Are Women Really More Risk-Averse?
The Lending Behaviour of Women-owned Cooperatives in India

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Abstract: Employing a novel dataset of Indian cooperative banks during 2004-2013, we exploit the natural experiment of the financial crisis to examine the lending behaviour of women-owned cooperatives. The findings indicate that these banks increased lending to both agriculture and small-scale industries, especially in high-income states. Further disaggregation reveals that the possible weaknesses in asset quality from lending to these sectors in low-income states could be driving the results. Robustness tests support these findings.

Introduction

The role of women in policy making has come to the forefront of public policy debate in recent times. Numerous scholars and policymakers have persuasively argued that women are more risk averse than men. To provide some examples, after analysing a whole host of studies from 1967-1997, Byrnes et al. (1999) conclude that the female responders are more risk averse than their male counterparts. Similarly, De Goeij and Smedts (2008) show that male equity analysts are more likely to issue extreme recommendations as compared with females. Employing data on professional mutual fund managers in the US, Niessen and Ruenzi (2007) find that female managers adopt more risk averse strategies than male managers.

One area where the role of women in decision-making has been subject to systematic empirical investigation has been in the sphere of banking. For example, Berger et al. (2014) analyse three demographic characteristics of executive officers of German banks, including gender, on bank risk-taking. They document a positive association between female representation on bank board and portfolio risk. As compared to this, employing data on around 300 publicly listed US bank holding companies for the four-year period around the financial crisis, Adams and Ragunathan (2014) show that banks with more women on board

were not necessarily more risk-averse; on the contrary, they displayed better performance during the financial crisis.

Given this conflicting evidence, it remains a moot question whether women-owned banks are less risk averse. We contribute to this debate by examining the lending behaviour of women-owned cooperative (WoC) banks for an extended time period that encompasses the financial crisis. To be more specific, we assemble data on a large sample of urban cooperative banks in India, comprising of those which are women-owned and those that are not. We exploit the exogenous nature of the global financial crisis within a difference-in-differences (DID) specification to investigate the lending and performance response of these banks during the financial crisis, after controlling for other observable characteristics.

Our findings indicate that women-owned cooperatives expanded credit at a faster pace during the crisis, *ceteris paribus*. The evidence holds in respect of loans both to agriculture and small-scale industries and is primarily manifest in high-income states.

The analysis contributes to the literature in a few important ways. First, to the best of our knowledge, it provides empirical evidence for an emerging market economy regarding the impact of women-owned banks on lending behaviour. Most prior studies explore the role of male versus female loan officers on lending behaviour. By way of example, using proprietary data on a bank which introduced an incentive-based compensation system for a certain proportion of its loan officers, Agarwal and Wang (2009) show that default loans on loans originated by women are higher than men. This contrasts with Beck et al. (2013) who find that the default probability of loans made by female officers is 4.2% lower than men. In the context of lending relationships, Bellucci et al. (2010) show a significant gender gap in in extending credit, although this gap disappears for borrowers with longer relationships with the bank. More recently, Berger et al (2014) investigate the effects of gender on risk-taking in German banks for the period 1994-2010 and find that the presence of women in management is associated with higher risk-

taking. In contrast, we focus on the behaviour of women-owned banks on their lending decisions. Since both the ownership and control of these banks are vested with the same entity, it avoids the moral hazard problems involved in their separation (Berle and Means, 1932) and thereby provides compelling case to understand the impact of gender on bank lending in a holistic fashion. Our findings indicate that women-owned cooperatives are not necessarily risk-averse in their lending behaviour.

Second, we augment the literature on cooperative banking by focusing on the lending behaviour of these banks during the financial crisis. Several studies have focused on various facets of cooperative banking and arrive at varied findings. In an early study on Austrian cooperatives, Gorton and Schmid (1999) found that their performance declines as the number of members increase. Other studies have observed that cooperative banks are more stable and resilient in the face of crisis and competition (Hesse and Cihak, 2007; Delbano and Reggiani, 2013; Fiordelisi and Mare, 2014; Chiaramonte et al., 2015). In the Indian case, employing longitudinal data on cooperative banks for 1993-2005, Chipalkatti et al. (2007) find limited evidence in favour of depositor discipline during periods of market stress. Thereafter, utilising depositor-level data on a cooperative bank, Iyer and Puri (2012) find that even informed and insured depositors are likely to withdraw deposits from distressed banks. More recently, exploiting micro-level data on a cooperative bank in the state of Gujarat, Iyer et al. (2016) find that regulatory signals regarding bank insolvency overwhelm depositors' own monitoring of bank fundamentals in determining the nature and quantum of depositor withdrawals. Unlike these studies, we focus on the lending behaviour of cooperative banks around the crisis and what factors determine this outcome. We find that women-owned cooperatives eschew lending to low-income states during periods of crisis, driven primarily by concerns of possible deterioration in their credit quality.

Third, our work is the mirror image of research that focuses on the

access to credit for women-owned firms. There is evidence to suggest that female entrepreneurs encounter greater challenges in accessing credit markets (Hisrich and Brush, 1984). This difficulty is pronounced in the start-up phase (Orser et al., 2000) and to an extent, is responsible for their lower overall growth (Alsos et al., 2006). Employing data from the Central Credit Register for Italy, Cesaroni et al. (2013) show that female-owned firms experienced a significant contraction in credit during the financial meltdown of 2007-09. In the Indian case, International Finance Corporation (2013) estimates the total financing gap for women-owned small businesses to be of the order of US $116 billion. Unlike these studies which focus on demand, our attention is on the supply side and more specifically on the lending behaviour of women-owned cooperatives. We find that although returns are higher in states with low-income, women-owned cooperatives eschew lending to these states during periods of crisis.

Finally, our study relates to the broader literature that examines the inherent relevance of gender for bank behaviour. Several studies have documented the greater risk-aversion of female decision makers (Agnew et al., 2003) and its implications for financial decision making (Barber and Odean, 2001; Christiansen et al., 2006). Other researchers have analysed the behaviour of women in different competitive environments (Black and Strahan, 2001, Goldin and Rouse, 2000; Niederle and Vesterlund, 2011). While our focus on performance makes it comparable with these studies, we differ from prior research by focusing on the behaviour of women-owned cooperative banks. By virtue of the superior set of soft information on their clientele, these banks are better able to assess incipient borrower risks and tailor their lending behaviour. The results suggest that although there is no impact on overall lending by women-owned cooperatives, there is a differential impact across high- and low-income states by these banks during the crisis.

The rest of the analysis proceeds as follows. In Section II, we briefly outline the theoretical literature and highlights the position of the paper

in this field. Section III provides an overview of the cooperative banking sector in India. Contextually, we also highlight the role and relevance of women-owned banks. Sections IV and V discuss the database and empirical strategy. This is followed by the results and robustness checks and the final section concludes.

II. Theoretical background

Three sets of theories have been proposed that examine the relevance of gender for firm functioning. The first set is based on the *human capital theory*. This view argues that greater the gender diversity, less the inclination towards group-think, thereby enhancing the efficacy of the decision-making process. Empirical evidence testing this theory appears suggest that this is indeed the case: decision-making in firms with women directors is much quicker than those without it (Singh and Vinnicombe, 2004; Carter et al., 2010).

The second set of studies is based on the *resource dependency theory*. This stream of literature contends that diverse boards have access to a broader pool of talent which not only augments the resource base but also engenders additional perspectives in decision making. Researchers who test this theory find support in favour of this contention. Gul et al (2011) for instance, find that boards with greater gender-diversity lead to an improvement in the informativeness of stock prices. Likewise, Adams and Ferriera (2009) show that a greater proportion of female directors improves overall attendance at board meetings.

The final stream of analysis is based on the *agency theory* and focuses on the monitoring function of the board. It is argued that gender diversity entails fresh perspective on manifold issues that are germane to the efficient functioning of the organisation, in turn, alleviating the informational biases that could permeate all-male boards. Consistent with this line of thinking, Carter *et al.* (2003) show that greater proportion of women members on firm board improves its value. Country case studies also concur with this finding (Campbell and Minguez-Vera, 2008; Nguyen and Faff, 2006; Ghosh, 2016).

A common thread running through these studies is their focus on board diversity and its implications for firm behaviour. In contrast, we focus on banks which are female-owned so that both the ownership and control are under the purview of women members. As a result, we are able to integrate the two apparently disparate strands of literature that analyse the role of female loan officers for lending behaviour and those that focus on board diversity and its implications for performance.

III. Cooperative banking in India

From humble beginnings coinciding with the enactment of the Cooperative Societies Act 1912, the cooperative sector in India has come a long way, being organised on the basis of 'one member, one vote' with the focus of dispensation of credit at the micro level, especially the small and marginal farmers and other under-served segments of the population. According to the OECD (2012), in 2009, there were a total of over 1000 cooperative banks in Germany with assets totalling US $ 970 billion and close to 500 in Italy with assets of US $ 700 billion. The figures for the US were much smaller, numbering 60 with assets worth US $ 15 billion. As compared to this, India had a total of 1700 cooperative banks in the same year, and their asset aggregated US $ 40 billion.

With over 150,000 outlets, the cooperative system has a total membership in excess of 150 million. In terms of asset market share, the share of cooperative banks in total banking asset is around 6-8%, with commercial banks accounting for the remaining. Notwithstanding the growing footprints of commercial banks, the cooperatives dominate in terms of their reach to the rural hinterland, averaging one ground level credit cooperative for every five villages, making it one of the extensive financial systems globally - in terms of both the number of clients served and the members involved. At end 2013, a total of 2724 cooperatives were operating in urban and rural areas of the country, with total asset close to Rs. 8000 billion (≈ US $ 120 billion), equal to 7% of India's 2013 GDP.

The sector can be classified into two heads: urban and rural. As the names suggest, the former primarily focus on delivery of credit to urban areas, whereas the later cater to rural areas. As at end 2013, the total assets of urban cooperative banks (UCBs) aggregated Rs.3373 billion (≈ US $ 50 billion), whereas that of rural amounted to Rs.4608 billion (≈ US $ 68 billion). Within the former, there is a distinction between scheduled and non-scheduled banks. The former are included in the second schedule of the Reserve Bank of India (RBI) Act, 1934 and include banks that have paid-up capital and reserves not less than Rs.500,000 million (≈ US $ 7400), which provides them access to the liquidity window of the Indian central bank. These banks are subject to regulatory and prudential norms as prescribed by the Indian central bank, although they are less stringent as compared to commercial banks. As compared to this, the non-scheduled UCBs are subject to light-touch regulation. The operations of both scheduled and non-scheduled UCBs are either limited to one state or stretch across states. Most of the non-scheduled UCBs are primarily single-state.

In terms of regulatory stipulations, UCBs are required to lend a minimum percentage of their total loans to designated (priority) sectors, such as agriculture and small-scale industries (SSIs) and a portion of such lending should go towards weaker sections. The minimum percentage lent to designated sectors has been increased from 40% earlier to 60% and a quarter of this amount has to be provided to weaker section. Data provided by the Indian central bank indicates that the share of loans to designated sectors has increased from 43% in 2004 to nearly 60% in 2013; the share of loans to weaker sections has hovered around 22-25% during this period.

Two features of the UCBs are of interest. The first is the high level of regional concentration. These banks are concentrated primarily in the Western and Southern regions of the country: over 80% of all UCBs are located in these two regions. At a further level of disaggregation, the top three states (in terms of shares) account for over 80% of both deposit and credit. The second is the dual control of these entities

wherein their banking-related activities are regulated by the Indian central bank, whereas the registration and management-related activities are under the purview of respective state governments. To address this challenge, Memoranda of Understanding (MoU) have been signed with the respective state governments.

One particular category of UCBs which have attracted attention is the women-owned cooperatives (WoC). A majority of these cooperatives are industrial in nature and involved in various small-scale activities. Women-owned cooperatives in different states have developed their own expertise. In Maharashtra, these cooperatives are engaged in handicraft and poultry activities and making of low-cost detergents. Women cooperatives in Gujarat focus on preparation of dairy and fast food products as well as embroidery activities. In Tamil Nadu and Karnataka, these cooperatives are more into activities such as tailoring, spinning and knitting.

Recognising their potential for the empowerment of women, these banks have been provided with concessions in the form of lower entry point capital norms, depending on the population size of the area where they are located. Therefore, as compared with a minimum capital requirement of Rs.40 million (≈ US $ 0.6 million) for UCBs in general having a membership of 3000, the comparable capital requirement for women-banks is Rs.20 million (≈ US $ 0.3 million). The Self-Employed Women's Association (SEWA), a cooperative bank formed in 1972 in India to meet the capital and production needs of self-employed women members, had a women membership base of nearly 1 million in 2013 and extended over Rs.1700 million (≈ US $ 25 million) of working capital loans (World Bank, 2014).

In terms of their governance structure, the ownership, control and management of these entities is vested with the members. As a result, these cooperative banks are chaired by women, with other women workers being co-opted as members. In 2008, the Indian central bank permitted these cooperatives, which conform to existing entry point norms, to enrol male members up to a limit of 25% of their total regular

membership, subject to compliance by these banks with their respective bye-laws. Reflecting this development, out of an average board size of 13.1 members in 2012, 11.2 of them were women.

Contextually, it may be mentioned that the concept of such banks finds echo in the US and elsewhere (See, for example, Price, 1990). According to a report by the Government Accountability Office (GAO, 2006), there were 195 minority-owned banks in the US at end-2005, of which 13 were owned by women; their performance parameters were lower than their non-minority counterparts (FDIC, 2014). Elsewhere, women-owned banks have been established in countries as diverse as Pakistan (First Women Bank in 1989), Tanzania (Women's Public Bank in 1999) and Ghana (Women's World Banking Ghana Savings and Loans Company in 1998).

IV. Database and variables

We employ both bank-level and state-level data. The former comprises of data collected from banks, beginning 2004. Using this database, we are able to obtain information on balance sheet and profit and loss items for 2004-2013 on nearly 1600 banks. These banks are spread over 27 states.

We subsequently delete several banks from the sample. First, we delete banks with less than three continuous years of data, lowering the sample size. We also exclude banks with gaps in-between years in the data, further reducing the sample. In the final stage, we delete banks with no reported information on some of the important variables employed in the analysis such as lending, asset or equity. These exclusions lower the final sample. The resultant sample is highly unbalanced, with a minimum of 57 banks in the initial year to a maximum of 1461 banks in 2011. Across state-years, there is a minimum of 1 bank across most states in 2004 and a maximum of 485 banks in Maharashtra in 2011; the average number of banks per year is 871.

Table 1 highlights the year-wise sample composition. The sample is representative in terms of the number of scheduled UCB (Sch. UCB), but much less so in terms of the non-scheduled banks, especially during the initial couple of years. On average, these banks account for 80% of total assets of UCBs during the period.

The major variable of interest is the women-owned cooperatives (WoC). In the sample, there are a average of 45 WoC, ranging from zero during the initial couple of years to a maximum of 82 in 2012; the asset of these banks averaged INR 176 million ($\approx$ US \$ 3.7 million) during the period (Table 2). These WoC span across 12 states, with a maximum of 27 in 2010 in the state of Maharashtra and a minimum of one for several states across years. In terms of size, these banks are quite small relative to their counterparts, with average total assets of US \$ 4 million, roughly one-hundred of the average total asset of non-WoC. However, as mentioned earlier, their advantage lies in catering to women and providing them with loans for production and working capital needs. We include a dummy which equals one if a bank is a WoC, else zero.

We also extract information on other state level variables, such as per capita state GDP, the gross fiscal deficit, share of agriculture and total credit extended. Information on these variables is obtained from various publications of the Indian central bank, such as the Handbook of Statistics (HBS) on the Indian Economy (RBI, 2015), Basic Statistical Returns (BSR) and state finance report (SFR) (RBI, 2010, 2015). Table 3 outlines the data sources and summary statistics.

As the Table suggests, the average lending amount translates into a nominal value of INR 200,000 ($\approx$ US \$ 2960); the values at the 25th and 75th percentile are US \$ 7400 and US \$ 1000, respectively. A significant proportion of these loans are towards agriculture and small-scale industries. On the profitability side, banks have low interest margin, notwithstanding the high return on loans. The levels of delinquent loans are high, standing at 11% on average. Banks appear to be well-capitalized, with equity levels averaging 10% of their assets.

At the state-level, average growth in state GDP is of the order of 7%, although the variability levels are high. On average, fiscal deficit averages 3% of state GDP, while the average credit penetration across states is close to 40%.

In the sample, 5% of the banks are women-owned cooperatives. Following Eichengreen and Gupta (2013), we define the crisis as the period 2008-2010. Around 40% of the sample years are affected by the crisis.

V. Empirical strategy

The analysis compares changes in the action of WoC around crisis periods with changes in the action of non-WoC during the same period, after controlling for state level macroeconomic and other bank-specific factors. To investigate this aspect, we employ a difference-in-differences (DID) regression for bank b at time t of the following form:

$$y_{bt} = \eta_t + \upsilon_b + \delta_1 WoC_{bt} + \delta_2 WoC_{bt} * Crisis_t + X_{bt-1}\gamma' + \varepsilon_{bt}$$

(1)

where y is the outcome variable of interest; η_t denotes year fixed effects and ε_{bt} is the error term.

WoC is a dummy variable that takes value one if the bank is a women-owned cooperative. If WoC expand credit relative to their counterparts, the coefficient δ_1 would be positive. Equation (1) also includes bank-specific fixed effects υ_b; this allows us to control for any other unobservable bank characteristic not directly incorporated in the specification.

Our coefficient of interest is δ_2 which captures the differential effect of the financial crisis on the outcome variable for WoC. To the extent that the crisis exerts a non-negligible impact on lending by WoC, one would expect δ_2 to be significant. Throughout, we cluster the standard errors at the state level.

X_{bt-1} is a vector of bank-specific controls, lagged one period to account for endogeneity concerns. Following previous research (Dinc et al., 2005), these include size and capital. Economically, bank size is an important determinant of lending decisions (Stein, 2000; Berger et al., 2006). In general, bigger banks are informationally less opaque and less susceptible to economic shocks, so that the association between lending and bank size should be positive. Secon, if bank soundness is an important factor affecting bank credit decisions, then the coefficient on *Equity* would be positive (Nier and Zicchino, 2005).

VI. Discussion of the results

VI.1 Baseline regressions

Regression results are set out in Table 4. The size variable *Ln Asset* is positive and statistically significant, consistent with the fact that bigger banks are able to expand credit at a faster pace. Intuitively, bigger banks benefit from scale economies which lower their cost of lending and enable better information acquisition (Boyd et al., 1993), thereby enabling them to expand lending. *Equity* bears a negative sign and is statistically significant for the entire sample. This suggests that well-capitalized cooperative banks tend to expand lending, consistent with extant research (Majnoni et al., 2003; Gambacorta and Marquez-Ibanez, 2011).

The second regression includes *WoC,* a dummy variable that equals one if a bank is a women-owned cooperative. It has a negative and statistically significant coefficient. In other words, women-owned cooperative banks tend to lower lending. The effect is quantitatively large, suggesting that an average WoC extends lending that is nearly 3% points lower than that of an average non-WoC.

The third regression includes an interaction term *WoC*Crisis,* where *Crisis* is a dummy variable for the years 2008-2010, else zero. If women-owned cooperatives behave differently during crisis years, the interaction term can capture those differences. The interaction term is

statistically insignificant, suggesting that there does not appear to exist any differential effect of the crisis on the lending behaviour of women-owned cooperatives.

Although the lending behaviour of these cooperatives is not significantly different overall, such differences could arise across states which have different levels of income for two reasons. First, the localised nature of these banks would suggest that their loans are given to entrepreneurs whose products have some sort of local demand, which is more likely to be manifest in high-income states. Second and during the crisis when there was an overall drop in demand, the residual demand for their products could be emanating from high-income as compared to low-income states. As a result, it appears likely that women-owned cooperative banks in high-income states could be extending credit during periods of crisis.

To investigate this further, we classify states as having high- and low-income. In particular, high income states are those with per capita GDP higher than the median value for the sample, else it is classified as low-income state. In columns (4) and (5), we run the regression separately for these two categories of states. As earlier, the coefficient on the interaction term *WoC*Crisis* is not statistically significant, suggesting that the overall lending behaviour of women-owned cooperatives do not differ across high and low income states during periods of crisis.

VI.2 Breakdown of lending by high- vs. low-income states

Next, we disaggregate the overall lending into its two major constituents such as lending to agriculture and to SSI, and run the regressions separately for high and low-income states. The results, set out in Table 5, shows that women-owned cooperatives lend more to both agriculture and SSI in the high income states during the crisis, although there is no such impact for the low income states. Note that since all regressions include bank-fixed effects, which control for all time-independent differences across these banks, therefore the differences related to crisis are less likely to be due to the general differences between women-

owned cooperatives and their non women-owned counterparts.

To understand the significance of these numbers, consider column 2 and consider the differential between the lending of an average women-owned cooperative and an average non women-owned cooperative. Temporarily ignoring the impact of the crisis, the differential is approximately 3.26% points. However, if it is a crisis year, the point estimates in column 2 yield a difference of approximately 3.12% points (-3.26+0.14=-3.12), a 5% increase with respect to the non-crisis year benchmark. In contrast, column 6 shows that there is no discernible difference in lending in case of low-income states.

Similar evidence also carries over in case of lending to SSI in high-income states. More specifically, during periods of crisis, women-owned cooperatives increase lending to SSI by roughly 0.15% points as compared with non-crisis years.

To sum up, our results refute the argument of risk-aversion in lending by women-owned cooperative banks and suggest that they increase their lending, especially during crisis periods. The rest of the analysis focuses on robustness tests of these results and analyse the reasons for this differential response across states.

VI.3 Role of state-level factors

In our baseline results, we had taken into account the state-level development by including per capita state GDP. However, given the relevance of macroeconomic factors in influencing bank lending, it becomes important to examine the robustness of the results to potential macroeconomic changes around crisis years. Accordingly, we consider four different variables: growth rate of state GDP, fiscal deficit, state-specific credit penetration and finally, share of agriculture in the state. We run these regressions separately for high- and low-income states, differentiated further by lending to agriculture and SSI, respectively.

Table 6 shows that in case of high-income states, only the coefficient on *Agriculture* is statistically significant and negative, meaning that states

with higher agriculture shares lend less to SSI, as expected. When we look at the coefficients for low income states, we find that fast-growing states actually lend less, presumably because of better and more profitable lending opportunities. Also, states with high credit penetration lend more to SSI, which could happen because these states are more industrialised and lending to SSI aids the process, since many of such SSI provide forward or backward linkages to the industries located in these states. Unlike in case of high income states, states with high agriculture shares lend more to SSI, perhaps in order to meet the minimum stipulated credit targets.

VI.4 What drive these results?

Our previous analysis shows that women-owned cooperatives lend more, both to agriculture and SSI, during periods of crisis, to high-income states. This raises the question as to what could be driving these results.

To understand this in detail, we run regressions similar to earlier, but instead, focus on the flow side of the balance sheet. More specifically, we employ profitability, returns and costs as outcome variables, in addition to the asset quality of the bank. We estimate the regressions for all states and separately for the high- and low-income states. Table 7 presents the findings.

In columns 1 to 4 of the table where we show the results for all states, it is observed that there is no differential effect of the crisis on the outcome variable for women-owned cooperative banks. However, these banks appear to have higher delinquent loans: on average, delinquent loans are roughly 0.5% points higher for WoC banks. When we estimate the model separately for the high- and low-income states, several interesting findings emerge.

In case of high income states (columns 5-8), the WoC exhibit lower return on loans during the crisis. Their cost of funds are also lower. Illustratively, the return on loans for WoC are 1.3 basis points lower

during the crisis; the impact on cost of funds is much less. There is however, no adverse impact on the asset quality of these banks during the crisis.

On the contrary, for low income states, we find that although they have high cost of funds during the crisis, their return on loans during this period are much higher to offset this cost; being higher by 3.1 basis points on average. What is important to note that during the crisis, there is a significant deterioration in the asset quality of these banks: NPLs are, on average, higher by 1.7% points during the crisis. Therefore, although these banks have higher returns which overwhelm the higher funding cost during the crisis, the sharp deterioration in asset quality during the crisis dissuades these banks from extending credit in low-income states.

VI.5 Reverse causality?

It is possible that the pre-crisis period provided incentives to women-owned cooperatives to increase lending. If that were the case, we might see an 'impact' of the change even prior to the crisis itself. To rule out this possibility, we examine the dynamics of the crisis on bank lending in greater detail.

Akin to Bertrand and Mullainathan (2003), we decompose the crisis into two separate periods: *Pre-crisis* is the one-year lagged value of the crisis whereas *Post –crisis* is the one-year forward value of the crisis. We estimate specifications similar to those earlier, controlling for all usual determinants of lending as well as year and bank fixed effects.

Table 8 shows these results. A positive and significant coefficient on *Pre-crisis*WoC* would be symptomatic of reverse causality. However, we find that this coefficient is insignificant across all specifications, suggesting that there does not appear to exist any reverse causation.

On the other hand, the coefficient on *Post-crisis*WoC* is negative and statistically significant in columns 3 and 7, indicating that lending to agriculture by women-owned cooperatives declines in the post-crisis period, both to the high and low-income states.

We can conclude that the crisis had a contemporaneous and subsequent effect on lending by women-owned cooperative banks; there was no lagged impact. Our results therefore do not appear to be susceptible to the problems of reverse causation.

VII. Summary and conclusions

The role and relevance of women in policymaking has attracted significant attention in recent times. Although some recent evidence has argued on the contrary, most research veer around the view that women are typically risk-averse as compared with their male counterparts, especially when it comes to risk-taking. A major shortcoming of such studies is their inability to integrate both ownership and control within a coherent framework, thereby limiting the empirical appeal.

In this context, the study employs longitudinal data on cooperative banks during 2004-2013 to examine this issue. More specifically, employing the natural experiment of the financial crisis, we compare the lending behaviour of women-owned cooperative banks with those which are not women-owned. Given that the owners of the company are also its managers, this circumvents the challenges involved in the separation of ownership from management control and thereby provides a clearer understanding of the risk-taking behaviour by women. The results indicate that, although overall lending is unaffected, there is a perceptible difference in the lending behaviour of these banks to agriculture and small-scale industries in the high- versus low-income states. The results are robust to changes in macroeconomic controls and not driven by concerns of reverse causality. These results call into question the conventional wisdom of attitude towards risk by women-owned entities.

As observed earlier, the Indian central bank had permitted these cooperatives to enrol male members up to a certain limit, subject to their

conformity with prescribed stipulations. That being the case, it is possible that this 'diversity' could be responsible to some extent for this differential lending response. It therefore begs the question as to whether there exists any 'threshold' diversity limit beyond which prudent behaviour is manifest more prominently (See, for example, Kanter, 1977). Although bank fixed effects takes care of some of these concerns, disaggregated information on board diversity in such banks could provide useful insights. Owing to paucity of data however, the analysis is unable to analyse this aspect in greater detail. Examining such issues constitutes part of future research focus.

REFERENCES

Adams, R. B., and Ragunathan, V. (2014). Lehman sisters. FIRN Research Paper. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2380036.

Adams, R., and D. Ferreira (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics* 94, 291–309.

Agarwal, S., and Wang, F.H. (2009). Perverse incentives at the banks? Evidence from a natural experiment. Federal Reserve Bank of Chicago Working Paper 8, FRB Chicago: Chicago.

Agnew, J., Balduzzi, P. and Sunden, A. (2003). Portfolio choice and trading in a large 401 (K) plan. *American Economic Review* 93, 193-215.

Alsos, G.A., Isaksen, E.J. and Ljunggren, E. (2006). New venture financing and subsequent business growth in men- and women-led businesses. *Entrepreneurship: Theory and Practice* 30, 667-686.

Barber, B. M., and Odean, T. (2001). "Boys will be boys: Gender, overconfidence, and common stock investment. *Quarterly Journal of Economics* 116, 261-92.

Beck, T., Behr, P and Guettier, A. (2013). Gender and banking: are women better loan officers? *Review of Finance* 17, 1279-1321.

Bellucci, A., Borisov, A. and Zazzaro, A. (2010). Do male and female loan officers differ in small business lending? A review of the literature. MoFIR Working Paper 47. Ancona: Italy.

Berger, A.N., Kick, T. and Schaeck, K. (2014). Executive board compensation and bank risk taking. *Journal of Corporate Finance* 28, 48-65.

Berger. A.N, and Udell. G.F (2006). A more complete conceptual framework for SME finance. *Journal of Banking and Finance* 30, 2945-2966.

Berle, A.A., Jr and Means, G. C. (1932). *The Modern Corporation and Private Property*. New York: MacMillan.

Bertrand, M. and Mullainathan, S. (2003). Enjoying the quiet life? Corporate governance and managerial preferences. *Journal of Political Economy* 111, 1043-1075.

Black, S., and Strahan, P.E. (2001). The division of spoils: Rent-Sharing and discrimination in a regulated industry, *American Economic Review* 91, 814–831.

Boyd, J. H., and Runkle, D. (1993). Size and performance of banking firms, *Journal of Monetary Economics* 31, 47–67.

Byrnes, J. P., Miller, D. C., and Schafer, W. D. (1999). Gender differences in risk taking: a meta- analysis. *Psychological Bulletin* 125, 367-383.

Campbell, K., and A.Minguez-Vera (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics* 83, 435-51.

Carter, D. A., B.J. Simkins and W.G. Simpson (2007). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review* 18, 396-414.

Carter, D., B.Simkins and W.Simpson (2003). Corporate governance, board diversity and firm value. *Financial Review* 38, 33-53.

Cesaroni, F.M., Lotti, F. and Mistrulli, P.E. (2013). Female firms and banks' lending behaviour: What happened during the great recession? Bank of Italy Working Paper 177. Bank of Italy: Rome.

Chiaramonte, L., Poli, F and Oriani, M.E. (2013). Are cooperative banks a lever for promoting bank stability? Evidence from the recent financial crisis in OECD countries. *European Financial Management* 21, 491-523.

Chipalkatti, N., Ramesha, K and Rishi, M. (2007). Depositor discipline, regulatory control and a banking crisis: A study of Indian urban cooperative banks. *Annals of Public and Cooperative Economics* 78, 567-594.

Christiansen, C., J.S. Joensen and J. Rangvid, 2006. Gender, marriage, and the decision to invest in stocks and bonds: Do single women invest more in less risky assets? Available from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=948164 [Accessed November 29, 2009].

De Goeij, P., and Smedts, K. (2008). Gender differences among analyst recommendations. Tilburg University.

Delbano, F., and Reggiani, C. (2013). Cooperative firms and the crisis: Evidence from some Italian mixed oligopolies. *Annals of Public and Cooperative Economics* 84, 383-397.

Dinc, I.S. (2005). Politicians and banks: Political influences on government-owned banks in emerging markets. *Journal of Financial Economics* 77, 453-479.

Eichengreen, B and P. Gupta (2013). The financial crisis and Indian banks: Survival of the fittest? *Journal of International Money and Finance* 39, 138-52.

Federal Deposit Insurance Corporation (2014). Minority depository institutions: Structure, performance and social impact. *FDIC Quarterly* 8, 33-63.

Fiordelisi, F. and Mare, D.S. (2014). Competition and financial stability in European cooperative banks. *Journal of International Money and Finance* 45, 1-16.

Gambacorta, L. and Marques-Ibanez, D. (2011). The bank lending

channel: Lessons from the crisis. *Economic Policy* 26, 135-182.

Ghosh, S. (2016). Why is it a man's world, after all? Women on bank boards in India. *Economic Systems* (forthcoming).

Goldin, C., and Rouse, C. (2000) "Orchestrating Impartiality: The impact of "blind" auditions on female musicians. *American Economic Review* 90, 715–742.

Gorton, G. and Schmid, F. (1999). Corporate governance, ownership dispersion and efficiency: Empirical evidence from Austrian cooperative banking. *Journal of Corporate Finance* 5, 119-140.

Government Accountability Office (2006): Minority banks: Regulators need to better assess effectiveness of support efforts. Government Accountability Office: United States.

Gul, F., B. Srinidhi and A.C.Ng (2011). Does board gender diversity improve the informativeness of stock prices? *Journal of Accounting and Economics* 15, 314-338.

Hesse, H. and Cihak, M. (2007). Cooperative banks and financial stability. IMF Working Paper 2. IMF: Washington DC.

Hisrich, R.D. and Brush, C. (1984). The women entrepreneur: Management skill and business problems. *Journal of Small Business Management* 22, 30-37.

International Finance Corporation (2013). *Improving access to finance for women-owned businesses in India*. IFC: Washington DC.

Iyer, R. and Puri, M. (2012). Understanding bank runs: The importance of depositor-bank relationships and networks. *American Economic Review* 102, 1414-1445.

Iyer, R., Puri, M and Ryan, N. (2016). A tale of two runs: Depositor responses to bank solvency risk. *Journal of Finance* (forthcoming).

Kanter, R.M. (1977). *Men and women of the corporation*. Basic Books.

Majnoni, G., Shankar, R. and Varhegyi, E. (2003). The dynamics of foreign bank ownership: Evidence from Hungary. Policy Research Working Paper No. 3114. The World Bank: Washington DC.

Niederle, M., and Verterlund, L. (2011). Gender and competition. *Annual Review of Economics* 3, 601-630.

Nier, E., and L. Zicchino (2005). Bank weakness and bank loan supply. Bank of England Financial Stability Review (December), 85-93.

Niessen, A. and Ruenzi, S. (2007). Sex matters: Gender differences in professional setting. SSRN:http://papers.ssrn.com/sol3/papers.cfm?abstract_id=966243.

Nyugen, H., and R.Faff (2006). Impact of board size and board diversity on firm value: Australian evidence. *Corporate Ownership and Control* 4, 24-32.

Organisation for Economic Cooperation and Development (2012). *Banking Statistics* 2012. OECD: Paris.

Orser, B., Hogarth-Scott, S. and Riding, A. (2000). Performance, firm size and management problem solving. *Journal of Small Business Management* 38, 42-58.

Price, D. (1990). Minority-owned banks: History and trends. Economic Commentary, Federal Reserve Bank of Cleveland (July). Available at [https://www.clevelandfed.org/Research/Commentary/1990/0701.pdf]

Reserve Bank of India (2006). *Report on Trend and Progress of Banking*

in India 2005-06. RBI: Mumbai.

Reserve Bank of India (2010). *Handbook of Statistics on State Finance* 2010. RBI: Mumbai.

Reserve Bank of India (2013). *State Finances: A Study of Budgets*. RBI: Mumbai.

Reserve Bank of India (2015). *Handbook of Statistics on the Indian Economy 2015*. RBI: Mumbai.

Reserve Bank of India. *Basic Statistical Returns of Scheduled Commercial Banks in India* (various years). RBI: Mumbai.

Singh, V., and Vinnicombe, S. (2004). Why so few women directors in Top UK boardrooms? Evidence and theoretical explanations. *Corporate Governance: An International Review* 12, 479-88.

Skala, D. and Weill, L (2015). Does CEO gender influence bank risk? Paper presented at Internationales d'Economie Monétaire et Bancaire, Nice, Italy.

Stein. J.C (2000). Information production and capital allocation: decentralized vs hierarchical firms. NBER Working Paper 7705. Cambridge: MA.

World Bank (2014). *Economic Empowerment Project for Women, SEWA.* The World Bank: Washington DC.

Table 1: Sample composition

Year	Whole sector				Sample			
	UCB	Asset	Sch. UCB	Asset	UCB	Asset	Sch. UCB	Asset
2004	1919	23	55	11.4	57	11.2	50	11.1
2005	1982	28	55	12.8	168	17.9	53	12.7
2006	1853	32	55	14.6	242	22.0	54	14.0
2007	1813	39	53	17.3	340	27.3	53	16.9
2008	1770	41	53	17.2	891	34.8	53	16.2
2009	1721	41	53	17.7	1315	38.2	53	17.3
2010	1674	52	53	22.7	1403	47.9	53	22.4
2011	1645	59	53	25.6	1461	54.3	53	25.2
2012	1618	57	52	26.6	1444	54.0	52	26.1
2013	1606	58	51	26.0	1392	55.0	51	25.7

Asset in US $ billion, based on average exchange rates prevailing during the year.

Table 2: Breakdown of Women-owned Cooperatives by year

Year	N.WoC	Total asset (US $ mn.)	N. Non-WoC	Total asset (US $ mn.)	All banks	Total asset (US $ mn.)
2004	0	..	57	112.5	57	112.5
2005	0	..	168	179.7	168	179.7
2006	3	0.8	239	214.7	242	215.5
2007	10	1.4	330	270.6	340	272.1
2008	46	3.8	844	342.1	891	345.9
2009	70	4.1	1245	378.6	1315	382.8
2010	82	5.9	1321	473.9	1403	479.9
2011	82	6.7	1379	538.6	1461	545.4
2012	83	6.5	1361	533.8	1444	540.3
2013	76	6.4	1316	541.4	1392	547.8
Average	**45**	**3.7**	**826**	**368.8**	**827**	**372.5**

Asset in US $ billion, based on average exchange rates prevailing during the year/sample period.

Table 3: Variables, data sources and summary statistics

Variables	Empirical definition	Data source	Mean (SD)	p.75 (p.25)
Outcome				
Loans	Ln (1+total loans)	OSS	2.91 (1.37)	3.82 (1.90)
Agri_loans	Ln (1+credit to agriculture)	OSS	0.50 (0.81)	0.72 (0.00)
SSI_loans	Ln (1+ credit to SSI)	OSS	0.81 (1.24)	1.20 (0.00)
NIM	Net interest margin, defined as Interest income – Interest expended/ Total asset	OSS	0.03 (0.02)	0.04 (0.02)
RTL	Return on loans, defined as Interest earned on loans/Total loans	OSS	0.17 (0.09)	0.21 (0.15)
CoF	Cost of funds, defined as Interest expended on deposits and borrowings/ Total deposits and borrowings	OSS	0.06 (0.03)	0.08 (0.05)
NPL	Non-performing loans/ Total loans	OSS	0.11 (0.13)	0.14 (0.03)
Explanatory				
Asset	Ln (total asset)	OSS	1.77 (0.62)	2.17 (1.32)
Equity	Total equity/ Total asset	OSS	0.10 (0.06)	0.12 (0.06)
WoC	Dummy=1 if a bank is a women-owned cooperative (WoC) bank, else zero	OSS	0.05 (0.22)	.. (..)
PC GDP	Ln (per capita state GDP)	RBI (HBS)	10.78 (0.31)	10.99 (10.61)
Gr_ PC GDP	Ln (PC GDP(t) - Ln (PC GDP (t-1)	RBI (HBS)	0.07 (0.04)	0.09 (0.04)
Credit	Credit/ State GDP	RBI (BSR)	0.37 (0.14)	0.63 (0.29)
GFD	Gross fiscal deficit/ State GDP	RBI (SFR)	0.03 (0.01)	0.03 (0.02)
Agriculture	Share of agriculture/ State GDP	RBI (HBS)	0.13 (0.06)	0.17 (0.09)
Crisis	Dummy=1 for the years 2008-2010, else zero	Eichengreen and Gupta (2013)	0.41 (0.49)	1 (0)

Table 4: Baseline regression – Impact of financial crisis on lending by women-owned cooperatives

	All states			High income states	Low income states
	(1)	(2)	(3)	(4)	(5)
Ln Asset, lagged	0.045**	0.045**	0.045**	0.147***	0.004
	(0.022)	(0.022)	(0.021)	(0.044)	(0.029)
Equity/Asset, lagged	-0.616***	-0.618***	-0.615***	-1.108***	-0.521*
	(0.148)	(0.151)	(0.149)	(0.176)	(0.307)
WoC		-2.703***	-2.706***	-2.110***	0.882***
		(0.511)	(0.516)	(0.338)	(0.348)
WoC*Crisis			-0.005	0.025	-0.022
			(0.026)	(0.024)	(0.039)
Ln PC NSDP	-1.022	-1.021	-1.022	-0.480	-0.690
	(0.662)	(0.663)	(0.663)	(0.528)	(0.695)
Bank FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
N.Obs	8601	8601	8601	4117	4484
p-Value of F-test	0.00	0.00	0.00	0.00	0.00
R-squared	0.9552	0.9554	0.9555	0.9850	0.9534

Standard errors (clustered by state) are in parentheses
***, ** and * denote statistical significance at the 1, 5 and 10%, respectively

Table 5: Impact of financial crisis on lending by women-owned cooperatives across states

	High income states				Low income states			
	Ln (1+agriculture)		Ln (1+SSI)		Ln (1+agriculture)		Ln (1+SSI)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln Asset, lagged	0.036***	0.035***	0.091***	0.089***	-0.025	-0.025	0.071	0.070
	(0.007)	(0.008)	(0.012)	(0.012)	(0.019)	(0.019)	(0.043)	(0.043)
Equity/Asset, lagged	-0.215	-0.226	-0.839***	-0.879***	-0.202	-0.202	-0.176	-0.177
	(0.273)	(0.274)	(0.197)	(0.197)	(0.138)	(0.137)	(0.152)	(0.149)
WoC	-3.243***	-3.256***	-1.198	-1.243	1.411***	1.402***	1.438***	1.440***
	(0.443)	(0.439)	(0.958)	(0.948)	(0.292)	(0.274)	(0.224)	(0.245)
WoC*Crisis		0.141***		0.146***		0.009		-0.002
		(0.005)		(0.029)		(0.033)		(0.072)
Ln PC NSDP	-1.160*	-1.166*	-1.072	-1.091	-0.334	-0.332	-0.675	-0.676
	(0.649)	(0.651)	(1.474)	(0.1.458)	(0.621)	(0.616)	(0.493)	(0.496)
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
N.Obs	4117	4117	4117	4117	4484	4484	4484	4484
p-Value of F-test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-squared	0.9212	0.9213	0.9259	0.9260	0.8948	0.8948	0.8792	0.8791

Standard errors (clustered by state) are in parentheses
***, ** and * denote statistical significance at the 1, 5 and 10%, respectively

Table 6: Impact of financial crisis on lending by women-owned cooperatives across states – Robustness

Panel A: High income states	Ln (1+agriculture)				Ln (1 + SSI)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln Asset, lagged	0.034***	0.034***	0.034***	0.033***	0.088***	0.088***	0.087***	0.087***
	(0.007)	(0.008)	(0.007)	(0.008)	(0.013)	(0.013)	(0.012)	(0.014)
Equity/Asset, lagged	-0.235	-0.245	-0.233	-0.227	-0.894***	-0.912***	-0.887***	-0.875***
	(0.264)	(0.267)	(0.266)	(0.272)	(0.185)	(0.195)	(0.191)	(0.200)
WoC	0.028	0.026	0.034	0.110*	0.302***	0.297***	0.305***	0.438***
	(0.048)	(0.045)	(0.451)	(0.057)	(0.048)	(0.044)	(0.043)	(0.062)
WoC*Crisis	0.140***	0.141***	0.140***	0.141***	0.146***	0.148***	0.145***	0.147***
	(0.005)	(0.005)	(0.004)	(0.004)	(0.028)	(0.027)	(0.029)	(0.029)
NSDP growth	-0.007				0.342			
	(0.158)				(0.362)			
Credit/NSDP		-0.405				-0.997		
		(0.475)				(1.248)		
GFD/NSDP			-0.544				-0.221	
			(1.061)				(1.084)	
Agriculture/NSDP				-1.728				-2.852*
				(1.225)				(1.417)
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
N.Obs	4117	4117	4117	4117	4117	4117	4117	4117
p-Value of F-test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-squared	0.9212	0.9212	0.9212	0.9212	0.9260	0.9260	0.9260	0.9261
Panel B: Low income states	Ln (1 + agriculture)				Ln (1 + SSI)			
Ln Asset, lagged	-0.027	-0.024	-0.025	-0.024	0.067	0.074*	0.072*	0.071*
	(0.019)	(0.020)	(0.021)	(0.020)	(0.044)	(0.042)	(0.041)	(0.040)
Equity/Asset, lagged	-0.192	-0.209	-0.206	-0.204	-0.152	-0.188	-0.183	-0.173
	(0.139)	(0.134)	(0.137)	(0.132)	(0.147)	(0.158)	(0.149)	(0.149)
WoC	1.257***	1.499***	1.299***	1.076***	1.145***	1.590***	1.229***	1.445***
	(0.031)	(0.216)	(0.061)	(0.180)	(0.081)	(0.271)	(0.109)	(0.192)
WoC*Crisis	0.012	0.009	0.012	0.013	0.005	-0.001	0.005	0.008
	(0.036)	(0.038)	(0.036)	(0.037)	(0.069)	(0.069)	(0.069)	(0.067)
NSDP growth	-0.341**				-0.865**			
	(0.164)				(0.396)			
Credit/NSDP		1.991				3.659*		
		(1.839)				(2.038)		
GFD/NSDP			1.206				2.419	
			(1.273)				(1.693)	
Agriculture/NSDP				-0.989				1.673**
				(1.016)				(0.799)
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
N.Obs	4484	4484	4484	4484	4484	4484	4484	4484
p-Value of F-test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-squared	0.8948	0.8945	0.8947	0.8949	0.8793	0.8792	0.8791	0.8792

Standard errors (clustered by state) are in parentheses

***, ** and * denote statistical significance at the 1, 5 and 10%, respectively

Table 7: Impact of financial crisis on the performance of
women-owned cooperatives across states

	All states				High income states				Low income states			
	NIM	RTL	CoF	NPL	NIM	RTL	CoF	NPL	NIM	RTL	CoF	NPL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ln Asset	-0.0007	0.0004	0.001	-0.005	-0.001	0.014	0.009**	0.002	-0.002**	-0.003	-0.001*	-0.006
	(0.0007)	(0.004)	(0.002)	(0.004)	(0.0009)	(0.010)	(0.004)	(0.006)	(0.0008)	(0.004)	(0.0007)	(0.007)
Equity/Asset	-0.013	-0.033	-0.011*	-0.011	-0.047	-0.051	-0.054	-0.064	-0.008	-0.046	-0.014	-0.014
	(0.012)	(0.048)	(0.006)	(0.044)	(0.033)	(0.129)	(0.033)	(0.129)	(0.009)	(0.060)	(0.011)	(0.069)
WoC	-0.009***	0.075	0.006	0.471***	0.019*	-0.157	-0.043	0.149**	-0.009***	0.077**	0.044***	0.348***
	(0.0006)	(0.046)	(0.008)	(0.034)	(0.010)	(0.178)	(0.027)	(0.038)	(0.002)	(0.038)	(0.006)	(0.132)
WoC*Crisis	0.0004	0.002	-0.0006	0.006	-0.0007	-0.013***	-0.004***	0.009	0.003	0.031*	0.006*	0.017**
	(0.001)	(0.008)	(0.002)	(0.007)	(0.002)	(0.004)	(0.001)	(0.006)	(0.002)	(0.017)	(0.003)	(0.007)
Ln PCNSDP	0.001	-0.151	-0.049***	-0.171**	0.032	-0.173	-0.067	0.347	-0.019	0.002	0.012	-0.179*
	(0.018)	(0.097)	(0.017)	(0.069)	(0.019)	(0.319)	(0.048)	(0.202)	(0.012)	(0.069)	(0.014)	(0.106)
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N.Obs	8563	8563	8562	8634	4103	4103	4103	4117	4460	4460	4459	4517
F-test (p-Value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-squared	0.4307	0.6291	0.4948	0.7416	0.4312	0.6667	0.5632	0.8041	0.5806	0.7155	0.6212	0.7983

Standard errors (clustered by state) are in parentheses
***, ** and * denote statistical significance at the 1, 5 and 10%, respectively

Table 8: Impact of financial crisis on lending by
women-owned cooperatives across states – Checking for reverse causality

	High income states				Low income states			
	Ln (1+agriculture)	Ln (1+SSI)	Ln (1+agriculture)	Ln (1+SSI)	Ln (1+agriculture)	Ln (1+SSI)	Ln (1+agriculture)	Ln (1+SSI)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln Asset, Lagged	0.035***	0.091***	0.036***	0.090***	-0.025	0.072	-0.025	0.071
	(0.007)	(0.012)	(0.008)	(0.011)	(0.019)	(0.044)	(0.019)	(0.043)
Equity/Asset, Lagged	-0.224	-0.854***	-0.220	-0.847***	-0.202	-0.178	-0.202	-0.175
	(0.262)	(0.187)	(0.273)	(0.193)	(0.138)	(0.151)	(0.138)	(0.152)
WoC	0.039	0.341***	-3.249***	-1.207	1.983***	3.039***	1.411***	1.437***
	(0.047)	(0.046)	(0.435)	(0.951)	(0.307)	(0.471)	(0.292)	(0.225)
WoC*Pre Crisis	0.146	0.175			-0.045	-0.234		
	(0.145)	(0.169)			(0.134)	(0.426)		
WoC*Post Crisis			-0.035**	-0.047			-0.027*	0.043
			(0.015)	(0.029)			(0.013)	(0.027)
Ln PC NSDP	-0.727	0.330	-1.185*	-1.105	-0.332	-0.669	-0.332	-0.677
	(0.660)	(0.335)	(0.645)	(1.467)	(0.621)	(0.495)	(0.620)	(0.494)
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
N.Obs	4117	4117	4117	4117	4484	4484	4484	4484
p-Value of F-test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-squared	0.9212	0.9259	0.9213	0.9259	0.8948	0.8792	0.8948	0.8792

Standard errors (clustered by state) are in parentheses
***, ** and * denote statistical significance at the 1, 5 and 10%, respectively