

Discussion

1. Piti Disyatat

In the wake of the global financial crisis, interest in studying the interaction between financial developments and the real economy has surged. One particular strand has focused on characterising the financial cycle. A number of papers, most prominently Drehmann, Borio and Tsatsaronis (2012), have shown that financial cycles tend to be much longer in duration as well as higher in amplitude compared to business cycles. The paper by Cagliarini and Price adds to this literature by examining the robustness of these conclusions in two key respects. First, it uses spectral analysis that does not *a priori* pin down the frequency of fluctuations to more flexibly characterise business and financial cycles. Second, they conduct the analysis across a number of countries to see how general the result is. The paper also offers a very balanced – and in some sense, because the authors do not take a firm stance one way or another, a *too* balanced – discussion of the pros and cons of using monetary and macroprudential policy to address financial stability objectives. Overall, they conclude that monetary policy may have a role, but as a last resort when all other tools have been exhausted.

The paper does a commendable job in both of the aspects above and the extensive literature review undertaken makes it a very useful entry point for those new to the debate. My comments centre around two main issues.

First is the presumption that business and financial cycles can be measured separately. The paper purports to investigate whether there exists financial cycles that are ‘separate’ and ‘distinct’ from business cycles. But the more relevant question to me is how business and financial cycles *interact* with one another and what the underlying drivers are. Given the intricate relationship between financial developments and economic activity, it would seem that one has no choice but to characterise them *jointly*. That is, one cannot have a view about the business cycle without implicitly having a view about the financial cycle and how it relates to the real economy. I will illustrate this below.

The second issue is that the paper seems to treat financial and business cycles as objectively measurable things that, once characterised, can be used to make judgements about policy trade-offs. But both business and financial cycles are *endogenous* to policy. And this endogeneity goes beyond just cyclical fluctuations; policy may have a very persistent effect on the trend itself so that the standard separation of trend from the cycle becomes problematic. Blanchard, Cerutti and Summers (2015), Martin, Munyan and Wilson (2015), and Reifschneider, Wascher and Wilcox (2015) provide a discussion of this issue.

In what follows, I elaborate on these points, drawing on some recent collaborative work that I have done (Juselius *et al* 2017). The starting point is a characterisation of the financial cycle based on two long-run relationships that together pin down the long-run sustainable credit-to-GDP ratio.

The first relationship relates the credit-to-GDP ratio to real asset prices and can be seen as a proxy for the role of collateral constraints. Deviations of this relationship from its long-run value are referred to as the *leverage gap*, \widetilde{lev}_t , which can be expressed as

$$\widetilde{lev}_t = (c_t - y_t) - (p_{A,t} - p_t) - \overline{lev} \quad (1)$$

where c_t is credit extended to the non-financial private sector, y_t is output, $p_{A,t}$ is a real asset price index, p_t is the consumer price level and \overline{lev} is a steady-state constant. The asset price index is constructed from residential property prices, commercial property prices and equity prices (see Juselius and Drehmann (2015) for details).

The second relationship is between the credit-to-GDP ratio and the lending rate on the debt outstanding, and captures the effect of cash flow constraints that households face due to interest payments (e.g. Hughson *et al* 2016). Deviations of this relationship from its long-term value are referred to as the *debt-service gap*, \widetilde{dsr}_t , and can be written as

$$\widetilde{dsr}_t = (c_t - y_t) + \beta_{dsr} i_{L,t} - \overline{dsr} \quad (2)$$

where $i_{L,t}$ is the nominal average lending rate on the stock of credit, and \overline{dsr} is a steady-state constant.

Together, relationships (1) and (2) pin down the long-run level of the credit-to-GDP ratio, consistent with real asset prices (via the leverage gap) and the nominal lending rate (via the debt-service gap). In effect, when *both* the leverage and debt-service gaps are closed, the credit-to-GDP ratio, real asset prices and the lending rate take values that are consistent with their long-run levels. This can be thought of as a measure of *financial equilibrium*.

Figure 1 depicts estimated leverage and debt-service gaps for the United States. The debt-service gap was large and positive before and during the three recessions in our sample (Juselius *et al* 2017), and notably for the most recent one. By contrast, the leverage gap was very low during the commercial real estate and leveraged-buyout boom in the late 1980s, and the housing boom in the mid 2000s. This simply reflects the fact that asset prices tend to run ahead of the credit-to-GDP ratio during booms, even as this ratio increases beyond historical trends. This makes borrowers look deceptively solid in the boom phase.

The two financial gaps can be incorporated within a standard filtering system to estimate trends, such as potential output. As Borio, Disyatat and Juselius (2017) show, utilising information from the financial cycle leads to a more precise and robust characterisation of business cycles. Figure 2 compares estimates of the output gap that takes into account financial cycle information (labelled 'finance-neutral output gap') with those of Laubach and Williams (2015). The two gaps are clearly different. For example, the finance-neutral potential output is higher and, thus, the output gap more negative, in the aftermath of the 2008–09 crisis in recognition of the substantial financial headwinds at the time. And whereas the Laubach-Williams output gap is persistently negative during most of the 1980s and 1990s, the finance-neutral measure is positive ahead of the recession in the early 1990s, reflecting the financial boom that was under way at the time.

Figure 1: US Leverage and Debt Service Gaps

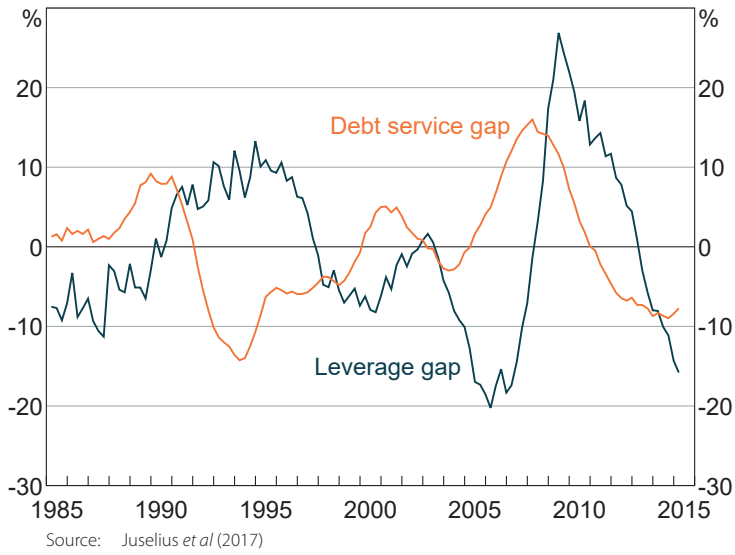
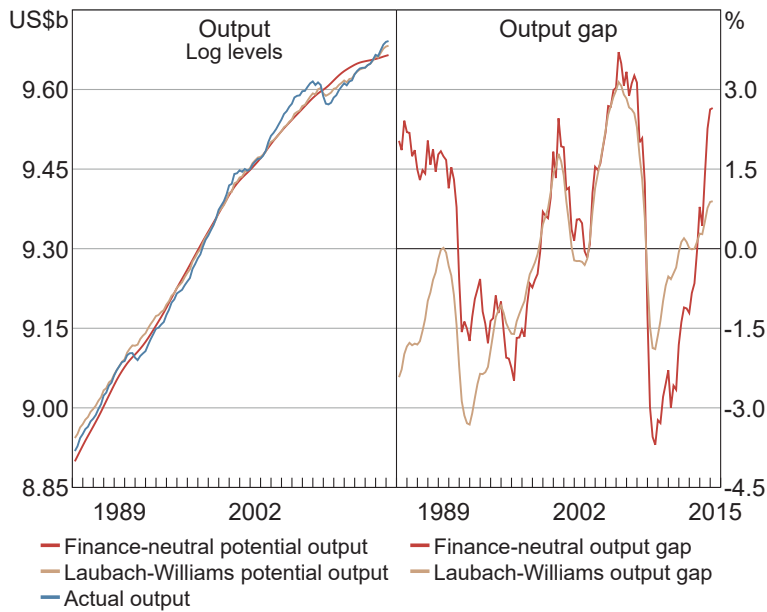


Figure 2: US Output and Output Gaps



DISCUSSION

The key point here is that business and financial cycles interact and that one must take a stance on this interaction in trying to characterise the cycles. Either one explicitly recognises the potential influence of financial factors on output or one does not, but either way, the resulting estimated cycle will be different. Instead of estimating the cycles separately, an approach that estimates them *jointly* would be more appropriate.

To study the interaction between financial and business cycles, the leverage and debt-service gaps can be combined in a vector autoregression that also includes output, inflation and the policy rate (Juselius *et al* 2017). The key takeaway from such an analysis is that the two financial gaps interact with one another to produce endogenous business cycles. For example, a negative leverage gap implies high credit growth and hence higher asset prices, which supports output, but also generates higher debt-service gaps which, in turn, act as a drag on growth. The latter effect, in particular, is very persistent implying that the current state of the financial cycle predicts subsequent output paths well. Indeed, Juselius and Drehmann (2015) show that knowledge of where leverage and debt-service gaps were before the global financial crisis is sufficient to predict much of the subsequent movement in output out of sample.

Within this set-up, the effects of different monetary policy rules can be studied. In particular, one can conduct counterfactual simulations of a policy rule in which monetary policy systematically reacts to financial imbalances with one that does not. Supposing that the counterfactual policy was implemented in 2003, Juselius *et al* (2017) shows that systematic reaction to the financial developments substantially dampens the financial cycle, with both leverage and debt-service gaps being smaller. This translates into significant output gains – by the end of the simulation period in 2015 the cumulative output gain is more than 12 per cent. Systematic policy matters and both business and financial cycles are endogenous to policy regimes. The gains are considerably larger if one starts the counterfactual experiment further back in history.

Relative to the standard arguments reviewed in the paper by Cagliarini and Price, this alternative perspective suggests that ignoring the financial cycle may lead to significant repercussions on medium-term output trajectories. The output effects occur regardless of whether a crisis takes place. Leaning against the wind should not be seen as taking policy actions only when signals of instability are apparent – within, say, the framework of an early-warning system – but policy should strive to maintain the economy close to financial equilibrium both in good and bad times. The path dependency generated by financial cycles implies that what matters is the cumulative role of policy. Finally, in its discussion of macroprudential policy, the paper would do well to recognise that utilising these tools as an offset to monetary policy – for example, to mitigate the financial stability effects of prolonged monetary easing – is both doubtful in effectiveness and may cause undesirable side effects. As with monetary policy, macroprudential tools also risk becoming overburdened.

References

Blanchard O, E Cerutti and L Summers (2015), 'Inflation and Activity – Two Explorations and Their Monetary Policy Implications', NBER Working Paper No 21726.

Borio C, P Disyatat and M Juselius (2017), 'Rethinking Potential Output: Embedding Information about the Financial Cycle', *Oxford Economic Papers*, 69(3), pp 655–677.

Drehmann M, C Borio and K Tsatsaronis (2012), 'Characterising the Financial Cycle: Don't Lose Sight of the Medium Term!', BIS Working Papers No 380.

Hughson H, G La Cava, P Ryan and P Smith (2016), 'The Household Cash Flow Channel of Monetary Policy', *RBA Bulletin*, September, pp 21–29.

Juselius M, C Borio, P Disyatat and M Drehmann (2017), 'Monetary Policy, the Financial Cycle, and Ultra-Low Interest Rates', *International Journal of Central Banking*, 13(3), pp 55–89.

Juselius M and M Drehmann (2015), 'Leverage Dynamics and the Real Burden of Debt', BIS Working Papers No 501.

Laubach T and JC Williams (2015), 'Measuring the Natural Rate of Interest Redux', Federal Reserve Bank of San Francisco Working Paper No 2015-16.

Martin R, T Munyan and BA Wilson (2015), 'Potential Output and Recessions: Are We Fooling Ourselves?', Board of Governors of the Federal Reserve System International Finance Discussion Paper No 1145.

Reifschneider D, W Wascher and D Wilcox (2015), 'Aggregate Supply in the United States: Recent Developments and Implications for the Conduct of Monetary Policy', *IMF Economic Review*, 63(1), pp 71–109.

2. General Discussion

Much of the discussion focused on the policy implications of the work and, in particular, whether macroprudential tools can and should be used to target financial cycles. A number of participants argued that macroprudential tools should not be used to target financial cycles. One mused on whether macroprudential policies should focus on the 'macro' or the 'prudential'? They suggested that macroprudential policies should focus on building financial system resilience (i.e. the prudential), mostly because there is little evidence that macroprudential policies have significant effects on business and financial cycles. Relatedly, another participant suggested that the case for policy intervention is strongest where there are market failures, such as information asymmetry or moral hazard. Therefore, policy should focus on addressing these failures, rather than a financial cycle. Adam Cagliarini agreed and asserted that market failures should be addressed before turning to traditional macroeconomic policy tools to address financial system risks.

DISCUSSION

One participant suggested that it may be appropriate to use macroprudential tools to target financial cycles in some states of the world, but not in others. In some states there is no trade-off between macroeconomic and financial stability and so monetary policy can be used to achieve both goals. When there are trade-offs, there is more of a role for macroprudential policies to target the financial cycle. The participant cited an example from Canada, where the Bank of Canada responded to the 2014–15 oil price shock by lowering its policy rate twice. The participant argued that the main threat to financial stability at the time was higher unemployment, so lower policy rates were viewed as having supported both real economic activity and financial stability – even though lower interest rates were expected to lead to higher household indebtedness and higher housing prices.

The theme of state dependence was echoed by another participant, who argued that the role of macroprudential policy was not to prevent all private sector mistakes. Rather it is to address the private sector mistakes that have an ‘aggregate demand externality’, and which are significant enough to push the economy into a deep recession where the economy hits the zero lower bound. They also noted that the consequences of financial cycles can depend on the policy interventions themselves; for example, if Lehman Brothers had not failed, the world economy may have performed very differently, even though the state variables (unrelated to policy intervention) would have been the same.

Some participants questioned the paper’s focus on measuring the length of financial cycles. One suggested that other aspects of the cycle are also likely to be important, particularly its amplitude. Piti Disyatat also reiterated his view that the interaction of the financial cycle with the business cycle was more important than the length of the financial cycle. Moreover, the separation between the two is somewhat ‘fuzzy’, given, for example, that monetary policy can influence both the business and financial cycles. These thoughts were echoed by two other participants. One suggested that modelling the interaction of financial and macroeconomic variables jointly could shed additional light on the relationship between financial variables and crises. Of particular interest is understanding when elevated levels of these variables tend to be associated with crises, and when they are not. The second participant built on this, noting that focusing on volatilities, as well as levels, was important.

In response, Dr Cagliarini stressed that the paper’s focus on the length of financial cycles was a deliberate response to a series of existing papers that base policy prescriptions on the notion that financial cycles are longer than business cycles. Dr Cagliarini also highlighted that another related motivation of the paper was to assess whether activity variables are ‘sufficient statistics’ for the state of the business cycle and the macroeconomy. For Dr Cagliarini, the paper’s results suggest that it remains unclear whether financial variables provide any extra information about business cycles.

Participants also discussed the data limitations that often plague financial cycle measurement. One participant highlighted the problem of small samples, noting that the most relevant period of analysis is after financial deregulation and that there have been very few financial and business cycles since then. In line with this thinking, they questioned the validity of the results of papers that employ long time series that extend back well before the 1980s. Another

participant agreed that there has been a regime change since the early 1980s, compared with the earlier post-war period, with the last three recessions in the United States having been associated with financial market disruptions. In contrast, a third participant argued that the historical causes and dynamics of financial crises remain relevant for today and therefore that long data sets can be useful.

