

WHAT SHOULD MONETARY POLICY DO IN THE FACE OF SOARING ASSET PRICES AND RAMPANT CREDIT GROWTH?

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In the aftermath of the financial crisis macroeconomists once again took an interest in the options offered by monetary policy to deal with asset price bubbles. Empirical studies seem to show that the soaring debt of agents is more dangerous than the soaring prices of financial assets. Macroprudential tools now appear to be able to limit the amplitude of cycles of indebtedness. The debate is henceforth focusing on the last resort role left to monetary policy in cases where the implementation of macroprudential tools will not be sufficient.

Keywords: monetary policy, asset prices, financial cycle, macroprudential policy.

The financial crisis of 2008 renewed the debate over the rationale for a central bank to tighten financial conditions (i.e. raise the interest rate) to tame financial assets and / or real estate price dynamics, in times when neither inflation forecast nor economic conditions justify a monetary tightening.

The renewal of this debate stands in stark contrast to the pre-crisis consensus that a central bank should focus on its inflation target. At the time financial stability issues were considered the sole responsibility of the financial system's prudential regulators and supervisors. In most countries these regulators followed a micro-economic approach organized around the health of financial institutions taken individually, with no aggregate view of risk. From this perspective the main role of monetary policy was to maintain price stability. In the event of financial crises, central banks had first to provide the liquidity needed for the

functioning of the financial system, and then to implement accommodative policies to avoid rising unemployment and the collapse of inflation.

The magnitude of the 2008 financial crisis, the difficulty of reviving the economy after the crisis, and the likely permanent damage it has left have reopened the debate on the role of monetary policy in preventing financial crises. This debate has been organized around several interrelated issues: what level of indebtedness or asset prices can be considered as threatening financial stability? Are central banks the best placed to monitor financial stability when they have a single instrument (the interest rate) that they already use to target inflation and keep unemployment to its equilibrium level? Even if financial stability is entrusted to bodies other than the central bank (as is currently the case in most G7 countries), should central banks intervene as a last resort, in the wake of the macroprudential bodies, in order to counter a surge in asset prices and credit?

1. Prior to the Crisis: A Recurrent Academic Debate but a Central Bank Consensus

The debate over monetary policy and bubbles is recurrent. It had re-emerged in the late 1990s, when valuations of companies in the digital economy seemed disproportional to their profits (really more often losses) and the press talked about the “dot.com bubble”. We will return later to the role of academic contributions to this debate. In terms of the conduct of monetary policy, the debate was decided in favour of a “reactive” attitude of the central bank, i.e. to adopt a monetary policy to support activity after the bubble burst in order to limit damage to the economy (rising unemployment, lower inflation, weak demand). The role of the central bank was therefore reduced to that of “cleaning”. This consensus among central banks to reject pro-active measures (“leaning against the wind”) was clearly spelled out in a speech by Bernanke (2002), then a member of the Federal Reserve board of governors. The first argument is that it is not easy to detect an asset price bubble in real time. If the central bank does not have more information than the market about the “true” value of companies, how can it justify opposing the market by acting on the basis of valuations that it considers too high? The second argument is that a preventive policy (an increase in rates when the existence of a potentially dangerous bubble is suspected) translates fairly quickly into an

economic slowdown and an increase in unemployment, without having a very significant impact on the presumably overvalued market. The interest rate is too broad an instrument to be used to force a surging financial (or real estate) market back on track. It is therefore not certain that acting once a bubble has been spotted (leaning) is better than acting after it has burst (cleaning). Finally, the two arguments are combined: the gain expected from a preventive action falls the more uncertain it is that there is a bubble.

This pre-2008 consensus does not mean that the central bank is unconcerned about financial stability, but rather that financial stability is to be achieved by using other tools: regulation, supervision and the power of a lender of last resort (see Bernanke, 2002). In 1996, when Alan Greenspan (then Chair of the US Federal Reserve) spoke of irrational exuberance to describe what was happening in the US financial markets, he was trying to alert investors to dot.com valuations that he believed were much too high. However, in accordance with the doctrine of the Federal Reserve and the consensus of the day, the course of monetary policy went unaffected, with the central bank remaining committed to its dual mandate: price stability and low unemployment. After the dot.com bubble burst in 2001 the Federal Reserve lowered its rate: the damage to the real economy was limited and the post-crash economic slowdown relatively short.

The 1929 trauma

One further argument, heard less often but probably very present in the minds of central bankers, particularly in the United States, is that a preventive policy was used in the past with the most disastrous results. In 1928, the US Federal Reserve, worried about high valuations in the US financial market, raised its interest rate just as the US economy was emerging from a recession. The Federal Reserve even further tightened its already restrictive policy in July 1929. After the 1929 stock market crash, the bubble had been eliminated (in part), but the economy had collapsed. It is difficult to attribute the great recession of those times to the reverberations of the stock market crash. On the one hand, some authors hold that the economic recession was already underway, before the monetary tightening, which merely accentuated it, and that the bubble would have burst anyway.¹ On the other hand, the scale

1. Cf. Bernanke, 2002.

and duration of the 1929 crisis also resulted from the lack of any reactive monetary policy measures until the middle of 1930 (after a brief episode of the large-scale provision of liquidity right after the crash in October)² and, more generally, a poor policy mix (or fiscal/monetary policy mix) in the years that followed. However, this failure of monetary policy (use of preventive and non-use of reactive) is still in the minds of monetary policy makers today.... and does not exactly encourage the use of pro-active monetary policy.

2. Private Debt and Surging Real Estate Prices – Potentially more Dangerous than Bubbles on the Financial Market

The 2008 crisis shook the consensus of the 1990s-2000s for several reasons. Not only did the post-crisis “cleaning” not really work, but the losses associated with the financial crisis were significant and lasting. It is also clear that the financial crisis was not a random event: it was preceded by a boom in the property market, a general rise in indebtedness, and the large-scale use of securitization, leading to the accumulation of systemic risks in the financial sector. All this took place in a low interest rate environment as central banks, including the Federal Reserve, were working to limit the negative effects of the burst *dot.com bubble*.

2.1. Better describing past financial crises

One focus of post-2008 empirical research has been on better describing past financial crises and developments in financial markets, indebtedness and the economy before, during and after the financial crises. An article by Schularick and Taylor (2012) focused on the outbreaks of financial crises in 14 economies (now developed) that took place from 1870 to 2008. It provides a wealth of information about financial crises that simply cannot be summarized here. With respect to the issue of the role of monetary policy before and / or after financial booms, their main conclusions were: (a) central banks were more inclined after the Second World War to intervene following financial crises so that the post-crisis period less often resulted in deflation (negative inflation) and a tightening of credit in the economy, but (b) the post-war crises were nevertheless more costly in terms of activity

2. The interested reader should consult Hamilton (1987).

and unemployment. They also note (c) that the credit growth pace is a good predictor of the imminence of a financial crisis, and that the probability of a financial crisis is greater when debt levels are high. Finally, Schularik and Taylor conclude (d) that a rise in the price of financial assets in the pre-crisis years does not really improve the ability to predict the coming of a financial crisis. Financial crises are therefore more episodes of credit booms going bad rather than episodes of runaway financial markets alone, a hypothesis that has been advanced before³ but which is difficult to validate empirically for developed countries due to the relative rarity of financial crises. Expanding on this work using long historical data, Jorda, Schularick, and Taylor (2013) showed that the severity of a crisis is linked to the expansion of credit in the pre-crisis period, which had already been shown by Cerra and Saxena (2008) and Reinhart and Rogoff (2009).

These empirical studies, which are very useful for understanding the genesis and consequences of crises, also provide orders of magnitude for quantifying the macroeconomic gains associated with financial stability. Above all, they help to rethink the hierarchy of effects: it is the surge in credit to individuals (in particular household debt) that, in the past, has been the main trigger of financial crises. Spectacular as they are, record levels reached by the stock market indices and the bursting of the bubbles that sometimes follow them are far from being as devastating.

2.2. The credit accelerator and risk-taking: two explosive ingredients when interest rates are low

How can credit surges be explained? How do they arise? For credit to have a potentially destabilizing effect on the economy, there must be some imperfection that keeps the credit market from functioning optimally. In frictionless economies, an increase in credit reflects an improvement in fundamentals and is not destabilizing: monetary policy does not have any interest in countering the growth of credit (nor does any other policy). But in economies where frictions and imperfections exist, agents' behaviour can give rise to financial vulnerabilities. In these contexts, monetary and macroprudential policies can be useful if they manage to limit risky behaviour and, as a result, the likelihood and severity of crises.

3. Cf. Minsky (1977), Kindelberger (1978), Reinhart and Rogoff (2009).

The first models used to measure the impact of monetary policy on credit and the opportunity to limit a surge in asset prices were based on the credit accelerator (Bernanke, Gertler, 2001), a consequence of imperfect information. More recently, the question of the desirability of pro-active policies has been studied in models that also incorporate banks' risk-taking behaviour arising from banks' limited liability (which limits shareholder losses) and/or deposit insurance (which limits bank depositors' losses).

The credit accelerator

Information is not perfect in the credit market: lenders are never certain that borrowers will pay them back, and collecting information on potential borrowers is expensive. To avoid some or all of these costs, banks may decide to grant loans on the basis of borrowers' wealth, with the idea that this wealth offers them guarantees of repayment (possibly in the form of explicit collateral in the loan contract). A fall in interest rates that increases (almost mechanically) the price of financial and real estate assets increases the borrowers' nominal wealth, with the banks then even more inclined to lend to them. This effect adds to the usual channels of monetary policy and amplifies it. When interest rates are low, not only do investment projects appear more profitable (interest rate channel) and agents feel richer (wealth effect) but also borrowers appear less risky to lenders who in turn reduce risk premiums. These transmission channels add-up to facilitate more debt, and hence the effect of the credit accelerator (Bernanke, Gertler, 2001). Numerous empirical studies have shown that agents who are initially financially constrained (that is, who do not manage to incur as much debt as they wish) are able to increase their debt level as a result of a shock to the value of their collateral⁴, thus lending credence to the credit accelerator hypothesis.

The risk-taking channel

Even before the outbreak of the 2008 crisis, Rajan (2005) and Borio and Zhu (2008) had pointed out the accumulation of risk in the financial system. In their wake, several authors have studied the link between the monetary policy stance and the risk-taking of banks and other investors. At least two reasons for their risky behaviour can be

4. See for example Almeida *et al.* (2006) and Lamont, Stein (1999) for households and Gan (2007) and Chaney *et al.* (2012) for firms.

traced to the activity of the banks and the environment in which they operate: first, their limited liability (common to all joint stock companies), which limits losses incurred by shareholders in the event of bankruptcies; and second, deposit insurance for clients in the event of their bank's bankruptcy. A protracted low interest episode exacerbates risk-taking. Banks are seeking yields, which encourages them (given the size of their balance sheet) to buy riskier assets (Rajan, 2005; Dell'Ariccia *et al.*, 2014). Jimenez *et al.* (2012) used a sample of Spanish banks to show that the search for yield is more apparent in less capitalized banks: the most vulnerable banks are those that take the greatest risk. In addition, when interest rates are low, banks tend to borrow to buy higher-risk assets (Adrian and Shin, 2009). Risk-taking can also be seen on the financing side: low interest rates increase the incentive for banks to engage in short-term financing (Stein, 2013) rather than long-term, heightening their exposure to sudden changes in financing conditions. In fact, Adrian and Shin (2010) showed that an increase in the Federal Reserve's monetary policy rate is associated with a decrease in short-term financing. Long periods of low interest rates thus leave banks more vulnerable to shocks: their balance sheets are both larger and riskier.

3. Macroprudential Tools

The destabilizing potential of finance was illustrated by the financial crisis of 2008. The question then arises of the tools available to the regulator and / or the central banks to contain this destabilizing potential without eliminating the positive effects of access to credit (and savings) for individuals and the economy as a whole. The first type of instrument is the prudential supervision and regulation of financial firms, including banks and insurance companies. This regulatory power can act on individual banks (microprudential regulation) or on the financial system as a whole (macroprudential regulation). Macroprudential regulation sets out stricter rules for the financial actors most likely to threaten the stability of the system (agents referred to as "systemic", usually the largest, and easy to spot) and/or modulates the rules according to the financial cycle so as to limit the risks of credit booms (which we have seen increase the likelihood of a financial crisis) and reduce the possibility that a single entity's difficulties will spread contagion throughout the financial system.

3.1. Powers and limits of macroprudential tools

If macroprudential tools were perfectly effective in limiting credit booms and asset price bubbles, there would be no question regarding the role of monetary policy in dealing with excess credit and these bubbles. It would then come down to macroprudential policy, which has sufficiently granular instruments to target a given market, institution or behaviour, and deal with the financial cycle and any glaring imbalances in specific markets, while monetary policy could concentrate on price stability, or even on reducing unemployment to a level compatible with price stability.⁵ The empirical evidence available today, however, is not reassuring that macroprudential tools are fully effective.

Macroprudential instruments seem capable of reducing the debt cycle

The importance attached to financial stability since 2008 has led to a growing interest in studying the effectiveness of macroprudential policies. Even before the outbreak of the crisis, Borio and Shin (2007) studied the implementation of prudential measures to limit credit growth and rising real estate prices in some fifteen countries. Based on a study of events, they found that these measures reduce credit growth and property prices rapidly after they are introduced. On a broader panel of 49 developed and emerging economies observed from 1990 to 2011, Lim *et al.* (2011) identified 53 episodes of the use of at least one macroprudential tool. Only nine countries in the sample did not use any macroprudential tool over the period. They concluded that a number of macroprudential instruments are effective in terms of their ability to reduce the pro-cyclicality of credit, regardless of the country's exchange rate regime or the size of its financial sector. This is the case of limits on debt relative either to the value of the property it finances, the Loan to Value Ratio (LTV), or to income, the Loan to Income Ratio (LTI), banks' reserve requirement ratio, counter-cyclical capital requirements and dynamic provisioning (provisions grow more than proportionally to assets). On an even more extensive database in terms of both the number of countries (57) and years (from 1980 to 2011), Kuttner and Shin (2016) showed that the Debt Service to Income ratio (DSTI) is the most universally effective instrument for reducing the rise in mortgages. On the other hand, this tool does not seem to have any effect on the dynamics of real estate prices, which tend to respond

5. Collard, F., Dellas, H., Bida, B. and Loisel O. (2017) propose a macroeconomic model that illustrates this divide between monetary policy and macroprudential policy.

instead to the taxation of real estate property. These results are consistent with what has been estimated for Hong Kong (He, 2014) and in emerging economies (Jacome and Mitra, 2015) where the use of LTV limits succeeded in containing household debt but had a limited impact on the rise in real estate prices, which are held down instead by higher transaction taxes.

It is worth noting the coarse nature of these impact assessments, which do not shed much light on the appropriate mix of macroprudential instruments. In most impact studies, policies are represented by discrete variables (e.g. 0 if no action is taken, +1 if the macroprudential tool is introduced or its intensity increased, and -1 if the use of the macroprudential tool is relaxed, as is the case in the analysis of Kuttner and Shin, 2016), with the intensity of the macroprudential measure itself not being taken into account.

Fewer empirical results for the impact of macroprudential measures on the risks taken by banks

Claessens *et al.* (2013) analysed the use of macroprudential policies aimed at reducing vulnerabilities in banks. From a sample of 2,300 banks observed over the period 2000-2010, they concluded that debt limits (LTV and DSTI) are effective in reducing the banks' debt ratio and the growth of their debt in boom periods. Once again, the variable representing the use of the macroprudential tool is binary (0 or 1) and does not take into account the intensity with which the macroprudential policy is applied.

The use of macroprudential tools seems to have limits

One limitation on the use of macroprudential tools is probably the difficulty in using them. Direct intervention in specific markets can have a high political cost, especially when it affects specific interest groups. The limits on household debt (limits on LTV ratios, DTIs or DSTIs) that do appear effective when they are used are also largely unpopular, especially as they are likely to affect the poorest households more.

There is also a risk that macroprudential tools, which act through the imposition of rules, might be circumvented by regulatory trade-offs and/or creative financial engineering (Aiyar *et al.*, 2012; Jeanne and Korinek, 2014), especially when policies are not coordinated at the international level. This is the argument made by advocates of the use of monetary policy rather than macroprudential tools for ensuring

financial stability, whose ranks include Borio and Drehmann (2009), Cecchetti and Kohler (2012), and Stein (2014). For these authors, since the interest rate is a universal price, it hits regulated sectors and non-regulated sectors alike.

4. Monetary Policy: Last Rampart Against Runaway Credit and Asset Prices?

Can monetary policy play a role in promoting financial stability when macroprudential policy alone is not enough?

Cost-benefit analysis of pro-active policies (leaning against the wind)

In several articles and blog posts, Svensson has presented a cost-benefit analysis of monetary policies. The set of arguments is summarized in Svensson (2016) and illustrated in an easy-to-use calculation file.⁶ Using this approach, four elements come into play in determining whether pro-active monetary policies are worthwhile:

- the extent of the tightening needed to curb indebtedness;
- the short-term macroeconomic cost of a rise in interest rates;
- the extent of the recession in the event of a financial crisis;
- the link between rising debt and the likelihood of a future financial crisis.

To quantify the first two elements, Svensson uses the results of the model developed by Sweden's central bank (where he was Governor from 2007 to 2013) to measure the effects of monetary policy. The results of the empirical study by Schularick and Taylor (2012) are used to quantify the last two elements above. Using these parameters, the cost (in terms of unemployment) of a pro-active policy appears much higher than that of a reactive policy. This is partly because it is very difficult for monetary policy to reduce the likelihood of a financial crisis: a 100 basis point increase in the short-term interest rate reduces the probability of a crisis by 0.02% per quarter. Similar simulations by the IMF (2015) show that even if the impact of a monetary tightening on the probability of crisis is multiplied by 15 (to 0.3% per quarter), pro-active policies are still overshadowed by reactive policies when the short-term costs to economic activity of the interest rate hike are taken

6. <http://larseosvensson.se/files/papers/svensson-simple-example-of-cost-benefit-analysis-of-leaning-against-the-wind-v3x.xlsx>

into account. However, as Adrian and Liang (2016) have pointed out, the assumption that the magnitude of the crisis is independent of the level of debt when the crisis erupts is crucial to this outcome. But this hypothesis is contrary to the empirical evidence put forward by Jorda, Schularick and Taylor (2013), for whom the magnitude of financial imbalances (in this case household debt) before the crisis increases not only the likelihood of the crisis but also its magnitude (in terms of a reduction in activity and in growth in the post-crisis years).

Full-fledged macroeconomic models for evaluating the role of monetary policy in the face of an asset price boom

The cost-benefit approach outlined above has the merit of being clear and instructive. It does not, however, describe monetary policy choices throughout the cycle (and not just at a given point in time, as in Svensson's approach). Full-fledged inter-temporal dynamic models can identify the contribution of policies (monetary, macroprudential) to the functioning of the economy. As mentioned above, these models must incorporate the elements that give rise to credit surges if they want to describe the financial cycles.

Bernanke and Gertler (2001) were the first to look at the effects of a monetary policy targeting asset prices. In a model incorporating a financial accelerator, they concluded that a monetary policy rule that merely responds to inflation and economic activity prevails over (from the point of view of the stabilization of inflation and activity) a rule that also includes the price of financial assets. However, this approach does not take into account the risk-taking behaviour of financial players, an element that seems to have been a major factor in the origin of the 2008 crisis.

Research has thus been developed around models that integrate the risk-taking behaviour of banks as well as the possibility of a shift of the economy towards a state of crisis. In these models, the assumption is that the likelihood of a crisis depends on a financial variable, such as the debt ratio for Woodford (2012) or the growth in credit for Ajello *et al.* (2016): the shift to a financial crisis is never certain, and a drift in the financial variable does not necessarily lead to a financial crisis. Sufficiently strong or repeated shocks to agents' debt may, however, lead the central bank to opt for a pro-active policy, despite the short-term cost of this policy. For example, in a "neo-Keynesian" model with three equations (an "IS" equation, a dynamic supply equation, and a debt

accumulation equation), Woodford (2012) showed that the optimal monetary policy rule takes into account not only inflation and the output gap (as is usually the case) but also an indicator of financial imbalances (the debt ratio). The simulations proposed by Ajello *et al.* (2016) showed that the tightening of monetary policy will in any case be very small, around 10 basis points, unless we assume that policy makers take into account the uncertainty surrounding the effects of the tighter conditions on financial variables. In a DSGE model, Gourio *et al.* (2016) also identified instances where monetary policy may have an interest in acting preventively to avoid the build-up of financial imbalances and reduce the likelihood and magnitude of the crisis, a result that they attribute in part to the fact that crises can have permanent effects on the economy. Nevertheless, in these three studies, the conditions for using of monetary policy to reduce the probability of a financial crisis or the damage it would cause are rarely met.

5. Conclusion

The desire to understand the events that led to the 2008 crisis and avoid a new financial crisis have given rise to theoretical and empirical research on “financial macroeconomics”. This research has already clarified several points. The first is that credit booms are dangerous for financial stability, far more so than stock market bubbles. These credit booms come from imperfections in the financial markets, in particular the excessive risk-taking of certain financial agents, notably the banks. Macroprudential policies, which are aimed precisely at ensuring that financial agents don't take too much risk, seem to be effective in fighting credit booms. Despite this, it is likely that they cannot guarantee complete financial stability: not only can the implementation of macroprudential measures be costly politically, but they may be circumvented either by financial innovations or by the behaviour of economic actors that are not covered by the regulator. Given this situation, can monetary policy offer a second line of defence? The representations of the economy that we have today identify the relatively rare conditions in which the use of monetary policy would be recommended to fight dangerous credit run-ups.

Research needs to make further progress. We have only qualitative knowledge about certain crucial phenomena: our understanding of the scale of the banks' risk-taking channel is poor, we don't have good measures of the effectiveness of macroprudential tools, nor are we

able to assess very well the capacity of rate rises to curb private indebtedness. These are empirical issues that, for the most part, need to be investigated using individual bank data. Central banks have this data. They are gradually allowing access to academic researchers (and not just their own researchers). New work should shed light on the key points.

In addition to these micro-economic questions about the behaviour of banks, there are macroeconomic issues that also condition the relevance and effectiveness of the interventions by macroprudential authorities and central banks: we are still uncertain about the long-term damage (loss in terms of growth) caused by a major financial crisis; and there are not good measures of the link between the level of private agent debt and the probability of a crisis occurring. Researchers have begun to look at these questions, but it is illusory to believe that they will dispel the uncertainties completely.

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