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### **Comments on Macro prudential Policy and Zombie Lending in Korea**

**(paper by Takeo Hoshi, Younghoon Kim, Comments by Poonam Gupta)**

The paper studies the effect of macro prudential policies which were used to limit the extent of mortgage financing in South Korea during 2000-2010. These policies were introduced as the upper limits on loan to value ratio (LTV) and debt to Income ratio (DTI) for housing finance. The paper observes, and concurs with Igan and Kang (2011), that these measures helped slow down the appreciation in house prices. It specifically asks whether these policies also slowed down the growth of total credit; and did the banks alter their lending in ways that encouraged less productive firms to survive, promoted less firm entry, and inhibited productivity growth.

The paper adds to the recent literature which asks whether macro prudential measures may become ineffective or may generate new regulatory challenges as the financial institutions change their behaviour in response to regulations. Or, as some others have put it more simply, “Do macroprudentials leak”? In its empirical approach the paper follows Caballero, Hoshi and Kashyap (2008) closely. It constructs an indicator of Zombie firms (firms which would not have survived unless for concessional lending by the banks) based on the cost of financing to sales ratio (measure of performance) and on the extent of new bank loans and the rolled over loans (measure of “help” from the banks).

The paper informs that the policies did not slow down the growth of total credit, but resulted in reallocation of bank credit. Banks shifted their lending to SMEs in response to the stricter regulations on mortgage financing. The paper anticipates, but does not show, that banks disproportionately increased lending to firms which were otherwise not very creditworthy or productive. These zombie firms had lower employment and investment growth and lower productivity, and impeded entry by new firms. The key messages are that the macro prudentials can leak. Thus even when they succeed in discouraging certain kinds of financial activities, they may result in regulatory arbitrage or excess activity somewhere else in the system. It also conveys that the concessional or directed lending to firms may discourage entry and impede investment, employment and productivity growth.

My comments are below.

#### **Objective of the paper**

The kind of exercise done here seemed more appropriate for the Japanese firms as in Caballero, Hoshi and Kashyap (2008). The Japanese banks lent to Zombie firms because not lending to these underperforming firms would have implied booking the loans as losses and providing for additional capital.

In addition, the banks faced social pressures to lend to firms. It is not clear whether a similar exercise is very meaningful here. For one thing, it is not clear why would the Korean banks lend to lower quality SMEs, when mortgage financing became more onerous, when they could have moved their lending to new or better firms or invest in sovereign bonds. One reason could be that these loans generated better returns. It is also not obvious whether these loans were of poorer quality and whether the ex post default rate was higher on these loans. If not, then lending to SME firms was a perfectly rational strategy for the banks.

As such, even though the paper implies that the credit allocation shifted to zombies due to stricter macro prudential, this link is not established in the paper. In order to establish the link the paper should have controlled for these policy changes in the regressions, while also controlling for other events which might have affected the allocation of credit to SMEs and to Zombie firms.

Igan and Kang (2012) show that the prudential regulations were imposed in different regions in Korea at different points in time. A more robust way to establish the link above would have been to use the cross regional data and estimate the regressions using the difference in difference estimates. The exercise would have asked whether zombie firms received more loans (and performed worse), as compared to the non zombie firms, in the regions which experienced stricter LTV and DTI ratios.

### **Regression Specification**

The regression specification for investment employment and productivity growth include a dummy for non zombie firms, thus using the zombie firms as the control group, an industry wide indicator of zombieness (percent of firms which are zombies) in each industry, and the interaction of the zombieness of the industry with the dummy for non zombie firms. In addition, it controls for industry fixed effects, year fixed effects, or industry-year fixed effects.

Even though it is a reasonable specification, it ought to adequately control for firm characteristics, since many of these are likely to be correlated with the dummy for zombieness. Not doing so may render the results biased. Some such variables are the size of the firm (size is likely to affect the terms at which the firm is able to borrow from the banks or from other sources); profitability of the firm (again it would affect the terms of the borrowings, it is also an indicator of the productivity growth or investment and is likely to be correlated with the firms Zombieness); perhaps the equity prices (I am not sure whether many of the SMEs were listed). Since the paper observes that the banks lent to old and established firms rather than to new and young firms, controlling for the age of the firms would be useful as well. Controlling for such relevant firm characteristics would also be a good robustness test for the quality of the zombieness index.

### **Robustness Tests**

The paper could conduct more robustness tests. It could construct the Zombieness variable in different ways, especially by incorporating the information on interest rate subsidy to firms and on their profitability, and discussed how correlated these different indicators are and how robust the results are. The paper says that.... "even after the global financial crisis, when the credit boom was over, these zombie firms still continued to survive benefiting now from government policies to help the firms hurt by the crisis". The authors could have incorporated the information on government assistance to construct the Zombieness index.

Another robustness would have been to drop the firms in the construction and real estate industries. Since the macro prudential regulations were aimed to curb the activity in these industries, perhaps more firms became Zombies due to the tight regulations. Excluding these firms would give results that are more general and robust.