

Executive Summary

Interest rate is said to be the most important variable to manage the economy. Therefore interest policy announcements are awaited with great interest and have a major impact on asset prices. When economy slows, central bank cuts the interest rate to intend firms and households to spend more and bring the economy back on track, whereas when it appears that the economy is overheating, they increase interest rates. Since the recent financial crisis we know that managing interest rates alone cannot prevent the economy from ending in a recession. Not even if all major central banks collaborate with each other. Considering the ongoing low interest rate policy, there is even less scope for central banks to react to economic turmoil by changing interest rates.

Geanakoplos (2010) suggests that leverage should also be managed by central banks, as in times of crisis this variable is more important than interest rates. He justifies this idea by speaking of a leverage cycle rather than an economic cycle. Accordingly, crises occur because of huge moves in collateral rates. When leverage is high, people are able to buy more assets because of easier access to credit and therefore drive prices up. On the other hand, when credit is scarce prices crash. This means that in normal times asset prices are too high, whereas in bad times they are too low. Geanakoplos and Zame (2010) provide an agent based model rested up on general equilibrium theory to get a better understanding of leverage.

Hence, this paper addresses the following research questions:

- Is there a link between collateral requirements and future prices?
- Does the model of Geanakoplos and Zame (2010) explain the massive collapse of prices during the recent financial crisis?
- How can these price declines be explained by forced selling?

For this reason the model is implemented into Matlab. We start by first calculating the Walrasian Equilibrium as a benchmark, which is compared to the outcomes were collateral is involved. Moreover, in a second step there is uncertainty introduced, leaving the agents either in a good or a bad state. The results show that the model of Geanakoplos and Zame (2010) is able to explain the main implications seen during the recent financial crisis. It proves that leverage indeed drives prices up to heights way above fundamental rational regions. This is no reason for immediate concern, as ex ante

leverage leads to higher wealth in society. However, ex post prices drop back as soon uncertainty about future values of collateral comes into play, mostly triggered by bad news. As uncertainty increases, this leads to higher margins to hold the same amount of leverage. This sets a natural process called deleveraging in motion, where investors are forced to sell their assets to meet the margin requirements, which reinforces a downward spiral and prices plummet. The simulation in Matlab shows the beginning effect of a deleveraging process, since it is based on two consumers only there is no downward spiral which drives prices further down.

Nevertheless, to avoid further crisis with the scale of the recent one, policy makers should introduce stronger provisions on leverage, in good as well as in bad times. This is the only way to break through this downward spiral and secure the financial system in the future.