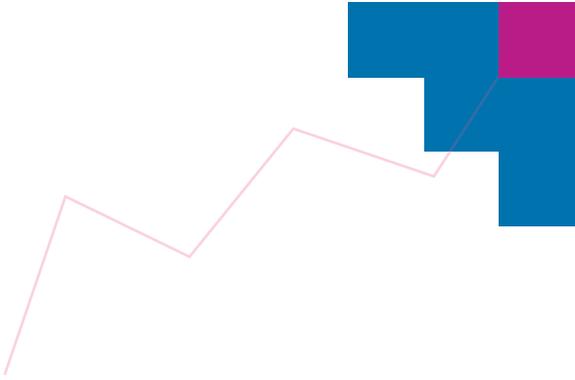


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Price stability and financial imbalances: rethinking the macrofinancial framework after the 2007-8 financial crisis

■ Fabio S. Panzera

FACULTÉ DES SCIENCES ÉCONOMIQUES ET SOCIALES
WIRTSCHAFTS- UND SOZIALWISSENSCHAFTLICHE FAKULTÄT
UNIVERSITÉ DE FRIBOURG | UNIVERSITÄT FREIBURG

Price stability and financial imbalances: rethinking the macrofinancial framework after the 2007-8 financial crisis

Fabio S. Panzera

Macroeconomics and Monetary Economics,
Department of Economics,
University of Fribourg,
Boulevard de Pérolles 90,
CH-1700 Fribourg, Switzerland
Phone: +41.26.300.8244
Fax: +41.26.300.9678
E-mail: fabio.panzera@unifr.ch

Abstract: During the two decades preceding the 2007-8 financial crisis, both advanced and emerging market economies experienced larger credit growth and asset price fluctuations than in the more distant past. These phenomena were largely due to the establishment of credible inflation targeting regimes, whose excessive focus on medium-run price stability bred unsustainable credit and asset price dynamics, to the detriment of financial stability over longer time horizons. As the financial crisis spread to the whole economy in the late 2008, many economists came to believe that monetary policy should actively lean against financial imbalances – thus challenging the canonical New Keynesian paradigm. This paper reviews the relevance of that paradigm in light of the recent financial crisis, arguing that the whole macrofinancial stability framework, rather than monetary policy *per se*, needs to be considered anew. In particular, some macro-prudential tools and a counter-cyclical tax on private debt could be useful instruments to counter overly credit expansion and, accordingly, smooth asset price fluctuations.

Keywords: inflation targeting, New Keynesian consensus, financial imbalances, macro-prudential regulation, counter-cyclical tax on debt.

JEL classification codes: E32, E58, G01, G18

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1 Introduction¹

“There is no means of avoiding the final collapse of a boom brought about by credit expansion. The alternative is only whether the crisis should come sooner as the result of a voluntary abandonment of further credit expansion, or later as a final and total catastrophe of the currency system involved.”

(Ludwig von Mises, 1949, p. 570)

If there is one thing that, over time, turned out to be indisputable is that a market-based economic system, beyond enhancing economic growth and standards of living around the world, has historically been subject to speculative bubbles, i.e., rising asset prices generating overly high expectations of further price rises, which are not warranted by fundamental factors. Starting from the late 1970s, credit and asset price fluctuations have grown in amplitude, becoming the major drivers of business cycles in both advanced and emerging market economies. These fluctuations have been further accelerated by the progressive adoption by many central banks around the world of a new framework for monetary policy – inflation targeting as from the end of the 1980s. By considering medium-run price stability as the overriding goal of monetary policy, inflation targeting regimes have come to neglect (or rather, have supported the formation of) financial imbalances on credit and asset markets, whose build-up occurred alongside price stability, as measured on the market for produced goods and services. In other words, inflation targeting central banks have become victims of their own success, insofar as the credibility they earned by taming inflationary pressures was obtained to the detriment of financial stability over longer time horizons. Accordingly, up to the 2007-8 financial crisis, a low and stable inflation rate coexisted with highly procyclical credit and asset price developments. Against this background, price stability was identified by the dominant New Keynesian paradigm as a necessary and sufficient precondition in the quest of preserving financial stability.

The severity with which the 2007-8 financial crisis spread to the whole economy towards the end of 2008 reopened the time-honored debate about whether monetary policy should actively lean against emerging financial imbalances, so as to counteract the excessive optimism prevailing on credit and asset markets during economic booms and reduce the probability (and the severity) of a potential crisis. After the financial crisis exploded in 2007, a growing number of economists (see, among others, Kohn, 2008; Yellen, 2009) within the academia revised their ideological commitments and challenged the canonical New Keynesian monetary paradigm – embracing the belief that monetary policy could and should be used to prevent overly credit growth and soaring asset prices. In this paper, we argue that the main policy instrument now at the disposal of central banks, the short-run interest rate, remains an unavailing tool to deal with system-wide financial imbalances – not least owing to welfare losses arising from the sharp policy tightening needed to counteract credit and asset price dynamics.

¹ We would like to thank Sergio Rossi for his comments and suggestions; all remaining errors are our own.

Nonetheless, the apparent bluntness of the short-run interest-rate instrument should not relieve central banks of any responsibility in the quest for financial stability. Macro-prudential tools are, against this background, better suited to address unsustainable credit dynamics, whose build-up lies at the heart of excessive asset swings and financial crises eventually. In addition, a counter-cyclical tax on debt addressing overall credit growth properly could complete the deficiencies of macro-prudential regulation.

The next section discusses the evolution and the rationale underlying the establishment of inflation-targeting regimes in advanced and emerging market economies, arguing that the achievement of a low and stable inflation rate is necessary but insufficient today to achieve financial stability. In light of the 2007-8 financial crisis, section 3 reviews the arguments underpinning the debate on whether central banks should react or not to unsustainable credit dynamics and/or misaligned asset prices. Section 4 offers policy considerations, arguing that the central banks' toolkit should be complemented by a number of macro-prudential tools. Additionally, a counter-cyclical tax on debt that internalises the negative externalities propelled by excessive debt expansion during periods of economic stability should be implemented. Section 5 concludes briefly.

2 Inflation targeting and the 'paradox of credibility'

In the late 1960s, but increasingly in the 1970s, major industrial economies were plagued with the spectre of high and variable rates of inflation, often reaching the double-digit mark. Besides the 1973-4 and 1979-80 oil shocks, inflationary pressures in industrial economies were caused by a misconception of the nature and the role of money in spawning inflation dynamics. Consistently with Keynesian philosophy, policy makers in industrial economies pursued activist monetary policies (so-called 'stop-go') aimed at keeping output growth close to its full employment level. The belief in the existence of a permanent, stable long-run trade-off between inflation and unemployment (known as Phillips curve) allowed monetary authorities to actively manage aggregate demand to attain a lower rate of unemployment, in exchange for a lower rate of inflation (Bernanke et al., 2001, p. 11). With the benefit of hindsight, the excessive activism of monetary authorities in an attempt to curb short-run economic fluctuations proved to be disastrous for macroeconomic stability, generating serious inflationary outbreaks. By then, as Borio and White (2004, p. 1) point out correctly in this regard, inflation has been "the great villain" for much of the post-war period.

The positive side of these macroeconomic failures was the emergence of consciousness that such policy mistakes should not be repeated in the future (Issing, 2008). In the late 1970s, a growing number of economists recognised the potential costs of inflation in terms of economic growth, acknowledging at the same time the various benefits of preserving price stability. These theoretical developments underpinned the incredible disinflationary process implemented in 1979 by Paul Volcker, the then Chairman of the Federal Reserve System. By imposing severe limitations on the growth of monetary and credit aggregates, Volcker brought down US inflation rates and stabilised (and anchored) inflation expectations, thus contributing to a prolonged period of economic

prosperity that lasted until the end of the second millennium. Owing to the success of the US experiment, as well as the gradual demise of monetary targeting regimes,² the late 1980s witnessed a common trend both in advanced and emerging market economies towards the adoption of a new framework for monetary policy, known as inflation targeting.³

As Bernanke and Mishkin (1997), Mishkin (2001/2002), and Arestis and Sawyer (2003) observe, an inflation targeting strategy is characterised by the announcement of medium-run official target ranges for the inflation rate, and by explicitly acknowledging that price stability is the overriding, long-run goal of monetary policy. The key rationale underlying the adoption of inflation targeting dates back to early influential monetarist writings. Indeed, Friedman (1963, p. 17) derives from the quantity theory of money that “inflation is always and everywhere a monetary phenomenon”. Accordingly, no long-run trade-off exists between inflation and unemployment. Albeit not leaving out the possibility that monetary policy may in the short-run affect real variables such as the unemployment rate or the rate of output growth, Friedman (1963) concludes that any expansionary attempt to boost economic growth in the long run will solely impact the inflation rate, leaving the level of economic activity unaffected.

Another rationale underpinning inflation targeting is closely related to the uncertain duration of the lags involved in the monetary policy transmission mechanism. These long and variable lags could make any discretionary attempt to manage aggregate demand doubtful at best, questioning the credibility of the central bank (Friedman, 1960; Palley, 2004). The latter argument is even reinforced to the extent that opportunistic monetary authorities are by nature prone to adopt a short-sighted view on public policy issues – altering monetary policy at their discretion to achieve policy goals (giving rise thereby to the ‘time-inconsistency problem’; see Bernanke et al., 2001). Not surprisingly, Bernanke and Mishkin (1997, p. 104) characterise inflation targeting as a regime that subjugates central banks to “constrained discretion”, that is, constraining their opportunistic behaviour but entrusting them with a somewhat high degree of flexibility to deal with temporary economic shocks.

These powerful arguments supported the nowadays widely-held view that monetary policy should be implemented exclusively to achieve medium-run price stability. Accordingly, over the past twenty years, delivering price stability has been identified as the best contribution that monetary policy could make to overall economic growth and financial stability. The benchmark version of the New Keynesian model (see Clarida et

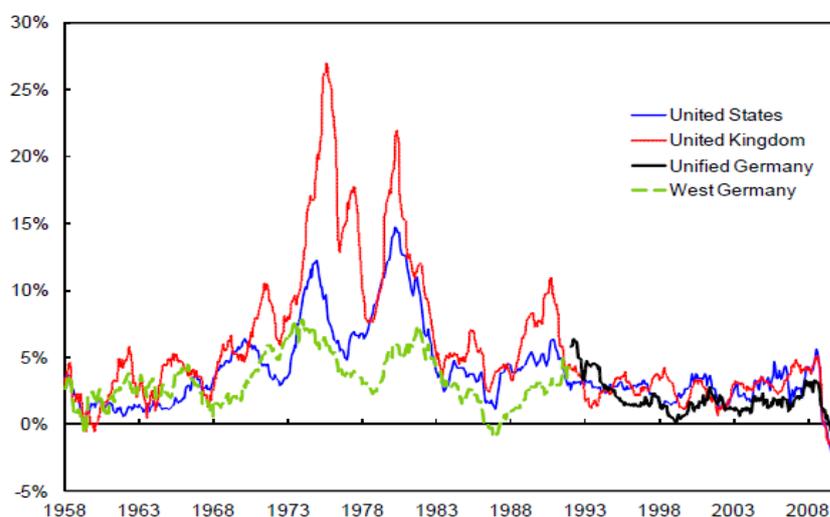
² A monetary targeting strategy targets the growth rate of a chosen monetary aggregate. This strategy was abandoned in the late 1980s, when instability in the demand for money (owing to financial liberalisation and deregulation) broke the statistical relationship between monetary aggregates, output, and inflation (Palley, 2003; Borio and White, 2004). The demise of monetary targeting led many central banks to overlook the evolution of monetary aggregates and their counterparts (above all credit) as an indicator for monetary policy (Issing, 2011). The neglect of money and credit developments is also a peculiarity of the current state-of-the-art in mainstream economics (the New Keynesian model).

³ For the course of our analysis, we do not discriminate between ‘strict’ and ‘flexible’ inflation targeting regimes, the latter designing a monetary policy background against which central banks, alongside promoting price stability, also aim at promoting output growth close to its potential level.

al., 1999) supports this view, showing that those central banks that achieve price stability are simultaneously delivering a zero output gap – a condition identified by the mainstream economic theory as a ‘divine coincidence’ (Blanchard et al., 2010).

The adoption of inflation targeting has allowed both advanced and emerging market economies to achieve low inflation rates (Figure 1). Several authors dub this remarkable decline in the volatility of both inflation and output growth “the Great Moderation” (see Stock and Watson, 2003; Bernanke, 2004). As King (2002) argues, during the Great Moderation inflation rates have been lower, more stable, and less persistent than in the decades before the adoption of inflation targeting.⁴ By the same token, as Figure 2 shows, the 2007-8 financial crisis reversed this downtrend, increasing the volatility of both output growth and inflation rates quite dramatically.

Figure 1 The steady decline of inflation rates in some major advanced market economies from 1958 to 2008

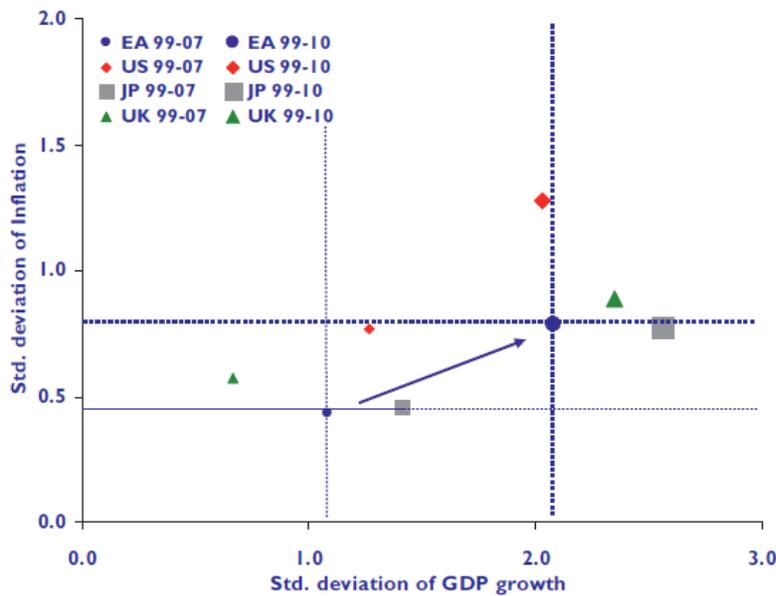


Source: International Monetary Fund (2010, p. 41)

To date, the success of inflation targeting is testified by the fact that, to our knowledge, no country having adopted this regime has ever been forced (or willing) to abandon it. Contrarily, owing to its supposed benefits, inflation targeting has grown in popularity among a large number of emerging market economies, like Brazil or South Korea, whose primary goal has been to stabilise domestic inflation rates in a way not to put productive capital inflows at stake.

⁴ In addition, Rose (2006; 2007) finds evidence that inflation targeting also reduced exchange rate volatility, without impairing capital inflows. Contrastingly, Ball and Sheridan (2003) find no evidence that inflation targeting improved economic performance, as measured by inflation, output, and interest rates.

Figure 2 The shift of the volatility of output growth and inflation from 1999-2007 to 1999-2010



Source: Fahr et al. (2011, p. 50)

In the run-up to the 2007-8 financial crisis, however, inflation targeting regimes have gradually come under increasing criticism, for a number of reasons. First, albeit inflation targeting has undoubtedly contributed to tame inflation, some authors point out that the disinflation process was achieved at a high sacrifice ratio in terms of output and employment losses (see, for instance, DeBelle and Fischer, 1994). Secondly, the question arises as to whether the Great Moderation should be considered as a by-product of the improvement in the conduct of monetary policy (that is, central banks being more averse to inflation), or rather as the benign confluence of exogenous factors, themselves contributing to subdue inflationary pressures. Finally, but in our view the most important shortcoming in light of the 2007-10 episodes of system-wide financial instability, inflation targeting did not prevent (rather abetted) the gradual build-up of financial imbalances, the latter culminating periodically in financial crises, whose macroeconomic costs have been extraordinary high in both advanced and emerging market economies.⁵

The latter shortcoming is based upon the belief that the conjunction of financial liberalisation with a monetary policy solely oriented at stabilising (output and) medium-run inflationary pressures has slightly modified the dynamics of market-based economic systems, amplifying boom and bust cycles on asset markets, as well as the scope for financial imbalances to develop during the expansionary phase of the business cycle

⁵ The term ‘imbalance’ defines here the evolution of a variable over a period of time, which tends progressively to deviate from its long-run trend in a way to jeopardise financial stability as it unwinds (that is, when a ‘mean reversion’ occurs).

(Borio and White, 2004). To put it differently, the decline in the variability of both output growth and inflation rates achieved following the establishment of credible inflation targeting regimes may have lulled policy makers and market participants into a false sense of security, generating overly optimistic assessments about the economic outlook. Against this background, central banks have become victims of their own success, to the extent that their commitment to fight inflation has given rise to the so-called ‘paradox of credibility’ (Borio and Lowe, 2002; Borio and White, 2004). This paradox points out that the pursuit of a credible anti-inflation policy, as has been the case of a growing number of central banks as from the 1990s, is a double-edged sword, insofar as delivering price stability may lead to unwelcome side effects. As enlightened by Borio and White (2004), while on the one hand the hard-won credibility as an inflation fighter helps central banks to better anchor long-term inflation expectations around an implicit or explicit target – allowing them to better neutralise the real effects of an adverse supply shock – on the other hand, a credible price stability-oriented monetary policy might unwittingly mask economic risks and support the formation of unsustainable asset and credit booms, the latter finding fertile ground in an environment of remarkably quiescent inflation rates, as measured on the product market. Then, when the ‘irrational exuberance’ driving up credit growth and asset prices vanishes, financial imbalances unwind in a disruptive manner, increasing both the depth of the financial crisis and the risk of a debt-deflation process eventually.

According to this view (hereinafter referred to as the ‘new environment view’), which gained prominence in the 1980s as financial instability became the main policy challenge, business cycles are an endogenous process⁶ whose key driving forces are swings in the perception of, and appetite for, risk (see Borio et al., 2003; Borio 2005). More precisely, the distinguishing feature of endogenous business cycles is the potential for fluctuations in economic activity to be driven by self-reinforcing financial developments that arise in conjunction with both positive supply shocks and a monetary regime solely hinged on promoting price stability on the market for produced goods and services. If these financial developments are allowed to self-reinforce without being properly counteracted by a reversal of the macroeconomic policy stance – be it through a less accommodative monetary policy or a strengthened macro-prudential framework – they may breed waves of excessive optimism and set off unsustainable asset booms (Crockett, 2003; Borio and White, 2004). This latter argument is even reinforced to the extent that, during economic upturns, unsustainable credit and asset price dynamics may be coupled with price stability, as measured on the market for produced goods and services. If that is the case, the accumulation of financial imbalances is not correctly appraised in the consumer price index (CPI) – the latter index remaining steady low

⁶ While an ‘exogenous’ shock is triggered by a random (stochastic) supply or demand shock that temporarily throws the economy away from its long-run growth path, an ‘endogenous’ shock is a deterministic shock whose origin is rooted in a confluence of financial developments, working together synergistically (in a procyclical way) within the financial sector so as to amplify the business cycle, both in upturns and downturns. For example, loosening credit constraints because of a muted risk perception by both lenders and borrowers increase risk-taking and drive up asset prices, whose growth, in turn, stimulates further credit expansion. See Spehar (2009) for characterisation of endogenous business cycles.

since it includes neither equity nor home prices. Thus, an economy exhibiting a low and stable rate of inflation does not give any information about whether monetary policy is properly conducted and interest rates are set at an appropriate level (Leijonhufvud, 2007). Even worse, as Leijonhufvud (2007, p. 1) points out, a central bank keeping to a CPI inflation target may pursue policies “that are inimical to financial stability over the longer run”.

To sum up, excesses in aggregate demand fueled by the wealth effect induced by soaring asset prices are not immediately mirrored in product (goods and services) inflation, and financial imbalances build-up against the backdrop of stable prices and strong economic activity (Borio and Lowe, 2002). Several factors are likely to explain how financial imbalances on credit and asset markets coexist with an environment of subdued inflation trends.

- First, structural factors, such as financial and technological innovation or enhanced productivity growth, contribute to dampen inflationary pressures in the product market. Expecting inflation rates to decrease, a central bank may be prone to cut its policy rate of interest, thus breeding waves of optimism in credit and asset markets (Bini Smaghi, 2009; Papademos, 2009).
- Secondly, an economic boom may temporarily reduce labour costs and boost business profits, insofar as nominal wages are sticky in the short run and may lag the increase in labour productivity. This allows firms to pursue aggressive pricing strategies, hence subduing inflationary pressures (Borio et al., 2003).
- Thirdly, insofar as the credibility of monetary authorities in ensuring price stability hinges inflation expectations, workers are less likely to adjust their nominal wages pretensions upwards. This attenuates the risk of a dangerous self-feeding upward spiral between wages and prices. Thus, the belief that inflation no longer represents a threat could accelerate the build up of financial imbalances, to the extent that the perspective of a recession induced by a monetary tightening is removed (Borio and White, 2004). As neatly explained by Crockett (2003), price stability pushes market participants to believe in never-ending economic growth, insofar as the quasi-absence of any inflationary pressures is interpreted as a sign that monetary policy will remain accommodative indefinitely. Consequently, both market participants and financial institutions could be prompted to construct high-risky portfolios and resort to excessive leverage, accepting balance-sheet structures that, over time, become highly vulnerable to financial market disturbances, since the ability to serve the liabilities borne by the debt eventually relies on the stability of income streams and/or the expectation that assets could be sold at a higher price in the future.⁷ In this regard, inflation targeting is deemed to be an insufficient guide for monetary policy, insofar as balance-sheet disorders that build up without any immediate

⁷ Minsky (1982) explains the dynamic whereby a sudden reversal in the interest rate structure (or an income shock) reveals the fragility of the financial system after a prolonged economic boom.

impact on inflation rates are likely to be overlooked if inflation is the sole target or indicator of monetary policy (Palley, 2003; Gnos and Rochon, 2006).⁸

For all the aforementioned reasons, a low and stable inflation rate on the product market could mask rising vulnerabilities within the financial system and give the illusion of a strong and stable economic system, lessening market discipline and lulling policy makers into inaction. This ‘inertia’ in the policy-making decision process could be reflected, for instance, in interest rates being kept too low for too long – central banks abetting the build-up of financial imbalances that sow the seeds of their own destruction further ahead. Against the backdrop of low interest rates, the subprime crisis exemplifies the potential danger to financial stability induced by an excessively loose monetary policy, insofar as the crisis can be interpreted as the unravelling of financial imbalances that silently accumulated during an extended period of artificially low policy rates.

To sum up, two points are worth underlining at this juncture. First, against the background of the ‘new environment view’, assessing the stance of monetary policy solely in terms of inflation forecasts is both insufficient and misleading, to the extent that it may offer a picture of the broader economy which is by far more complacent than what is revealed by economic fundamentals. This is even truer insofar as an environment characterized by a prevalence of positive supply-side shocks is conducive to low inflation rates. Then, a central bank excessively sensitive and averse to disinflation may itself be a source of instability, insofar as policy forbearance *vis-à-vis* disinflationary forces fuels financial exuberance, leading in turn to financial imbalances (Issing, 2011). This point is even more compelling as the evidence indicates that credit and asset booms tend to develop against the background of disinflation. Likewise, inflationary pressures do not pick up systematically prior to financial crisis or lending booms (Borio and White, 2004). Inflation is therefore a lagged indicator of the business cycle (Figure 3).

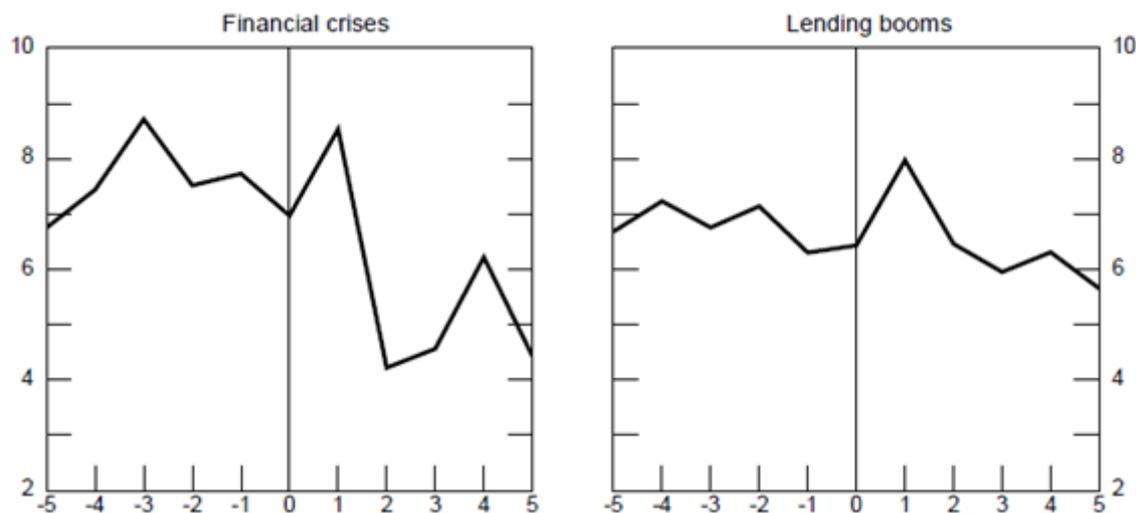
Secondly, a monetary policy framework promoting low and stable inflation rates fails to deliver financial stability as a by-product. In other words, price stability and financial stability are not natural bedfellows.⁹ In this regard, the 2007-8 financial crisis challenged the orthodox, conventional wisdom, which claims that a monetary regime fostering price stability is automatically attaining other policy objectives, such as

⁸ Balance-sheet disorders, that is, the tendency to resort to short-term funding to finance excessive debt positions, may be further exacerbated if market participants perceive monetary policy as being asymmetrical – that is, cushioning the unravelling of financial imbalances in the downturn, but refraining from intervening in a timely way when a credit and/or asset price boom threatens to jeopardise the stability of the financial system as a whole.

⁹ Albeit being extensively used in the literature, the concept of ‘financial stability’ lacks a clear definition yet. For the course of our analysis we follow Crockett’s (2003, p. 1) definition, according to which financial stability reflects a situation where “the capacity of financial institutions and markets to mobilise savings, provide liquidity and allocate investments is maintained unpaired”. Although not fully exhaustive, this definition provides at least the advantage of including both the failure of financial institutions and the appearance of unsustainable credit and asset price dynamics. See also Allen and Wood (2006).

maximum sustainable economic growth and financial stability. As a matter of fact, the conventional wisdom holds that the best contribution that central banks could offer to enhance financial stability is to prevent unanticipated swings in the price level. Ancient research work on this subject matter (Bernanke and Gertler, 1999; 2001) supports this conventional wisdom, arguing that inflation-targeting central banks should not respond directly to asset prices fluctuations, insofar as controlling product inflation stabilises asset prices and reduces the frequency of asset price booms.

Figure 3 Inflation rate dynamics around financial crises and lending booms



Source: Borio and Lowe (2002, p. 19)

Note: the year of the financial crisis is indicated with 0.

Nonetheless, in an environment characterised by financially-driven business cycles (consistently with the ideological foundation of the ‘new environment view’), financial instability is not so much the result of an unanticipated decline in the price level, as measured on the market for produced goods and services, as rather the consequence of a decline in asset prices, whose unwinding occurs after a prolonged boom in which financial imbalances have been left free to develop (see Borio and Lowe, 2002). Further, if the decline in inflation rates is the result of supply-demand dynamics, the stability of the financial system is not jeopardised unless the decline of inflation rates is accompanied by the unwinding of financial excesses on asset markets. These arguments call for central banks to pay more attention to asset prices in the conduct of monetary policy, to the extent that, against the backdrop of the ‘new environment view’, a monetary policy that keeps inflation rates constant does not necessarily reduce asset price fluctuations.

In sum, this section contends that preserving financial stability today requires greater vigilance against the build-up of financial imbalances during economic booms, at times when central banks foster price stability on the product market. As some economists have contended in the recent past (see, e.g., Cecchetti et al., 2000; 2002), this would be

tantamount to pretend that, when financial imbalances threaten to emerge against the backdrop of economic stability, central banks adopt a somewhat tighter monetary policy stance than merely what would be dictated by the macroeconomic outlook (that is, they should raise short-run policy rates of interest at the cost of deviating temporarily from inflation targets). Then, the success of monetary policy will not be solely measured in terms of achieving medium-run price stability and promoting maximum sustainable output growth, but through the lens of enhancing financial stability additionally. The next section addresses these issues from a central-banking perspective, arguing that, despite the necessity of taking into account financial imbalances, monetary policy is nowadays not coped with the proper tools to deal with unsustainable credit and asset price booms, whose conflagration tests the resilience (and increases the vulnerability) of advanced financial systems with increased regularity.

3 Asset price bubbles and monetary policy

Free-market capitalism has been the most effective means to support economic growth, maximise material well-being, and enhance standards of living around the world. By the same token, the history of market-based economic systems has been marked by periodically collapsing speculative bubbles. Greenspan (2011, p. 16) depicts speculative bubbles as excessive movements in asset prices “driven by the innate human propensity to intermittently swing between euphoria and fear”, whose occurrence has become “increasingly independent” of economic activity. Against this background, the housing bubble that developed and burst in the US mortgage market over the period 1996-2005, in spite of its severity and the high economic costs entailed, was not an isolated phenomenon, as rather the climax of a long list of speculative episodes, whose amplitude has gradually intensified. Looking back over the previous decades, indeed, we observe that, starting from the late 1980s, many advanced and emerging market economies have experienced larger credit and asset price fluctuations than in the more distant past. As argued in the previous section, these fluctuations were to some extent encouraged by the establishment of a credible anti-inflation commitment by central banks merely focused on promoting price stability over the medium to long run, to the detriment of financial stability over longer time horizons.

From a central-banking perspective, the years up to the 2008 global financial crisis were characterised by low and stable worldwide inflation rates, strong economic growth, and narrow credit spreads in a variety of financial markets. Against this background, “managing monetary policy had become an unexpectedly easy task” during the Great Moderation (Gerlach, 2010, p. 1). These golden years of central banking lulled economists into thinking that monetary policy had become more of a science over time – central banks having succeeded in preserving macroeconomic stability in such a way to prevent financial shocks from affecting negatively economic activity. In the United States, this belief was further reinforced by the aftermaths of several episodes of heightened financial distress, such as the 1987 stock market crash, the debacle of the Long Term Capital Management hedge fund or the dotcom bust in 2001. Indeed, in the aftermath of these financial shocks, the prompt intervention of the Federal Reserve in

support of the national financial system effectively restored investors' confidence and the proper functioning of financial markets. By the same token, these successful interventions may have persuaded US policy makers that monetary policy was also well equipped to deal with asset price busts, fostering a policy of 'benign neglect' with respect to asset bubbles (Blanchard et al., 2010).

Major financial crises offer a unique opportunity to redesign the dominant monetary policy paradigm and rethink both the mandates and functions of central banks (Stark, 2011). The 2007-8 financial crisis, beyond representing a hard hit for those policy makers who were fallen into the trap of thinking that monetary policy had become as boring as dentistry, called into question many of the well-established principles that underpinned central banking during the Great Moderation (Mishkin, 2007). Two key insights emerged from the 2007-8 crisis with regard to the working of integrated financial markets and the conduct of monetary policy. First, financial sector developments matter. Albeit their complexity and their 'pretence of knowledge', general equilibrium macroeconomic models used by central banks prior to the onset of the 2007-8 financial crisis largely disregarded financial sector developments, leaving out from their analysis some key financial elements, such as the financial intermediation process or the credit channel, whose disruption turned out to be crucial in amplifying the procyclicality of the financial system after the housing bubble burst on the subprime mortgage market during the second half of 2006.¹⁰

Secondly, asset price bubbles matter. Before the 2008 crisis, central banks were fully aware that the bust of a speculative bubble, to wit, asset prices falling back precipitously to their fundamental values after having climbed to unsustainable high levels, has often been accompanied by a pronounced decline in economic activity (see Kindleberger, 1978). The decline in economic activity is particularly acute at times when the financial accelerator mechanism amplifies the adverse feedback loop between credit and asset prices.¹¹ In this respect, the credit and housing bubbles that developed during the first decade of the third millennium, lying at the heart of the subprime crisis, challenged the conventional wisdom prevailing before that crisis on the relationship between monetary policy and asset prices. Likewise, this crisis reopened the old cleavage between those who believe that, owing to the growing economic costs of asset bubbles, central banks

¹⁰ To be sure, up to the 2006 subprime crisis, financial markets were depicted as a complete, frictionless, and welfare-enhancing means of dispersing risks efficiently throughout the economic system (International Monetary Fund, 2010). The severity of that crisis underscored the necessity to integrate financial frictions and macro-financial linkages in macroeconomic models, in order for monetary policy to better understand the working of the financial system and its relationship with the whole economy. In this respect, even if still in its infancy, a growing literature (see, among others, Curdia and Woodford, 2009; Boissay, 2011; Brunnermeier and Sannikov, 2011; Gertler and Karadi, 2009) tries to incorporate financial sector developments (the 'periphery' of macroeconomics) into dynamic stochastic general equilibrium models (the 'core' of macroeconomics). See Caballero (2010) for analytical elaboration on this subject matter.

¹¹ The self-reinforcing positive feedback loop between credit growth and asset prices is a potential source of systemic risk, insofar as it seriously affects the balance sheets of financial institutions, especially banks. During market downturns, these banks are forced to cut back on lending and to fire-sell their leveraged positions in order to satisfy margin calls (and/or capital requirements). See Panzera and Rossi (2011).

should try to address directly asset price misalignments by tightening monetary policy (the ‘activist’ view), and those who argue that central banks should not consider asset price misalignments in their own monetary policy decisions, except to the extent that misaligned asset prices affect the future path of inflation and output (the ‘conventional’ view). Let us take our analysis a step further, before reviewing the main arguments for and against policies designed to counteract the emergence of speculative bubbles.

To date, a consensus on whether asset bubbles exist has not emerged in the literature. While some economists claim that even the most famous speculative bubble episodes in history can be justified by fundamental factors, the modern view recognises the existence of asset price bubbles, at least implicitly.¹² As a consequence, the key question in the literature is not whether asset bubbles exist or not, but rather whether the latter require or not a proactive monetary policy attitude. To be sure, until the outbreak of the financial turmoil in 2007, the dominant monetary policy consensus was firmly grounded in the New Keynesian paradigm (known as ‘Jackson Hole consensus’). This paradigm states that central banks should respond to asset price misalignments only to the extent that the latter collide with the achievement of the final policy goals, to wit, price stability and sustainable output growth. To state it differently, central banks should not react to misaligned asset prices, unless when the latter affect the outlook for inflation and output over the medium run. This attitude of ‘benign neglect’ with regard to asset bubbles can be interpreted as the corollary of a poor understanding of the forces driving speculative bubbles as well as the grounded belief that financial developments have a limited role to play in the conduct of monetary policy (Kohn, 2006; Bini Smaghi, 2009). Two arguments underpin the aforementioned pre-crisis consensus.

First, according to Greenspan (1999; 2002; 2010), it is very difficult to recognise the existence of a bubble *ex ante* – that is, before its bursting confirms its existence. Likewise, the simple fact for a central bank to recognise the existence of an impending bubble is tantamount to pretend that the judgment of “hundreds of thousands of informed investors” is wrong, casting serious doubts on investor rationality (Greenspan, 1999). Moreover, even if the existence and the ability to timely identify bubbles is ascertained, policy makers may not be able to discern with reasonable confidence between a boom and a bubble. Then, policy makers might erroneously abort an asset boom that, in retrospect, turns out to be warranted by economic fundamentals – inducing thereby undesirable economic fluctuations.¹³

¹² To some extent, this may even seem paradoxical given that central banks are ideologically committed to the notion of efficient markets. This neoclassical myth rules out by definition the existence of bubbles, since rational and well-informed investors would arbitrage away price inefficiencies, that is, any mispricing between the actual and the fundamental value of assets.

¹³ Insofar as equity booms are driven by technological advances, aborting an asset boom that, with the benefit of hindsight, turns out not be harmful, seriously impairs productivity growth (DeLong, 2002). Discerning between an asset boom (justified by fundamentals) and a bubble presupposes the ability to determine the fundamental value of an asset, which is a difficult task. In the run-up to the 2000-6 housing bubble, for instance, many economic models found that home prices were overvalued (Case and Shiller, 2003; Gallin, 2004), while other models concluded that, even at the apex of the real-estate bubble, home prices were justified by fundamentals (McCarthy and Peach, 2005).

Secondly, and by far the most important argument for the course of our analysis, central banks are ill-equipped to lean against the build-up of unsustainable asset booms, insofar as the main monetary policy tool at their disposal, to wit, the short-run interest rate, is too blunt a tool to deal with financial imbalances (Rudebusch, 2005). This argument is even reinforced to the extent that financial imbalances are frequently contained within specific sectors and the interest rate tool cannot be calibrated across them, but impacts the whole economy. Greenspan (2009; 2011) is not acquainted with an episode where monetary policy has successfully deflated a bubble – any historical attempt to prick a bubble having systematically ended in tears. A number of reasons elucidate the ‘bluntness’ of the short-run interest rate tool with respect to asset bubbles.

- First of all, if in the eyes of some influential market participants the buoyancy of asset markets is going to be sustained for a sufficient period of time, they will rationally try to ride the boom as long as possible, trusting in their ability to leave the market early enough before the latter goes in reverse eventually. This amounts to saying that bubbles can persist over a substantial period of time (see Abreu and Brunnermeier, 2003). Likewise, if speculation on asset markets is fed by bank credit, a rise in the key policy rates of interest may not be enough to freeze credit growth – the banking sector accommodating the surge in the demand for credit as the value of collateral rises. Against this background, any restrictive monetary policy will not halt speculation, particularly if the bubble reflects a rational willingness of both investors and banks to take risks. In the worst-case scenario, if the attempt by monetary authorities to curb the bubble turns out to be ineffective, speculation may even increase further, insofar as the belief in rising asset prices self-validates (see Aglietta and Rigot, 2009; Orlean, 2009, for elaboration on perverse dynamics peculiar to asset markets).
- Secondly, the required increase in key policy rates of interest may be so large that it will depress the whole economic activity considerably (Assenmacher-Wesche and Gerlach, 2008). Boivin et al. (2010) show that a central bank relying on an augmented Taylor rule, which responds to credit conditions besides inflation and the output gap, needs a sharp policy interest rate increase to stem an unsustainable credit boom, thereby undershooting both inflation and output growth targets.
- Thirdly, the presence of long lags between changes in monetary policy and changes in macroeconomic conditions complicates the implementation of a timely-calibrated monetary policy response. Should monetary tightening unfold its effects when asset prices have already begun to reverse their course, then the economic downturn is further intensified. Hence, if policy makers recognise too late the danger of an asset price collapse, monetary easing, rather than tightening, is required (Bean et al., 2010).
- Finally, and for the sake of completeness, in an open economy with perfect capital mobility, a short-run interest rate hike implemented to resist asset price inflation may be counterproductive, to the extent that a higher interest rate feeds a wave of capital inflows, part of which could finance speculative transactions.

Against this background, owing to the difficulty of leaning against presumed asset bubbles, Greenspan (1999) and Bernanke (2002) contend that monetary policy should be solely implemented in a manner to clean up the mess after the bubble has burst.¹⁴ The strategy of ‘mopping up’ after the bursting of a bubble requires central banks to loosen the monetary policy stance and provide ample liquidity to the financial sector, at times when the unwinding of financial imbalances threatens to depress aggregate demand and adds undesired deflationary risks.

Having analysed the most compelling arguments in support of the dominant pre-crisis paradigm, there seems to be very little room for a more active role of monetary policy in pricking asset bubbles. Nonetheless, the severity with which the 2007-8 financial crisis spread to the whole economy in 2008, paralysing economic activity all around major developed economies, swung the ideological climate with respect to asset bubbles back towards a more pragmatic approach. Within academic circles, many economists that were heretofore persuaded that monetary policy was too blunt a tool to lean against the build-up of financial imbalances recanted their ideological positions after the bankruptcy of Lehman Brothers in the fall of 2008, which drag many advanced economies on the brink of a severe credit crunch (see Kohn, 2006; 2008; and Yellen, 2005; 2009, for some notable ideological swings). These economists recognise that, in some cases at least,¹⁵ pricking an incipient asset bubble through an optimal ‘leaning against the wind’ (hereinafter referred to as LATW) policy is the optimal solution.

The most exhaustive definition of a LATW policy has been advanced by Trichet (2005). He describes it as the propensity of central banks “to cautiously raise interest rates even beyond the level necessary to maintain price stability over the short to medium-term when a potentially detrimental asset price boom is identified”. Accordingly, the rationale underlying LATW policies is the benefit of trading a reduction of economic growth today off against the prospect of enhanced financial stability in a more distant future. Specifically, a central bank facing the threat of emerging imbalances on credit and/or asset markets should raise the policy-controlled short-run interest rate over and beyond the level dictated by a Taylor rule that simply aims at stabilising inflation and the output gap on a medium-run horizon. This ‘extra action’ should act as a pre-emptive insurance policy that contains the build-up of financial imbalances in good times and avoids potentially larger economic costs at some point in the future, when financial excesses unravel (Lowe, 2005). This suggests that, while in most cases price stability

¹⁴ This asymmetrical risk management approach to asset price bubbles arises from two distinctive features of the New Keynesian monetary policy paradigm, that is, the disregard for monetary and financial developments as well as the underestimation of low-probability tail events (the ‘black swans’). In this respect, the 2007-8 financial crisis exemplified that, while ‘black swans’ remain unlikely events, their seldom occurrence is likely to jeopardise the stability of the whole economic system in a disruptive manner, well beyond the level foreseen by macroeconomic models.

¹⁵ Mishkin (2009) divides asset bubbles in two classes, namely, credit driven bubbles (such as the 2000-6 housing bubble in the United States) and irrational bubbles (like the dotcom bubble). According to the same author, the former bubbles deserve special attention by monetary authorities, insofar as they imply an easing of lending standards and involve a greater use of leverage.

fosters financial stability, in certain circumstances a potential short-run trade-off between the two main monetary policy goals (price stability and output growth) and financial stability exists.¹⁶ To put it differently, the fundamental problem faced by inflation-targeting central banks is how they should behave when inflation forecasts show downside risks to price stability, while at the same time excessive credit growth threatens to fuel unsustainable asset price dynamics, thereby jeopardizing financial stability in the near future.

After the 2007-8 global financial crisis, a number of arguments have been pointed out to rationalise the necessity to lean against financial imbalances. In this regard, the proponents of the 'activist' view argue that monetary policy would have been a powerful weapon to restrain the US housing bubble in the years preceding the financial crisis. Likewise, if central banks had taken the signals coming from strong monetary and credit growth more seriously, monetary policy might have better contained the build-up of these financial imbalances that ultimately led to the financial crisis (Bini Smaghi, 2010). Let us now turn to these arguments.

- First, as regards the 1996-2006 real-estate cycle in the US mortgage market, Taylor (2007) argues that higher short-run interest rates could have slowed the demand for housing and moderated the appreciation of home prices eventually. Adrian and Shin (2009) point out that a tighter monetary policy might have affected the process of balance-sheet expansion, slowing leverage and credit growth. Further, owing to the high sensitiveness of leverage and maturity mismatches to small changes in the yield curve, the two authors conclude that the profitability of off-balance-sheet structures would have been strongly weakened if monetary policy was less accommodative (Adrian and Shin, 2008). Likewise, Loisel et al. (2010) show that if central banks tighten monetary policy in the early stage of a boom, they likely break those forms of herding behaviour that are conducive to asset price bubbles. Other recent works (see, for instance, Hoerova et al., 2009) focus on the central banks' communication strategy, arguing that a monetary policy which optimally complements risk warnings by a series of small steps of interest rate hikes in the boom phase helps cooling down asset prices.
- Secondly, rising pre-emptively interest rates during economic upswings provides central banks with more flexibility and room for manoeuvre to offset the disruptive effects of an adverse shock. On the one hand, this should mitigate the magnitude of the economic contraction and enables the economy a 'soft landing' once the bubble has begun to dissipate. On the other hand, a pre-emptive increase in key policy rates of interest reduces the likelihood that the economy falls into a deflationary trap, by averting monetary policy from being overwhelmed by the zero lower bound (ZLB) binding constraint, which limits its scope and puts its efficacy at stake.

¹⁶ De Graeve et al. (2008) provide evidence in favour of the existence of a short-run trade-off between price and financial stability, insofar as a monetary policy tightening increases the average probability of financial distress of banks. See also Fan and White (2002) for evidence of a trade-off between output growth and financial stability, owing to the US personal bankruptcy system.

- Thirdly, a LATW policy that responds symmetrically to financial imbalances, during both upturns and downturns, eliminates the moral-hazard problem (often characterised as ‘Greenspan put’) that arises when central banks are expected to intervene solely in the aftermath of a bubble to protect financial markets from the unravelling of imbalances. Further, a symmetrical monetary-policy approach allows central banks to keep higher interest rates in the growth phase of the business cycle, thus discouraging excessive risk-taking.¹⁷ As Giavazzi and Giovannini (2010) cogently argue in this regard, an asymmetrical monetary policy, which does not increase interest rates during economic upturns, to wit, at times when financial fragility is building up disguised by economic stability, might unwittingly create larger imbalances further ahead and push the economy into a low-interest-rate trap. Then, an environment of systematically downward-biased interest rates leads to the pursuit of risky strategies and increases the likelihood of financial crises, whose occurrence requires in turn low interest rates to keep the fragile financial system alive.¹⁸
- Fourthly, although it is widely accepted that the central bank must show flexibility when acting as a lender of last resort during a financial crisis – supporting price stability and financial stability at the same time – the cost of cleaning up financial excesses has increased notably over time. This cost is even high, as the economy has been long stuck in a low-interest-rate’s equilibrium.

Yet, having analyzed the arguments underpinning a more active role of monetary policy in macroeconomic stabilisation as well as the ideology supporting the dominant monetary paradigm, both share some elements of truth. With respect to the ‘activist’ view, the 2007-8 financial crisis enlightened the need for monetary policy to be more symmetrical, that is, leaning against these imbalances whose precipitous unwinding can put financial stability at stake. By the same token, an active role of central banks faces two major drawbacks. On the one hand, diagnosing financial imbalances in real time remains subject to a high degree of uncertainty, and hardly ever reaches a unanimous agreement as to whether a policy intervention is warranted. This is even truer insofar as we live in a world of Knightian uncertainty, where associating a probability to any tail event may be extremely difficult, if not impossible at all. On the other hand, any policy intervention that responds discretionarily to emerging imbalances will face huge political pressures, especially if inflation is subdued. In this respect, tightening monetary policy to preserve financial stability in a more distant future may be hardly understandable by market participants, insofar as they do not see the counterfactual. As far as the central bank is concerned, it faces the conundrum of being accountable to the

¹⁷ The perspective of low interest rates provided by an asymmetrical monetary policy acts as a loss-insurance for financial institutions, the latter being encouraged to pursue high-risk activities, especially if they know to be ‘too big to fail’ (see Panzera and Rossi, 2011). An extensive literature explains the channels whereby low interest rates affect risk-taking behavior (on the risk-taking channel of monetary policy see Jimenez et al., 2007; Borio and Zhu, 2008; Gambacorta, 2009; Altunbas et al., 2010).

¹⁸ There is compelling evidence that the low-interest-rate trap is nowadays a relevant issue, as many advanced market economies that have been seriously hit by the 2007-8 financial crisis face hard difficulties in carrying out credible exit strategies.

general public of the restrictive policy undertaken in an attempt to avoid the disruptive effects of a hypothetical event that has not materialised yet (Trichet, 2011). For these reasons, too, monetary policy is not well suited to lean against financial imbalances, at least when the latter are sector-specific. Conversely, in an attempt to counter financial imbalances and deal with the build-up of emerging systemic risks, we favour the adoption of a flexible rule-based approach, which is consistent with both ‘conventional’ and ‘activist’ views. More precisely, it is crucial that inflation-targeting central banks complement their conventional monetary policy arsenal by a number of macro-prudential tools, which can be used to constrain overly credit growth during economic booms. Let us elaborate on this in the next section.

4 Some policy proposals

As the previous section has pointed out, proponents of the ‘activist’ view consider the unwinding of financial imbalances as the key threat to financial stability and, accordingly, call for an overhaul of the major responsibilities of central banks. Beyond fostering price stability over the medium to long run, assessing the stance of monetary policy requires central banks to give greater weight to the potential risks for financial stability stemming from imbalances that build up silently during economic booms.

While reaffirming the centrality of price stability as the overriding goal of monetary policy, the post-crisis debate within the economics profession is centred on how, rather than whether, inflation targeting should be rethought in order to reconcile price stability with financial stability, in such a manner not to throw the baby out with the bath water. As Mishkin (2010) argues in this regard, albeit the support for flexible inflation targeting regimes has not been weakened by the 2008 crisis, some details concerning its conduct need to be rethought. Against the background of rethinking inflation targeting, two main proposals for reform¹⁹ have emerged. The first proposal, by Blanchard et al. (2010), suggests that central banks should allow inflation rates to rise beyond the current 2 percent ceiling in normal times.²⁰ According to the same authors, a higher inflation target would remove the constraint imposed by the ZLB and gives policy makers increased room for manoeuvre to reduce interest rates after an adverse shock hit the economy. In particular, the higher inflation expectations, the more the real interest rate can be brought down to lower levels when the nominal interest rate approaches the ZLB, hence boosting aggregate demand (Mishkin, 2010).

The suggestion of widening the inflation target band has been hardly criticised, especially by those economists fearing either a loss of central banks’ credibility or an unhinging of inflation expectations. According to our view, and consistently with the

¹⁹ To be sure, a third proposal for reform can be found in the literature, arguing that central banks should target the price level rather than the inflation rate. For elaboration on this subject matter see Bean et al. (2010) and Mishkin (2010).

²⁰ Reifschneider and Williams (2000) point out that an inflation target rate of 2 percent yearly entails frequent episodes of the ZLB constraining monetary policy. Conversely, Bean et al. (2010) provide strong arguments against raising the current inflation ceiling.

arguments exposed throughout this paper, raising the inflation ceiling misses the point, insofar as the issues stemming from the build-up of financial imbalances in good times are left unaddressed. Indeed, the proposal by Blanchard et al. (2010) is nothing but an *ex-post* remedy for dealing with the economic disruptions caused by an unexpected shock, say, the unravelling of financial imbalances. The reform required for an inflation targeting framework to operate successfully should allow central banks to address the build-up of financial imbalances early enough (that is, before their unravelling jeopardises the stability of the whole system) whilst, at the same time, promoting price stability on the market for produced goods and services. As Borio and White (2004) note, mutually reinforcing anchors in both the monetary and financial spheres must be put in place, so as to reduce the scope for financial imbalances to threaten price stability and financial stability.

In an attempt to integrate financial imbalances in the monetary policy framework, a second proposal for reform has emerged vigorously after the 2007-8 financial crisis. To be sure, the theoretical foundation underpinning this reform dates back to a number of works realised in the early 2000s (see, for instance, Bean, 2003; Borio and White, 2004; King 2004). These works argue that monetary policy decisions based on forecasts of future inflation and output gaps should be implemented on the basis of longer horizons, that is to say, beyond the common one-to-three years range adopted by inflation targeting regimes.²¹ Specifically, the authors argue, financial imbalances are accurately weighted in the monetary policy decision process, insofar as these imbalances usually affect consumer price inflation with considerable lags, not least because of the hazy channels involved in the monetary policy transmission mechanism (Bean, 2003). Accordingly, central banks should be held responsible for maintaining price stability over a longer horizon, say, three or four years. In sum, extending the monetary policy horizon allows policy makers to better assess the overall risks to the economic outlook posed by the build-up of financial imbalances. This proposal seems a promising step towards reconciling price stability with financial stability during periods of economic expansion. It suffers, however, from two major shortcomings. First, owing to the significant degree of uncertainty embodied in the art of forecasting the key variables used to assess monetary policy, lengthening the usual policy horizon over which the rate of inflation has to be kept under control increases the uncertainty surrounding monetary policy. Against the backdrop of uncertainty, inaccurate forecasts may lead central banks to miss inflation targets, jeopardising price (and financial) stability. By then, a central bank that, on several occasions, undershoots inflation targets may potentially put its credibility at stake, threatening inflation expectations to unhinge. The second concern is related to accountability issues. As pointed out by Bean (2003), if the monetary policy framework is ill-defined – leaving central banks a high degree of discretion in the pursuit of price stability over a given time horizon – then, making a central bank accountable for the actions undertaken could be a tricky task. Moreover, in an attempt to counter the build-up of financial imbalances through a LATW policy, lengthening the monetary policy horizon could make it harder for a central bank to rationalise the choice of tightening the stance of monetary policy so as to counter financial imbalances,

²¹ A precondition for lengthening the policy horizon is that inflation expectations remain well anchored.

especially if the rate of inflation is expected to remain below its target for an extended period (Borio and White, 2004).

To sum up, while these two proposals for reform have the merit of taking into account financial imbalances, both are doomed to not be adopted until better models to forecast long-run inflation dynamics and the macroeconomic effects of financial imbalances are available. Hence, inflation-targeting central banks should continue to deliver price stability within the same operational framework as the one that prevailed prior to the 2008 crisis, insofar as widening the inflation target band or lengthening the monetary policy horizon (or a combination of both) does not effectively reconcile financial stability with price stability. By the same token, it is the whole structure of the current macrofinancial stability framework, rather than monetary policy *per se*, that needs to be reconsidered afresh. Having, on several occasions, underscored the need to include asset prices and credit growth in the monetary policy framework, we argue that, while central banks should keep on pursuing medium-run price stability on the market for produced goods and services, some complementary macro-prudential tools should be added to the central banks' toolkit.²² Albeit not being a panacea against future financial crises, macro-prudential tools are better suited to affect credit growth and, accordingly, enhance financial stability. In this respect, the weight put by prudential regulation on tackling overly credit growth arises from the close interaction between strong credit expansion and soaring asset prices, whose positive feedback loop impinges on financial stability negatively.

Nonetheless, some economists fear that extending the scope of central banks' activities beyond price stability undermines the efficacy of monetary policy. Without underestimating the strength of the latter argument, the central bank's toolkit can be supplemented with some new macro-prudential tools, without a significant loss of monetary policy effectiveness.²³ Conversely, by hindering excessive credit growth during economic booms, macro-prudential tools lessen the need for monetary policy to pre-emptively increase interest rates over the level dictated by inflation. Further, insofar as a targeted implementation of macro-prudential tools allows central banks to address leverage and credit growth in a calibrated manner, these tools can be implemented so as to impinge on specific sectors of the economy (that is, these sectors whose distortions pose risks to financial stability). Then, as far as prudential tools have been effectively implemented, monetary policy can make its best contribution in the quest of delivering price stability.²⁴

²² Insofar as macro-prudential tools pursue the stability of the whole financial system, rather than the soundness of its individual components, they represent the first line of defence against financial imbalances. Albeit a cost-benefit analysis of concentrating prudential tools in the hands of central banks goes beyond the scope of this paper, we support such *modus operandi*, owing to the strong intertwinedness between monetary policy and prudential regulation.

²³ Some important issues arise here, such as the coordination between monetary policy and prudential regulation as well as the risk of losing independence if central banks are made accountable for the implementation and attainment of macro-prudential goals.

²⁴ According to Boivin et al. (2010), as far as financial imbalances are sector-specific and well-targeted prudential tools exist, monetary policy plays a minor role in dealing with financial imbalances.

Against the background of prudential regulation, counter-cyclical capital buffers for highly-leveraged systemically-important financial institutions (SIFIs) are the most promising tool in the quest of curbing credit expansion. The rationale behind this prudential tool is to force SIFIs to raise capital buffers in excess of the minimum requirements in good times (for instance, at times when asset prices or the credit to GDP ratio are rising faster than their historical growth trend) to be used during economic downturns to absorb losses incurred. By then, counter-cyclical capital buffers represent an effective tool to prevent massive leveraged positions, whose build-up might fuel unsustainable asset price dynamics. Dynamic loan-loss provisions are another anti-cyclical macro-prudential tool that forces SIFIs to set aside more capital in good times. During the expansion phase of the business cycle, when losses on loans are deemed to be (and to remain) low, a provision is charged to account for potential future losses. These provisions will be used in bad times to sustain credit growth, precisely when institutions are more prone to tighten their lending standards – cutting access to credit, even to sound borrowers. Finally, as far as the real-estate market is concerned, maximum loan-to-value (LTV) ratios constrain the availability of mortgage loans and limit the equity portion against which homeowners can borrow.

Despite macro-prudential regulation is a critical step towards preventing financial imbalances, it might not be sufficient in every case. For instance, some of the countries that put in place prudential measures before the 2007-8 financial crisis in order to address excessive domestic credit growth and strengthen the resilience of the banking system (for example, the case of Spain with dynamic provisioning) failed to prevent boom and bust cycles on local asset markets. Moreover, before the inception of the 2008 financial turmoil, more than half of the US credit was not generated inside the perimeter of the traditional banking system, but within institutions that were subject to little or no regulatory oversight (see Guerra and Panzera, 2009). By then, macro-prudential regulation merely deals with one part of the problem, namely, the part of credit kept on the balance sheets of regulated SIFIs. In an attempt to consider the whole private credit supplied (that is, within and outside the regulated banking system), it is necessary to overtake a purely macro-prudential approach and find a policy tool that, albeit preserving some prudential features, addresses with enough precision credit growth as a whole. To be effective, this policy tool should act as an automatic stabiliser of credit growth and, accordingly, smooth asset price movements.

Against this background, a counter-cyclical tax on debt, as the one proposed by Jeanne (2008), is the most promising solution to curtail credit expansion, so as to encompass institutions outside the regulated perimeter. Deeming higher credit expansion a source of systemic risk, this counter-cyclical tax internalises the negative externalities induced by overly debt creation during periods of economic stability – at times when the optimism about the economic outlook lulls both lenders and borrowers into complacency, neglecting the risks associated with over-indebtedness. According to the

Conversely, as far as imbalances have spilled over to the entire economy and/or prudential tools are broad based, monetary policy likely has a role to play and needs to be coordinated with prudential regulation.

‘polluter-payer’ principle, the rationale underlying the counter-cyclical tax is to collect a progressive tax to be paid by lenders on every new private debt issued at times when the growth of private credit has overtaken a predetermined critical threshold. Let us assume, for instance, that a year-over-year growth rate of the ratio of private sector credit to GDP equal to, say, 3 percent, is judged consistent with price stability and moderate economic growth. Then, the more the ratio of private sector credit to GDP overtakes this threshold, the higher will be the tax levied on private lending. Hence, a higher tax discourages over-indebtedness, ensuring at the same time that credit growth does not fuel unsustainable asset booms. As far as the real-estate market is concerned, variations in the amount of mortgage interest rate deductions could be considered (Posen, 2009). Accordingly, if the private credit to GDP ratio is raising faster (slower) than the level judged consistent with the mandate, the amount of mortgage interest rate deductions allowed on personal income taxes is reduced (increased). In sum, variations of mortgage interest rate deductions act as an automatic stabiliser for housing prices.

Nevertheless, for the sake of completeness, it is correct to recognise that not all asset price bubbles are credit-induced and associated with emerging systemic risks. Against the backcloth of irrational bubbles, other policy measures are worth of being considered. In the real-estate market, these measures include levying a tax on the debt principal or interests; raising the minimum down payment for second-home buyers (that is, lowering the LTV ratio for those borrowers who already possess a home); or, more indirectly, extending the length of time before a homeowner is legally allowed to sell his/her property.²⁵ As far as the equity market is concerned, raising margin requirements for stock purchases, under certain circumstances, might represent a helpful tool in the hands of central banks to address any speculative frenzy, without impacting negatively on the whole economy.²⁶

5 Conclusion

Rapid credit expansion has often been a harbinger of asset bubbles, whose bust has caused financial crises to become increasingly frequent. The onset of the financial crisis in 2007 has exemplified that credit developments are, nowadays, the key driving force in generating and amplifying business cycles. Accordingly, if credit aggregates are allowed to rise excessively without being properly counteracted, they could breed waves of excessive optimism and set off unsustainable asset price dynamics. This has led some economists to rethink the pre-crisis dominant monetary paradigm, according to which monetary policy should clean but not lean against asset bubbles – be they credit driven

²⁵ Some of these measures have recently been implemented in Asia (especially in China, Hong Kong, and Singapore) to contrast the sharp appreciation of domestic house prices. Although it is too early to draw a firm conclusion, these measures appear to be effective in cooling down house price increases.

²⁶ The manipulation of margin requirements remains a controversial subject within central banks. According to Greenspan (2002), there is little evidence that higher margin requirements affect financial market conditions in a manner to dampen financial speculation, unless higher margin requirements are followed by an increase in short-run interest rates.

or not. These economists point out that central banks, as guardians of overall financial stability, should pay closer attention to asset market bubbles and actively counteract them through a tighter monetary policy. Yet, even after the 2007-8 financial crisis, the conventional wisdom is that the interest rate remains too blunt a policy tool to deal with asset price dynamics. As far as asset market bubbles are induced by overly credit growth, this paper has shown that the adoption of a range of prudential tools is a critical but insufficient step. To dispose of the systemic risk stemming from excessive credit growth during periods of economic stability, both within and outside the perimeter of the traditional banking system, a counter-cyclical tax on debt completes the deficiencies of macro-prudential regulation. Such a tax is a crucial step to undertake in an attempt to both internalise the negative externalities that arise from excessive credit creation and reduce the amplitude of financially-driven business cycles.

By the same token, asset market bubbles cannot be avoided in the future. As Rosengren (2011) cogently points out, every historical episode of speculative frenzy has been justified by a different financial myth – first held by most market participants, and then discarded by the crowd when financial euphoria dries up. Accordingly, this is no time for complacency. The economic history has (or should have) taught us that, sooner or later, perhaps at that very moment when we feel sheltered from financial crises and we believe capable of dominating any instability, we are forced to deal with its invincible, destructive forces.

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Author

Fabio S. PANZERA

Macroeconomics and Monetary Economics, Department of Economics, University of Fribourg, Boulevard de Pérolles 90, CH-1700 Fribourg, Switzerland Phone: +41 26 300 8244 Fax: +41 26 300 9678

E-mail: fabio.panzera[at]unifr.ch <http://www.unifr.ch/mapom/en/team/assistants/fabio-panzera>

Abstract

During the two decades preceding the 2007-8 financial crisis, both advanced and emerging market economies experienced larger credit growth and asset price fluctuations than in the more distant past. These phenomena were largely due to the establishment of credible inflation targeting regimes, whose excessive focus on medium-run price stability bred unsustainable credit and asset price dynamics, to the detriment of financial stability over longer time horizons. As the financial crisis spread to the whole economy in the late 2008, many economists came to believe that monetary policy should actively lean against financial imbalances - thus challenging the canonical New Keynesian paradigm.

This paper reviews the relevance of that paradigm in light of the recent financial crisis, arguing that the whole macrofinancial stability framework, rather than monetary policy *per se*, needs to be considered anew. In particular, some macro-prudential tools and a counter-cyclical tax on private debt could be useful instruments to counter overly credit expansion and, accordingly, smooth asset price fluctuations.

Keywords

inflation targeting, New Keynesian consensus, financial imbalances, macro-prudential regulation, counter-cyclical tax on debt

JEL Classification

E32, E58, G01, G18

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