

4. ASSET PRICES AND MONETARY POLICY: SOME SKEPTICAL OBSERVATIONS

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In reaction to the current global financial crisis, a growing number of observers are calling for monetary policy to play a more active role in preventing future episodes of financial instability by “leaning against” asset price bubbles. This demand reflects the now widely held view that low and stable inflation provides no guarantee against the development of financial imbalances, whose resolution risks triggering sharp recessions and unleashing deflation pressures.

Of course, the idea that monetary policy should also have a financial stability objective raises a number of questions for economic research. In my talk today, I will discuss what the role of monetary policy should be in preventing asset price bubbles. Since no consensus has emerged in the literature, I will present my interpretation of the current state of knowledge. I recognise that since there is little agreement about these issues in the profession, some of you will disagree with my views. That is good: only by a lively debate can we promote our understanding of these important matters.

My talk is structured as follows. I first review what role monetary policy played in the run-up to the crisis. To my mind, the key ingredient of the crisis, from a monetary policy perspective, was the fall in the yields on long real indexed (real) bonds, which triggered the search for yield which drove the demand for the new, highly complex and opaque financial instruments that played an important role in the crisis. I argue that that it is difficult to believe that changes in the short nominal interest rates that central banks control can account for this decline in long, real yields. Consequently, I think the role of monetary policy in the run-up to the crisis has been exaggerated.

Next I briefly review the two polar positions in the debate about asset prices and monetary policy: the *traditional* view that says that central banks shall focus solely on inflation in setting interest rates, and the *activist* view that holds that interest rates should help prevent the development of financial imbalances. I argue that the latter view presumes that financial imbalances, in the form of rapid credit expansion and asset prices misalignments, contain information about macro economic conditions beyond the two-three year horizon that central banks typically focus on in setting monetary policy. Furthermore, monetary policy must

¹ This chapter developed from a presentation first given at a conference on *Asset Prices and Monetary Policy* organised by Bundesbank, the GTZ and the People's Bank of China in Beijing on May 7, 2009.

have a large impact on asset prices relative to on real economic activity, since leaning against asset prices bubbles is otherwise likely to exacerbate the business cycle.

I go on to review the information content of a number of indicators of financial imbalances proposed in the literature, and argue that it is negligible. Thus, it is difficult for policy makers to know when a bubble that will have highly adverse macroeconomic consequences is forming. This suggests that they are likely frequently to conclude that a bubble is forming when in fact one is not.

This naturally leads to the question of what the effects of a leaning-against-the-wind policy on asset prices and the broader economy would be. This is a difficult question since no central bank to date has pursued such a policy. However, to the extent that it merely implies that central banks occasionally change interest rates by small amounts for financial stability reasons, it might not entail a fundamental change in the monetary policy framework. If so, it may be instructive to look at estimates of the effects of monetary policy based on data from recent decades. My interpretation of the available evidence is that a leaning-against-the-wind policy may exacerbate macroeconomic fluctuations.

Overall, I conclude that since central banks don't know when to respond to financial markets development but doing so is likely to have large, contractionary effects on the real economy, leaning-against-the-wind with monetary policy – as opposed to with regulatory and supervisory policy – would seem to be undesirable.

4.1. MONETARY POLICY AND THE CRISIS

Did monetary policy cause the crisis? It is now generally recognized that a number of factors played an important role in triggering the bubble that preceded the crisis. Severe incentive problems were plainly important. For instance, subprime lenders had little reason to conduct proper credit risk analysis in light of the fact that the loans would be securitized. Similarly, remuneration schemes in the financial sector encouraged short-term risk taking and herding. Furthermore, the fact that rating agencies sold advice to issuers about how to structure financial products so as to ensure a high rating was indicative of severe conflicts of interest in this important part of the financial system.

The crisis has also revealed weaknesses in the regulation and supervision of financial institutions. For instance, subprime mortgage originators were apparently not regulated. Furthermore, the existence in some countries of multiple regulatory agencies generated opportunities for regulatory arbitrage or for gaming the system. For instance, AIG was an unregulated business entity that exploited the

strength of its insurance affiliates that were large, regulated entities in good standing².

But while micro economic factors were of crucial importance, macro economic developments also played a role. In particular, the great moderation – the decline in the volatility of economic activity and inflation and the resulting increase in the predictability of monetary policy – led investors to conclude that financial markets had become much less risky. Together with the decline in expected returns, best captured by the fall in long real (indexed) interest rates, this triggered a search for yield that took two forms. First, investors increased leverage in order to raise returns. Second, they proved willing buyers of a range of new, highly complex and poorly understood financial instruments that promised higher returns at little extra risk, as evidenced by the fact that they frequently were triple-A rated.

What was the role of monetary policy in this process? Some prominent observers have argued that expansionary monetary policy pushed down real interest rates, and in this way stimulated the search for yield. But the argument that changes in policy-controlled short-term nominal interest rates impacted on long real interest rates seems incompatible with the idea that in the long run the real and nominal sides of the economy are approximately independent which provided the intellectual foundation for gearing monetary policy to low inflation.

Figure 1 (see page 57) contains plots of long real and short nominal interest rates in the UK and the US before the crisis erupted, and shows that that monetary policy indeed turned highly expansionary in the US in 2001 and, but less so, in the UK. Monetary policy was tightened from 2003-04 onwards, that is, some three years before the crisis erupted. In contrast, long real interest rates fell by half between the late 1990s and 2007, from around to 4% to around 2%, raising the prices of a range of assets and providing a powerful stimulant to financial market activity.

The monetary policy explanation thus faces the problem that theory suggests that the short nominal interest rates that central banks control should not have much impact on long real interest rates. Moreover, a cursory look at the data provides no support for the hypothesis that changes in monetary policy affected real interest rates.

4.1.1. Monetary policy responses to real interest rates

While monetary policy thus arguably played a negligible role in setting the stage for the crisis, it is interesting to ask the question whether the decline in long real

² See Kohn (2009).

interest rates could have induced central banks to adopt more expansionary monetary policies. That is, could there have been reverse causation?

To think about that issue, recall that monetary economics holds that the output gap, defined as the difference between the actual and the neutral level of output, depends on the wedge between the expected short-term real interest rate and the neutral real interest rate, and on the expected future output gap.

Suppose first that the neutral real interest is constant and the central bank cuts the nominal interest rate. If inflation is slow to adjust, the short real interest rate falls below the neutral rate, implying that monetary policy is too expansionary. Over time, this leads inflation pressures to build up, requiring the central bank after some time to raise the nominal interest rate in order to maintain inflation at the desired level. Excessively expansionary monetary policy will thus be undone after some time if the central bank seeks to stabilize inflation.

Assume next that the current and future neutral real interest rates fall, depressing long real interest rates, but that the central bank does not change the stance of monetary policy. With the actual real interest rate unchanged and the neutral rate having fallen, monetary policy is now too tight. For the central bank, it appears that, unexpectedly, economic activity is slowing and inflation falling. To maintain inflation at the desired level, it will reduce short-term nominal interest rates. Thus, theory suggests that policy-controlled interest rates, which are set or largely determined by policy, may respond to changes in long real interest rates, but that the converse is not true.

The idea that monetary policy may respond to changes in long real interest rates is also supported by data. To show this, I estimate a VAR model on monthly data from the UK for the one month nominal interest rate as a measure of the stance of monetary policy and the yield on indexed ten-year treasury bonds³. The sample starts in January 1993 when the Bank of England started to target inflation and ends in July 2007 before the financial crisis started. To identify the shocks I order the nominal interest rate first, which implies that the contemporaneous correlations of the innovations are attributed to the short, nominal interest rate affecting the long real rate⁴.

The first graph in the first column of Figure 2 (see page 58) shows the effects of shocks to the short, nominal interest rate. These rise on impact and continue to rise for a few months, before gradually returning to the initial level. Interestingly, the shock has virtually no impact on long real interest rates, as shown by the second graph in the first column.

³ See also Gerlach *et al.* (2009).

⁴ The results are not sensitive to the inclusion of prices and the output gap; similar results are obtained on US data.

The second column shows the effects of shocks to long real interest rates. As shown by the lower graph, these are highly persistent: after two years the real interest rate remains about 10 basis points above the initial level. Interestingly, nominal interest rates rise gradually, reaching the same level as the real rate after about twelve months, as indicated by the upper graph.

Overall, these results are strikingly supportive of the analysis above: innovations of short nominal interest rates have virtually no effects on long, real yields. By contrast, innovations in long real yields elicit over time a one-for-one response in short nominal interest rates.

4.1.2. The decline on long real yields

It thus seems that a change in long real interest rates is, with a delay, reflected one-for-one in the stance of monetary policy. Thus, the decline in long real interest rates in the decade before the crisis may have influenced the entire term structure of interest rates and thus triggered a search for yield. But why did long real interest rates fall?

Bernanke (2005) argued that the decline in real yields was due to a global savings glut, that is, a tendency for *net* savings to rise at the going real interest rate. As an illustration, Figure 3 (see page 58) shows that in Emerging Asia, saving was roughly constant as a fraction of GDP between 1995 and 2001. In contrast, investment spending fell sharply following the onset of the Asian financial crisis in 1997, partially because the investment spending had been at an unsustainably high level during the boom phase that preceded the crisis. Only after 2001 did saving start to rise in Asia (although the increase is fully matched by an increase in investment). Figure 4 (see page 59) shows the same graph for oil-producing countries. In this case investment was roughly constant between 1995 and 2005 but saving rose sharply from 1998 onwards in response to higher oil prices. While global saving and investment both fell from 2003 onwards, as shown by Figure 5 (see page 59), this is of course compatible with the idea that there was an incipient increase in saving relative to investment.

One way to think about a global saving glut is as a reduction in the demand for goods and services at the going real interest rate. To restore equilibrium, real interest rates would have to fall to the point where the interest rate sensitive components of spending had risen sufficiently to restore goods market equilibrium. Since it is generally agreed that housing investment is particularly sensitive to real interest rates, the global savings glut hypothesis thus suggests that we would have observed a global housing boom from about 2000 onwards, as indeed was the case.

It is important to note that this housing boom – and the consumption boom

fuelled by housing equity withdrawal in some countries – was not the source of the crisis, but rather a symptom of the underlying imbalances that set the stage for the subsequent developments. Indeed, had housing investment not risen, real interest rates would have had to fall even further to induce an increase in some other component of spending.

4.2. TWO VIEWS ABOUT MONETARY POLICY AND ASSET PRICES

But if monetary policy did not cause the crisis, could it have prevented it? How should interest rates be adjusted in there is evidence that asset prices are rising rapidly or if they are rising elevated levels? There are two views.

A growing number of observers argue that central banks should take an *activist approach* and raise interest rates if signs of financial imbalances develop. Central banks operating with explicit or implicit inflation targets react in principle to all developments, including rapid credit growth and the asset-price increases that are the defining characteristics of financial bubbles, which influence aggregate demand and impact on the outlook for inflation. But the activist view goes further than so in arguing that monetary policy makers should react to financial imbalances over and beyond what they imply for inflation at the two-to-three-year policy horizon that central banks typically focus on. Slowing asset-price increases and reducing credit growth is warranted, it is argued, because a bursting bubble can have disproportionately large effects on inflation and economic activity at longer time horizons than those central banks normally consider when setting interest rates.

The activist view relies on four empirical propositions being true. First, central banks can determine in real time what constitutes an asset-price bubble by looking for signs of financial imbalances that are supposedly easily identifiable. Second, such imbalances contain information that is useful for forecasting the future path of inflation and output, also beyond the two-to-three-year horizon. Third, monetary policy can be used to influence asset prices and there is no risk of “non-linearities” in the sense that a small increase in interest rates might lead to a collapse in asset prices and trigger a deep recession. Fourth, the improvement in economic performance resulting from a tightening of monetary policy to forestall an asset-price bubble exceeds the short-run costs of inflation falling below target and economic activity being weaker than it otherwise would have been.

The competing view, which we call the *wait-and-see approach*, holds that central banks have insufficient information to conduct policy in this way⁵. There are

⁵ See Kohn (2006 and 2008).

several reasons for this view. Most obviously, it is difficult to know when financial developments have become unsustainable since not all increases in asset prices are unwarranted. Moreover, by the time it starts to become clear that a bubble has formed, it has become too risky to tighten monetary policy since this may lead to an abrupt fall in asset prices and the risk of a sharp recession. There is also a risk that raising interest rates will do little to slow developments in the financial sector but that doing so will have a large effect on real economic conditions.

The wait-and-see approach thus holds that rather than gearing policy to asset prices, central banks should focus on the outlook for inflation and output and not react to a hypothetical future collapse in asset values. However if asset prices were to decline abruptly, central banks should be quick to reduce interest rates and to take whatever other measures are necessary to forestall a recession and inflation falling below the desired level.

These polar opposite views result from radically different assessments of how easy it is to diagnose financial imbalances and of the effects of monetary policy on asset prices and macroeconomic conditions. Next I review each of these issues separately.

4.2.1. The information content of financial imbalances

For it to be desirable for central banks to react with monetary policy to asset prices and credit growth it must plainly be the case that these variables contain information about future economic developments. Many authors, most recently the IMF (2009), follow the suggestion of Borio and Lowe (2002) and use the deviation of the current level of stock or property prices, or of credit, from a one-sided trend as a measure of financial imbalances⁶. The use of such “gaps” is natural and appealing in that they emphasize cumulative processes and seem suitable for capturing the gradual process by which financial systems tend to become overextended.

As emphasized by Borio and Lowe (2002), it seems likely to only “large” financial imbalances contain information about the future state of the economy. To operationalize this idea, the requirement that in order to be classified as a financial imbalance, deviations from trend must exceed an exogenously given threshold set by the analyst is typically used⁷. For instance, Assenmacher-Wesche and Gerlach (2009) use a threshold of 4% in the case of the credit-to-GDP ratio, 10% in the case of equity prices and 7.5% in the case of property prices.

⁶ Of course, in computing the trend it is essential that only current and past data are used.

⁷ The requirement that the deviations must persist for some time (typically four quarters) is also used by many authors.

Once financial imbalances have been defined, their information content for different variables can be explored. While the literature generally tends to focus on the information content of such “gaps” for future asset prices and banking crises, it appears more natural to study their information content for inflation and real economic activity since these are the goal variables of central banks. Indeed, only financial imbalances that impact materially on inflation and economic activity warrant an adjustment of monetary policy, even if their dissolution triggers disruptive adjustments in the financial sphere of the economy. Similarly, financial imbalances that unwind without triggering adverse dynamics in financial markets but do impact on broad macroeconomic conditions would seem to merit a monetary policy response.

Assenmacher-Wesche and Gerlach (2009) review the information contained in measures of financial imbalances constructed in the spirit of Borio and Lowe (2002) for inflation and output gaps, using a data set for 18 developed economies over a twenty-year period starting in the mid-1980s. Since central banks as a matter of course monitor inflation and output gaps and the stance of monetary policy as captured by short-term interest rates, Assenmacher-Wesche and Gerlach (2009) use a simple benchmark forecasting model only incorporating these variables. Next, they augment this equation using various combinations of the credit, equity price and property price gaps and compare out-of-sample forecasting performance of the benchmark and augmented models for forecast horizons ranging from 1 to 20 quarters. Importantly, they find that the models augmented with financial imbalances provide worse forecasts of both inflation and output gaps than the benchmark model, as could be expected given that they involve the estimation of more parameters on a finite data set.

However, one concern with financial imbalances is that they may have asymmetric effects. In particular their resolution may be associated with extreme tensions in the financial sector, leading to a collapse of aggregate demand and a large fall in economic activity and, potentially, the onset of deflation. The above forecasting experiments, which disregard the distinction between predicting increases and falls in inflation and the output gap, therefore miss the spirit of the activist view.

Assenmacher-Wesche and Gerlach (2009) therefore also consider forecasting dummy variables that are intended to capture “adverse macro economic conditions”, defined as an output gap of less than -1% or inflation being either negative or declining by more than 2 percentage points, over four quarters. In this case, the augmented models forecast better than the benchmark model, but the improvement is negligible. More importantly, all models considered falsely predict a large number of episodes of adverse macroeconomic conditions that in fact did not occur.

What should be made of these findings? One may argue that as a consequence of

the Great Moderation in the mid-1980s, inflation and output became more stable and therefore more difficult to forecast. Thus, part of the reason for the poor forecasting performance may be that the sample period is unrepresentative. But using data from the 1970s would seem to be inappropriate since the large gyrations in inflation, output, interest rates, credit and asset prices in that period arguably largely reflect poor monetary policy. Since monetary policy frameworks have improved considerably over time – *e.g.* central bank independence has risen, policy has become more clearly focused on achieving and maintaining low inflation, decision-making procedures have been strengthened, transparency has been increased, economic forecasting has improved – it seems difficult to argue that data from this period is relevant for modern central banks.

An alternative explanation for the weak forecasting performance is that the measures of financial imbalances used are poor and, in particular, lack theoretical underpinnings. For instance, rather than looking at equity and property prices relative to time trends, one could look at them relative to corporate earnings (or dividends) and rental income. While it certainly seems desirable to address these issues in future work, whether that would improve the forecasting performance is an empirical issue.

Another plausible explanation is that the use solely of data on economy-wide credit and asset prices misses important information. Perhaps better results could be obtained using measures of credit expansion for housing purchases or investment. Furthermore, data on housing investment or housing starts may also be informative about property price bubbles. Again, more work seems to be warranted.

But although the indicators of financial imbalances might be improved, it is difficult to deny that the notion that it is easy to construct measures of financial imbalances that are useful for monetary policy makers has been oversold. To my mind, the finding discussed above are best interpreted as indicating that it is inherently difficult to forecast rare events, such as large recessions, and that long run forecasting is not easy⁸.

4.3. EFFECTS OF MONETARY POLICY

One important consequence of the difficulties predicting future macroeconomic developments is that using discretionary monetary policy to deal with financial imbalances is likely to work poorly since false alarms are likely to be common.

⁸ Indeed, better long run forecasts than those coming from the benchmark model considered by Assenmacher-Wesche and Gerlach (2009) can be constructed by assuming that in the long run inflation and the output gap are at their means.

But what, then, would the macro economic consequences be if the central bank raised interest rates in response to a perceived financial imbalance?

Addressing this question is difficult because no central bank has conducted monetary policy in this way. One way to approach the question is to argue that this policy would in fact be similar to the policies central banks have pursued in the recent past, except that, on occasion, they would move interest rates a small amount in response to credit growth and rising asset prices. Assenmacher-Wesche and Gerlach (2009) suggest that, if so, the effects such as an occasional deviation from the current policy regime could be captured quite well by the type of econometric model commonly used to study the monetary transmission mechanism.

Alternatively, the adoption of a leaning-against-the-wind policy could constitute a fundamental change in the way in which central banks set interest rates. In particular, the announcement effects could be large, as participants would know that rapid increases of asset prices would not be allowed to go unchecked for long and would have to consider the consequences of the expected tightening of monetary policy on the profitability of their actions. In this case, little can be learned from data generated under other monetary policy regimes.

Assenmacher-Wesche and Gerlach (2009) investigate the effects of monetary policy on the economy, assuming that the new policy regime is quite similar to that used by central banks in the recent past. They draw several important conclusions. First, they argue that the effects of monetary policy on asset prices are about as well defined as those on real economic activity. The common notion that asset prices are driven largely by sentiment and are therefore insensitive to monetary policy thus appears to be wrong. Second, the effects of monetary policy in the economy in boom times appear to be broadly the same as that on the economy in normal times. Third, monetary policy elicits a roughly five times larger response of asset prices than real GDP. Fourth and finally, equity prices respond much more rapidly than property prices to monetary policy changes.

These latter two conclusions have direct implications for a leaning-against-the-wind policy. Most importantly, leaning with monetary policy against an increase in asset prices will depress real economic activity. For instance, if monetary policy was tightened in order to unravel a 20-30% bubble in property prices, a literal interpretation of these results would suggest that real GDP would fall by perhaps 5%, an unimaginably large number. Even if the effect on asset prices was ten times the effect on real GDP, tightening monetary policy to undo the property price bubble would depress real GDP by 2.5%, which also entails a large loss of output.

One could argue that the same estimates imply that using monetary policy to stabilize real GDP would also induce movements in asset prices. That is of course true but those effects would be much smaller since real GDP fluctuates much less

than asset prices over the business cycle. For instance, an attempt to raise real GDP by 2%, which is quite a larger amount, would lead merely to about a 10% rise in asset prices.

The finding that equity and property prices respond at different rates is also important, since it implies that monetary policy cannot be used to stabilise both asset prices. Thus, if central banks were to attempt to mitigate swings in property prices by moving interest rates, it seems plausible that equity prices would experience larger gyrations than otherwise.

Overall, the evidence thus suggests that a leaning-against-the-wind policy is likely to be costly in the sense that stabilising property prices will destabilise real GDP. Of course, this would not be a concern if high and rising asset prices coincide with real GDP above trend. If so, leaning against property prices would merely push real GDP back towards the trend. While this is true, in this case a leaning-against-the-wind policy would be superfluous since central banks typically raise interest rates if real economic activity rises above trend.

4.4. CONCLUSIONS

The analysis above suggests the measures of financial imbalances proposed in the literature in practice to contain little information useful for predicting the future path of the economy. While it no doubt is feasible to construct better measures of financial imbalances, forecasting – particular beyond the two-three horizon central banks typically use – is inherently difficult. The notion that discretionary monetary policy can be used to prevent bubbles from forming therefore seems excessively optimistic. Furthermore, while monetary policy does have a powerful effect on asset prices, it also has important effects on real economic activity. It thus seems likely that leaning-against-the-wind with monetary policy is likely to amplify macroeconomic fluctuations, perhaps greatly. Overall, these two findings urge caution in adopting a leaning-against-the-wind policy.

While this conclusion may be discouraging, central banks and financial regulators have other sources of information, including supervisory data, that can be used to assess whether the financial imbalances are emerging. Moreover, they retain tools beyond interest rates that can be used to reduce the likelihood and severity of asset price bubbles. Overall it appears more appropriate to focus on regulation and supervision in seeking to maintain financial stability. Only if these tools are ineffectual is it desirable to use monetary policy measures.

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Figure 1

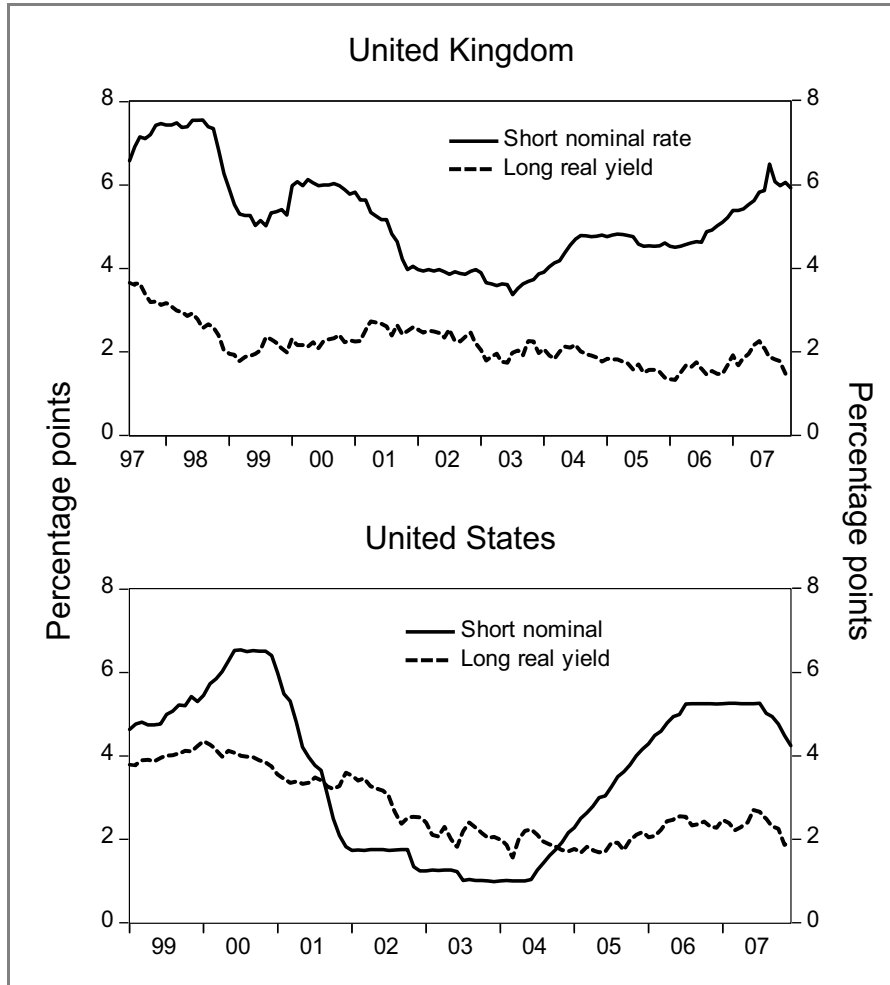


Figure 2

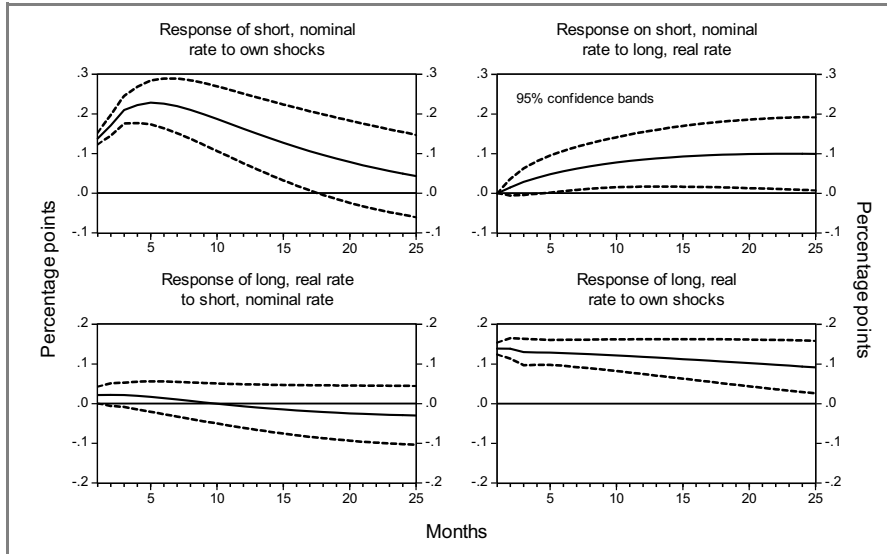


Figure 3: National saving and investment rates
(in % of area related GDP; Source: Moïc and Frey (2006, p. 4))

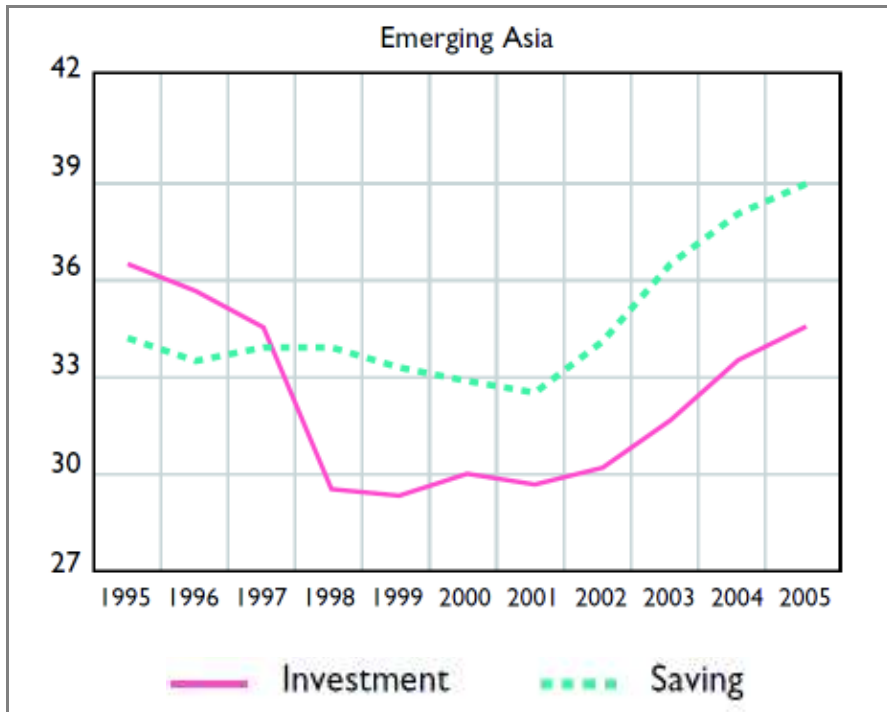


Figure 4: National saving and investment rates
(in % of area related GDP; Source: Moëc and Frey (2006, p. 4))

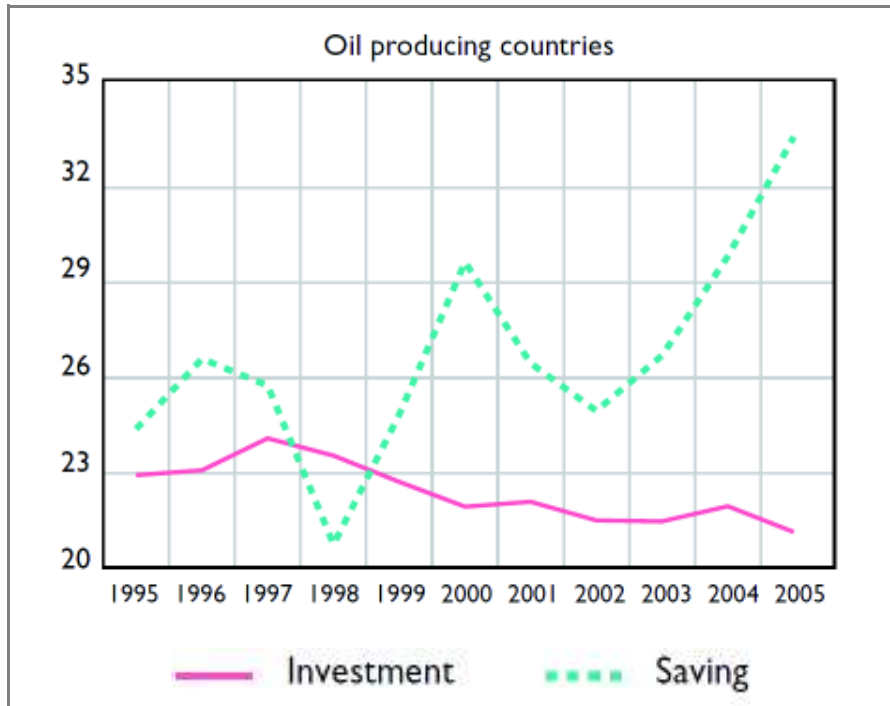


Figure 5: Global Saving and Investment
(Percent of world GDP; Source: IMF (2005, p. 92))

