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# 9 Financial stability: The role of macroprudential policies

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The belief held during the period of the Great Moderation that macroeconomic stability could be attained by monetary policy has been replaced by a growing consensus on the crucial role of macroprudential policies. The main goal of macroprudential policies is to promote financial stability by limiting excessive risks and vulnerabilities in the financial system. Macroprudential policies inherently represent a trade-off between efficiency and welfare losses *ex ante* in good times and the gains *ex post* should a crisis arise. Analysis of this trade-off has been the focus of research in the ADEMU project.

As the Great Recession was largely caused by a collateral crisis in financial markets, macroprudential policies targeting excessive leverage have received most attention in the literature. Geanakoplos (2009) and Geanakoplos and Fostel (2012) show that collateral rates or leverage are more important to economic activity and asset prices than interest rates. During a leverage cycle there is too much leverage in normal times and therefore asset prices are too high, and vice versa in bad times. The loan-to-value ratio on new loans changes dramatically over time, and its rapid change is an important source of economic crises. The leverage cycle makes returns riskier, and creates an inefficient mix of skills and allocation of resources in the economy. Gehrig and Levinsky (2018) confirm these theoretical results in a laboratory experiment.

Possibly the best policy to prevent a collateral crisis is to act before it occurs. Restricting leverage in good times might be a policy that can achieve this end. Such restrictions are supposed to complement risk-based capital requirements as a simple regulation to mitigate cyclical fluctuations and to decrease the risk of contagion in the financial system documented by Adrian and Shin (2010) and Brunnermeier and Pedersen (2009). Boháček (2017) derives endogenous leverage bounds arising from

adverse selection and moral hazard between borrowers and lenders in an environment with imperfect monitoring and default. Incentive compatible allocations are mapped into restrictions on margins for collateralised loans. These margins are used to simulate the macroprudential policies trade-off: in good times, restricting leverage is costly as it limits the efficient allocation of resources to their most productive use; on the other hand, accumulation of assets prevents excessive deleveraging during a recession or after a change in regulatory framework. Numerical simulations show that the efficiency costs are less than ½ percent of total output in the good state, while the gains are more than 8% during a simulated financial crisis.

Bianchi (2011) documents that over-borrowing externalities have a large quantitative impact on welfare. When agents fail to internalise the price effects of their borrowing decisions, collateral credit constraints in nontradable goods can induce sharp and sudden adjustments in access to foreign financing. When agents have accumulated a large amount of debt and a typical adverse shock hits, the economy suffers the typical dislocation associated with an emerging market crisis. This pecuniary externality can be corrected by reducing the amount of borrowing ex ante, either by a tax on debt or margin restrictions. Macroprudential policies (a simple tax on debt) imposed before a crisis can increase the amount of precautionary savings and reduce the incidence and severity of the crisis when it occurs.

Korinek and Simsek (2016) model the aggregate demand externality of excessive leverage. It is desirable to slow down the accumulation of leverage because borrowers who individually behave rationally undertake excessive leverage from a social point of view. Agents do not take into account general equilibrium effects. Greater ex ante leverage leads to a greater ex post reduction in aggregate demand and a deeper recession. This is because deleveraging transfers liquid wealth from borrowers to lenders when the former have a much higher marginal propensity to consume. A macroprudential policy restricting leverage could make all agents better off. Korinek and Simsek also show that when debt is collateralised by financial assets, a fire-sale externality exacerbates aggregate demand externalities, leading to a more severe deleveraging episode and a deeper recession.

To prevent episodes with household deleveraging and a subsequent liquidity trap, Farhi and Werning (2016) emphasise *ex ante* macroprudential restrictions on borrowing during the credit boom in order to alleviate the severity of the future crisis in the form of loan-to-value or debt-to-income ratios. In a currency union where monetary policy is constrained by a fixed exchange rate, capital controls can be used to smooth the business cycle. Similarly, when agents are subject to collateral constraints that depend on the terms of trade, taxes on capital inflows might be imposed in anticipation of binding collateral constraints. The authors offer a general theory for macroprudential policies based on nominal rigidities and constraints on monetary policy (the zero lower bound or a fixed exchange rate in a currency union). Instead of pecuniary externalities, their theory emphasises aggregate demand externalities. The optimal Pigouvian taxes provide incentives for agents to reallocate their wealth to states with higher marginal propensities to spend.

Unconventional policies might be required to alleviate the effects of the financial crisis. Gaballo and Marimon (2016) propose credit easing by targeted subsidies in a new theory of self-confirming equilibria. For monetary policy constrained at the zero bound, Molteni (2017) suggests an unconventional policy of swapping illiquid government bonds for highly liquid papers (short-term debt or money).

Direct purchases or collateralised loans might be necessary for a successful alleviation of contractionary effects of a liquidity shock. In an international setting, Molteni (2017) focuses on the role of funding liquidity – the ease with which investors can obtain funding against a collateral. Government bonds are the prime collateral securities in the European repo market, an essential source of funding for the banking system. During the financial crisis, the increase in counterparty credit risk led to a shift to secured funding backed by collateral. The resulting deleveraging channel had quantitatively large, negative effects on aggregate output and price levels. Rodriguez-Lopez (2018) studies how cross-country differences in asset liquidity affect the international allocation of economic activity. The model generates positive spillovers of the market for liquidity on the size and productivity of the sector that generates liquid assets. Similar to precautionary savings in a Bewley model, agents over-accumulate assets due to the liquidity services they might provide should potential opportunities to trade in the financial market occur.

Seoane and Yurdagul (2018) model small open economies subject to collateral constraints with endogenous borrowing limits. They study the role of demand shocks to international lending in a model where the collateral constraint depends on the tradable value of domestic income. They find procyclical optimal macroprudential capital controls (tax on foreign debt), similar to Fernández et al.'s (2015) capital controls that alleviate over-borrowing cycles.

The design of effective macroprudential policies might require international cooperation. Fornaro and Romei (2018) study countercyclical macroprudential policies that limit debt accumulation during booms to sustain aggregate demand and employment during liquidity traps triggered by deleveraging episodes. They show that these policies, while effective from the perspective of individual countries, might backfire if applied on a global scale. The reason is that prudential policies implemented by booming countries generate a rise in the global supply of savings or, equivalently, a fall in global aggregate demand, which exacerbates the recession in countries currently in a liquidity trap. A paradox of global thrift might arise because national governments do not internalise the impact of their actions on other countries.

Several papers in the ADEMU project analyse the effects of monetary policy during and after the Great Recession. Hedlund (2018) studies the effects of explicitly inflating away mortgage debt in a model of endogenously illiquid housing market with default. The generated inflation can boost house prices, reduce foreclosure activity, and accelerate the macroeconomic recovery. However, except for the case of fixed rate mortgages, the various inflationary channels cancel out and the overall effect is weak. Cui and Radde (2017) develop a monetary model with a search theory of asset market liquidity and endogenous financing constraints. As money relaxes financing constraints, private assets must pay an endogenous liquidity premium that rises with financing constraints. Shocks to the intermediation costs are essential to jointly capture the countercyclical liquidity premium, procyclical and volatile asset prices, and large fluctuations of macroeconomic variables as observed in the data.

The ADEMU project has shown that designing the optimal macroprudential policies is a demanding theoretical exercise based on important insights in market externalities. In economies with incomplete asset markets and credit constraints, a redistribution of asset holdings induces relative price changes in spot markets. These relative price

changes represent a pecuniary externality that is not internalised by otherwise rational private agents. Such inefficient equilibria can be improved by macroprudential policies in the form of taxes or restrictions on allocations. At the same time, it is important to study macroprudential policies as a trade-off between the ex ante losses in efficiency and welfare and the ex post gains during a crisis. The costs can be large as severe financial crises with deleveraging episodes are rare and highly uncertain events. Second, while often welfare-improving, simplified policy tools might have costly side effects. Macroprudential policies constrain efficient allocations and might limit not only excessive risk-taking but also innovations. For example, a simple interest rate policy that promotes a precautionary accumulation of collateral also affects agents whose allocations are efficient. A leverage regulation disadvantages borrowers with low savings and might actually push some of them towards alternative and riskier sources of borrowing (credit cards, unsecured loans, etc.). A higher interest rate might slow down economic growth and even generate a recession. These complex effects of optimal stabilisation policies illustrate the importance of the contribution that ADEMU research makes to the new macro-finance literature and to our understanding of macroprudential policies and their role in financial markets.

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