



Macroprudential policy and the financial cycle: Some stylised facts and policy suggestions

Claudio Borio

Bank for International Settlements, Basel

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I would like to thank the organizers for their kind invitation; it is a pleasure and great honor for me to be here in such distinguished company.

In the limited time available, I would like to provide context. The objective is to explore what I consider *the* major source of systemic risk; namely, the financial cycle and its link with systemic financial (banking) crises and the far better known business cycle. I would like to highlight a few stylized facts and then turn to the implications for macroprudential policy.

By “financial cycle” I mean, somewhat loosely, the self-reinforcing interaction between risk perceptions and risk tolerance on the one hand and financing constraints on the other that, as experience indicates, can lead to serious episodes of financial distress and macroeconomic dislocations. This is what has also come to be known as the procyclicality of the financial system.

There are three takeaways from my presentation. First, the financial cycle should be at the very core of our understanding of the macroeconomy. To my mind, macroeconomics without the financial cycle is very much like *Hamlet* without the prince. Second, the financial cycle has significant implications for the design and limits of macroprudential policy. And finally, it also has significant implications for the design and limits of other policies, notably monetary and fiscal.

I will address two questions in turn. What are the properties of the financial cycle? I will highlight seven. What are the policy issues it raises? I will highlight four.

Let me stress that what I will be presenting is based on research carried out at the Bank for International Settlements (BIS) over the years. But many of the findings are quite consistent with work carried out elsewhere, including here at the IMF.²

The Financial Cycle: Seven Properties³

It is useful to think of the financial cycle as having seven properties.

First, its most parsimonious description is in terms of the joint behavior of credit and property prices. In some respects, equity prices, while so prominent in finance and macroeconomics, can be a distraction. This, in turn, is related to the next property.

Second, the financial cycle has a much lower frequency than the traditional business cycle.⁴ By “traditional business cycle” I mean how economists and policymakers think of the business cycle and measure it. This business cycle has a duration of up to eight years. By contrast, the financial cycle that is most relevant for serious macroeconomic dislocations has had a duration, since the early 1980s, of 16 to 20 years. It is a medium-term process. This, at least, is what we have found in a sample of seven advanced economies for which we had good data (Drehmann, Borio, and Tsatsaronis 2012).

The point is illustrated for the United States in Figure 1. **[[add chapter number to figure numbers?]]** The figure plots the traditional business cycle (red line) and the financial cycle (blue line) as measured through band-pass filters as well as peaks and troughs (vertical lines). The financial cycle is identified by combining the behavior of credit, property prices, and the ratio of credit to GDP.⁵ The difference in duration is obvious.

Equities can be a distraction in the sense that their time-series properties are closer to those of GDP in terms of the duration of swings. For example, the stock market crashes of 1987 and 2000 were followed by slowdowns in GDP or outright recessions. But the financial cycle

as measured by credit and property prices continued to expand, only to turn a few years later (early 1990s and 2007–2008, respectively), bringing the economy down and causing even greater damage. Seen from this longer-term perspective, one can thus consider the early contraction phases in economic activity “unfinished recessions” (Drehmann et al. 2012).

Third, peaks in the financial cycle tend to coincide with systemic banking crises or serious strains. This is true for all crises after 1985 in the sample of advanced countries we examined (Drehmann et al. 2012). And those crises that occurred well away from the peak were “imported”; that is, they reflected losses on cross-border exposures to financial cycles elsewhere. Think, for instance, of the losses that German and Swiss banks incurred in the most recent financial crisis on their exposures to the United States. Not surprisingly, business cycle contractions that coincide with the bust of financial cycles are much deeper.

Fourth, thanks to the financial cycle, simple leading indicators can identify risks of banking crises fairly well in real time (*ex ante*)⁶ and with a good lead (between two to four years, depending on calibration). The indicators we have found most useful at the BIS are based on the positive deviations of the (private sector) credit-to-GDP ratio and of asset prices, especially property prices, *jointly* exceeding their respective historical trends (e.g., Borio and Drehmann 2009; Borio and Lowe 2002).⁷ One can think of these indicators as real-time proxies for the buildup of financial imbalances: The deviations of asset prices provide a sense of the likelihood and size of the subsequent reversal; those of the credit-to-GDP ratio, a sense of the loss absorption capacity of the system. These indicators flashed red in the United States in the mid-2000s (Figure 2). There is also growing evidence that cross-border credit often outpaces purely domestic credit during such financial booms (e.g., Borio, McCauley, and McGuire 2011; Avdjiev, McCauley, and McGuire 2012).⁸

Fifth, and for much the same reasons, the financial cycle also helps construct estimates of sustainable output that, compared with traditional potential output estimates, are much more reliable in real time, as well as statistically more precise (Borio, Disyatat, and Juselius 2013). None of the current methods, ranging from full-fledged production function approaches to simple statistical filters, spotted that output was above its potential sustainable level ahead of the financial crisis. In recent work, we have found that incorporating information about the behavior of credit and property prices allows us to do just that.

Figure 3 illustrates this for the United States by comparing our estimates of the output gaps (the so-called “finance-neutral” gap) with those from the IMF and OECD, based on more full-fledged model approaches and with a popular statistical filter (the Hodrick-Prescott filter). The traditional estimates made in real time during the economic expansion that preceded the crisis indicated that the economy was running below, or at most close to, potential (red lines in the corresponding panels). Only after the crisis did they recognize, albeit to varying degrees, that output had been above its potential sustainable level (blue lines). By contrast, the finance-neutral measure sees this all along (bottom right-hand panel, red line). And it hardly gets revised as time unfolds (the red and blue lines are very close to each other). One reason why production function and similar approaches miss the unsustainable expansion is that they draw on the notion that inflation is the only signal of unsustainability. But, as we know, ahead of the crisis it was the behavior of credit and property prices that signaled that output was on an unsustainable path; inflation remained low and stable.

Sixth, and critically, the amplitude and length of the financial cycle are regime-dependent: They are not and cannot be a kind of cosmological constant. Arguably, three key factors support financial cycles: financial liberalization, which weakens financing constraints; monetary policy frameworks focused on near-term inflation control, which provide less resistance to the buildup of financial imbalances as long as inflation remains low and stable; and positive supply-side developments (e.g., the globalization of real economy), which fuel the financial boom while at the same time putting downward pressure on inflation. It is not a coincidence, therefore, that financial cycles have doubled in length since financial

liberalization in the early and mid-1980s and that they have become especially virulent since the early 1990s (figure 1).

Finally, busts of financial cycles go hand-in-hand with balance sheet recessions.⁹ In this case, compared with other recessions, debts and capital stock overhangs are much larger, the damage to the financial sector much greater, and the policy room for maneuver much more limited, as policy buffers—prudential, monetary, and fiscal—get depleted. Evidence also indicates that balance sheet recessions result in permanent output losses (growth may return to its long-run precrisis rate, but output does not regain its precrisis trajectory) and usher in slow and long recoveries. Why? I suspect it reflects the legacy of the previous boom and the subsequent financial strains.

The Financial Cycle: Four Observations about Macroprudential Policy

How should prudential policy address the financial cycle? The financial cycle requires that prudential policy have a systemic, or macroprudential, orientation. This means addressing the procyclicality of the financial system head-on—what has come to be known as the time dimension of macroprudential policy: this is the dimension that relates to how systemwide or systemic risk evolves over time (e.g., Crockett 2000; Borio 2011; and Caruana 2012a).¹⁰

The general principle is quite simple to describe but quite difficult to implement: It is to build up buffers during financial booms so as to draw them down during busts. This has two objectives. It would make the system more resilient and better able to withstand the bust. And, ideally, it would constrain the financial boom in the first place, thereby reducing at its source the probability and intensity of the bust. Note that these two objectives are very different; the second is much more ambitious than the first. I will return to this point later.

Let me now highlight four observations about macroprudential policy. They are all intended to manage expectations about its effectiveness and to set a realistic benchmark about what it can and cannot do—and this from someone who has been a strong advocate of the approach for over a decade now and who continues to be one. The reason is that the financial cycle is a hugely powerful force.

First Observation

Beware of macro stress tests as early warning devices in tranquil times (Borio, Drehmann, and Tsatsaronis 2012). In fact, to the best of my knowledge, none of them flashed red ahead of the recent crisis.¹¹ Their relentless message was “the system is sound.”

There are two reasons for this.

The first has to do with our risk measurement technology. Our current models are unable to capture convincingly the fundamental nonlinearities and associated feedback effects that are at the core of the dynamics of financial distress. In essence, no matter how hard you shake the box, little falls out. This shifts the burden to the required size of the shocks, which become unreasonably large and, therefore, are discounted by policymakers. The deeper point here is that the essence of financial instability is that normal-sized shocks cause the system to break down. An unstable system is not one that would break down only if hit by a huge shock, such as an outsized recession. An unstable system is *fragile*. As empirical evidence indicates, crises break out close to the peak of the financial cycle, well before GDP has plunged into a deep recession or asset prices have collapsed.

The second reason has to do with the context, or what might be called the “paradox of financial instability” (Borio 2011). Initial conditions are unusually strong just before financial strains emerge. Credit and asset prices have been surging ahead; leverage measured at market prices is artificially low; profits and asset quality look especially healthy; and risk premia and short-term volatilities are extraordinarily compressed. Taken at face value, these

signals point to low risk when, in fact, they are signs of high risk taking. The system is most fragile when it looks strongest. And this point is reached after years of solid and relentless expansion, typically alongside widespread financial innovations. Under these conditions, the temptation to believe that this time things are really different is extraordinarily powerful (Reinhart and Rogoff 2009).

Bottom line: At worst, macro stress tests can lull policymakers into a false sense of security. That said, if properly designed, they can be an effective tool for crisis management and resolution—a tool to promote balance sheet repair. After all, the crisis has already broken out, nonlinearities have revealed themselves, and hubris has given way to prudence. “Properly designed” means that the authorities need to have the will to shake the system hard, need to start the tests from very realistic asset valuations, and should put in place the necessary liquidity and solvency backups.

Second Observation

Beware of network analysis as a tool to detect vulnerabilities (Borio et al. 2012). As a source of vulnerabilities, bilateral links (counterparty exposures) matter far less than common exposures to the financial cycle.

Network analysis views the financial system as a web of connections linking institutions. It then models systemic risk by tracing the knock-on effects of the default of one institution on the rest along those interconnections. The larger the portion of the system that fails, the larger the systemic risk.

The main problem is that, as empirical evidence confirms, given the size of the interconnections, it is too hard to get large effects. The reason is simple: Mechanical exercises abstract from behavior. A financial crisis is more like a tsunami that sweeps away all that gets in its way than a force knocking down one domino after another. The main force driving it is indiscriminate behavioral responses. This also explains why the failure of small and seemingly innocuous institutions can trigger a major crisis. Small institutions do not matter because of what they are but because of what they signal about the rest: They signal shared vulnerabilities; they are the canary in the coal mine. When the financial cycle turns, the failure of the first institution can shake previously seemingly unshakable convictions and trigger a paradigm shift.

That said, this does not imply that information about bilateral exposures has little value. Much like macro stress tests, it can be very valuable in crisis management as a tool to identify pressure points and understand where and how best to intervene. But for this to be the case, the information has to be quite granular and very up to date (Borio 2013).

Third Observation

Beware of overestimating the effectiveness of macroprudential policy (Borio 2011; Caruana 2012a). There are two sets of reasons here as well, which in some ways echo those that explain the limitations of stress tests.

The first set is technical. The tools are more effective in strengthening the resilience of the financial system (the first objective mentioned above) than in constraining financial booms (the second, more ambitious, objective). To be sure, some instruments are more effective than others. For instance, it stands to reason, and it seems to be confirmed by empirical evidence, that ceilings on loan-to-value and debt-to-income ratios have more bite than capital requirements (e.g., CGFS 2012). After all, capital is cheap and plentiful during booms. But for typical calibration of the tools, it would be imprudent to expect a strong impact. Moreover, and critically, all such tools are vulnerable to regulatory arbitrage. And the longer they stay in place, the easier arbitrage becomes.

The second set of reasons has to do with political economy. Compared with monetary policy, it is even harder to take away the punchbowl when the party gets going. The lags between the buildup of risk and its materialization are very long, certainly longer than those between excess demand and inflation (recall how long the financial cycle is compared with the business cycle). For some of the tools, the distributional effects are more prominent and concentrated. And while there is a constituency against inflation, there is hardly any against the inebriating feeling of getting richer. All this puts a premium on sound governance arrangements and on a right balance between rules and discretion.

Fourth Observation

Beware of overburdening macroprudential policy (e.g., Caruana 2010, 2012b; Borio 2012a,b). This follows naturally from the previous observation. The financial cycle is simply too powerful to be tackled exclusively through macroprudential policy or indeed prudential policy more generally, be it micro or macro. Macroprudential policy needs the active support of other policies.

What does this mean in practice? For monetary policy, it means leaning against the buildup of financial imbalances even if near-term inflation remains under control (exercising the “lean option”).¹² Monetary policy sets the universal price of leverage in a given currency. In contrast to macroprudential tools, it is not vulnerable to regulatory arbitrage: You can run, but you can’t hide. For fiscal policy, it means being extra-prudent, recognizing the hugely flattering effect of financial booms on the fiscal accounts. This is because of the overestimation of potential output and growth (figure 3), the revenue-rich nature of financial booms owing to compositional effects, and the contingent liabilities needed to address the subsequent bust.

As an important aside, a big open question is how macroprudential frameworks should address sovereign risk. These frameworks were originally designed with private sector vulnerabilities in mind, linked to the financial cycle. But such cycles leave in their wake seriously damaged sovereigns, which can all too easily sap banks’ strength. Moreover, as history indicates, sovereigns may cause banking crises quite independently of private sector excesses. At a time when the sovereigns’ creditworthiness is increasingly in doubt, much more attention should be devoted to this issue.

Against this broad backdrop, is there a risk that adjustments in policy frameworks are falling short? Ostensibly, this was the case before the crisis, but what about since then? My answer is that the risk should not be underestimated.

Progress has been uneven across policies (Borio 2012b).

Prudential policy has adjusted most. A major shift from a micro- to a macroprudential orientation has taken place in regulation and supervision. Think, for instance, of the adoption of a countercyclical capital buffer in Basel III (BCBS 2010; Drehmann et al. 2011) and, more generally, of the efforts under way to implement full-fledged macroprudential frameworks around the world (CGFS 2012). That said, expectations about what these frameworks can deliver are running too high, and there is a question of whether enough has been done with respect to instruments, their calibration, and governance arrangements. Moreover, more could and should have been done to repair banks’ balance sheets in some jurisdictions.

Monetary policy has adjusted less. To be sure, there has been some shift toward adopting the lean option, but the will to exercise it has been quite limited. The temptation to rely exclusively on the new macroprudential tools has been very powerful, to avoid disturbing monetary policy. And it is worth asking whether the limitations of monetary policy to tackle financial busts have been fully appreciated.

Fiscal policy has adjusted least. There is as yet little recognition of the hugely flattering effects of financial booms on the fiscal accounts and of the big risks that busts pose for the sustainability and even effectiveness of fiscal policy.

Bottom line: There is a real risk that policies are not sufficiently mutually supportive. And, critically, they are not sufficiently symmetric between financial booms and busts. They tighten too little during booms, with the serious danger that buffers get depleted during busts. This poses a huge constraint on the room for maneuver—one that becomes tighter over successive cycles. Policy horizons are simply too short—not commensurate with the duration of the financial cycle (Borio 2012b).

Conclusion

There is a need to bring the financial cycle back into macroeconomics. Macroeconomics without the financial cycle is very like *Hamlet* without the prince. This raises huge analytical challenges that the profession is just beginning to tackle.

The financial cycle has major implications for macroprudential policy and beyond. I highlighted four observations: Beware of macro stress tests as early warning devices. Beware of network analysis as a tool to identify financial vulnerabilities. Beware of the limitations of macroprudential policy. And beware of overburdening it.

Has enough been done to adjust policy frameworks? Not quite. In the case of macroprudential policy, more and better can be done with respect to the calibration and activation of the instruments. In the case of monetary policy, more can be done with respect to the exercise of the lean option. And in the case of fiscal policy, there is a need to recognize the hugely flattering effect that financial booms have on the fiscal accounts.

So much for prevention and how to address the financial boom; what about the question of how to address the bust? If anything, here the questions are even bigger and more controversial, while progress has been more limited (Borio 2012a,b). There is a serious risk, in particular, that the effectiveness of monetary and fiscal policy is overestimated and of a new, more insidious, form of time inconsistency. But this is another story.

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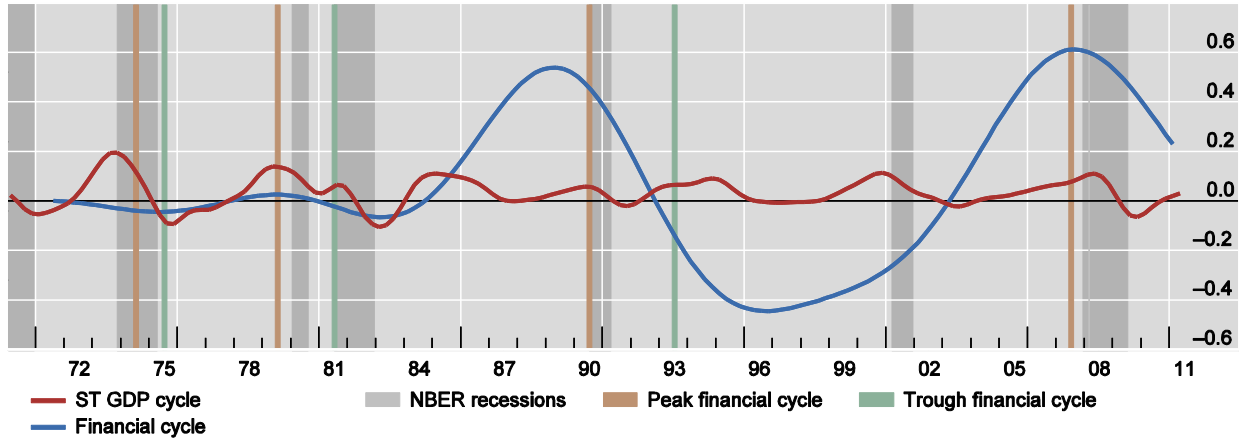
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Figure 1

The financial and business cycles in the United States

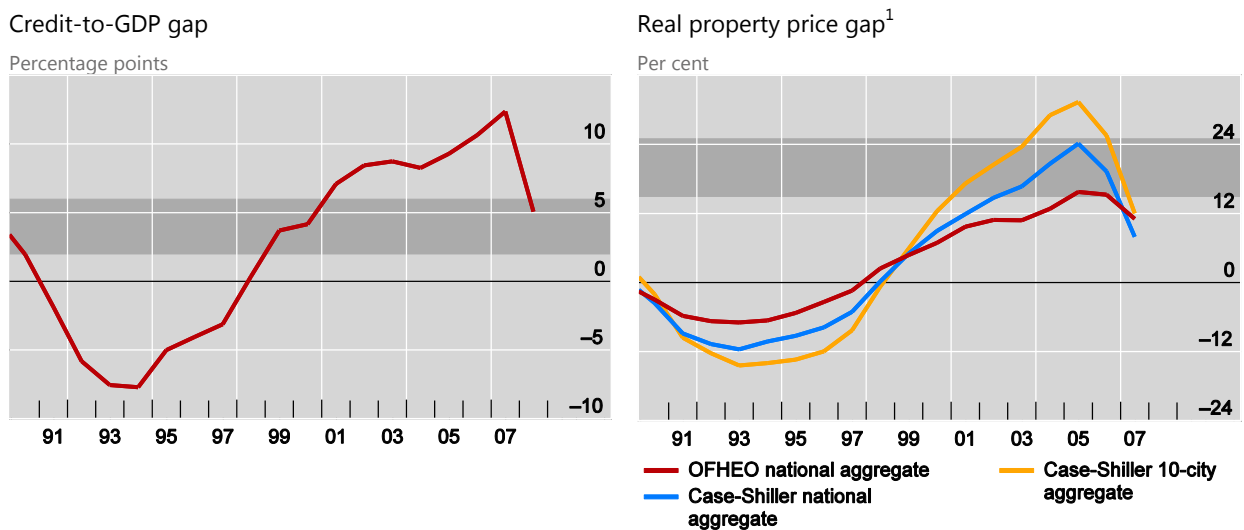


Note: Brown and green bars indicate peaks and troughs of the combined cycle using the turning-point method. The frequency-based cycle (blue line) is the average of the medium-term cycle in credit, the credit-to-GDP ratio, and house prices (frequency-based filters). The short-term GDP cycle (red line) is the cycle identified by the traditional short-term frequency filter used to measure the business cycle. NOTE: The amplitude of the blue and red lines are not directly comparable. NBER stands for National Bureau of Economic Research.

Source: Drehmann, Borio, and Tsatsaronis (2012).

Figure 2

Leading indicators of banking crises: credit and property price gaps for the United States



Note: The shaded areas refer to the threshold values for the indicators: 2–6 percentage points for credit-to-GDP gap; 15–25 percent for real property price gap. The estimates for 2008 are based on partial data (up to the third quarter). OFHEO stands for Office of Federal Housing Enterprise Oversight.

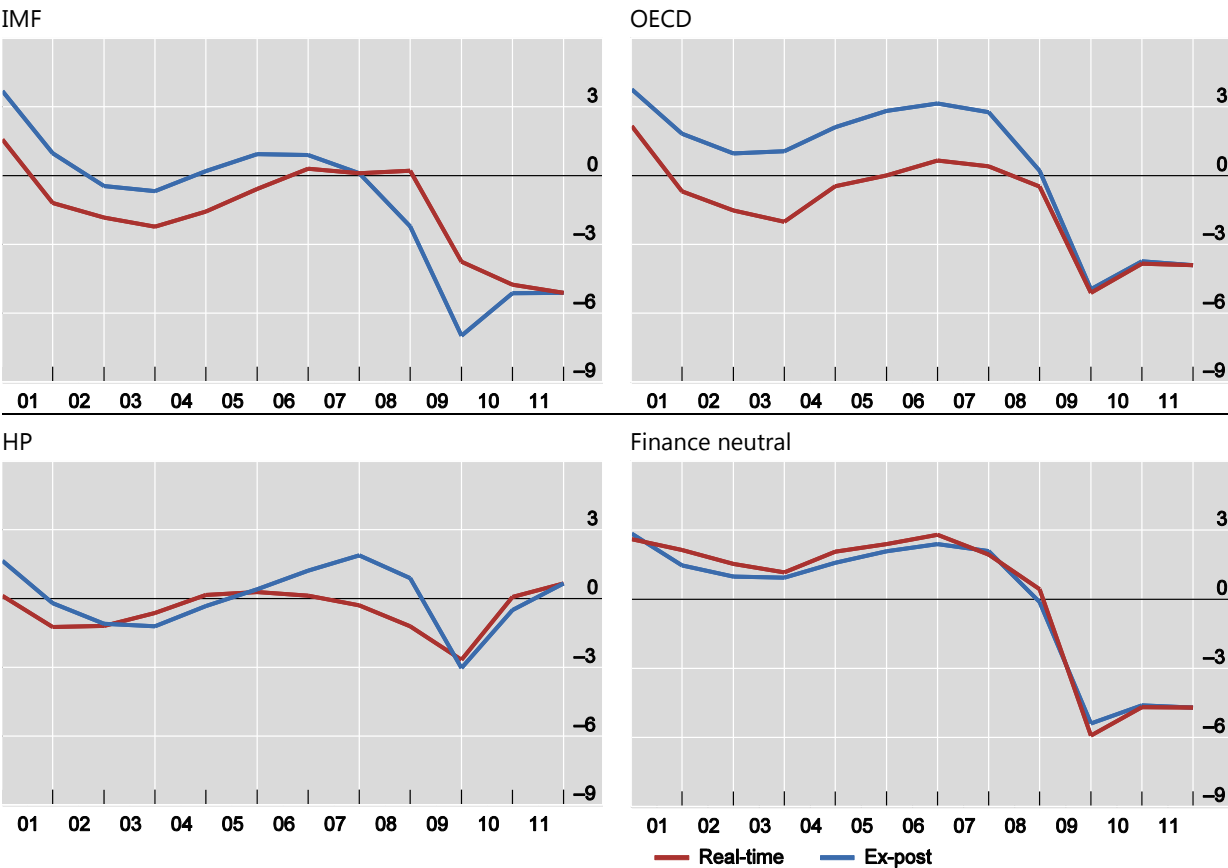
¹ Weighted average of residential and commercial property prices with weights corresponding to estimates of their share in overall property wealth. The legend refers to the residential property price component.

Source: Borio and Drehmann (2009).

Figure 3

U.S. output gaps: full-sample (ex post) and real-time (ex ante) estimates

In percentage points of potential output



Note: Linear estimates; the nonlinear ones for the finance-neutral, which should better capture the forces at work, show an output gap that is considerably larger in the boom and smaller in the bust. HP stands for Hodrick-Prescott.

Source: Borio, Disyatat, and Juselius (2013).

¹ The views expressed are my own and not necessarily those of the Bank for International Settlements.

² The references will be almost exclusively to BIS work, especially recent work, although the institution’s support of macroprudential policy goes back a long way (e.g., Clement 2010). That work contains extensive references to the literature.

³ This section draws, in particular, on Borio (2012a).

⁴ The qualification “traditional” is important. The data also reveal longer swings in GDP, which are closer to those for the financial cycle. See Drehmann and others (2012).

⁵ Although the changes in amplitude over time in the business and financial cycles are meaningful, because the financial cycle combines different series, it is not possible to draw inferences about the relative amplitude of the two cycles from the graph. See Drehmann et al. (2012) for a discussion of the technical issues involved.

⁶ Real-time or ex ante refers to an estimate that is based only on information that is available at the time it is made.

⁷ Not surprisingly, these trends are consistent with the average length of the financial cycle (see Drehmann, Borio, and Tsatsaronis 2011).

⁸ All this casts doubt on the view that current account imbalances were a cause of the financial crisis; for an in-depth discussion of this issue, see Borio and Disyatat (2011).

⁹ Koo (2003) seems to have been the first to use such a term. He employs it to describe a recession driven by nonfinancial firms’ seeking to repay their excessive debt burdens, such as those left by the bursting of the bubble in Japan in the early 1990s. Specifically, he argues that the objective of financial firms shifts from maximizing profits to minimizing debt. The term is used here more generally to denote a recession associated with the financial bust that follows an unsustainable financial boom. But the general characteristics are similar, in particular the debt overhang. That said, we draw different conclusions about the appropriate policy responses, especially with respect to prudential and fiscal policy (see Borio 2012a).

¹⁰ There is also a cross-sectional dimension, which relates to how risk is distributed in the financial system at a point in time (see, e.g., Crockett 2000 and Borio 2011).

¹¹ Even the Financial Stability Assessment Program (FSAP) for Iceland, released in August 2008, concluded that “...stress tests suggest that the system is resilient.”; see IMF(2008), p 8.

¹² The existence of a “risk-taking” channel of monetary policy, whereby changes in interest rates (and other monetary policy tools) influence risk perceptions and risk tolerance, strengthens the case for an active role of monetary policy. It is not, however, a necessary condition for it. See Borio and Zhu (2011).