
Frequently Asked Questions on Singapore's Monetary Policy Framework



Monetary Authority
of Singapore

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Economic Policy Group
Monetary Authority of Singapore

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1 What is the objective of monetary policy in Singapore?

The Monetary Authority of Singapore (MAS) is Singapore's central bank. A primary function of MAS is therefore to conduct monetary policy, in addition to the other common roles of a central bank such as managing Official Foreign Reserves, issuing currency, overseeing payment systems and serving as a banker to and financial agent of the Government.¹

This section explains why price stability is the overriding objective of monetary policy in Singapore and spells out the criteria that MAS uses to assess price stability.

1.1 What is the objective of MAS' monetary policy?

MAS is responsible for maintaining price stability conducive to sustainable growth of the economy. This objective is enshrined in the MAS Act.

The MAS Act does not prescribe any other mandate for monetary policy, unlike some other central banks which may have a dual mandate to achieve both maximum employment and price stability.

1.2 What is price stability? How does MAS assess price stability in the Singapore economy?

Price stability describes a situation in which broad-based inflation—or *average* price increases in the economy—is contained, and is not a significant consideration for households and businesses when they make consumption and investment decisions.

MAS looks at a broad range of price and cost indicators in the economy to assess whether there is overall price stability. Two key measures of consumer price inflation that MAS pays close attention to are 'MAS Core Inflation' and 'CPI-All Items inflation'.

In addition, MAS monitors developments in wages and rentals, import and export prices, output prices, and also measures of resource utilisation and indicators of inflation expectations as these contain information about future price dynamics.

Focusing on average price movements in the broader economy means that MAS does not seek to offset *relative* price changes, i.e. the change in the price of one good with respect to other prices. For example, if an increase in global oil prices causes the price of petrol to rise relative to the price of other goods and services in the economy, MAS does not necessarily tighten monetary policy to offset this shift. In fact, orderly relative price movements in the

¹ In addition, MAS is Singapore's integrated supervisor of the financial services sector, and is responsible for financial stability surveillance. It also fosters Singapore's development as an international financial centre.

economy play a valuable signalling role in inducing optimal responses in consumption and production behaviour.

However, if the higher cost of petrol feeds into increased business costs and induces perceptions that future inflation will be higher, this will result in a generalised increase in prices. In this instance, MAS may tighten monetary policy to offset rising inflationary pressures.

1.3 What is core inflation in Singapore?

'CPI-All Items inflation' is the change in the overall Consumer Price Index (CPI) and measures the average price change in a fixed basket of consumption goods and services commonly purchased by households. 'CPI-All Items inflation' is also often referred to as 'headline inflation'.

'MAS Core Inflation' is a measure of underlying consumer price inflation. It is based on a subset of the CPI basket that better captures the underlying trend in prices which can be addressed by MAS' monetary policy. Core inflation is the measure that MAS monitors most closely, among the range of indicators.

In other countries, 'core inflation' strips out the prices of food and energy items as these tend to be volatile and susceptible to global commodity market fluctuations. In Singapore, these items are included in MAS Core Inflation because MAS' monetary policy can directly influence the pass-through from global prices to domestic prices.

Instead, MAS Core Inflation strips out the costs of accommodation and private road transport. The bulk of accommodation cost is comprised of imputed rentals on owner-occupied accommodation. Imputed rentals are meant to reflect the costs to homeowners of utilising housing services. They do not reflect the cash outlays of the large majority of households who own their homes, nor necessarily influence the broader, underlying price dynamics in the economy. MAS Core Inflation therefore excludes the cost of accommodation. Meanwhile, private road transport costs are significantly influenced by the domestic policy framework for controlling road congestion.²

1.4 Does MAS have an inflation target?

MAS does not have an explicit inflation target. Nevertheless, MAS has concluded that, on average, a core inflation rate of just under 2%, which is close to its historical mean, is consistent with overall price stability in the economy.

² For example, private road transport costs fluctuate according to prices of 'Certificates of Entitlement' determined under the vehicle quota system, which allocates a fixed quantity of additional cars through a bidding process.

This differs from some other central banks which have specific inflation targets. For example, the Bank of England is required by the government to keep the rate of inflation of the UK's consumer price index at 2%.

MAS also monitors a range of other price and cost measures so that it has a comprehensive view of inflationary pressures in the economy. This enables MAS to take the appropriate monetary policy actions to ensure medium-term price stability.

1.5 Why is price stability important?

A low and stable rate of inflation provides a conducive environment for sustainable economic growth and improves the well-being of Singaporeans through several channels.

When inflation is low and stable, businesses are better able to plan and decide on investment and job creation. Conversely, a high rate of inflation tends to be associated with volatile price changes which creates uncertainty. In an environment of heightened uncertainty, businesses may hold back on their expansion and hiring plans.

During periods of high inflation, wages tend to increase rapidly as well, and run ahead of productivity gains. Businesses' unit labour costs will rise at a rapid pace and result in further inflationary pressures and a wage-price spiral if firms pass on cost increases to consumers by raising prices.

High inflation can mean particular hardship for households whose incomes do not keep pace with rising prices, such as retirees. Keeping inflation low and stable therefore protects the purchasing power of the S\$ and households' savings.

However, deflation (negative inflation) is also damaging to an economy. When prices are persistently falling, firms may try to maintain profit margins by reducing costs. However, because costs such as wages cannot fall continuously, firms may reach a point where they are unable to cut costs further. Businesses that are making sustained losses may be forced to shut down and retrench their workers.

There is also the risk that if households hold back on their purchases in anticipation of price declines, a negative spiral could ensue where consumers reduce expenditure, companies shut down, unemployment rises, and spending falls further.

1.6 Has Singapore been successful in keeping inflation low and stable?

Singapore has succeeded in keeping inflation low since the adoption in the early 1980s of a monetary policy framework clearly aimed at achieving medium-term price stability, and implemented through the management of the exchange rate. (See Question 2.2)

CPI inflation has generally been below that of the advanced economies (Table 1) and has also been less volatile.

Table 1: Inflation in Singapore, the 7 Major OECD Economies, and the World³

| Period | Singapore | | 7 Major OECD Economies* | | World |
|-----------|-------------------------|--------------------|-------------------------|-----------------------------|---------------|
| | CPI-All Items Inflation | MAS Core Inflation | CPI Inflation | Core Inflation [~] | CPI Inflation |
| 1981–89 | 2.1 | ... | 4.8 | 5.3 | 15.5 |
| 1990–99 | 1.9 | 1.8 | 2.7 | 2.9 | 20.0 |
| 2000–09 | 1.5 | 1.7 | 2.0 | 1.6 | 4.2 |
| 2010–17 | 1.9 | 1.6 | 1.4 | 1.4 | 3.5 |
| 1981–2017 | 1.9 | 1.7 [^] | 2.7 | 2.8 | 11.1 |

* Refers to Canada, France, Germany, Italy, Japan, UK and US.

[^] MAS Core Inflation data is only available from 1990.

[~] Excludes food and energy.

Endnotes

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³ Inflation data for the 7 Major OECD economies is from Haver Analytics. World inflation is from the IMF *World Economic Outlook*, and is derived from the inflation rates of 193 economies in the database.

2 What is MAS' monetary policy framework and its rationale?

This section explains why the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) is MAS' chosen intermediate target for monetary policy and identifies the channels through which the exchange rate impacts prices in the economy.

It also clarifies that MAS' exchange rate policy is Singapore's only form of monetary policy. As Singapore's monetary policy is centred on the exchange rate and its capital markets are open, domestic interest rates are largely determined by global interest rates and foreign exchange market expectations of the Singapore dollar.

2.1 Why does MAS use the nominal exchange rate as the intermediate target of monetary policy?

Unlike most central banks which target interest rates, MAS uses the nominal exchange rate as the *intermediate target* of monetary policy.

This is because, in a small and open economy such as Singapore, where gross exports and imports of goods and services are more than 300 percent of GDP and almost 40 cents of every dollar spent domestically is on imports, the exchange rate has a much stronger influence on inflation than the interest rate.

The nominal effective exchange rate, directly and indirectly, affects a wide range of prices in the Singapore economy, such as import and export prices, wages and rentals, consumer prices and output prices. (See Question 2.3)

Indeed, empirical research supports the view that the exchange rate is a relatively more effective instrument of monetary policy in very open economies, such as Singapore.⁴

The IMF has also concluded that MAS' monetary policy framework has served Singapore well in delivering domestic price stability.

⁴ For example, Mihov (2013) has shown that in an open economy with external consumption habit formation, monetary policy centred on the exchange rate results in superior welfare outcomes—in the form of less volatile output and inflation—than if an interest rate regime were used. Similarly, Chow et al (2014) show that when export price shocks are the major source of real volatility, an exchange rate regime has a comparative advantage over an interest rate rule in dampening inflation volatility.

2.2 What is the operating framework for MAS' monetary policy?

The operating framework for MAS' monetary policy is centred on managing the Singapore dollar against a *basket* of currencies along a typically appreciating path or *crawl* within a policy *band*. The framework is often referred to as the 'Basket', 'Band', and 'Crawl' or 'BBC' system.

MAS' intermediate target of monetary policy is the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER), which is a *trade-weighted basket*⁵ of currencies.

The S\$NEER has a stable and predictable relationship with inflation, MAS' ultimate target of monetary policy, which makes it a suitable intermediate target of monetary policy.

MAS focuses on the S\$NEER rather than a *bilateral* exchange rate between the S\$ and any foreign currency, as the trade-weighted exchange rate better reflects Singapore's diverse trading patterns. The S\$NEER also tends to be more stable than bilateral exchange rates (Chart 2.1), as it is not unduly affected by idiosyncratic factors in any one particular economy.

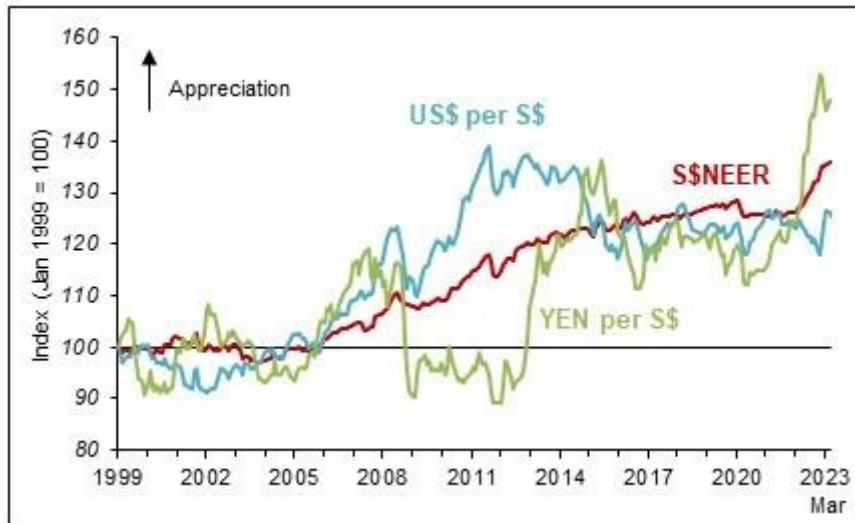
At each monetary policy review in April and October, MAS formulates monetary policy by setting a path for the S\$NEER policy band to ensure price stability in the medium term. MAS does this by allowing the band to *crawl* or appreciate at different rates over time, depending on current and future expected price developments in the economy. (See Question 3.6)

MAS does not have a crawling peg to a basket of currencies. Instead, the S\$NEER is allowed to float within a policy *band* that is set around the targeted crawl rate. When necessary, MAS can adjust the width of the band, as well as the level at which it is centred. (See Questions 3.7 and 3.8)

MAS' monetary policy decisions are thus typically characterised by shifts in the slope of the S\$NEER policy band (i.e. the rate of crawl) and occasionally by changes in the *level of the midpoint* or the *width of the band*.

MAS' monetary policy guides the path of the S\$NEER policy band over time to ensure that it remains aligned with domestic price stability.

⁵ The composition and weights of the basket of currencies are reviewed and adjusted periodically to ensure that the exchange rate remains relevant for achieving price stability as Singapore's trade pattern evolves.

Chart 2.1: S\$NEER and Bilateral Exchange Rate with US\$ and Japanese Yen

2.3 How does the exchange rate affect inflation in Singapore?

The exchange rate affects a broad range of costs and prices in the economy through two main channels: the '*imported inflation*' channel and the '*derived demand*' channel.

The '*imported inflation*' channel reflects changes in the S\$ prices of imported goods and services that arise from fluctuations in the nominal exchange rate.

For example, an appreciation of the Singapore dollar against the currencies of our major trading partners reduces the S\$ prices of imported goods and services, which subsequently dampens the consumer prices that Singapore households pay.

MAS' empirical research consistently shows that there is strong, and almost full, pass-through of exchange rate changes to import prices which, in turn, filter through to consumer prices with a time-lag.

The '*derived demand*' channel operates when nominal exchange rate changes affect firms' demand for domestic factors of production and hence the output gap.

For example, when economic activity (GDP) rises above the economy's potential (a positive output gap), it may be a precursor of rising costs, and thus, an acceleration of price inflation in the period ahead.

In this instance, an appreciation of the S\$—in the face of short-run price and cost rigidities—will dampen aggregate demand, leading firms to cut back on domestic production and hold back on investment and hiring. This causes the positive output gap to narrow, which reduces inflationary pressures.

Over the long run, MAS' nominal exchange rate policy, like monetary policy everywhere, has no impact on real variables like aggregate demand and employment, and only affects prices. (See Question 3.1 and 5.1)

2.4 Is MAS' exchange rate policy Singapore's only form of monetary policy?

Yes. MAS' exchange rate policy is Singapore's only form of monetary policy.

In most countries, the central bank conducts monetary policy by setting a desired level for a short-term interest rate which maps to the final target or targets of monetary policy.

MAS uses the exchange rate as the intermediate target of monetary policy in an analogous way. MAS sets a desired path for the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) to ensure medium-term price stability, which is the sole and *final* target of monetary policy in Singapore.

In theory, there is equivalence between monetary policy frameworks centred on the interest rate and those centred on the exchange rate.

In classical economic models, an increase in domestic money supply by the central bank (expansionary monetary policy) reduces the domestic interest rate. At the same time, since the relative supply of domestic currency to foreign currencies increases, expansionary monetary policy is associated with a depreciation of the exchange rate.

MAS has chosen to use the S\$NEER as its intermediate target of monetary policy because Singapore is a small and open economy, where gross exports and imports of goods and services are more than 300 percent of GDP and almost 40 cents of every dollar spent domestically is on imports. Accordingly, the exchange rate has a much stronger influence on inflation than the interest rate.

2.5 How are interest rates determined in Singapore?

Given Singapore's open capital markets, interest rates in Singapore are largely determined by no-arbitrage conditions such as Uncovered Interest Parity (UIP) or Covered Interest Parity. The UIP relationship for Singapore has been corroborated in several empirical studies.

This means that Singapore's domestic interest rates such as S\$ Swap Offer Rate (SOR) or S\$ SIBOR generally track global interest rates, notably the US\$ LIBOR. However, domestic interest rates can be at a discount (premium) to global interest rates when the S\$ is expected to appreciate (depreciate) against other currencies.

In practice, the S\$ SIBOR and S\$ SOR have tended to be at a discount to the US\$ LIBOR given market expectations that the S\$ would appreciate against the US\$.

The lower interest return in Singapore is thus compensated by the expected rise in the value of the S\$ in international currency markets.

2.6 What is the role of MAS in the domestic interbank market?

Money Market Operations (MMOs) are conducted daily by the Monetary and Domestic Markets Management Department (MDD) in MAS to manage liquidity within the banking system.

These are distinct from the implementation of exchange rate policy as MAS does not use domestic interest rates as a tool to carry out its exchange rate-centred monetary policy.

Instead, MMOs are primarily used to ensure there is sufficient liquidity to meet banks' demand for precautionary, reserve and settlement balances.

The extent and size of MMOs will depend on the net liquidity impact of autonomous flows on the banking system and the prevailing market conditions.

Autonomous flows, for instance, include changes in the stock of outstanding Singapore Government Securities (SGS), where net issuance (redemption) of SGS drains (injects) liquidity from (into) the domestic banking system. During times of financial market stress, banks may also desire to hold larger buffers of liquidity.

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3 How does MAS formulate its monetary policy?

This section explains the principles that guide MAS' formulation of monetary policy and how these principles have been applied in the context of the BBC framework:

First, monetary policy should be targeted at achieving price stability over the medium-term.

Second, monetary policy should be well-understood and systematic.

Third, monetary policy should be forward-looking and focused on the medium term.

Fourth, monetary policy should take into account the effects of all other macroeconomic policies, although certain circumstances may require monetary policy to work in concert with other policies, such as during times of economic crises.

3.1 Why is Singapore's monetary policy targeted at price stability?

First, monetary policy should be targeted at price stability as it matters for the welfare of households and businesses.

The welfare of households and businesses is enhanced when there is domestic price stability. Low and stable price inflation is a prerequisite for the efficient allocation of resources, and provides a conducive environment for sustainable economic growth. It also protects the purchasing power of savings.

Second, monetary policy should be targeted at price stability as prices are ultimately what the central bank can influence in the long run.

In the short run, cost and price rigidities mean that MAS' monetary policy has an effect on real aggregate demand, and hence, growth and employment. Indeed, this is one of the channels through which the exchange rate impacts domestic prices.

However, it is not the objective of monetary policy in Singapore to achieve a GDP growth or employment target. Instead, monetary policy responds in a countercyclical way to developments in the output gap and unemployment gap as they have a strong bearing on future costs and price dynamics in the economy.

If economic activity (GDP) rises above potential (a positive output gap), for example, it may be a precursor of rising wages and costs and thus, an acceleration of price inflation in the period ahead.

In the long run, MAS' nominal exchange rate policy only has an impact on prices, as is the case with monetary policy everywhere. If the S\$NEER is kept too low, output would rise above the economy's potential and eventually inflation would rise. Conversely, if the S\$NEER is kept too high, a recession would result, and inflation would fall.

This neutrality of monetary policy is equivalent to other central banks having no influence over real interest rates and the key factors influencing growth in the long run, such as productivity.

Accordingly, Singapore's exchange rate-based monetary policy cannot be used to target an undervalued real exchange rate to boost international competitiveness, GDP growth, net exports, or the external balance. (See Questions 5.1 and 5.2)

3.2 Why should monetary policy be systematic and well-understood?

Clear and systematic monetary policy formulation ensures that MAS' exchange rate policy does not become an additional source of uncertainty and disturbance to the economy.

Moreover, it helps to maintain MAS' credibility, which in turn reinforces the effectiveness of its exchange rate policy.

Monetary policy rules are one way of ensuring that the monetary policy formulation process is transparent and predictable.

Although MAS does not follow a rigid policy rule since a certain degree of (constrained) discretion is necessary to be able to deal with unexpected events, research has shown that MAS' exchange rate policy settings are well-characterised by a modified Taylor Rule. The Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) responds in a counter-cyclical way to variations in the output gap and inflation. This, along with MAS' long track record of ensuring low and stable inflation, has helped to anchor inflation expectations, which feeds back in a virtuous cycle to strengthen MAS' credibility.

3.3 Why should monetary policy be forward-looking and focused on the medium-term?

The main reason why monetary policy formulation needs to be forward-looking is that, as in other countries, monetary policy in Singapore works with significant time-lags.

MAS' econometric models suggest that the peak impact of a change in exchange rate policy on the economy occurs only after four to six quarters.

As a small, open economy, Singapore is also frequently buffeted by external shocks. Given the impossibility of calibrating and timing policy changes to exactly offset all shocks, and the long and variable lags in the transmission process, monetary policy that attempts to respond to every shock could add to economic volatility rather than reduce it.

Instead, MAS' policy band allows the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) to adjust to small and transitory shocks. MAS typically looks past transitory shocks to the economy or temporary deviations in inflation, and focuses on establishing a trajectory for the S\$NEER policy band that will bring core inflation closer to its historical average of just under 2% over the medium term.

3.4 Why should monetary policy take into account the effects of other macroeconomic policies? When should monetary policy work in conjunction with other macroeconomic policies?

MAS takes into account the effects of other macroeconomic policies so that it has a comprehensive view of all factors acting on inflation in the economy. Other macroeconomic policies that can affect aggregate demand, costs, as well as underlying price trends include fiscal policy and macroprudential policy.

There are also certain circumstances under which monetary policy works in conjunction with other macroeconomic policies. The two examples below illustrate.

First, in a severe economic downturn, a monetary policy response alone may not provide sufficient support to an economy. During the Global Financial Crisis, MAS eased monetary policy twice: reducing the rate of appreciation of the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) policy band to 0% in October 2008, and re-centring the policy band downwards in April 2009. At the same time, fiscal policy played a significant role in buffering the economy against the externally-led downturn: the FY2009 Budget provided for a \$20.5 billion (8.2% of GDP) Resilience Package to save jobs, enhance the cash flow of firms, support families, and strengthen the economy's long-term capabilities.

Having macroeconomic policies working in a complementary fashion during the crisis provided effective counter-cyclical support for the economy.

Second, when the global financial system is flushed with liquidity and capital inflows are strong, a boom in the interest rate-sensitive segments of the economy can lead to a rapid increase in credit and a build-up in inflationary pressures. In the aftermath of the Global Financial Crisis, unconventional monetary policies by the world's major central banks drove interest rates in Singapore down to around zero per cent. This resulted in faster growth in credit for property purchases and a sharp rise in property prices that caused inflation expectations to rise and pass through to headline inflation.

MAS assessed that it was appropriate to tighten monetary policy in order to anchor inflation expectations amid rapidly rising inflation. However, policy was not tightened in an overly aggressive way, amid persistent weakness in the broader economy, and given that the exchange rate would not be effective in reducing price pressures in the housing and car markets.

Together with other government agencies, MAS chose to respond by introducing several macroprudential measures to cool the housing market, which served to safeguard financial stability and cap rising inflation expectations. This was a targeted approach that, combined with a modest and gradual appreciation of the S\$NEER policy band, helped to secure overall macroeconomic and medium-term price stability in the economy.

3.5 Why doesn't MAS target the exchange rate and the interest rate?

MAS is unable to target both the exchange rate and the interest rate because it has an open capital account, which means that international financial capital is free to move into and out of Singapore.

The 'policy trilemma' of open economy macroeconomics states that it is very difficult, if not impossible, for policymakers to 'fix' or 'manage' the currency and at the same time target a domestic interest rate vastly different from global interest rates if financial capital is free to cross borders.

For example, an economy with an open capital market that pegs its currency to the US\$ typically has a domestic interest rate that moves one-for-one with the US federal funds rate. This is because attempting to target an interest rate significantly different from the US federal funds rate would result in capital inflows or outflows and accompanying foreign exchange market pressure that will eventually force the country to give up its peg.

Singapore does not run an exchange rate peg. However, the limits of setting a S\$ interest rate that is inconsistent with MAS' targeted policy band for the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) and prevailing international financial market conditions are still binding.

For example, if MAS had tried to raise domestic interest rates significantly in the aftermath of the Global Financial Crisis to counter asset price increases, strong capital inflows would have driven the S\$NEER beyond the upper bound of the policy band and would have caused inflation to fall to very low rates inconsistent with medium-term price stability.

3.6 When does MAS change the crawl rate or slope of the policy band?

The slope of the policy band is changed when MAS assesses that the trajectory of economic activity over the medium-term policy horizon is changing gradually.

A positive slope to the band is typically equivalent to a tightening of monetary policy, in the same way that other central banks, such as the US Federal Reserve, tighten monetary policy by raising their policy interest rate. An appreciating trajectory for the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) helps to contain inflationary pressures.

In comparison, following a negative shock to the economy that results in a lower trajectory of inflation, MAS may ease monetary policy by reducing the rate of appreciation of the policy band. The slope of the policy band has been set as low as 0%.

For example, the rate of appreciation in the S\$NEER policy band was reduced in January and October 2015 before it was set at 0% in April 2016. This sequential easing in the monetary policy stance took place as the growth and inflation outlook softened.

Although MAS can theoretically set a negative slope to the S\$NEER policy band in response to a weakening macroeconomic outlook, it has never done so in practice. From a market perspective, a negative slope could trigger entrenched market expectations of a weaker S\$ and induce a self-reinforcing sell-off in the domestic currency. This could lead to financial and macroeconomic instability.

Instead, if economic conditions were to warrant it—for example, if inflation and growth fell sharply and a prolonged period of low or negative inflation was expected—MAS could re-centre the policy band lower.

3.7 When does MAS change the level at which the policy band is centred?

A more significant adjustment in monetary policy settings may be necessary if the outlook for growth and inflation changes abruptly and rapidly, and both are projected to have fundamentally shifted to a new path. In such instances, MAS may change the level at which the policy band is centred.

For example, MAS re-centred the mid-point of the policy band down in April 2009 after the Singapore economy went into recession in the last quarter of 2008, and inflation concomitantly fell sharply from 5.4% in Q4 2008 to 2.4% by January–February 2009. Moreover, MAS had lowered its projections for headline inflation for 2009 as a whole, from 2.5–3.5% to –1–0%, earlier in the year. This re-centring move in April 2009 followed the flattening of the slope of the policy band in October 2008.

By comparison, MAS shifted to a positive slope and simultaneously re-centred the policy band upwards in April 2010 following a strong rebound in Singapore's GDP growth and the emergence of incipient inflationary pressures from both domestic and external sources.

As these examples suggest, the re-centring of the band can take place following a previous change in the slope of the policy band, or both of these moves can be implemented at the same time.

Decisions to re-centre the band are carefully formulated and communicated to maintain market stability and promote confidence among economic agents.

3.8 When does MAS change the width of the policy band?

The policy band is widened when there is a significant increase in the level of uncertainty about the future path of the economy and inflation, and MAS expects this uncertainty to persist.

A wider policy band allows more room for market-determined movements in the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) during the period of uncertainty.

An example of a widening of the policy band was in October 2001 after the terrorist attacks in the United States.

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4 How does MAS carry out its monetary policy?

Monetary policy in Singapore is carried out in three stages.

The first stage is the formulation of monetary policy by the Economic Policy Group (EPG) at MAS.

In the second stage, the proposed monetary policy stance is submitted to the Monetary and Investment Policy Meeting (MIPM) for their approval and a decision is made.

Finally, the chosen policy is communicated to the public by a Monetary Policy Statement (MPS) and implemented by the Monetary and Domestic Markets Management Department (MDD).

4.1 How does the Economic Policy Group at MAS formulate monetary policy in practice?

MAS' monetary policy stance is announced every six months, in April and in October.

Prior to that, the Economic Policy Group (EPG) of MAS assesses the latest information on the domestic and external economies and prepares its baseline projections for a range of real and nominal economic variables.

EPG ensures that these forecasts are internally consistent and robust. In addition to analyses of macroeconomic data, EPG also obtains feedback from private and public sector sources about the prospects for Singapore's growth and inflation.

EPG's assessment of whether the economic outlook has materially shifted compared to the previous monetary policy review forms the basis for thinking about the different possible policy paths for the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER).

The implications of a chosen policy stance are simulated using MAS' suite of macroeconomic models to produce projections of the key variables relevant to monetary policy, such as core inflation, headline inflation, real GDP and the unemployment rate.

These 'baseline' model simulations serve to indicate the most appropriate policy that keeps inflation low and stable in the near and medium term. Alternative simulations may also be undertaken to test the robustness of the monetary policy stance to various risk scenarios and to assess trade-offs across the policy horizon.

4.2 What is the process by which monetary policy decisions are made?

EPG prepares a monetary policy review report, which comprises of an in-depth assessment of recent economic developments, projections of inflation and economic growth over the medium term, policy options, and a recommendation for the monetary policy stance. The report is finalised after a discussion with the Managing Director of MAS and the Deputy Managing Director overseeing monetary policy. It is then presented to the Monetary and Investment Policy Meeting (MIPM), a committee of the Board of Directors of the MAS.⁶

MIPM decides on the monetary policy stance that MAS should adopt, after a discussion of the trade-offs and considerations around various policy options under different scenarios presented in EPG's report.

EPG drafts the Monetary Policy Statement (MPS) that announces the policy decision and its economic rationale, which MIPM approves after further discussion and inputs. The MPS is released on the MAS website on a pre-announced date in April and October at 0800 hours.

4.3 How is MAS' monetary policy stance communicated?

MAS' monetary policy stance is currently communicated to the public via three channels.

The first and main channel is the twice-yearly Monetary Policy Statement, released in April and October.

The second channel is the biannual Macroeconomic Review that MAS releases about two weeks after the Monetary Policy Statement. It provides a detailed elaboration of MAS' rationale for the monetary policy decision as well as the associated economic analysis.

Third, MAS also carries out closed-door briefings for the Singapore media and private sector analysts when it releases the Macroeconomic Review.

4.4 How is MAS' monetary policy implemented?

The Monetary and Domestic Markets Management Department (MDD) of MAS is responsible for monetary policy implementation. This means ensuring that the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER)—which is MAS' intermediate target of monetary policy—is kept within the boundaries of the policy band.

⁶ The MIPM is a committee of the Board of Directors of MAS and consists of the Chairman and Deputy Chairman of the Board, the Managing Director of MAS, and one to two other directors. All directors on the Board are appointed by the President of Singapore.

MDD's primary tool for managing the S\$NEER is intervention operations in the spot foreign exchange (FX) market.

MDD conducts FX intervention operations involving the sale or purchase of US\$ against the S\$ to ensure that the S\$NEER is kept within the policy band, and is consistent with domestic price stability. S\$-US\$ intervention is the preferred operation since this is by far the most liquid S\$ currency pair traded.

In the process of monetary policy implementation, MAS accumulates or expends Official Foreign Reserves (OFR) leading to changes in the size of MAS' balance sheet. MAS' intervention operations are thus akin to interest rate-targeting central banks' monetary policy operations. Instead of using money market operations to achieve a targeted policy rate, MDD uses FX intervention operations to ensure that the S\$NEER stays within the policy band.

Under both exchange rate and interest rate regimes, monetary policy operations lead to changes in the central bank's balance sheet. For example, the selling of US\$ to strengthen the S\$NEER will have the effect of reducing OFR on the asset side of MAS' balance sheet, which is matched by a reduction in banks' cash balances with the MAS on the liabilities side. This is akin to a central bank that targets a higher interest rate by selling domestic currency-denominated securities and thereby reducing the asset side of its balance sheet, matched by a reduction in banks' cash balances with the central bank on the liabilities side.

In practice, MDD generally does not need to conduct significant intervention operations to implement the monetary policy stance after the policy announcement.

This reflects MAS' credibility in formulating monetary policy that is congruent with the prevailing outlook for the economy and the objective of maintaining medium-term price stability. The rationale for the policy decision is also communicated clearly through the Monetary Policy Statement and the accompanying *Macroeconomic Review*.

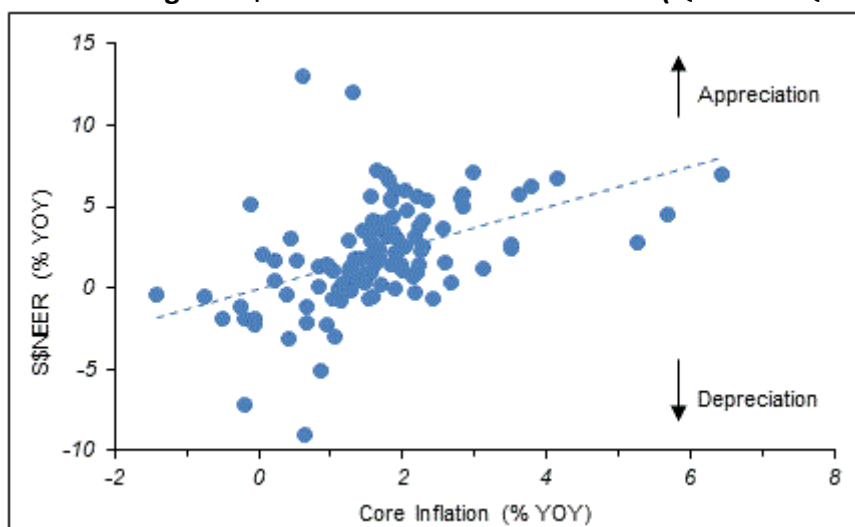
4.5 What are the key principles that guide MAS' foreign exchange intervention operations? What explains the size of MAS' FX interventions?

MAS' monetary policy settings, as defined by the slope, width and mid-point of the Singapore dollar nominal effective exchange rate (S\$NEER) policy band, are calibrated to be consistent with medium-term price stability.

Typically, when forces acting on the S\$NEER are orderly and largely self-equilibrating, MDD allows the market to determine the level of the S\$NEER within the policy band.

Chart 4.1, which plots the year-on-year change in the S\$NEER against MAS Core Inflation, shows that the S\$NEER has generally fluctuated in line with underlying economic conditions.

Chart 4.1: Change in S\$NEER and MAS Core Inflation (Q1 1991–Q2 2018)



This tight relationship has been due to both the appropriateness of MAS' monetary policy stance as well as the implementation of monetary policy through FX intervention operations.

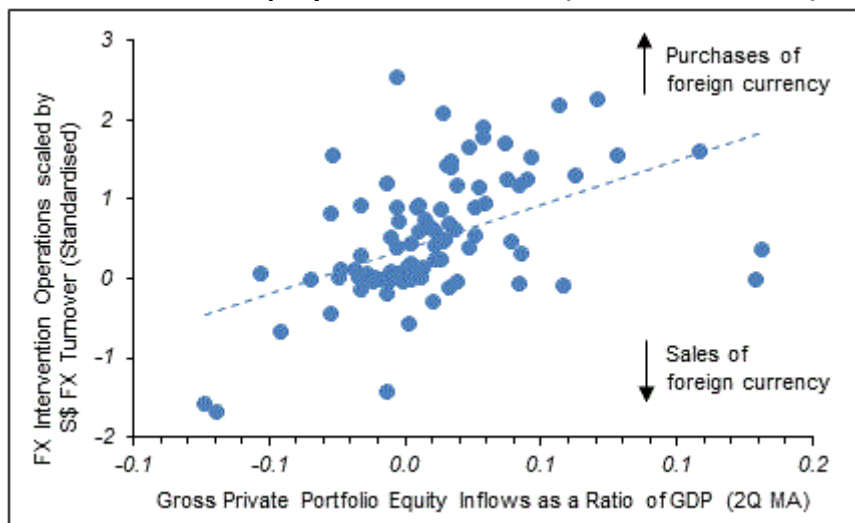
FX intervention operations are necessary to lean against exchange market pressure which may drive the S\$NEER away from a level consistent with domestic price stability. For example, net issuance of Singapore Government Securities results in an overall drain of S\$ liquidity from domestic money markets that, all else equal, causes the S\$ to appreciate. At the same time, as the S\$ is internationally traded and freely useable globally, the S\$ is frequently subjected to significant gross capital flows, driven by external factors such as global liquidity and risk aversion. The S\$ also serves as a proxy for the region, given Singapore's strong economic linkages with Asia and its open capital account. These factors cause exchange rate pressures that are often unrelated to Singapore's underlying inflation, and may necessitate sizeable FX intervention operations to ensure that the S\$NEER is in line with domestic economic conditions.

The size of MAS' FX intervention operations needs to be seen in light of S\$ FX turnover. Based on the 2019 BIS Triennial Central Bank Survey of FX markets, about US\$37 billion of S\$ FX spot transactions are carried out daily, ranking just behind the G10 currencies, Chinese Renminbi, Hong Kong Dollar and Mexican Peso. Relative to the size of the economy, total S\$ FX turnover is the third highest in the world, after the New Zealand Dollar and the Swiss Franc.

Chart 4.2 plots a standardised measure of MAS intervention operations against gross private equity portfolio inflows as a percentage of nominal GDP. It shows that MDD's intervention operations "lean against the wind" and thereby help ensure that the S\$NEER is in line with underlying economic conditions. MDD sells S\$ and buys US\$ when there is a surge in capital

inflows, moderating the excessive appreciation pressure, and buys S\$ and sells US\$ when foreign capital flows out, tempering the undue weakening of the exchange rate.

Chart 4.2: FX Intervention Operations scaled by S\$ FX Turnover (Standardised) and Gross Private Equity Portfolio Inflows (Q1 1995–Q2 2018)



In late 2006 and 2007, for example, Singapore experienced a sharp increase in gross capital inflows or a ‘surge’ episode. This was followed by a sharp capital outflow or ‘stop’ episode during the peak of the Global Financial Crisis in 2008–09.

MDD undertook intervention operations to lean against the wind during this entire period, even as the S\$NEER was allowed to appreciate over 2006–07 when inflation was rising, and then ease when inflation fell in 2009.

4.6 Does MAS disclose the parameters of the monetary policy framework?

MAS does not disclose the currencies in the Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) basket or their weights. However, MAS releases weekly indexed data on the S\$NEER.

MAS currently does not disclose the conjunctural parameters of the policy stance, which are the slope and width of the S\$NEER policy band, and the specific level at which the band is centred. However, when MAS changes the monetary policy stance, it provides qualitative descriptions of the adjustment to the policy parameters (e.g. a ‘slight’ increase in the slope).

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5 How does MAS' monetary policy affect Singapore's international competitiveness and external balance?

This section aims to clarify some misconceptions about Singapore's unique exchange rate-centred monetary policy framework.

MAS does not use the exchange rate to bolster Singapore's international competitiveness or to target a current account surplus.

Instead, Singapore's international competitiveness is underpinned by its economic and institutional fundamentals, while its current account surplus reflects a level of national saving that is higher than domestic investment.

5.1 Does MAS aim to keep the S\$ weak in order to boost Singapore's international competitiveness?

No. Pursuing international competitiveness through an artificially weaker Singapore Dollar Nominal Effective Exchange Rate (S\$NEER) is unsustainable and not in Singapore's interest.

First, a persistently low S\$NEER will not keep the Singapore Dollar Real Effective Exchange Rate (S\$REER) undervalued for long.

If MAS were to opportunistically try to keep the S\$NEER undervalued to boost Singapore's competitiveness, this would eventually result in an excess demand for factors of production and higher wages and prices in the economy. Moreover, many exporting industries in Singapore are part of global value chains, which implies that there is a high degree of imported content in Singapore's merchandise exports.

Thus, a persistent weakening of the exchange rate would be accompanied by a rise in the costs of imported intermediate inputs, wages and rentals, and ultimately, prices. This erodes any competitive gain from the initial nominal exchange rate depreciation as the real exchange rate strengthens because of higher domestic costs. This would also be incompatible with MAS' aim to keep inflation low and stable.

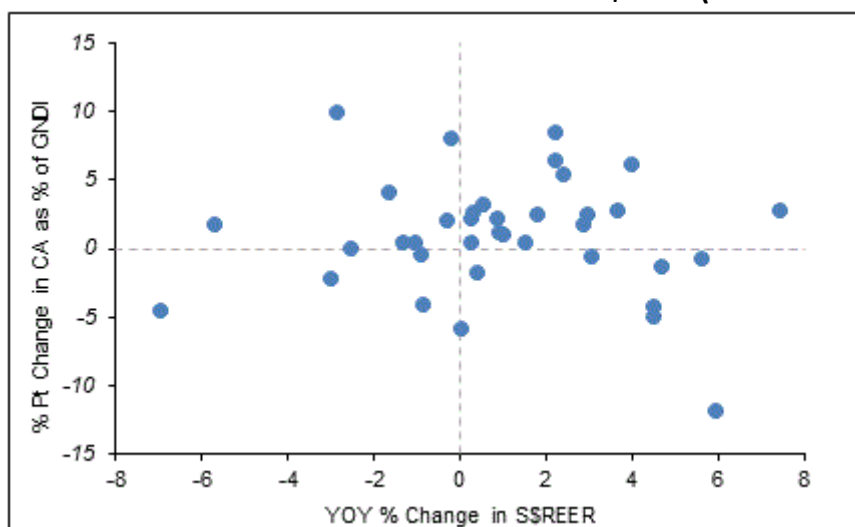
Second, the competitiveness of Singapore's exports is not determined by the S\$REER, or relative international prices, alone.

Singapore specialises in producing and exporting sophisticated, high value-added products and services that are relatively price-insensitive. This ability to do so is underpinned by the underlying factors that determine Singapore's international competitiveness: human capital, infrastructure, connectivity and institutional quality, among others.

Economic research has shown that there is a very limited role for the exchange rate in determining the export competitiveness of economies which produce high-value goods. Empirical analysis by the IMF has shown that demand for a wide range of Singapore's merchandise exports is relatively insensitive to changes in price (which includes a nominal exchange rate component) but is instead more sensitive to changes in global income.

Chart 5.1 plots the medium-term relationship between the change in the S\$REER and that of the current account since 1981. The scatter plot does not provide *prima facie* evidence that an "undervaluation" of the exchange rate supports the current account surplus.

Chart 5.1: Current Account Balance and the S\$REER (1981–2017)



N.B. GNDI refers to Gross National Disposable Income.

Overall, it is not in Singapore's interest to keep the S\$NEER weak. Apart from fostering inflationary pressure in the economy, a cheap exchange rate will hamper the necessary reallocation of resources that would allow producers to move up the value chain.

Singapore's economic strategy has been to continuously restructure its economy and move into higher value-added industries and products over time. This has been the underlying source of Singapore's sustained economic competitiveness.

In fact, a strong S\$NEER, high domestic wages supported by high productivity, and full employment are prime indications of a highly-competitive economy.

5.2 Does the current account surplus mean that Singapore's exchange rate is undervalued?

It is sometimes asserted that the Singapore Dollar Real Effective Exchange Rate (S\$REER) is undervalued. That is, in common currency terms, domestic wages and prices in Singapore are “too low” relative to those in other economies. The main evidence put forth is that Singapore's current account surplus, of which a component is the trade balance, is “too large” relative to GDP.

It is important to appreciate that the current account is fundamentally the difference between a country's gross national saving and domestic investment. Singapore's current account surplus implies that, on a net basis, a proportion of national saving is invested abroad. Meanwhile, the current account deficit in other countries reflects higher domestic investment than national saving can finance. Indeed, on a global basis, surplus countries effectively fund the excess of investment (or consumption) over national saving in deficit economies.

Notably, the ability to smooth consumption over time through external saving or borrowing benefits both lending and borrowing countries, as countries face different demographic trends and rates of potential growth over time. In the decades since independence, Singapore has benefitted from both the ability to borrow and lend abroad. (See Question 5.3)

Even as current account surpluses and deficits are often linked to ‘misaligned’ exchange rates, it may also be argued that such imbalances are due to ‘misaligned’ interest rates or fiscal policies. Countries with current account deficits (surpluses) could have interest rates that are too low (high) or fiscal policies that are too loose (tight). There is therefore no reason for attributing current account imbalances to misaligned exchange rates alone.

However, it is widely accepted that countries should tailor their monetary and fiscal policies to achieve internal balance—or full employment and low and stable inflation—even though such policies may impinge on the current account balance.

Singapore sets its macroeconomic policies to ensure internal balance.

Fiscal policy in Singapore is primarily used to enhance the supply side potential of the economy through facilitating the restructuring and upgrading of the economy. It is also used as a counter-cyclical policy tool when necessary. Most importantly, it is calibrated to ensure long-term financial sustainability.

Singapore's exchange rate-based monetary policy is directed at securing medium-term price stability. It does not target the current account, nor does it aim to maintain an undervalued exchange rate. Indeed, the IMF has consistently endorsed the appropriateness of MAS' monetary policy settings against the objective of medium-term price stability.

5.3 Why does Singapore have a current account surplus?

The current account should be understood in the context of the evolution of national saving and domestic investment. Long-term trends in Singapore's saving and investment rates are well explained by the shifting stages of Singapore's development, its demographics, as well as the fact that as a small country, risk diversification dictates that it invests a portion of its saving abroad.

Charts 5.2 and 5.3 show Singapore's saving-investment gap, as well as its constituent series, scaled by Gross National Disposable Income (GNDI).

Chart 5.2: Singapore's Saving-Investment Gap

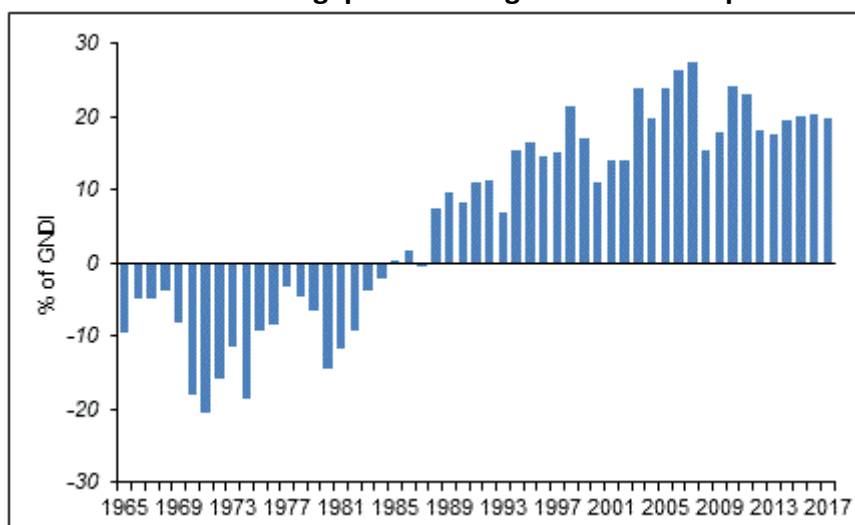
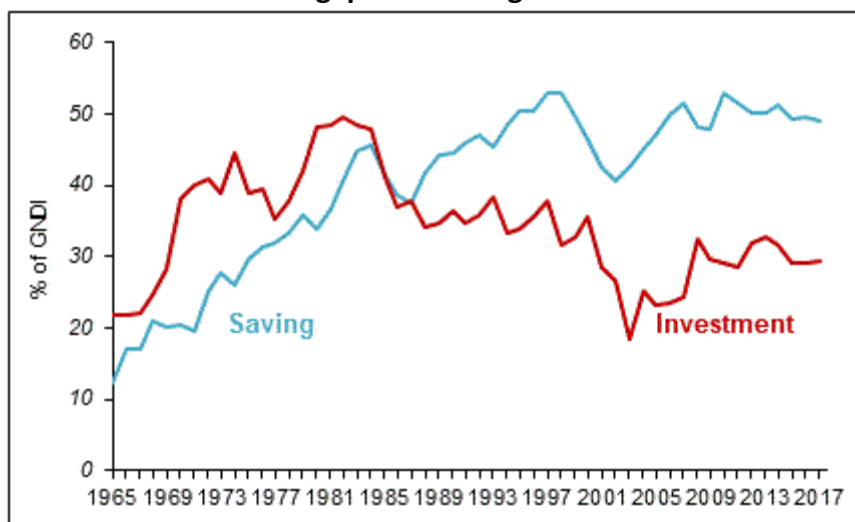


Chart 5.3: Singapore's Saving and Investment



N.B. GNDI is only available from 1980. For Charts 5.2 and 5.3, data from 1965–1979 are scaled by GDP, while data from 1980 are scaled by GNDI.

In the early stages of development after independence in 1965, Singapore had a young population and a rapidly growing economy. As domestic investment needs could not be met with national saving alone, foreign capital was sought to finance this investment. Singapore ran a current account deficit until the mid-1980s, which enabled the rapid build-up of capital stock in the economy and the catch-up of labour productivity and incomes to near-developed economy levels. (Chart 5.3)

Subsequently, Singapore switched to a current account surplus, as saving rose while the need for domestic investment moderated.

As the economy matured, the rate of investment in fixed capital declined, as signalled by a fall in the returns to capital. At the same time, national saving has grown in line with rising incomes and as Singaporeans stepped up saving for old age. Singapore has a fully-funded, defined contribution pension scheme called the Central Provident Fund (CPF) in which Singaporeans save for retirement and medical needs.

In addition, the government had deemed it prudent from the beginning that Singapore diversify some of its saving abroad. Singapore is a small economy, and cannot diversify its risk domestically, unlike a large country. As an economy with no natural resources, there is also a need to preserve Singapore's international purchasing power during crises, since a large proportion of domestic consumption is imported.

Thus, Singapore's economic development and the shift in demographics over the years resulted in it having a current account surplus since the mid-1980s, which gradually rose to a peak of 27% of GNDI in 2007 before trending down to an average of around 20% of GNDI in recent years.

Over the last decade, the trend growth rate of the maturing Singapore economy has slowed, while expenditure to provide for an ageing population has grown. This demographic-driven trajectory of the current account surplus has been broadly as predicted.

Singapore's current account trajectory is thus the outcome of shifting saving and investment behaviours in the domestic economy.

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