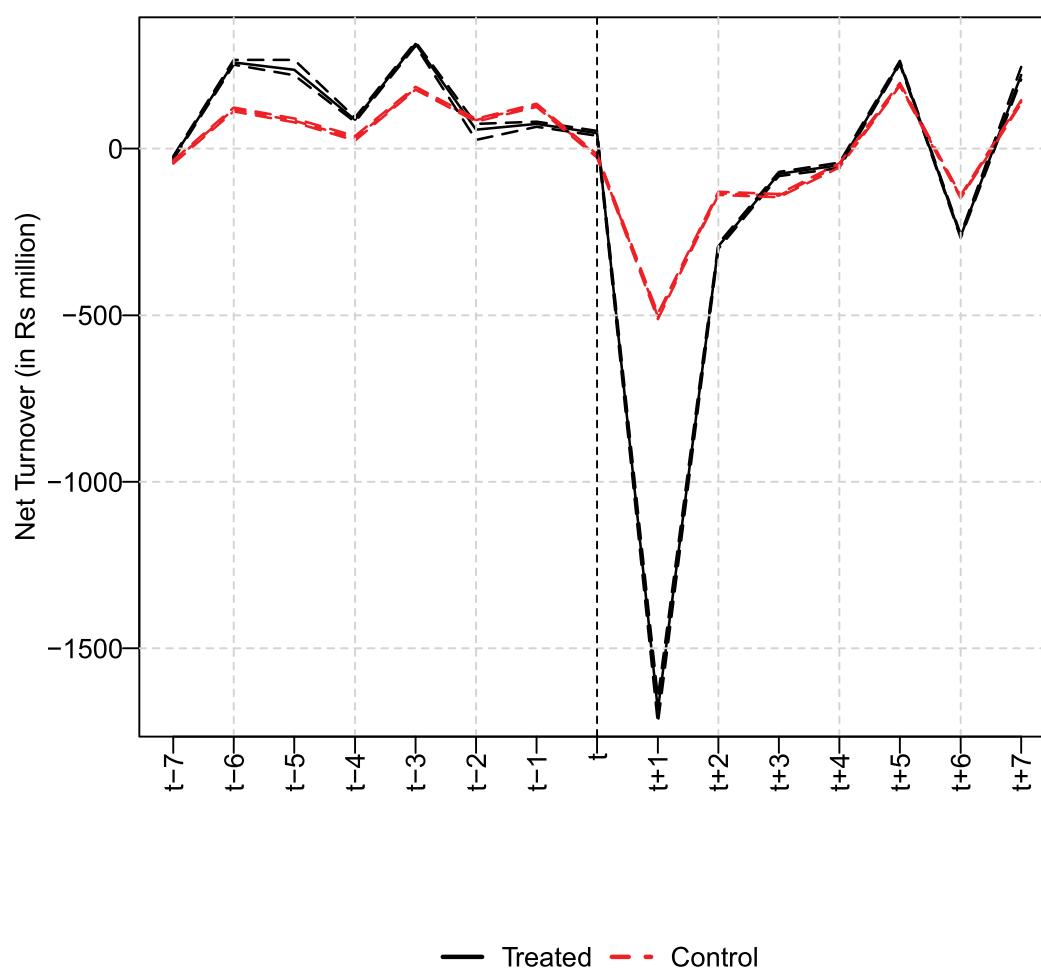
The data on daily investor account holdings comes from the National Securities Depository Limited (NSDL), the largest depository in India in terms of total assets tracked (roughly 80%). I am thus able to observe trading behaviour immediately after the event, and on a daily basis for an extended period of time unlike other papers that base their analysis on household survey data, or observe investors at monthly or yearly frequency. I focus on investors who held Satyam shares in their accounts one day prior to the event (Treated), and compare their trading behaviour to those who did not hold Satyam (Control). The selection on observables problem, that is ensuring that treated and control investors are alike at least on metrics that are observable, is overcome by using a matching framework. Matching procedures are preferable to randomly selecting investors with no exposure to Satyam as they are less likely to lead to estimation bias by picking investors with completely different characteristics.

3. Results

I find that investors with direct exposure to Satyam trade more intensely immediately i.e. over seven days after the Satyam event relative to control investors, and that this trading was largely driven by cashing out of the portfolio. Treated investors cash out almost 10.6 percentage points of their overall

portfolio relative to control investors post the crisis. The cashing out is largely restricted to the “bad stock”. Over the period of a month, there is no difference in the trading behaviour i.e. the net traded value, of the treated and control investors. The result is presented in Figure 1.

Figure 1 : Net traded value of the treated and control investors



The results are robust to comparison with days of similar portfolio losses, and dealing with rumblings on the Satyam stock a few weeks prior to the scandal. This is done as follows.

A possible criticism of the analysis could be that there are unobservable differences between the treated and control group that are driving the behaviour. While the matching strategy controls for differences on observables, it does not account for differences such as risk aversion that are not captured by the variables available for analysis. Another criticism could be that when there is a

portfolio loss, people always sell, and this has nothing to do with the impact of fraud revelation on trust. One way to test for unobservables is to look at people who once held Satyam, but for some reason did not on the day of the crisis. These investors are likely to be more similar to the treated investors, than those who have never purchased Satyam. I divide the control group into three kinds: those that never held Satyam (strict control), those that exited Satyam before Maytas and those that exited Satyam after Maytas. The second group allows me to test for importance of unobservables as these are the investors “similar” to the Satyam investors. Results remain the same when the control group is restricted to those who had exited Satyam before Maytas.

To evaluate if it is loss in portfolio value that is driving this behaviour, for each treated investor, I calculate the portfolio loss to the Satyam investor in the event of the crash. I find a date on which the same investor faced a similar loss, and plot the average net traded value for a seven day window on both these dates. I find that on similar portfolio loss dates, there is a sharp fall in the net traded value i.e. investors cash out. However, the magnitude of the fall is lower than the Satyam case. This suggests that the effect is specific to the “Satyam” event.

These results are contrary to international evidence in two respects. First, the results show that the effect is restricted only to those investors who held stocks that were the subject of the governance fraud, unlike results from the US which show that households withdraw from unrelated stocks as well as from the asset class itself. Second, the results show that the effect is attenuated over time. Results from the US indicate that effects of fraud are long-lasting (Gurun, Stoffman, and Yonker, 2017; Giannetti and Wang, 2016). The type of fraud, and the cultural and institutional settings in which the fraud takes place may vary across locations, and possibly explain the differences in the results with the international literature.

4. Conclusion

Instances of fraud may deter participation overall and cause fewer people to enter the market, but data restrictions prohibit us from throwing light on this important question. In order to understand the impact of firm specific fraud revelation, and the channels through which it manifests, it is important to build up a literature that analyses such events across multiple settings. This paper is the first, to the best of my knowledge, to focus on the impact of fraud in an emerging market. The literature on limited participation in emerging economies, especially India, has so far focused largely on supply side challenges i.e. the problems in the distribution of retail financial products (Anagol and Kim, 2012; Halan, Sane, and Thomas, 2014; Halan and Sane, 2016). This paper presents evidence on the demand side by studying investor reaction to fraud.

Foreign Currency Borrowing of Corporations as Carry Trades: Evidence from India

Viral V. Acharya and Siddharth Vij ¹

1. Introduction

Over the last decade, the low interest rate environment in advanced economies (AEs) has coincided with increased capital flows into emerging market economies (EMEs). Non-financial corporate debt has been a conduit for much of this inflow. According to the IMF, the stock of EME non-financial corporate debt quadrupled between 2004 and 2014. Much of this increase has been debt denominated in foreign currency, mainly US dollars. Recently, concern has risen that the magnitude of this foreign currency debt not only leaves the borrowing firms vulnerable to adverse exchange rate movements but given their size, it might have implications for the stability of the local financial sector as well as domestic growth.²

Like their counterparts in other emerging economies, Indian companies have also been increasingly tapping foreign currency debt markets to fund their balance sheets. The share of foreign currency commercial debt in India's total external debt has climbed rapidly in the last decade. Growing from 19.7% in 2005 to 37.4% of a total external debt of \$456.1 billion at the end of 2016, foreign currency commercial borrowings are now the largest component of the country's external debt. What is this cause of this surge in foreign currency debt? How do companies use the funds obtained through this increasingly important source? What risks does this phenomenon pose? In this study, we use detailed borrowing, accounting and market data on Indian companies to answer these questions.

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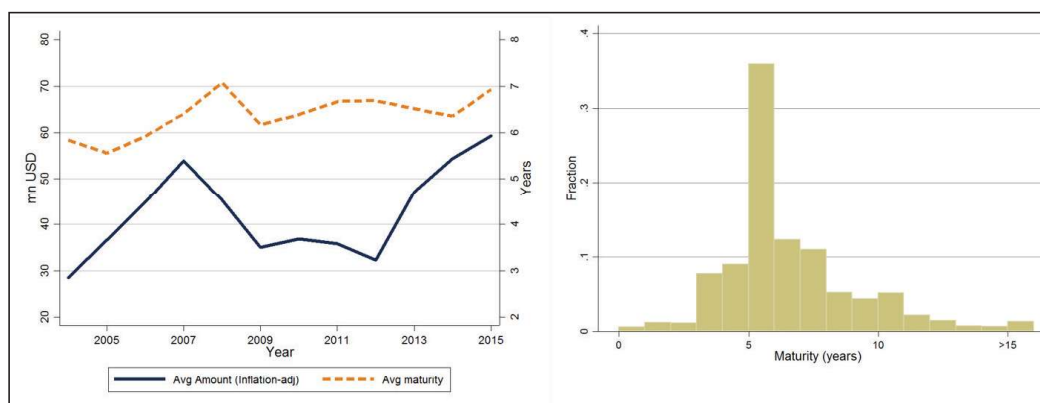
² Please refer to our associated working paper for relevant citations throughout.

2. External Commercial Borrowings: The Indian context

There are two modes by which non-financial corporations might take out debt denominated in foreign currency. The first is trade credit which tends to be of shorter maturity and where the lender is the firm's supplier while the second, the focus of this study, is External Commercial Borrowings (ECB) which might be either bond or bank debt and is of longer maturity. ECB issuance is regulated by the Reserve Bank of India (RBI). All issue sizes above \$750 million need RBI approval. The central bank also determines eligible lenders and maintains restrictions on the maturity, cost and use of funds. Debt maturities have a floor of three years and the permissible overall cost of borrowing (or 'all-in cost') is capped at 450 basis points above 6-month LIBOR. One of the features of the Indian market is the relative scarcity of convertible bond issuance as compared to bank debt. Around 90% of the funds are raised through banks, the bulk from Asian and American banks.

Though large public firms do indeed represent the bulk of the issuance volume, over 4000 companies issued ECBs between 2004 and 2015. Figure 1 plots some of the characteristics of the issuances.

Figure 1: Characteristics of ECB



The average amount raised rose from less than \$30 million to over \$50 million in a four-year span just before the 2008 crisis. Issue sizes decreased during the crisis and right after but have started rising since 2012 and now are at their highest level in the sample period. Though many of the assets being funded through these borrowings are long-lived and take a while to generate cash flows, long maturity issues remain relatively rare. This is partly due to most of the debt being bank loans rather than bonds. Term loans of five-year duration are, by far, the most popular kind of claim issued.

The major purposes for which ECBs are undertaken include the import of capital goods,

modernization, rupee expenditures on local capital goods, overseas acquisitions, new projects and refinancing of existing ECBs. The refinancing of rupee loans is also permitted but requires approval from the RBI. On-lending or investment of proceeds in capital markets in India is generally not permitted. Guarantees from local banks are discouraged.

3. Causes of increase in ECB

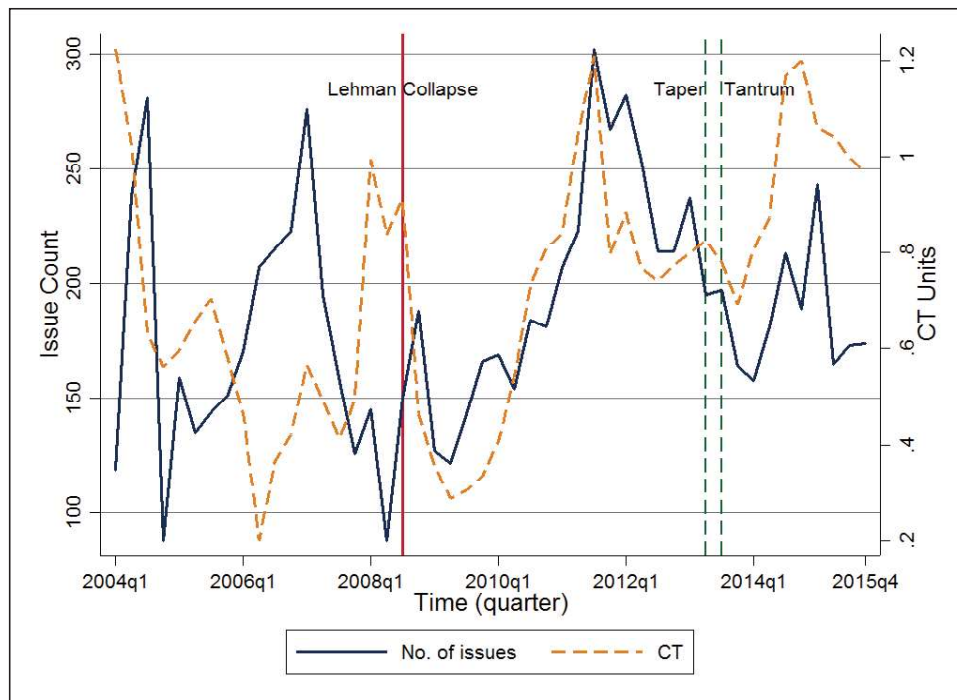
Multiple reasons could be behind companies increasing their foreign currency debt issuance: first, for Indian multinationals increasingly selling in foreign markets, their sales provide a natural foreign currency hedge for their dollar borrowing since they generate revenue and pay interest in the same foreign currency, usually US dollars; second, companies wanting to invest in long-lived foreign assets (e.g. oil and gas companies) would like to finance those assets in the same currency as the cash flows generated; third, companies borrow abroad to finance positive NPV local projects, and ensure they are adequately hedged through financial markets; and fourth, non-financial corporates may try to take advantage of favourable funding conditions by indulging in a “carry trade” i.e. borrowing cheaply and parking the proceeds in higher yielding deposits at home.

Which of these causes was responsible for the sharp rise in ECBs? To answer this question, we conduct regression analysis at the company level using detailed issuance and financial statement data. We find robust evidence that the “Carry Trade” motive explains the rise in ECBs particularly in the period following the global financial crisis. The larger the difference in short-term interest rates between India and the US, our proxy for the profitability of the “Carry Trade”, the more the ECB issuance activity. Figure 2 plots this relationship over time.³

Prior to the crisis, the relationship between aggregate number of ECB issues and the CT index was negative but it becomes strongly positive following the onset of the crisis. We confirm this aggregate result at the company level as well i.e. the same company is more likely to issue ECBs higher the value of the CT index.

³ CT is an index measuring the profitability of the “Carry Trade” defined as the difference between Indian and US 3-month interest rates scaled by the implied volatility of 3-month FX options. Scaling by implied volatility allows us to adjust for risk.

Figure 2: Carry Trade and ECB Issuance



Additionally, we do not find evidence consistent with the other explanations. Investment opportunities do not explain increased issuance nor does a rising share of exports in a company's total sales. The "carry trade" explanation also requires that the companies invest the raised proceeds in short-term rupee deposits. This is exactly what we find: Post-ECB issuance, the proceeds held as cash or bank deposits is higher vis-à-vis an equivalent amount of funding raised through other sources such as domestic borrowing or retained earnings.

4. Consequences of increase in ECB

Borrowing in foreign currency exposes companies to exchange rate risk. If unhedged, company balance sheets might be impaired by significant exchange rate depreciations. This might not only hamper investment, but any losses that non-financial corporates suffer on their foreign liabilities would reduce their creditworthiness and push the more highly levered non-financial corporates towards defaulting even on their domestic obligations.

Are corporates hedging the exchange rate risk that comes from their increased ECBs? Borrowers might be able to hedge this risk either naturally, in the case of exporters, or through financial contracts.

However, our analysis suggests that the currency risk is not adequately hedged. We construct a stock market-based measure of foreign exchange risk for publicly traded companies, and find that following a new ECB issuance, on average, the foreign exchange exposure of borrowers, as proxied by our measure, increases. We validate our measure as well as test potential consequences of ECB on borrowing firms through a case study of a period of market stress known as the ‘taper tantrum’.

4.1 Taper tantrum case study

Between May and September 2013, the US Federal Reserve made a series of statements about the probability of the tapering of their quantitative easing (QE) program. These statements led to a surge of foreign capital outflows from emerging markets, creating turmoil and a sharp decline in asset prices, a phenomenon that became known as the ‘taper tantrum’. In India, the Rupee declined almost 14% against the US Dollar while the NIFTY market index fell about 2.35%.⁴

The ‘taper tantrum’ episode provides an ideal natural experiment to test market reactions to shocks to foreign exchange volatility. It also served as a potential preview to tighter international funding conditions. In an event study framework, we look at equity market returns of ECB issuing companies around three key dates on which the Federal Reserve made statements about tapering QE.⁵

Our results show that companies more likely to borrow when the CT index is higher i.e. those borrowing to take advantage of the “carry trade” are hit hardest during the stress period. Their stock returns are lower even after controlling for market and foreign exchange returns. Our results also show that our market-based measure does a better job of identifying corporates that see lower returns than measures based purely on balance sheet metrics like the ratio of foreign currency debt to total debt. Among firms with highest foreign exchange risk, it is exactly those firms that borrowed when the CT index was higher that are the hardest hit. All in all, this natural experiment suggests that companies are not adequately hedging the exchange rate risk that comes from ECBs and this leaves them vulnerable during times of stress.

4.2 Effects on domestic financial sector

The rise in ECB issuance also has important implications for the domestic financial sector. Losses suffered on foreign currency liabilities by highly levered large corporates might lead them to default

⁴ In August 2013 the RBI responded by imposing capital controls on outflows by residents

⁵ The dates were May 22, 2013, June 19, 2013 and September 18, 2013.

on their domestic obligations. Additionally, the “carry trade” motive implies that companies are putting the proceeds from ECB in domestic wholesale deposits. A sudden shock to company balance sheets might force them to withdraw deposits, potentially causing a funding squeeze for banks that have come to rely on these wholesale deposits for their funding needs.

Using data on the domestic banking relationships of ECB borrowers, we find that domestic banks with links to these companies are themselves more exposed to foreign exchange risk than other banks. This confirms that there is a risk of spillover from ECB borrowers to domestic banks they have relationships with.

5. Policy implications

With interest rates in AEs starting to rise, foreign currency borrowers might face heightened stress. It is possible that rolling over debt or paying it off will be harder. Policymakers need to be cognizant of the risks that this poses for the domestic economy and financial sector. Our analysis suggests steps that could be taken. Market-based measures should be used to measure the foreign exchange exposure of companies rather than balance sheet-based measures. While this is only possible for publicly traded firms, the overall message is that foreign currency hedging is not being adequately done. Additionally, risks to the banking system need to be considered with special attention paid to banks linked to ECB borrowers. Perhaps the risk weights on Rupee loans made to such borrowers can be increased. Overall, regulators can also be more stringent about approvals given to ECBs since our analysis suggests that companies are borrowing just to take advantage of favourable funding conditions rather than to fund productive investment.

6

How Do Small Investors Impact Derivative Markets? Evidence from a Policy Experiment

Ankit Jain, Mrinal Mishra and Prasanna Tantri¹

1. Introduction

Regulators all over the world have expressed concern regarding participation of unsophisticated small investors, either directly or through unconventional funds, in derivative markets. For example, the US Securities and Exchange Commission in its public statement on pro-active regulation of derivatives issued on December 11, 2015 stated that the “retail investors might find it challenging and difficult to comprehend and appropriately weigh the trade-offs posed by sophisticated and complex investment strategies.”² The South Korean market regulator Financial Services Commission recently tightened qualification criteria for participation in derivative markets. One of the key officials said that the purpose of these regulations was to “prevent retail investors from making reckless investments and incurring huge losses”.³ The qualification criteria included a compulsory education program and a high initial margin.⁴ Indian market regulator Securities Exchange Board of India (SEBI hereafter)--recently echoing a similar view, more than doubled the minimum lot size applicable to equity derivatives. A common theme underlying all the above regulatory actions is that small investors are not sophisticated enough to understand the working of derivatives markets, and hence by indulging in “reckless noise trading”⁵ in derivatives, such investors not only lose money but also damage market fundamentals by increasing volatility and reducing informativeness of prices.

Despite there being a lot of regulatory and practitioner interest on the issue of the impact of small investors on derivatives market, surprisingly, to the best of our knowledge, very little academic work has been done on the subject. An appropriate economic setting for studying the question under

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² Source: <https://www.sec.gov/news/statement/protecting-investors-through-proactive-regulation-derivatives.html>

³ Source: <https://fimag.fia.org/issues/2014-09/korea-overhauls-derivatives-market>

⁴ The margin stipulated was 30 million Korean won, which worked out to be USD 29,000.

⁵ Aims to define investor behaviour where one trades based on heuristics and beliefs instead of pre-determined strategies.

consideration is one where arbitrarily defined limits govern the entry of small investors and such entry or exit happens a number of times. The rules governing equity derivative lot sizes introduced in India in the year 2010 provide such a setting.

2. Research Design

On 8th January 2010, SEBI issued new rules for determination of trading lots for equity derivatives in India. Hitherto, trading lot sizes were determined by the respective exchanges. The main purpose of the regulation was to keep the minimum contract value of a single derivative contract close to Rupees 400,000. The manner in which the rule was implemented greatly facilitates identification. First, for all stocks with prices between 0 and 50, the applicable lot size was determined to be 8000. Similarly for stocks with prices between 50 and 100, 100 and 200, 200 and 400, 400 and 800, and 800 and 1600 the lot size was determined to be 4000, 2000, 1000, 500 and 250 respectively. Finally, for stocks with price above 1600, the lot size was determined to be 125. SEBI, also specified that the lot sizes would be reviewed once in six months during March and September, and lot size should be adjusted based on average price in those two months. The minimum lot size of those stocks whose average price calculated as per rules cross the threshold limit from below are required to be cut by 50%. In case the threshold is breached from above, the lot size is doubled. While the downward revision is carried out immediately, the upward revision is done with a lag of three months.

The identifying assumption we make is that an average stock that barely crosses any of the six thresholds from below (treated) is unlikely to be systematically different on unobservable characteristics when compared to an average stock that comes close to the threshold but fails to cross the same (control). Note that there are six thresholds and eight revisions in our setting. We cannot think of a confounding factor that systematically varies between stocks that are close to each other in terms of price but fall on the opposite sides of the threshold. The setting, therefore, lends itself nicely for regression discontinuity (RD henceforth) test. We use robust regression discontinuity design developed by Calonico et al. (2014) in order to examine the impact of entry of small investors on the functioning of the derivatives markets. Irrespective of the threshold used, the lot size is changed when the gross contract value reaches Rupees 400,000 from below. Therefore, in our RD tests, we use the gross contract value of a lot as the running variable with Rupees 400,000 as the cut-off.

The broad idea underlying the measures we use is the following: if prices are efficient, then market wide events are likely to be priced in quickly. In such a scenario, after controlling for the impact of contemporaneous market returns (NIFTY50), lagged market returns are not expected to explain current stock returns in a significant way. In case they do, then it is a sign of inefficiency. We find that price efficiency of treated stocks increases by 5.9% (5.8%) in the spot (derivatives) markets.

Finally, we move on to test the impact of entry of small investors on volatility. If the concerns expressed by the regulators are correct, then one would expect to see an increase in volatility. We test the impact on volatility using the volatility measures used in Das et al. (2014). Surprisingly, we detect a marginal increase in standard deviation of returns in derivative markets and no significant change in other measures such as skewness and kurtosis. All measures of volatility remain unchanged in the spot market.

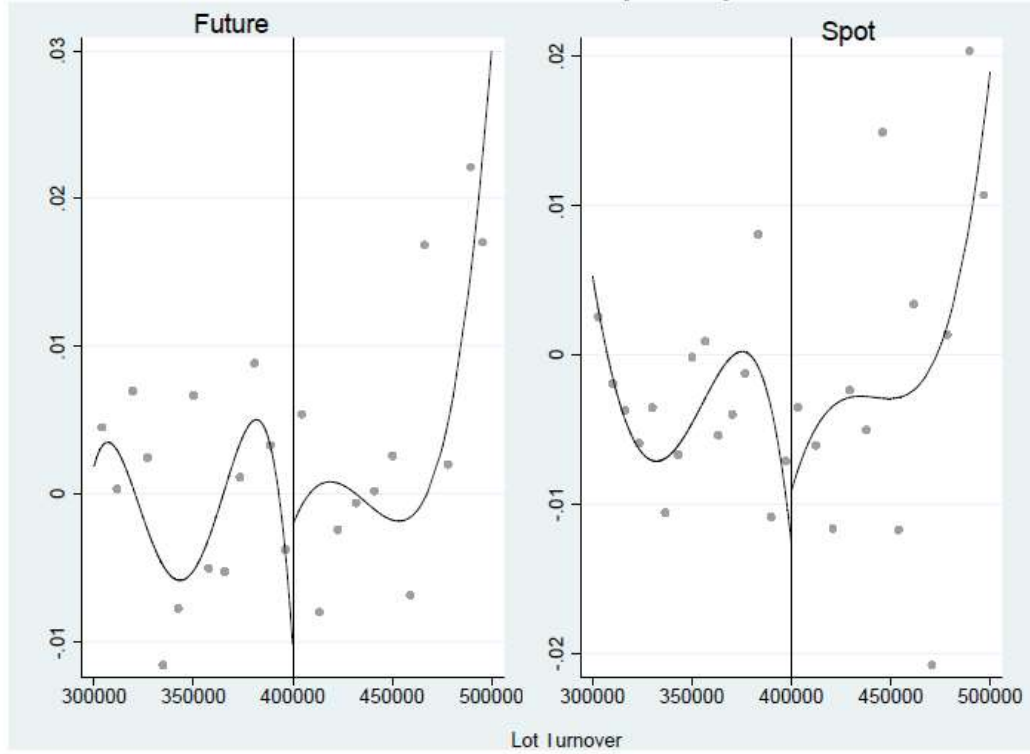
3. Data and Sample Construction

We obtain our data from:

- 1) National Stock Exchange: More than 85% of the derivative trading in India is executed at the NSE. We obtain all price and turnover information from NSE. NSE also provides information about the list of stocks that were eligible for trading in the derivative segment at any point of time. We use the above information to identify our treatment and control groups. Finally, from the NSE, we also obtain data regarding the trading volume executed by different category of traders at stock-day level in the derivative segment. Traders are categorized into five categories, namely retail, domestic institutional, foreign institutional, corporate and proprietary. We consider the last four categories as institutional traders.
- 2) Center for Monitoring Indian Economy (CMIE) Prowess: We obtain company-level financial information from Prowess. In particular we collect data relating to sales, capital expenditure, earnings after interest and tax (EBIT), gross value of assets and cash flows.
- 3) SEBI website: We obtain all relevant SEBI circulars from their web site. From these circulars, we collect information pertaining to lot size rules and changes in them. We also learn about the effective dates of various regulations from this source.

4. Empirical Strategy & Results

Our empirical strategy comprises of using the robust regression discontinuity (RD) designed by Calonico et al. (2014).



The horizontal axis represents lot turnover and the vertical axis cumulative abnormal returns accumulated from Day 0 to Day 3.

Impact on Retail Trading: Our first aim is to verify whether trading by retail traders indeed increased because of derivative lot size split. Our hypothesis is that the minimum lot size requirement acts like a hurdle for retail investors and hence, relaxation of lot size requirement leads to entry of retail investors. We observe that the proportion of retail trading is higher by nearly 2.6 percentage points for treated stocks when compared to control stocks. Given that the average retail trading is nearly 40%, this represents an increase of more than 6% in the proportion of retail trade. Hence, results support our hypothesis that the number of traders indeed increases after the split.

Impact on Futures' Market: We try to examine the impact of split in derivative lot size on derivative price and price of underlying stock. We have multiple events per firm and in total 141 firm-events carried out across eight different periods. Our results clearly show that the stocks that

are on the immediate right of the cut-off (of 400,000) yield a higher positive Cumulative Abnormal Return⁶ (CAR) when compared to stocks that are on the immediate left. Using a 3 (5) day CAR, we find that stocks that barely cross the threshold outperform those that barely miss the threshold by 2.8% (3.3%). Given that stocks on both sides are comparable and we have accounted for firm specific and event specific characteristics, it is reasonable to infer from the above results that entry of small investors indeed adds value to the derivative market.

Impact on Spot Market: The derivative lot size split is limited to the derivative markets and no changes were made in the spot markets. However, new entrants to derivatives markets may engage in hedging or speculative trading strategies that involve taking simultaneous but opposite positions in spot and derivative markets. Second, market makers in the derivative markets may take positions in the spot market in order to hedge their positions (Hu, 2014). This can lead to increased activity in the spot segment because of increased derivative activity. Finally, any one sided move in the derivatives markets may attract arbitrageurs into the spot market and hence lead to increased trading activity⁷. We find that the stocks that barely cross the threshold from below outperform stocks that barely fail to cross the threshold by 2.3%. The results clearly show that the impact of entry of small investors spills over to the spot markets and affects the spot market valuation of the firm positively.

Impact on Market Fundamentals: We also examine the impact of entry of small investors on fundamental characteristics of markets such as price efficiency, liquidity and volatility. To test price efficiency, we use the methods developed by Hou and Moskowitz (2005). The first measure D1, focusses on the relative explanatory power of current and lagged market returns. The second D2, focuses on the difference in economic magnitude of the influence of current and lagged market returns. We do not observe any significance for D1. However, D2 shows that after the split in lot size, price efficiency increases by about 5.8% (5.9%) in derivative (spot) markets. The results show that participation of small investors leads to increased price efficiency.

For liquidity, we use two measures--Total turnover and Amihud illiquidity measure. The results show that total turnover increases and Amihud illiquidity factor decreases significantly in derivatives markets. This shows a clear improvement in liquidity in the derivative segment. However, results in

⁶ Sum of the differences between the expected return on a stock (systematic risk multiplied by the realized market return) and the actual return often used to evaluate the impact of news on a stock price

⁷ If a secular upward movement occurs in the derivative markets, then arbitrageurs would go short in the derivative markets and long in the spot markets till prices converge

the spot market are not very strong. While Amihud measure shows an increase in liquidity, the total turnover measure is statistically insignificant.

Our final measure, which tries to capture market fundamentals, is volatility. SEBI while imposing restrictions on trading in derivatives, clearly stated that the purpose of these restrictions is to protect market integrity and reduce volatility. Given that the derivative instruments are complicated by nature, such apprehensions may be even higher for derivative instruments. We test whether volatility indeed increases post the entry of small investors. We use standard deviation, skewness and kurtosis of daily returns as dependent variables for our different regression equations. We find that in derivative markets, skewness and kurtosis measures do not see any change in the post event period as shown by the interaction term. However, standard deviation increases by barely statistically significant but economically insignificant 0.2%. In spot markets, we do not see significant change in any of the three volatility measures that we employ. From the above results, it is reasonable to conclude that volatility does not change significantly post the entry of small investors.

5. Conclusion

Increased use of financial derivatives is often considered as one of the factors that worked as a catalyst during the recent financial crisis (Foster and Magdoff, 2009). This has led to a deluge of regulatory actions and pronouncements with respect to financial derivatives in the recent past. Apart from many structural issues relating to derivatives, regulators all over the world are also concerned about the consequences of participation of unsophisticated small investors in the derivatives markets. These concerns are not limited to paternalistic views about protecting small investors from losses but also extend to market stability and efficiency. Therefore, the issue of small investor participation in derivative market has attained immense regulatory attention. Surprisingly however, financial economists have not focused much on this topic. This paper seeks to fill this gap by examining the consequences of entry of small investors into equity derivative markets. Our results suggests that concerns expressed by regulators regarding the “distortionary” impact of small investor participation seems to be misplaced. On the contrary, our findings suggest that entry of small investors is likely to lead to increased valuations both in spot as well as derivatives markets on the back of improved liquidity and price efficiency. Measures of volatility do not change significantly.

Creditor Rights, Threat of Liquidation, and Labor-Capital Choice of Firms

Shashwat Alok, Ritam Chaurey and Vasudha Nukala ¹

1. Brief Introduction

In 2002, a legal reform introduced in India allowed secured creditors to bypass lengthy court proceedings in order to seize and liquidate the defaulter's assets. Presumably, the intention behind the reform was to improve loan recovery and consequently increase the supply of credit. We study how firms' respond in their production input choices (i.e. capital and labor) in response to this law. We find that firms increased investment in employment, decreased their capital investment, and substituted secured credit with unsecured credit. These results are consistent with an increased threat of liquidation for firms. We find support for our main results across regions with different pre-policy court-efficiency and across industries with different elasticities of substitution between capital and labor. Specifically, we find that treated firms in those regions where turn-around time for court cases were higher and firms in industries with higher elasticity of substitution between capital and labor increased investment in employment, decreased capital investment and moved towards unsecured credit following the passage of SARFAESI.

2. Context

India has historically been a pro-debtor economy and creditors had limited rights in recovering their money. This was largely attributed to the inefficiency of the judicial procedures in the Indian civil court system. To increase the judicial efficiency, Indian government legislated two reforms:

- 1) The Debt Recovery Tribunal Act of 1993 (DRT hereon after) and
- 2) Securitization and Reconstruction of Financial Assets and Enforcement of Security Interests Act of 2002 (SARFAESI hereon after).

Though DRT was passed in 1993, there were large delays for the creditors to get back their money in the case of a default. With DRT law, creditors still could not seize the assets without court/

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tribunal order. Due to large number of payment defaults and excess demand of court orders, DRT still resulted in significant time delays for the creditors to recover their money. Thus, to avoid these significant delays, SARFAESI was passed in 2002 to circumvent court orders. This law resulted in giving creditors immense powers of seizing assets by posting a 60-day demand notice and bypassing the court proceedings in the process.

3. Is collateral law related to firm's decisions?

Creditor rights are legal provisions provided to the lenders in order to help them recover their capital. These are fundamental to the functioning of credit markets and govern the allocation of assets and control rights in situations such as bankruptcy, liquidation proceedings, restructuring, etc. The evidence regarding the impact of creditor rights on firm level outcomes is mixed. On the one hand, strengthening creditor rights can increase the supply of credit and lower the cost of debt (Visaria (2009), Haselmann et al. (2010)). This in turn can enhance the ability of firms to borrow long-term, increase leverage, and consequently the level, quality, and horizon of capital investments (Benmelech and Bergman (2011), and Gopalan et al. (2016)). Further, La Porta et al (1998) provide evidence showing that stronger creditor rights are associated with more developed financial credit markets as it raises the expected loan recovery rates for lenders, thereby reducing the build of non-performing assets and increasing their willingness to supply credit.

On the other hand, stronger creditor rights can also decrease the supply of credit to small borrowers (Lilienfeld et al. (2012)) and increase the threat of liquidation for firms (Acharya et al.(2011)). As a consequence, this can have an adverse impact on the demand for debt, asset growth, risk-taking, and reduce both the amount and quality of innovation pursued by firms (Acharya and Subramanian (2009), Acharya et al. (2011), and Vig (2013)). The seemingly contrasting findings stem from the differences in the kind of creditor rights protection offered by legal changes. Specifically, creditor protection offered to lenders spans the rights afforded to them in bankruptcy, collateral laws, efficiency of judicial debt recovery, and extra-judicial rights to seize and liquidate collateral.

Thus, changes in creditor rights can engender very different real outcomes depending on which aspect of the creditor protection the law affects. For instance, improvement in the efficiency of bankruptcy process, expansion in the set of collateralizable assets, or judicial efficiency may enhance

both the supply and demand for credit. In contrast, theory suggests that an increase in the rights of banks to directly seize and liquidate collateral may result in sub-optimally “excessive” liquidations (Acharya et al. (2011)) of firms with positive continuation value. This increased threat of liquidation in turn imposes deadweight costs on firms and can adversely impact their demand for credit and distort their investment decisions. In this study, we examine whether and how do firms alter their input choices of production i.e. capital and labor allocation in response to the increased threat of liquidation brought about by SARFAESI in particular and stronger creditor rights more broadly.

4. Our study

This study’s main focus is to examine the ex-ante effects of the strengthening of creditor rights following the passage of SARFAESI on firm’s hiring and capital investment decisions. Further, we intend to understand the mechanism underlying the effects on firm’s decisions. In particular, as discussed above, increased creditor protection can have contrasting effects on employment and investments of firms depending on which aspect the law might affect. To gain a better understanding, we conducted a series of tests to examine if SARFAESI indeed resulted in increased threat of liquidation for firms. For this purpose, we examined the impact of the law on the likelihood of firm closures and find that the analysis does support increased threat of liquidation.

Our main results are that as a result of SARFAESI, firms with higher fraction of collateralizable assets (treated firms) differentially increase the total number of employees (by 7.9%-9.1%), and reduce their investment in fixed capital (by 25%), and plant & machinery as compared to firms with low collateral assets (control firms). Further, we also find that firms with high collateral assets differentially increase their expenditure on rented plant and machinery. Since tangible assets such as plant & machinery can be easily seized and liquidated in the event of default, firms ex-ante prefer to move away from investing in capital and move towards hiring more workers and using rented capital. This evidence is consistent with a higher threat of liquidation after SARFAESI.

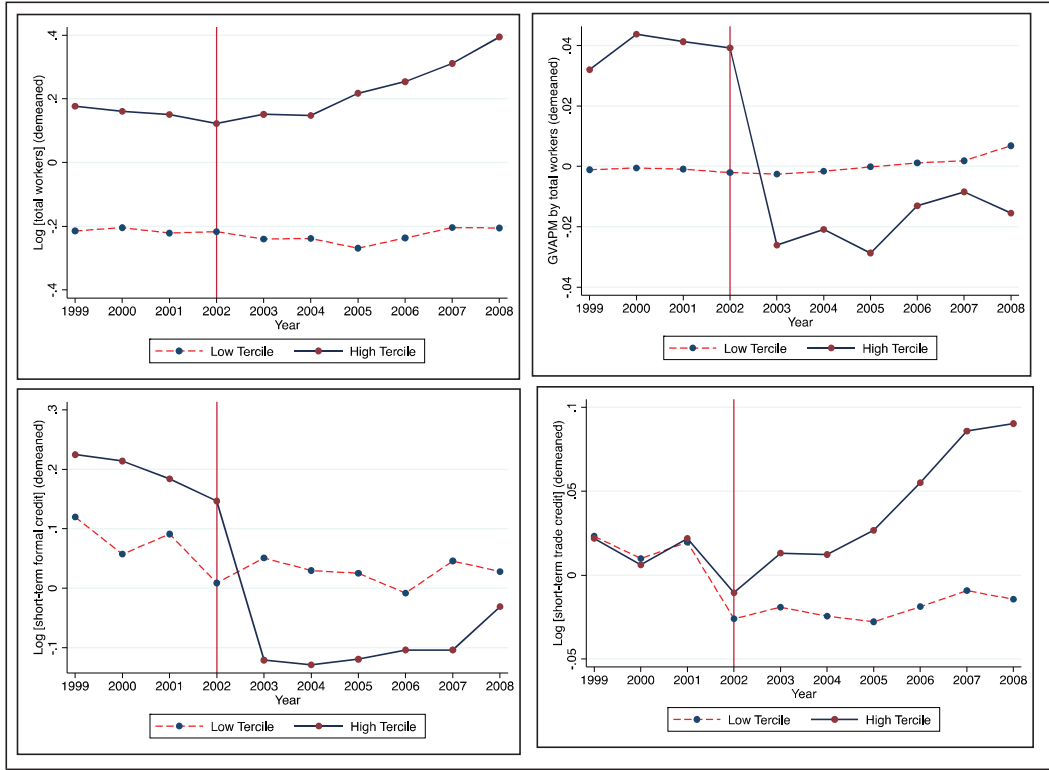


Figure 1: Dynamic plot representing the pre- and post-SARFAESI measures of total workers, gross value of additions to plant and machinery (GVAPM), Short-Term Formal Credit and Trade Credit across treatment (High Tercile) and control (Low Tercile) firms.

To further understand the mechanism underlying our results, we examine the heterogeneous effects of the strengthened creditor rights across states with varying levels of pre-SARFAESI judicial efficiency. Judicial efficiency measure used in this paper is based on Amirapu (2015), constructed as fraction of trials that are disposed of in less than one year in the District/Sessions court. We find that firms with more collateralizable assets differentially hire more workers and invest less in capital in states that had a lower pre-SARFAESI judicial efficiency, presumably because secured creditors have greater incentives to avoid the lengthy judicial process and thus more likely to invoke SARFAESI in order to directly liquidate assets of firms in states that had more inefficient courts. Further, we find that the differential effects of hiring more workers and investing less in capital is particularly stronger for firms in industries with a higher elasticity of substitution between capital and labor.

In addition, we analyzed the effects of creditor rights in states with different labor regimes. We find that firms with more collateralizable assets do not exhibit any differential capital investment responses across different labor regulations. That is given the increased threat of liquidation, firms in both pro-labor and pro-employer states find it optimal substitute capital with labor. The difference is in the kind of labor firms in different labor regulation regimes hire. We find that firms in pro-labor states substitute capital with contract workers while those in pro-employee states hire permanent workers.

Next we look at the effects of SARFAESI on short-term debt. We find that as a result of SARFAESI, firms with more collateralizable assets differentially reduce the amount of secured short-term formal loans as compared to control firms. Specifically, we document a novel result with regards to other sources of firm financing. We find that treated firms differentially increase their reliance on trade credit post-SARFAESI compared to control firms. In essence, post-SARFAESI, treated firms substitute away from secured credit towards trade credit (unsecured credit) as compared to control firms.

5. Conclusion and Policy Implications

Our study establishes theoretically and empirically that there exists a critical threshold limit of the strength of creditor rights that balance both creditor's need of maximizing expected recovery value and firm's needs of maximizing expected firm value. From the firm's perspective, investing in tangible capital that can be used as collateral allows them to borrow more and scale up their production process. On the other hand, a higher tangible capital pledged as collateral in a legal regime with stronger creditor rights would also increase the bank's return from the liquidation proceedings. This higher return, in turn increases the likelihood of the firm being liquidated. This tradeoff between greater borrowing capacity and increased threat of liquidation creates the tension in the choice of capital for the firm.

Empirically, we find that excessive strengthening of creditor rights in a setting without an alternative efficient bankruptcy procedure can lead to an increased threat of liquidation for the firms and can result in ex-post inefficiencies. First, though the policy was intended to expand access to credit, the increased threat of liquidation faced by firms led to a reduction in demand for credit leading to unanticipated changes in their labor-capital allocation. Second, since SARFAESI had the unanticipated effect of moving firms towards more labor-intensive production process, it can hurt firm productivity in the long run.

Summarizing, our paper provides novel evidence on a new channel through which creditor rights affect real economic activity. In our setting, we find that the strengthening of creditor rights led to an increased liquidation bias for firms that subsequently hired more workers, and invested less in fixed capital including plant and machinery, i.e. SARFAESI, had the unanticipated effect of moving firms towards more labor-intensive production process. Our findings have broader policy implications as developing countries all over the world seek to improve their credit markets through changes in debt enforcement. To the extent that such policy changes can affect firms' labor hiring and investment decisions, it has implications for firm value, and economic growth. While the primary objectives of policies that aim to strengthen creditor rights is to increase the supply of cheaper credit and consequently boost investment activity, our study indicates that policymakers should bear in mind the unintended effects such piecemeal policies can have on the economy.