

Discussion

1. Philip Lowe

It is a privilege for me to be able to comment on these papers by two of the main contributors to the debate on asset prices and monetary policy. Both Steve and Charlie have been able to combine their academic rigour with their high-level policy experience to produce the type of thought-provoking papers that we have heard this morning.

By and large I agree with the ideas that they put forward. In my comments this morning, therefore, I would like to touch on four very practical issues that the papers address. These are:

- the difficulty of identifying bubbles or imbalances;
- the appropriate forecast horizon;
- the political economy of responding to potential imbalances; and
- the use of prudential policy.

If there is a central theme to my comments, it is that good monetary policy needs to be not only concerned with central forecasts, but also with the risks around those forecasts. And inevitably this means that, occasionally, monetary policy may need to respond to risks being built up in private-sector balance sheets, even if those risks pose no threat to the *immediate* outlook for inflation or economic activity.

Identification

As Steve alluded to, the debate on asset prices and monetary policy can quickly become polarised by those who argue that central banks cannot judge fundamental asset values any better than the market. In my view, polarisation on this point is unfortunate, because I don't really see it as the main issue. Instead the focus should be on the ability of central banks to assess whether developments in credit and asset markets are materially increasing macroeconomic and financial system risk. In my opinion such assessments, while difficult, are not impossible. Knowing the answer to the bubble question would obviously be helpful, but it is not essential. It seems perfectly reasonable to argue that one is agnostic as to whether asset prices have become overvalued after an extended period of credit and asset-price increases, and at the same time, argue that the level of risk in the system has increased. History provides us with too many examples in which credit and asset-price booms, often accompanied by high levels of investment, have ended in severe economic contractions. While clearly not all booms end in this way, the record of the past century or so strongly suggests that these developments can materially increase the risk of something going wrong.

And ultimately, good monetary policy involves good risk management. Another way of saying this is that a given set of forecasts for inflation and output are, by

themselves, not enough to determine the level of the policy interest rate. Central banks need to be thinking about the risks around those forecasts, and whether changes in monetary policy are likely to increase or decrease those risks. This does not mean that central banks should target asset prices. It does not mean that they should target credit growth. It does not mean that they should set out to burst ‘bubbles’. It does mean, however, that they need to be asking themselves whether developments in credit and asset markets are leading to greater macroeconomic risk, and whether monetary policy can lessen those risks in a welfare-improving way. As I have said, I think we do know something about the determinants of risk and, in some circumstances, monetary policy may well be able to alter those risks in a way that passes the cost-benefit test.

Forecast horizon

The second issue is the appropriate forecast horizon. Sometimes I hear the argument that if central banks are so worried about medium-term risks arising from credit and asset-price booms then they should simply increase their forecast horizons. So instead of setting the interest rate so that the inflation forecast at a two-year horizon is equal to the target, they should set it so that the inflation forecast is at the target at a three- or four-year horizon.

As Charlie argues, using longer horizons in policy assessments makes sense. However, just extending the horizon over which one prepares and publishes central forecasts is of relatively little benefit. The problem is twofold. The first is that beyond two years, forecasts invariably revert to trend. I know from my own experience once you go out this far it is very hard to fight the feeling that ‘the trend is your friend’. Second, the type of risks that we are talking about can’t easily be incorporated into central forecasts. While we might feel reasonably comfortable with an assessment that macroeconomic risk has increased, we are inevitably much less comfortable in assessments about timing. Given this, the types of events we are talking about are difficult to factor into central forecasts, and we tend not to do it.

In practical terms, then, where I think this leaves us is not so much extending the forecast horizons for our central forecasts, but extending our risk assessment horizons. Perhaps in discussion we might be able to turn to how this could be done in practice.

Political economy

The third issue is the political economy of responding to risks arising from developments in credit and asset markets.

As Steve notes in his paper, the most cited argument against responding to developments in credit and asset markets is the identification issue. Given what I have just said, I do not see this as the biggest problem. Rather, it is the political economy that is the obstacle; or in other words, the difficulty that the central bank faces in explaining its actions to the public. While it is undeniable that there are serious communication issues here, I think some central banks have probably made

it more difficult for themselves by virtue of the way that they have communicated with the public over recent years.

Too often, inflation-targeting central banks have implied that inflation targeting is about setting the policy interest rate so that the inflation forecast is at the target at the policy horizon, say around two years. Once you have told people that this is what you should be doing, it is very hard to do anything else. And doubly so, if the main form of public communication is an 'inflation report' whose main job is to establish the credibility of the forecast.

Now there may have been a time when convincing the public that this was what inflation targeting was about was useful, particularly when central banks did not have a lot of credibility. But it is probably now time to move on. And part of this process of moving on is communicating a slightly different message, or as Charlie says, changing the rhetoric.

In his paper Charlie did not say exactly what the rhetoric should be, so I thought it might be useful to spell out four possible elements of the message. The first is that inflation targeting is about medium-term inflation control, not about keeping the annual rate of inflation always within a very tight band. The second is that monetary policy needs to take account of medium-term risks to price stability, and this means that interest rates do not always need to be set so that the inflation forecast is at the target at a fixed horizon. The third is that medium-term risks to price stability are most likely to find their roots in developments in credit and asset markets, and consequently central banks may need to respond to these developments even if they pose no immediate threat to inflation. And the fourth is that the case for a monetary policy response need not rest on an increased risk of financial instability, but rather on a general threat to macro stability. As we are seeing in the United States now, the macroeconomic fallout from an asset-price boom can be significant even if financial institutions do not get themselves into difficulties.

As Charlie notes, such rhetoric is not inconsistent with inflation targeting. While the message is a little more sophisticated than that sometimes delivered by central banks, the way that central banks communicate is beginning to change. The papers that we have heard this morning are part of this process, for I doubt that the Bank of England would have expressed such ideas five years ago. One place that the rhetoric does not seem to have changed much is the US, although interestingly Steve's paper says actions have changed. I found this result a little surprising and perhaps Steve could elaborate on how robust his findings are to ways of calculating the excess risk premium. More generally, in discussion it might be useful to address the issue of how central banks should communicate with the public.

Regulatory responses

The final issue is the possibility of using regulatory instruments to address an increase in financial system and macroeconomic risk. The logic of the idea seems impeccable: if risk is increasing, then capital buffers in the banking system should rightly be higher, and lending criteria should rightly be tightened. And if the

private sector is not delivering these outcomes because of problems in measuring the cyclical dimension of risk, or because of incentive problems, then the public sector – through the regulatory authorities – should arguably require institutions to make these adjustments.

While the logic is straightforward, the practice is not. Many regulatory authorities run a mile when you start talking along these lines. They simply don't see it as their role to second-guess financial institutions about how risk is moving over the course of the business cycle. Nor do they want to be making discretionary adjustments in prudential requirements for macroeconomic reasons. Given the current intellectual approach that underpins bank regulation this reluctance is understandable, although increasingly it will come under the spotlight with the implementation of Basel II, given the way that both internal and external ratings move over the course of the business cycle.

An alternative to discretionary adjustments in prudential requirements is adjustments based on some form of rule. While Steve notes that there are formidable obstacles to such an approach, one idea that I think is worth further consideration is to apply the concept of 'statistical provisioning', as used in Spain, to bank capital, rather than provisions. Under such a system if a bank's actual losses turn out to be less than its expected losses, the 'unexpected profit' would be added to the bank's regulatory capital requirement, up to some limit. The result would be a build-up of bank capital in good times which would then be available in bad times. Such a system could easily sit along Basel II and I think it is preferable to statistical provisioning, as it does not run foul of accountancy and transparency concerns.

While this idea is worthy of further study, it suffers from two major difficulties. The first is that if institutions perceive capital requirements to be 'too high' they will simply securitise the lending. The second is that some imbalances might pose a threat to the macroeconomy, but only a small threat to the health of financial institutions. In such cases, the logic for using prudential instruments is considerably weakened. These difficulties mean that at the end of the day we may be left with monetary policy having to shoulder most of the burden, although perhaps over the next day we might hear some other ideas.

2. Warwick McKibbin

The papers by Bean and Cecchetti (this volume) are together an excellent overview of the existing theoretical debate on monetary policy and asset prices. In these comments I aim to summarise the key messages from the papers, raise some issues regarding each paper and then present some results from a more complete model of the economy that raises issues not addressed in the simpler models that underlie the papers. The main issue that the theoretical literature and the papers need to focus more on is the different impacts of asset-price fluctuations for aggregate supply versus aggregate demand and the importance of this distinction for monetary

policy settings in practice and the specification of simple monetary policy rules in theory.

There are two broad questions asked in these papers. The first question covered by both papers is ‘Should monetary policy respond to asset price movements?’ The second question, taken up by Cecchetti is ‘Has the Fed responded to asset prices in practice?’ Surprisingly, given the academic debate to date and the apparent position of the two authors in that debate, there is now almost consensus reached in these papers. Bean argues that there is no need for additional responses by policy-makers to changes in asset prices because the changes in asset prices would already be incorporated in sensible forward-looking policy rules. Cecchetti argues that there should be an asset-price term in a modified Taylor rule¹, but that is because the rule is not as forward-looking as Bean proposes. In reality both papers make the same point that asset prices matter for monetary policy to the extent that they affect future inflation and output. In the empirical part of his paper, Cecchetti finds that the Fed has responded to asset prices (defined as a significant term on asset prices in a Taylor rule), although I have some questions about the empirical approach later in this comment.

There is a point in the Bean paper where it might appear ambiguous to the reader that asset prices matter at all, in the comment that the first order condition (Equation (6)) has no asset prices appearing. It is true that the asset prices do not appear in this condition, but once the inflation and demand terms are substituted out to derive the policy rule for interest rates, asset prices will appear in the fully optimal rule to the extent that they affect aggregate demand. As Bean stresses they are completely offset in this simple class of models and therefore have no additional influence on policy.

A key element of most of the literature on policy rules and asset prices is the focus on asset prices and aggregate demand. Yet I believe that the most important issues are not the impact of asset prices on aggregate demand but the impact of asset prices on aggregate supply. If asset prices only affect aggregate demand then it is clear that monetary policy clearly should respond to the change in asset prices so as to neutralise the demand effects – indeed Bean focuses on this point about demand management in his paper. Yet the main problems for policy are when the asset prices also feed into aggregate supply. An illustration as to why this is likely to be the main problem is set out in the following section. Charlie Bean begins to raise this issue in his Appendix but the issues are far more wide-ranging than a simple model can adequately deal with.

Before proceeding, it is important to identify what is meant by a ‘bubble’ or a ‘misalignment’ of asset prices. For example suppose there is a shift out of US equities into other assets because of an increase in the equity risk premium (i.e. the excess return required to hold equities relative to government bonds).² Is the rise in price of other assets such as housing and bonds as people sell equities and buy

-
1. This is one of a more general class of rules in Bryant, Hooper and Mann (1993).
 2. Some might interpret this as a bursting bubble.

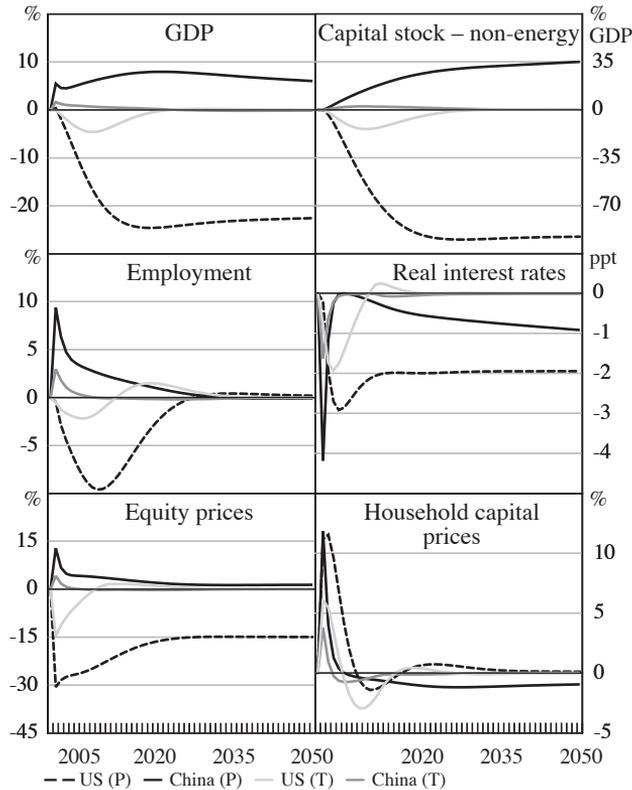
these other assets a misalignment? Or are the sharp observed price movements due to fundamentals which might have a long dynamic profile in which it takes time for the supply of these assets to respond.³ To identify a misalignment in asset prices, it is important to identify the underlying fundamental valuations, and then identify movements in asset prices in excess of fundamentals as a possible misalignment. It is also important to stress that the fundamental components of the price changes in assets are not just related to earnings but also can include some capital gains or losses. Since in the example of a rise in the equity risk premium, if there is a non-responsive (or inelastic) supply of assets, then some of the fundamental adjustment will be in terms of capital gains to holders of existing assets. This also needs to be taken into account in calculating the short-run value of an asset. To illustrate how long some of the adjustment lags might be, consider the example from a recent paper.

In McKibbin and Vines (2003) we used the G-cubed model⁴ to simulate a 5 per cent rise in the equity risk premium in the US as well as across the OECD economies – under alternative assumptions about whether this was a permanent increase or a temporary increase in equity risk. The G-cubed model has the same basic foundations as the model in Bean (this volume) but it has a more extensive treatment of assets and asset markets. It is a new Keynesian model with substantial sectoral disaggregation and country coverage. There is explicit treatment of financial assets (bonds, equity, housing, foreign debt) with stickiness in physical capital differentiated from flexibility of financial capital. As well there is short-run deviation from optimising behaviour due to stickiness in labour markets and some myopia in the behaviour of firms and households. This creates a short-run ‘New Keynesian’ model with a Neoclassical steady state. The presence of various types of sticky behaviour is important because of the co-existence with flexible asset prices.⁵

We explore what happens if the US equity risk premium rises from 0 to 5 per cent permanently in 2001 versus a temporary change, defined as a jump to 5 per cent and then 4.5 per cent above base etc until it is back to baseline by year 2010. Some of the results are shown in Figures 1 and 2. All results are presented as the deviation from a baseline projection of the model, as a result of the change in the equity risk premium. Figure 1 focuses on results for the United States (experiencing the shock) and China (not directly experiencing the shock) for the permanent versus temporary OECD-wide equity shock. Figure 2 contains the results of the optimal policy response (similar to the approach in Bean) when there are three types of central bankers in the United States. The first is the ‘base’ which has the Fed following a simple nominal income-targeting rule. The second labeled ‘inf’ is a pure inflation targeter. The third is ‘infemp’ where the policy-maker calculates a time-consistent policy rule that trades off targets for inflation with unemployment with double the weight on inflation relative to the log of employment.

-
3. The elasticity of supply is critical. Housing has a slow supply response thus we would expect housing prices to move more sharply than other assets with high supply elasticities.
 4. See McKibbin and Wilcoxon (1999) for the analytical basis of the model.
 5. See McKibbin and Vines (2000) for discussion on the importance of stickiness in intertemporal models.

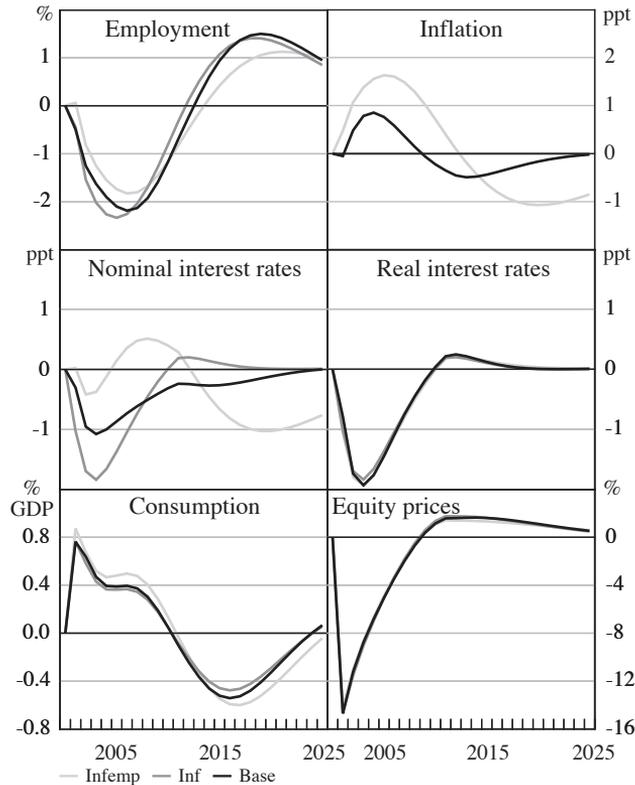
Figure 1: Permanent versus Temporary OECD-wide Equity Risk Premium Shocks
Deviation from baseline



Source: MSG3 model version O50

Figure 1 illustrates that a 5 per cent rise in the equity risk premium permanently reduces US GDP by around 23 per cent relative to base by 2030. This is an enormous effect and demonstrates how important asset market valuation might be for economic activity. With a higher equity risk premium, the return on capital must rise relative to bonds and therefore the desired capital stock must fall by a substantial amount. Over the period from 2001 to 2015, the growth rate of the US economy is approximately 1 per cent per year lower than baseline (which was roughly 3.5 per cent per year). The US economy eventually returns to the long-run growth rate driven by population and productivity growth in the baseline but the level of GDP is permanently lower relative to base. This lower economic growth for a sustained period of time is due to a significant fall in investment which leads to the running-down of the capital stock as the US economy shifts from the initial growth path equilibrium to a new equilibrium with a substantially lower desired capital stock. The higher rate of return on capital is achieved by reducing the capital-labour ratio. By contrast, China receives some of the capital that is pulled out of US equities and experiences stronger

Figure 2: Optimal Policy Response in US to Temporary OECD-wide Equity Risk Premium Shocks
Deviation from baseline; inflation/employment versus inflation targeting



Source: MSG3 model version O50

growth for a decade. More details on the international transmission can be found in McKibbin and Vines (2003).

In the case of the temporary shock to the equity risk premium, this effect disappears, however there is still a long adjustment period.

An important aspect of Figure 1 is that the prices of other assets such as housing jump sharply as households sell equity and buy other assets in the United States and globally. Over time the supply of housing capital responds and prices begin to move back to base, but it takes a decade before the permanent shock has dissipated in the housing market. Another important result in Figure 1 is that the real interest rate (globally) is permanently lower as a result of the shock. This might seem surprising in a model with intertemporally optimising consumers. Usually, theory suggests that the real rate of interest is tied directly to the rate of time preference. However, because we have a full vector of assets in this model, the condition from the consumer's Euler equation that holds is that the average return on wealth is

equal to the rate of time preference. Since wealth is held in equities, which are now assumed to have a higher rate of return than government bonds, the only way that the equilibrium condition can hold is that the return of bonds must be lower. In this case the average return across the portfolio is equal to the rate of time preference with the real return of equities permanently higher and the real return on bonds permanently lower.

The results in Figure 1 have important implications for the Taylor-type rule⁶ in Cecchetti as well as in the existing literature on policy rules. In the face of an equity risk shock (or any change in asset preferences), both the level of potential output as well as the equilibrium real interest rate need to be re-calculated otherwise the simple rule will impart an inflation bias into the economy. The critical issue is how likely is it, that asset-price misalignments (or other shocks) will enter the supply side of an economy. The results of simulations from this large-scale general equilibrium model suggest that it is highly likely once a fully specified rather than a simplified economic model is considered. Indeed surely the historical experience of asset-price misalignments demonstrates that the losses from supply collapses are more harmful than the aggregate demand effects when asset prices change dramatically.

In Figure 2, the optimal response of monetary policy to the shift in asset prices is calculated under different assumptions about the preferences of policy-makers, or the rules being followed. This figure illustrates that the real adjustments such as in consumption and employment are dominated by the underlying shock. The monetary policy change, although important, only has a relatively small impact relative to the scale of the shock. Note that equity prices are almost unchanged when conditioned on the monetary response. The outcomes for inflation and nominal interest rates are very different. The assumption of complete credibility of each type of policy-maker causes the nominal interest rate to be lower under the inflation-targeting regime because the inflation premium in interest rates is lower. Employment is importantly affected by monetary policy but around the much larger real cycle generated by the shock.

The results from this model illustrate that aggregate supply is expected to be affected by changes in equity risk premia, or changes in the pricing of assets. The first point is that the role of monetary policy in this case is to manage changes in demand around changes in aggregate supply, which is very different to much of the theoretical literature (including the two papers) that treats asset price changes as primarily issues of demand management. Secondly, in the simple Taylor-type rule in both papers, the problem to grapple with is how to evaluate the change in potential output in the rule but also how to evaluate the changes in the equilibrium real interest rate in the rule. Almost all empirical implementations of the Taylor-type rules assume the equilibrium real rate of interest is constant. This is clearly incorrect for the type of shocks evaluated in this paper.

There is still a large amount of research required in order to understand the consequences of asset-price misalignments for real activity and for policy in general.

6. This is one of a more general class of rules in Bryant *et al* (1993).

The two papers in this volume are useful contributions to our understanding of these issues and a good place from which to start.

References

- Bryant R, P Hooper and C Mann (eds) (1993), *Evaluating policy regimes: new research in empirical macroeconomics*, Brookings Institution, Washington DC.
- McKibbin WJ and D Vines (2000), 'Modelling reality: the need for both inter-temporal optimization and stickiness in models for policy-making', *Oxford Review of Economic Policy*, 16(4), pp 106–137.
- McKibbin WJ and D Vines (2003), 'Changes in equity risk perceptions: global consequences and policy responses', ANU Working Papers in Trade and Development No 2003/15. Available at <<http://rspas.anu.edu.au/economics/publish/papers/wp2003/wp-econ-2003-15.pdf>>.
- McKibbin WJ and P Wilcoxon (1999), 'The theoretical and empirical structure of the G-cubed model', *Economic Modelling*, 16(1), pp 123–148.

3. General Discussion

There was some discussion about the practice of central banks warning the public about possible asset-price misalignments. This discussion was in part framed in the context of the US Federal Reserve's early warnings about the possible existence of 'irrational exuberance' within share market participants, and the perception that its subsequent views on the acceleration in US productivity growth appeared to endorse higher valuations for equities. Several conference participants argued that central bank commentary on the possibility of misalignments in asset prices was a strategy with little discernable downside risk, and so should at least be attempted. It was also suggested that such a strategy allowed a targeted response to a particular sector of the economy affected by the asset-price misalignment. Related to this, one participant thought that it may be difficult to communicate a focused policy response in an inflation-targeting framework as in their view most of the communication associated with inflation targeting pertains to the aggregate economy.

There was some disagreement with Cecchetti's view that estimating the fundamental value of an asset was no less difficult than estimating potential output. It was raised that asset prices tend to fluctuate considerably more than the real economy, which may make discerning long-term trends more difficult. In addition, a number of participants wondered if Cecchetti's empirical results would be robust to alternative specifications. One participant suggested that real-time forecasts could have been used in the augmented Taylor rule to better reflect the information set the US Federal Reserve had at the time of making its decision. Cecchetti responded that doing so would have meant the loss of the last five years of the sample, and that it was not always clear from the US Federal Reserve's Green Books what the official forecasts were. Other participants raised issues about the construction of the equity premium

measure used as a proxy for equity-price misalignment, and about the assumption of a constant neutral real rate in the Taylor rule.

Several of the participants commented on the simulations presented in McKibbin's comments. They noted the magnitude and prolonged nature of the effects of asset-price misalignments in the simulations.

There was substantial discussion of the issues involved in augmenting a strict inflation-targeting regime to account for the macroeconomic risks introduced by asset-price misalignments. One participant argued strongly that extending the forecast horizon was not a practical option for dealing with such misalignments. Bean responded that the analysis of longer horizons could be qualitative, rather than quantitative. Another participant wondered if the 'risk management' framework proposed by Lowe was sufficiently concrete. However, in general there appeared to be substantial agreement that a risk management framework for determining policy was appropriate. Lowe argued that particular importance should be placed upon any negative skewness apparent in assessment of risks. There was also agreement that the augmentation of a simple policy reaction function (such as a Taylor rule) would not be an adequate representation of such a monetary policy framework.

A number of participants endorsed Lowe's suggestion that prudential regulation should be considered as a possible tool for addressing financial sector risks and thereby reducing macroeconomic risks. However, there were some reservations about the feasibility of such an approach. One participant suggested that it would be difficult to communicate any change in prudential regulation that was not related to financial sector stability. Other participants endorsed the view in Cecchetti's paper that rules-based adjustments to capital requirements would be difficult to implement.