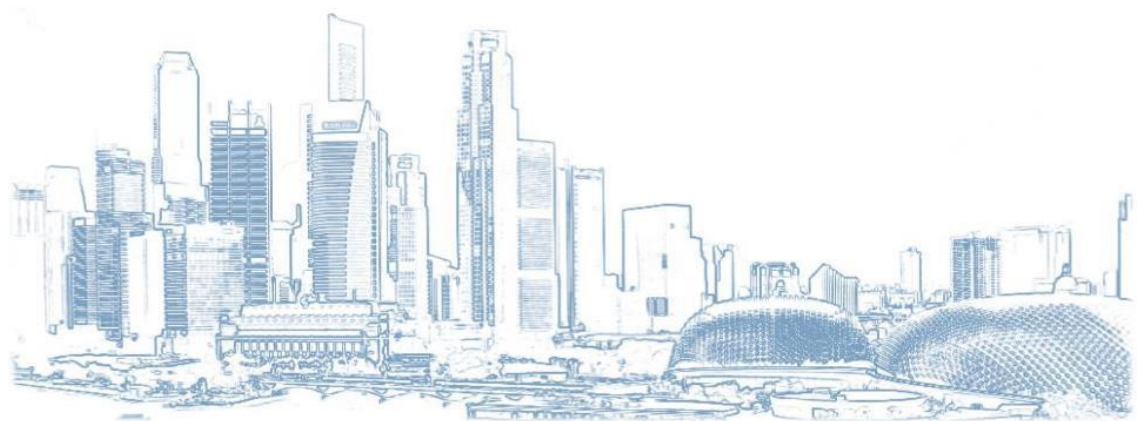


Economics Explorer Series

Monetary Authority of Singapore

3



MONETARY POLICY & THE ECONOMY

A closer look at the nuts and bolts behind monetary policy in Singapore – what its objectives are, how it is conducted by MAS, and how it affects the economy.

Monetary Policy

Monetary policy refers to the actions taken by central banks to affect monetary and financial conditions in order to achieve broad macroeconomic objectives. By controlling the amount of money available, interest rates, or, in Singapore's case, the exchange rate, central banks aim to influence the rate of change in the general level of prices in the economy.

What Are The Objectives Of Monetary Policy?

In the 1960s and 1970s, policymakers in many advanced countries believed that they could reduce unemployment by stimulating the economy with monetary or fiscal policy without compromising on low and stable price inflation. In hindsight, the unemployment target was set too low and when combined with the oil price hikes in 1973 and 1979, the result was unprecedentedly high inflation in the 1970s and early 1980s – dubbed the 'Great Inflation.'

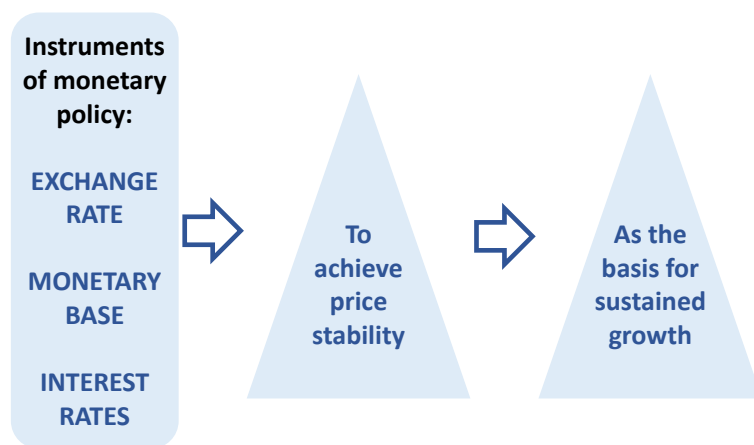
Many economists now believe that central banks should focus primarily on achieving price stability, or low and stable consumer price index (CPI) inflation of between 1–3%, in their conduct of monetary policy. This is based on evidence accumulated over many decades that countries with high inflation not only have higher price volatility, but also tend to have lower rates of economic growth. In contrast, in an environment of price stability, movements in the relative prices of goods and services can serve as clear signals to consumers, businesses and the government, so that resources are allocated efficiently. In addition, price stability encourages saving and investment as it prevents the value of assets from being eroded by unanticipated inflation.

Focusing monetary policy on achieving price stability does not, however, mean that central banks cannot pursue other policy objectives. By law, the European Central Bank (ECB) assigns overriding importance to price stability, but it also seeks to achieve full employment and balanced economic growth. The US central bank, the Federal Reserve (or 'Fed'), has a 'dual mandate' whereby stable inflation and maximum sustainable employment are given equal priority.

How Does a Central Bank Conduct Monetary Policy?

Many central banks typically use a very short-term interest rate as their primary instrument of monetary policy. The Fed, for example, targets the federal funds rate or the interest rate at which banks lend to each other on an overnight maturity. To control the target interest rate, the central bank can vary the amount of liquidity (the amount of cash reserves held by banks): when the central bank provides more liquidity, banks have more funds to lend out, the money supply increases accordingly, and the interest rate falls. The reverse happens when the central bank drains liquidity from the banks.

Figure 1: Monetary Policy



There are three conventional ways in which the central bank can change liquidity in the banking system, although not all of them are available or used in every country. First, if the central bank wishes to change the money supply and interest rates it could vary the monetary base, which consists of currency (notes and coins) in circulation, and the total reserves of banks which are held on deposit with the central bank or as cash in their vaults. In countries with developed financial markets, the easiest way to alter the monetary base is to carry out 'open market operations' by buying or selling short-term government securities from or to the banks. In this way, the central bank can effect changes in the desired level of reserves held by commercial banks.

A second way for the central bank to increase the money supply is to allow banks to borrow more reserves from it. This is usually accomplished by lowering the interest rate they must pay on these loans — the discount rate.

Third, the central bank could raise reserve requirements. This means that banks will be required to keep with the central bank a larger portion of each dollar deposited with them. However, this policy is rarely used in the more advanced countries as it could disrupt the business of banking. It has also become less effective nowadays because many banks already hold 'excess reserves'. It is, however, still used in developing or emerging market economies where the first two instruments of monetary policy could be less effective, reflecting the relatively less advanced stage of development of their financial systems.

In some small open economies, central banks have eschewed their ability to conduct monetary policy by choosing to peg the domestic currency to the value of another currency, called the 'anchor currency'. This is a means for the country to achieve long-term price stability through the provision of a nominal anchor for the average price level. An even stronger commitment to monetary discipline is achieved by setting up a currency board, whereby the currency is backed 100% by the anchor currency and the monetary authority stands ready to exchange its currency for the anchor currency at a fixed rate. This is the case in Hong Kong, which has fixed the HK\$ to the US\$ since 1983.

If capital is free to move in and out of the country, the central bank effectively relinquishes an independent monetary policy when it pegs the exchange rate to another currency. If, for example, the US tightens monetary policy by raising interest rates, this will cause capital to flow out of Hong Kong where interest rates are lower and the HK\$ would depreciate. The Hong Kong Monetary Authority would then be obliged to buy the HK\$ with its official foreign reserves of US\$. The money supply in Hong Kong would automatically decrease, which, all other things equal, would cause interest rates to rise to match US interest rates.

In less extreme cases, countries may choose to keep their currency at a particular value which is neither fixed to an anchor nor freely floating. This is known as 'managed floating'. As we shall see, Singapore practices a variant of this arrangement, whereby the MAS manages the Singapore dollar against a basket of currencies, also called the S\$ nominal effective exchange rate (S\$NEER).

Quantitative Easing and the Problem of the Zero Lower Bound

One of the challenges thrown up by the Global Financial Crisis and the 'Great Recession' of 2009 is that if inflation falls to a low level and, at the same time, the economy is growing very slowly or is in recession, conventional interest rate-based monetary policy can become ineffective. This is because the nominal interest rate set by the central bank to stimulate investment and consumption of interest-sensitive goods, such as houses and cars, cannot in theory be pushed below zero. This is known as the problem of the zero lower bound.

For example, if inflation is 2% and the central bank lowers its nominal policy interest rate to zero, as the Fed did in December 2008, the real interest rate relevant to investment and consumption decisions would be minus 2% ($0\% - 2\%$)¹. This might be sufficient to stimulate the economy but what if inflation now falls to 1%? The real interest rate would actually rise to minus 1% ($0\% - 1\%$).

Of course the central bank could, in practice, make the banks pay a negative interest rate on their reserves. In fact, the Swedish and Danish central banks in recent times have used negative interest rates to stimulate the economy, as have the ECB and the Bank of Japan (BOJ). However, it is too early to say whether this policy can solve the problem of the zero lower bound. After all, banks would be accepting a return on their reserves which is less than if they kept them in their vaults as cash. At the same time, it is not clear whether they would be able to recoup their losses by imposing negative interest rates on the deposits of their customers.

Another solution might be to raise the central bank's inflation target to say, 4% which would give them more room to lower real interest rates during a downturn. But would the public understand this change? Ironically, it is because the major central banks have been so successful in achieving their target of around 2% inflation and anchoring public expectations to that level, that they are now disinclined to raise the target for fear that inflation and inflation expectations might spiral upwards. This would cause central banks to lose the credibility they have painstakingly built up in recent decades.

A potentially more effective solution when conventional monetary policy breaks down is to adopt unconventional monetary policy, otherwise known as quantitative easing (QE). Instead of targeting a short-term policy interest rate which might already be at the zero bound, quantitative targets are put in place to increase the monetary base. During the recent Global Financial Crisis, central banks around the world provided financial institutions with emergency liquidity and acted in their capacity as the lender of last resort. In the aftermath of the crisis, the Fed, the Bank of England and the ECB purchased large amounts of private assets, including consumer and corporate debt, as well as long-term government debt. This was done with the aim of lowering long-term interest rates and expediting the recovery from the recession.

The success of QE critically depends on the central bank's ability to persuade financial markets, consumers, and producers that cheap funding will be available for long enough to increase inflation and growth. This would help to reverse the psychology of deflation, whereby consumers spend less because they expect prices to keep falling and producers are reluctant to invest because sales are weak. Indeed, central banks' unconventional monetary policies, like conventional policies, have to be credible.

¹ The real interest rate is defined as the difference between the nominal interest rate and the inflation rate.

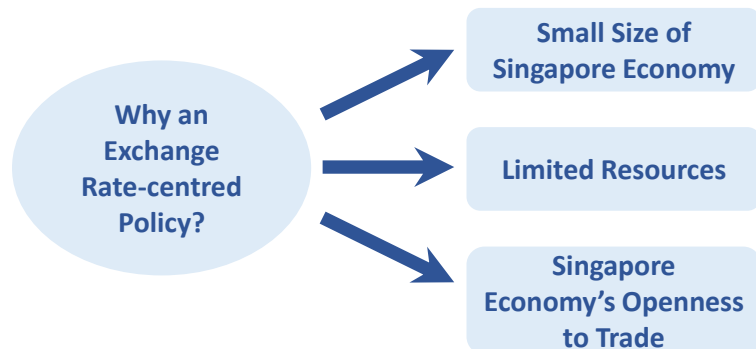
The Monetary Policy Framework in Singapore

Since 1981, monetary policy in Singapore has been centred on the exchange rate. In the small and open Singapore economy, the exchange rate is a more effective tool in maintaining price stability than interest rates or the monetary base.

Why is monetary policy centred on the exchange rate?

The choice of an exchange rate-centred monetary policy, rather than money supply or interest rates, as the principal tool of monetary policy is unusual. It has been influenced by Singapore's small size and high degree of openness to trade (Figure 2). Singapore may well be unique in its choice of monetary policy tool.

Figure 2: An Exchange Rate-centred Monetary Policy for Singapore

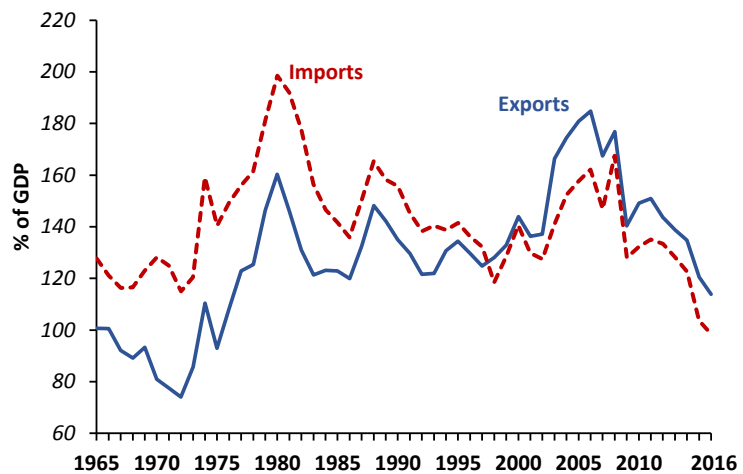


Singapore's small size and lack of natural resources means that it has to import even the most basic daily requirements, such as food, water and raw materials, and export goods and services to pay for them. This has resulted in a very open trade policy, with few import restrictions.

Just how open to trade is Singapore?

As can be seen from Figure 3, both imports and exports of goods amount to around 100% of Singapore's GDP each. Another indicator of the extreme openness is the very high import content of final expenditure: for every Singapore dollar spent in Singapore, approximately 40 cents leak out as imports.

Figure 3: Singapore's Exports and Imports of Goods as a % of GDP



Source: Singapore Department of Statistics

What are the consequences of Singapore's small size and openness to trade?

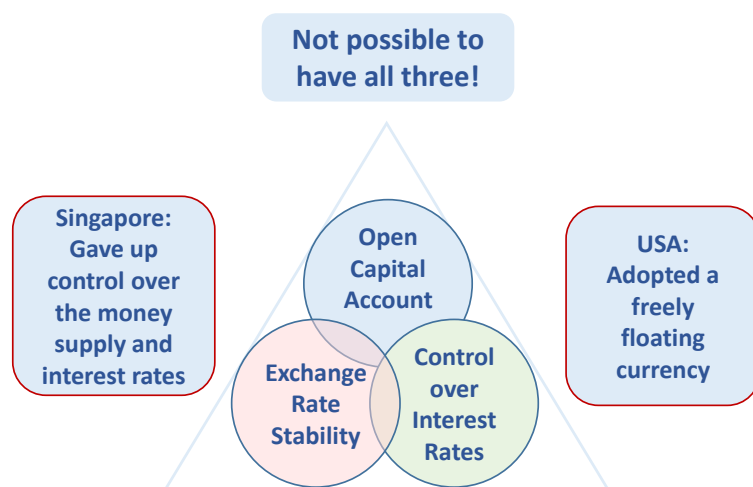
First, because Singapore is small as a buyer or seller of goods in world markets, it is a price-taker and domestic producers and consumers have to accept prices dictated by global supply and demand. The price of rice or electronic goods in Singapore, for example, is thus largely determined by the world price, converted into domestic currency through the exchange rate. In addition, the very high import content of domestic expenditure means that changes in world prices or in the exchange rate have a powerful effect on domestic prices. Thus, MAS can allow the S\$NEER to appreciate or strengthen more quickly when global food and energy prices are high, to offset their effects on inflation in Singapore.

Managing the exchange rate is therefore the most effective way of maintaining price stability in a small, open economy like Singapore. As the monetary policy instrument, the exchange rate is relatively controllable by the central bank and bears a stable and predictable relationship with the policy objective, which is price stability. The importance of external demand also means that the exchange rate has a larger effect on the overall level of economic activity in Singapore (and therefore, domestic inflation) than in economies where domestic demand dominates aggregate demand.

Implications of an Exchange Rate-Based Monetary Policy

According to the Open Economy Trilemma, a country cannot have an open capital market, conduct conventional monetary policy based on domestic interest rates, and manage its currency at the same time. It can choose only two of the three policy options. (Figure 4) The US, for example, has an open capital market and wants to control domestic interest rates, so it allows its currency to float freely. Other countries may desire to use domestic interest rates to stimulate the economy and to fix their currencies at the same time. In such instances, they would have to impose currency and capital controls in order to maintain stability in the exchange rate.

Figure 4: The Open Economy Trilemma



Singapore has chosen to manage the exchange rate as its operating instrument of monetary policy for the reasons explained earlier. It is also a major international financial centre and has had no capital or currency controls since 1978, which means the economy is completely open to capital flows. Any shift in domestic interest rates relative to world rates would be met by a shift of funds in or out of Singapore, causing the exchange rate to appreciate or depreciate.

To keep the S\$NEER within the policy band, the MAS must offset the impact of any initial adjustments to the domestic interest rate. In doing so, MAS effectively gives up control over the domestic interest rates and the money supply. Consequently, monetary policy in Singapore is synonymous with exchange rate policy.

As a result, the S\$ SIBOR² is largely determined by foreign rates, such as the US\$ LIBOR and market expectations of movements in the Singapore dollar. As we can see from the chart below, the three-month S\$ SIBOR has closely tracked the three-month US\$ LIBOR over the years. (Figure 5)

Figure 5: Global and Domestic Three-Month Interbank Interest Rates



Source: ABS Benchmarks Administration Co Pte Ltd and ICE Benchmark Administration Ltd

Like most other central banks, MAS also carries out daily money market operations to manage the level of liquidity in the banking system. These are not targeted at any level of interest rate or money supply. Instead, they aim to ensure that the domestic banking system has sufficient liquidity to meet banks' demand for precautionary and settlement balances as well as their Minimum Cash Balance, which is set at 3% of banks' liabilities base. The extent and size of MAS' money market operations would depend on the net liquidity impact of the inflow and outflow of funds between MAS and the banking system. These could arise from the issuance of notes and coins, CPF Board and government fund transfers, net issuance of Singapore Government Securities (SGS), foreign exchange intervention operations, and the maturing of previous money market operations.

To manage the liquidity impact, MAS uses direct borrowings, foreign exchange swaps, repurchase agreements (repos) on Singapore Government Securities (SGS), and MAS Bills issuance. For example, if there is a large amount of CPF funds placed with

² The S\$ SIBOR refers to the Singapore dollar interbank offered rate, and is based on banks' submissions of the rates at which they are willing to offer unsecured funds to each other.

MAS by the CPF Board, MAS can offset the loss of liquidity from the banking system by issuing less MAS Bills relative to the maturing amount. The choice of financial instruments to use depends on the circumstances, and such money market operations are quite distinct from MAS' foreign exchange interventions to manage the S\$NEER.

How Are Domestic Interest Rates Determined?

The interest rate is the price at which money today may be traded for money at a future date. In other words, it is the rate of return to savings or alternatively, the cost of borrowing.

How do interest rates affect the economy?

Interest rates impact the economy through their effects on domestic investment and consumption. A rise in interest rates increases companies' borrowing costs, thereby reducing profits and raising the required return on new investment projects.

In Singapore, however, companies in the manufacturing sector may be relatively less affected by interest rate increases, as the sector is dominated by multinational corporations (MNCs) which rely on their own sources of funds, especially from their head offices. In contrast, companies in the building and construction sector may be somewhat more affected as they rely to a greater degree on bank borrowing and their cash flows are tighter, given the long duration of their projects.

Higher interest rates also affect households by increasing mortgage repayments and could make it more difficult for them to repay their debt, forcing them to cut back on consumption. At the same time, higher interest rates provide a greater incentive for households to save for the future rather than to spend now and these savings can be channelled into investments.

What determines interest rates in Singapore?

In view of the policy trilemma and the fact that MAS targets the exchange rate, it cannot also determine domestic interest rates or the money supply. Since Singapore has no controls on capital flows, changes in the difference between the global and domestic interest rates (such as the US\$ LIBOR and S\$ SIBOR) will result in capital flowing in or out. Such movements will change market expectations of the exchange rate as well as the relative money supplies in each country, and hence interest rates. The S\$ has tended to appreciate against most other currencies over long periods of time, and hence domestic interest rates in Singapore move in line with, but are typically a little lower than, global rates (Figure 5). This relationship is known as 'uncovered interest parity' (UIP) because once allowance is made for expected differences in exchange rates, domestic interest rates are brought in line or into 'parity' with global interest rates, when expressed in terms of a common currency. In sum, interest rates in Singapore are effectively determined in global financial markets, particularly those in the US.

Characteristics of Monetary Policy in Singapore

Singapore's exchange rate-based monetary policy framework can be described in short as a *basket, band and crawl* or BBC system.

The Singapore dollar is managed against a *basket* of currencies of our major trading partners and competitors. The various currencies are assigned different degrees of importance or weights, depending on the extent of our trade relations with each particular country. The more important a country is as an import source, or the greater the competition Singapore faces from that country in domestic, foreign and third-country markets, the larger its weight in the basket. The basket provides a more relevant reference point for monitoring movements in the S\$ than a single currency, given that Singapore's trade is highly diversified. Accordingly, the composition of the basket is revised periodically to take into account changes in trade patterns.

MAS operates a managed float exchange rate regime, whereby the trade-weighted S\$ exchange rate (S\$NEER) is allowed to fluctuate within a policy *band*. This allows MAS to keep the currency in a "bounded path" that will enable it to achieve monetary policy objectives. At the same time, the S\$NEER can adjust within the band in line with market forces, so that short-term market volatility can be absorbed, but without the excessive fluctuations that could occur if the currency was to float freely.

Finally, the *crawl* refers to the slope of the S\$NEER policy band. This is reviewed every six months (as is the width of the band) to ensure that it remains consistent with the underlying fundamentals of the economy and to avoid any misalignment of the currency. Typically, the crawl is set on an upward (i.e., appreciating) or flat path (i.e., a slope of 0%).

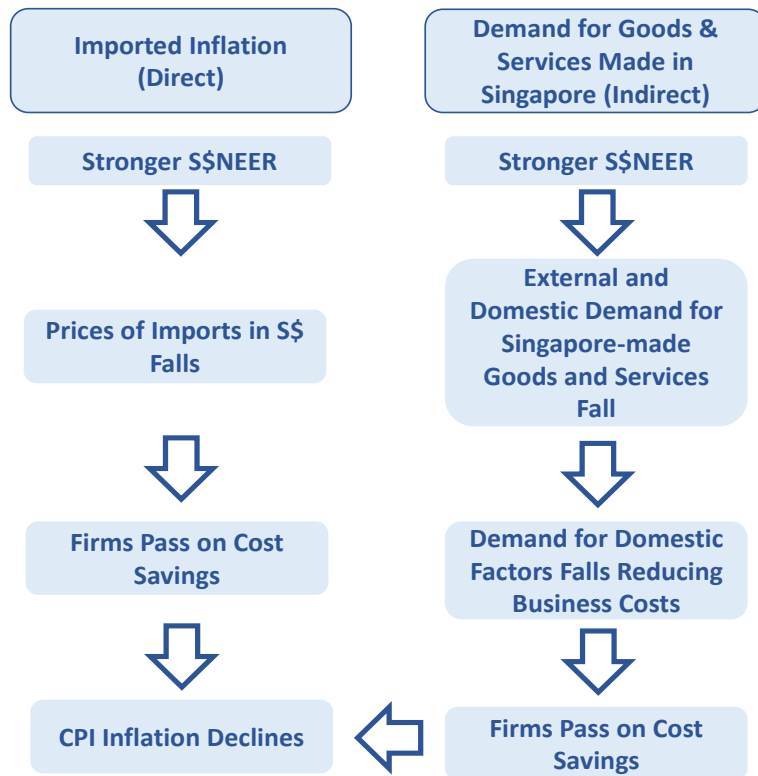
Together, these features define the S\$NEER framework and they ensure that monetary policy will remain disciplined. That is, the system serves as the nominal anchor for the economy. If MAS attempted to materially alter the money supply, the S\$NEER might potentially breach its bands, and the exchange rate-centred monetary policy would be compromised. This would also be true if MAS attempted to engage in opportunistic competitive depreciations of the Singapore dollar.

The Transmission Mechanism of Monetary Policy

There are two main channels through which the exchange rate policy of MAS affects inflation and economic activity in Singapore: the direct channel via import prices and an indirect

channel via the demand for goods and services made in Singapore. (Figure 6)

Figure 6: Monetary Policy Transmission Channels



Direct Channel through Import Prices

The first and more direct channel through which monetary policy in Singapore affects inflation is via the impact of the exchange rate on import prices.

To understand how this channel works, let us look at a simple example. Suppose MAS sets the S\$NEER policy band on a faster rate of appreciation. As the exchange rate strengthens, the prices of foreign goods and services which Singapore imports will be lower when converted into S\$. This puts downward pressure on the CPI, depending on the extent and speed with which importers and retailers pass through the lower prices to consumers.

Indirect Channel through the Demand for Singapore-made Goods and Services

The second channel through which monetary policy affects inflation in Singapore is via its effect on demand for goods and services made in Singapore.

Continuing with our previous example, when MAS increases the rate of appreciation of the S\$NEER policy band and the currency strengthens, goods and services produced in Singapore would be less competitively priced in world markets in the short term. In addition, domestic demand would be dampened by a substitution effect as lower prices for imported goods reduce demand for Singapore-produced goods.

The drop in both external and domestic demand for Singapore-made products and services would lead to lower production and weaker demand for factor inputs such as manpower, factory space, and machines. Consequently, wages and other business costs would moderate, and inflationary pressures would ease. This indirect transmission mechanism is somewhat more complex than the direct channel and may take longer to work its way through the economy.

If MAS Depreciated The S\$NEER Would This Make Exports More Competitive?

At first glance, it appears tempting to depreciate the nominal exchange rate in order to raise the export price competitiveness of Singapore's goods and services and boost export growth. Upon closer inspection, however, the transmission mechanisms mentioned earlier suggest that the benefits of weakening the exchange rate are likely to be very small and transitory.

With depreciation, exports would initially rise as they are now cheaper in international markets. However, at the same time, imports of intermediate inputs used for production in Singapore would cost more through the direct import price channel, especially for domestic producers who are heavily reliant on imported raw materials and intermediate components.

Moreover, if exports were to increase, this could cause the economy to overheat, pushing up the demand for domestic factors of production, such as labour, and leading eventually to higher wages and prices via the indirect channel of transmission.

In addition, Singapore's exports appear to be much more sensitive to changes in global income than to differences between domestic and foreign prices. Assisting exporters to compete through a temporarily weaker currency would send the wrong signal to firms and encourage them to neglect productivity improvements.

Communication of Monetary Policy

In recent years, many central banks, including MAS, have gradually moved towards adopting greater transparency in monetary policy, including in the communication of policy goals, operating procedures and changes in the monetary policy stance. This includes disclosing information on the economic models used in making assessments of the outlook for the economy, upon which policy decisions are based.

Why is transparency important?

The principal argument for greater transparency is to promote accountability and render monetary policy more effective in achieving its objectives. The latter can be achieved if the public knows the goals and instruments of policy and if the authorities make a credible commitment to meeting them. Good governance also calls for central banks to be accountable for their actions.

Moreover, increased transparency in monetary policy helps to improve the working of financial markets by reducing uncertainty and volatility. It also minimises the risk of policy being manipulated for political purposes, therefore enhancing the credibility and independence of the central bank in pursuing its objectives.

What has MAS done to improve transparency?

Over the years, MAS has made significant progress towards a more open and communicative process in its monetary policy reviews. One of the key initiatives was the publication, since February 2001, of a formal Monetary Policy Statement (MPS) to announce the policy stance following MAS' review every six months. In addition, an accompanying report, the *Macroeconomic Review*, provides detailed information on the assessment of macroeconomic developments and trends in the Singapore economy. The Review is aimed at enhancing market and public understanding of the monetary policy stance announced in the MPS.

In 2006, MAS also began publishing data on the weekly S\$NEER twice a year, at the time of the MPS release. Since 2012, weekly data on the S\$NEER has been made available each month. This allows researchers to analyse the data, thus enhancing accountability.

MAS has also taken a more active role in raising public awareness of economic issues. It has been releasing publications on its website, such as the "Economics Explorer" briefs and "Staff Paper" series, and conducting seminars and presentations for students, private sector analysts, and representatives from local and overseas agencies. In addition, MAS organised a macroeconometric modelling conference in February 2000 to launch its flagship Monetary Model of Singapore (MMS), which is used in policy simulations. From time to time, information on

new models has also been disseminated through the *Macroeconomic Review*. In a seminar in August 2014, further details on MAS' suite of macroeconomic models were released to enhance collaboration with academia.

How has greater transparency enhanced monetary policy?

In promoting understanding of the thinking behind the monetary policy stance, greater transparency in monetary policy communication has clearly helped to align the views of the market with those of policymakers, thus reducing the need for interventions by MAS to achieve the desired exchange rate outcome. By increasing the amount of information available to the public, greater transparency has also helped to reduce the uncertainty surrounding the price and wage developments that affect business decisions.

Rules versus Discretion in Monetary Policy

There is a long-standing and ongoing debate in monetary policy as to whether central banks should be required to follow a specific rule in the conduct of monetary policy, or be allowed full discretion to deal with the economic circumstances as they see fit.

One application of a rules-based approach is the so-called Taylor Rule, named after Stanford University's John Taylor. The rule requires the central bank to set its policy interest rate in relation to the current level of output, and the inflation rate relative to specified targets.

Closely linked to this is the practice of inflation targeting which has been adopted by many countries in the last three decades. In such regimes, the central bank is compelled to announce its medium-term inflation target—typically the mid-points of ranges between 1% and 3%—and in some cases, is required by law to achieve it. Inflation targeting also entails an institutional commitment on the part of the central bank to price stability as the primary goal of monetary policy. In practice, most central banks have adopted a form of 'flexible inflation targeting' which allows them some leeway to achieve the inflation target with respect to the timeframe, and incorporates other goals such as keeping output close to its potential level.

There are several benefits of a rules-based approach. First, there is a benchmark against which policymakers at the central bank can be judged. Second, the central bank is more independent and less likely to be subject to political interference. Third, the temptation to promise to act in a particular way and later renege on that promise—the so called time-inconsistency problem—is reduced.

The present view seems to be that while a rules-based approach can be used as a guide to monetary policy, some discretion is also necessary. Policymakers do not have a perfect model of the economy and so do not know exactly the current or future level of output and inflation. Historical data are often revised, and shocks to the economy, such as the Global Financial Crisis of 2008–9, clearly require a much more flexible approach.

In line with this consensus, MAS uses the rules-based approach as a complementary check on monetary policy, but combines this with a forward-looking approach which allows sufficient discretion to deal with events as they unfold. Thus, MAS does not operate strict inflation targeting, but many of the core features of this regime are embodied in its monetary policy and communications frameworks. For instance, MAS is operationally independent in formulating and implementing monetary policy, and has achieved its overriding objective of low and stable inflation very successfully since 1981 when the exchange rate framework was formalised. Greater transparency and a high degree of credibility help ensure the objectives of monetary policy are met without the need for explicit inflation targeting or a rules-based approach.

Recent Challenges Confronting Monetary Policy

Rising asset prices and financial stability

The collapse of the housing market in the US in 2006 which, with hindsight, marked the beginning of the Global Financial Crisis, has highlighted the issue of whether central banks should use monetary policy to moderate asset prices in the housing and equity markets to ensure financial stability. After all, substantial economic costs result from the bursting of asset bubbles³, including a fall in output and a rise in banks' non-performing loans. Yet, bubbles are by their very nature difficult to foresee and pre-emptive monetary tightening could lead to an unnecessary recession. It might also compromise achievement of the overall price stability goal and make the communication of monetary policy more difficult.

The view of many economists is that it is better to let the central bank focus on price stability in the economy as a whole, but deal with specific asset prices using targeted administrative measures. This is indeed what Singapore did in 2009 and 2010 when macroprudential measures were introduced to ensure sustainable conditions in the property market. The measures included lowering the loan-to-value ratio to 50% for individuals obtaining a second housing loan, imposing punitive additional buyers' stamp duties, and placing a 60% total debt-service ratio on individuals seeking to take out a mortgage with a bank. These policies appeared to have contributed to a gradual moderation in property prices since late 2013.

Inflationary impact of economic restructuring

A potentially more challenging problem facing monetary policy in Singapore is how the restructuring of the economy towards

³ Asset bubbles occur when asset prices exceed an asset's fundamental value because current owners believe they can resell the asset at an even higher price.

higher productivity activities could temporarily push up domestic sources of inflation. For example, in sectors such as construction and food and retail services, reducing the numbers of low-productivity workers from abroad can put upward pressure on wages and other business costs in the short run. In response, MAS adopted in 2012 a policy of tightening monetary policy in such a way that “tempered but not fully offset” increases in inflation due to restructuring, as it recognised that ongoing supply-side cost adjustments had to occur as the economy transited away from an over-reliance on low-skilled labour to a more productivity-driven growth model.

Constraints on Monetary Policy

Monetary policy involves trade-offs

Central banks cannot do everything, and must make hard choices between competing objectives. First, as described in Box C, if MAS were to depreciate the S\$NEER, this would likely boost exports in the short run. However, the boost is expected to be small and the subsequent rise in inflation through both the direct and indirect channels would negate this benefit quite quickly. Moreover, by acquiring a reputation for making the currency weaker, MAS’ commitment to a strong S\$ and investors’ confidence in Singapore as a financial centre could be undermined.

A second trade-off is the well-known Phillips Curve relationship between inflation and unemployment. In the short run, there is a trade-off insofar as the central bank could stimulate the economy by adopting a looser monetary policy. Unemployment would fall, albeit at the cost of higher inflation. But since long-run or ‘potential’ GDP growth depends only on supply-side factors, such as growth in the labour force, capital accumulation and productivity growth, stimulating the economy through monetary policy would only drive up wages and prices with no permanent effect on output. In other words, the long-run Philips Curve is vertical at the level of potential output and there is no gain to be made in terms of lower unemployment beyond the short run.

The Phillips Curve

In 1958, economist A.W. Phillips documented the empirical finding that there was an inverse relationship between the rate of unemployment and the rate of wage increases, which came to be known as the Phillips Curve. Subsequently, other economists extended the “wage” Phillips Curve to one based on prices, positing that there was a stable relationship between inflation and unemployment. This was thought at the time to imply that policymakers could use monetary and fiscal policy to influence aggregate demand and move the economy to any desired level of unemployment and accept the resultant trade-off with inflation, or vice versa.

This understanding proved incorrect. The misguided perception of a stable trade-off between growth and inflation led many governments in the 1960s and 1970s to pursue overly expansionary monetary and fiscal policies to reduce unemployment, resulting in the Great Inflation. As inflation remained stubbornly high even as growth stayed sluggish, Milton Friedman argued in 1968 that the inverse relationship between inflation and the unemployment rate was not a stable but a short-run phenomena. Instead, each short-run Phillips Curve was associated with a given expected inflation rate. Edmund Phelps concurrently formalised the idea that as expectations of inflation changed, the Phillips Curve would shift. Moreover, the unemployment rate would eventually gravitate towards its “natural” rate, regardless of the inflation rate. This meant that the long-run Phillips Curve was vertical, with no trade-off between unemployment and inflation.

Over the past decade, the global economy has recovered from the Global Financial Crisis and labour markets have gradually tightened. However, inflation and wage pressures in many economies have remained subdued. This has led economists to question whether the short-run trade-off between unemployment and inflation or wage growth still holds. The current consensus suggests that the short-run Phillips Curve relationship remains, but it may have been temporarily dampened.

In Singapore’s case, the short-run wage Phillips Curve appears to have shifted downwards over 2012–17, as indicated by the red and green dots below the historical trend line from 2001–11. (Figure 7) That is, at each given level of the resident unemployment rate, wages have increased by less than before. As in other countries, this could, in part, be a consequence of a temporary fall in inflation expectations, following a prolonged period of subdued economic growth and muted inflation.

Figure 7: Wage Phillips Curve for Singapore (2001–2017)



Source: Ministry of Manpower

Monetary policy cannot work alone

Monetary policy does not operate in a vacuum. Instead, it benefits from a supporting framework of sound and consistent macroeconomic policies, as well as efficiently functioning institutions.

Singapore's labour market, for example, is relatively flexible compared to many countries, and during a cyclical downturn, the variable component of wages and bonuses in both the private and public sectors can be reduced temporarily to lower production costs and speed up the recovery. The financial markets are also deep and efficient, as shown during the Global Financial Crisis when the fallout on Singapore was relatively mild.

Crucially, sound fiscal policy provides a supportive backdrop against which monetary policy can work well. In some developing countries, governments spend much more than they receive in revenue and expect the central bank to finance their deficits by 'printing money', that is, creating currency for the government to spend and thus increasing the money supply. Not only does this compromise the independence of the central bank but it quite often leads to rapid inflation. This does not happen in Singapore because of the government's prudent fiscal policy.

At the same time, the effects of monetary policy take quite long to work through the economy. During a recession when output suddenly falls sharply, and where it may be important to provide confidence in the face of heightened risk aversion in financial markets, weakening the S\$NEER may not be helpful. Instead, expansionary fiscal policy should be used to support businesses and households, while monetary policy provides the anchor of stability.

A good example of the coordination of monetary and fiscal policies in Singapore was during the Global Financial Crisis of 2008–9 when a more accommodative monetary policy stance was complemented by a S\$20.5 billion fiscal 'Resilience Package' contained in the budget. A Jobs Credit Scheme was also introduced to provide subsidies to firms to keep Singaporeans employed. At the same time, lending schemes were initiated to ensure that companies continued to have access to credit to sustain their operations. Businesses and households were also given tax concessions and direct assistance to help them tide

through the downturn. This mix of monetary and fiscal policies contributed to the quick and strong economic recovery from the crisis.

Central banks have to formulate monetary policy in an uncertain world with incomplete information

At any point in time, central banks have to make judgment calls on whether recent developments will only have temporary effects on growth and inflation, or whether there has been a structural change in the economy that has permanently affected growth and inflation in the future.

Accordingly, economists at the central bank do their best to create reliable models of the economy and test them against incoming economic data. However, despite the best efforts of the national accounts statisticians, the central bank does not have up-to-the-minute and totally reliable information about the state of the economy. Economic data is limited because of lags in their publication as it takes time to capture the myriad of transactions in the economy. Besides, some sectors are difficult to quantify and statisticians have to make do with estimates. At the same time, policymakers do not have perfect knowledge about how the economy works: its multitude of linkages, causes and effects. To complicate matters, monetary policy affects the economy with long and variable time lags and even the best available model can become less relevant if the structure of the economy and the behaviour of producers and consumers change over time.

For these reasons, central banks rely on a host of economic indicators to guide monetary policy formulation. These include monetary indicators, such as interest rates, exchange rates and the money supply; real economy indicators such as indices of industrial production and exports, as well as 'soft' data such as consumer confidence and business surveys. Of particular importance for Singapore, given its extreme openness to international trade and financial markets, are forecasts of GDP growth in its major trading partners, which influence exports, and projections of global oil and commodity prices, which impact the domestic inflation rate.

In MAS, the monetary policy formulation process also mitigates as much of the uncertainty and risks as possible through a thorough assessment and presentation of the recommended

policy stance to the Monetary and Investment Policy Meeting or MIPM. The MIPM is the equivalent of the Monetary Policy Committee in other central banks. It comprises of experienced public officials and senior policymakers who independently contribute to the collective wisdom of decision-making.

The global economy has become subject to more frequent shocks in the last few decades, including the sharp fall in demand for electronics in 2001–2, geopolitical shocks such as terrorist attacks, medical pandemics, and the 2008–9 Global Financial Crisis. The sudden and unanticipated nature of these shocks posed significant challenges to monetary policymakers. Indeed, Alan Greenspan, former Chairman of the Fed, explicitly recognised the role of uncertainty in the conduct of monetary policy when he said: “uncertainty is not just an important feature of the monetary policy landscape; it is the defining characteristic.” Consequently, the conduct of monetary policy in central banks all over the world, including the MAS, will necessarily involve “crucial elements of risk management, a process that requires an understanding of the many sources of risk and uncertainty that policymakers face and quantifying of those risks when possible.”

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