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Monetary Policy in Singapore and the Global Financial Crisis

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MONETARY POLICY IN SINGAPORE AND THE GLOBAL FINANCIAL CRISIS

Chow Hwee Kwan and Peter Wilson

"I'm forever blowing bubbles, pretty bubbles in the air. They rise so high they reach the sky and like my dreams they fade and die." (West Ham United supporters' song)

SINGAPORE'S MONETARY POLICY RESPONSE TO THE FINANCIAL CRISIS

Prior to the crisis the consensus amongst central bankers in advanced economies was that price stability, in the form of low and stable price inflation, was a top priority for monetary policy and could best be achieved by targeting interest rates (usually overnight) or monetary aggregates, such as Narrow Money (M1) and Broad Money (M2). Liquidity in the banking system could be flexibly adjusted on a daily basis through open market operations to increase or decrease the

monetary base which would be transmitted to the rest of the economy through financial intermediation. Financial markets would then adjust longer-term interest rates relevant to the real economy, such as mortgage rates and 12-month corporate bond rates, and could largely be left alone to price risk and allocate credit efficiently, since financial markets were generally considered to be rational and efficient.

But there is a problem if banks will not lend because lenders are worried that loans will not be repaid or could not be sold on. The result is a credit crunch reflected in a widening of interest rate spreads as banks borrow cheaply from the central bank but lend to their customers at much higher rates (or not at all) in the inter-bank market. This clogs up the traditional monetary transmission mechanism and eventually spills over into the real economy and produces a deflationary spiral. Monetary policy thus becomes powerless as everyone rushes into cash to fill the holes in their short-term funding and any increase in the monetary base engendered by the central bank ends up mostly in the reserves held by the banks themselves rather than in the money supply. The problem is compounded by the fact that no central bank can reduce nominal interest rates below zero.

Once the global financial crisis had clearly broken in the second half of 2008[69] and it was clear that reducing nominal interest rates and providing more liquidity through traditional channels was insufficient, the emphasis quickly switched to avoiding a loss of confidence in the financial markets, a catastrophic fall in spending and asset prices and a full-blown depression of the 1930s variety. Central banks responded by offering emergency measures in the form of more types of credit, easier borrowing conditions and longer terms for loans. The European Central Bank (ECB), for example, guaranteed unlimited funds for up to six months instead of one week. Meanwhile in the autumn of 2008 the US Federal Reserve (FED) introduced targeted direct lending to the private sector *via* purchases of commercial paper and its Term

[69] See Asian Development Bank (2009) and Chapter 2 of this book for the timeline of the crisis.

Asset Backed Securities Loan Facility (TALF), which purchased asset-backed securities collateralized by student loans, credit card loans and loans guaranteed by the Small Business Administration, and the US Government agreed to buy assets and equity from financial institutions through its Troubled Asset Relief Program (TARP).

Moreover, with interest rates close to zero central banks had effectively begun to increase the monetary base through 'quantitative easing' or the monetizing of debt. In the UK the Bank of England bought gilts and corporate debt to increase liquidity and the Bank of Japan purchased medium and long-term government bonds and asset-backed securities and equity and paid for them by 'printing money'.[70] In the US the FED extended its balance-sheet with new assets and liabilities without sterilization. Even the European Central Bank engaged in the practice by increasing the range of assets it was prepared to accept as collateral. More unorthodox measures were introduced where necessary and in many cases governments stepped in to guarantee bank deposits to prevent 'a run on the bank' or the switching of deposits to other countries, such as the Irish Republic, where such guarantees were already in place. In the UK the government took troubled bank Northern Rock into national ownership in February 2008 following a 'run on the bank' in 2007 and acquired a significant stake in other threatened banks, such as the Royal Bank of Scotland. Rescue packages guaranteed potential losses and credit guarantees allowed banks to issue bonds backed by government loans.

In Asia, where the direct financial effects of the global crisis were much less severe, governments tended to respond with more orthodox monetary and fiscal policies (apart from Japan which had been fighting deflation since the early 1990s and whose central bank had been engaged in explicit quantitative easing since 2001), including monetary easing to ensure adequate liquidity and main-

[70] Other, more creative methods, used to increase liquidity have included the Bank of Japan's lending of foreign exchange reserves to Japanese companies operating abroad, such as Toyota, and letting small and medium sized enterprises borrow using cuttlefish and sea slugs as collateral.

tain the flow of credit and stimulatory fiscal packages to sustain spending in the economy.

This was also the case in Singapore which, as suggested in Chapter 2, was not significantly affected by the direct financial fallout from the sub-prime mortgage crisis and resulting credit crunch. Although Singapore's banks had become more internationalized since the late 1990s and had been active in cross-border mergers and acquisitions in the Asian region, large foreign multinational banks are not dominant in the domestic banking system, so it was easier for Singapore's central bank, the Monetary Authority of Singapore (MAS) to carry out its supervisory functions and ensure a continuation of lending.[71]

Whilst discretionary macroeconomic policies in Singapore are seen to be broadly countercyclical, especially during prolonged downturns, when they can help to cushion the impact and prevent a more severe deterioration in domestic activity than might otherwise be the case, it has long been recognised that the power of such policies is limited by the ultra-openness of the economy. Not only is the Republic particularly exposed to externally-driven demand shocks, but any adjustment through a change in domestic expenditure is weakened by a very high import leakage.

Monetary policy in Singapore since 1981 has been explicitly aimed at providing an environment for sustained non-inflationary economic growth and price stability over the medium-term horizon but, as we shall see, it is also designed to be countercyclical in the shorter run, especially when the economy is overheating and inflationary pressures threaten, as in the second half of 2007. In addition the financial system has, by and large, been well-regulated and a high savings policy has provided a large and growing pool of foreign exchange reserves to reinforce the credibility of exchange rate policy and provide the means for the MAS to actively engage in the foreign exchange market to

[71] According to an interview given by the Managing Director of the MAS to the Singapore Straits Times on 10th April 2010, of the 150 foreign banks operating in Singapore none of them suffered a "major incident" during the crisis. AIA, the local subsidiary of the giant insurance company AIG was also largely unaffected despite AIG itself being on the verge of collapse in September 2008.

manage the Singapore dollar on a daily basis. On the other hand, there seems to be a psychological limit to the willingness of the MAS to push the Singapore dollar *substantially* downwards if the economy is moving into a potentially deep recessionary phase, since this conflicts with its overriding mission (as with other central banks) to preserve the purchasing power of the local currency in global markets to safeguard the value of private savings, compulsory Central Provident Funds (CPF) and the official foreign exchange reserves.[72]

Crucial, therefore, to macroeconomic adjustment in Singapore during severe contractions, are complementary policies which can take some of the heat out of exchange rate adjustment. Historically this has been helped by automatic labour market adjustment through a fall in wages, together with direct cost-cutting exercises by the government, including reductions in employer contributions to the CPF and price reductions by the public utilities. In 1998, for example, a package of cost cuts together with improvements in productivity and wage restraint effectively cut unit business costs by an impressive 12% in 1999 compared to the previous year (Peebles and Wilson, 2005).

In the past, there is a case for saying that the main brunt of the burden of adjustment to recessions in Singapore has been borne by domestic workers through wage cuts and cuts to their employers' CPF contributions and by foreign workers on short-term contracts who have been sent home. Interestingly, in the current crisis, although there has undoubtedly been a significant cut in wages and exodus of foreign workers, the impact on Singaporean workers was significantly softened by the Skills Programme for Upgrading and Resilience (SPUR) and the subsidies to employers provided through

[72] Moreover, even if the TWS$ were depreciated strongly, the competitive benefits for Singapore's exports would be small while the pass-through of higher import costs into domestic prices and costs would be very strong and quick given Singapore's dependence on imports. All the evidence suggests that it is income effects not price effects which drive Singapore's exports so that the expenditure switching benefits of a large devaluation are small and transitory. The protection of Singapore's savings is part of the implicit social contract between citizens and the government. See Chapter 11 for further details.

the January 2009 S$4.5 billion Jobs Credit Scheme which was designed to keep Singaporeans in employment.[73]

One way to think about this is that during a recessionary phase in the business cycle there is a need to reduce the real effective exchange rate to offset the fall in external demand. This can partially be done by a central-bank induced depreciation of the nominal trade-weighted Singapore dollar (TWS$) but this can be reinforced by a fall in domestic costs. For a historical look at these issues, see Peebles and Wilson (2005).

The difficulties for monetary policy are compounded by the fact that the Singapore government appears to be very reluctant to use fiscal policy automatically as a countercyclical tool in the same way as in other countries, but rather prefers to apply fiscal measures in an *ad hoc* and temporary fashion during downturns. This stems partly from the very large import leakage from a dollar of government spending, but also from a long-term commitment to budget surpluses to support a high savings rate, an ideological aversion to universal welfare payments and the desire to focus fiscal policy on long-run goals, including the attraction of export-oriented mobile foreign capital and social goals, such as increasing the citizen birth rate and reducing traffic congestion.

In the recent economic downturn both monetary and fiscal policies were employed in Singapore to lighten the impact of the global crisis on the domestic economy but the main emphasis was undoubtedly placed on the fiscal response.[74] The FY2009 Budget was brought forward to January and included a S$20.5 billion Resilience Package (about 8% of GDP) to save jobs, enhance the cash flow and the competitiveness of firms, support families, and strengthen the economy's long-term capabilities. A key feature of the package was the S$4.5 billion Jobs Credit Scheme, which provided cash grants to employers to subsidise part of their local wage bill. The government also extended S$5.8 billion in capital for a

[73] The adjustment of the labour market during the crisis and the role of government subsidized training schemes is the focus of Chapter 5.

[74] See Chapter 9 for details on Singapore's fiscal policy in relation to the crisis.

Special Risk-Sharing Initiative (SRI) to co-share risks with the banks and stimulate bank lending and ensure that a broader segment of companies had access to credit to sustain their operations. In addition, to reduce the cost burden and ease the cash flow of businesses, a number of tax measures were introduced including a 40% property tax rebate for industrial and commercial properties and a reduction in the corporate income tax rate. To address longer-term structural issues the government pressed ahead with investment in infrastructure, education, healthcare and research and development. These investments stimulate aggregate demand in the short-run but have the added merit that they also produce some longer-term social return.

As far as monetary policy specifically is concerned, the priority in Singapore, as in other countries in the region was to ease monetary policy, increase liquidity and prevent a mass withdrawal of deposits. Bank deposits were fully guaranteed until 2010 and the MAS arranged a US$30 billion foreign exchange swap with the US Federal Reserve (FED) to enable banks to get access to emergency liquidity should it be needed. MAS also loosened monetary policy, but to understand how this was actually implemented, requires some elaboration on Singapore's rather unique exchange rate-centred monetary policy.[75]

Since 1981, Singapore's monetary policy, summarised in the acronym 'BBC' or basket, band and crawl, has been centred on the exchange rate with the primary objective of ensuring domestic price stability as an anchor for macroeconomic stability in general and a sound basis for sustainable economic growth.[76] The exchange rate is monitored and 'managed' against a trade-weighted basket of currencies (TWS$) of Singapore's major trading partners and

[75] For the exchange rate aspects of Singapore's monetary policy see Chapter 10.

[76] There is no doubt that, despite its unorthodoxy, monetary policy in Singapore has been very successful since 1981 in helping the economy to adjust to periodic economic shocks. It has delivered a stable currency and low and stable consumer price inflation without sacrificing economic growth and employment, and has avoided balance of payments crises. See Wilson (2002) and Peebles and Wilson (2009).

competitors but is allowed to float within an undisclosed policy band determined by the MAS in order to absorb short-term market volatility. A particular policy band for the TWS$ is identified twice a year in April and October which will ensure price stability over the medium term and the 'monetary policy stance' is communicated to the public in an official Monetary Policy Statement (MPS). This can be fine-tuned if necessary through a 'crawl' mechanism to prevent the TWS$ from becoming misaligned if conditions change in the period before the next policy announcement. The precise width of the policy band and the weights used to calculate the TWS$ are not released to the public but market participants and academics can usually make reasonable guesses about them. This allows the MAS some room to 'surprise' the market on a day-to-day basis to prevent excessive speculation against the Singapore dollar.

Singapore's decision to forego the use of traditional monetary policy instruments, such as interest rates and monetary aggregates, is a consequence of its extreme openness to international trade and capital flows and its desire to 'manage' the currency to some degree. Because Singapore imposes negligible protection against imports from the rest of the world and has little by way of natural resources it must import most of what it needs and export to pay for it. As a result it is a classic price taker in international goods markets and the combined ratio of its exports and imports to GDP — a measure of openness to trade — is in excess of three. What the MAS has done since 1981 has been to turn this import dependence into a virtue by taking advantage of the powerful link between the exchange rate, import prices, and domestic prices. Because domestic prices are largely determined by world prices for a given exchange rate, intervention to appreciate the TWS$ effectively lowers import prices and, subsequently, wholesale and consumer prices, as the effects of the appreciation 'pass-through' to the domestic economy. On the other hand, if inflation is not a threat and there is a risk the economy will slow down or slip into recession, the TWS$ can be depreciated to enhance export competitiveness. Empirical studies have shown that the exchange rate is an effective instrument of monetary policy in Singapore and bears a stable and predictable relationship with price

stability as the ultimate target of monetary policy over the medium term. See, for example, the policy simulations carried out in Abeysinghe and Choy (2007).

A second factor determining the choice of monetary policy in Singapore is Singapore's openness to international capital flows. Foreign exchange controls and restrictions on inflows and outflows of capital were resmoved in 1978 and Singapore has always adopted an 'open-arms' approach to foreign investment.[77] There is also a very close relationship between the domestic banking system and the substantially larger offshore Asian Dollar Market or ADM.[78] There is, in essence, almost perfect capital mobility and substitutability between domestic (onshore) and foreign (offshore) financial assets. The consequence of this is that interest rates in Singapore are essentially determined by world money markets.[79] Singapore is, in the financial sense, too small to set its own interest rates in any effective way and the MAS does not seriously attempt to manage interest rates or money aggregates. What it does do, however, is carry out money market operations on a daily basis to ensure that there is sufficient liquidity in the local banking system to satisfy the banks' demand for cash balances to meet their intra-day settlements amongst themselves and with the central bank and to neutralize the effects on the domestic money supply of its own

[77] Although there have been some restrictions in place since 1981 to limit the offshore use of the Singapore dollar to prevent speculation.

[78] The ADM is a market where the banks in Singapore which are licensed to deal in the ADM can lend and borrow in a foreign (offshore) currency, usually the US dollar. Even if the transaction is in another currency, such as the yen, it is still referred to by convention as the Asian Dollar Market.

[79] This is reinforced by the well-known 'policy trilemma' which suggests that central banks will have to sacrifice traditional monetary autonomy in terms of targeting domestic interest rates or money aggregates if they wish to 'manage' the currency and keep the capital market open. Because managing the currency is thought to be more effective in Singapore in achieving low and stable inflation than traditional monetary instruments the MAS gives up the latter in favour of an exchange rate centred monetary policy.

foreign exchange operations.[80] Since the money markets continued to operate normally in Singapore there was no need for the MAS to actually provide extra liquidity. In central banking jargon 'no extraordinary measures have been needed'. In any case it could not do so since its money market operations are the endogenous result of its need to keep the TWS$ within its targeted policy band.

Interpreted in this way, Singapore's monetary policy response to the global crisis was to provide any needed liquidity within the TWS$ policy band and to loosen monetary (exchange rate) policy. By the end of 2007 MAS had progressively tightened policy in response to increasing domestic and external inflationary pressures by increasing the slope of the TWS$ policy band (Figure 1) and policy was further

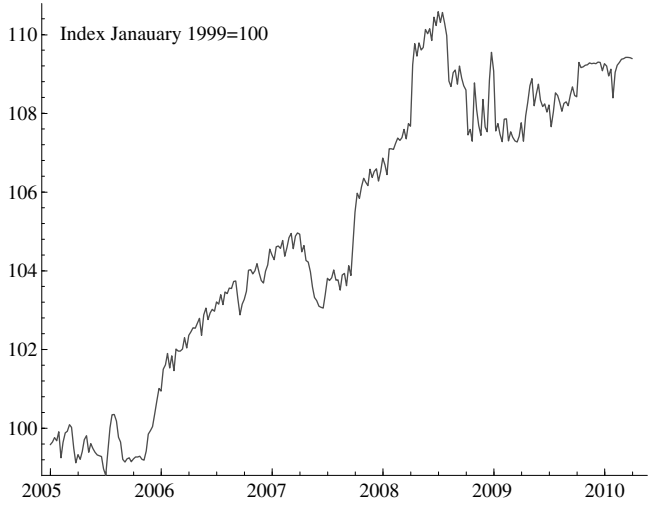

Figure 1: The Trade-Weighted Singapore dollar 2005–2010.

Source: Monetary Authority of Singapore financial database, mas.gov.sg.

[80] For example, when liquidity is drained from the banking system by government budget surpluses or a rise in net contributions to the CPF, MAS may use money market operations, such as open market purchases of government bonds, to inject liquidity back into the money market and keep domestic interest rates stable. Sterilization is not, it seems, an automatic response to neutralize its own forex market operations but depends on the balance of other factors affecting money market liquidity at the time.

tightened in April 2008 by re-centring the policy band upwards to the prevailing level of the TWS$.[81]

Then in October 2008, against the backdrop of a fragile global economy and dissipating inflationary pressures MAS moved to a neutral stance by flattening the TWS$ policy band and in April 2009 eased further by re-centring the band downwards to the prevailing level of the TWS$ but retaining the zero percent appreciation path. In October 2009, with the TWS$ fluctuating in the upper part of the policy band due to weakness in the US dollar and a surge in capital inflows into the region, the zero percent appreciation was maintained but with no change to the width of the policy band or the level at which it was centred. This was a response to the rebound in the economy in the second and third quarters of 2009.

Finally, in April 2010, and in concert with other central banks in the region, MAS began once again to tighten its monetary policy stance by re-centring the exchange rate policy band to the prevailing level of the TWS$ and shifting the policy band from a neutral zero percent appreciation back to one of 'a modest and gradual appreciation'. This is predicated on the view that the domestic economy has now rebounded from the downturn and is expected to continue on a firm recovery path. The official growth forecast for 2010 was revised upwards to between 7% and 9% in April 2010 and further in July to a sizzling 13–15%. At the same time, inflationary pressures resulting from rises in global commodity prices as well as some domestically-driven cost pressures are expected to increase in the months ahead as the labour market tightens and liquidity remains high given low global interest rates and a continuing inflow of foreign capital.

[81] There was some debate about whether MAS should have tightened further in October 2007 given the sharp rise in inflationary pressures. MAS' own counterfactual simulations suggest, however, that had there been further tightening this would have injected greater volatility into the economy and exacerbated the fall-off in prices when the global economy slowed in the second half of the year, taking into account the long time lags typically associated with the exchange rate pass-through process. Thus, the subsequent decline in economic activity would have necessitated a sharper reversal of policy in October 2008.

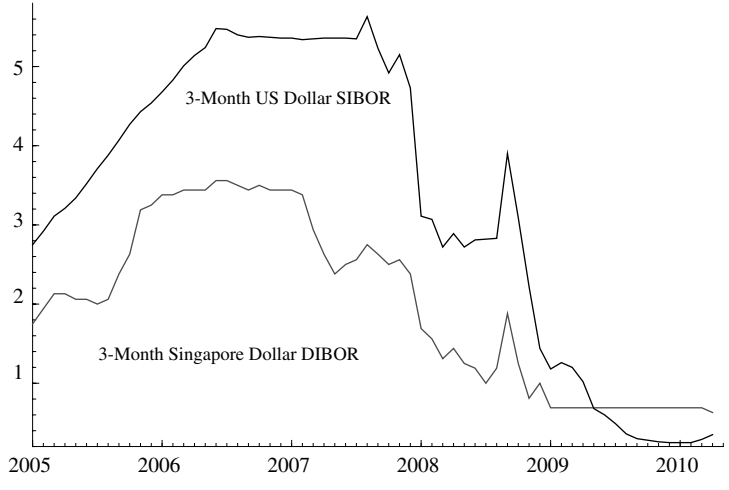

Figure 2: Interest rates in Singapore 2005–2010.

Source: Monetary Authority of Singapore financial database, mas.gov.sg.

Consumer price inflation is now forecast to come in at around 2.5% to 3.5% this year compared to 0.6% last year.

Figure 2 plots the 3-month Singapore interbank offer rate (SIBOR), which captures global interest rates measured in US dollars, and the 3-month Domestic Interbank Offer Rate (DIBOR) denominated in S$. Figure 3 plots the Domestic Liquidity Indicator (DLI), which is a measure of overall liquidity conditions in Singapore combining changes in the TWS$ and DIBOR. A rise in the index signals a monetary tightening compared to the previous quarter.[82] Liquidity tended to become tighter by the third quarter of 2007 as inflationary pressures increased but interest rates subsequently fell sharply as global rates were pushed down by central banks in response to the credit crisis and monetary conditions in Singapore were broadly accommodative (downward trend in the cumulative DLI) from about August 2008 as the crisis unfolded. Only in mid-2009 did the DLI begin to stabilize.

[82] Note that when interest rates are fairly constant, as in 2009 and 2010, the DLI is almost entirely driven by changes in the TWS$.

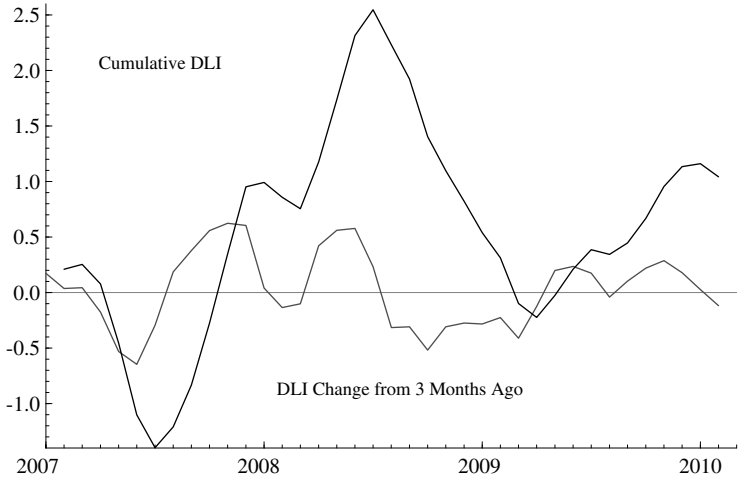

Figure 3: The Singapore domestic liquidity indicator 2007–2010.

Source: Monetary Authority of Singapore financial database, mas.gov.sg.

Figures 4 and 5 graph the level of domestic credit to the private sector and its growth over time. Credit growth reached a peak in May 2008 and declined thereafter. Despite the fact that the cost of borrowing was falling to low levels, making it cheaper to borrow, the demand for domestic credit in Singapore tends to be more responsive to the overall level of activity in the economy.[83] The financial impact of the crisis on Singapore was thus cushioned by the fact that the fall in domestic non-bank loan growth, which occurred alongside the contraction in overall GDP, was less severe than during the Asian financial crisis of 1997 and the 2001 downturn, due to strong demand for credit in the building and construction industry and from the residential housing sector.[84] As Figure 5 shows, total and business loan growth from the previous year did fall between Q4 2008 and Q3 2009 but consumer loan growth was quite resilient.

[83] See Monetary Authority of Singapore (2009).

[84] Based on Monetary Authority of Singapore (2009) estimates, the peak-to-trough decline in domestic banking units' non-bank loans was 0.8% between the third quarter of 2008 and the first quarter of 2009 compared to a 4.0% fall during the previous two recessions.

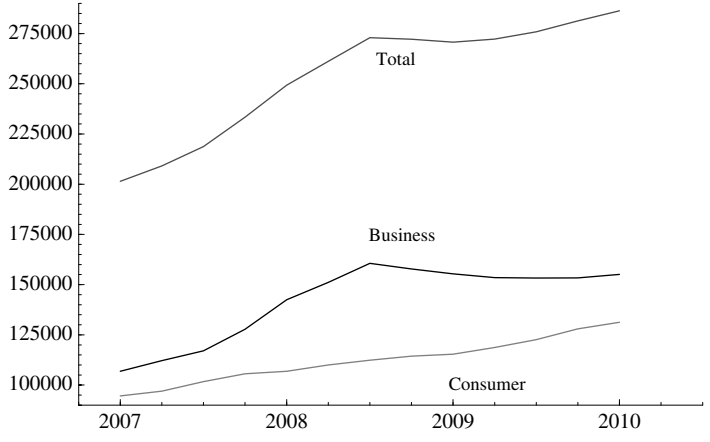

Figure 4: Singapore's bank lending to non-bank customers, S$ million, 2007–2010.

Source: Monetary Authority of Singapore database, mas.gov.sg.

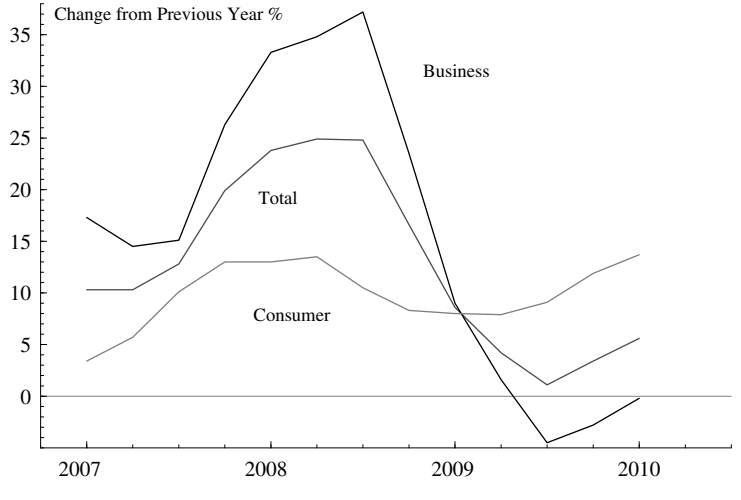

Figure 5: Growth in bank lending to non-bank customers in Singapore 2007–2010.

Source: Monetary Authority of Singapore financial database, www.mas.gov.sg.

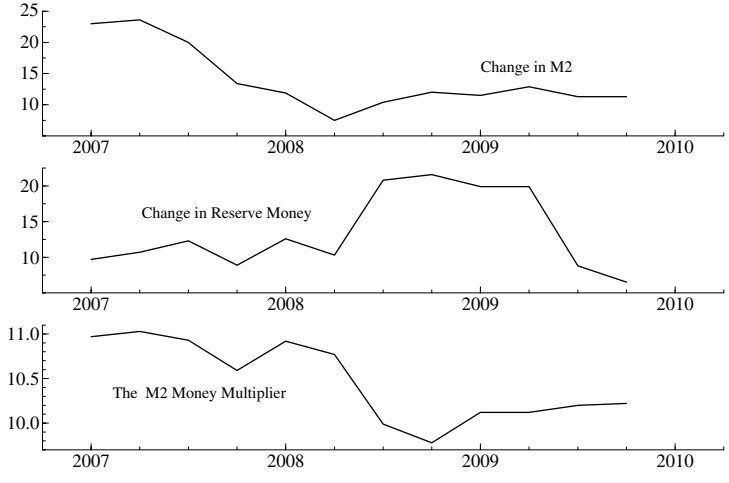

Figure 6: Monetary aggregates 2007–2009.

Source: Monetary Authority of Singapore financial database, mas.gov.sg.

As far as money aggregates are concerned (Figure 6), the broad measure of the money supply (M2), which is determined by both changes in the monetary base (reserve money) and the intermediation of reserve money by the banks through the money multiplier process, fell sharply following the contraction in output in 2008 but stabilized in 2009 as the economy recovered.[85] During the crisis the demand by banks for reserve balances rose as a result of growing liabilities with a spike in September 2008 following the collapse of Lehman Brothers and uncertainty over counterparty credit and illiquidity in international funding markets. At the same time the banks kept higher cash balances as a precautionary measure. Public sector transactions, however, which also affect money market liquidity, were, on balance contractionary, especially at the start of the fiscal year.

[85] Broad money in Singapore comprises demand deposits and currency in circulation, together with 'quasi-money' such as fixed savings deposits held in banks plus negotiable certificates of deposit issued by Singapore banks in Singapore dollars. Reserve money is notes and coins held by the public plus banks' vault cash and current accounts with the MAS.

The behaviour of reserve money and broad money is also complicated by net capital inflows from abroad, which increase the monetary base and tend to appreciate the currency, and the actions of the MAS to sterilize the liquidity effects of its own foreign exchange operations on the money market. In 2009, for example, capital inflows picked up significantly and if MAS intervenes in the forex market to dampen excessive volatility by selling the Singapore dollar in exchange for US dollars, this will also increase the monetary base and may require offsetting sterilization through money market operations. This explains why a capital inflow need not automatically lead to a corresponding rise in the monetary base and M2 in Figure 6.

Taking all these factors into consideration, the increase in reserve money (Figure 6) was modest.

In sum, the MAS responded to the crisis by loosening the monetary policy stance by flattening the exchange rate policy band and then re-centring it downwards. From the middle of 2008 overall domestic liquidity, as measured by the DLI, trended downwards as interest rates in Singapore fell in line with a fall in global rates to low levels as economic activity slackened and central banks eased monetary policy. At the same time, broad money in Singapore fell as bank intermediation of reserve money contracted and banks increased their demand for reserve and settlements balances and the fall in GDP reduced the number of transactions. To counter overall contractionary forces operating in the local money market net of its own foreign exchange operations, MAS carried out money market operations to ensure sufficient liquidity in the banking system.

However, monetary policy in Singapore does not work alone. Indeed fiscal policy has played a larger countercyclical role during this crisis than in the past and was probably quantitatively more important than monetary policy. In fiscal year 2009, the government recorded a primary deficit[86] of about S$4 billion following surpluses of S$3 billion

[86] This is defined as operating revenue excluding net investment income or returns less the sum of operating and development spending. The investment income or returns are excluded on the grounds that they are volatile.

and S$7 billion in the previous two years. Revenue fell because of a fall in tax receipts while both operating and development expenditure increased. Using the 'Fiscal Impulse' (FI) measure to better capture the overall stance of fiscal policy[87], it clearly switched from being contractionary in 2007 to expansionary mode in 2008 and 2009 (Monetary authority of Singapore, 2010). Moreover, simulations by the Monetary Authority of Singapore (2009) suggest that the measures introduced in the January 2009 budget would add approximately 1.5 percentage points to GDP growth in 2009 and reduce headline inflation by 0.2 percentage points. Monetary policy, by comparison, would have had a smaller impact on GDP growth, although it may have helped to alleviate some of the burden on exporters' revenue streams at a time when they were being hit by falling sales orders.

Overall, therefore, both monetary and fiscal policy switched from being contractionary in 2007 when the economy was operating above potential to expansionary in 2008 and into 2009 when GDP started to fall below potential as the global crisis began to impact the Republic. Although one can always argue that the magnitude of the fiscal and monetary stimuli could have been larger, the fact remains that the economy has recovered much more quickly than expected and the depth of the recession was much less severe than anticipated.

WHITHER MONETARY POLICY AFTER THE CRISIS?

What are the implications of the global financial crisis for the conduct of monetary policy in Singapore?

Clearly Singapore already had in place a number of safeguards to help insulate the domestic financial system from the crisis as it unfolded in the second half of 2008. The ability to access funds from other central banks, such as the FED, if necessary through swap arrangements was one of them. Also helpful was the 'domestic'

[87] The FI measure takes into account the effects of the cyclical performance of the economy on the budget.

nature of the banking system in Singapore in which local ownership over key financial institutions is predominant, despite the openness of the Singapore economy to trade and capital flows; and the ability of the MAS to provide funds and effect any necessary restructuring through 'moral suasion' rather than large bailouts or nationalization. Although Singapore had introduced substantial financial reforms in the late 1990s, including the gradual opening up of the local banking system to international participation, a change in emphasis from regulation to supervision in line with the prevailing view that financial markets were generally efficient, and an incremental switch from a rules-based to a risk-management approach, all of which might have increased the risk of contagion from the crisis, in fact Singapore's banks were not heavily exposed to toxic assets and by all accounts had sound financial fundamentals (see Chapter 2).

Nonetheless, some lessons have been learned. For example, the need to tighten supervision over off-balance-sheet activities in the 'shadow' banking system and the marketing and selling of structured investment products. In February 2010 MAS announced new safeguards, including a cooling-off period for structured products and published the findings of an investigation into the sale of structured notes linked to Lehman Brothers.[88] They found some non-compliance with MAS Notices and Guidelines and banned some financial institutions from selling them for periods between six months and two years. MAS also issued a consultation paper to review the 2006 Deposit Insurance Scheme and replace the full guarantee for individual bank deposits introduced during the crisis. The original insurance coverage of S$20,000, funded by banks and insurance companies licensed to accept deposits, will be increased to S$50,000 and the scope of the coverage of the scheme extended to non-bank depositors.

MAS is also responding to regulatory changes arising from the G-20 Finance Ministers and Central Bank Governors Financial Stability Board and Basel Committee on Banking Supervision and International

[88] According to the MAS some 80% of investors had recovered at least half of the money invested as of February 2010 (The Straits Times, April 10, 2010).

Accounting Standards Board, which are due to be implemented by the end of 2012. Singapore has formed the Corporate Governance Council to update its standards on compensation and corporate governance for companies listed in the Republic. More regulatory changes are expected.

From a monetary policy perspective, the failure of the traditional reliance on interest rates and money aggregates operating through the financial intermediation of banks was of less relevance to Singapore given its exchange-rate centred monetary policy, but it does emphasise again the limitations of this policy in dealing with a severe downturn in the absence of a strong fiscal stimulus and, if necessary, other unorthodox cost-cutting measures. It also raises an interesting question: if necessary would MAS resort to extensive quantitative easing along the lines of the US and UK if the domestic financial system were on the brink of collapse?

Surprisingly, there are no obvious institutional or psychological constraints to this happening. The MAS is not an independent central bank and there is no historical evidence to suggest that it would be unwilling to cooperate with the Finance Ministry to provide targeted direct lending to the private sector if necessary. Neither is there any reason to believe that it would rule out the 'nuclear option' of 'printing money'. Singapore does not run a currency board system in the same manner as Hong Kong but it does have a Currency Board located within the MAS which, under the Currency Act, must maintain sufficient foreign assets in its Currency Fund to provide 100% backing for any currency notes it issues to the banks.[89]

However, since the Currency Board holds foreign currency reserves well in excess of the amount of currency in circulation, this should not be a binding constraint. Anyway the law could always be changed. Of course, quantitative easing would not be its first choice, given the inflationary risks, but it need not be ruled out. The more subtle problem would be whether the subsequent increase in liquidity

[89] For the differences between the currency boards in Singapore and Hong Kong, see Peebles and Wilson (2002).

would depreciate the Singapore dollar to an unacceptable level in terms of its purchasing power in international markets. On the other hand, one of the lessons from the credit crunch is that there may be worse things than inflation, and financial stability, as opposed to price stability, may need to be incorporated more explicitly into the policy objectives of central banks.

Allied to this is the controversial issue whether a central bank should tighten monetary policy preemptively in order to moderate asset price bubbles before a sudden bust triggers financial instability, such as a large rise in non-performing loans?[90]

An asset price bubble is generally characterized as a persistent increase in an asset price that is not fully justified by fundamentals but is caused by speculative activity and occurs mostly in periods of easy credit and high leverage. The buildup in the asset price misalignment implodes at some point, often unexpectedly, with a sharp correction. An extreme case of this is what Noriel Roubini (2005, 2009) has described a 'monster bubble' when cheap credit leads to speculative leveraging in a wide range of risk assets, including commodities. When central banks eventually tighten monetary policy, the unwinding leads to a crash.

On the other hand, if the burst in economic activity is more akin to Mishkin's (2008) 'echo bubble', the situation may be far less serious since it is merely a reaction to a crash caused by loose monetary policy and 'irrational exuberance', such as the 1987 stock market collapse. Since there is no cycle of leveraging against higher and higher asset values, the bubble will eventually peter out and central banks are justified in keeping interest rates low.

Figure 7 depicts the Singapore residential property price index and the share price index from the first quarter of 1985 to the last quarter of 2009. The Singapore housing market experienced several boom-bust cycles during this period, with an average quarter-on-quarter growth of 1.5%. Sharp appreciations in house prices occurred in periods of rapid

[90] Much of the discussion here has been taken from Chow and Choy (2009). For more on the debate over the relationship between monetary policy and bubbles, see Bernanke and Gertler (2001), Mishkin (2008), Roubini (2005) and White (2009).

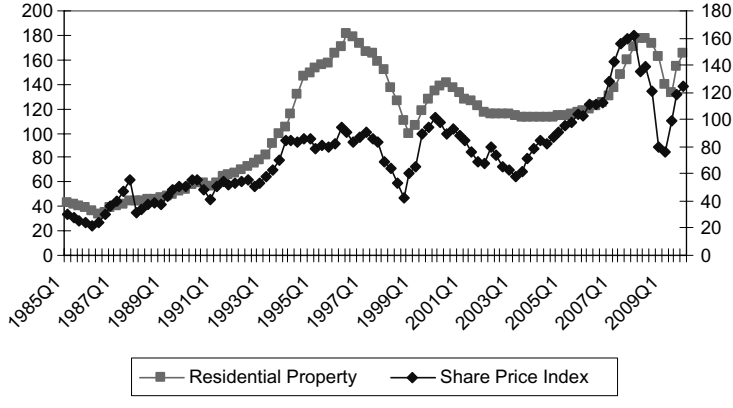

Figure 7: Singapore residential property and stock price indices.
Source: CEIC Database and International Monetary Fund International Financial Statistics.

economic growth and were mostly associated with the liberalization of the housing finance sector and, in particular, CPF regulations. Conversely, downturns in house prices coincided with economic recessions or the implementation of anti-speculation measures such as direct credit controls. The quarter-on-quarter house price inflation rates range from –14.1% to 15.8%, partly reflecting the rise and fall of foreign investor interest in the Singapore property market.

Compared to house prices, stock prices in Singapore have a higher average quarter on-quarter growth rate of 2.3%. As expected, swings in stock price cycles are more pronounced with the growth rates spanning a wider range of –43.1% to 42.8%. The cyclical behavior in stock prices is related to business cycles as well as the ebb and flow of foreign portfolio investment in the local stock market.

Should central banks react to bubbles using the instruments of monetary policy?

One lesson from the present global financial crisis is that policymakers should not practice benign neglect in the face of asset price bubbles. If the bubbles are big enough the result could be inflation and then a fall in economic activity below desired levels which monetary policy may not easily be able to rectify after the fact. Moreover, not leaning against asset prices could be more harmful to the economy

because mopping up after the event can be very costly and may give rise to 'moral hazard' and further bubbles if investors believe that the central bank is providing insurance against downside risks. This may then encourage them to take on excessive risks during the upswing, thereby exacerbating the bubble. On the other hand, tightening monetary policy during an upturn would reduce the financial institutions' exposure to bad debts and lessen the severity of subsequent real and financial disruptions. Furthermore, credible statements by the central bank that it is concerned and would be willing to act could move private sector behavior in a more stabilizing direction (White, 2009). While this is unlikely to get rid of the bubble entirely, its size would arguably be smaller and the damaging effects less pronounced.

Secondly, asset inflation may threaten general price stability by over-stimulating consumption and investment spending or raising inflationary expectations. For example, swings in house prices can have potent effects on the economy *via* their impact on household wealth, as the recent collapse in the US housing market has shown, while a stock price boom could be costly to the extent that it encourages excessive business investment in sub-optimal projects. Moreover, if proactive monetary tightening is viewed as an insurance against the risk of economic damage brought on by an eventual crash, then the uncertainty of the boom would still justify preemptive action, just as a homeowner needs to take some fire insurance even though he is uncertain that his house will burn down (Borio and White, 2003).

The case for pro-active policy of some kind is also strengthened if bubbles are seen not as one-off events but rather as a permanent feature of the economic environment. As Singapore's Finance Minister, Tharman Shanmugaratnam puts it:

> "Bubbles occur frequently-more so than can be explained if the 'efficient-market hypothesis' holds. They are prolonged, and can cause considerable economic damage when they burst. Bubbles and the miss-pricing of risk are not exceptional events, but part of the regular functioning of the financial markets."[91]

[91] See Shanmugaratnam (2009a).

There is, however, a widespread view prevalent among central bankers themselves, that monetary policy specifically should not react to anticipated bubbles. A key argument is that bubbles are, by definition, extremely difficult to identity and there is a lack of precise criteria for determining if the change in asset prices is consistent with the change in economic fundamentals.[92] How then should the central bank react to a bubble when there is uncertainty about its size and indeed whether it even exists at all? Is it a 'monster' bubble in the making or merely an 'echo' bubble?

A good example of this was at the beginning of 2010 when there were different views as to whether there were bubbles building up in the Beijing, Shanghai and Hong Kong property markets or whether it was the result of genuine demand. In China's case this was compounded by the fact that there was little evidence of bubbles elsewhere in the economy.[93]

This argument is strengthened if there were to be collateral damage from preemptive tightening on other parts of the economy. In other words, there is no 'safe popping' of asset price bubbles since monetary policy is a blunt instrument. Given expectations of further increases in asset prices, the tightening required to quash any market euphoria may have to be severe and hence, might throw the economy into recession. According to this point of view policy makers should be 'clean' rather than 'lean', that is, the central bank should wait for the bubble to collapse and then adopt traditional monetary easing to deal with the aftermath instead of preemptive

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[92] See the opposing views about China's property bubble in the Singapore Business Times of June 17, 2010.

[93] Since then (May 2010) clearer evidence has emerged that property bubbles are indeed building up in both China and Hong Kong and the authorities have responded accordingly. In Beijing families are now limited to buying one new apartment and cannot receive a loan if they have not paid their taxes or social security contributions and the government is reclaiming land hoarded by developers. In Hong Kong stamp duty has been increased for luxury flats, corporate purchases are now restricted to 10% of total sales and the supply of land has been increased. In August 2010, the rules were tightened further.

tightening during an upswing. After all, accommodative monetary policy after the bust would not only help the financial sector to cope with balance sheet vulnerabilities but will also soften the blow on aggregate demand.

A second argument against using monetary policy to counter potential bubbles is that the central bank already has too many objectives to be achieved with a limited range of policy instruments. Indeed, perhaps monetary policy should serve exclusively as a counter-cyclical tool and asset price fluctuations that do not affect inflation within the central bank's forecast horizon, that is one to two years, should be ignored (Bernanke and Gertler, 2001).

This fits in with those who feel that central banks, especially in emerging economies, already have a difficult job trying to achieve a range of goals simultaneously. For example, by late 2009 foreign funds had begun to flow rapidly into emerging Asia and in a world of mobile short-term capital flows and volatile exchange rate movements threatened to create bubbles in stock and property markets as investors anticipated higher returns than in developed countries where interest rates were historically low. The dilemma is that if Asian central banks respond by forcing up interest rates through tighter monetary policy this would have the perverse effect of attracting even more foreign capital. Moreover, if their currencies are appreciating because of a fall in the US dollar, this puts pressure on their central banks to intervene in the foreign exchange market to offset a potential loss of export competitiveness by selling their own currencies. But this has the effect of further increasing domestic liquidity. There are no easy fixes and adding asset price bubbles into the equation can only make life more difficult for central banks.

Linked to this is the view that using monetary policy to lean against asset prices will complicate central bank communication to the public. In particular, the use of the word "bubble" could lead to misinterpretation and cause asset prices to react in unpredictable ways. For example, tightening of monetary policy by the Bank of China in January 2010 led to a sharp fall in stock prices in Shanghai.

Moreover, monetary policy is not the only policy that can mitigate asset price bubbles. Fiscal and macro-prudential policies might offer

better alternatives and monetary policy may not be the most effective or the most precise instrument. For instance, if the surges in asset valuations are confined to particular sectors (or cities) or are the result of productivity improvements, directed prudential policies, such as varying the ceiling in loan-to-value ratios, may be more appropriate.

This seems to be the view of the MAS according to its Managing Director Heng Swee Kiat:

> "In our case because we are also a regulator, we don't think we should use monetary policy in a blunt way. Monetary policy should respond to the real economic conditions going forward. And so we need to keep a very clear focus on using monetary policy to anchor inflation expectations and make sure we don't use it for more than we can deliver."[94]

As well as the Ministry of Finance:

> "The government will respond to the property bubble "in a calibrated fashion to prevent boom and bust in the property market. It won't involve macro levers such as interest rates since they apply across the board to businesses at large not just to asset markets so and risk engendering a slump. So Use credit rules, land supply decisions and, in the extreme, tax policies. It is also difficult to monitor 4–5 years ahead."[95]

In the third quarter of 2009, a 16% surge in property prices in Singapore persuaded the government to release more land for development and disallow borrowers from deferring property payments. In February 2010 further measures were introduced to cool the property market, following a spike in the sales and prices of private new homes in the form of an additional 3% stamp duty if a property is sold within one year of purchase and lending institutions (apart from the Housing Board) were now only allowed to lend up to 80% of the purchase price instead of 90%. By working directly on lending margins and countering speculative purchasing directly there was seen to be no need for aggressive monetary policy, particularly at a time when the economic outlook was still uncertain, as was the case in early 2010.

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[94] Heng (2009) according to *The Wall Street Journal's* Real Time Blog on October 21, 2009.

[95] Shanmugaratnam (2009b).

Nonetheless, whether monetary policy should be used as a tool for limiting upswings in asset prices in Singapore still depends empirically on the effectiveness of such policy in offsetting asset price movements and, if the answer is yes, what the costs would be if the bubble is deflated at the expense of slower economic growth and higher unemployment. Moreover, since it is the mission of MAS to promote sustained non-inflationary economic growth, it is also important to understand the effects of asset price inflation on consumer price inflation over the medium to long term.

In order to answer these questions empirically Chow and Choy (2009) examined Singapore's monetary system with particular reference to local stock price and house price cycles.[96] GDP and the consumer price index are used to represent domestic economic activity and price movements, while the Singapore residential property price index and the Stock Exchange of Singapore (SES) price index are used to proxy asset prices in the economy. For the reasons given earlier, the TWS$ exchange rate is also included because Singapore is a very small and open economy but, more importantly, because changes in the TWS$ are a key indicator of the monetary policy stance in Singapore. Interest rates and monetary aggregates, on the other hand, are not included since the MAS does not explicitly target these variables when it carries out monetary policy.

The time paths of the variables in the model following a one time shock to monetary policy are then traced out and provide an indicator of the extent to which monetary policy might influence asset prices. At the same time, the responses of inflation and output growth serve as an indication of both the benefits and costs of monetary policy.

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[96] They utilize a factor augmented VAR (FAVAR) model. The VAR model is a dynamic system of equations that allows for interactions between economic variables while imposing minimal assumptions about the underlying structure of the economy while FAVAR models permit the incorporation of information from large datasets in a parsimonious manner in order to adequately capture the information monitored by the central bank for a better identification of monetary policy innovations. The monetary VAR is augmented in this case with common factors extracted from a large panel dataset spanning 127 local and foreign economic time series from the first quarter of 1980 to the second quarter of 2008.

The results suggest that the growth rates of asset prices in Singapore fall by a much greater extent than the growth rates of output and inflation when there is a contractionary monetary policy shock. This implies that monetary policy might indeed be effective in leaning against upswings in property and stock prices in Singapore. Furthermore, housing asset inflation contributes about 18% to changes in consumer price inflation after 4 years so monetary policy could lean against the build-up of asset price misalignments even if near-term inflation pressures remain relatively subdued.

These results are, of course, preliminary and more work will need to be done to see if there are links in the data through which monetary policy could influence asset prices. The dynamics here are also very difficult to model since monetary policy actions are unlikely to have only temporary effects so a strong monetary policy reaction to a potential asset price bubble may risk having significant collateral damage to GDP growth in the longer period. Also the model does not explicitly take into account the Uncovered Interest Parity or UIP relationship which seems to hold for Singapore empirically and suggests that a strengthening currency to offset a bubble would lead to stronger capital inflows and a further stimulus to asset prices through downward pressure on domestic interest rates. Given the constraints under which the MAS operates, including extreme vulnerability to external shocks and the use of only one effective instrument (the TWS$) to deal with multiple objectives, it is difficult to envisage that it would also want to use monetary policy to address bubbles any time soon. Nonetheless the global financial crisis has made it more likely that central banks, such as the MAS, will have to monitor bubbles more closely than they have done in the past, make policy statements about them beyond Alan Greenspan's famous 'irrational exuberance', and communicate their views to the public.

It may be difficult to identify a bubble but this does not preclude central banks from extracting information provided by asset price developments on the outlook for output and inflation in the medium term and responding to rising asset prices, albeit in a more muted fashion, if they judge that sufficient is known to suggest that prices are moving well beyond what the fundamentals might suggest. For example, given

the likely correlation between credit cycles and asset price cycles, monitoring variables, such as 'credit' growth, which may have some causal impact on asset price bubbles can provide a practical way of dealing with the situation and would make communication to the public simpler. On the other hand, monetary policy that acts too narrowly in terms of paying insufficient attention to signs of financial vulnerability may itself encourage the run up in asset prices. In other words, financial stability is ultimately to some degree endogenous to monetary policy.

There is also need for monetary policy to work in tandem with financial policies on macro-prudential regulation and supervision even though the linkages between asset prices, financial instability and monetary policy are complex, if only to reduce the pro-cyclicality of credit cycles in order to combat instabilities caused by asset price bubbles. If the circumstances that call for preemptive monetary restrictions can also be inferred from weaknesses in private sector balance sheets and prevailing market expectations, as well as from movements in macroeconomic variables, such as output growth and headline inflation it follows that there should be coordination between the monetary and prudential authorities. In this way an analysis of monetary conditions and financial flows can provide important complements to the usual macroeconomic models used by central banks. Since supervisory and macro-prudential policies are also the responsibility of MAS, this should be an easier task than in other countries where they have either been divested on the assumption that financial markets are generally efficient, or are located in separate and often competing institutions, as in the UK before the crisis.

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