

**ENLIGHTENED DISCRETION IN MONETARY POLICY:  
SINGAPORE'S EXPERIENCE\***

*A Presentation to the Economic Society of Singapore Seminar on  
Understanding the Singapore Economy, 5 August 2000*

**Financial and Special Studies  
Economics Department  
Monetary Authority of Singapore**

**August 2000**

\* The views in this paper are solely those of the staff of the Financial & Special Studies Division, and should not be attributed to the Monetary Authority of Singapore.

<b>Contents</b>	<b>Page</b>
1 Introduction	1
2 Monetary Policy Framework in Singapore	1
▪ Instruments and Targets	1
▪ Exchange Rate Policy in Action	2
3 Responding to the Asian Crisis	6
▪ An External Shock	6
▪ Policy Response	7
▪ Implications and Lessons of the Crisis	9
4 Monetary Policy and the New Economy	11
▪ Long-run Effects of the New Economy	11
▪ Uncertainties in Monetary Policy in the Short-Run	13
5 Conclusion	15

# ENLIGHTENED DISCRETION IN MONETARY POLICY: SINGAPORE'S EXPERIENCE

---

## 1 Introduction

1.1 This paper provides an overview of the exchange rate-centred monetary policy framework in Singapore. The system, which has been in place since about the early-1980s has played an important role in contributing to the macroeconomic stability of the country.

1.2 The plan of the paper is as follows. The next section describes the rationale for the choice of exchange rates as the intermediate target of monetary policy, and the way in which exchange rates can influence inflation outcomes in the economy. Section 3 highlights how the flexibility of the exchange rate system helped alleviate somewhat the impact of the regional economic downturn provoked by the Asian financial crisis of 1997/98. We also draw some lessons from the experiences of the crisis. Finally, Section 4 offers some tentative observations about the implications of the new economy on the conduct of monetary policy.

## 2 Monetary Policy Framework in Singapore

### Instruments and Targets

2.1 Discussions about monetary policy operations focus on instruments, intermediate targets, and policy goals. Monetary policy *instruments*, such as the interest rate on borrowed funds from the central bank, are used to achieve macroeconomic *targets* in terms of inflation and/or GDP growth outcomes. *Intermediate-target* variables fall in between the sequence that links monetary policy instruments with real economic activity or inflation. In particular, the instruments of policy are manipulated to

achieve a pre-specified value of the intermediate target. (Please see Chart 1.)

**Chart 1: The Language of Monetary Policy**

Instruments	Intermediate Targets	Targets
<b>Central bank holdings of foreign currency reserves</b>	<b>Exchange rates</b>	<b>Inflation</b>
Interest rate on central bank reserves	Interest rates	Unemployment
Reserve requirement ratios	Money aggregates	

N.B. Bold entries apply to Singapore.

2.2 As Singapore's central bank, the MAS makes use of intervention operations in the foreign exchange markets (instrument) to control the path of the exchange rate (intermediate target), which is pre-specified to achieve price stability (target). In this sense, the term “exchange rate-centred monetary policy” is often used to describe the system that we operate.

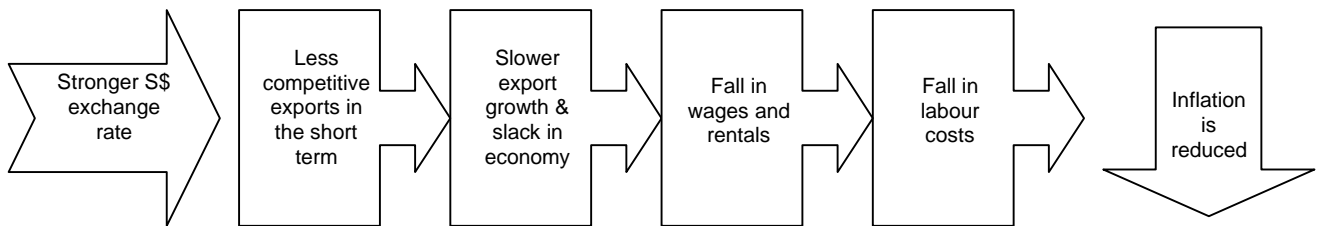
2.3 The exchange rate was chosen as the intermediate target of monetary policy for two reasons: It is relatively controllable and it is also highly correlated with the ultimate objective of monetary policy, price stability. The exchange rate is an effective tool to influence macroeconomic variables in the short-run because of the high degree of openness of the Singapore economy. This is explained in greater detail below.

#### Exchange Rate Policy in Action

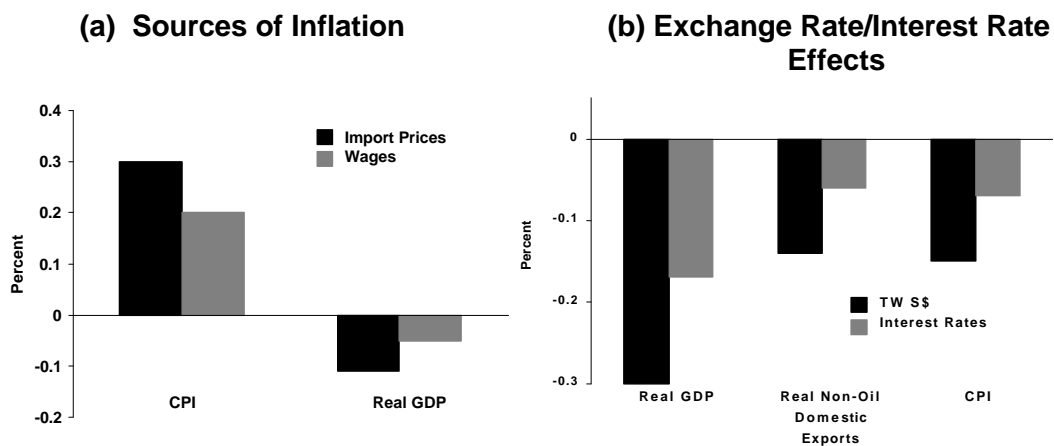
2.4 Exchange rates influence inflation outcomes in the economy in two ways. Firstly, there is the direct channel of exchange rates influencing imported goods prices in Singapore. In essence, the effect of exchange rates is to “filter” the price of foreign goods before they reach the domestic market. An illustrative example may be useful here. Singapore imports rice from Thailand. Thai rice is quoted in baht, and the price we pay for it in Singapore dollars is determined by the prevailing exchange rate between

Singapore dollars and baht. If the price of Thai rice rises from 10 to 20 baht per kilogram, all things remaining equal, the price of Thai rice in Singapore will also double. Thus, CPI inflation in Singapore goes up from an external source. But suppose the MAS intervenes in the foreign exchange markets in such a way as to cause the Singapore dollar to appreciate or strengthen against the baht. This implies that the Singapore price of rice will rise less than the amount that it did in Thailand. This will help, at least partially, to prevent the high prices in Thailand from affecting prices here in Singapore. In this way, the exchange rate policy is used to reduce imported inflation. This channel of monetary policy transmission is an important one, as imported items make up a fairly large proportion of the average consumer's spending.

2.5 Second, exchange rates also operate indirectly through the aggregate demand channel to influence inflation rates in the economy. Consider the export of semiconductor chips, which form an important proportion of Singapore's non-oil exports. The price that other countries – for instance, Thailand – pay for these goods depends on the Singapore dollar production costs for these items and the prevailing exchange rate. Changes in the exchange rate will influence Thailand's demand for Singapore's products. If the Singapore dollar were to weaken against the Thai baht, the price of Singapore-made chips will be correspondingly low in Thailand and thus, demand will be high. This means that Singapore manufacturers will have to work harder and hire more staff to meet the increase in demand. Given the limited availability of resources, manufacturers will bid up the prices of factors, including wages, which ultimately are likely to be passed on as higher prices for final consumption goods in Singapore. Thus, in the short-term, a weak exchange rate policy can have the effect of raising wage and inflation pressures by stimulating external demand. This channel of transmission is more complex than the previous one described and may also take a longer time to work itself through the economy. Chart 2 illustrates this indirect channel.

**Chart 2: The Transmission of Monetary Policy**

2.6 It is useful to provide here evidence of the empirical relevance of some of the relationships we have just discussed. We report here two sets of estimates from the MAS' new macroeconomic model of the Singapore economy, called the MMS or Monetary Model of Singapore. First, we illustrate the sources of CPI inflation in Singapore, shown in Chart 3(a). We simulated the effects of a once-off 1% increase in import prices (foreign source of inflation) and wages (domestic source of inflation). The bar chart, which report the short-term impact multipliers of the shock, clearly indicates that import prices have a stronger effect on domestic CPI than wages. For example, the CPI rose 0.3% following a 1% increase in import prices compared to a rise of 0.2% following a similar increase in wages.

**Chart 3: Empirical Evidence from the MMS**

2.7 Second, we estimated what would happen if the exchange rate went up by 1%, and compared this with an interest rate increase of the same amount. Chart 3(b) shows that the exchange rate, represented by the trade-weighted Singapore dollar, has a much greater influence on GDP and inflation than interest rates. These two simulations provide some empirical

relevance for the use of exchange rates as an effective tool to control inflation and short-run activity in Singapore. Box Item 1 provides further information on the exchange rate system.

### **Box Item 1: Features of the Exchange Rate System in Singapore**

There are four main features of the exchange rate system in Singapore.

First, the Singapore dollar is managed against a *basket* of currencies of our major trading partners. The various currencies are given different degrees of importance, or weights, depending on the extent of our trade dependence with that particular country.

Second, the Singapore dollar is allowed to fluctuate within a *band*, rather than kept to a fixed value. As long as the dollar remains in this region, the MAS does not intervene; if, however, the exchange rate exceeds the bands, the MAS will step in, either buying or selling foreign exchange so as to preserve the dollar's value.

Third, this exchange rate band is periodically reviewed to ensure that it remains consistent with the underlying fundamentals of the economy. Sometimes this feature is referred to as the *crawl* feature of the target exchange rate path. It is important to continually assess the path of the exchange rate in order to avoid a misalignment in the currency value.

Fourth, the choice of the exchange rate as the intermediate target of monetary policy implies that the MAS gives up control over domestic interest rates (and money supply). In the context of free movement of capital, interest rates in Singapore are largely determined by foreign interest rates and investor expectations of the future movements in the Singapore dollar.

Economists often employ two criterion in evaluating an exchange rate system. First, the exchange rate system should be flexible enough to allow the value of the domestic currency to move to reflect changes in the country's underlying macroeconomic fundamentals. This is important to avoid a misalignment of currencies over the medium- to long-term, a situation that could invite speculative attacks.

In relating the value of the currency to underlying economic fundamentals, the focus is on the real exchange rate, which is the nominal exchange rate adjusted for inflation differentials between Singapore and her main trading partners. Since the mid-1980s, the trade-weighted Singapore dollar has generally been on a secular appreciating path. Our econometric work has shown that this is broadly in line with stronger economic fundamentals in the Singapore economy, such as the trend increase in our savings rate and higher productivity in the export sector. The flexibility accorded by our exchange rate system has therefore been able to accommodate the movements in Singapore's underlying fundamentals, and prevent a serious misalignment from developing.

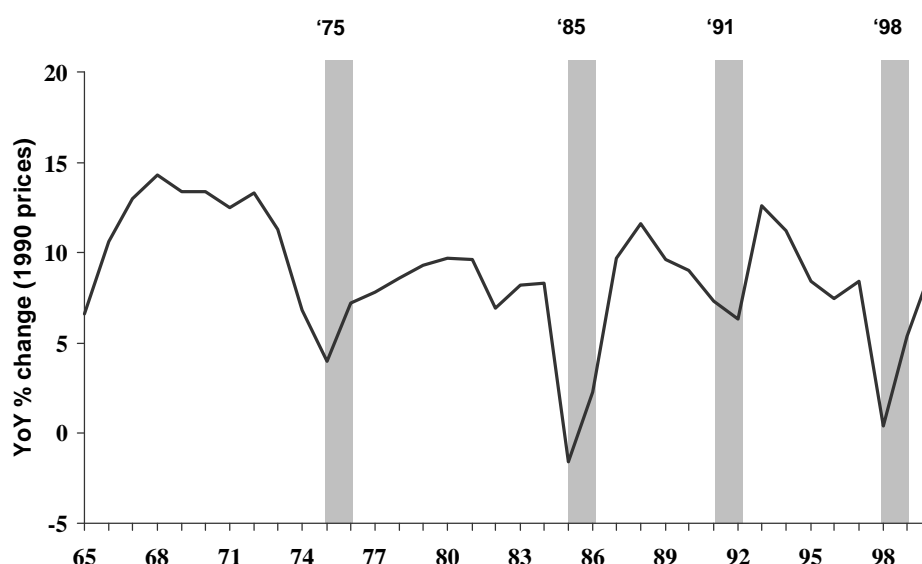
The second criterion is of a more short-term focus, and has to do with the capacity of the exchange rate system to prevent excessive short-term volatility in financial markets from adversely affecting the real economy. Our policy of managing the exchange rate within a band has provided us with the flexibility to cope with such situations. This was well illustrated by our experience during the Asian crisis, which is discussed in Section 3 of the main text.

### 3 Responding to the Asian Crisis

#### An External Shock

3.1 The recent Asian Crisis is a useful case study to illustrate the workings of monetary policy in Singapore. Chart 4 isolates the major economic downturns in the Singapore economy over the past three decades or so. The period 1997-98 saw the second-most severe downturn, after that of 1985. Given our high degree of dependence on trade, the downturn in the regional economies constituted an adverse external shock, which badly affected domestic economic activity in Singapore.

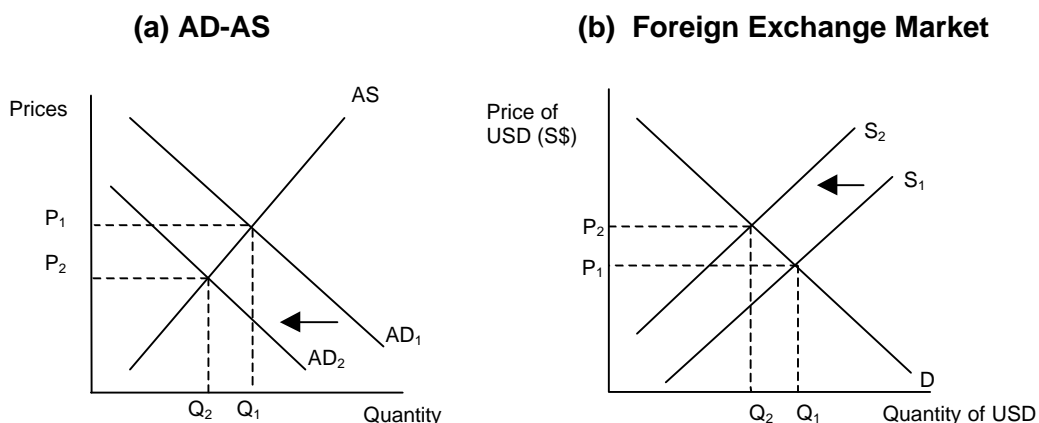
**Chart 4: Real GDP Growth in Singapore, 1965-99**



3.2 A simple way of representing what occurred is to use the framework of an aggregate demand-aggregate supply (AD-AS) schedule, as in Chart 5(a). In Singapore's case, foreign demand is a major determinant of the position of the AD curve. As incomes collapsed across the region in 1998, the demand curve facing Singapore producers contracted at all price levels, represented by a rightward shift from  $AD_1$  to  $AD_2$ . As a consequence, economic activity as measured along the horizontal axis contracted to  $Q_2$ , and the general price level in the economy also declined. Thus, in 1998, Singapore's real GDP growth fell to 0.4%, compared to 9% in 1997.

Economic activity contracted by 1.9% and 1.1% in the third and fourth quarters of 1999, technically implying that the Singapore economy was in recession. CPI inflation also fell in 1998, to -0.2%, compared to 2% the year before.

**Chart 5: Collapse in Demand in Singapore**



3.3 The market for foreign currency displayed one of the earliest and most visible effects of the crisis (see Chart 5(b)). Foreign investors were afraid of losing their money, so they pulled out *en masse* from all countries, not just the crisis-affected ones. As Chart 5(b) shows, the supply of US dollars in the foreign exchange market in Singapore was therefore greatly reduced, a reflection of the sharp increase in investors' risk-aversion. Assuming the demand schedule for US dollars in Singapore remained at D<sub>1</sub> (although there was a leftward shift given the collapse in domestic spending), this resulted in two things – a reduced quantity of US dollars traded in Singapore, and a higher price for US dollars in terms of Singapore dollars i.e. the local currency depreciated. Thus, Singaporeans wishing to travel to the US or purchase books and CDs from Amazon.com during this period had to pay more Singapore dollars for the US goods than before.

### Policy Response

3.4 The government's assessment of the situation was that the recession was caused mainly by external factors, rather than any fundamental problems associated with the domestic economy. Given this,

the domestic economy would not enjoy a sustained recovery until external demand improved so as to shift the aggregate demand curve back again to  $D_1$ . The government's policy approach was therefore to make sure that the necessary adjustment process - illustrated in Chart 6 - proceeded in as swift, effective and painless a manner as possible.

**Chart 6: The Government's Response to the Crisis**

<i>Foreign exchange market</i>	<i>Labour market</i>	<i>Goods market</i>
<p>MAS adopted a more flexible exchange rate policy.</p>	<p>The government cut employer CPF contributions to reduce production costs and thus labour retrenchment. Worker placement and job retraining programs were introduced.</p>	<p>Governments' off-budget measures helped to reduce business operating costs such as rentals and port charges. Budget automatic stabilisers and increased infrastructure spending also helped to cushion fall in demand.</p>

3.5 In the foreign exchange market, MAS adopted a more flexible approach towards managing the exchange rate. This was in line with the pressures for a lower value of the Singapore dollar shown in Chart 5(b). In addition, the general weakening in export demand, shown in Chart 5(a) as a contraction in the AD schedule, also suggested a more flexible approach in our exchange rate policy. From the discussions above (paragraph 2.2.2), maintaining too strong an exchange rate would have exacerbated the fall in external demand caused by the fall in income in the regional countries. The fact that the MAS manages the Singapore dollar within a band, rather than fixing it at a specific value, helped to accommodate these policy responses at that time, without causing undue uncertainty in the markets.

3.6 The government introduced two off-budget packages of measures in June and November 1998 which were largely directed at reducing business costs. Among the measures was a reduction in employers' CPF contribution rates and other variable components of wages. It was hoped that lower wage costs, which implied lower production costs, would enable manufacturers to avoid laying off too many workers. In addition, lower wages meant lower taxes collected by the government. By allowing its budget

balance to move temporarily into smaller surplus, the government made use of the "automatic stabiliser" effect of fiscal policy on the economy. When the government's tax revenue contracts during an economic downturn, this constitutes an indirect stimulus to the economy, because less money is being withdrawn from the income stream in the economy.

3.7 At the same time, the government took advantage of the lull in growth to carry out economic restructuring and strategic planning. This would help to ensure sustained growth for the Singapore economy in the future. The vision is for Singapore to evolve, in the next decade, into an advanced and globally-competitive knowledge-based economy, with manufacturing and services as the twin engines of growth. The government increased and improved its investments in infrastructure and education, in addition to training and retraining workers so as to bring them up to par with new information technologies. MAS carried out key financial sector reforms so as to keep the financial sector vibrant and competitive.

3.8 The Singapore economy rebounded fairly quickly in the first quarter of 1999, less than two years from when the Asian crisis first erupted. For the year as a whole, GDP growth registered a respectable 5.4%. In the first half of 2000, the Singapore economy expanded by 8.8% compared to the same period a year ago.

### Implications and Lessons of the Crisis

3.9 The experience of the Asian Crisis brought to the fore many principles and lessons that Singapore can and must draw on. First, strong economic fundamentals are important – these include a wide range of factors, such as consistent and prudent macroeconomic policies, high savings and reserves, and an efficient supervisory framework in the financial sector. The fact is that Singapore suffered less because it was in a much stronger position than its neighbours when the crisis struck. Lawrence Summers, the US Treasury Secretary expresses the point as follows: "The best national response to crisis is not to have one. The next best is to have

a sufficiently robust set of domestic institutions and national economic system that the crisis is contained and self-limiting and does not reach the stage where a country's capacity to meet its international obligations comes into question."<sup>1</sup>

3.10 Second, the Asian crisis has once again confirmed that many crises have their roots in the excessiveness of the *boom* stage in the economic cycle of a country. Allowing a boom to go on too long creates the conditions for a bust, and a recession after that. These conditions include over-investment and over-borrowing in the economy, spurred by positive sentiment, euphoria and often relatively loose credit conditions. It is therefore important for macroeconomic policy to be sufficiently pre-emptive during an economic expansion.

3.11 Third, it is important for open economies to maintain an appropriate exchange rate system. Some degree of flexibility can be advantageous as we have seen above, in order to ensure that the exchange rate is fairly valued against the evolving economic fundamentals of the country. Singapore's policy of managing the exchange rate within a band has also provided us with the flexibility to cope with exceptional periods of volatility in foreign exchange markets and uncertainty in economic conditions.

---

<sup>1</sup> Summers (2000), "International Financial Crises: Causes, Prevention, and Cures", The Richard Ely Lecture, Papers and Proceedings of the 112<sup>th</sup> Annual Meeting of the American Economic Association.

## **4 Monetary Policy and the New Economy**

4.1 In this section, we offer some preliminary observations on monetary policy and the new economy. A key characteristic of the new economy is that it will be increasingly "weightless". This means that greater value of production will reside in economic commodities that have little or no physical manifestation – things like research and development, graphics design and logistic services, rather than traditional manufactured products<sup>2</sup>. Creativity, as opposed to mindless efficiency, will be a potent competitive advantage; some even claim that it will be possibly be the only sustainable source of growth in the long-run.

4.2 The new economy is most evident in the US, where technological advances have led to strong productivity growth. This has kept inflationary pressures at bay even though labour markets have never been tighter and growth is currently the highest recorded in more than a decade. Although Singapore has yet to experience productivity gains on the same scale as the US, the government's current emphasis on creating a knowledge-based economy, cultivating entrepreneurship and investing in technology and research and development is expected to provide a catalyst for the emergence of new economy activities.

### Long-run Effects of the New Economy

4.3 The objective of central banks must be to create conditions conducive to the full realisation and exploitation of the benefits and opportunities presented by the new economy in the long-run.

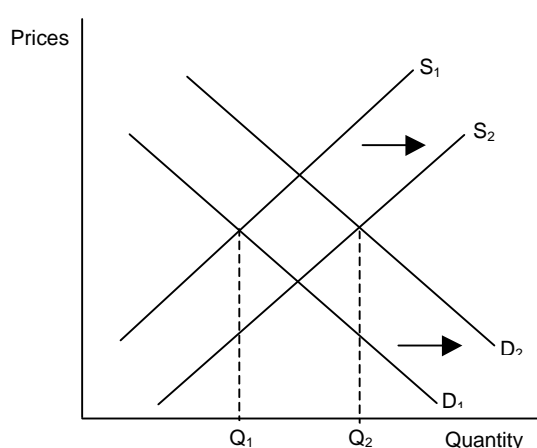
4.4 The potential opportunities presented by the new economy in the long-run can be reflected as an outward shift of the aggregate supply curve of the economy. This could occur as a result of an increase in the average

---

2 "Increasingly weightless economies" by Danny T. Quah, Bank of England Quarterly Bulletin, February 1997.

total productivity of the economy, perhaps because people have discovered more creative ways of doing things. This causes the marginal cost curve or supply schedule to shift rightward, and producers can thus support the same volume of output at a lower market-price than before (see Chart 7). The demand schedule would also shift outward as incomes rise. The economy's sustainable level of economic activity could rise to  $Q_2$  without necessarily generating an increase in inflationary pressures.

**Chart 7: The New Economy**



4.5 In Singapore's context, the permanent shift in the supply curve will underpin an appreciation in the fundamental or equilibrium value of the real exchange rate in the long-run. One way of thinking about this is that a permanent productivity increase leads to an expansion in output, which supports a higher level of savings. As excess savings are channelled overseas, the country initially becomes a net lender of capital in world financial markets. The capital outflows will cause a depreciation of the exchange rate in the short-run. However, over time, the foreign assets acquired overseas will generate interest payments from foreigners, and the increase in net income flows from abroad supports a strengthening of the real exchange rate<sup>3</sup>.

<sup>3</sup> See for example J. Stein and Associates, "Fundamental Determinants of Exchange Rate", Oxford 1995. The argument that increasing productivity in the tradable sector appreciates a country's real exchange rate has traditionally been based on the Samuelson-Balassa effect.

4.6 The required real exchange rate appreciation in this context can be accomplished by an appreciation in the nominal exchange rate, an increase in the domestic prices or a combination of both types of adjustment. When the exchange rate is flexibly managed, as in Singapore, the required real appreciation can be take place by letting the nominal exchange rate appreciate, without too significant an adjustment (rise) in domestic prices (as in Chart 7).

#### Uncertainties in Monetary Policy in the Short-Run

4.7 In the short-run, monetary policy response to the arrival of the new economy is fraught with uncertainties, especially in the short-run. For example, central banks do not know for sure whether productivity increases are permanent, or if it is demand- or supply-side factors that are dominating observed GDP outcomes. It is therefore difficult for policymakers to gauge the most appropriate monetary policy response.

4.8 To provide a flavour of such difficulties, we examine a situation where there is general uncertainty associated with determining how much productivity has increased in the economy (or by how much the supply curve has shifted outwards). Chart 8 attempts to capture this dilemma. The shaded area indicates the range over which the supply curve might shift outward. Each supply curve implies different *speed limits* for the economy, that is, the volume of economic activity that can be sustained over the medium-term without generating inflation.

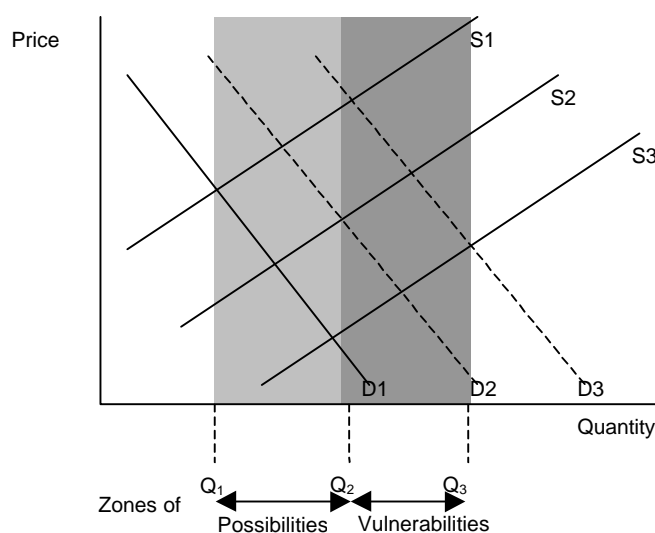
4.9 What should the central bank's response be, given this uncertainty? A general principle would be that monetary policy should accommodate increases in activity up to the lightly-shaded region traced out by supply curve  $S_2^4$ . This region will be referred to as the "zone of possibilities". Increases in activity beyond that encroach into the "zone of

---

<sup>4</sup> See for example Laurence Meyer, "Structural Change and Monetary Policy", remarks before the Joint Conference of the Federal Reserve Bank of San Francisco and the Stanford Institute for Economic Policy Research, 3 March 2000.

vulnerabilities", and the central bank should then pre-emptively tighten policy. The point is that the region marked up to  $Q_2$  along the horizontal axis falls within a *plausible* range of implied productivity gains – as determined by the behaviour of productivity in the past, for instance – and the central bank might therefore be able to safely accommodate activity increases up to that point. However, beyond  $Q_2$ , activity reaches the "zone of vulnerabilities", which is some considerable distance away from the current supply curve  $S_1$ . In this case, one might seriously question whether or not economic agents are perhaps pushing the limits of the new economy too far. The likelihood of the emergence of inflation and other macro imbalances is very high, and the central bank should therefore step in to slow down economic activity.

**Chart 8: Monetary Policy and the New Economy**



4.10 Consider a specific situation in which the economy may find itself in this zone of vulnerabilities. A number of US Federal Reserve officials, including Chairman Alan Greenspan, have pointed out that promises of the benefits of the new economy in the future may actually lead to inflationary pressures now. This occurs because productivity improvements affect aggregate demand as well as aggregate supply, and may in fact initially have an even larger effect on demand than on supply. In other words, we may have a situation where the aggregate demand curve shifts to the right

(to  $D_2$  and  $D_3$ ) even before the aggregate supply curve does; the economy may move into the “zone of vulnerabilities”.

4.11 The increase in demand could take place through the wealth effect associated with appreciating stock prices; stock prices go up because investors think that the future returns of their investment will increase in the new economy. However, this rise in asset prices takes place in the present, which makes consumers richer and induces them to increase their spending immediately, even before higher productivity gets translated into an increase in total supply. The result is an increase in current inflation rates. As pointed out, the correct response of the central bank would be to tighten monetary policy and slow down demand. It appears, therefore, that some old-fashioned rules about monetary policy remain relevant in the new economy.

## **5 Conclusion**

5.1 This paper has discussed the framework of monetary policy in Singapore, which has served us relatively well since the 1980s. We have stressed the important role that the flexibility of the exchange rate system has played in terms of preserving the long-run value of the currency, as well as dealing with excessive short-term volatility in the markets. The government's response to the Asian crisis was also examined and we highlighted the importance of strong economic fundamentals in enabling the economy to pull through the crisis without severe disruption.

5.2 The paper also discussed some implications of the new economy. Even though much of what has been claimed about the new economy may be hype, what remains is significant enough to be a factor for consideration when assessing the long-term growth potential of the Singapore economy and deciding on the appropriate macroeconomic policy response.

5.3 Alan Blinder in his 1997 Lionel Robbins Lecture challenged central bankers to exercise 'enlightened discretion" in the conduct of

monetary policy.<sup>5</sup> This phrase could be interpreted as incorporating two elements. First, it implies that monetary policy cannot be run on the basis of rigid rules, which may have worked in the past. The economic structure is always changing and the central bank cannot be sure that monetary policy decisions will have the same effect on the economy as they did in the past. Monetary policy must instead involve active discretionary choices based on ongoing assessment of current and future economic conditions.

5.4           Second, adopting an enlightened approach in monetary policy also implies a continued adherence to the philosophy and principles that have served us well in the past. Although central banks would need to adapt strategies to changing circumstances and conditions, the fundamentals of prudence, stability and confidence will continue to be the relevant guiding philosophy in monetary policy management in the new economy. In fact, it is the adherence to these fundamentals that will ensure that the benefits of the new economy are translated into higher standards of living for the population as a whole. Chairman Greenspan puts it this way: "We may be in a rapidly evolving international financial system with all the bells and whistles of the so-called new economy...but the old-economy rules of prudence are as formidable as ever. We violate them at our own peril"<sup>6</sup>.

---

<sup>5</sup> Blinder, A. (1998), "Central Banking in Theory and Practice", MIT Press.

<sup>6</sup> "Global Challenges", remarks by US Federal Reserve Board Chairman Alan Greenspan at the Financial Crisis Conference, Council on Foreign Relations, 12 July 2000.