Monetary Authority of Singapore

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LIST OF ABBREVIATIONS

3MMA	three month moving average
ACU	Asian Currency Unit
ASEAN	Association of Southeast Asian Nations
COE	Certificate of Entitlement
CPF	Central Provident Fund
CPI	consumer price index
CSP	community, social & personal
DBU	Domestic Banking Unit
DLI	Domestic Liquidity Indicator
EIA	Energy Information Administration
EPG	Economic Policy Group
EU	European Union
FDI	Foreign Direct Investment
FI	Fiscal Impulse
GFCF	Gross fixed capital formation
GST	goods and services tax
HDB	Housing Development Board
IMF	International Monetary Fund
IPI	import price index
IPO	Initial Public Offering
ISM	Institute of Supply Management
IT	information technology
LIBOR	London interbank offered rate
m-o-m	month-on-month
NIEs	newly-industrialised economies
NEER	nominal effective exchange rate
NODX	non-oil domestic exports
OECD	Organisation of Economic Cooperation and Development
OPEC	Organisation of the Petroleum Exporting Countries
PMET	Professionals, Managers, Executives & Technicians
PMI	Purchasing Managers' Index
q-o-q	quarter-on-quarter
QE	Quantitative Easing
REER	real effective exchange rate
SA	seasonally-adjusted
SAAR	seasonally-adjusted annualised rate
SIBOR	Singapore interbank offered rate
SOR	swap offered rate
URA	Urban Redevelopment Authority
WTO	World Trade Organisation
WTI	West Texas Intermediate
y-o-y	year-on-year

Preface

The *Macroeconomic Review* is published twice a year in conjunction with the release of the MAS Monetary Policy Statement. The *Review* documents the **Economic Policy Group's (EPG)** analysis and assessment of macroeconomic developments in the Singapore economy, and shares with market participants, analysts and the wider public, the basis for the policy decisions conveyed in the Monetary Policy Statement. It also features in-depth studies undertaken by EPG on important economic issues facing Singapore.

The *Review* was edited by Associate Professor Peter Wilson, and continues to feature our collaborations with academics. We are pleased to have Professor Benjamin Friedman of Harvard University write Special Feature B of this issue, entitled, "Toward a New Understanding of Monetary Policy". We are also grateful to Associate Professor Martin Bodenstein of the NUS Department of Economics for contributing to Box B, which examines inflation dynamics in Singapore using the open economy New Keynesian Phillips Curve (NKPC).

The data used in the *Review* was drawn from the following government agencies, unless otherwise stated: ACRA, BCA, CPF Board, DOS, EDB, IE Singapore, LTA, MOF, MOM, MPA, MTI and URA.

The *Review* may be accessed in PDF format on the MAS website: http://www.mas.gov.sg/Monetary-Policy-and-Economics/Monetary-Policy/Macroeconomic-Review.aspx

The *Review* may also be purchased at major bookstores, online (http://asp.marketasia.com.sg/subscriptions/mainsubindex.asp), or on an annual subscription basis (details can be found on the last page).

Highlights

In a departure from the trend last year, the G3 economies gained momentum in the first half of 2013, while growth in most parts of Asia ex-Japan moderated somewhat. This divergence in relative growth performance is set to continue and will have a bearing on Singapore's near-term prospects. In particular, the outlook for Asia ex-Japan is clouded by ongoing uncertainty regarding the extent of China's restructuring-induced slowdown, as well as the impact of the Federal Reserve's QE tapering on regional capital flows and interest rates. In comparison, the recovery in the advanced economies appears to be on a surer footing, with US and Eurozone growth expected to improve and Japan's recovery likely to remain resilient. Still, several wildcards—such as policy missteps associated with the unwinding of the Federal Reserve's QE measures or a failure to satisfactorily resolve the US budget and debt disagreements in 2014—could present fresh setbacks to the G3 turnaround. Notwithstanding these uncertainties, the Singapore economy should achieve modest growth of 2.5–3.5% for the whole of 2013 and a similar outcome in 2014.

Chapter 1 begins with an analysis of recent developments in the external and domestic economies. In Singapore, the firm pace of activity in the first half of the year faltered in mid-2013 and GDP contracted mildly in the third quarter. This pullback was broad-based, with the trade-oriented sectors slackening alongside their domestic consumer-facing counterparts. The former saw a sharper downturn as regional economic activity softened, exacerbating the reaction of financial markets over the timing of Fed tapering. Furthermore, an analysis of growth dynamics using the approach in McConnell and Perez-Quiros (2000) shows that although the Singapore economy has moved to a lower medium-term growth path since 2010, this has not been accompanied by a commensurate decline in the volatility of GDP growth. This contrasts with the experience of other countries, where both growth and volatility were lower than their historical averages.

Chapter 2 focuses on recent developments in the labour market and prices. Domestic cost pressures have persisted, largely as a result of the tight labour market. With slowing foreign worker inflows, firms have increasingly turned to the resident workforce to fill job vacancies. As a result, even though the resident population expanded more slowly in H1, residents accounted for the bulk of job gains, quickening the pace of wage growth. Meanwhile, consistent with the pickup in CPI-All Items and MAS Core Inflation, disaggregated CPI data shows that inflationary forces in the economy have become relatively more broad-based recently, amid a strengthening in the cost pass-through. To examine the inflation dynamics more fully, Chapter 2 also contains a box item prepared in collaboration with Associate Professor Martin Bodenstein from the National University of Singapore. In this box, a reduced-form version of the open economy New Keynesian Phillips curve is estimated and the results show that inflation dynamics tend to be forward-looking in Singapore, a finding that is broadly similar to that in other open economies. In addition, agents appear to systematically take into account anticipated changes in marginal costs, highlighting the role of expectations in driving inflation and the importance of monetary policy in providing an effective nominal anchor.

Chapter 3 discusses the economic outlook, both global and domestic. Despite a divergence in growth prospects, the present sluggishness in emerging Asia is unlikely to negate the positive effects of a recovery in the developed countries on the Singapore economy. Detailed data on the domestic value added of production shows that Singapore's exports remain more closely tied to final demand in the G3 economies than to final demand in emerging Asia. In the short term, therefore, a stronger pickup in the advanced economies should provide some support to the domestic electronics industry as well as to trade-related services. However, the anticipated rise in labour demand will come up against binding labour supply constraints across more sectors of the Singapore economy, leading to stronger wage increases. Given that domestic costs are also expected to pass through more strongly into consumer prices, there is likely to be

some upward pressure on MAS Core Inflation, which is projected to come in at 1.5–2.0% in 2013 and 2–3% in 2014. The continuation of the appreciating stance of MAS' exchange rate policy will, however, help to moderate inflationary pressures and anchor inflation expectations, whilst facilitating the ongoing restructuring of the economy.

Also included in Chapter 3 is a box item that analyses the compositional shifts in trade flows within Asia over the last decade. As China steps up its domestic capabilities in intermediate goods production, the rest of Asia is expected to face stiffer competition. Even so, the analysis shows that there is scope for ASEAN economies, in particular, to re-orientate themselves towards the manufacture of consumption goods in order to meet rising demand from an increasingly affluent population in the region.

This issue of the *Review* includes two Special Features. Special Feature A highlights the use of nowcasting models to resolve the problems of mixed frequency and missing data which arise when more up-to-date monthly information is used alongside quarterly indicators, such as real GDP. Two main approaches to nowcasting are evaluated. The first, which has been the main approach until recently, uses bridge equations; while the second, and more recent approach, utilises a dynamic factor model proposed by Mariano and Murasawa (2003). Applying the criteria of relevance, timeliness and correlation, five monthly indicators were chosen as inputs into the nowcasting models. The results show that both approaches to nowcasting can be used on their own, or in combination, to produce GDP growth projections on a timelier basis, pending the release of official data.

This *Review* ends with a Special Feature by Professor Benjamin Friedman of Harvard University entitled, "Toward a New Understanding of Monetary Policy". Current models of monetary policy are not only incapable of incorporating the most widely accepted accounts of how the Global Financial Crisis occurred, but are unable to satisfactorily analyse the policy responses taken by policy-makers in the wake of the crisis. In this timely conceptual piece, Professor Friedman introduces a tractable model of monetary policy that also has pedagogical value. The model distinguishes between the interest rate that the central bank actually sets (the policy interest rate) and the interest rate at which households and firms regularly borrow (the private interest rate). In two comparative static exercises, he uses this model to illustrate the transmission channel through which unconventional monetary policy affects economic activity and prices.

The next issue of the *Review* will be released in April 2014.

Economic Policy Group
Monetary Authority of Singapore
29 October 2013

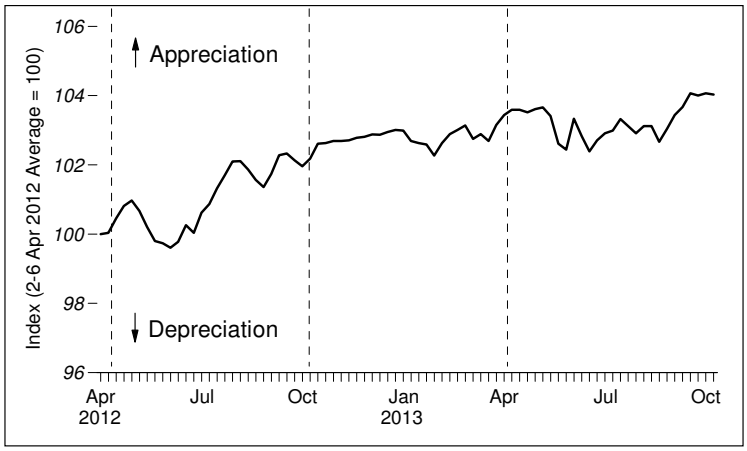
14 October 2013

Monetary Policy Statement

INTRODUCTION

1. In April 2013, MAS maintained the modest and gradual appreciation path of the S$NEER policy band, with no change to its slope, width, and the level at which it was centred. This policy stance, which has been in place since April 2012, has helped to alleviate inflationary pressures and anchor inflation expectations, as well as facilitate the restructuring of the economy.

Chart 1
S$ Nominal Effective Exchange Rate (S$NEER)



- - - - - indicates release of Monetary Policy Statement

2. Over the last six months, the S$NEER remained in the upper half of the policy band. It experienced some volatility, mainly reflecting market reactions to the prospective tapering of asset purchases by the US Federal Reserve. More recently, the S$NEER appreciated on account of the relative weakness of regional currencies against the US$, as well as the Fed's decision in mid-September to defer tapering. With global monetary conditions still accommodative, the domestic three-month interbank rate has remained low, averaging 0.40% from April through September 2013.

OUTLOOK FOR 2013 AND 2014

3. The Singapore economy is projected to grow modestly for the rest of 2013 and into 2014 as the external environment continues to improve, notwithstanding intermittent turbulence in financial markets. Following the strong performance in Q2 2013, economic activity contracted in Q3 but should resume an expansion trend in the quarters ahead. Headline and core inflation have stayed low in recent months. However, they have picked up in the latest readings and may continue to rise in the next few quarters, as accumulated business costs pass through to consumer prices alongside the cyclical uplift in economic activity.

Growth

4. According to the Advance Estimates released by the Ministry of Trade and Industry today, Singapore's GDP contracted by 1.0% in Q3 2013 on a quarter-on-quarter seasonally adjusted annualised basis, following the 16.9% surge in Q2. The financial services sector shrank as equity and foreign exchange market activities fell on concerns over a reduction in the pace of asset purchases by the Fed and the threat of military intervention in Syria. Manufacturing also posed a drag on GDP growth, with overall industrial production declining sequentially in July and August 2013 due to weakness in the electronics and pharmaceutical industries.

5. Incoming data suggests that the recovery in global economic activity is continuing, although there remain uncertainties, including those associated with the recurring fiscal impasse in the US and potentially disorderly market adjustments to the Fed's tapering of asset purchases. The outlook for the G3 is underpinned by the gradual revival in labour and housing markets in the US, expansionary macroeconomic policies in Japan, and improvements in business sentiment in the Eurozone. These developments should support global activity even as GDP growth in China stabilises at a sustainable level. Most other Asian economies have thus far withstood the recent bouts of financial market volatility and the tightening of financial conditions, and are taking policy measures to sustain growth. Meanwhile, the upturn in global GDP growth will buttress the incipient recovery of the global IT industry in 2014.

6. Singapore's external-oriented sectors are thus expected to see a modest uplift, while the domestic-driven sectors, such as construction, healthcare and education services, remain resilient. Overall GDP growth is projected at 2.5–3.5% in 2013, and is unlikely to be significantly different in 2014. The labour market should remain at full employment.

Inflation

7. Imported price pressures have been muted, given moderate inflation in Singapore's major trade partners, notwithstanding the rise in oil prices in recent months. In comparison, domestic inflationary pressures have picked up as businesses pass on more of accumulated cost increases to consumer prices, following the relatively weak pass-through into prices in earlier quarters. As a result, MAS Core Inflation, which excludes private road transport and accommodation costs, edged up to 1.8% y-o-y in August, from 1.6% in the first seven months of the year. Reflecting the recovery in COE premiums, CPI-All Items inflation rose to 1.9% in July–August, from 1.6% in Q2 2013.

8. While global demand conditions will strengthen, spare production capacity in the advanced economies and ample supply buffers in commodity markets should keep a lid on imported inflation. However, the pass-through of domestic costs to prices of consumer services could intensify, given the rising cost pressures firms are facing from business rentals, COE premiums for commercial vehicles, and labour costs. The unemployment rate should stay below its historical average, alongside slowing labour force growth. MAS Core Inflation is expected to be 1.5–2% in 2013 and rise to 2–3% in 2014.

9. Imputed rentals on owner-occupied accommodation will increase at a slower pace with the greater supply of housing coming on stream. COE premiums could continue to rise in the short term as the market adjusts to the pending re-categorisation of COEs. However, the increases are unlikely to be sustained at the same pace. For 2013, CPI-All Items inflation is projected to come in at the upper half of the 2–3% forecast range.[1] For 2014, the forecast for CPI-All Items inflation is similar to that for MAS Core Inflation, at 2–3%.

MONETARY POLICY

10. The Singapore economy should continue to expand for the rest of 2013 and into 2014, although some volatility in growth rates is likely. There are short-term uncertainties in the external environment, and MAS is closely monitoring economic and financial developments. Barring a significant deterioration in global demand conditions, the labour market will remain tight, and exert further upward pressures on MAS Core Inflation as firms pass on accumulated costs to consumer prices.

11. MAS will therefore maintain its policy of a modest and gradual appreciation of the S$NEER policy band. There will be no change to the slope of the policy band, and the level at which it is centred. The present width of the band is sufficient to accommodate temporary fluctuations in the S$NEER, and will be kept unchanged. This policy stance is assessed to be appropriate, taking into account the balance of risks between external demand uncertainties and rising domestic inflationary pressures.

[1] At the Annual Report 2012/13 Press Conference on 23 July 2013, MAS revised the forecast for CPI-All Items inflation for 2013 down to 2–3%, from 3–4% at the April 2013 Monetary Policy Statement, in view of the sharp fall in car prices following the announcement of financing restrictions on motor vehicle loans.

Chapter 1

Macroeconomic Developments

1.1 External Developments

Global Growth Strengthens on G3 Drivers

An upturn in G3 economies offset slower growth in most of Asia ex-Japan.

In a trend reversal from last year, the G3 economies gained momentum in H1 2013, while growth in most parts of Asia ex-Japan eased. On the whole, global growth remained relatively muted. (Table 1.1 and Chart 1.1) The improvement in the G3 economies was attributable to the resilient US consumer who shrugged aside fiscal headwinds, and an unexpected exit from recession in the Eurozone. Additionally, firm exports and robust consumption contributed to a ramp-up in Japan's output in H1 2013.

The cyclical upswing in the G3 economies owed partly to the unconventional monetary policies undertaken by central banks since the Global Financial Crisis (GFC). These policies helped to minimise tail risks and created a supportive environment for private sector deleveraging. For instance, US households have taken advantage of low interest rates and relatively steady income growth to reduce their debt burden. In the Eurozone, unconventional monetary policies lowered bond yields in the periphery and allowed fiscal austerity measures to be relaxed. More recently, aggressive monetary easing in Japan has raised expectations of a stronger growth trajectory for the economy.

In Asia ex-Japan, the demand rebalancing process seems to have lost momentum in some countries. A concerted campaign in China to cut back on extravagant official spending weighed on consumption, while the share of investment in GDP remained high. In contrast, persistent under-investment has constrained India's supply-side potential and contributed to a fall in growth to its lowest level in more than four years. In the ASEAN economies, though some progress has been made in raising investment-output ratios amid easier monetary conditions, there is still room for further capital deepening. Meanwhile, the NIEs recorded a significant boost to domestic demand, underpinned by stronger fiscal support.

Table 1.1
GDP Growth

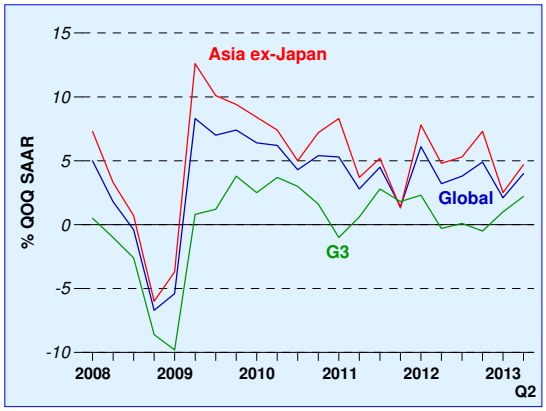
(%)

	2012		2013	
	Q3	Q4	Q1	Q2
	q-o-q SAAR			
Total*	**3.8**	**4.9**	**2.1**	**4.0**
G3*	**0.1**	**−0.5**	**1.0**	**2.2**
US	2.8	0.1	1.1	2.5
Eurozone	−0.5	−2.0	−0.9	1.1
Japan	−3.5	1.1	4.1	3.8
Asia ex-Japan*	**5.3**	**7.3**	**2.5**	**4.7**
Hong Kong	4.3	5.7	0.9	3.2
Korea	0.2	1.1	3.4	4.5
Malaysia	4.0	9.2	−1.4	5.5
Taiwan	3.0	7.1	−2.5	2.3
Thailand	7.9	11.4	−6.5	−1.4
Philippines	7.0	7.8	9.6	5.7
	y-o-y			
China	7.4	7.9	7.7	7.5
India	5.2	4.7	4.8	4.4
Indonesia	6.2	6.1	6.0	5.8

Source: CEIC and EPG, MAS estimates

* Weighted by shares in Singapore's NODX.

Chart 1.1
G3 and Asia ex-Japan GDP Growth



Source: CEIC and EPG, MAS estimates

Note: Series are weighted by shares in Singapore's NODX.

US private demand withstood fiscal retrenchment ...

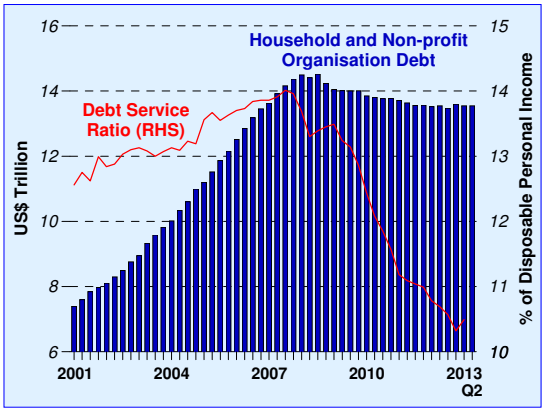
US economic growth increased to 2.5% q-o-q SAAR in Q2 2013 from 1.1% the quarter before, as private demand held firm in the face of tax hikes and the withdrawal of fiscal concessions since the beginning of the year. The expiry of unemployment benefits, as well as the budget sequester that began in March, saw government spending contracting at an average rate of 2.3% q-o-q SAAR in H1 2013. Nonetheless, as corporate profits strengthened further in Q2, gross investment increased by 9.2% q-o-q SAAR on the back of a rebound in spending on structures. Additionally, the housing recovery continued to support residential investment growth.

As US households restored their balance sheets to a healthier position by gradually paring down their debt levels, the debt service ratio declined to 10.5% in Q1 2013, from a peak of 14.0% during the GFC. (Chart 1.2) The fall occurred even though income growth remained sluggish, averaging around 1.5% q-o-q SAAR since the recession ended in mid-2009. Meanwhile, slightly slower growth in house prices and overall employment restrained consumption growth, which was more moderate at 1.8% q-o-q SAAR in Q2 2013, compared with 2.3% in Q1. Although the unemployment rate fell steadily, this was partially the result of a lower labour force participation rate (LFPR), as non-farm payrolls increased by a monthly average of just 182,000 in Q2 2013, compared with 207,000 in Q1. A large part of the decline in the LFPR could have been due to cyclical factors and it may rise as discouraged workers who still want a job return to the labour force. (Chart 1.3) However, if jobs growth were to slow, part of the decline in the LFPR may become structural in nature, with more workers remaining unemployed for longer periods and losing their skills.

... while the Eurozone emerged from recession in Q2 2013.

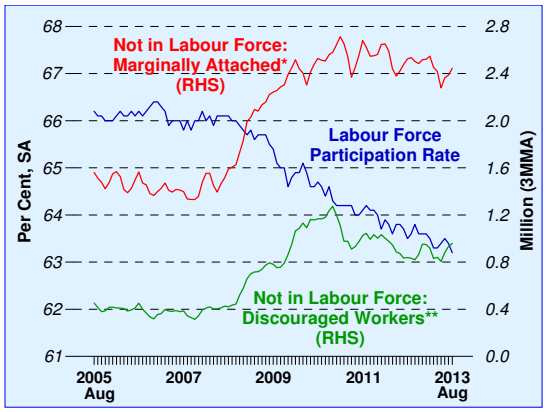
Following a recession that lasted six quarters, the longest since its inception, the Eurozone economy expanded by 1.1% q-o-q SAAR in Q2 2013. The exit from recession was underpinned by a recovery in both domestic and external demand. Private consumption expanded on account of an increase in sales of big-ticket items, such as passenger cars, suggesting pent-up demand for consumer durables. With improving business sentiment and higher capacity

Chart 1.2
US Household Liabilities and Debt Service Ratio



Source: The Federal Reserve Board

Chart 1.3
US Labour Market



Source: CEIC

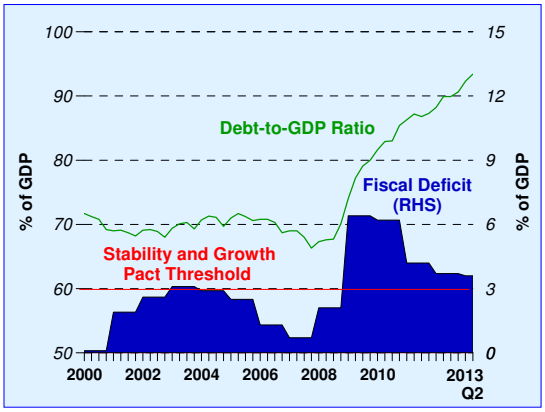
* Refers to persons who want and are available for a job, have searched for work in the last twelve months, but not in the past four weeks.

** Refers to persons who did not actively look for work in the prior four weeks for reasons such as "no work available", "lacks schooling or training" etc.

utilisation levels, fixed investment also rose for the first time in more than two years in Q2 2013.

While an easing of fiscal austerity policies is likely to have contributed to the Eurozone's emergence from recession, it has also caused a delay in the correction of excessive public deficits, particularly in countries that received some form of official financial aid—Greece, Ireland, Spain, Portugal and Cyprus. As a result, the Eurozone's gross government debt-to-GDP ratio continued on its upward climb since 2008, reaching 93% in Q2 2013, or 3.5% points higher than the same period a year ago. (Chart 1.4) In the next few years, public sector deleveraging will have to proceed at a faster pace, in order for Eurozone member states to adhere to the more rigorous fiscal discipline standards under the reinforced Stability and Growth Pact.[1] This may pose renewed headwinds to growth.

Chart 1.4
Eurozone Gross Government Debt-to-GDP Ratio and Fiscal Deficit

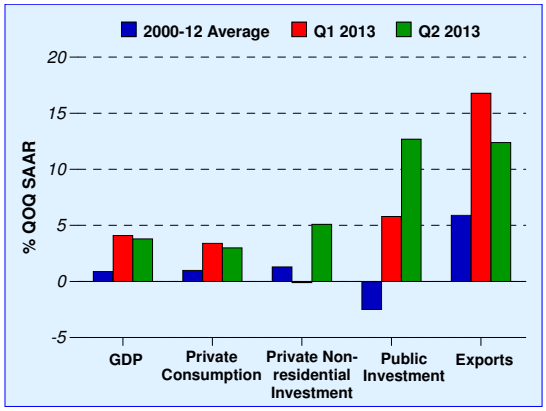


Source: Eurostat and EPG, MAS estimates

The Japanese economy surged on the back of fiscal stimuli and a weaker yen.

Japan's GDP growth stayed strong at 3.8% q-o-q SAAR in Q2 2013, only slightly slower than the 4.1% in the previous quarter. Since the Abe government came into office in late 2012, real GDP has seen a discernible uplift, in contrast to the tepid growth for more than a decade. (Chart 1.5) In spite of stagnant wages, private consumption rose by 3.0% q-o-q SAAR in Q2 2013 on the back of buoyant consumer confidence. Net trade contributed 0.7% point to GDP growth, as Japanese manufacturers benefited from stronger US demand for automobiles, which partly reflected the effects of a weaker yen. The increase in exports, in turn, led to a revival in private non-residential investment, which rose by 5.1% q-o-q SAAR in Q2—the first gain in six quarters. The disbursement of government expenditures approved in February as part of a fiscal stimulus package also sent public investment soaring by 12.7% q-o-q SAAR.

Chart 1.5
Japan's GDP Growth by Expenditure



Source: CEIC and EPG, MAS estimates

China's growth is still investment-led.

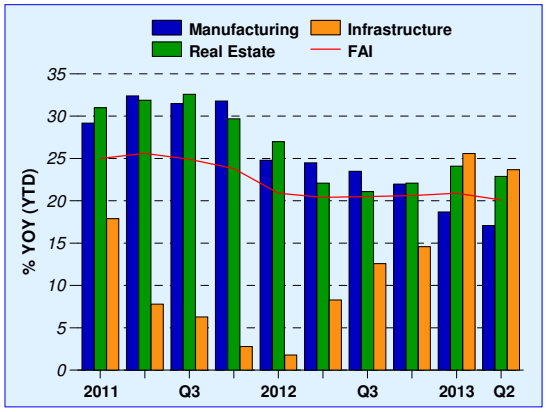
Buffeted by external headwinds and domestic reform imperatives, China's economic growth fell for two successive quarters, from 7.9% y-o-y in Q4 last year to 7.7% in Q1 2013 and 7.5% in Q2. The expansion in

[1] The Stability and Growth Pact is a framework for the coordination of national fiscal policies in the European Union. Under this pact, the headline fiscal deficit should not exceed 3%, while public debt levels must not exceed 60% of GDP (or should at least diminish sufficiently towards the 60% mark).

industrial production dropped to single-digits in the first half of 2013, dragged down by subdued export orders and an inventory overhang in the heavy industries. Retail sales growth of 13% y-o-y in Q2 was also below the average of 14% in 2012, due to the lingering effects of policies to rein in lavish official spending early this year.

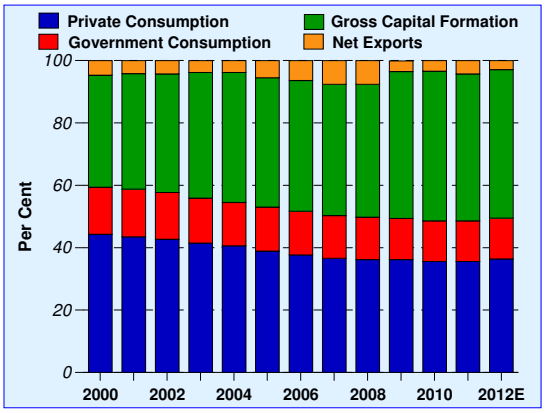
Thus far in 2013, investment continued to be the leading driver of China's economic growth, supported by real estate and infrastructure construction. (Chart 1.6) Gross capital formation contributed to more than half of GDP growth in H1 2013, while consumption played a diminished role compared with 2012. Indeed, the share of household consumption in GDP has stayed essentially unchanged since the financial crisis, hovering at around 36%. (Chart 1.7) In contrast, gross capital formation rose as a share of GDP from 43% in 2008 to 48% in 2012, reflecting the massive policy stimulus implemented in response to the global recession, which predominantly took the form of investment projects. Thus, internal rebalancing away from investment towards private consumption has yet to occur. Nevertheless, China's attempts to shift away from export-led growth have made some headway, with the share of net exports falling to 2.9% in 2012 from an average of 5.3% over 2000–08.

Chart 1.6
China's Fixed Asset Investment (FAI)



Source: CEIC and EPG, MAS estimates

Chart 1.7
China's Real GDP Decomposition



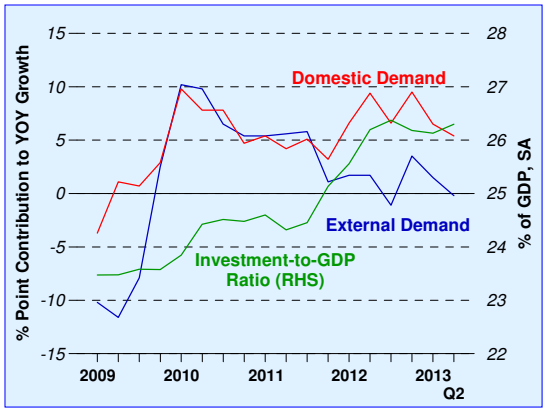
Source: United Nations and EPG, MAS estimates

There is scope for further rebalancing in the ASEAN-4 economies and India.

Strong economic growth in the ASEAN-4 economies has been maintained during the post-GFC period, as robust domestic demand more than offset the prolonged weakness in exports. (Chart 1.8) Fuelled by ample liquidity and an acceleration in infrastructure spending, fixed investment grew by a rapid 9.6% per annum over 2010–12, on average, lifting the region's aggregate investment-to-GDP ratio from 24% to 26%. Buoyant labour market conditions and government cash transfers supported private consumption, which grew at roughly the same pace as output, thus keeping the region's consumption ratio stable at 58%.

However, GDP growth in the ASEAN-4 countries moderated in H1 2013 to 5.0% y-o-y from 5.9% on average in 2010–12, as domestic demand slowed. With subdued export growth of 1.0% y-o-y in H1 2013, the external positions deteriorated further. The region's overall current account balance recorded a deficit of 2.5% of GDP in Q2 2013, compared to a

Chart 1.8
Contribution to ASEAN-4 GDP Growth and Investment-to-GDP Ratio



Source: CEIC and EPG, MAS estimates

negligible surplus of 0.01% in 2012. Following market expectations of Fed tapering, several regional countries experienced capital outflows, which induced a tightening of financial conditions. Against this backdrop, investment growth in the region eased to 6.9% y-o-y in H1 2013, even though there is scope for the share of investment in GDP to rise further. Meanwhile, the high level of household debt in Thailand has restrained private consumption, offsetting the boost to the region's domestic demand from election-related government spending in Malaysia and the Philippines in Q2 2013.

In India, the inadequacy of basic infrastructure, together with a policy gridlock, has weighed on growth, which slowed to 4.4% y-o-y in Q2 2013. This was the weakest growth since Q1 2009 and reflected a broad-based deceleration across both the industrial and services sectors. In Q2, India's manufacturing sector contracted for the second time since the GFC, by 1.2% y-o-y. Fixed investment shrunk by the same amount, after expanding by 3.4% in Q1 2013.

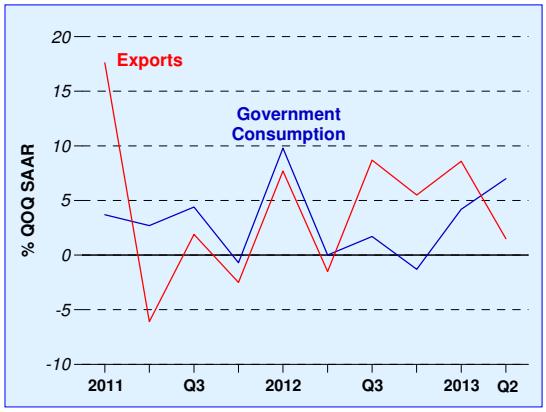
The NIEs were the bright spot in the region.

The NIE-3 posted a strong outturn in Q2, growing by 3.2% q-o-q SAAR on average, compared with a lacklustre 0.5% in the previous quarter. Expansionary fiscal policies provided a lift to domestic demand in Korea and Hong Kong, offsetting the effects of somewhat sluggish foreign demand. (Chart 1.9) Korea grew at its fastest pace in more than two years, driven by the frontloading of planned budget spending; in Hong Kong, investment was given a fillip by public infrastructure works. A pickup was also apparent in Taiwan, where the announcement of a government stimulus package in May boosted optimism and consumer spending.

Global inflation remained subdued in H1 due to contained food and energy prices.

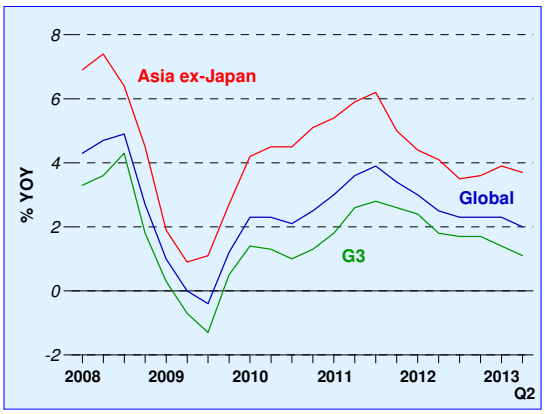
Global inflationary pressures continued to recede in H1 2013, with the weighted CPI inflation rate easing from 2.3% y-o-y in Q1 2013 to 2.0% in Q2. (Chart 1.10) In the G3 economies, consumer inflation averaged 1.1% y-o-y in Q2, compared with 1.4% in the previous quarter. Headline inflation in the US and Eurozone softened, reflecting reduced healthcare costs and lower energy prices respectively. In Japan, however, import price inflation picked up due to the weaker yen, resulting in a more moderate pace of CPI deflation.

Chart 1.9
NIE-3 Government Consumption and Export Growth



Source: CEIC and EPG, MAS estimates

Chart 1.10
G3 and Asia ex-Japan Headline CPI Inflation



Source: CEIC and EPG, MAS estimates
Note: Series are weighted by 2012 nominal GDP.

After rising earlier this year, headline inflation in Asia ex-Japan fell back to 3.7% y-o-y in Q2 2013, mainly on account of slower price increases in India. CPI inflation in India declined due to lower food price pressures and a slowdown in economic activity. China's headline inflation remained subdued at 2.4% y-o-y in Q2 amid stable commodity prices. In ASEAN, however, inflation was elevated at 4.1% y-o-y in Q1 and Q2 2013, as upward price pressures in Indonesia, due to food import restrictions and the fuel price hike in June, offset the disinflationary trend in the rest of the region.

1.2 Domestic Economy

A Volatile Growth Profile

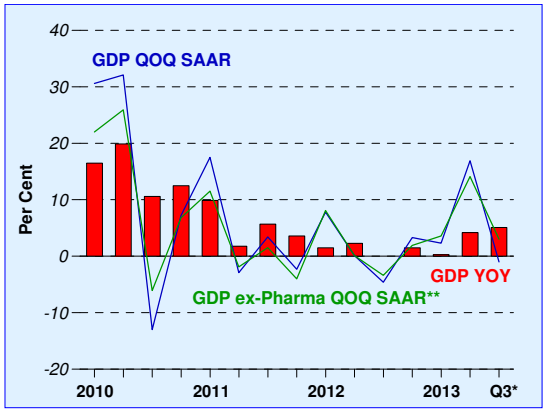
The Singapore economy continued to experience swings in growth momentum.

The volatility that characterised Singapore's economic growth over the past few years has continued into 2013. While Q2 saw GDP growth surging to 16.9% q-o-q SAAR, up from 2.3% in the preceding quarter, the momentum fell off steeply in Q3. (Chart 1.11)

The firmer pace of activity seen in the first half of the year faltered going into Q3 as fresh external headwinds cast a pall on the durability of the global recovery. In particular, subdued activity in emerging market economies, coupled with expectations of QE tapering, caused a broad-based pullback in the Singapore economy. The latest *Advance Estimates* indicate that the domestic economy recorded a mild contraction of 1.0% q-o-q SAAR in Q3 2013.

GDP growth is expected to stay on a modest expansion path for the remainder of 2013 and through next year. A more in-depth discussion on the outlook for the domestic economy is presented in Chapter 3.

Chart 1.11
Singapore's GDP Growth



* *Advance Estimates*.

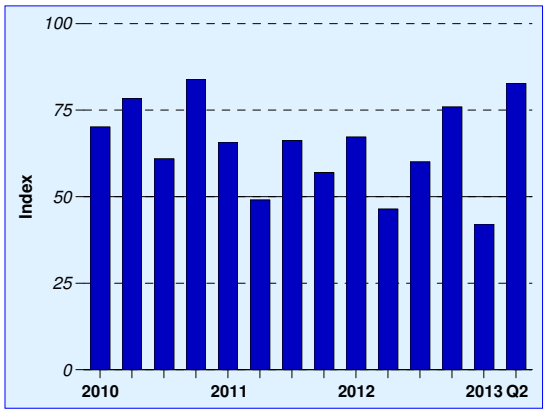
** EPG, MAS estimates.

The upswing in Q2 was supported by a turnaround in the trade-related sectors …

The recovery of the domestic economy, which started in Q4 last year, gained further traction in Q2 2013. This was the first time in three years that GDP recorded three consecutive quarters of sequential growth. In addition, EPG's VA-weighted diffusion index indicated that the percentage of industries registering positive growth in Q2 was the highest since the start of 2011. (Chart 1.12) Indeed, the upward momentum broadened to the external-facing industries, from the domestic demand-reliant growth in earlier quarters.

The step-up in growth momentum in Q2 2013 was underpinned by a synchronised acceleration in trade-related activities, which comprise the

Chart 1.12
VA-Weighted Diffusion Index

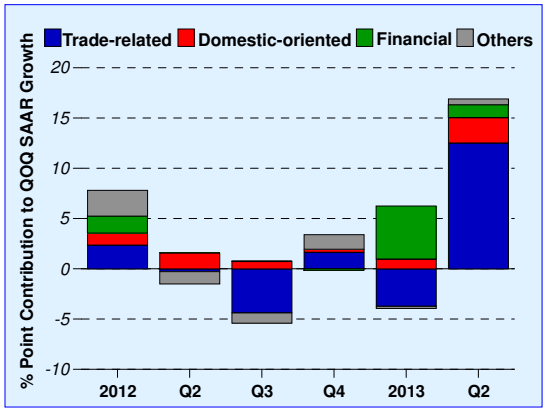


Source: EPG, MAS estimates

Note: The index is constructed by assigning a value of one to each of the 58 industries across the major sectors in the economy that registered positive q-o-q SAAR growth, and a value of zero otherwise.

manufacturing, wholesale trade and transport & storage sectors. (Chart 1.13) Notably, this cluster staged a robust rebound in Q2, growing by 27.4% q-o-q SAAR following a contraction of 7.4% in the preceding quarter. Within the manufacturing sector, output was strong across both the electronics and non-electronics segments. The electronics industry registered a second consecutive quarter of sequential growth in Q2, in tandem with the turnaround in the global IT cycle. DRAM prices worldwide have risen since the start of this year, which helped to lift semiconductor production. Meanwhile, the non-electronics industries strengthened in Q2 2013, mainly on account of a surge in biomedical and transport engineering output.

Chart 1.13
Contribution to GDP Growth



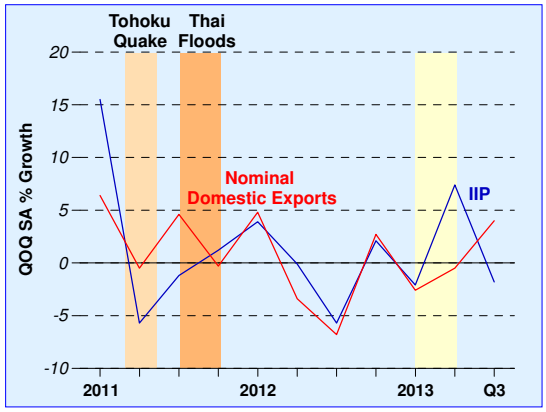
The stellar manufacturing outturn was accompanied by double-digit growth in trade-related services. In the wholesale trade sector, for instance, non-oil re-export volumes posted an expansion of 12.5% q-o-q SA in Q2, with strong gains in both the electronics and non-electronics segments. Concomitantly, the water transport industry was buoyed by a 10.7% q-o-q SA increase in sea cargo volumes handled, reversing the decline in the previous quarter.

… although growth in domestic exports was muted.

Despite the upswing in manufacturing activity, trade growth has remained subdued. Singapore's headline Index of Industrial Production and nominal domestic exports saw a widening gap in Q2. While production picked up, the latter remained in negative territory. (Chart 1.14) Although such divergences have occurred in the past, these were typically triggered by extreme external events—such as the Tohoku earthquake and the Thai floods—which caused sharp swings in inventories and misalignments between production and trade. This time round, however, the discrepancy has widened despite a comparatively benign external backdrop.

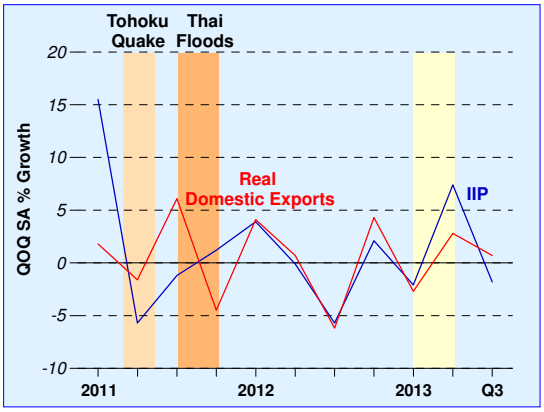
Two factors could have accounted for the divergence between the production and export series. First, a decomposition of Singapore's nominal domestic exports shows that there were some negative price effects exerting a drag on oil for example, amid softening demand from the emerging economies.

Chart 1.14
IIP and Nominal Domestic Exports



Indeed, abstracting from price effects, the gap between production and trade narrowed considerably. (Chart 1.15) Second, the remaining discrepancy between production and exports could be the result of swings in inventory holdings, especially in electronics, where growth in real domestic exports has significantly trailed movements in the Index of Industrial Production. A build-up of inventories was indicated by an increase in the electronics inventory PMI measure in Q2 this year. Given the uptick in the global IT industry, companies may have increased production in anticipation of stronger demand ahead. Subsequently in Q3 2013, there was an inventory drawdown and the divergence between IIP and real domestic exports—both at the aggregate level as well as in electronics—narrowed.

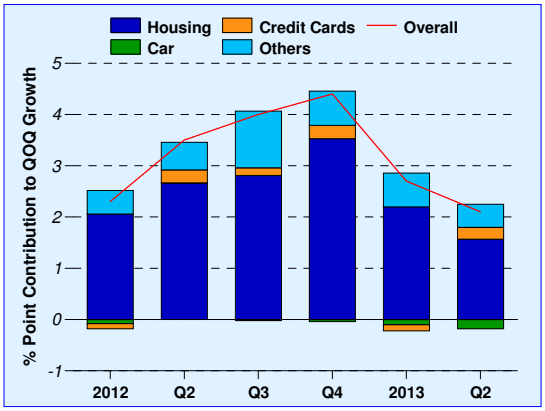
Chart 1.15
IIP and Real Domestic Exports



Growth in financial services moderated from the exceptional Q1 outturn.

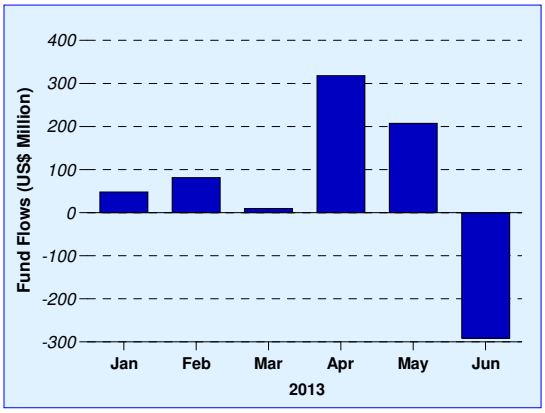
The financial services sector expanded by 9.2% q-o-q SAAR in Q2, on the heels of a stellar 51.2% outturn in the previous quarter. Growth in Q2 was largely supported by the insurance industry which saw strong gains in net earned premiums across most business segments. ACU activity likewise turned in a robust showing, in part due to offshore non-bank lending which was buoyed by firm credit demand from East Asia. On the domestic front, loans to both businesses and consumers continued to grow, albeit at a slower pace. In particular, credit extended to consumers rose by a tepid 2.1% q-o-q, the slowest since Q1 2009, as the property cooling measures and financing restrictions on motor vehicles took effect. (Chart 1.16)

Chart 1.16
Contribution to Domestic Consumer Loan Growth



The sentiment-sensitive cluster performed well in Q2 2013. After a lull at the end of 2012, IPO activity resumed through most of this year. In spite of the strong 114% q-o-q expansion in Q1 2013, IPO volumes grew by a further 7.3% q-o-q in Q2. Meanwhile, inflows to the domestic fund management industry surged in April and May, although there was some reversal in June on the back of concerns over a potential QE tapering. (Chart 1.17) The industry still saw inflows of US$234 million for the whole of Q2, more than 1.5 times that in the previous quarter.

Chart 1.17
Bond and Equity Funds Domiciled in Singapore



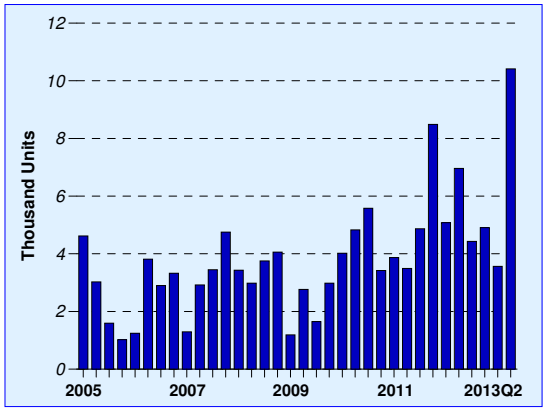
Source: EPFR Global

Meanwhile, the domestic-oriented industries continued to fare well.

Activities reliant on domestic demand stood firm as a whole, although there was some differentiation in performance across industries. For instance, the construction sector recorded a double-digit expansion of 20.9% q-o-q SAAR in Q2 2013, following an 8.5% gain in Q1. This was mainly on account of construction starts for a bumper crop of private residential units during the quarter. (Chart 1.18) In addition, output was boosted by the completion of several major projects, such as the Jem shopping mall and the commercial-industrial centre Oxley BizHub 2.

In contrast, the pace of expansion in the more cyclically-sensitive segments weakened slightly as consumers trimmed their discretionary expenditure. Domestic non-vehicle retail sales were sluggish as demand for big-ticket items such as household durables and furniture waned. Similarly, revenue in the food & beverage cluster was flat in Q2 following a 1.9% q-o-q SA gain in the quarter before, owing to lacklustre takings by food caterers and restaurateurs.

Chart 1.18
Number of Private Residential Units Commenced

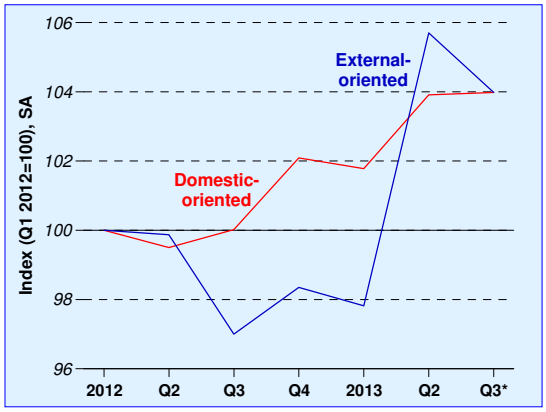


Overall activity slackened into Q3 2013.

Activity in the Singapore economy showed signs of slowing in Q3 2013, with a broad-based cyclical pullback following the strong Q2 performance, and alongside renewed uncertainties in the external environment. This was corroborated by EPG's Economic Activity Index, which pointed to muted outturns in Jul–Aug across both the external-oriented and domestic-oriented industries. (Chart 1.19)

The financial services sector, especially the sentiment-sensitive cluster, saw some retrenchment in activity amid renewed expectations of US QE tapering in September and fears of a Western military intervention in Syria. The forex market was subdued in Jul–Aug, with daily trading volumes declining by 5.8% m-o-m on average as investors retreated to the sidelines. In addition, the local bourse remained on a downward trajectory during this period. Although the Federal Reserve's decision in mid-September to delay the start of QE tapering provided some respite to financial markets, investor risk appetite remained muted.

Chart 1.19
EPG's Economic Activity Index



Source: EPG, MAS estimates

Note: The Economic Activity Index (EAI) is a composite index that traces the performance of the domestic economy. It aggregates a set of coincident and high-frequency indicators across the major sectors of the economy.

* Readings for Q3 2013 are based on an average of Jul–Aug data.

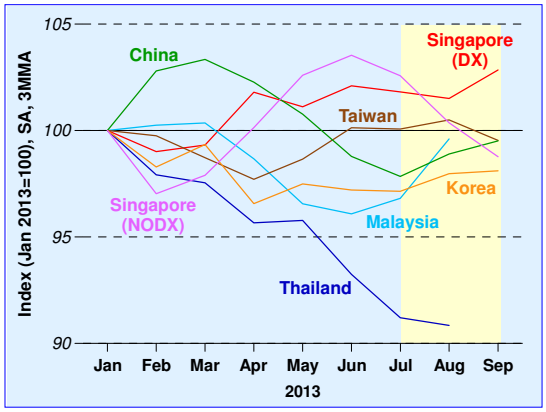
Trade activity was likewise sluggish going into Q3. Growth of real domestic exports slowed to 0.7% q-o-q SA in Q3, down from 2.8% in the previous quarter. The drag stemmed from the non-oil segment, particularly pharmaceuticals and electronics. The moderation in exports over Q3 was also evident in some Asian economies such as Taiwan and Thailand. (Chart 1.20) Concomitantly, Singapore's manufacturing output fell by 3.4% q-o-q SAAR in Q3, following a 33.5% surge in the preceding quarter, according to *Advance Estimates*. Growth momentum in the trade-related services sectors flagged as well.

Turning to domestic-oriented activities, growth momentum also softened in Q3, with the consumer-facing clusters bearing the brunt of the slowdown. Domestic retail sales declined by 7.4% q-o-q SA in Jul–Aug, largely on account of a sharp fall in vehicle sales which was caused by policy-induced factors. Further, non-vehicle sales registered a mild retraction, particularly in discretionary items such as electronic gadgets and telecommunication devices, as consumer sentiment waned further amid concerns about Fed tapering and muted activity in some Asian economies. Food & beverage sales similarly languished over the same period.

In comparison, activities reliant on domestic corporate demand fared better. The information & communications sector saw further sequential expansions on the back of rising demand for IT-related services, while the professional business services sectors—particularly legal, business and management consultancy—remained on an upward trajectory.

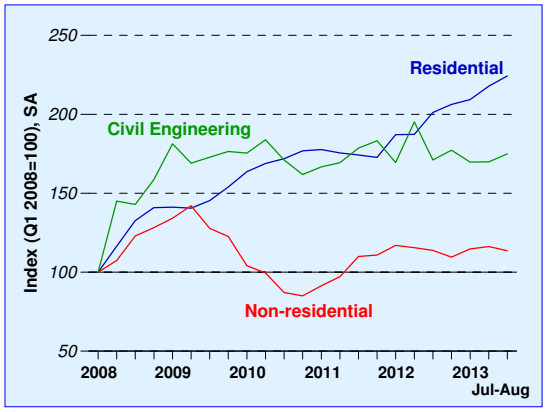
Meanwhile, the construction industry posted a contraction of 8.8% q-o-q SAAR in Q3, following an expansion of 20.9% in the quarter before. Despite the sequential pullback, the level of underlying activity held firm. The latest readings of certified progress payments—a proxy for construction output—generally held up in Jul–Aug, especially in the residential segment. (Chart 1.21) Further, on-site building activities related to the Sports Hub, South Beach complexes and commercial malls proceeded apace.

Chart 1.20
Real Exports of Regional Economies



Source: CEIC and EPG, MAS estimates
Note: Series are denominated in local currency.

Chart 1.21
Certified Progress Payments



Source: EPG, MAS estimates

The economy may be in a lower-growth and more volatile phase.

Given the ebb and flow of global headwinds over the last few years, a sustained and broad-based pickup in the domestic economy has so far proven elusive. Indeed, the Singapore economy has seen a step-down in growth since the onset of the GFC. (Chart 1.22) In addition, there have been persistent fluctuations in the quarter-to-quarter GDP profile over this period. To investigate this, we adopted the methodology of McConnell and Perez-Quiros (2000)[2] to identify the timing of structural breaks in the volatility of real GDP growth in Singapore over the period Q2 1985 – Q2 2013. More specifically, the first difference of deviations in the logarithm of real GDP from a HP-filtered trend was used to construct a mean-volatility equation.[3] Tables 1.2 and 1.3 present, respectively, the structural breakpoints and summary statistics for the episodes identified.

There are two main results. First, there has been a downshift in Singapore's trend GDP growth, as shown by the step-down in mean quarterly growth rates across each successive episode. (Table 1.3) It appears that the subdued growth of the current phase was mainly due to weakness in the external environment. Indeed, GDP growth in Singapore's key trading partners fell, from an average of 5.2% q-o-q SAAR pre-GFC to 3.5% in the latest period. (Chart 1.23)

Chart 1.22
Singapore's GDP Growth

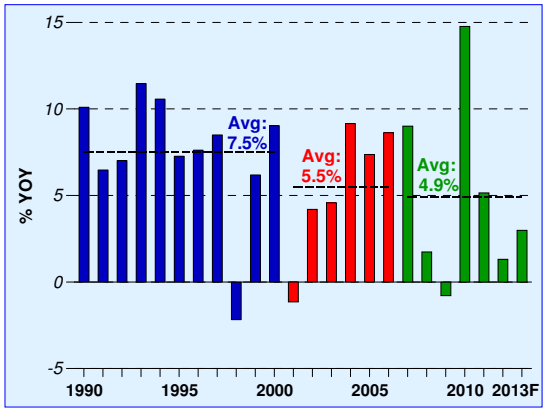
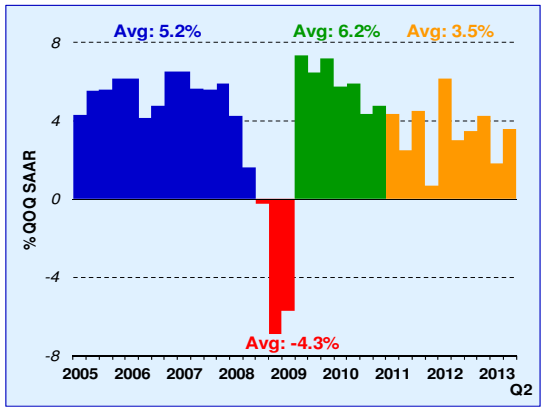


Chart 1.23
GDP Growth of Singapore's Major Trading Partners*



* Weighted by shares in Singapore's NODX.

[2] McConnell, M M and Perez-Quiros, G (2000), "Output Fluctuations in the United States: What Has Changed since the Early 1980s?", *American Economic Review*, Vol. 90(5), pp. 1464–1476.

[3] A multiple-breakpoint test, designed by Bai, J and Perron, P (2003), "Computation and Analysis of Multiple Structural Change Models", *Journal of Applied Econometrics*, Vol. 18(1), pp. 1–22 was applied to test for the presence of structural breaks on the transformed residuals extracted from the mean-volatility equation. The results were similar if unfiltered logarithms of real GDP were used instead.

Table 1.2
Structural Breakpoints in Singapore's GDP Growth*

Period	Structural Breakpoints Identified for:	
	Trend Growth	Trend Growth Volatility
Q2 1985 – Q2 2013	Q4 2010	Q2 2008, Q4 2010

* On a q-o-q SAAR basis.

Table 1.3
Summary Statistics for Singapore's Growth Episodes

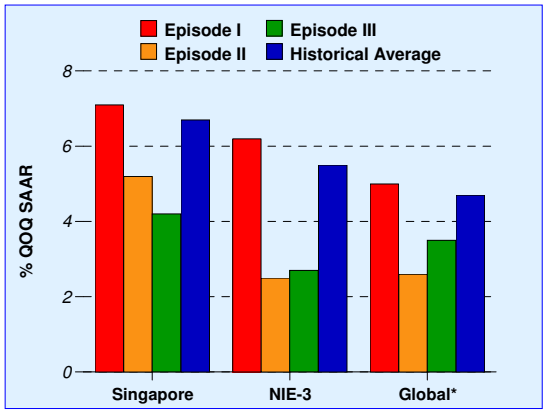
Episodes	% QOQ SAAR	
	Mean	Standard Deviation
I: Q2 1985 – Q1 2008	7.12	7.31
II: Q2 2008 – Q3 2010	5.15	18.11
III: Q4 2010 – Q2 2013	4.23	7.23
IV: Q2 1985 – Q2 2013 (Historical Average)	6.67	8.68

However, domestic developments would have also played a role in the transition of the Singapore economy to a lower-growth phase. Indeed, supply-side constraints in the domestic economy have come into sharper focus amid the ongoing restructuring drive. For instance, the progressive tightening of foreign worker policy—which was aimed at reducing the economy's reliance on low-skilled foreign labour—would have tempered growth somewhat over the near term. These measures should however facilitate the shift towards productivity-led growth over time.

Second, although the Singapore economy has moved to a lower medium-term growth path, there has not been a commensurate decline in the volatility of GDP growth. The standard deviation of quarterly GDP growth has remained close to its historical average in the most recent period. (Table 1.3) This contrasts with the experience of other countries, where both GDP growth and volatility were lower than their historical averages. (Charts 1.24 and 1.25)

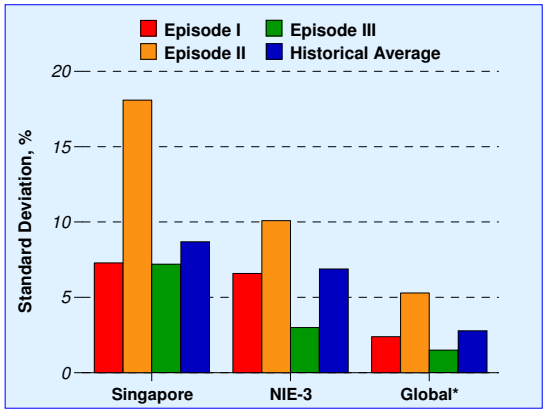
Moreover, a variance decomposition analysis shows that the volatility in the latest episode was mainly driven by fluctuations in net exports. (Chart 1.26) In fact, the external-induced volatility has not subsided significantly compared to Episode II which spanned the GFC. Further, the volatility in gross fixed capital formation (GFCF) and change in stocks was also sizeable in Episode III. The persistent uncertainty in the global economic environment, including financial markets, over the post-GFC period could have

Chart 1.24
GDP Growth of Selected Economies



* Weighted by shares in Singapore's NODX.

Chart 1.25
Standard Deviation of GDP Growth



Note: Growth is computed on a q-o-q SAAR basis.
* Weighted by shares in Singapore's NODX.

resulted in continued fluctuations in short-term, quarter-to-quarter investment and inventory decisions of locally-domiciled firms. Nonetheless, the worsening of the growth-volatility trade-off in the latest phase did not seem to have impinged on the long-term spending decisions of the domestic corporate sector. Business investment commitments have climbed steadily in the aftermath of the GFC, despite elevated uncertainties in the global economy. (Chart 1.27) Further, although the number of company cessations has risen during this period—likely the result of some attrition in lower value-added activities amid economic restructuring—it has been consistently outpaced by the number of new company formations. (Chart 1.28)

Looking ahead, a continuing recovery in the external environment should provide some upside to Singapore's GDP path. However, this does not rule out fluctuations around the mild upward trajectory, particularly in view of the still-uneven export demand conditions. As such, the modest-growth, heightened-volatility GDP profile can be expected to persist for Singapore in the coming quarters.

Chart 1.26
Output Volatility

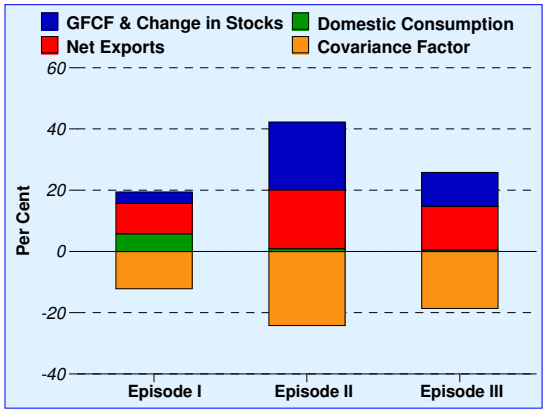


Chart 1.27
Business Investment Commitments

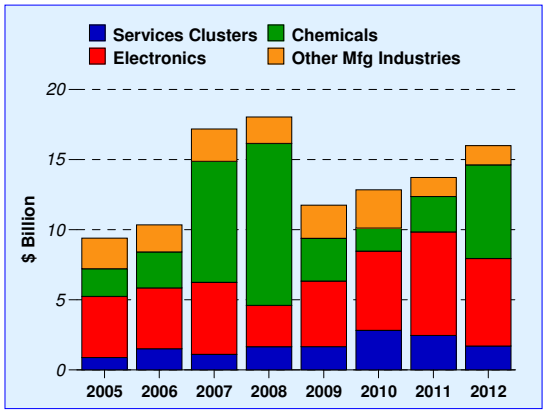
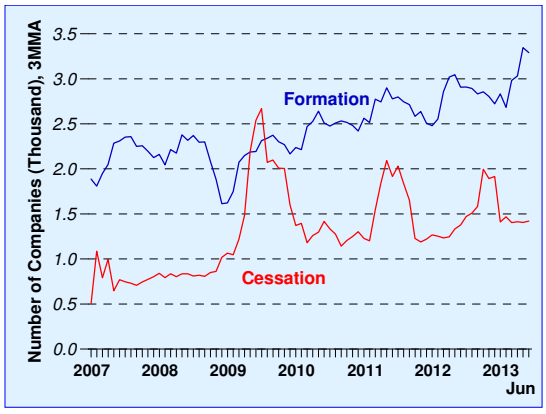


Chart 1.28
Company Formation and Cessation



1.3 Macroeconomic Policy

Monetary Policy

The monetary policy stance adopted since April 2012 was maintained in April and October 2013.

After hitting a soft patch in the middle of 2012, the Singapore economy embarked on a recovery trajectory with GDP growth turning positive in Q4, and expanding by a further 2.3% q-o-q SAAR in Q1 2013. Although trade-related activities retracted in Q1 due to an idiosyncratic decline in pharmaceuticals output, electronics production experienced a cyclical turnaround, underpinned by the pickup in the advanced economies. Financial services also surged as investor confidence improved following decisive actions by major central banks to keep global monetary conditions accommodative. At the same time, the domestic-oriented sectors were resilient. Given the broad-based recovery, demand for workers was robust even as foreign worker policies were being tightened. Notwithstanding the moderation in MAS Core Inflation from 2.5% in 2012 to 1.6% in Q1 2013, price pressures were anticipated to pick up in the latter part of the year, as the labour market continued to be at full employment.

In April 2013, MAS announced that it would keep the slope of the S$NEER policy band on a modest and gradual appreciation path, with no change to its width or the level at which it was centred. This policy stance has helped to alleviate inflationary pressures and anchor inflation expectations while facilitating the restructuring of the economy.

Since then, uncertainties about the near-term global economic outlook have re-emerged and resulted in sporadic bouts of financial market turbulence. While the economy took a step up in Q2 2013, its growth momentum subsequently faltered, with GDP contracting by 1.0% q-o-q SAAR in Q3. Rising risk aversion stemming from the prospective tapering of asset purchases by the Federal Reserve, and possible military intervention in Syria, weighed on financial markets. Concomitantly, a steep decline in the production of pharmaceuticals and PC peripherals dampened domestic manufacturing output. Beyond some short-term volatility, however, economic activity should continue to increase gradually, supported by the

recovery in the G3 economies and stable growth in emerging Asia. All in, Singapore's GDP growth is expected to come in at 2.5–3.5% in 2013, and should not differ significantly in 2014. (Chart 1.29)

The expansion of the Singapore economy will continue to chafe against constraints in key factor markets and the tight labour market will intensify wage pressures. In addition, rising COE premiums for commercial vehicles and elevated levels of business rentals could exacerbate business costs. As these accumulate, and as sentiment improves in tandem with the turnaround in activity, the pace at which firms pass on costs to consumer prices should intensify. Thus, MAS Core Inflation is projected to increase from 1.5–2% in 2013 to 2–3% in 2014.

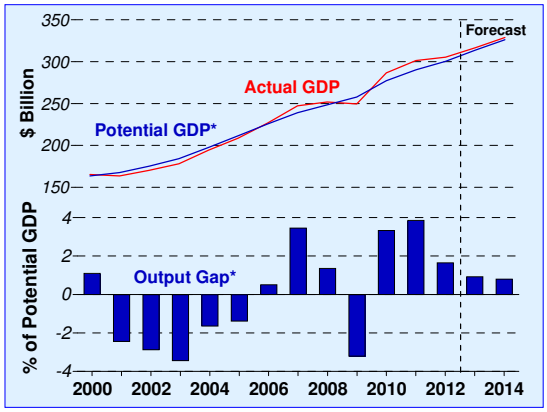
Imputed rentals on owner-occupied accommodation will grow at a slower pace in 2014, with a greater supply of housing coming on-stream. At the same time, car prices could continue to rise in the short term as the market adjusts to the pending re-categorisation of COEs, although the pace of increase is unlikely to be sustained. CPI-All Items inflation is, therefore, projected to be 2.5–3% in 2013 and 2–3% in 2014.

MAS' monetary policy formulation continues to take into account the medium-term impact of economic restructuring. As tighter foreign worker policies become more binding, the relative wages of skilled resident workers should rise. This, alongside other higher cost factors such as rentals, will result in a temporary pickup in the core inflation rate as businesses pass on costs during the transition period. Over the medium term, however, the restructuring initiatives are expected to reap productivity gains, which will then dampen labour cost increases and inflation.

Accordingly, MAS maintained the modest and gradual appreciation path of the S$NEER policy band in October 2013, with no change to the slope, width, or level at which it was centred.

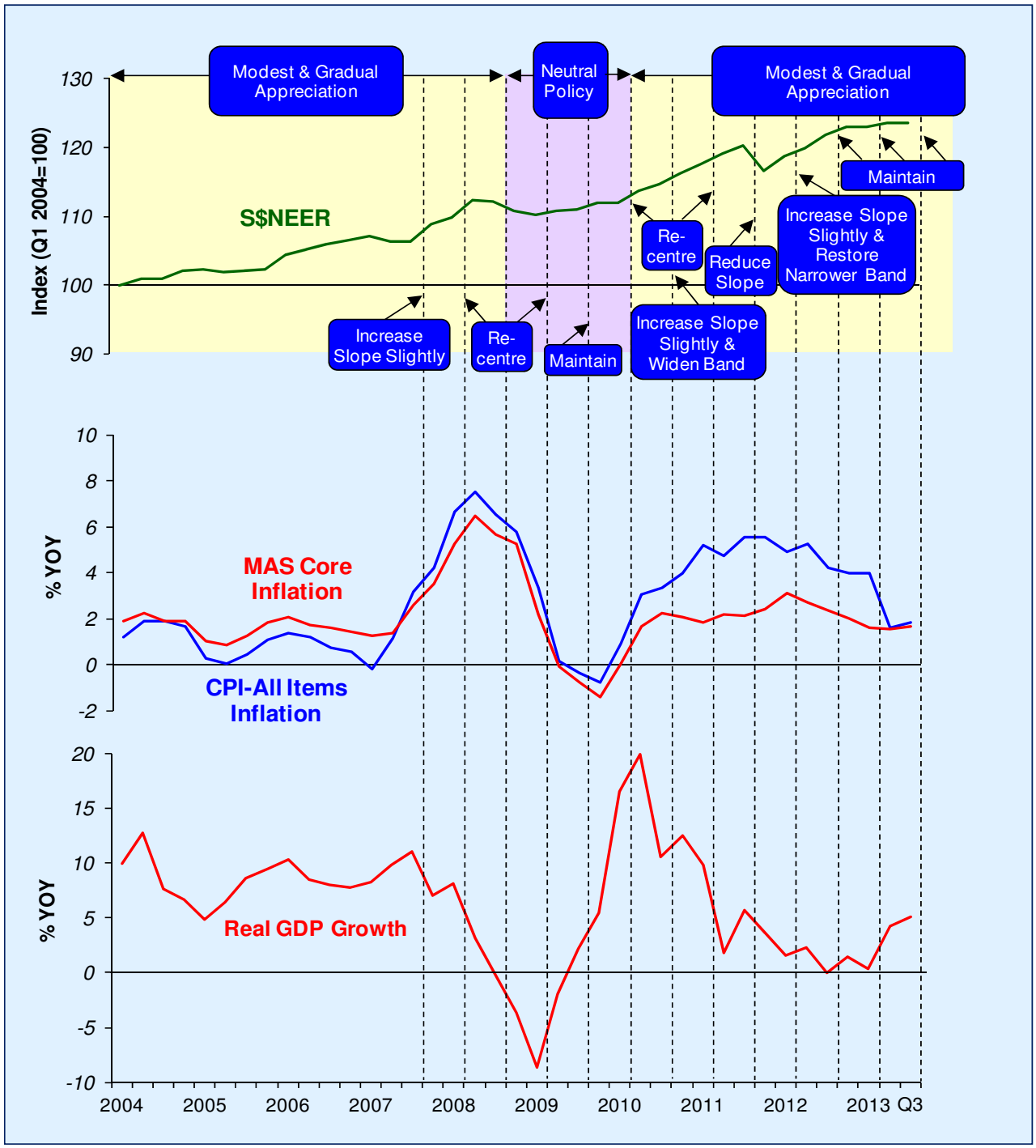
Chart 1.30 traces the evolution of monetary policy in relation to growth and inflation developments in the Singapore economy. Despite the impact of bouts of turbulence in the global economic environment, the current monetary policy stance is assessed to be appropriate, taking into account the balance of risks between lingering growth uncertainties and rising inflationary pressures.

Chart 1.29
Real GDP and Output Gap



* EPG, MAS estimates.

Chart 1.30
Key Macroeconomic Variables and Changes in the Monetary Policy Stance



The S$NEER has experienced some volatility in the six months since April 2013.

The S$NEER has remained within the upper half of the exchange rate policy band since the last policy review. However, it has been volatile as financial markets reacted to global economic and geopolitical developments. (Chart 1.31) Between May and August 2013, the S$NEER experienced several bouts of depreciation pressure, as emerging market and regional currencies weakened vis-à-vis the US$, in anticipation that the Federal Reserve would reduce the pace of its asset purchases as early as September. (Chart 1.32) However, the S$NEER returned to an appreciation trajectory in September and October, as the domestic currency strengthened against the US$ amid the Federal Reserve's surprise move to defer tapering and uncertainty arising from the US fiscal impasse.

The S$REER depreciated in Q2 as inflation in Singapore fell relative to that in its trading partners.

The S$ real effective exchange rate (S$REER) is a measure of the prices of goods and services in Singapore relative to its trading partners, based on a common weighted exchange rate index, the S$NEER. When deflated by the CPI, the S$REER peaked in Q1 2013 before depreciating by 1.2% q-o-q in Q2. (Chart 1.33) Relative price changes accounted for the bulk of S$REER developments in the first half of 2013, unlike in previous quarters when the exchange rate was the main driver. While foreign inflation rose slightly on a sequential basis in Q2, Singapore's CPI inflation declined, as COE premiums corrected sharply following the imposition of car financing measures earlier in the year. Notwithstanding its recent decline, the S$REER has in fact appreciated by 0.4% since Q4 2012. As of Q2 2013, it was some 16% above its level in Q1 2010, the quarter before MAS shifted from a neutral monetary policy stance to a modest and gradual appreciation path for the S$NEER policy band.

Chart 1.31
S$NEER

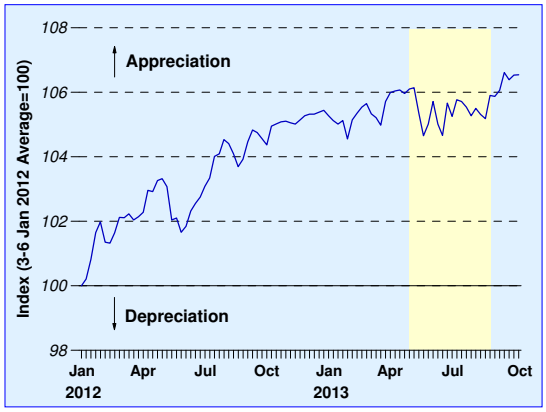


Chart 1.32
Movements of Regional Currencies against the US$

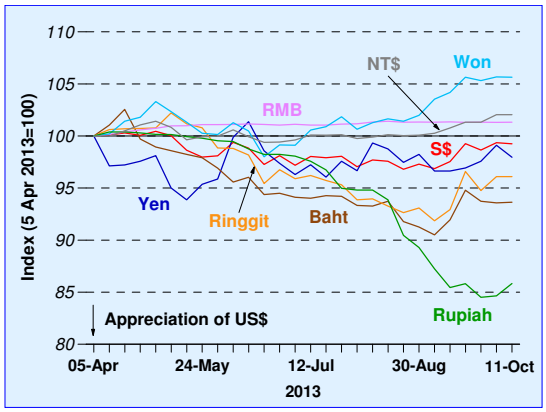
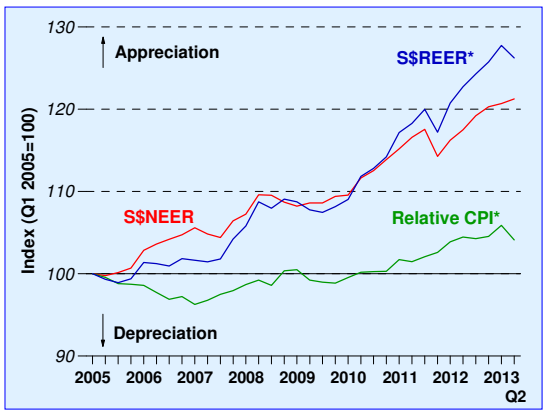


Chart 1.33
S$NEER, S$REER and Relative CPI



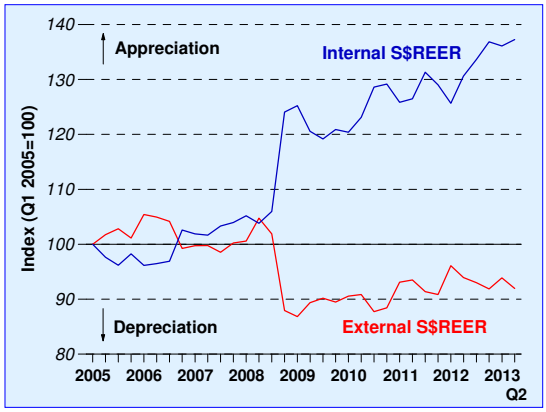
* EPG, MAS estimates.

The S$REER appreciated slightly in H1 2013, as the relative price of non-tradables to tradables rose at a faster pace in Singapore than abroad.

The S$REER can alternatively be decomposed into the 'external' S$REER and the 'internal' S$REER, where the former represents the price of tradable goods in the domestic economy relative to abroad, in terms of a common reference currency. The latter refers to the relative price of non-tradables to tradables in the domestic market compared to foreign markets.[4]

The external S$REER has been volatile in the first half of the year, rising by around 2% in Q1 but reversing its gains in Q2. (Chart 1.34) Overall, the external S$REER rose by a marginal 0.1% in H1 2013. While the price of tradable goods in the Singapore economy relative to abroad fell by 0.7% between Q4 2012 and Q2 2013, this was offset by the 0.8% appreciation of the S$NEER over the same period. At the same time, the internal S$REER also appreciated by 0.3%, as the relative price of non-tradables to tradables increased at a more rapid pace in Singapore than in its trading partners. Overall, for the first half of 2013, the 0.4% rise in Singapore's real effective exchange rate was mainly driven by the internal S$REER, as has generally been the case since 2007.

Chart 1.34
External and Internal S$REER

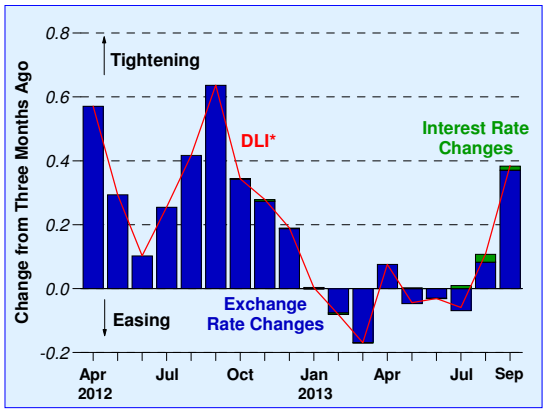


Source: EPG, MAS estimates

Liquidity conditions eased from May to July but tightened in recent months.

Overall liquidity conditions in the economy are captured by changes in the Domestic Liquidity Indicator (DLI), which reflects movements in the S$NEER and the domestic three-month interbank rate. Liquidity conditions eased from May to July, compared to three months ago, as the S$NEER faced several bouts of depreciation amid heightened risk aversion in global financial markets. (Chart 1.35) Since August however, liquidity conditions have tightened as the S$NEER appreciated against the US$ and regional currencies. The domestic three-month interbank rate, which has been stagnant since late 2011, rose slightly in recent months, and also contributed to tighter liquidity conditions.

Chart 1.35
Domestic Liquidity Indicator



* EPG, MAS estimates.

[4] Please refer to the April 2013 issue of the *Review* for a more detailed analysis of the external and internal S$REER.

The domestic three-month interbank rate has been at a premium over three-month US$ LIBOR throughout 2013. (Chart 1.36) In the first half of the year, this differential solely reflected movements in the US$ LIBOR, which declined from 0.30% to 0.27% between January and June as global monetary conditions remained accommodative. At the same time, the domestic interbank rate stayed unchanged at 0.38%. Between July and September, however, the domestic interbank rate edged up to an average of 0.42%. Consequently, the interest rate differential widened to an average of 16 bps over this period from 9 bps in the first six months of the year.

The three-month S$ swap offered rate (SOR), which represents the cost of borrowing S$ through a FX swap, has broadly followed the trend in US$ LIBOR. While the SOR typically tracks the domestic interbank rate closely, it can respond more quickly to changes in global liquidity conditions, as swap markets are deeper than deposit markets. The SOR rose from 0.20% in March to 0.27% in May, before easing to 0.22% in September 2013.

Despite an uptick in the domestic interbank rate, deposit rates remained low. Banks' savings deposit rates eased by a marginal 1 bp in April 2013 and have stayed at 0.10% since. Meanwhile, banks' fixed deposit rates remained unchanged, including the 12-month fixed deposit rate which has been at 0.32% since August 2012, close to its historical low of 0.29%. (Chart 1.37)

Chart 1.36
Interest and Swap Rates

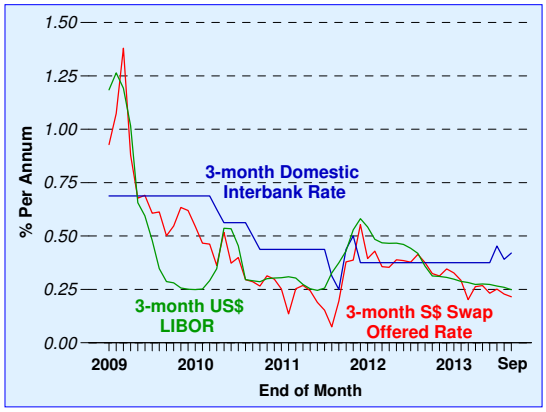
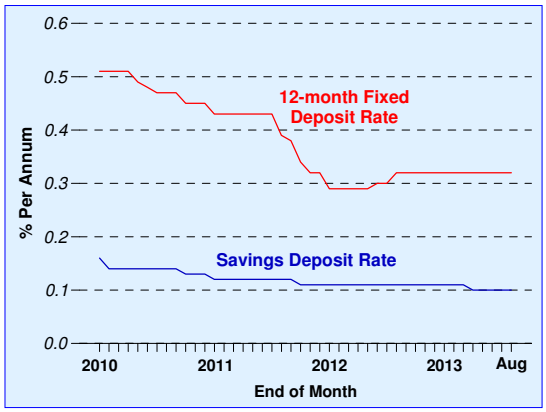


Chart 1.37
Deposit Rates

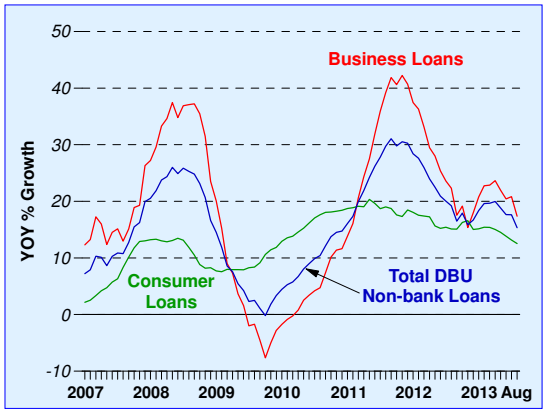


Note: This is the simple average of the top 10 banks' deposit rates.

Credit growth moderated given uncertainties about the global economic outlook.

As uncertainty about global growth and the prospect of Fed tapering heightened in May, the growth of domestic credit to the private sector slowed from a cyclical peak of 20% y-o-y in April 2013 to 15% in August. (Chart 1.38) Business loan growth declined from 24% y-o-y to 17% over the same period, with credit to trade-related sectors, such as manufacturing and commerce, expanding more slowly. Consumer credit growth also moderated, as the stock of car loans continued to shrink under the motor vehicle financing restrictions, while housing and bridging loans growth eased.

Chart 1.38
DBU Loans to the Non-bank Private Sector



The growth in monetary aggregates fluctuated with GDP growth.

Growth in M1 peaked at 18% y-o-y in June 2013, the fastest since October 2011. (Chart 1.39) As GDP surged in Q2, the demand for money and money-equivalents for transaction purposes, namely demand deposits, also rose in tandem. (Chart 1.40) Subsequently, M1 grew at a slower pace as economic activity faltered in Q3, averaging 15% y-o-y in Jul–Aug.

The broader monetary aggregates, M2 and M3, also rose at a more moderate pace. Both M2 and M3 expanded by slightly over 7% in August, from around 10% y-o-y in May. The slowdown was broad-based across the different types of deposits. For example, fixed deposit growth decelerated to 1.3% y-o-y in Jul–Aug, its lowest since May 2011.

Chart 1.39
Monetary Aggregates

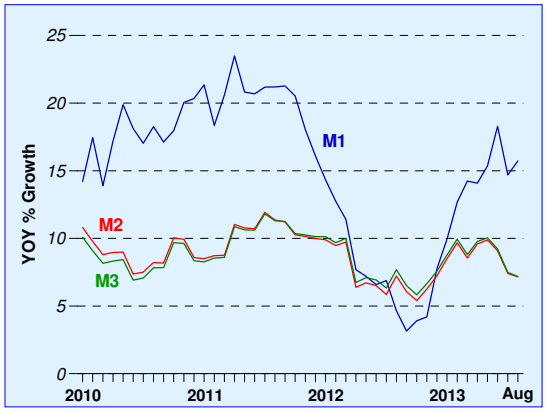
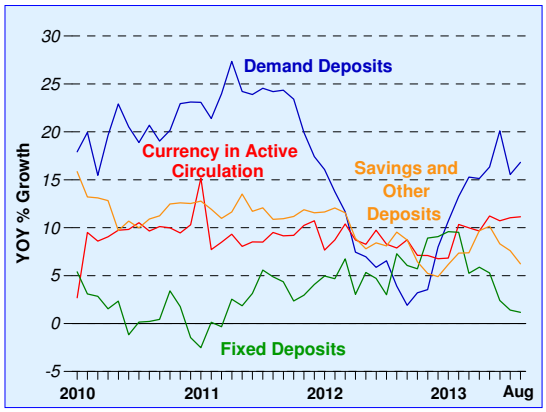


Chart 1.40
Components of Money Supply



Fiscal Policy

Government operating revenue increased in H1 2013, alongside the economic upturn.

In line with the Singapore economy's expansion, the government's operating revenue rose from $26.7 billion (15.5% of GDP) in H1 2012 to $29.1 billion (16.4% of GDP) in H1 2013. Income tax, GST and property-related taxes were the main contributors to this increase. (Chart 1.41)

In the first half of this year, the government collected $11.3 billion in income taxes, the largest component of operating revenue, representing a $0.7 billion increase from a year ago. Boosted by healthy corporate earnings and wages, personal and corporate income taxes rose by around $0.4 billion each. GST, the second largest contributor to operating revenue, also increased by $0.4 billion from a year ago to $4.7 billion in H1 2013, as consumption growth held firm. (Chart 1.42)

Receipts from stamp duty and property taxes rose by $0.5 billion and $0.2 billion, respectively, supported by firm property prices and changes in the structure of the additional buyers' stamp duty (ABSD), even though transactions were on a generally declining trend. As part of the property cooling measures announced and implemented in January 2013, the ABSD was raised to up to 10% for Permanent Residents (PR) and Singaporeans, and 15% for foreign and corporate buyers. It was also extended to PRs purchasing their first property, and Singaporeans purchasing their second property.

In comparison, other fees & charges only increased by a marginal $0.1 billion in H1 2013 on a year-ago basis. This was largely due to the sharp fall-off in COE premiums following the imposition of the motor vehicle financing measures in February. At its trough in April, COE premiums were 33% below their peak in January 2013. (Chart 1.43)

The increase in government expenditure was driven by operating expenses.

Total government spending rose by $2.3 billion to $27.1 billion (15.3% of GDP) in H1 2013, due to the rise in operating expenditure, which encompasses expenses on manpower, equipment and supplies, as well as operating grants to statutory boards and aided

Chart 1.41
Components of Operating Revenue

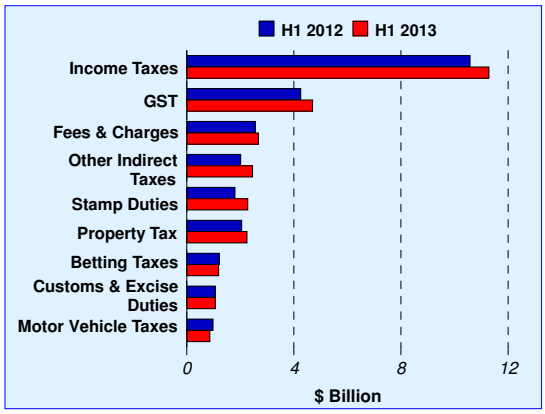


Chart 1.42
GDP, GST and Income Taxes

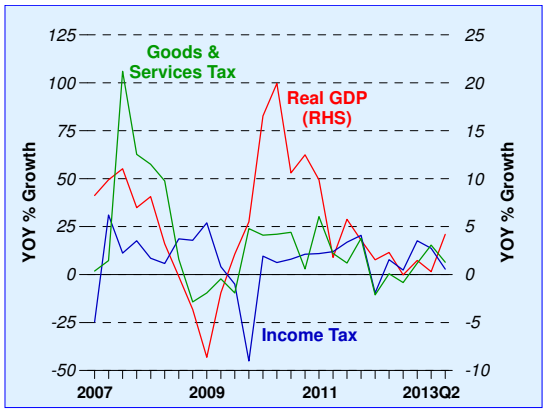
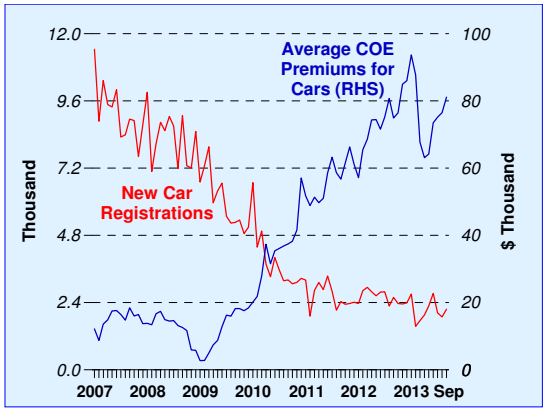


Chart 1.43
COE Premiums and New Car Registrations



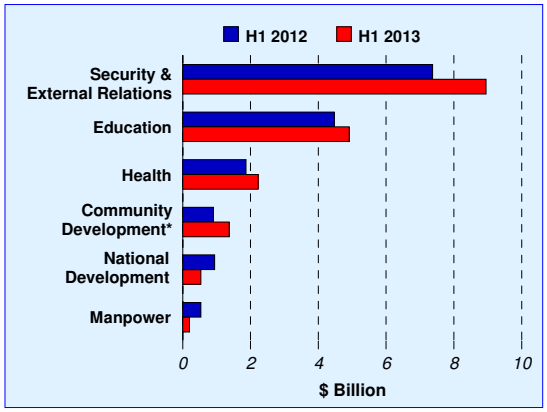
educational institutions. Operating expenses increased to $20.5 billion. A large part of this increase was for security and external relations purposes.

The next largest increase in operating expenditure was on community development. The Ministry of Social and Family Development (MSF)[5] disbursed funds as part of the Marriage & Parenthood Package 2013, for enhanced childcare and infant care subsidies, and for government-paid childcare and maternity leave. Education spending rose following the expansion in publicly-funded university places and salary adjustments for teachers, while the Ministry of Health (MOH) also incurred higher expenditure to provide more subventions to restructured hospitals, community hospitals, and Voluntary Welfare Organisations (VWOs) in the Intermediate and Long-Term Care (ILTC) sector. (Chart 1.44)

Meanwhile, development expenditure was unchanged from H1 2012, as increased spending by the Ministry of Transport (MOT) and Ministry of Trade & Industry (MTI) was offset by a decline in the national development and education ministries. The bulk of the increase in transport development expenditure was for ongoing works on rail projects, such as the Downtown Line and Tuas West Extension, while continued spending by MTI on research and development activities also contributed to the growth in overall government development expenditure. (Chart 1.45)

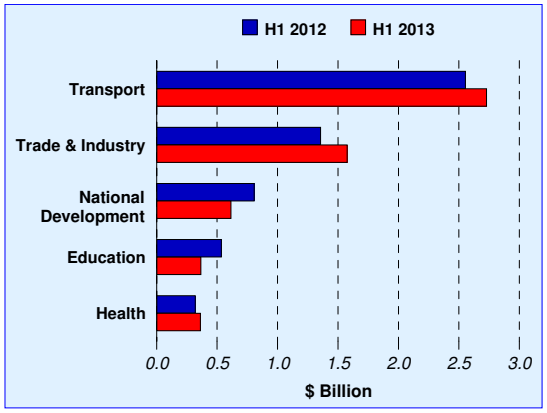
In comparison, the Ministry of National Development (MND) recorded a reduction in development expenditure due to lower spending on the Selective En Bloc Redevelopment Scheme (SERS) and several existing major upgrading programmes such as the Lift Upgrading Programme, which have also wound down. At the same time, the Ministry of Education (MOE) had lower funding requirements upon the completion of the Institute of Technical Education's (ITE) third regional campus in Ang Mo Kio.

Chart 1.44
Selected Components of Operating Expenditure



* Comprises the Ministry of Social and Family Development (MSF) and the Ministry of Culture, Community & Youth (MCCY).

Chart 1.45
Selected Components of Development Expenditure

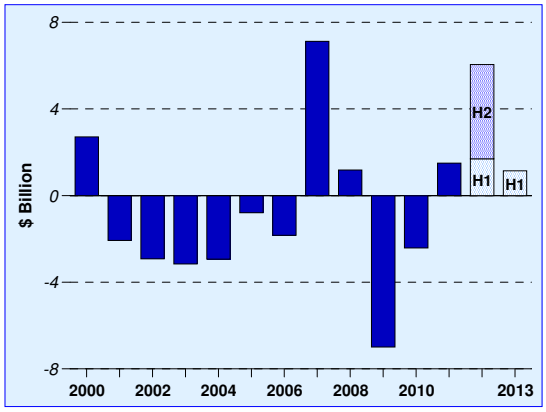


[5] The Ministry of Community Development, Youth and Sports (MCYS) and the Ministry of Information, Communications and the Arts (MICA) were restructured with effect from November 2012 to form the Ministry of Social and Family Development (MSF), the Ministry of Culture, Community and Youth (MCCY), and the Ministry of Communications and Information (MCI).

The government continued to record surpluses in its primary and basic balances.

As the increase in revenue was almost matched by the rise in expenditure, the government's primary surplus remained largely unchanged, at around $2.0 billion in H1 2013 compared to the same period last year. However, the basic balance showed a smaller surplus of $1.2 billion, compared to $1.7 billion a year ago, reflecting the special transfer of one-off CPF Medisave account top-ups for elderly Singaporeans. Overall, the amount of special transfers disbursed has doubled to $6.9 billion in H1 2013, although this mainly comprised contributions to the GST Voucher Fund, which had no impact on the basic balance.[6] (Chart 1.46)

Chart 1.46
Government's Basic Balance

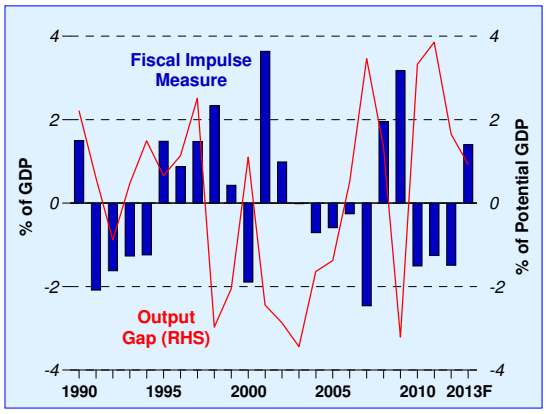


The fiscal policy stance is estimated to be mildly expansionary in 2013.

The FY2013 Budget had two main thrusts—encouraging businesses to continue with their restructuring efforts for sustained and quality growth in the future, and building a more inclusive society. In line with the former, the government introduced a three-year Transition Support Package to help businesses as they restructure. In particular, the Wage Credit Scheme[7] (WCS) was designed to help defray part of the rising costs facing businesses during this period of restructuring, and incentivise firms to share productivity gains with workers. The existing Productivity Innovation Credit (PIC) scheme was also enhanced to include a matching cash bonus for businesses and more liberal conditions for equipment that qualified for PIC benefits. At the same time, the Budget introduced more measures to promote social mobility and make the fiscal system more progressive, such as raising the quality of the pre-school sector and enhancing the Workfare Income Supplement (WIS) Scheme payouts and coverage. Further, the Budget included one-off special payments to help households cope with the cost of living.

Taking into account these measures targeted at helping firms and households, the fiscal policy stance is slightly expansionary in 2013 compared to the previous year. This is shown by the fiscal impulse measure, which is estimated to be positive at 1.4% of GDP in CY2013. (Chart 1.47)

Chart 1.47
Fiscal Impulse Measure



Source: EPG, MAS estimates

[6] The basic balance is the primary balance less special transfers (excluding top-ups to endowment and trust funds).

[7] Under the WCS, the government will co-fund 40% of wage increases for Singaporean employees earning a gross monthly wage of up to $4000. The WCS covers wage increases given over the next three years.

Box A
Review of MAS Money Market Operations in FY2012/13[1/]

This box reviews MAS' money market operations in FY2012/13. Money market operations are undertaken to manage liquidity within the banking system, and are distinct from the implementation of exchange rate policy. More information may be found in the monograph on "Monetary Policy Operations in Singapore", March 2013.

This box first describes how money market operations are conducted. This is followed by a review of banks' demand for cash balances with MAS and the behaviour of autonomous money market factors in FY2012/13. Finally, the box examines the composition of money market operations carried out during this period.

Money Market Operations in Singapore

The open-economy trilemma posits that a country that maintains an open capital account cannot simultaneously manage its exchange rate and domestic interest rates. Thus, Singapore's open capital account and exchange rate-centred monetary policy imply that its domestic interest rates and money supply are necessarily endogenous. MAS' money market operations are therefore not targeted at any level of interest rate or money supply; instead, they are aimed at ensuring that there is sufficient liquidity in the banking system to meet banks' demand for reserve and settlement balances.

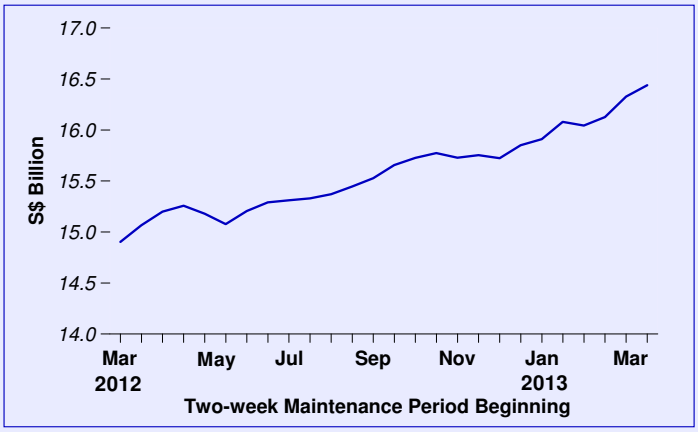
Money market operations are conducted daily by the Monetary & Domestic Markets Management Department at MAS. The amount of liquidity in the banking system is estimated by taking into consideration the banking sector's demand for funds and the net liquidity impact of autonomous money market factors. After carrying out money market transactions, MAS monitors market and liquidity conditions throughout the day.

Banks' Demand for Cash Balances

Banks hold cash balances with MAS to meet reserve requirements and for settlement purposes. Banks in Singapore are required to maintain with MAS a Minimum Cash Balance (MCB) equivalent to 3% of their liabilities base on a two-week average basis. This forms a base demand for cash balances. Banks also hold cash balances for settlement and regulatory purposes. Hence, the total demand for reserve balances could vary across periods as banks hold excess cash balances to make large payments (settlement purposes), or to use as high quality liquid assets (regulatory purposes). Since the financial crisis, there has been a tendency for banks to hold slightly more liquidity in the form of central bank reserves.

In FY2012/13, banks' demand for balances to meet reserve requirements grew, reflecting a growing liabilities base and rising bank intermediation activity. (Chart A1)

Chart A1
Average Reserve Requirements over Two-week Maintenance Periods

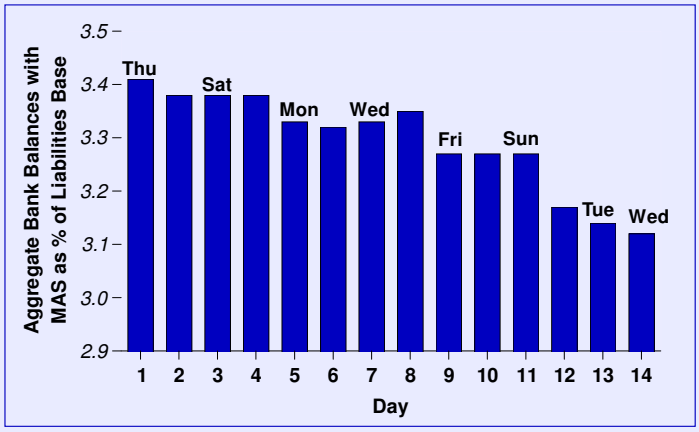


1/ This box is contributed by the Monetary & Domestic Markets Management Department of MAS.

Although banks are required to keep an average MCB ratio of 3% over the two-week maintenance period, their daily effective MCB ratios may fluctuate between 2% and 4% of their liabilities base, allowing them more flexibility in their liquidity management. Hence, there may be day-to-day variations in banks' demand for cash balances with MAS within each maintenance period.

Chart A2 illustrates the daily fluctuations in cash balances within an average maintenance period in FY2012/13. Banks tend to maintain higher cash balances during the start of a maintenance period so as to avoid being caught short of cash towards the end of the period. Hence, the daily cash balances required by the banking system during the last few days of a maintenance period are usually lower.

Chart A2
Daily Effective Cash Balances as % of Liabilities Base over a Typical Two-week Maintenance Period in FY2012/13

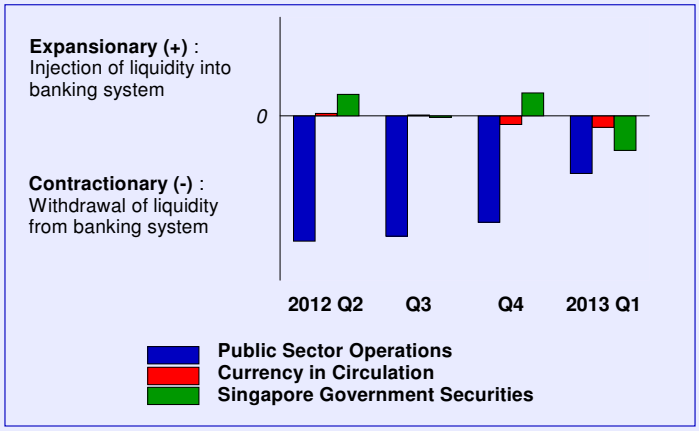


Money Market Factors

Chart A3 shows the liquidity impact of each of the autonomous money market factors, which include (i) public sector operations, (ii) currency in circulation, and (iii) Singapore Government Securities (SGS) and Treasury Bills (T-bills) issuance, redemption and coupon payments, over FY2012/13. Public sector operations include Government and CPF Board net transfers of funds between their accounts with MAS and their deposits with commercial banks.

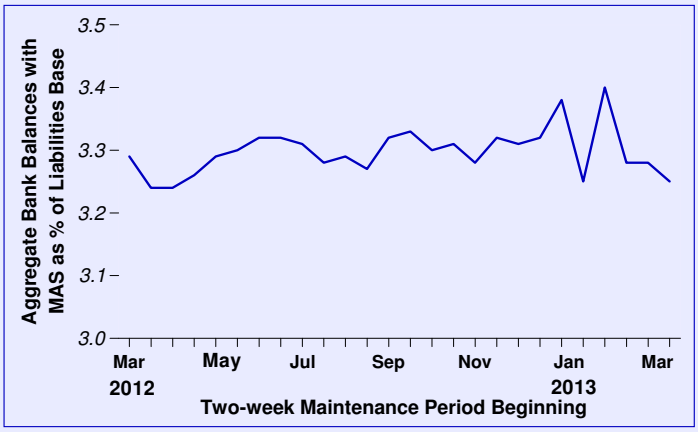
In FY2012/13, the liquidity impact of the autonomous money market factors was net contractionary, largely due to public sector operations. In contrast, the liquidity impact arising from the issuance and redemption of SGS and T-bills was mildly expansionary, while the impact of currency in circulation was negligible.

Chart A3
Liquidity Impact of Autonomous Money Market Factors



During FY2012/13, banks were generally conservative in their liquidity management, with an average two-week effective cash balance of 3.2–3.4% of their qualifying liabilities throughout the period. (Chart A4)

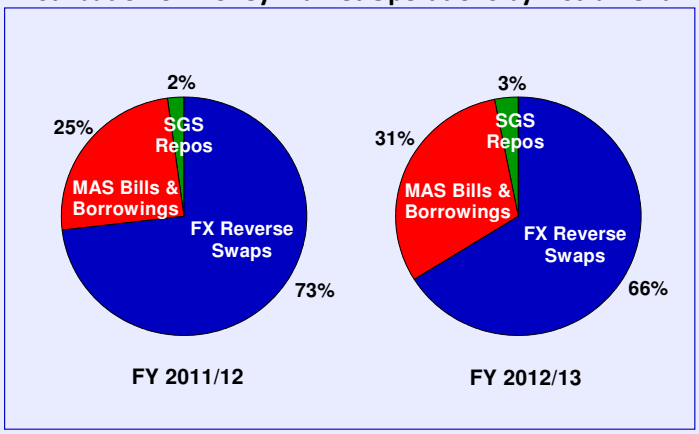
Chart A4
Average Two-week Effective Cash Balances as % of Liabilities Base



Composition of Money Market Operations

MAS relied on four instruments to inject liquidity into, and withdraw liquidity from, the banking system in FY2012/13, namely, (i) FX swaps; (ii) SGS repos; (iii) clean lending or borrowing; and (iv) MAS Bills. Since MAS Bills were introduced in 2011, they have grown in importance as an instrument used in money market operations, with total outstanding issuance growing to S$37.2 billion in FY2012/13, up from S$18.0 billion in FY2011/12. Chart A5 compares the composition of instruments between FY2011/12 and FY2012/13.

Chart A5
Distribution of Money Market Operations by Instrument



Chapter 2

Wage-Price Dynamics

2.1 Labour Market Conditions

Strong Job Creation amid Labour Supply Constraints

Total employment continued to expand at a robust pace in H1 2013, notwithstanding the tighter foreign labour policy and more modest increase in resident population. The domestic-oriented services and construction sectors led overall job growth, even as a recovery in the external-facing sectors added to labour demand. Despite the increase in resident labour force participation, labour market conditions remained tight and wage growth rose.

Domestic-oriented sectors continued to account for the bulk of job creation.

In line with stronger economic growth, 62,600 workers were added to the workforce in H1 2013 compared to 58,900 in H1 2012. (Chart 2.1) The faster job creation came on the back of sustained demand for workers in the domestic-oriented sectors, which accounted for almost nine in ten of the net job gains in H1 2013, the highest since H1 2009. (Chart 2.2)

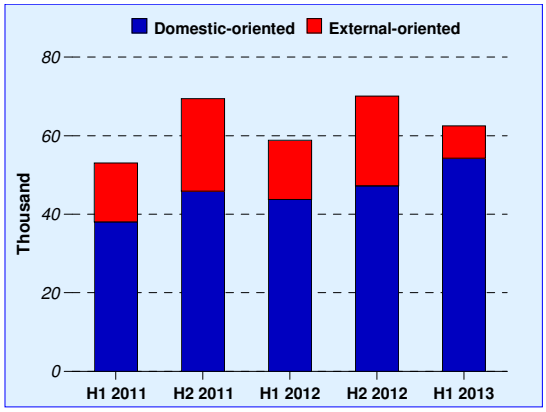
Construction employment gains remained high in H1 2013 due to the pickup in private residential building activity and ongoing public infrastructure development. Hiring also continued to be robust in administrative & support and community, social & personal services. The latter was likely spurred by the ongoing expansion of childcare centres and tertiary education institutes, as well as healthcare and social support facilities.

Meanwhile, ancillary services such as the information & communications and professional services benefited from the broadening of economic growth to the external-oriented industries.

Hiring in some external-oriented sectors also turned around.

In the manufacturing sector, hiring in the electronics industry rose slightly in Q2 2013 after nine consecutive quarters of job cuts. (Chart 2.3) The related upstream machinery & equipment segment followed by adding modestly to headcount after job losses in the preceding two quarters. The transport equipment industry meanwhile posted strong employment gains, likely

Chart 2.1
Share of Employment Changes by Sector



Note: The external-oriented sectors comprise manufacturing, wholesale & retail trade, transportation & storage, financial & insurance services and accommodation.

Chart 2.2
Employment Changes by Sector

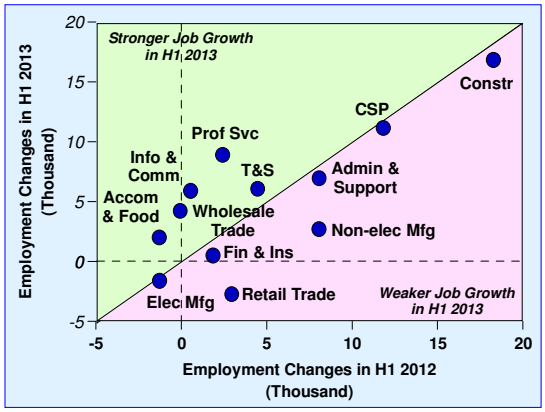
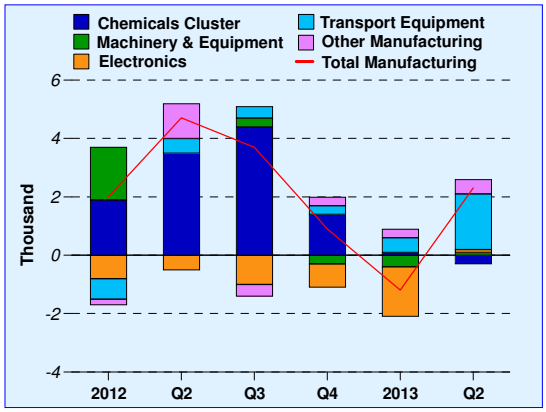


Chart 2.3
Manufacturing Employment Changes by Segment



accounted for by the opening of a new shipyard.

The stronger hiring in these segments more than offset the shedding of workers in the chemicals cluster following the completion of expansion works at a major petrochemical plant. On the whole, headcount in the manufacturing sector expanded by 2,300 in Q2 2013, after falling by 1,200 in Q1. The pickup in manufacturing activity in turn had a positive spillover effect on job growth in the trade-related transportation & storage and wholesale trade segments.

In comparison, headcount expansion continued to slow in financial & insurance services in tandem with some restructuring in the sector. Despite the surge in financial services activity in H1, the segment registered one of the highest number of redundancies across the economy in Q2 2013, owing to manpower re-organisation within firms.

Tighter foreign worker policy led to a shift from non-resident to resident workers ...

The contribution of foreign workers to total employment growth slowed in H1 2013, as foreign labour policies became more binding. (Chart 2.4) Notably, the number of Work Permit Holders (WPH) rose by only 18,500 in H1 2013 compared to 43,500 for the whole of 2012, while the inflow of S Pass Holders (SPH) moderated to 11,700 in H1 from 28,500 in 2012. At the same time, the number of Employment Pass Holders (EPH) fell by 1,700 in the first six months of the year, extending the decline of 1,600 in 2012.

The slower inflow of WPHs and SPHs reflected the further restrictions placed on their hiring in H2 2012 and 2013, while the fall in EPHs can be attributed to the raising of the minimum qualifying salary from January 2012. In the construction industry, for example, contracts awarded after June 2012 had to meet new rules where Man-Year Entitlements were significantly reduced, while levies for WPHs—on whom the sector is heavily reliant—were hiked again in January 2013.

Similarly, the services sector saw higher foreign worker levies for WPHs and SPHs, as well as cuts in the Dependency Ratio Ceilings that began in July 2013.

Chart 2.4
Local and Foreign Share of Employment Changes

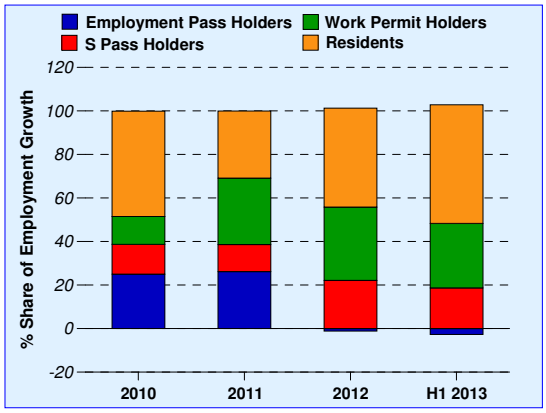


Chart 2.5
Resident Labour Force Participation Rate and Resident Population Change

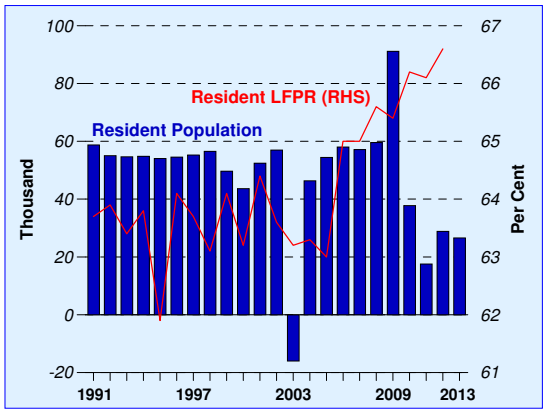
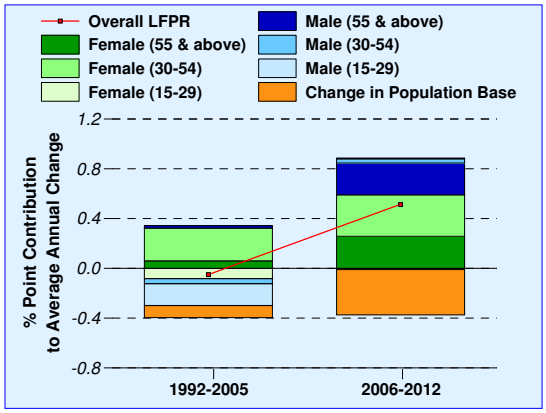


Chart 2.6
Decomposition of Average Annual Change in Resident Labour Force Participation Rate



Source: EPG, MAS estimates

… increasing the resident labour force participation rate ...

Labour demand was thus increasingly met by resident workers who accounted for approximately 55% of overall job gains in H1 2013, compared to 45% in 2012 and 31% in 2011. (Chart 2.4) Taking into account the slower pace of resident population growth and strong gains in resident employment, the resident labour force participation rate (LFPR) is estimated to have risen to a new high of over 67% in 2013. (Chart 2.5) As in recent years, most of the increase in the resident LFPR likely came from women and older residents. As these groups of workers tend to prefer flexible working arrangements and shorter working hours, they were unlikely to have fully offset the constraints in foreign labour supply. (Chart 2.6)

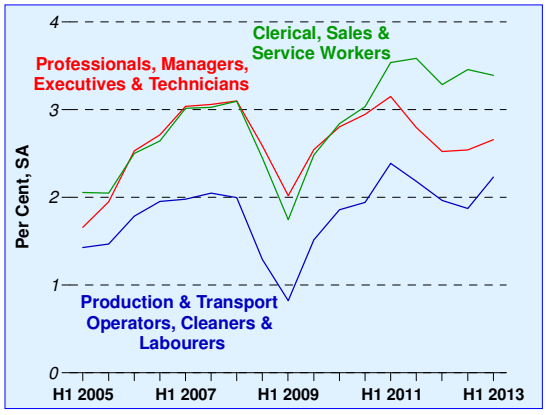
… and supporting the rise in vacancy rates.

Consequently, the seasonally adjusted overall job vacancy rate rose to 2.7% in H1 2013 compared to 2.5% in H2 2012. In particular, the vacancy rates of PMETs, production & transport operators and cleaners & labourers ticked up slightly in H1 2013 on the back of the recovery in the external-oriented and ancillary services industries. (Chart 2.7) Vacancy rates had generally been weak for these groups of workers over the last two years relative to that of clerical, sales & service workers as robust hiring in the domestic-oriented sectors had mainly benefited the latter.

The labour market remained tight and resident wages grew firmly.

Reflecting the broadening of labour demand, resident wage growth on a year-ago basis picked up across most sectors of the economy in H1 2013 compared to the preceding six months. (Chart 2.8) Overall, resident wage growth accelerated to 4.5% y-o-y in H1 2013 from 2.3% in 2012. This was largely consistent with the resident unemployment rate which remained low at around 3.0% in H1 2013. (Chart 2.9)

Chart 2.7
Vacancy Rates by Occupation



Source: EPG, MAS estimates

Chart 2.8
Resident Wage Growth by Sector

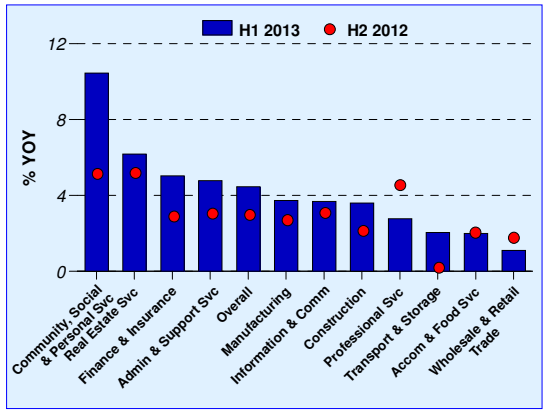
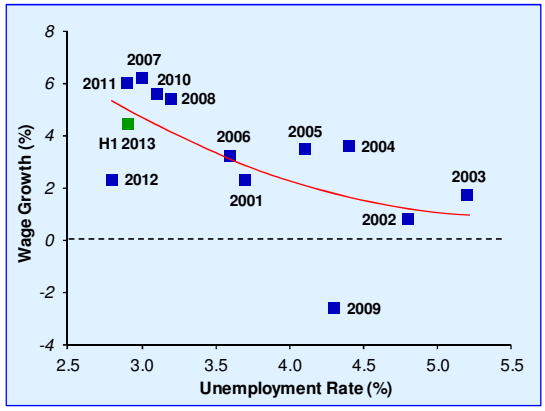


Chart 2.9
Resident Wage Growth & Resident Unemployment Rate



Nonetheless, effective wage pressures are possibly slightly stronger than that implied by the headline wage growth, given the rising prevalence of part-time employment and hence the trend decline in the number of hours worked by residents. (Chart 2.10) Indeed, based on the latest available data[1], the 0.7% fall in average hours worked by residents in 2012 meant that resident wage growth, on a per hour basis, was somewhat higher at 3.0% last year.

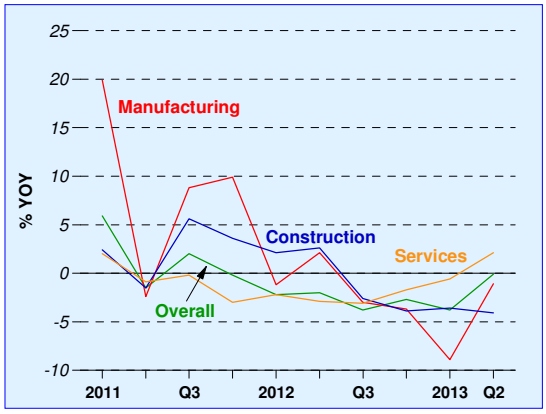
Chart 2.10
Average Usual Hours Worked by Employed Residents

Weak labour productivity kept unit labour costs high.

Overall labour productivity remained weak in H1 2013 even as wage growth accelerated. (Chart 2.11) After taking into account the slight decline in total hours worked, labour productivity, as measured by output per hour worked, fell further in Q1 this year before improving in Q2 largely on account of the surge in GDP. Nonetheless, productivity growth was relatively lacklustre across most sectors, although services productivity appeared to be on a mild uptrend.

Coupled with the strong wage growth and foreign worker levy increases, unit labour costs (ULC) rose further by 3.9% y-o-y in Q2 2013, following the 8.5% increase in Q1.

Chart 2.11
Growth in Output per Hour Worked



Source: EPG, MAS estimates

[1] Data on hours worked by residents are required to adjust resident wage growth and they are available only on an annual basis since 2006. Total hours worked by all workers are available on a quarterly basis and are used to compute value added per worker in the next section.

2.2 Consumer Price Developments

Core Inflation Picked Up in Q3 after Moderating for More than a Year

Core inflation moderated for five consecutive quarters …

Core inflation was modest in recent quarters on account of benign cyclical factors. Except for the recent rise in oil prices, external price pressures were muted. Domestic cost pass-through to consumer prices was also generally contained, owing to subdued economic sentiment.

MAS Core Inflation, which excludes the costs of accommodation and private road transport, moderated for five straight quarters, from a multi-year peak of 3.1% y-o-y in Q1 2012 to 1.6% in Q2 2013. (Chart 2.12)

CPI-All Items inflation fell to 1.6% y-o-y in Q2 2013 from 4.0% in the preceding two quarters, largely reflecting the sharp correction in car prices following the tightening of the motor vehicle financing policy[2] as well as the easing of underlying price pressures in the economy. (Charts 2.12 and 2.13)

On a sequential basis, core inflation was modest from Q2 2012 to Q2 2013, staying below its ten-year historical average. (Chart 2.14) CPI-All Items inflation was volatile, hitting −1.2% q-o-q in Q2 after averaging 1% over the past four quarters.

… but picked up slightly in Q3 2013.

However, MAS Core Inflation inched up to 1.7% y-o-y in Q3, as businesses passed on more of their cumulative cost increases to consumers alongside an improvement in economic conditions. Likewise, CPI-All Items inflation rose to 1.8% in Q3 due to a smaller drag from car prices. (Charts 2.12 and 2.13)

Sequentially, MAS Core Inflation reverted to its historical average in Q3, while the overall CPI surged. (Chart 2.14)

Box B at the end of this chapter examines the inflation dynamics in Singapore using the open economy New Keynesian Phillips Curve.

Chart 2.12
CPI-All Items and MAS Core Inflation

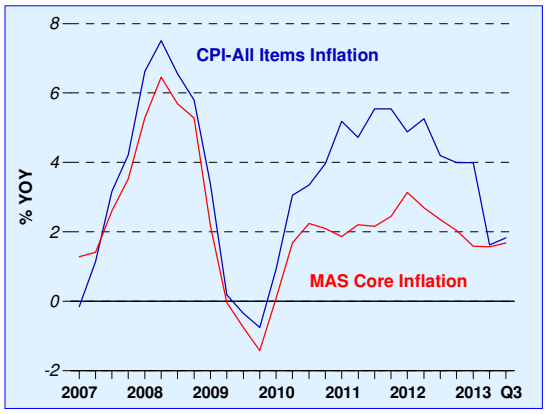


Chart 2.13
Contribution to CPI-All Items Inflation

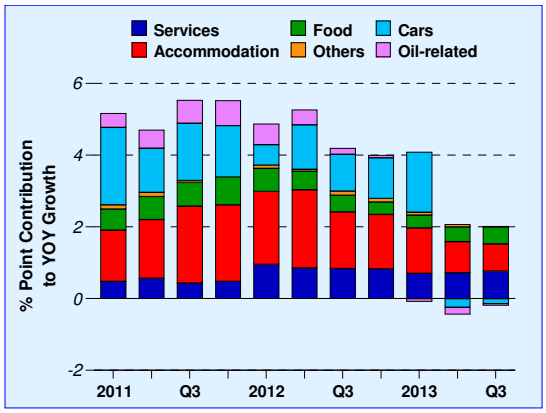
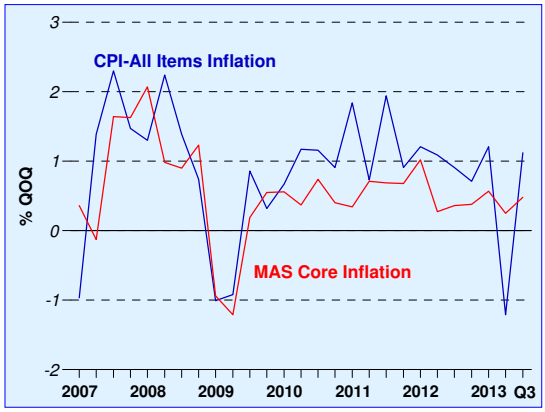


Chart 2.14
Sequential CPI-All Items and MAS Core Inflation



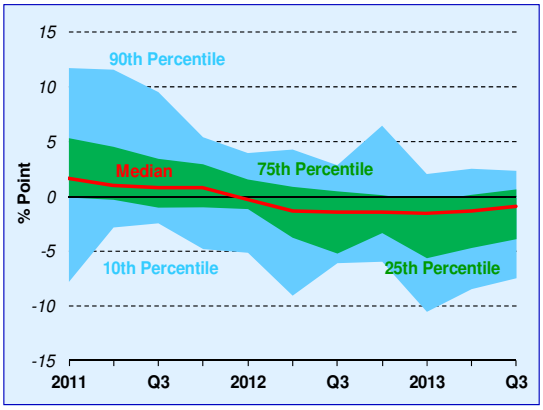
[2] In February 2013, MAS put in place restrictions to limit car loans to no more than 60% of the vehicle's purchase price and the repayment period to no more than five years.

The proportion of CPI items with stronger inflation increased recently after moderating since 2012.

Apart from CPI-All Items and MAS Core Inflation, disaggregated CPI data also provide useful information about price changes in the economy. Specifically, EPG examined the distribution of the change in y-o-y inflation rates across the 184 categories of goods and services in the CPI. For each of these categories, we compared the inflation rate with a year ago and computed the difference, taking into account the category's weight in the CPI basket. The results are shown in Chart 2.15. Goods and services that experienced higher (lower) inflation in a particular quarter compared to a year ago are depicted above (below) the zero line for that quarter.

The 10th, 25th, 75th and 90th percentiles, as well as the median changes in inflation rates for each quarter, are plotted. The results show that inflationary forces in the economy have become less widespread since early 2012, given that a larger proportion of the shaded areas—represented by the different percentiles—fall below the zero line. However, consistent with the pickup in CPI-All Items and MAS Core Inflation, the disaggregated data show that inflationary pressures have started to build in the more recent period. Indeed, the proportion of the CPI basket that experienced a rise in inflation compared to a year ago increased from 25% in H1 2013 to 36% in Q3 2013.

Chart 2.15
Distribution of Changes in CPI Inflation Rates Compared to a Year Ago

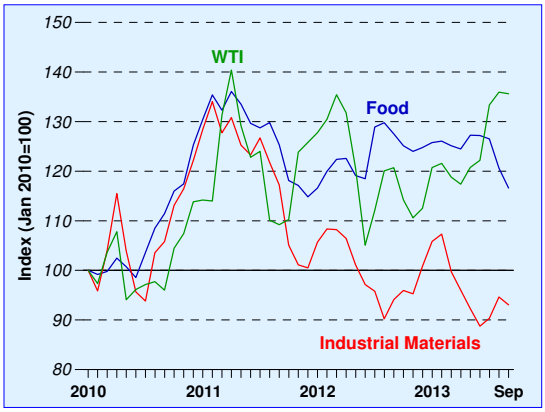


External inflationary pressures remained broadly subdued.

External price developments have been benign since the previous *Review*. Wholesale prices in Singapore's major trading partners were largely flat as the moderation in GDP growth kept prices stable in Asia, while the slack in the labour market constrained price increases in the developed economies.

At the same time, prices of industrial materials were depressed by weaker demand from China and other emerging economies. (Chart 2.16) Global food prices also fell in recent months on account of growing optimism over this year's crop harvests in the US. Energy prices were the main exception, having increased by around 10% since end-May 2013, amid geopolitical tensions in the Middle East

Chart 2.16
Global Commodity Prices



Source: EIA, IMF

and a spate of production outages.[3]

Domestic fuel costs rose in line with global oil prices, while food inflation was driven up by higher business costs.

Given benign external price developments, Singapore's non-oil imported inflation was generally muted, at 0.1% q-o-q in Q3. The increase in non-oil import prices largely reflects the pass-through of the earlier spike in global food prices in the second half of 2012 and the S$ depreciation against the US$ on expectations of an imminent tapering of asset purchases by the Federal Reserve. Overall import prices, however, rose by a more significant 1.5% q-o-q in Q3 due to the surge in global oil prices. (Chart 2.17)

In tandem with import prices, domestic retail prices of oil-related items increased by 1.0% q-o-q in Q3, after falling by 1.3% in the preceding quarter. Retail food price inflation also picked up to 0.7% q-o-q in Q3, from 0.2% in Q2. Apart from costlier raw materials, the rise in food inflation likely reflects the stronger pass-through of domestic business costs. Notably, prepared meals, which have a higher domestic cost component than non-cooked food items, experienced relatively higher inflation. Prices of prepared meals also rose at a faster pace in Q3 2013 compared to their historical trend. (Chart 2.18)

Domestic cost pressures continued to mount, given rising wages …

Domestic cost pressures persisted, largely as a result of the tight labour market. In particular, in light of the more restrictive foreign worker policy, firms have increasingly turned to resident workers to fill job vacancies. Consequently, the resident unemployment rate remained low, supporting wage growth of 4.5% y-o-y in H1 2013, considerably higher than the historical average of 3.3%. The strong wage increments in turn kept ULC high. Notwithstanding a fall in Q2 this year on account of the strong but one-off cyclical uptick in productivity, ULC has risen sharply over the past few years and added to business cost pressures. (Chart 2.19)

Chart 2.17
Sequential Import Price Inflation and Contribution from Mineral Fuels

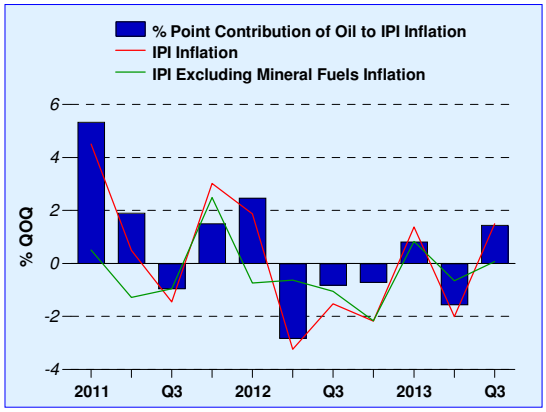


Chart 2.18
Sequential Growth in Consumer Food Prices

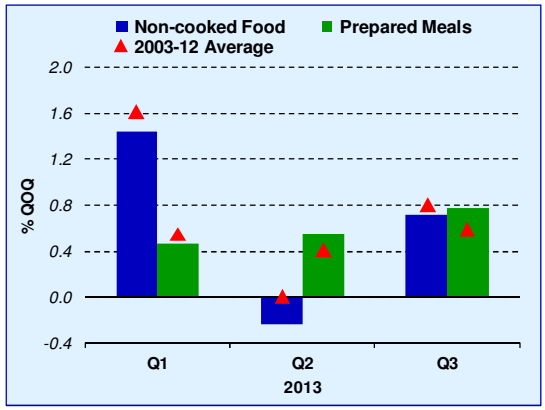


Chart 2.19
Unit Labour Cost Index

[3] The US Energy Information Administration estimated that in August, unplanned disruptions reached 2.7 million barrels per day, or 3% of global oil demand, the highest level since January 2011 during the outbreak of the Libyan civil war. The latest disruptions mainly arose from the oil theft in Nigeria, the militia labour strikes in Libya and the disputes between South Sudan and Sudan.

… elevated commercial rentals ...

Meanwhile, despite office and retail space rentals remaining broadly stable as new supply came on-stream, firms that recently renewed their leases likely faced an increase in rental cost compared to what was paid under previous contracts signed three years ago. (Chart 2.20)

… and higher COE premiums for commercial vehicles.

Businesses which had to renew or bid for new commercial vehicle (Category C) COEs also continued to face higher costs. Premiums for Category C COEs have risen sharply from 2011, reaching a record high of $76,000 in October 2013, despite a 38% increase in quota since the beginning of the year. (Chart 2.21) This was driven by sharply higher demand for commercial vehicles, possibly underpinned by strong construction activity, a mandatory replacement of a large number of vehicles purchased twenty years ago and the rush to acquire less costly models before they are phased out by stricter environmental regulations.

Pass-through of costs to consumer prices increased recently after staying sluggish over the past year.

Until recently, lacklustre GDP growth constrained firms' ability to pass on cost increases, resulting in a decline in firms' cost mark-ups. (Chart 2.22) However, there have been recent signs of a pickup in cost pass-through, though this was not uniform across industries. Reflecting differences in cost pass-through, current price adjustments relative to historical trend were weak for sentiment-sensitive items such as retail goods, but were stronger for consumer services, including education and holiday travel. (Charts 2.23a and 2.23b)

Chart 2.20
Commercial Property Rentals

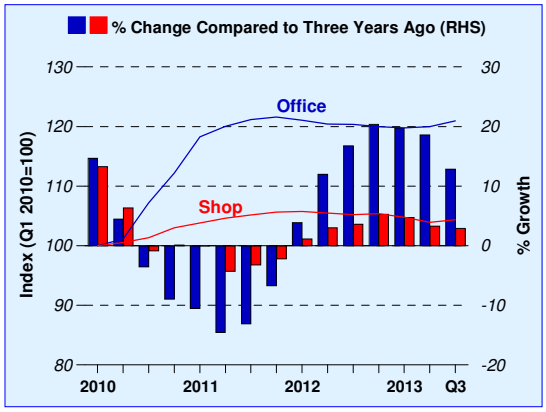


Chart 2.21
Category C COE Premiums and Monthly COE Supply

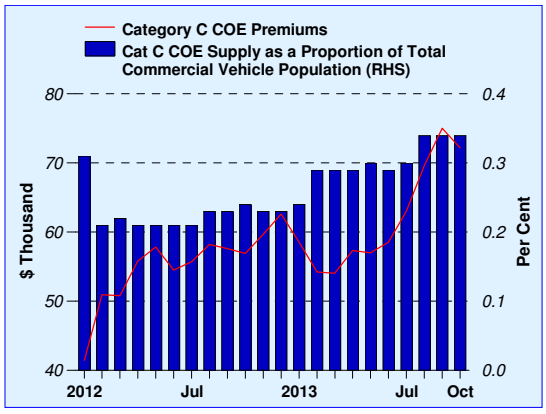
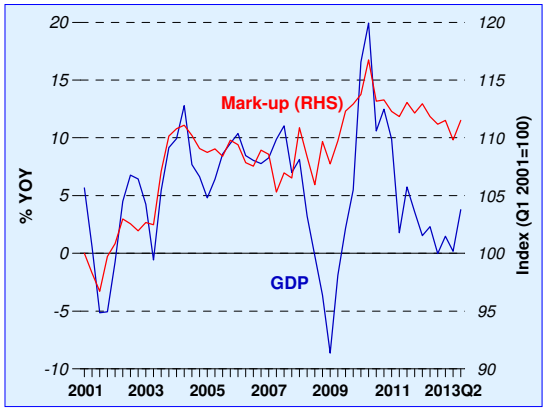


Chart 2.22
GDP Growth and Mark-up Coefficient Index[4]



[4] The firms' mark-up coefficient is proxied by MAS Core Inflation/Weighted Import & Unit Labour Costs. Weights were derived using the cost structure breakdown of various sectors that cater to final private consumption expenditure in the 2007 Input-Output tables.

For non-core CPI items, imputed rental inflation continued to slow …

The increase in imputed rentals eased following some stabilisation in the public and private residential rental markets.[5] HDB flat rentals rose at a slower pace compared to the past three years as leasing demand moderated alongside slower foreign labour inflows and immigration. Market rentals for private residential units were broadly flat in 2013 after rising over the three preceding years, as a significant supply of residential units came on-stream.

Overall, imputed rentals contributed 0.7% point to CPI-All Items inflation in Q3, down from 1.1% points in Q1 this year.

… while COE premiums for cars have been on the rise.

COE premiums for cars have been on the rise in recent months and are now close to 30% higher compared to that during the April *Review*. (Chart 2.24) As a result, on a year-ago basis, private road transport cost contributed negligibly to overall inflation in Q3 this year, compared to the −0.3% point in Q2. New car demand remained relatively firm in recent months, partly due to policy uncertainties surrounding COEs, as buyers sought to lock in their purchases before any changes are implemented.

Together, accommodation cost and car prices accounted for slightly more than a third of CPI-All Items inflation in the last two quarters, down from more than 60% last year.

Chart 2.23(a)
Price Movements of Retail Goods

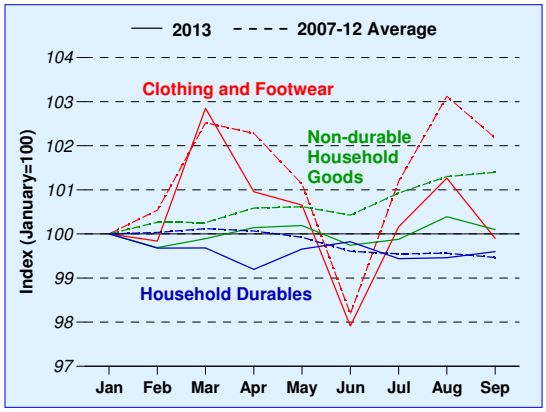


Chart 2.23(b)
Price Movements of Selected CPI Items

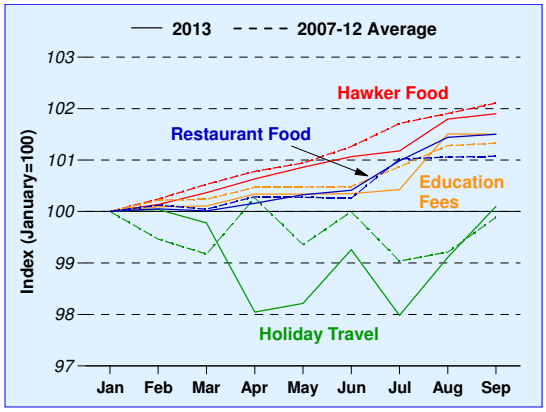
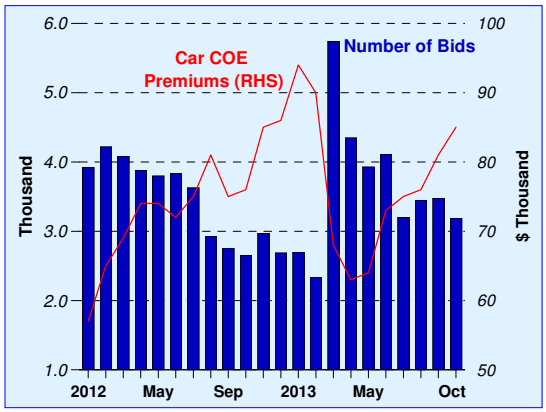


Chart 2.24
Car COE Premiums and Number of Bids Submitted



[5] Imputed rentals on owner-occupied accommodation in the CPI are measured using the average rentals of the entire stock of lease properties including new and renewed leases signed during the period and existing leases signed earlier. This is unlike rental indices published by URA and HDB which only track rentals of new and renewed rental contracts that were signed during the reporting period.

Box B
A New Keynesian Phillips Curve for Singapore[1/]

The relationship between inflation and measures of economic activity has been at the core of monetary analysis and policy since Phillips' seminal contribution in 1958. Phillips (1958) examined the relationship between wage inflation and unemployment in the UK over the period 1861–1957 and found a significantly negative relation between the two variables. Similar results were also obtained in other countries even when alternative measures of inflation were used. Since then, various versions of the Phillips Curve have appeared as theoretical and empirical challenges to the original formulation, but continue to uphold the fundamental relationship between economic activity and inflation. In this box, the evolution of the Phillips Curve to its now widely used form as the New Keynesian Phillips Curve (NKPC) is outlined, following which a reduced-form version for Singapore is estimated. The results unequivocally show that inflation dynamics are forward-looking in Singapore and broadly similar to other open economies.

From Phillips Curve to New Keynesian Phillips Curve

Phillips' work was initially interpreted as presenting policymakers with a permanent choice between price (or wage) inflation and the level of economic activity. However, this conflicted with the notion of long-run monetary neutrality, which Edmund Phelps (1968) and Milton Friedman (1968) later argued was due to the absence of expectations in the Phillips Curve. They stressed that anticipated changes in inflation would have no impact on economic activity, and that only unanticipated changes in inflation would be able to generate a trade-off between inflation and economic activity. This subsequently led to the formulation of the expectations-augmented Phillips Curve, with the inflation-unemployment trade-off being confined to the short-run.

Despite its reformulation, the Phillips Curve fell from grace in the late 1970s, particularly among the academic community. This period of stagflation was interpreted as evidence against the Phillips Curve trade-off, and the onslaught of the rational expectations revolution led by Lucas (1972) and Sargent and Wallace (1975) provided further theoretical reasoning against it. If the expectations of economic agents were rational, in the sense that their forecasts of the economy were derived from a robust understanding of the economy and economic policy, and that they do not make systematic forecasting errors, policymakers would be unable to create unanticipated inflation systematically, thereby leaving little room for monetary policy to steer the economy. However, the rapid adjustment of the price level predicted under rational expectations stood in contrast to the observed smooth evolution of the price level. It was the early contributions of Calvo (1983), Rotemberg (1982), and Taylor (1980) to overcome this tension that ultimately led to the revival of the Phillips Curve. By the late 1990s, the New Keynesian paradigm had emerged as the predominant monetary framework. This approach was derived from microeconomic principles and incorporated the lessons from rational expectations theory, but also allowed for a trade-off between inflation and economic activity (typically measured by the output gap) in the short run.

The (Hybrid) New Keynesian Phillips Curve

In its simplest form, the NKPC states that inflation in time t, π_t, depends positively on the output gap, x_t, and expected inflation, $E_t\pi_{t+1}$. While the traditional Phillips Curve assumed that inflation expectations are entirely backward-looking, in even the simplest formulation of the NKPC, inflation expectations are purely forward-looking. This makes empirical validation of the NKPC challenging, since this specification solves out inflation as a function of the current and all expected future output gaps, posing difficulties for estimation.[2/]

1/ This box was prepared in collaboration with Martin Bodenstein, Associate Professor at the NUS Department of Economics.

2/ With inflation lags absent from this specification, persistence in inflation is solely determined by the persistence in the output gap. The model also implies that inflation leads the output gap over the business cycle. Data, however, contradicts these features, causing empirical estimation of the purely forward-looking NKPC to be difficult.

To overcome these difficulties, Fuhrer and Moore (1995) and Galí and Gertler (1999) advocate augmenting the NKPC with features that would reintroduce lags of inflation. Assuming that some economic agents follow "rules of thumb" rather than exhibiting full rationality, Galí and Gertler (1999) proposed a hybrid NKPC. They found, however, that the hybrid NKPC was sensitive to the output gap measures used. Accordingly, they reformulated their model, substituting out the output gap with real marginal costs, and augmenting it further with measures of marginal costs to yield the following specification:

$$\pi_t = \lambda_f E_t \pi_{t+1} + \lambda_b \pi_{t-1} + \lambda_{mc} \widehat{mc}_t \qquad (1)$$

where $\widehat{mc}_t$ measures the deviation of marginal costs from its long-run trend. In models of this nature, the labour income share in GDP is often used to proxy marginal costs, and inflation is usually defined in terms of the GDP deflator.

Estimating the Hybrid NKPC for Singapore

Studies by Balakrishnan and Lopez-Salido (2002), and Batini *et al*. (2005), however, show that the hybrid models of Galí and Gertler (1999) tend to produce parameter estimates that were inconsistent with New Keynesian theory when aspects of the open economy are ignored. They argue that the labour share of income, used to proxy marginal cost in a closed economy, was not tenable in an open economy context, since it does not account for the potentially large impact of imported intermediate goods on domestic inflation dynamics. To address these issues, Leith and Malley (2007) developed a framework in which marginal cost is allowed to respond to the relative wage (domestic wage relative to import price) and the terms of trade (domestic price relative to import price), in addition to labour share and aggregate output in the closed economy case. The relative wage and terms of trade variables encapsulate a model of price setting behaviour that allows firms to substitute imported intermediate goods for domestic labour in production and to sell their products in both home and foreign markets. As in the closed economy case, the labour share is modelled as a measure of marginal cost, together with aggregate output. Altogether, the four terms constitute a more appropriate proxy for marginal cost in an open economy setting.

The hybrid NKPC specification that is estimated for Singapore is modelled in the spirit of the Leith and Malley (2007) study. Notably, equation (2) below specifies the form of the NKPC for Singapore, with y-o-y CPI-All Items inflation, π_t, regressed against its expected value in the next period, its lagged value, and the separate components of real marginal costs, which include the labour income share in GDP, $\hat{s}_t$, the ratio of the CPI to the import price index, $\widehat{tot}_t$, aggregate output, $\hat{y}_t$, and the domestic wage relative to the import price index, $\hat{w}_t$.[3/]

$$\pi_t = \lambda_f E_t \pi_{t+1} + \lambda_b \pi_{t-1} + \lambda_1 \hat{s}_t + \lambda_2 \widehat{tot}_t + \lambda_3 \hat{y}_t + \lambda_4 \hat{w}_t \qquad (2)$$

Estimation Results

Table B1 presents the estimation results for three different regression models. The first model M1 reports the results when marginal cost comprises only the labour share of income in nominal GDP, which is closest in form to the Galí and Gertler (1999) specification. The remaining model specifications (M2 and M3) add the other components of marginal costs sequentially. Generalised Method of Moments (GMM) is used to estimate the equations for Singapore over the sample period from Q1 1994 to Q1 2013, using four lags of aggregate output and global commodity inflation as instruments.

3/ All hatted-variables enter into the model as deviations from their respective HP-filtered trends while inflation enters as a deviation from its long-run mean.

Table B1
Main Estimation Results
Dependent Variable: CPI-All Items Inflation

	M1	M2	M3
$E_t\pi_{t+1}$	0.82*** (0.09)	0.84*** (0.10)	0.65*** (0.21)
π_{t-1}	0.27*** (0.10)	0.27** (0.11)	0.33** (0.14)
$\hat{s}_t$	0.08** (0.03)	0.08** (0.04)	0.18*** (0.06)
$\widehat{tot}_t$		0.02 (0.06)	0.18 (0.14)
$\hat{y}_t$			0.18** (0.08)
$\hat{w}_t$			−0.18* (0.11)
Adjusted R^2	0.917	0.913	0.905

Note: Standard errors in parentheses.

* Statistically significant at the 10% level.

** Statistically significant at the 5% level.

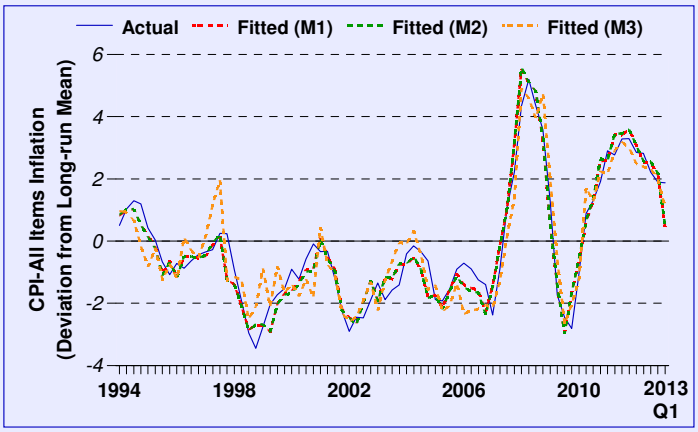
*** Statistically significant at the 1% level.

The results show that both forward- and backward-looking inflation expectations have a significant role in driving inflation dynamics in Singapore. The coefficient on $E_t\pi_{t+1}$ in particular is highly significant in all three regression models, exceeding the coefficient on π_{t-1} by at least two times in all cases. Interestingly, the results also highlight the importance of adopting the appropriate hybrid NKPC model for an open economy like Singapore. In M1, when a closed economy specification is adopted, forward-looking inflation is found to have a much larger role in determining inflation dynamics relative to backward-looking inflation. However, M3 shows that when the hybrid NKPC model controls for aspects of the open economy through $\widehat{tot}_t$ and $\hat{w}_t$, the relative importance of forward-looking inflation expectations falls to a level that is more consistent with the experience in other countries. The $\widehat{tot}_t$ term in M3 is positive and is economically meaningful relative to the other components of marginal cost, even though it is not statistically significant. Compared to M2, the coefficient on the $\widehat{tot}_t$ term is higher in M3, reflecting the importance of accounting not just for trade in final goods, but also in intermediate goods.[4/] Moreover, the component variables of marginal cost are jointly statistically significant in M3, indicating the consistency of these results with the framework in Leith and Malley (2007).

Chart B1, which plots the fitted values for inflation from the three models together with actual inflation, shows that the NKPC framework captures inflation dynamics in Singapore well. Interestingly, the hybrid NKPC model can be rewritten to express inflation as the sum of discounted expected marginal costs. The strong influence of expectations, therefore, indicates that agents systematically take into account anticipated changes to marginal costs. Notably, if the marginal cost changes are persistent, the sum of discounted expected marginal costs more than outweighs contemporaneous movements in marginal costs. Invariably, this highlights the role of expectations in driving inflation, and thus the need for monetary policy to provide a nominal anchor in managing inflation expectations.

4/ The $\widehat{tot}_t$ variable captures trade in final goods using the relative prices of domestic goods to foreign goods, while the $\hat{w}_t$ variable measures trade in intermediate goods which can be substituted for labour in production.

Chart B1
Actual and Fitted Inflation



Sum-up: Modelling Inflation at MAS

The above results show that the New Keynesian framework is useful in analysing inflation dynamics in Singapore. Two of MAS' macroeconomic models adopt some form of the NKPC. For instance, the Monetary Model of Singapore (MMS)[5/] has a wage equation that features an inflation expectations-augmented Phillips curve in which expected inflation is one of the key drivers of nominal wage growth. The Satellite Model of Singapore (SMS)[6/], in comparison, incorporates a hybrid NKPC equation directly within its framework. In the SMS, current inflation is driven by expected and lagged inflation, the output gap, and changes in the real exchange rate. Inflation expectations are model-consistent, resulting in an inflation process that is forward-looking, while the lagged inflation term is used to capture inflation inertia. The NKPC formulations in the MMS and SMS are fully integrated within the whole economy model specification, thereby providing a consistent approach to modelling inflation dynamics in the Singapore economy.

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5/ For further details on the MMS, see Special Feature A of the October 2007 *Review*.

6/ An overview of the SMS can be found in Special Feature A of the October 2011 *Review*.

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Chapter 3

Outlook

3.1 External Outlook

Divergent Growth amid New Uncertainties

Economic momentum is picking up in the G3, but Asia ex-Japan faces new uncertainties.

Growth prospects for the advanced and emerging Asian economies have further diverged since the last *Review* in April 2013. (Table 3.1) The positive momentum in the US economy appears to have continued into Q3 2013, although the federal government shutdown and fiscal impasse over the debt ceiling in October could have dented sentiment and activity. More encouragingly, the economic recovery in the Eurozone is gaining traction, with short-term indicators suggesting that the Q2 rebound in investment spending has not flagged. The outlook for Japan has strengthened considerably, as a string of recent data releases point to sustained consumer spending and upbeat corporate sentiment.

An improvement in the growth prospects of the advanced countries, while by no means assured, would be expected to boost the exports of Asia's trade-dependent economies. Nevertheless, new risks have begun to cloud the growth outlook for Asia ex-Japan. First, China's renewed drive to restructure its economy has led to a growth slowdown, and may result in further slippages in activity in the short term. Second, the anticipated tapering of the Federal Reserve's asset purchases has sparked a reversal of capital flows from the region, draining liquidity and pushing up lending rates. Third, the credit cycle which helped to fuel domestic demand in the ASEAN economies over the last few years seems to be ebbing at the same time as fiscal spending moderates. Although the Federal Reserve's decision to delay QE tapering in September provided a temporary reprieve, renewed volatility in financial markets cannot be ruled out, especially for economies with weaker fundamentals.

Consequently, growth forecasts for China and the ASEAN-4 economies have been revised downward for 2013. (Chart 3.1) A pickup in the global economy is expected only in 2014, led by the G3 economies. On a trade-weighted basis, GDP growth in Singapore's key trading partners is projected to rise to 4.3% next year, from 3.8% in 2013.

Table 3.1
GDP Growth Forecasts

(%)

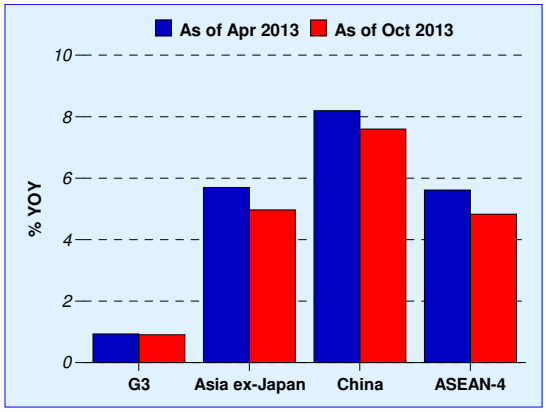
	2012	2013F	2014F
Total*	**3.9**	**3.8**	**4.3**
G3*	**1.2**	**0.9**	**1.7**
US	2.8	1.6	2.6
Eurozone	−0.6	−0.3	0.9
Japan	2.0	1.9	1.7
Asia ex-Japan*	**5.1**	**5.0**	**5.4**
NIE-3*	**1.6**	**2.8**	**3.6**
Hong Kong	1.5	3.0	3.6
Korea	2.0	2.7	3.5
Taiwan	1.3	2.4	3.6
ASEAN-4*	**6.1**	**4.8**	**5.2**
Indonesia	6.2	5.6	5.5
Malaysia	5.6	4.3	5.1
Thailand	6.5	3.5	4.4
Philippines	6.8	7.1	6.1
China	7.7	7.6	7.4
India**	5.1	4.6	5.7

Source: CEIC and Consensus Economics Inc.

* Weighted by shares in Singapore's NODX.

** Forecasts refer to fiscal year ending March.

Chart 3.1
Changes in 2013 GDP Growth Forecasts



Source: Consensus Economics Inc. and EPG, MAS estimates

The US recovery faces headwinds on the macro policy front.

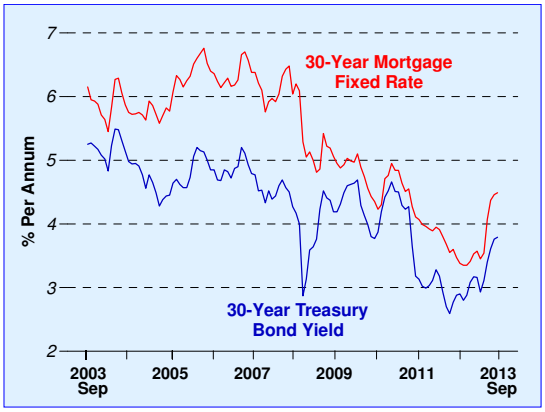
Having registered stronger growth in Q2 2013, US economic activity remained at a relatively high level in early Q3. Industrial production expanded by an average of 0.3% m-o-m SA in Q3, slightly faster than in H1 2013. However, private consumption growth moderated, with food receipts and retail sales rising by a slower 0.2% m-o-m SA in these two months. Recent ISM PMI readings confirm that the expansion in the overall economy is still ongoing, although growth in the services sector might soften somewhat. Following the Federal Reserve's signals on the tapering of its QE programme in May, mortgage rates have risen in tandem with bond yields, by a cumulative 104 bps since April, thus tempering home sales activity. (Chart 3.2)

The partial government shutdown in the first two weeks of October has had a clear negative impact on sentiment. The University of Michigan Consumer Confidence Index fell from 77.5 in September to 73.2 in October, while the Gallup Economic Confidence Index registered its largest two-week decline in 2013 over the 1–13 October period. (Chart 3.3) Nonetheless, the impact on overall growth is expected to be relatively modest and the latest Beige Book shows that the economy continued to expand from September through early October. The last-minute agreement by Congress to extend the debt ceiling will allow economic conditions to normalise, although concerns remain as government funding will only extend to early 2014. At this stage, consensus forecasts are for US growth of 1.6% in 2013 and 2.6% in 2014.

The Eurozone is on track to grow modestly in 2014.

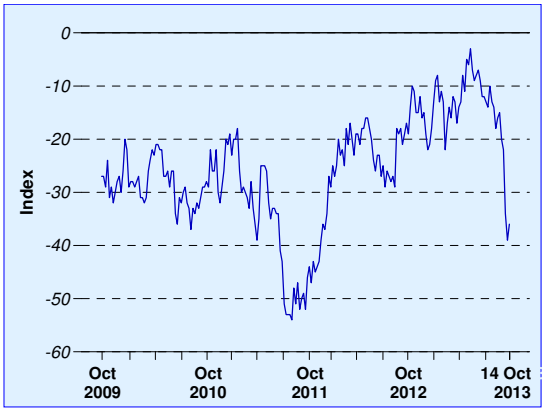
Economic prospects in the Eurozone have brightened, as a return of confidence in the industrial sector has spurred investment spending. In September, the European Commission's Industrial Confidence Indicator rose to its highest level since February 2012. Moreover, in July, the EU Council granted some countries with excessive fiscal deficits an additional one to four years to bring their deficits in line with the targets set out in the Stability and Growth Pact. (Chart 3.4) These extensions will mitigate the required annual fiscal adjustments for these countries, thus reducing the risk of an overly rapid budget consolidation snuffing out the nascent recovery.

Chart 3.2
US Financing Conditions



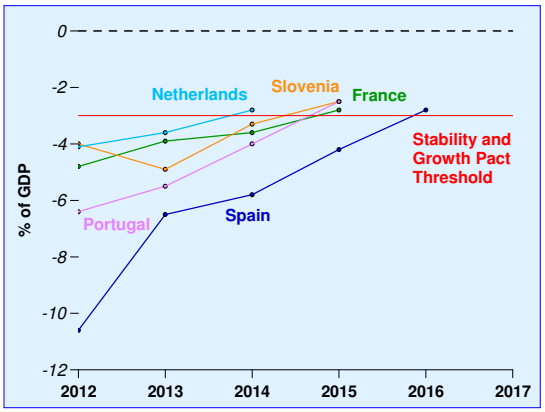
Source: CEIC

Chart 3.3
US Economic Confidence Index (Weekly)



Source: Gallup

Chart 3.4
New Fiscal Adjustment Paths in Selected Eurozone Countries



Source: Eurostat, EU Commission

Even as fiscal drags ease in the Eurozone, the correction of external imbalances in deficit countries has proceeded apace. Aided by sharp reductions in unit labour costs, Spain and Portugal, in particular, have turned in strong export performances and contributed to a record Eurozone current account surplus of 2.2% of GDP in Q2 2013. Meanwhile, tentative signs of stabilisation in the region's housing markets have emerged. The Eurozone House Price Index increased by 0.3% q-o-q in Q2, bucking the declining trend observed in the previous three quarters. Overall, Eurozone growth is likely to pick up gradually, with the latest consensus forecasts pointing to a marginal contraction of 0.3% this year and modest growth of 0.9% in 2014.

Japan's economic revival will be sustained ahead of a consumption tax hike.

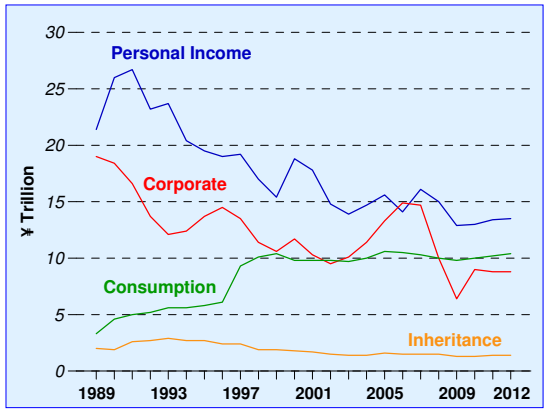
Economic growth in Japan during the latter part of 2013 and early 2014 will be sustained by robust public and private demand. The fiscal spending package approved earlier this year will bolster public investments while improved business sentiment and corporate profits, which reached their highest levels in six years in Q2 2013, are likely to shore up private capital spending. Household consumption should be supported by rising inflationary expectations and, in the short term, the frontloading of expenditure ahead of the consumption tax hike in April next year.

The Japanese government's decision to increase the consumption tax from 5% to 8% was aimed at reducing Japan's soaring public debt, as tax revenues have fallen steadily over the years in tandem with declining economic growth. (Chart 3.5) To soften the impact of the tax rise on aggregate demand, the government is planning to inject fiscal stimulus worth about 5 trillion yen, equivalent to about 1.0% of GDP. Nonetheless, GDP growth is still projected to slip to 1.7% next year, from 1.9% in 2013.

China has kept a tight rein on credit growth and rolled out new fiscal measures.

Since mid-2013, the Chinese authorities have been restraining credit growth by restricting liquidity to the formal banking sector and tightening regulations on shadow banking. (Chart 3.6) To alleviate the effects of the resulting credit contraction on the real economy, the government subsequently introduced modest fiscal

Chart 3.5
Japan's Tax Revenues*

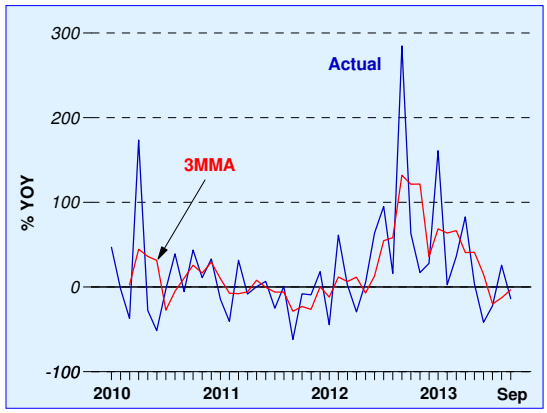


Source: MOF Japan

Note: A consumption tax was introduced in 1989 at 3% and raised to 5% in 1997.

* Data is reported in fiscal year terms.

Chart 3.6
Total Social Financing Growth in China



Source: CEIC

Note: Total social financing is the PBOC's measure of the amount of financing extended to the real economy by the financial sector.

measures to support growth, including tax breaks for small businesses and an acceleration of rail construction. These measures appear to have had the desired impact, with GDP growth recovering to 7.8% y-o-y in Q3. Industrial production accelerated to double-digit growth of 10.1% for the first time in three quarters, even as export orders remained lacklustre. Fixed investment continued to be buoyant, while retail sales growth edged up alongside a tighter labour market and higher disposable household incomes.

Going into next year, Chinese authorities' fine-tuning of macro policies should continue to cushion economic activity, even though the ramping up of structural reforms may cause some temporary displacement of resources. At the same time, the anticipated cyclical rebound in exports to the G3 should provide additional support to the industrial sector. On balance, GDP growth is projected to moderate from 7.7% in 2012 to 7.6% in 2013, and 7.4% in 2014.

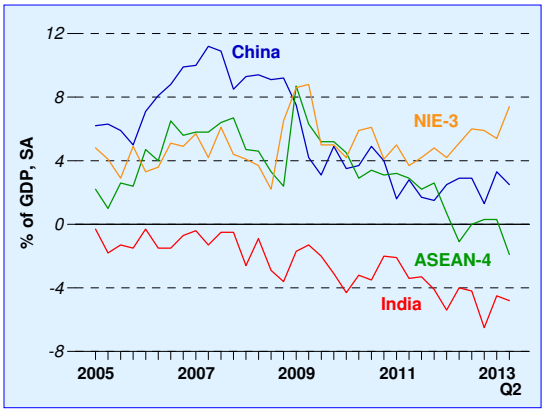
China's slowdown will have some impact on regional trade flows …

In the short term, the policy-induced slowdown in China is expected to weigh on the export performance of the resource-rich ASEAN economies and, to a lesser degree, the NIEs. EPG's estimates show that, compared with the NIEs, a higher share of exports from Indonesia, Malaysia and Thailand to China was channelled towards serving Chinese domestic demand during the period 2009–12. A significant proportion of ASEAN's exports to China consisted of raw materials, which are overwhelmingly tied to Chinese investment. Therefore, to the extent that Chinese restructuring measures lead to a temporary pullback in aggregate demand, ASEAN's growth would be dampened via the commodity channel.

… although the NIEs will be supported by an upturn in trade with the G3.

The impact of China's slower growth on the trade-oriented NIEs is expected to be mitigated by the upturn in the G3 economies and the global electronics cycle. Given their stronger fundamentals and sustained trade surpluses, these economies were less affected by the emerging markets sell-off in May and June this year. (Chart 3.7) Indeed, NIE governments have been able to pursue expansionary fiscal policies, which should prop up domestic demand in the next few

Chart 3.7
Current Account Balances in Asia ex-Japan



Source: CEIC and EPG, MAS estimates

quarters. As a result, growth in the NIEs is expected to accelerate to 2.8% this year and an even stronger 3.6% in 2014.

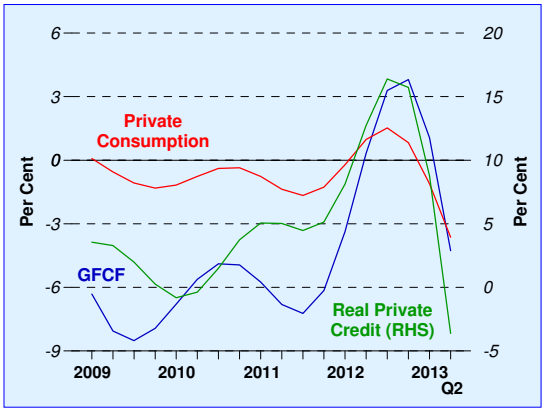
The ebbing credit cycle has slowed domestic demand in ASEAN.

In contrast, growth prospects in the ASEAN-4 economies have dimmed somewhat, as the cyclical drivers that have hitherto supported domestic demand continue to dissipate. (Chart 3.8) EPG's estimates show that credit has played an important role in boosting domestic demand, accounting for about 25% of the variation in private consumption and 35% of the variation in investment. Hence, a waning credit cycle, alongside an outflow of capital from the region and higher interest rates, is expected to translate into slower growth in fixed investment and private consumption in the quarters ahead. This compression in domestic demand will be more acute in Indonesia, where higher inflation and a weaker current account have necessitated more aggressive policy tightening. (Chart 3.9) Initiatives to rationalise fiscal subsidies, such as fuel price hikes in Indonesia and Malaysia, will further restrain private consumption growth in the short term.

The slowdown in domestic demand will, however, be mitigated by a modest recovery in external demand, aided by the recent depreciation in the regional currencies. Moreover, structural drivers of growth in the ASEAN region remain relatively intact. Incomes are well supported by healthy labour markets, while FDI inflows continue to be attracted to the region, alongside an accelerated rollout of infrastructure projects. For example, Thailand is embarking on an ambitious 2 trillion baht infrastructure programme over the next seven years, while the Philippines government is accelerating its Public-Private Partnership (PPP) projects. On balance, GDP growth in the ASEAN-4 economies is expected to slow to 4.8% in 2013 from 6.1% in 2012, before picking up modestly to 5.2% in 2014.

In India, private consumption is likely to ease further as the effects of the rupee's recent depreciation are reflected in higher import and fuel prices. Weak business confidence and uncertainty ahead of next year's parliamentary elections will keep investment muted. However, agricultural output is likely to be boosted by a good monsoon season, although this will

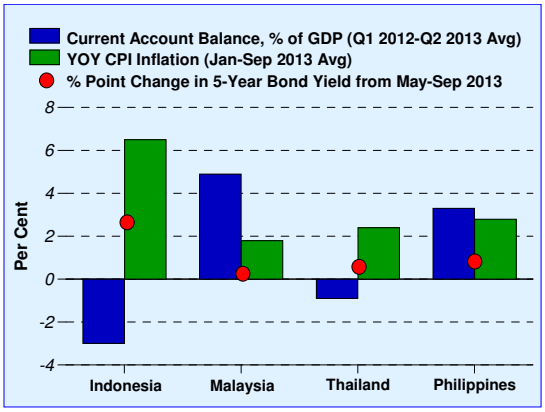
Chart 3.8
Credit and Domestic Demand Cycles in ASEAN-4



Source: CEIC and EPG, MAS estimates

Note: Cycles are obtained by smoothing the data with a band-pass filter.

Chart 3.9
Current Account, Inflation and Bond Yields in ASEAN-4



Source: Bloomberg, CEIC and EPG, MAS estimates

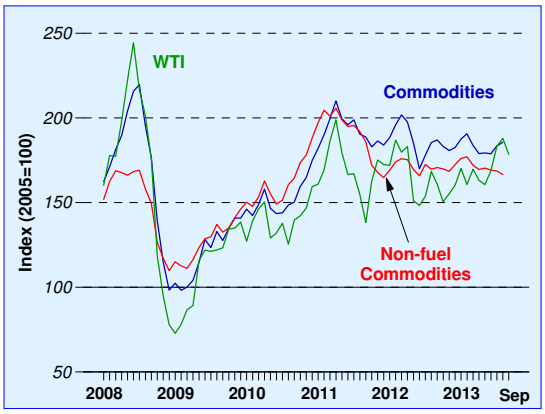
be insufficient to offset the sluggishness in both industry and services. All things considered, India's growth is projected to decelerate to 4.6% in FY2013 and rebound to 5.7% in FY2014, as policy uncertainties lift and business confidence improves.

Inflation will continue to be benign, with exceptions.

Inflationary pressures will be kept in check by stable commodity prices even as the output gaps in the G3 economies narrow gradually with improving demand conditions. (Chart 3.10) In Japan, CPI inflation is expected to turn positive as the weaker yen pushes up import prices, and the consumption tax hike takes effect in April 2014. Consequently, the average inflation rate in the G3 is projected to ease to 1.3% this year from 1.9% in 2012, before climbing to 1.7% next year.

Price pressures are expected to be contained in most of Asia ex-Japan. However, CPI inflation in India and Indonesia remain elevated due to the pass-through from the sharp depreciations of their currencies and cutbacks in fuel subsidies. Nonetheless, slackening domestic demand and monetary tightening should help to limit price increases. In China and the NIEs, higher food inflation due to adverse weather conditions will be offset by persistent producer price deflation, which will dampen the prices of manufactured goods. Overall, inflation in Asia ex-Japan is likely to remain stable at 4.1% in 2013 and 2014.

Chart 3.10
Commodity and Oil Prices



Source: Bloomberg and IMF

3.2 Outlook for the Singapore Economy

Gradually Regaining Momentum

The Singapore economy is forecast to register modest growth in 2013 and 2014.

Singapore's near-term outlook will be influenced by the relative growth performance in the developed and emerging market economies, which are presently at different stages of the business cycle. Emerging Asia will need to adjust to the rise in global interest rates, while China is poised for some slowdown in the short term as policymakers attempt to steer the economy towards more balanced growth. Conversely, the recovery in the advanced economies appears to be on a surer footing. The resultant pickup in G3 final demand should countervail to some extent the deceleration in emerging Asia as a whole, and help support global economic growth. In turn, this should give a positive impetus to the Singapore economy, especially its external-oriented sectors.

Nonetheless, downside risks remain. The recovery in the advanced economies is by no means assured. Several wildcards—such as policy missteps associated with the unwinding of QE measures by the Federal Reserve, failure to satisfactorily resolve the US budget and debt disagreements in 2014 and a re-escalation of sovereign debt concerns in the Eurozone—could present fresh setbacks to the turnaround. In Asia, an abrupt downshift in activity could occur if the Chinese economy experiences an unexpected hard landing, or if regional economies experience balance of payment difficulties triggered by an inability to adjust to less accommodative global monetary conditions.

EPG's baseline view remains that growth of the Singapore economy should come in at 2.5–3.5% for the whole of 2013, and is unlikely to be significantly different in 2014. External-facing activities are expected to provide the main support and domestic demand should still be resilient. However, bouts of volatility could still occur from time to time, until the global recovery becomes more even and durable. On the domestic front, supply-side constraints could translate into temporarily larger increases in business costs and constrain the extent of the cyclical upturn.

Singapore remains more exposed to the advanced economies than to emerging Asia.

The slowing growth in emerging Asia is unlikely to negate the positive effects from a recovery in the developed countries. To examine this further, Chart 3.11 presents the OECD-WTO's estimates of Singapore's value added embodied in foreign final domestic demand, expressed as a percentage of Singapore's GDP. These estimates represent the amount of domestic value added from Singapore-based producers of goods and services that was exported—both directly and indirectly via its trading partners—to other economies for consumption and investment.[1] They therefore provide a useful way to assess the relative extent of support provided by the G3 and emerging Asia to Singapore's export-facing industries.

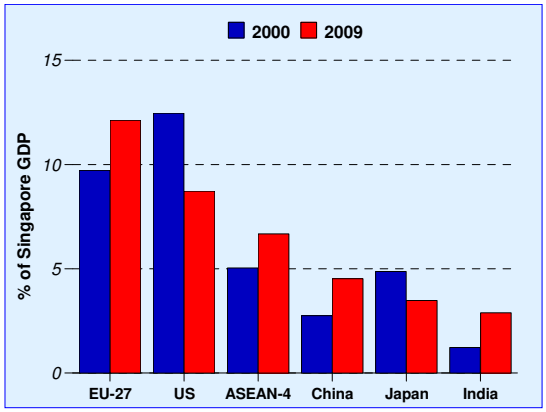
Singapore's reliance on the domestic demand of its emerging market neighbours, namely the ASEAN-4, China and India, rose considerably through the 2000s and accounted for 14% of its GDP in 2009.[2] Nonetheless, Singapore remained more tied to domestic demand in the advanced economies, with its exposure to the G3 totalling 24% of GDP.

A further sectoral breakdown indicates that the positive spillovers from a G3-led recovery would likely be broad-based. The manufacturing, trade-related services and financial & business services sectors each account for about a third of the total value added exported by Singapore to the industrial countries during 2009. (Chart 3.12) In contrast, Singapore's exposure to the Asia-6 economies was more concentrated in manufacturing and trade-related services. Within the manufacturing industry, electronics and chemicals exhibited the greatest value-added linkages with the advanced economies.

Rising G3 demand should facilitate a recovery in the global IT industry ...

In the global IT industry, an incipient recovery in recent months has been supported by the turnaround in the developed countries. Over the past two years, worldwide semiconductor sales have largely been

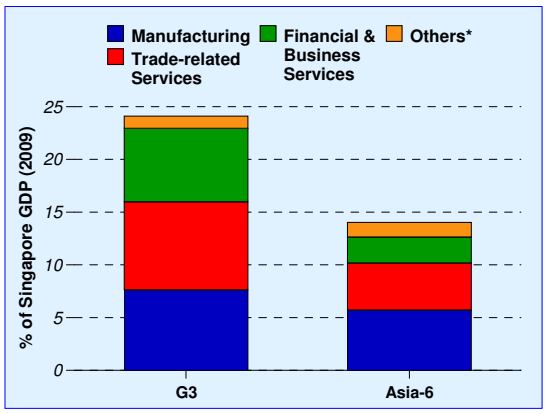
Chart 3.11
Singapore's Value Added Embodied in Foreign Final Domestic Demand (by Destination)



Source: OECD-WTO TiVA Database

Note: ASEAN-4 comprises Indonesia, Malaysia, Thailand and the Philippines.

Chart 3.12
Singapore's Value Added Embodied in Foreign Final Domestic Demand (by Destination and Sector)



Source: OECD-WTO TiVA Database

Note: Asia-6 comprises China, India, Indonesia, Malaysia, Thailand and the Philippines.

* Including primary goods, utilities, construction and other services.

[1] The OECD and WTO derived the domestic value-added content of the gross exports of 57 selected economies, after taking into account their bilateral trade flows, as well as intermediate imports embodied in their exports based on a harmonised set of their Input-Output tables.

[2] The latest estimates in the OECD-WTO TiVA Database are based on 2009 data.

flat amid a sluggish global economy. However, high-frequency indicators suggest that the industry is emerging from this malaise. Following a 2.4% q-o-q SA increase in Q2 2013, worldwide chip sales expanded by 4.5% in Jul–Aug, led by gains in the G3, which accounted for over 90% of this growth. (Chart 3.13)

As the recovery in the industrial economies gains traction, the global IT industry should likewise see a more decisive upturn, given its increasing responsiveness to business cycles. Historically, the global IT cycle has tended to move in tandem with broader macroeconomic developments. Notably, the correlation between global GDP growth and worldwide semiconductor sales seemed to have tightened during the latter half of the 2000s. (Chart 3.14) This can be corroborated by regression analysis, which shows that the near-term sensitivity of global chip sales to business cycle fluctuations has increased, both in terms of the speed and magnitude of response.[3]

From a product perspective, the consumer segment is expected to be the key locomotive of global IT growth, in view of the continuing proliferation of mobile computing devices such as smartphones and tablets. Corporate IT demand should also see some expansion ahead, especially if the turnaround in the advanced economies were to gather pace. The Empire State Manufacturing Future Technology Spending index, a forward-looking indicator for IT expenditure among firms in the US, has picked up since its trough in June this year. (Chart 3.15) Further, Microsoft's withdrawal of support for Windows XP in Q2 2014 should prompt a renewal in the corporate IT cycle as firms will be incentivised to adopt updated versions of the Windows platform. Supply-side developments are similarly expected to facilitate an increase in production. PC inventory stockpiles in the US, for instance, have reached unprecedentedly low levels following a destocking phase last year.

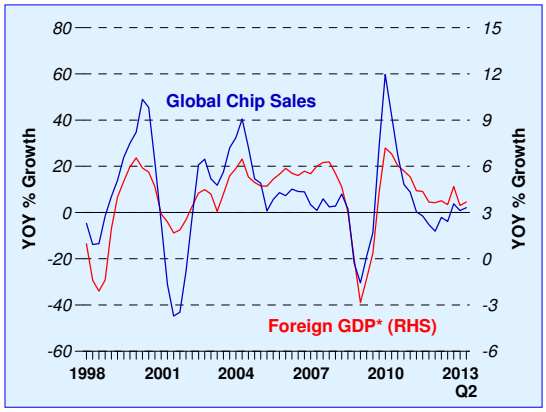
… thereby providing some support to Singapore's electronics sector.

Taking all things into consideration, demand and supply conditions are supportive of a firmer recovery in the global IT industry, which should in turn provide an

Chart 3.13
Global Chip Sales

Source: Semiconductor Industry Association and EPG, MAS estimates

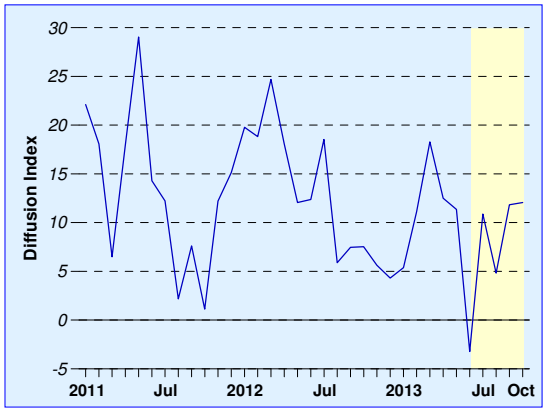
Chart 3.14
Global Chip Sales and Foreign GDP



Source: Semiconductor Industry Association and EPG, MAS estimates

* Weighted by shares in Singapore's NODX.

Chart 3.15
Future Technology Spending in the US

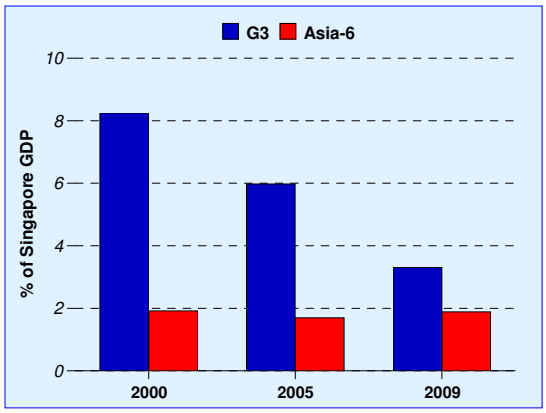


Source: CEIC

[3] Over the period 1998–2005, the global GDP growth variable was statistically significant in predicting chip sales with a lag. However, when the estimation window was recursively expanded to Q2 2013, only the contemporaneous GDP growth indicator was statistically significant, thereby suggesting that global chip sales now appear to react more quickly to business cycle fluctuations. Moreover, the magnitude of response has intensified in the late 2000s.

uplift to Singapore's electronics industry. However, compared to past episodes, the extent to which the domestic electronics industry can benefit from the cyclical tailwinds in the G3 economies may be more modest this time round. In particular, the share of Singapore's gross nominal IT domestic exports to the developed countries fell by 10% points over the latter half of the 2000s. The waning impact of G3 demand is likewise evident in value-added terms. While the OECD-WTO estimates affirm that Singapore's IT industry remains more exposed to the G3 than to Asia ex-Japan, the gap has narrowed significantly over the decade. (Chart 3.16)

Chart 3.16
Singapore's IT Value Added Embodied in Foreign Final Domestic Demand



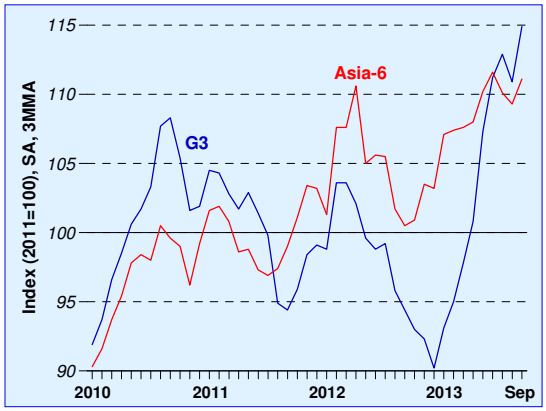
Source: OECD-WTO TiVA Database

Other external-oriented activities are likewise expected to pick up …

More broadly, the upward momentum in the domestic manufacturing industry is set to galvanise further expansions in the trade-related services sectors. Wholesale trade activity, for instance, should see a boost from rising G3 demand, even as emerging Asia continues to account for the bulk of Singapore's re-export trade. Notably, Singapore's re-exports to the developed countries have grown strongly thus far in 2013, outpacing re-exports to the Asia-6 countries. (Chart 3.17) This came on the back of increased demand for telecommunications, electronics and chemical products, which together account for 33% of the non-oil wholesale trade sector. An improvement in wholesale trade activity should in turn create positive spillovers to the transport & storage industry.

A more entrenched recovery in the advanced countries would also raise investor confidence and impart upside to Singapore's financial services sector, especially the sentiment-sensitive activities such as stock broking and forex trading. The prospect of firmer growth in the G3, however, does not preclude further turbulence in financial markets. Renewed concerns over unresolved fiscal issues in the US could precipitate another bout of uncertainty, and some volatility can be expected when the Federal Reserve shifts into tapering mode.

Chart 3.17
Singapore's Real Re-exports by Destination



Source: EPG, MAS estimates

… even though support from Asia could slow somewhat in the short term.

At the same time, Singapore's financial services industry could face some downdrafts from Asia. With growth in offshore non-bank loans being largely fuelled by East Asian credit demand in recent years, lending activity in this segment could moderate as several regional economies decelerate and enter a credit tightening phase. (Chart 3.18) Moreover, the fund management industry has considerable exposure to the region, with 70% of total assets under management invested in the Asia Pacific in 2012, according to MAS' Singapore Asset Management Industry Survey. Although there is strong interest at present from global fund houses seeking to set up or expand their Asian presence in Singapore, there could be some near-term rebalancing of investment portfolios away from the region should the G3 continue to strengthen relative to Asia. This could potentially dampen demand for fund management services out of Singapore.

Domestic demand should stay broadly resilient.

The domestic-facing industries are likely to remain a key pillar of support, even as their contribution to Singapore's GDP growth falls somewhat. In particular, the momentum in the construction sector and related industries should be sustained over the coming quarters. There are approximately 31,000 and 50,000 residential units due for completion by the end of 2013 and 2014 respectively, significantly higher than the preceding three-year average of around 27,000 units. (Chart 3.19) Concomitantly, a bumper supply of non-residential buildings is slated to come on-stream, alongside major infrastructural projects such as the Downtown Line Stage 1, the Marina Coastal Expressway and the Jurong Rock Cavern—the largest underground hydrocarbon storage facility in the region. (Chart 3.20) These developments augur well for the construction industry, given that a considerable amount of a project's value added is typically realised during the end-phase of the building cycle.

Further, such construction activities will generate significant spillovers to ancillary industries such as real estate management and financial services. Several facilities—including the Ng Teng Fong General Hospital, the Jurong Community Hospital and the new SIM

Chart 3.18
Contribution to ACU Non-bank Lending

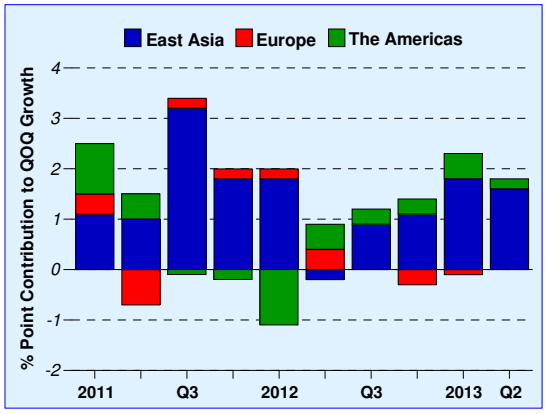


Chart 3.19
Completions of Residential Dwellings

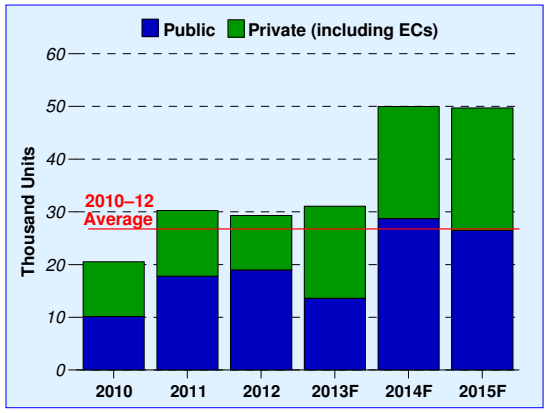
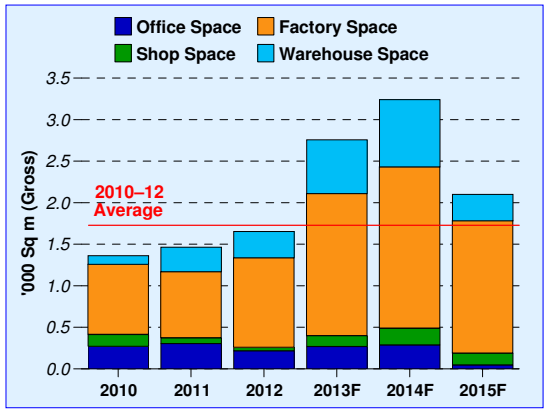


Chart 3.20
Completions of Non-residential Space



Campus at Clementi—are also scheduled to open in 2014, which should facilitate the expansions of healthcare and education services.

In contrast, industries reliant on domestic consumption, such as the retail and food & beverage sectors, are likely to face supply-side headwinds. This is in view of the higher foreign worker levies and stricter dependency ratio ceilings which are being progressively introduced from July 2013. However, the net impact on GDP growth is likely to be mild, given that these consumer-facing industries account for less than 4% of overall production.

Over the medium term, important shifts in global and intra-Asian trade patterns are taking place alongside Singapore's own restructuring initiatives.

Barring severe policy missteps, the G3 is expected to provide the bulk of the improvement in external support to Singapore's economy in the near term. However, Asia should increasingly feature over the longer term, as both a source of demand and a producer of higher value-added products.

Indeed, there have been structural shifts in global trade over the past decade. Asia has emerged as a significant driver of trade flows, particularly in the post-Global Financial Crisis (GFC) period. As highlighted in the April 2011 *Review*, a sizeable proportion of world trade was accounted for by the high income countries in the 1990s.[4] However, by 2009, Asian exporters emerged as prominent suppliers of intermediate, capital and consumption goods. Notably, intra-Asian trade was a key catalyst for the region's trade growth. As global rebalancing continues, there should be some compression of consumption and imports in the deficit economies, which are mostly in the industrialised bloc. An onshoring wave in US manufacturing could further temper the country's import demand. Taken together, these events are likely to presage a continued orientation of Singapore's external growth sources towards emerging Asia.

Important transitions are also underway in intra-Asian trade patterns. (See Box C) Within the merchandise goods space, Singapore could face greater competitive pressures in intermediate goods, especially as China augments its domestic production capabilities. There

[4] Kalra, S (2011), "The Shifting Contours of Global and Asian Trade", *Macroeconomic Review*, Vol. X(1), pp. 21–24.

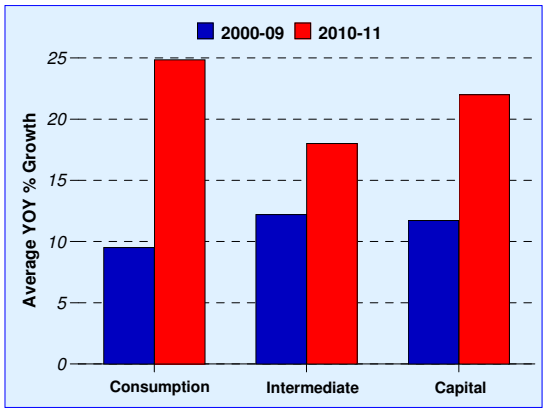
could therefore be some attrition of lower value-added manufacturing activities in Singapore. Viewed in this context, Singapore's ongoing economic restructuring should facilitate this process and at the same time, lay the foundations for the next step up the manufacturing value chain.

On the consumer goods front, Asian demand is projected to rise over time in light of growing affluence in the region and policies aimed at rebalancing growth away from export-led drivers. These developments are favourable to the flourishing of a consumer-oriented ecosystem in Singapore, which spans activities from high value-added manufacturing such as consumer care products and specialty ingredients, to services such as R&D, brand management and advertising. For instance, Givaudan, one of the world's largest fragrances firms, and Mead Johnson Nutrition recently established multi-million dollar manufacturing and research facilities here. Singapore's exports of consumption goods to Asia ex-Japan have also registered the largest improvement in growth rates, compared to that of intermediate goods and capital goods. (Chart 3.21)

Meanwhile, intra-Asian trade in services is poised to accelerate, driven especially by demand from China and the major ASEAN economies. As a key services hub in the region, Singapore is well-positioned to capitalise on this trend. During the latter half of the 2000s, Singapore's services exports to its regional neighbours recorded robust average growth of around 12% annually. Notably, Singapore has made some strides in enlarging its market share in Asian demand for modern services.[5] (Chart 3.22) Of the regional markets, Singapore has become more tapped into demand from ASEAN and the NIEs, particularly in areas such as communications, computer & information and financial & insurance.

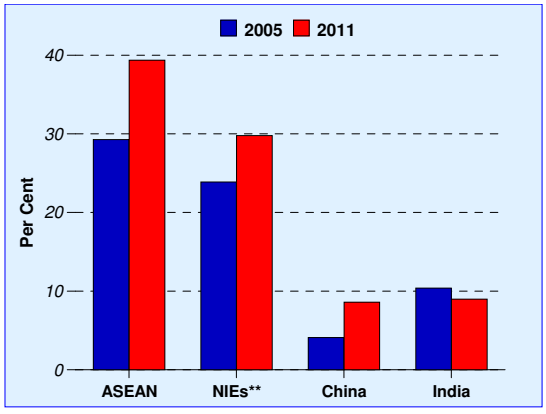
These compositional shifts in global and intra-Asian trade patterns over the medium term are likely to have important implications for Singapore's external growth drivers. Although there is heightened competition in the intermediate goods space, there is scope for Singapore to exploit niche opportunities in high-end consumer goods and modern services.

Chart 3.21
Singapore's Goods Exports to Asia ex-Japan by Category



Source: UN Comtrade and EPG, MAS estimates

Chart 3.22
Singapore's Share of Asian Demand for Modern Services*



Source: WTO and EPG, MAS estimates

* Modern services comprise communications, computer & information, financial & insurance and intellectual property-related activities.

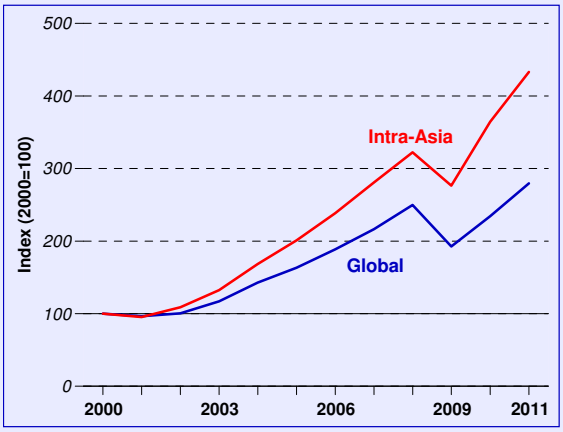
** NIEs comprise Hong Kong and Korea.

[5] Singapore's share in the Chinese market, for instance, refers to Singapore's modern services exports to China expressed as a percentage of China's imports of such services.

Box C
Shifts in Regional Trade

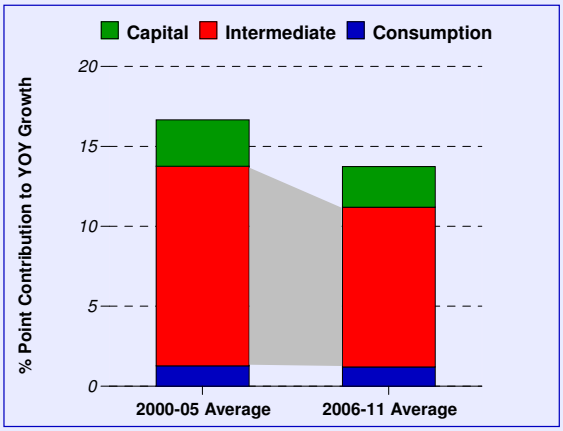
Global trade in goods and services recorded strong growth from 2000 to 2011, which averaged 11% per annum, outpacing the expansion in GDP over the same period. Nonetheless, there were underlying shifts in global trade patterns during the latter half of the 2000s. Notably, the contribution of advanced economies to global merchandise trade growth fell, while intra-Asian trade flows continued to record firm expansion. In fact, intra-Asian trade flows more than quadrupled over the past decade, significantly outstripping that of global trade. (Chart C1) There were also important shifts in the composition of merchandise trade flows within Asia in the 2000s. This box delves deeper into recent developments concerning intra-Asian trade, both in goods and services, to assess the outlook for the regional economies over the medium term.

Chart C1
Global and Intra-Asian Merchandise Trade



Source: IMF IFS, UN Comtrade and EPG, MAS estimates

Chart C2
Contribution to Intra-Asian Trade Growth by Product Type

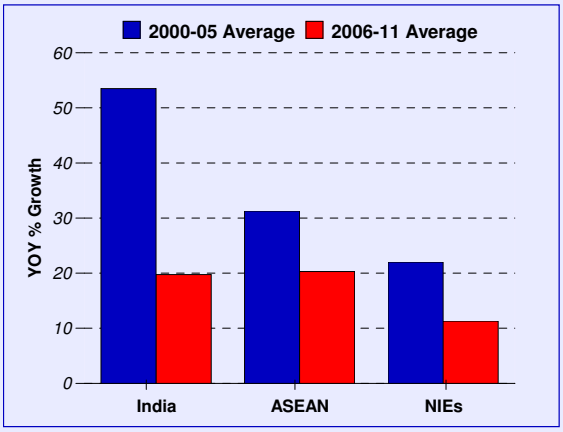


Source: UN Comtrade and EPG, MAS estimates

Asian Trade in Intermediate Goods has Moderated, Reflecting in Part China's Increasing Production Capabilities

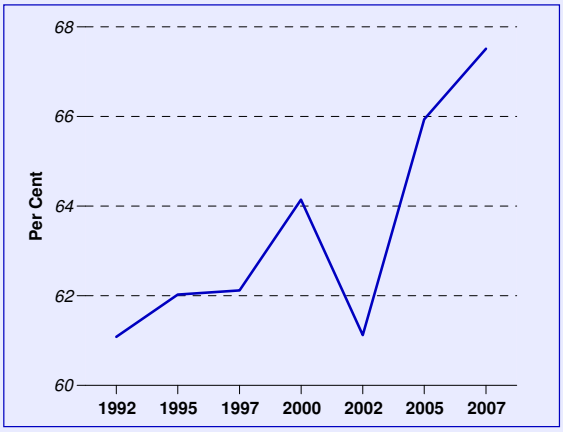
Importantly, over the last decade, intra-Asian trade witnessed a slowdown in the growth of intermediate goods flows, whose contribution to regional trade growth slipped in 2006–11 compared to the first half of the decade. In comparison, the contributions of consumption and capital goods remained largely unchanged. (Chart C2) This was partly on account of a significant moderation in the growth of China's intermediate goods imports from other Asian economies. (Chart C3) Indeed, China has stepped up its production capabilities, as indicated by a rising share of domestic intermediate inputs in manufacturing output, especially during the 2000s. (Chart C4) In particular, China's "internalisation" of midstream production was more pronounced in higher value-added industries such as chemicals and machinery & equipment.

Chart C3
China's Intermediate Goods Imports from Asia



Source: UN Comtrade and EPG, MAS estimates

Chart C4
Share of Domestic Intermediate Inputs in China's Output

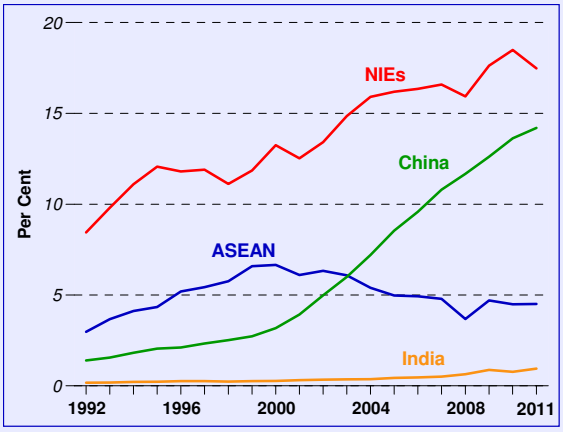


Source: CEIC and EPG, MAS estimates

Some Asian Economies Face Challenges in Scaling the Intermediate Goods Value Chain

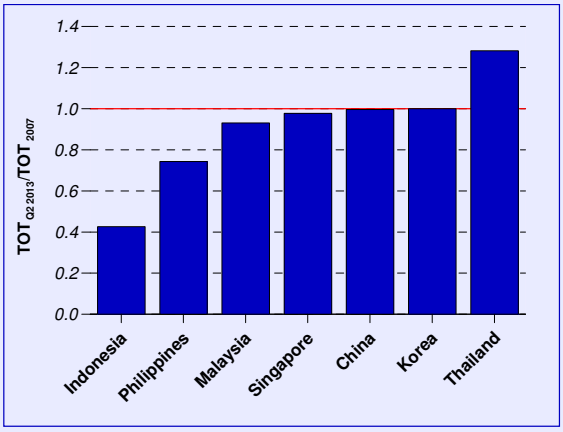
China had seen a surge in its global market share of intermediate goods after 2000.[1/] (Chart C5) The NIEs also gained market share over this period, but the ASEAN economies experienced a decline.[2/] This differentiated performance across the region can also be seen in a terms of trade (TOT) comparison. (Chart C6) The deterioration of ASEAN's terms of trade for electronics goods post-GFC suggests a dip in the value-added content in their exports. Further, estimates by the OECD-WTO indicate that some ASEAN exporters such as Indonesia, Malaysia and the Philippines have seen their value-added content embodied in total foreign final demand (as a percentage of GDP) declining from 2000 to 2009. More specifically, the domestic value-added content of IT exports in Malaysia dipped by 1.6% points as a fraction of GDP, while the Philippines saw a 1.1% points decline. Overall, these developments suggest that ASEAN producers face some challenges in moving up the manufacturing value chain.

Chart C5
Global Market Share of High-Tech Intermediate Goods Exports



Source: UN Comtrade and EPG, MAS estimates

Chart C6
Asia's Electronics Terms of Trade (Q2 2013 Compared to 2007)



Source: CEIC and EPG, MAS estimates
Note: Data for Indonesia and the Philippines is up to Q1 2013.

1/ Based on SITC Revision 3 product classification by UNCTADstat.

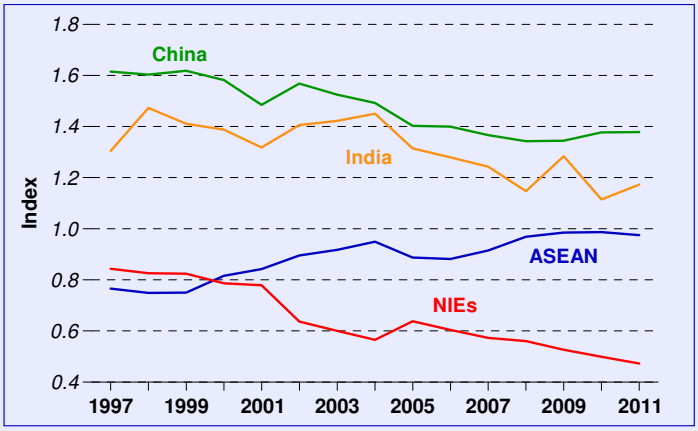
2/ ASEAN comprises Indonesia, Malaysia, Thailand, the Philippines, and Vietnam. NIEs comprise Hong Kong, Korea and Singapore. Taiwan's data is not available for the analysis of its trade in merchandise goods.

There are Opportunities for ASEAN in the More Sophisticated Consumer Goods Space

Nonetheless, ASEAN can potentially take advantage of new opportunities on the consumer goods front. Several developments—such as recent minimum wage hikes in some ASEAN economies, growing momentum in China's urbanisation drive, and labour productivity increases in emerging Asia—have led to rising affluence within the region. This has in turn bolstered demand for consumption goods, with trade being especially robust along the ASEAN-China corridor. More broadly, a breakdown of consumption goods imports by technological intensity shows that Asian import demand from the region for higher-tech consumer goods has increased the most as compared to the low- and medium-tech segments, climbing fivefold over the past decade.

While China has maintained an above-unity revealed comparative advantage (RCA) in the export of consumption goods to the region, this has tapered off over the years.[3/] (Chart C7) In contrast, the RCAs of the ASEAN countries have risen in the latter half of the 2000s. Over this period, ASEAN's exports of certain high-tech consumer products to the rest of Asia—such as optical goods and electronics—saw rapid growth rates. This is corroborated by anecdotal accounts of foreign firms expanding their production bases in some ASEAN countries. For instance, Taiwanese electronics manufacturer Foxconn, a leading contract manufacturer for major global brands such as Apple, has announced plans to start production in Indonesia next year.

Chart C7
Revealed Comparative Advantage: Consumption Goods



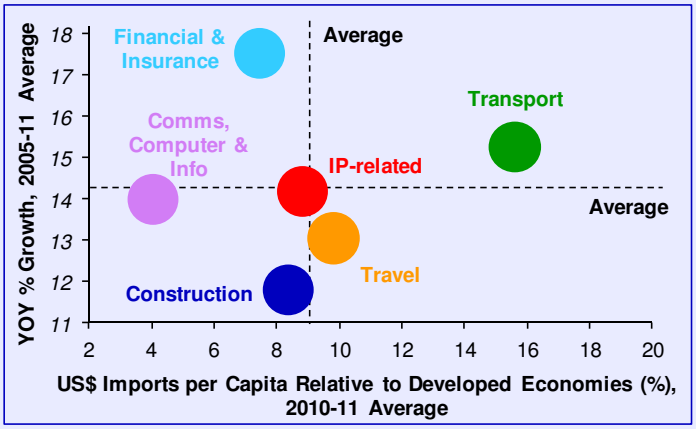
Source: UN Comtrade and EPG, MAS estimates

Rising Asian Demand for Services Augurs Well for the NIEs and India

On the services front, Asia has become an increasingly important source of demand, with services imports doubling from US$394 billion in 2005 to US$821 billion in 2011. A breakdown of services imports by sector shows that this is especially so for modern services such as communications, computer & information, financial & insurance and intellectual property-related (IP) activities. (Chart C8)

3/ The Revealed Comparative Advantage Index is defined as the percentage of a country's exports of a specific good type in its total export basket, divided by the equivalent percentage for a reference set of countries. In this case the reference group comprises ASEAN, NIEs, China and India.

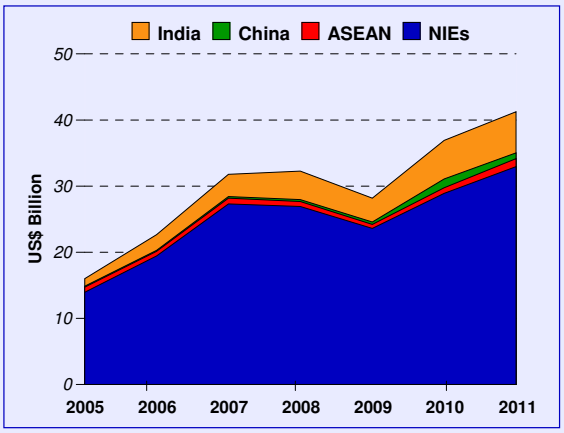
Chart C8
Asian Services Imports By Category



Source: WTO and EPG, MAS estimates

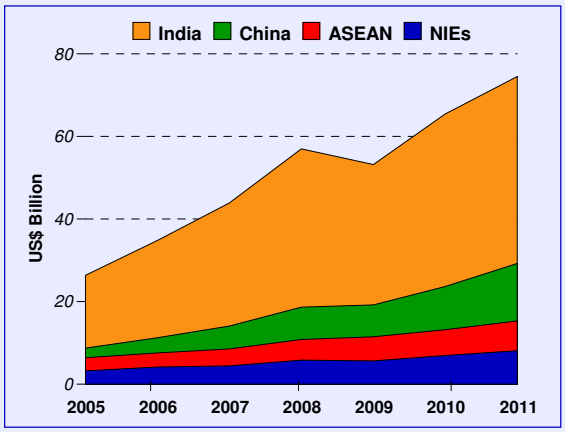
From an end-market perspective, the bulk of Asian demand for modern services stems from China and the NIEs, while that from ASEAN remains modest.[4/] On the supply side, the NIEs and India are likely to be the key beneficiaries of a deepening in modern services trade. For instance, the NIEs have already established a strong lead in financial services exports, accounting for 80% of total Asian exports of such services. (Chart C9) Singapore and Hong Kong are key financial services hubs and have regularly featured in the top four rankings of the Global Financial Centres Index survey since 2007.[5/] A study by PricewaterhouseCoopers released earlier this year also found that Singapore is expected to emerge as the top centre for global fund management over the next two years, and should benefit especially from emerging market demand.[6/] Meanwhile, India's strength is in the communications, computer & information sector, in outsourcing of activities such as helpdesk services, payroll processing and business accounting. Its exports of such services have more than doubled over the period 2005–11, accounting for 61% of Asia's total exports in this segment in 2011. (Chart C10)

Chart C9
Asia's Exports of Financial Services



Source: WTO and EPG, MAS estimates

Chart C10
Asia's Exports of Communications, Computer & Information Services



Source: WTO and EPG, MAS estimates

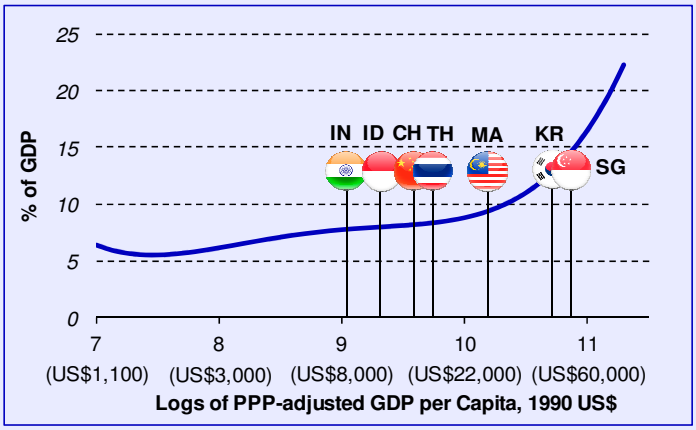
4/ For the analysis of services trade, NIEs comprise Hong Kong, Korea, Singapore and Taiwan.

5/ The Global Financial Centres Index was first compiled in 2007 by Z/Yen Group, a London-based think tank. It ranked 80 financial centres drawing on previous research as well as survey methods.

6/ See PricewaterhouseCoopers (2013).

Currently, Asian demand for services is still at a nascent stage. Using the magnitude of services imports by developed economies as a benchmark, Asian demand for services is on average 9% that of the developed economies. (Chart C8) Over the medium term, Asia's trade in services is expected to rise further. Based on a methodology first employed by Eichengreen and Gupta (2009), a fixed country effect panel regression was used to analyse how income levels, as measured on a PPP-adjusted per capita basis, correlate with the size of services imports as a share of GDP. The data set comprises 134 countries over 1980–2011. Notably, the regression results suggest that China and the major ASEAN economies are near the inflection point at which services demand is set to accelerate. (Chart C11)

Chart C11
Asian Services Imports by Income Level



Sum-up

Trade deepening in Asia has continued apace following a brief interruption from the onset of the GFC. Nonetheless, there have been some compositional shifts in trade flows within the region over the last decade, and these trends are likely to continue into the medium term. More specifically, as China steps up its domestic capabilities in intermediate goods production, the rest of Asia will face greater competition. Notwithstanding these challenges, there could be scope for some ASEAN economies to re-orient their production towards consumption goods. On the services front, the NIEs and India are well-positioned to ride the imminent wave of greater services trade.

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PricewaterhouseCoopers (2013), "Navigating to Tomorrow: Serving Clients and Creating Value", *Global Private Banking and Wealth Management Survey*.

3.3 Labour Market

Labour Supply Constraints will Intensify

In the next few quarters, an anticipated rise in labour demand will come up against binding labour supply constraints across more sectors of the economy. Accordingly, the resident unemployment rate is expected to remain low, in turn supporting stronger wage increases alongside modest gains in labour productivity.

Hiring intentions have picked up in the external-oriented sectors …

In line with the expectation of a gradual recovery in the external-oriented sectors, overall hiring intentions have ticked up in H2 2013. The net employment outlook in ManpowerGroup's Q4 2013 survey, for instance, rose on the back of more positive hiring sentiment in financial services and manufacturing. (Chart 3.23) Financial institutions have indicated stronger demand for workers in front office sales as well as back office risk and compliance roles, in tandem with the steady stream of IPOs, while semiconductor manufacturers in particular are planning to raise headcount in view of better prospects for the global IT industry. A strengthening of trade flows, including in the region, will also benefit the wholesale trade and transportation & storage sectors.

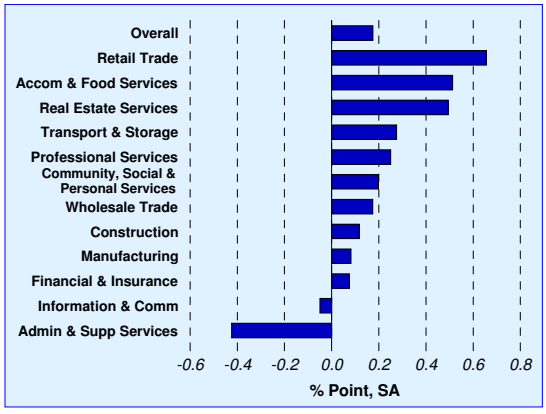
Chart 3.23
Net Employment Outlook

Source: ManpowerGroup

… while labour demand remains firm in other parts of the economy.

In the domestic-oriented sectors, hiring is likely to remain brisk on account of positive spillovers from the construction and property-related sectors. The large pipeline of housing, commercial and infrastructure projects will underpin construction employment growth and create more jobs in the upstream architectural & civil engineering services (professional services) as well as downstream real estate services segments. The completion of various shopping malls and office developments over the next few quarters will also require workers to fill positions in retail trade, food services and security & cleaning services (administrative & support services).

Chart 3.24
Change in Vacancy Rates by Sector (H1 2013 over 2012)



Source: EPG, MAS estimates

Similarly, the progressive completion of the Downtown Line, beginning in December 2013, will add to labour demand, such as for train drivers and maintenance personnel, in the land transportation segment (transportation & storage). A further boost to employment will come from the opening of new Ministry of Education kindergartens in January 2014 and the addition of 50 childcare centres in Punggol and Sengkang over the next few years (community, social & personal services).

On the whole, hiring is expected to rise across a wider range of sectors over the next few quarters, in contrast to the recent period when jobs were mainly created in the domestic-oriented industries. (Chart 3.24)

The weakness in the PMET job market appears to be dissipating.

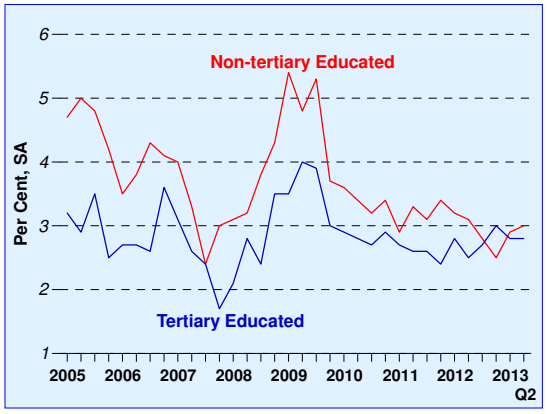
As discussed in Chapter 2, professionals, managers, executives and technicians (PMET) saw a soft patch in hiring over the last year amid the weakness in overall GDP growth. Indeed, the unemployment rate of tertiary educated residents—a proxy for unemployed PMETs—has trended up since 2012, even as that of non-tertiary educated residents has broadly fallen. (Chart 3.25)

While the relative rise in unemployment of tertiary educated residents was probably due to weak PMET job creation, the secular increase in their supply also likely made them more vulnerable to demand shocks. By Q2 2013, the number of tertiary educated resident workers had risen to equal that of non-tertiary educated resident workers for the first time. (Chart 3.26) The change in the profile of workers reflects the fact that older residents with lower educational attainment were increasingly being replaced by more qualified entrants to the resident workforce.[6]

Nevertheless, graduates of local tertiary institutions have been able to maintain relatively stable (and positive) wage differentials over their non-tertiary educated counterparts. (Chart 3.27)

Further, the demand for PMETs has also recently grown in tandem with the pickup in economic activity. Industries such as community, social & personal

Chart 3.25
Resident Unemployment Rate by Educational Attainment



Source: EPG, MAS estimates

Chart 3.26
Resident Labour Force by Educational Attainment

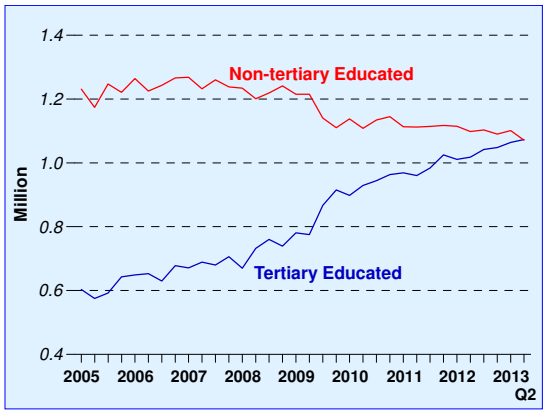
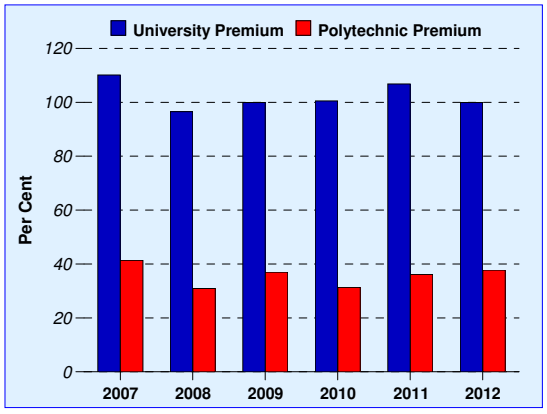


Chart 3.27
Higher Education Wage Differentials



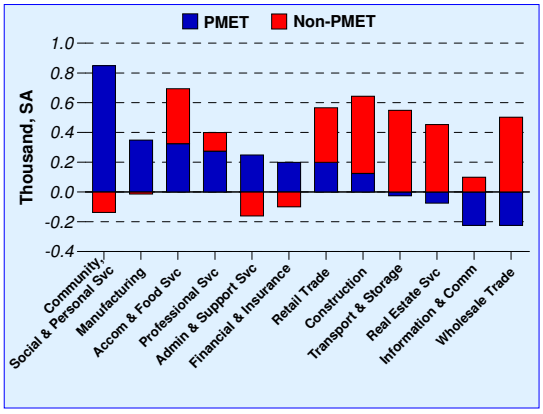
Source: Graduate Employment Survey 2012

Note: The estimates are calculated as the difference between the median monthly gross starting salaries of fresh university/polytechnic graduates and ITE graduates.

[6] In 2012, three-quarters of the resident population aged 25–34 had tertiary qualifications compared to less than a fifth among the resident population aged 60 and above.

services, manufacturing and professional services have, for example, seen fairly strong increases in PMET vacancies. (Chart 3.28)

Chart 3.28
Change in Job Vacancies
(H1 2013 over 2012)



Source: EPG, MAS estimates

Greater constraints on S Pass and Employment Pass holders will provide opportunities for tertiary educated residents.

Importantly, recent manpower policies to tighten the inflow of S Pass and Employment Pass holders (EPH) will boost the hiring of tertiary educated residents, particularly at the entry level. In July 2013, the minimum qualifying salary for S Pass holders was raised to $2,200 from $2,000, while the S Pass sub-Dependency Ratio Ceiling (DRC) for the services sector was cut to 15% from 20%. Further, from January 2014, the minimum qualifying salary for entry-level EPHs will be increased from $3,000 to $3,300, while qualifying salaries for more experienced EP applicants will also be raised. Under the Fair Consideration Framework, which will be implemented in August 2014, employers will be required to place PMET job vacancies on a publicly available jobs bank for 14 days before application for EP permits are allowed.

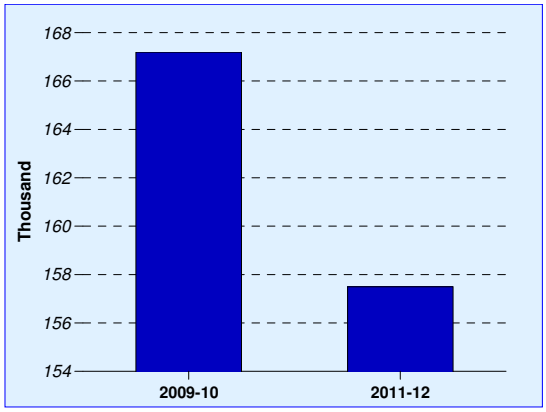
The resident labour force participation rate is likely to rise at a slower pace.

In all, labour supply is likely to become more constrained on several fronts. Apart from tighter foreign labour policy across the skills spectrum and a slower increase in the resident population, the resident labour force participation rate (LFPR) is also expected to rise at a slower pace over the next few years.

First, according to MOM's Comprehensive Labour Force Survey 2012, the number of economically inactive residents who intend to rejoin the labour force in the next two years fell in 2011–12. (Chart 3.29) This portends a slower rate of increase in the resident labour force in 2013–14 following the sharp rise in recent years.

Second, recent increases in the participation rate could partially reflect the effects of temporary measures such as the Special Employment Credit (SEC) and Wage Credit Scheme (WCS). These subsidies for hiring Singaporeans have likely boosted the demand for locals. However, the SEC and WCS will cease in 2016 and 2015 respectively, with a dampening effect on the extent of future LFPR increases.

Chart 3.29
Potential Entrants into the Labour Force

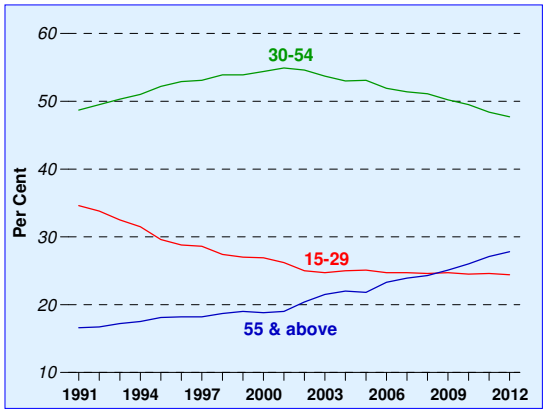


Note: Potential entrants refer to economically inactive residents who intend to look for a job within the next two years.

Third, the rapid ageing of the resident population will pose a significant drag on the overall LFPR in the near term. From around the middle of this decade, the share of the resident population aged 55 and above will rise at a considerably faster pace than before as the bulk of the baby boomers begin to move into this age group. (Chart 3.30) As noted in Chapter 2, the shift in the resident population to older age groups, where participation rates are markedly lower, has already exerted a negative drag on the resident LFPR since the mid-2000s.

Thus, while the LFPR is likely to rise further over the next few years due to secular forces, such as improved educational attainment and more flexible part-time work opportunities, the pace of increase is expected to slow due to demographics and policy-related changes. This will become an additional binding resource constraint on the pace of growth in the economy.

Chart 3.30
Share of Resident Population by Age Group

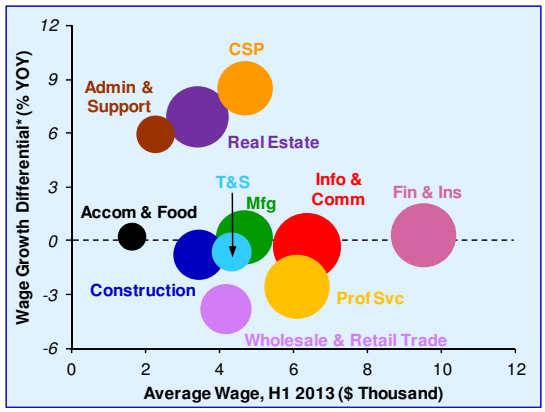


The labour market will tighten and wage growth will be strong.

The resident unemployment rate is therefore likely to remain below its natural rate amid continuing demand for manpower and more binding labour supply constraints. As a result, wage growth will be strong, including in the high-wage sectors, which have thus far seen wage growth at or below trend. (Chart 3.31) Overall wage growth is expected to stay above the historical average of 3.3% in 2013 and 2014. Coupled with the hikes in the foreign worker levy and a modest pickup in productivity, unit labour costs (ULC) will continue to rise in the near term, although government subsidies such as the Wage Credit Scheme will provide some offset.

In sum, more intense adjustments in the labour market are likely to occur in the next two to three years, owing to slowing labour force growth and relatively muted productivity increases. These will result in strong wage and cost pressures for domestic businesses. Moreover, changes in the composition of the resident labour supply mean that the labour-intensive domestic-oriented sectors will face a relatively greater labour crunch, with an attendant effect on wage increases.

Chart 3.31
Changes in Wage Growth and Wage Levels by Sector



Source : EPG, MAS estimates

Note: The size of the bubble represents the share of PMETs in the workforce.

* The wage growth differential is the difference between y-o-y wage growth in H1 2013 and the 2008–12 average.

3.4 Inflation

Domestic Cost Increases will Remain the Key Source of Inflation

Inflation will pick up over the next few quarters.

Underlying consumer price inflation is likely to rise alongside the gradual improvement in the economy. Although external price pressures should stay subdued, domestic business costs will continue to increase and pass through to consumer prices. CPI-All Items inflation will therefore come in higher in the next few quarters, and will be susceptible to swings arising mainly from developments in car prices.

External sources of inflation will be largely benign …

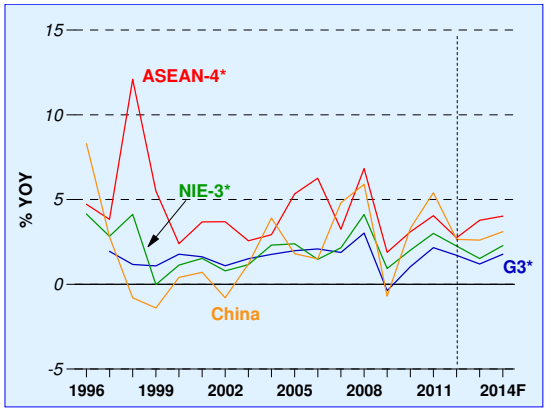
External price pressures are likely to stay subdued in 2014. (Chart 3.32) Notably, while the global economic outlook has improved, the slack in the labour market in the developed economies will cap price increases in the near term. Commodity prices are also generally projected to decline in 2014, on account of more favourable supply conditions. (Chart 3.33)

… as upward pressure on global oil prices dissipates.

Global oil price pressures have subsided recently and will likely remain contained, barring a fresh outbreak of geopolitical tensions in the Middle East North African (MENA) region. Demand and supply conditions in the oil market are expected to become more balanced as production recovers from the outages over the past year.[7] (Chart 3.34) Any unanticipated increase in global oil consumption should be accommodated by OPEC's surplus production capacity, which is projected to reach its highest level in three years in 2014.

As a result, the Energy Information Administration (EIA) expects the West Texas Intermediate (WTI) benchmark oil price to fall gradually, averaging US$99 for this year and US$96 next year. Hence, while oil-related items will add to domestic inflation in the near term, they are expected to make little or no contribution to inflation for the whole of 2013 and 2014.

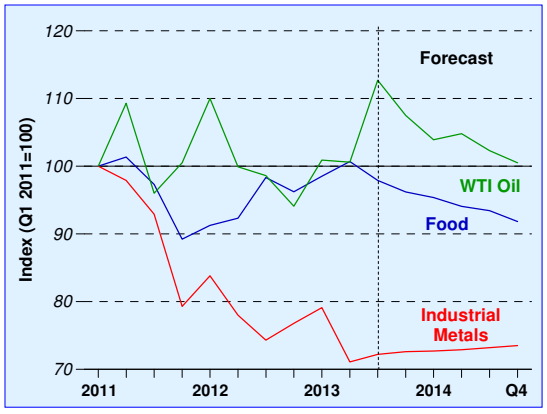
Chart 3.32
CPI Inflation in Singapore's Major Trading Partners



Source: Consensus Economics Inc.

* Weighted by average import shares for 2007–11.

Chart 3.33
Commodity Price Forecasts in US$



Source: EIA and IMF

[7] Recent disruptions to global oil supply include the oil theft in Nigeria, militia labour strikes in Libya and disputes between South Sudan and Sudan.

Domestic food inflation will be driven up by business costs, even as global food prices moderate.

The sharp rise in global food commodity prices in late 2012 will continue to filter through to domestic non-cooked and cooked food prices over the next few months. Thereafter, while prices of non-cooked food should rise more slowly given favourable projections of global crop harvests, cooked food prices will face upward pressure from higher domestic costs. In particular, cooked food vendors are likely to pass on increases in labour and rental costs to consumers, as these account for a significant share of their operating expenses compared to non-cooked food establishments. (Chart 3.35)

For the year as a whole, domestic food inflation is expected to rise from around 2% in 2013 to close to 3% in 2014, but will remain lower than the 3.4% average over the last five years.

Domestic cost pressures will continue to build and pass through more strongly into consumer prices.

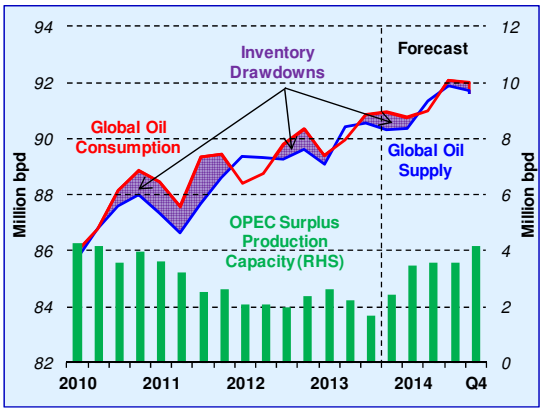
With sustained demand for manpower and tighter foreign worker policies, firms will increasingly turn to locals to fill job vacancies. In turn, this will place upward pressure on resident wages. At the same time, productivity should pick up only slightly, thus providing only a partial offset to higher labour costs.

In light of this and improving economic sentiment, businesses will likely pass on more of the accumulated cost increases to rebuild their profit margins. Services inflation is thus expected to rise from 2.4% in H1 2013 to around 3% in H2 2013 and the whole of 2014. This will be the first time in nearly two decades that services inflation stays above 2% for three consecutive years.

Pricing decisions are dependent on cyclical factors.

Consumer prices in Singapore are strongly influenced by cyclical factors. Indeed, EPG's empirical work shows that prices respond asymmetrically to a given change in ULC across different phases of the business cycle.[8] The ULC has a much larger impact on the CPI during periods

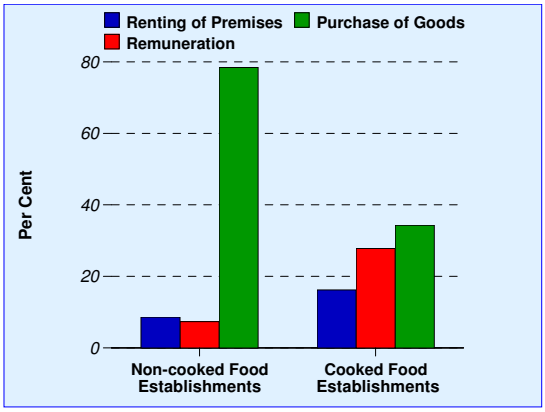
Chart 3.34
Global Oil Consumption, Global Oil Supply and OPEC Surplus Production Capacity



Source: EIA

Note: EIA defines OPEC surplus production capacity as the volume of production that can be brought on within 30 days and sustained for at least 90 days. It is typically used as an indicator of the world oil market's ability to respond to potential demand surprises and supply-side disruptions.

Chart 3.35
Remuneration, Rental and Raw Material Costs as a Proportion of Total Costs for Food & Beverage Establishments in 2011



Source: Department of Statistics Economic Surveys Series 2011

[8] For the methodology used here, refer to Chew, J, Ouliaris, S and Tan, S M (2009), "An Empirical Analysis of Exchange Rate Pass-through in Singapore", *MAS Staff Paper* No. 50.

of strong cyclical uplift, due to a greater degree of cost pass-through. (Table 3.2) Conversely, retailers tend to pass on a smaller proportion of cost increases when the economy is weaker.

Micro-level CPI data also shows that prices are adjusted fairly frequently in Singapore in response to costs and cyclical activity. Looking at more than a hundred CPI categories, EPG found that about two-thirds of the core consumer items have an average price duration of two months or less, where the price duration of a product is defined as the uninterrupted period during which its price remains unchanged.[9] (Chart 3.36)

EPG's analysis reveals that even during the cyclical weakness in the economy from the start of last year to Q3 2013, the frequency of price adjustments had remained high. This reflects price cuts for oil-related and sentiment-sensitive items, as well as upward price adjustments for other goods, albeit of smaller magnitude than during periods of strong growth.

Car prices could face greater volatility and upside risks …

Car price movements will be the single largest factor behind the month-to-month fluctuations in overall inflation in the near term as the market adjusts to the pending re-categorisation of COEs. Following the announcement of refinements to the COE framework in early September, car COE premiums have climbed by 7% and could rise further before the new changes take effect, as affected car buyers frontload their purchases. However, any increase in premiums is unlikely to be sustained at the current pace, especially as the supply of COEs is projected to rise, driven by higher de-registrations as more cars reach the end of their 10-year COE period. (Chart 3.37)

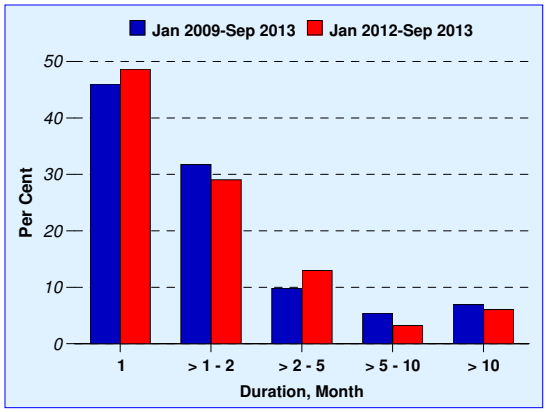
Car prices could contribute as much as 0.5–1% point to overall inflation for the whole of 2013 and 2014, down from an average of 1.3% points over the past three years.

Table 3.2
ULC Pass-through Coefficients to CPI

State of the Economy at t−1	Impact on CPI at Period t from 1% Increase in ULC at t−1 (%)
Output gap > +1%	0.14
Output gap < +1%	0.05

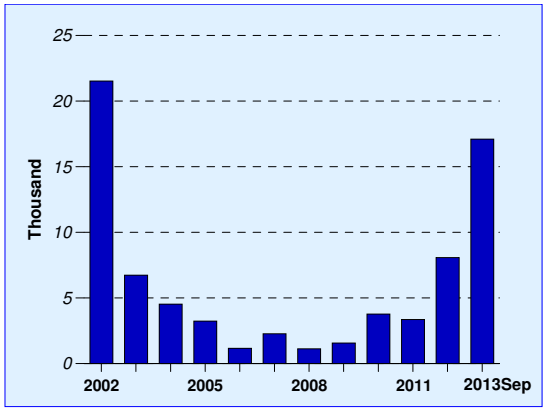
Source: EPG, MAS estimates

Chart 3.36
Distribution of Price Duration in Core CPI, 2009–13



Source: EPG, MAS estimates

Chart 3.37
Number of Cars Aged Between 9 and 10 Years as at End of Period



[9] Similar studies on the characteristics of price adjustments in the US and Euro area include: i) Dhyne, E, Álvarez, L J, Le Bihan, H, Veronese, G, Dias, D, Hoffmann, J, Jonker, N, Lünnemann, P, Rumler, F and Vilmunen, J (2006), "Price Changes in the Euro Area and the United States: Some Facts from Individual Consumer Price Data", *Journal of Economic Perspectives*, Vol. 20(2), pp. 171–192; and ii) Klenow, P J and Kryvtsov, O (2008), "State-Dependent or Time-Dependent Pricing: Does It Matter for Recent US Inflation?", *The Quarterly Journal of Economics*, Vol. 123(3), pp. 863–904. The relatively short price duration for Singapore could be due to the more aggregated price data used compared to other studies.

… while the growth in imputed rentals will likely continue to moderate gradually.

Residential property rental increases are likely to slow further, particularly for the private segment, as foreign labour inflows ease and a large number of new housing completions come on-stream. However, rental demand for the more affordable HDB flats should stay resilient, supporting a moderate rise in HDB rentals. On balance, imputed rentals are expected to increase more gradually going forward, and add around 0.5% point to overall inflation in 2014, compared to an average of 1.3% points over the past three years.

Core and overall inflation will rise in the next few quarters before tapering towards the end of 2014.

Sequential core price increases are expected to pick up to slightly above their historical average over the next few months, as domestic cost pressures manifest more prominently. (Chart 3.38) Coupled with the low base in the past year, core inflation will rise on a year-ago basis to reach around 2.5% in Q2 and Q3 2014. (Chart 3.39) Towards the end of next year, it should ease as base effects become more favourable.

Overall CPI inflation, however, will be volatile due to possible fluctuations in car prices. On a sequential basis, it is projected to remain elevated until Q1 2014, before decelerating rapidly thereafter. On a y-o-y basis, it is expected to reach around 3.5% in Q2 2014 on account of the exceptionally low base a year ago, when COE premiums corrected significantly. It could then ease to below 2% in Q4.

For the year as a whole, MAS Core Inflation is anticipated to rise from 1.5–2% in 2013 to 2–3% in 2014, while CPI-All Items inflation is projected to be 2.5–3% in 2013 and 2–3% in 2014. Imputed rentals on owner-occupied accommodation and cars will together account for around half and a third of CPI-All items inflation in 2013 and 2014 respectively. (Chart 3.40) Services fees will contribute around one-third to overall inflation in both years, and commodity-related items will make up less than a quarter.

Chart 3.38
Sequential Q-O-Q Inflation Forecasts

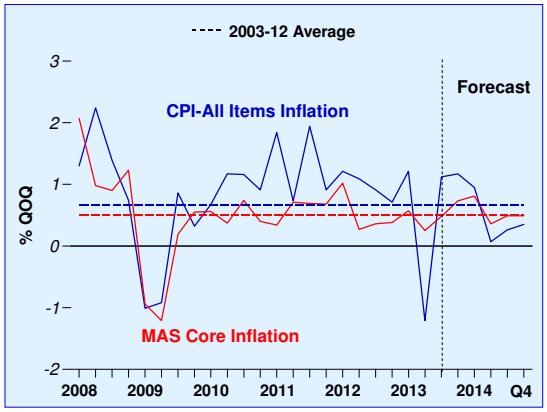


Chart 3.39
Y-O-Y Inflation Forecasts

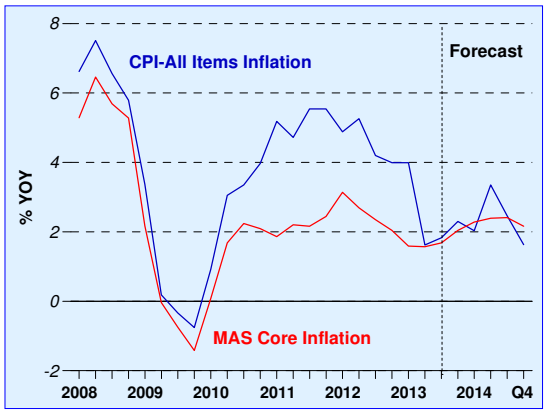
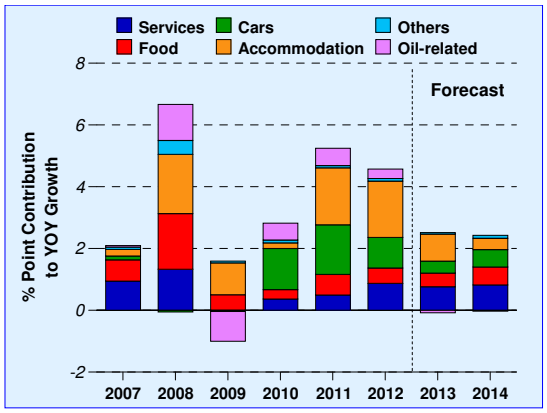


Chart 3.40
Contribution to CPI-All Items Inflation



Special Features

Special Feature A

Enhancing Surveillance of the Singapore Economy: The Nowcasting Approach

Introduction and Motivation

Real-time policy analysis and formulation depends critically on an accurate and timely reading of the evolving state of the economy. At present, EPG employs a suite of approaches for ongoing surveillance of the Singapore economy. As shown in Chart 1, these approaches can be broadly classified as either model-based or spreadsheet-based. Macroeconometric models such as the Monetary Model of Singapore (MMS) and the Satellite Model of Singapore (SMS), which were featured in previous *Reviews*, fall into the first category, providing economy-wide perspectives of the interactions between aggregate demand, supply, and prices in a consistent framework.

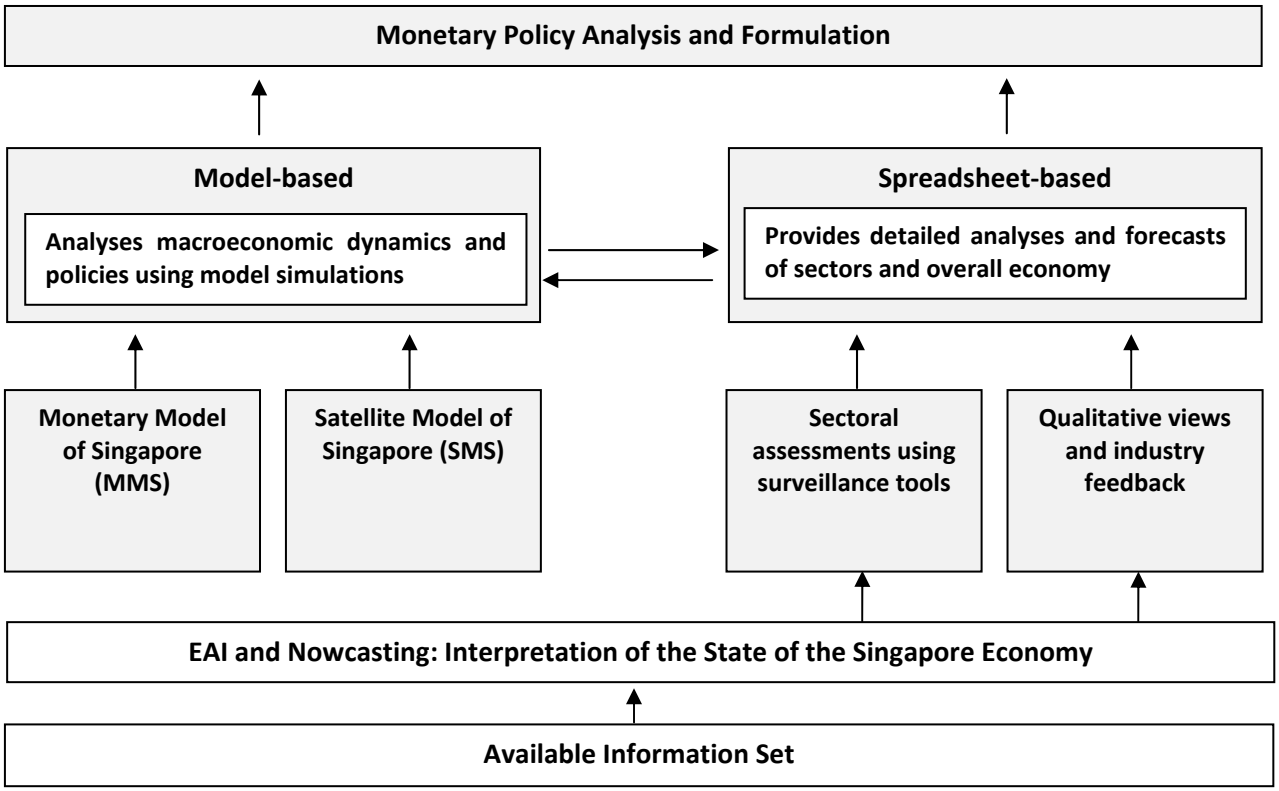
In comparison, the spreadsheet approach focuses on a detailed analysis of current sectoral developments and projections of short-term trends. Apart from monitoring a large number of relevant indicators, the sectoral analysis is supported by qualitative assessments and feedback gathered from industry players, financial institutions and other government agencies. In addition, EPG uses industry-specific tools that serve as valuable inputs to the surveillance and forecasting process. For instance, the Electronics Leading Indicator (ELI) index was developed to help predict the state of the domestic electronics manufacturing industry. Another surveillance tool is EPG's Economic Activity Index (EAI), introduced in the October 2010 *Review*. The EAI is a monthly composite index of coincident economic series, providing useful information on monthly developments within any given quarter.

However, a specific impediment to timely surveillance of the economy has been lags in the collation and publication of essential economic data. In Singapore, the first comprehensive estimate of economic activity, the Gross Domestic Product (GDP), is released at least two to three weeks after the end of every quarter.

In the interim, policy-makers and analysts can look to a steady flow of higher frequency—monthly or weekly—indicators as more timely gauges of current economic conditions. These typically include "hard" data such as industrial production, exports and retail sales, as well as "soft" indicators such as consumer and business surveys, especially the widely monitored Purchasing Managers' Index (PMI). The latter tend to be compiled and released more promptly than the "hard" data, although they only provide snapshots of households' and firms' present situation.

Nevertheless, the use of monthly indicators as a surveillance tool poses two difficulties. First, there is the issue of relating the intra-quarter information in such indicators to the quarterly GDP measure of overall activity. Second, there is a need to deal with the "jagged edge" structure of data flow due to non-synchronous publication lags. From a statistical point of view, a satisfactory solution would have to resolve both of these *mixed frequency* and *missing values* problems for the more up-to-date information in monthly indicators to be efficiently utilised.

Chart 1
Economic Surveillance Framework in EPG, MAS



This Special Feature presents an approach to overcoming these problems that has come to be known as "nowcasting", thus augmenting EPG's suite of macroeconomic surveillance tools. Economic nowcasting should be distinguished from the traditional activity of forecasting. It refers to an assessment of the state of the economy made during the reference quarter, while forecasting refers to an estimate made prior to the quarter.

In the next few sections, two alternative nowcasting models are presented and implemented. Following this, their relative efficacy in providing an early estimate of Singapore's economic performance is evaluated in a pseudo real-time context, and an attempt is made to see whether combining the approaches results in more accurate nowcasts.

Alternative Nowcasting Models

Until recently, the main approach to nowcasting has been based on the econometric estimation of "bridge" equations (Baffigi, Golinelli and Parigi, 2004). As its name suggests, a bridge equation entails the specification of a dynamic relation between changes in quarterly GDP and the corresponding movements in a plethora of monthly time series. Such an approach aims to bridge the gap between the information content of the higher frequency indicators and the delayed (but more complete) national accounts data. Nonetheless, the estimation of bridge equations does not entail the presumption that the relationship between GDP and the monthly indicators is causal or behavioural—the only requirement is that the predictor variables have strong explanatory power. On this basis, a general empirical form is preferred when specifying the bridge equation, as in the autoregressive distributed lag (ARDL) model:

$$\Delta y_t^Q = \mu + \sum_{k=1}^{\ell} \phi_k \Delta y_{t-k}^Q + \sum_{i=1}^{q} \sum_{k=0}^{\ell} \varphi_{ik} \Delta x_{it-k}^Q + \varepsilon_t \quad (1)$$

In this equation, the change in quarterly GDP (Δy_t^Q) is regressed on lags of itself and the contemporaneous and lagged values of a carefully selected set of time-aggregated monthly indicators (Δx_t^Q). In real-time nowcasting, these regressors are obtained using the known monthly values together with projections from Box-Jenkins (or ARIMA) models for data that has yet to be released.

More recently, the related fields of forecasting and nowcasting have been revolutionised by the rediscovery of factor models, which exploit the information in a large number of economic variables for prediction purposes.[1] The second approach employed in this Special Feature for nowcasting the Singapore economy is based on such a model, albeit the more parsimonious variant proposed by Mariano and Murasawa (2003). The point of departure in their approach is the static one-factor model given by:

$$\begin{pmatrix} \Delta y_t^M \\ \Delta x_t^M \end{pmatrix} = \begin{pmatrix} \mu^y \\ \mu^x \end{pmatrix} + \begin{pmatrix} \beta^y \\ \beta^x \end{pmatrix} f_t + \begin{pmatrix} u_t^y \\ u_t^x \end{pmatrix} \qquad (2)$$

where y_t^M is a latent variable associated with monthly GDP and x_t^M is a vector of variables observed every month. The common factor driving the co-movements in these variables, f_t, is modelled as an autoregressive process while the idiosyncratic disturbance terms in u_t^y and u_t^x are assumed to be uncorrelated with each other.

If monthly observations of GDP were available, the nowcasting model above reduces to a standard factor model. Hence, known and projected values of the monthly indicators can be used to nowcast current quarter GDP growth. However, in practice, y_t^M is unobservable and only y_t^Q is observed every third month. To circumvent this, Mariano and Murasawa (2003) made use of the following accounting identity linking monthly to quarterly GDP.[2]

$$y_t^Q \equiv \frac{1}{3}\left(y_t^M + y_{t-1}^M + y_{t-2}^M\right) \qquad (3)$$

Taking three-period differences of y_t^Q results in:

$$\Delta y_t^Q = \frac{1}{3}\Delta y_t^M + \frac{2}{3}\Delta y_{t-1}^M + \Delta y_{t-2}^M + \frac{2}{3}\Delta y_{t-3}^M + \frac{1}{3}\Delta y_{t-4}^M \qquad (4)$$

Substituting the equation for Δy_t^M in (2) into (4) yields the following dynamic factor model:

$$\begin{pmatrix} \Delta y_t^Q \\ \Delta x_t^M \end{pmatrix} = \begin{pmatrix} 3\mu^y \\ \mu^x \end{pmatrix} + \begin{pmatrix} \beta^y\left(\frac{1}{3}f_t + \frac{2}{3}f_{t-1} + f_{t-2} + \frac{2}{3}f_{t-3} + \frac{1}{3}f_{t-4}\right) \\ \beta^x f_t \end{pmatrix} + \begin{pmatrix} \frac{1}{3}u_t^y + \frac{2}{3}u_{t-1}^y + u_{t-2}^y + \frac{2}{3}u_{t-3}^y + \frac{1}{3}u_{t-4}^y \\ u_t^x \end{pmatrix} \qquad (5)$$

Unlike (2), this model can be estimated by the Kalman filter using the observed data. Thus, the dynamic factor model provides an elegant solution to the mixed frequency problem, essentially by treating the change in quarterly GDP as distributed lags of the (monthly) common factor and disturbance term. At the same time, the missing values of the monthly indicators can be replaced by forecasts within the dynamic factor framework.

Table 1
Monthly Indicators for Nowcasting

Economic Indicator	Marginal $\bar{R}^2$	Publication Lag	Time Series Model
Index of Industrial Production (IIP)	0.36	26 days	ARIMA(0,1,|1,4|)
Non-Oil Domestic Exports (NODX)	0.04	17 days	ARIMA(1,1,|1,3|)
Food and Beverage Receipts (F&B)	0.10	45 days	ARIMA(1,1,1)
Manufacturing Purchasing Managers' Index (PMI)	0.03	3 days	ARIMA(1,0,0)
Construction Certified Progress Payments (CP)	0.01	31–37 days	ARIMA(1,1,2)

[1] See Stock and Watson (2002) and Angelini, Bańbura and Rünstler (2010). An application to forecasting Singapore's economy is found in Chow and Choy (2009).

[2] Quarterly GDP is expressed as the average instead of the sum of monthly GDP to make it comparable with the monthly indicators used in the empirical model.

Indicator Selection

In deciding on the monthly indicators (the x_t^M's) to be used in the nowcasting models, three criteria are emphasised: relevance, timeliness and correlation. First, the indicators chosen should be reasonable proxies for the production or sale of some type of goods or services in Singapore; otherwise, there would be no economic rationale for using them to nowcast aggregate output. Applying this criterion produced an initial list of 40 potential indicators covering a wide range of macroeconomic phenomena and economic sectors. They include real activity measures such as industrial production indices, trade aggregates, sales and employment data, as well as survey indicators and financial series.

Second, the requirement of timeliness dictates that delays in releasing the selected indicators should not be so long as to render them useless for nowcasting. Two important series used to compile GDP through the income approach, employment and wages, are therefore ruled out, as both are subject to long publication lags.

The third criterion of strong correlation is implemented in the following way. Initially,pairwise correlation coefficients of the individual indicators with quarterly real GDP are computed. Not surprisingly, "hard" indicators such as non-oil domestic exports and the overall industrial production index rank highly on this score. Accordingly, the quarter-on-quarter changes in these two variables are incorporated into a static regression with the corresponding growth in GDP as the dependent variable and the remaining candidate variables are added, one at a time. The indicator that produces the largest increase in the $\bar{R}^2$ statistic is then selected. This process is repeated until the incremental change in the $\bar{R}^2$ value as a result of adding a further indicator becomes insignificant.

Based on the selection criteria, a total of five monthly indicators are chosen. These are listed in Table 1 together with their marginal explanatory power and publication lags. The number of indicators is deliberately kept low to preserve degrees of freedom and to avoid multicollinearity amongst the chosen indicators.

Estimation of Bridge Equation and Factor Model

The shortest series among the five indicators is the manufacturing PMI, which started from Q1 1999. Consequently, the period from Q1 1999 to Q1 2013 is used to estimate the quarterly bridge equation, making for a total of 57 observations. Seasonal adjustment is performed where necessary and all the data series are transformed into logarithms. The number of lags in the bridge equation is chosen through a general-to-specific procedure, and the final specification is validated by the usual diagnostic tests. The estimated bridge equation is:

$$\Delta y_t^Q = \underset{(-0.36)}{-0.03} + \underset{(1.32)}{0.07}\,\Delta y_{t-1}^Q + \underset{(14.5)}{0.25}\,\Delta IIP_t^Q + \underset{(3.92)}{0.11}\,\Delta NODX_t^Q + \underset{(0.44)}{0.01}\,PMI_t^Q + \underset{(5.28)}{0.14}\,\Delta F\&B_t^Q + \underset{(2.36)}{0.05}\,\Delta CP_t^Q$$

$$\bar{R}^2 = 0.89 \quad S.E. = 0.008 \quad DW = 1.88$$

In this equation, the industrial production index and non-oil domestic exports are both statistically significant, as seen from the *t*-statistics shown in parentheses. This may help to explain why the PMI is not, as all three series tend to be highly correlated. Of the remaining variables, food and beverage receipts appear to capture services output well, while certified payments is an obvious proxy for construction activity. Overall, the selected variables have good explanatory power for GDP growth, as shown by the very high $\bar{R}^2$ value.

The dynamic factor model in Equation (5) is estimated for the same sample period from Q1 1999 to Q1 2013 by including the five monthly variables in the vector x_t^M, together with y_t^Q, the quarterly GDP series. The Akaike Information Criteria (AIC) is used to select an optimal lag length of two for the dynamic factor structure. In the estimated factor model, the loading coefficients ($\hat{\beta}^y$ and $\hat{\beta}^x$) have the right signs and are mostly significant.

Model Comparison and Combination

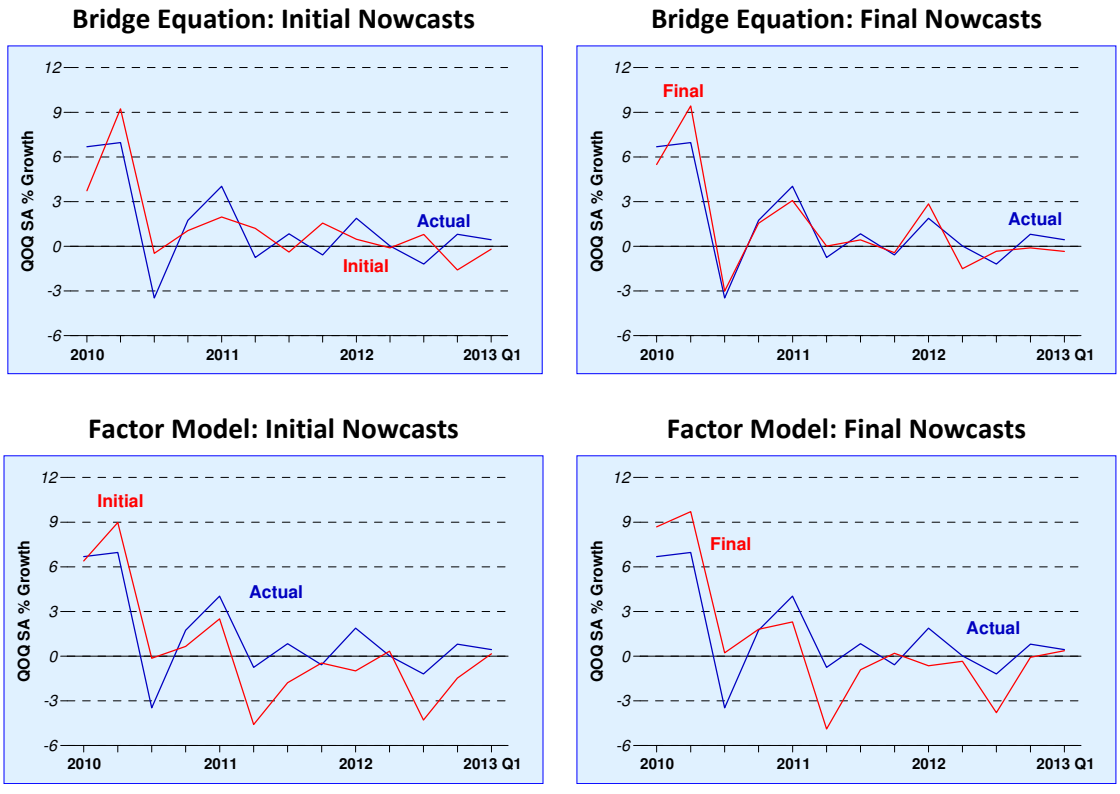
In this section, the two alternative approaches to nowcasting Singapore's current quarter-on-quarter GDP growth, namely, the bridge equation and the dynamic factor model, are compared. To this end, both models are estimated over a shorter sample period from Q1 1999 – Q4 2009, and nowcasts are generated over the period Q1 2010 – Q1 2013. The real-time context of nowcasting is replicated by re-estimating the models recursively at each quarter using the latest available data. However, the functional form of the bridge equation is kept unchanged and two autoregressive lags are maintained in the factor model.

As mentioned earlier, missing values of the monthly indicators within a quarter need to be filled in by forecasts before estimating the bridge equation. The time series models employed for this purpose are reported in Table 1. These are relatively low-order ARIMA models fitted to the logarithms of the respective series. In the case of the factor model, the unknown observations are automatically replaced by projections.

For each quarter, two sets of nowcasts are generated. The first is produced towards the end of the second month in the reference quarter, when one month's information on three of the indicators, viz., industrial production, exports and PMI, become available. This is referred to as the 'initial' nowcast. The second nowcast, made at the end of the quarter, adds one month of data for the food and beverage index and certified payments, as well as a second month of observations on the other series. This is referred to as the 'final' nowcast. In total, 26 pseudo-nowcasts of Singapore's quarterly GDP growth are generated from each model, with one-half of them coming from the initial round and the other half from the final cycle.

These point nowcasts are plotted in Chart 2 alongside the actual GDP outcomes. Several conclusions emerge from comparing the initial and final nowcasts generated by the bridge and factor models.

Chart 2
Real-time Performance of Nowcasting Models, Q1 2010 – Q1 2013



First, it is evident that both approaches produce less precise *ex ante* initial nowcasts of GDP growth, when the information set is limited to a single month of data. Second, the initial nowcasts from the bridge equation are more accurate in terms of being closer to observed outturns, while the factor model tends to underestimate actual quarterly GDP growth. Nonetheless, the latter generally produces more reliable predictions of the *directional changes* in Singapore's real GDP growth from one quarter to the next, suggesting that the factor model may be better at detecting turning points in the business cycle.

Third, the bridge equation also performs better than the factor model with respect to the final nowcasts. Indeed, the out-of-sample nowcasts from the model are able to track the pattern of rather volatile gyrations in GDP growth, except for the most recent period. Table 2 reports the root mean squared errors (RMSEs) of the initial and final nowcasts. At just over 1%, the RMSE of the bridge equation is less than half that of the factor model, and is also relatively small when compared to the mean variation in quarterly GDP growth, which is about 3%.

In addition, the reduction in RMSE obtained by moving from the initial to the final nowcasts in the bridge equation is of an order of magnitude around one percentage point. This represents a substantial improvement and suggests that the information content in the second month of any given quarter is crucial for the accuracy of the nowcasts.

Following the forecasting literature, a combination of nowcasts from the bridge equation and factor model is also created by taking their simple average.[3] This procedure generates a sequence of predictions which performs better in the initial nowcasting stage than the two underlying approaches, as shown in Table 2. However, the combination strategy is not able to improve on the bridge equation with regard to the final nowcasts, suggesting that the bridge equation summarises well the information in the high frequency indicators.

In sum, the bridge equation and dynamic factor model can be jointly used to generate combination nowcasts at the earlier stage when only one month of data is available. When an additional month of data is available, the nowcasts from the bridge equation are more reliable.

Table 2
Comparison of Nowcast Accuracy* (%)

Model	Initial	Final
Bridge	1.95	1.07
Factor	2.21	2.21
Combination	1.70	1.26

* Figures are the average root mean squared errors in percent.

Sum-up

This Special Feature shows that nowcasting models can be a valuable tool to help guide economic policy-makers and analysts to an informed view of the current state of the economy. The five monthly economic variables selected for the pseudo real-time nowcasting exercises are found to contain useful cyclical information on current growth in Singapore, by virtue of either their robust correlation with aggregate activity, or their spillover effects on the broader economy. Hence, the two nowcasting models can be utilised on their own, or in combination, to produce quantitative GDP growth projections on a timely basis, pending the release of official data. Such efforts will further add to and enhance EPG's economic surveillance and forecasting toolkit, and form part of our pluralistic approach towards monetary policy analysis and formulation.

[3] A weighted average using the models' respective RMSEs as weights did not produce qualitatively different results.

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Special Feature B

Toward a New Understanding of Monetary Policy

by Benjamin M. Friedman[1]

Introduction and Motivation

The financial crisis that struck most of the world's advanced industrialised economies during 2007–09 has presented a major challenge for economists concerned with economic fluctuations, and especially for those interested in the workings of monetary policy. By many measures, the crisis constituted the most significant macroeconomic event since World War II. Further, the origin of these events (as the label suggests) was squarely in the financial sector, and the policy actions that governments in many countries took in response, first during the crisis and then in the post-crisis recovery effort, importantly, involved monetary policy. Yet the models of monetary policy now commonly in use, both for teaching students in the field and for supporting policy-making within central banks, are not only incapable of incorporating the most widely accepted accounts of how this episode occurred, but incapable too of analysing the actions that monetary policy-makers took. As a result, the gap between the models and the world of monetary policy-making is now wider than at any time since the 1930s.

Today's standard macro-models typically include no financial sector variables other than a short-term interest rate and (perhaps) the quantity of "money". More importantly, these models do not allow for what happens in the financial arena to affect non-financial economic activity other than via "the" interest rate's role in intertemporal consumer choice, which may also be influenced by real money balances. The larger empirical models used by many central banks incorporate more detail, but the basic mechanism remains the same. Neither type of model offers any way to understand why the failure of a firm like Lehman Brothers in September 2008 would have had a meaningful effect on the economy, or why it mattered that governments in the United States and elsewhere acted vigorously to prevent other firms from failing. Nor do these models offer any explanation of why or how the unusual actions that central banks took—establishing special lending facilities for banks, purchasing targeted securities like commercial paper and residential mortgages, and providing forward guidance on the policy interest rate—would have any effect. According to the models, once the central bank's policy interest rate reaches the practical lower bound of zero, monetary policy simply has no further role to play.

To their credit, macroeconomists and others have reacted to the crisis with a profusion of new research efforts exploring the workings of financial intermediation and asset holding. Attention has focused in particular on the implications of a variety of frictions that intermediation inherently entails in any even moderately advanced economy. But there is no point of contact between most of this work and the standard workhorse models. Anyone seeking to understand how this new research fits into the canonical macroeconomic framework therefore sees two seemingly incompatible lines of thinking. Ironically, researchers seeking to establish the motivation for their work among more than a narrow audience of fellow specialists are able to appeal to what everyone has read in the

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newspapers, but not to what the field holds out as the accepted conceptual framework.

The most obvious example of this divide is the behaviour of central bank balance sheets, both during and in the aftermath of the crisis. Most central banks in the advanced economies responded to the crisis by rapidly expanding their balance sheets, purchasing assets in the open market and correspondingly issuing liabilities. The US Federal Reserve System and the Bank of England have increased their balance sheets by more than four-fold since the beginning of 2007, and the European Central Bank by nearly three-fold.

Moreover, this radical departure in central bank asset holding was not just a matter of total quantity; the character of the assets these central banks held changed as well. Traditionally, most of the assets that central banks hold have been obligations of their own governments, and within those, mostly short-term obligations. But during and in the wake of the crisis, most of the major central banks massively substituted loans to specific financial institutions and then privately-issued securities for their customary holdings. By mid-2010, residential mortgages represented nearly half of the Federal Reserve's entire portfolio; today, with the total balance sheet at $3.5 trillion, mortgages still constituted 35% of total assets.

Why did these central banks undertake such massive expansions of their asset holdings? And what reason did they have for doing so primarily via loans to banks and then purchases of assets like commercial paper and mortgages? Why should an informed economist have expected these actions to affect either the financial markets or, more importantly, non-financial activity? By what metric would one judge whether these actions were effective? Students educated to view the macroeconomy and the role of monetary policy through the standard models have no way even to begin to pursue any of these very natural questions. And the researchers who have pursued them have little way to connect their work to the conceptual frameworks that the standard models offer.

In addition, the huge increase in central bank asset holdings meant an equally huge increase in their outstanding liabilities. Students taught to view the macroeconomy through the lens of central bank (or "high-powered") money supply would presumably have expected not just an increase of a few percentage points in these economies' rates of inflation, but hyperinflation, perhaps even reminiscent of what occurred in Germany and Russia after World War I or in Hungary after World War II. Indeed, more than a few economists predicted just such a consequence of these extraordinary central bank actions. But no such increase in inflation has yet appeared, in any of these economies. To be sure, no one can preclude with certainty that hyperinflation, or something like it, may ensue some time somewhere. But even if inflation in these countries does pick up at some point, a response of several percentage points to this magnitude of increase in central bank liabilities, and only after a delay of more than half a decade, is widely at variance with the core implications of standard models relating prices to central bank money.

In this Special Feature, I introduce a small, workable model of monetary policy that expands the most familiar existing framework to incorporate the new monetary policy landscape.

A Conceptual Framework

The most familiar workhorse model of monetary policy macroeconomics today is the three-equation New Keynesian model consisting of an aggregate demand equation representing consumers' forward-looking intertemporal choice for a given interest rate, a Phillips curve representing the forward-looking behaviour of price-setters operating under some form of impediment to perfect price flexibility, and an equation representing the central bank's setting of a short-term nominal interest rate in response to observed movements of prices or output, or both. The problem with this model, for current purposes, is not so much that it is wrong but that it is incomplete. Once the central bank's policy interest rate has reached the zero lower bound, the model implicitly portrays monetary policy as impotent to undertake any further economic stimulus. It leaves no room even to consider the kinds of additional measures that many central banks undertook during and in the aftermath of the financial crisis.

The remedy, therefore, is not to discard this otherwise useful framework but to expand it, while nonetheless preserving, in so far as possible, its analytical advantages in terms of parsimony and compactness. The model's crucial lacuna, for purposes of representing the actions of central banks during this recent period and their effects on the non-financial economy, is the absence of any distinction between the interest rate that the central bank sets—the "policy interest rate"—and the interest rates at which households and firms regularly borrow and lend, and that therefore matter for their spending decisions, either as direct costs (if they are borrowers/investors) or as opportunity costs (if they are lenders/savers). The simple framework suggested here fills that gap by adding a two-equation supply-demand apparatus explicitly representing lenders' and borrowers' behaviour in the market for private sector obligations.

Two elements of the standard New Keynesian model suffice with no change: Price-setters set today's prices in response to the aggregate output of goods and services, and to their expectations of future prices. The central bank sets the policy interest rate in response to the difference between actual output and its target level of output (presumably the level that would deliver stable inflation) and to the difference between actual inflation and the target rate of inflation.

The third element of the standard model is necessary as well, although with an important change. Aggregate demand for goods and services depends on expected future output, as in the standard model, but also on the expected real interest rate derived from the nominal interest rate relevant to private sector spending decisions. The important distinction is that the nominal interest rate that matters for these decisions is not the policy interest rate, but some private sector rate instead.

Distinguishing between these two interest rates means abandoning the assumption, which has been commonplace in standard macroeconomic theory ever since the inception of the field, that all non-money assets are perfect substitutes. Most central banks normally conduct monetary policy by setting an overnight interest rate, or for some other very short maturity: in the US, the Fed funds rate (usually overnight transactions), in Europe the Euro overnight index average (EONIA), and in Japan the uncollateralised call loan rate (also mostly one-day loans). By contrast, the obligations that either households or firms issue to finance their spending, and likewise the instruments in which households invest their savings, are typically of much longer maturity, often measured in years rather than days.

Further, while the interest rates that central banks set for purposes of monetary policy are mostly for obligations that are implicitly guaranteed—often claims on banks' holdings of reserves at the central bank itself—private sector obligations are potentially subject to default. On grounds of both maturity and default risk, therefore, the obligations underlying the policy interest rate and the constellation of private sector rates respectively are not perfect substitutes so long as investors are risk-averse. Moreover, the difference, or spread, between the two interest rates can vary over time even if investors' risk aversion is constant.

It therefore remains to determine the private interest rate, given the policy interest rate set by the central bank. Two further relationships, representing supply and demand in the market for private securities, suffice for this purpose: households and firms borrow in relation to how much they expect to spend (borrowing more when they expect to spend more) and, importantly, to how much it costs them (borrowing less when the expected real interest rate—the nominal interest rate on the securities they issue minus the inflation they expect over the securities' life—is higher). Correspondingly, private investors, who likewise include households and firms within the economy but perhaps also financial intermediaries as well as foreign investors, lend to households and firms in relation to their expectations of the borrowers' future income levels (lending more as they expect borrowers to earn more and therefore be more creditworthy) and, importantly, to the difference between the return they expect on private securities compared to returns on alternative investments (buying more private securities when that difference is greater). Further, for at least some private investors such as banks, a plausible alternative investment is in assets that yield the policy interest rate. Hence the policy interest rate that the central bank is setting today matters, but so does the policy interest rate that investors expect the central bank to set over the remaining life of the private securities.

The volume of private securities issued by households and firms must equal the volume of these securities bought. In the absence of purchases by the central bank, this would refer to the volume bought by private sector investors. But when the central bank also buys privately issued securities—as many central banks have done in response to the recent crisis—then market clearing instead requires that the volume of these securities issued by private borrowers equal the volume bought by private investors plus the volume bought by the central bank.

Two Examples from Recent Central Bank Policy Actions

Figures 1 and 2 illustrate the workings of this expanded model's portrayal of an adverse shock to financial intermediation, as occurred during the recent crisis, followed by policy actions of the kind taken by many central banks. The downward-sloping line labelled IS in Figures 1(b) and 2(b) shows the relationship between spending on goods and services and the private sector interest rate, conditional on given expectations of future output and inflation. The downward-sloping line in Figures 1(a) and 2(a), labelled C_S, depicts households' and firms' supply of private securities, as a function of the interest rate on these securities and for given expectations of future output and inflation.

The solid upward-sloping line in Figures 1(a) and 2(a), labelled $C_D + C_{CB}$, correspondingly depicts private investors' demand for these securities, as a function of the interest rate they bear, given expectations of future incomes, the value of the policy interest rate set by the central bank today and expectations of the policy interest rate in the future, plus a given level of purchases of these securities by the central bank. Figures 1 and 2 arbitrarily portray the initial supply-demand equilibrium in the asset market in the left-hand panel, labelled point A, at the private-sector interest rate level that, when transposed to the right-hand panel, intersects with the IS line at the full-employment value, labelled y*.

Effect of a Central Bank Asset Purchase

Figure 1(a)

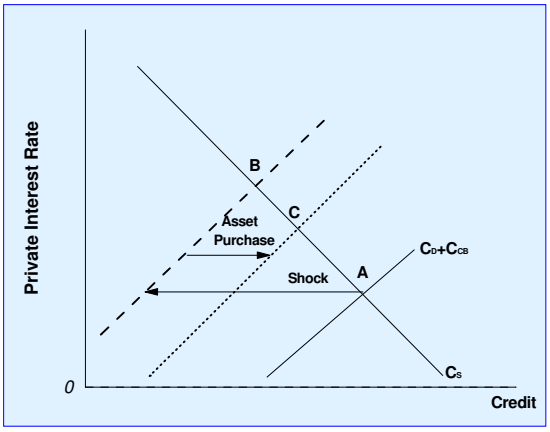
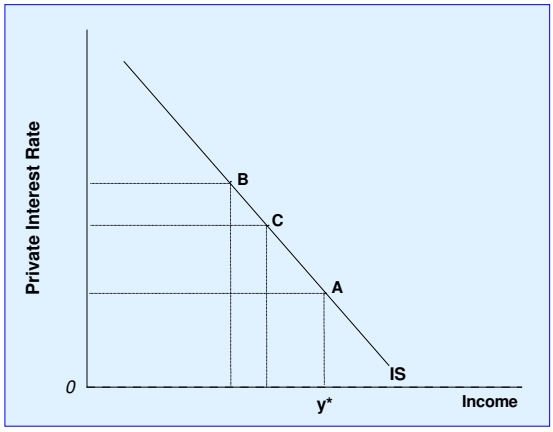


Figure 1(b)



Effect of Forward Guidance on the Policy Interest Rate

Figure 2(a)

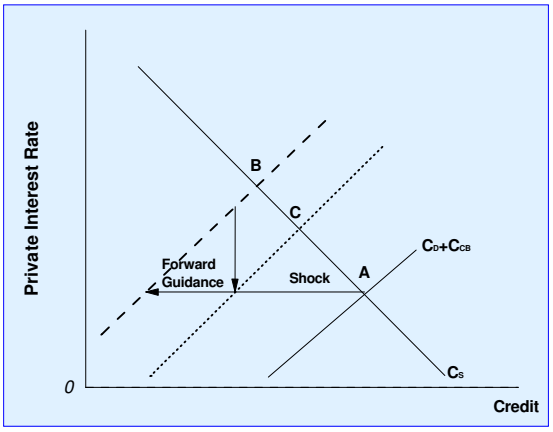
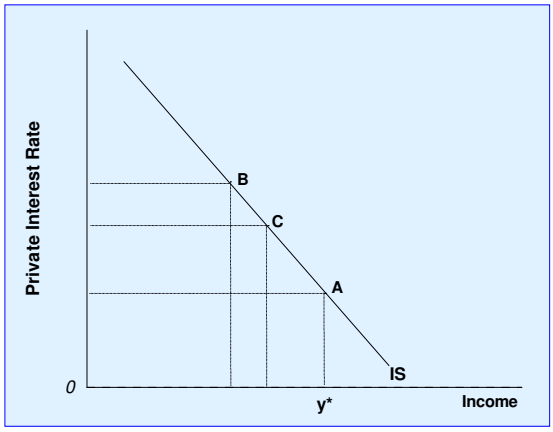


Figure 2(b)



The story told in each figure begins from the kind of adverse shock that figured prominently in the recent financial crisis: a decline in house prices, or realised loan losses that deplete lenders' capital, or even simply investors' concern that the economy may be heading into a slow period in which private sector borrowers' creditworthiness will be under stress. Any or all of these events reduces private investors' demand for private-sector securities and therefore, all else equal, shifts the demand curve backward to the respective broken lines in Figures 1(a) and 2(a). The result in each case is a higher market-clearing private-sector interest rate, and therefore a reduced value of income, at the respective points labelled B. Under normal circumstances, when movements of the policy interest rate are not limited by the zero lower bound, the central bank presumably would choose to reduce its policy interest rate. Doing so would shift the demand for private-sector securities so as to reduce the private interest rate as well, and thereby restore output to its original level. For purposes of thinking about the 2007–09 crisis, however, the policy interest rate had reached the zero lower bound and so further cuts were not an available option.

Many central banks therefore turned to large-scale purchases of private-sector securities. Figure 1 illustrates the effect of such purchases following an adverse shock (again, from an erosion of borrowers' creditworthiness, or a depletion of lenders' capital) on the demand for private securities. Here the central bank's purchases are a straightforward addition to the total market demand for these securities, and so they shift the demand curve outward to the dotted line in Figure 1(a), thereby lowering the market-clearing private interest rate for given expectations and a given (presumably zero) policy interest rate. The corresponding result in

Figure 1(b) is an increase in output. Both intersections are labelled as point C. Figure 1 illustrates the more realistic case in which the central bank's purchases are not sufficient to restore output to the initial full-employment level.

A second policy tool to which some central banks turned following the crisis, in the absence of the ability to cut the policy interest rate any further, was forward guidance in the form of public statements indicating policy-makers' intentions for their future actions. The Federal Reserve's Open Market Committee (FOMC) reduced its target for the Fed funds rate to 0–0.25% in December 2008. At the same time, it publicly stated that "the Committee anticipates that weak economic conditions are likely to warrant exceptionally low levels of the Fed funds rate for some time." Apart from a change in wording from "some time" to "an extended period," the Committee repeated the same public statement after each meeting that it held through June 2011. From August 2011 on, the FOMC switched to a more explicit time frame in its forward guidance, but extended the specific horizon several times. By late 2012, the Committee was indicating the anticipation of low short-term interest rates "at least through mid-2015." In December 2012, the FOMC shifted to a new form of statement explicitly conditioned on observed and forecast economic outcomes: "the Committee … currently anticipates that this exceptionally low range for the Fed funds rate will be appropriate at least as long as the unemployment rate remains above 6.5%, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2% longer-run goal, and longer-term inflation expectations continue to be well anchored."

Figure 2 illustrates the working of this kind of forward guidance on the future policy interest rate. Reducing the policy rate that investors expect in the future shifts the demand curve for private-sector securities downward, again lowering the market-clearing private interest rate, as indicated by the dotted line in Figure 2(a), and correspondingly raising output in Figure 2(b), in each case to the point labelled C. (With the linear demand curve drawn here, the downward movement due to a lower expected future policy rate in Figure 2 is visually indistinguishable from the outward movement due to greater central bank purchases in Figure 1; but the movement in the demand curve due to forward guidance is vertical, not horizontal.) Here too the figure illustrates the case in which the effect of the central bank's forward guidance is not sufficient to restore income to the initial level, presumably because of the zero lower bound on the policy interest rate.

Sum-up

The practice of monetary policy, as carried out by the central banks of the advanced industrialised economies, has changed since the Global Financial Crisis. The analysis of monetary policy needs to change as well. Monetary policy is no longer merely a matter of the central bank setting some short-term nominal interest rate. Once they had cut their policy interest rates to the effective lower bound, many central banks pursued further measures like targeted asset purchases and forward guidance on the policy rate itself, in both cases intended to reduce longer-term interest rates for private sector borrowers and thereby stimulate non-financial economic activity. The analysis of monetary policy needs to be able to accommodate these monetary policy actions. It is no longer sufficient to represent the central bank as having a single policy tool at its disposal.

The point is a fundamental one in two ways. First, for decades the common theoretical understanding has been that a central bank has only one independent instrument at its disposal. It can set the quantity of its outstanding liabilities, or it can set their market price—that is, the interest rate at which they are exchanged—but it cannot independently control both. In modern times, with brief exceptions, most central banks have chosen to carry out monetary policy by setting the interest rate corresponding to banks' holdings of reserves at the central bank. In their response to the 2007–09 crisis, most of the major central banks initially used the interest rate instrument and then, once the policy interest rate had reached the lower bound, turned to the quantity instrument. Viewed from this perspective, in each phase of the response to the crisis the central bank was, as in the traditional understanding, still using only one monetary policy instrument at a time.

But the ongoing discussion of monetary policy in the post-crisis recovery has made clear that, under arrangements now in place in most of the high-income economies—specifically, with the central bank able to pay interest on banks' reserve balances—monetary policy-makers need not deploy only one of these instruments at a time. The central bank's ability to choose what quantity of assets to purchase (with a consequent increase in its liabilities), as many central banks did during and following the crisis, is not merely an artifact of the policy interest rate being at the lower bound. Paying interest on reserves effectively establishes a floor to short-term market interest rates. Importantly, it does so without the central bank needing to carry out conventional open market operations; indeed, it can even do so while the central bank is changing the quantity of its assets and liabilities in the opposite direction to what would correspond, under the traditional theory, to whatever change in the policy interest rate it is implementing at the same time. Given today's institutions, therefore, the central bank can choose both the quantity of its outstanding liabilities and their market price (that is, the interest rate at which they trade). Monetary policy has not one independent instrument but two.

That said, the movement of central banks' liabilities has been, in most cases, merely the passive (and, for macroeconomic purposes, mostly irrelevant) counterpart of the changes central banks have made in their asset holdings, and this is a second way in which the monetary policy response to the 2007–09 crisis has represented a fundamental departure from the typical conceptual framework. Policy-makers' decisions, and whatever economic effects have ensued, have been a matter of the asset side of central banks' balance sheets, not their liabilities.

Numerous researchers have been actively engaged in seeking to understand, and where possible to quantify, the working of monetary policy within this new and very different theoretical framework. The necessarily simplified conceptual framework that macroeconomists teach to students of the subject—and to which they turn in their own short-hand intuitive thinking—should incorporate this changed monetary policy landscape as well. The simple framework set forth here provides a way of doing so.

Statistical Appendix

TABLE 1: REAL GDP GROWTH by Sector

Period	Total	Manu-facturing	Finance & Insur-ance	Business Services	Const-ruction	Wholesale & Retail Trade	Accom & Food Services	Transpor-tation & Storage	Info & Comms	Total	Manu-facturing	Finance & Insur-ance	Business Services	Const-ruction	Wholesale & Retail Trade	Accom & Food Services	Transpor-tation & Storage	Info & Comms
	Year-on-Year % Change									Seasonally-adjusted Quarter-on-Quarter Annualised % Change								
2011	5.2	7.8	8.9	3.0	6.3	1.6	8.2	3.8	3.6									
2012	1.3	0.1	0.5	3.9	8.2	-0.7	2.8	2.7	2.6									
2012 Q1	1.5	-1.2	0.9	3.6	9.4	-0.3	4.2	4.3	3.8	7.8	13.8	14.8	4.8	10.5	-10.4	7.1	5.9	6.9
Q2	2.3	4.1	0.7	4.8	11.4	-0.7	2.7	1.7	1.8	0.1	-1.0	0.2	4.0	15.0	-0.6	2.1	4.8	1.4
Q3	0.0	-1.4	-2.9	4.0	6.7	-0.2	2.1	1.7	1.1	-4.6	-16.6	0.2	2.6	3.2	2.1	-0.7	-0.5	5.5
Q4	1.5	-1.1	3.3	3.3	5.8	-1.5	2.2	3.2	3.8	3.3	3.1	-1.3	2.1	-3.9	2.3	0.8	2.6	2.0
2013 Q1	0.2	-6.7	10.6	3.7	5.8	0.2	2.6	-0.9	3.1	1.7	-12.1	51.2	6.0	10.3	-2.6	8.2	-9.8	3.4
Q2	3.8	0.2	13.1	3.7	5.1	5.6	3.2	2.5	3.5	15.5	32.1	9.2	4.0	11.2	22.1	4.4	19.6	3.0

Source: Singapore Department of Statistics

TABLE 2: REAL GDP GROWTH by Expenditure

Year-on-Year % Change

Period	Total Demand	Domestic Demand							Exports of Goods & Services	Imports of Goods & Services
		Total	Consumption			Gross Fixed Capital Formation				
			Total	Private	Public	Total	Private	Public		
2011	4.2	6.5	3.7	4.6	0.5	6.3	5.2	12.3	3.5	3.6
2012	2.4	9.7	0.9	2.2	-3.6	6.6	6.9	5.3	0.3	3.2
2012 Q1	4.3	10.3	2.1	4.7	-4.4	23.7	30.2	-0.7	2.6	5.9
Q2	3.1	4.5	1.1	1.6	-2.0	3.7	3.0	7.8	2.7	3.5
Q3	-0.2	6.3	-0.1	0.5	-2.4	-3.8	-5.5	5.9	-2.1	0.0
Q4	2.6	17.7	0.7	2.0	-4.6	5.8	5.2	9.2	-1.9	3.5
2013 Q1	-1.7	5.8	4.7	1.3	14.2	-5.8	-7.3	1.6	-4.1	-2.4
Q2	3.1	3.4	4.1	2.7	12.2	-3.8	-4.1	-2.4	3.1	2.9

Source: Singapore Department of Statistics

TABLE 3: LABOUR MARKET (I)

Year-on-Year % Change

Period	Average Monthly Earnings	Labour Productivity									Unit Labour Cost	
		Total	Manufacturing	Construction	Wholesale & Retail Trade	Accom & Food Services	Transportation & Storage	Information & Communications	Finance & Insurance	Business Services	Overall Economy	Manufacturing
2011	6.0	1.3	7.9	3.3	-2.0	2.2	0.2	-6.7	1.3	-2.4	3.5	-1.7
2012	2.3	-2.6	-1.4	-0.2	-3.5	-1.0	-0.8	-0.7	-3.7	-1.0	4.1	3.2
2012 Q1	0.9	-2.2	-1.8	2.7	-3.6	-0.1	0.9	-2.7	-4.3	-1.2	1.9	3.3
Q2	2.8	-1.6	2.5	3.0	-3.7	-1.4	-1.6	-2.2	-3.5	0.1	3.6	-0.9
Q3	3.1	-3.8	-3.2	-2.4	-2.7	-1.2	-1.6	-0.5	-6.4	-1.1	5.8	5.3
Q4	2.5	-2.5	-3.1	-3.5	-3.9	-1.4	-0.9	2.8	-0.4	-1.9	5.2	4.7
2013 Q1	4.9	-3.8	-8.7	-3.6	-2.0	-1.6	-5.0	1.5	6.6	-1.5	8.5	12.7
Q2	4.0	-0.3	-1.1	-3.7	3.5	-2.2	-2.4	-2.0	10.0	-1.9	3.9	5.1

Note: Labour productivity figures are based on SSIC 2010 classification.

Source: Singapore Department of Statistics/Central Provident Fund Board

TABLE 4: LABOUR MARKET (II)

Thousand

Period	Changes in Employment										
	Total	Manufacturing	Construction	Wholesale & Retail Trade	Accom & Food Services	Transportation & Storage	Information & Communications	Finance & Insurance	Business Services	Other Services	Others
2011	122.6	3.4	22.0	15.9	9.2	6.7	8.0	10.9	21.0	24.3	1.1
2012	129.1	11.4	39.1	10.1	8.0	8.6	0.9	6.5	22.5	20.4	1.5
2012 Q1	27.2	2.0	8.7	0.7	-0.5	2.2	-0.1	0.0	4.8	8.8	0.7
Q2	31.7	4.7	9.7	2.0	-0.9	2.2	0.5	1.8	8.7	3.0	0.0
Q3	26.2	3.7	9.7	0.1	1.5	1.5	0.4	2.9	4.9	1.4	0.1
Q4	44.0	0.9	11.1	7.3	7.9	2.8	0.1	1.7	4.0	7.3	0.8
2013 Q1	28.9	-1.2	8.4	2.6	-0.1	2.5	1.5	1.9	6.3	6.3	0.5
Q2	33.7	2.3	8.5	-1.1	2.2	3.6	4.6	-1.3	10.0	5.0	0.2

Note: Changes in employment numbers are based on SSIC 2010 classification.

Source: Ministry of Manpower

TABLE 5: EXTERNAL TRADE

Year-on-Year % Change

Period	Total Trade	Exports	Domestic Exports					Re-exports	Imports	Exports	Domestic Exports			Re-exports	Imports
			Total	Oil	Non-oil						Total	Oil	Non-oil		
					Total	Electronics	Non-electronics								
	At Current Prices									At 2012 Prices					
2011	8.0	7.5	13.2	38.6	2.2	-3.8	5.8	1.4	8.6	3.1	6.4	8.2	5.3	-0.6	1.5
2012	1.1	-0.9	1.3	2.8	0.5	-4.1	3.0	-3.5	3.2	-0.5	1.6	0.4	2.3	-2.9	3.2
2012 Q1	7.5	4.8	10.0	17.4	6.0	3.5	7.4	-1.3	10.5	1.4	4.9	1.1	7.2	-2.8	5.3
Q2	2.9	1.4	6.0	9.9	3.7	2.2	4.6	-4.1	4.6	1.4	6.3	10.6	3.8	-4.3	4.5
Q3	-2.8	-4.2	-7.2	-13.6	-3.2	-8.7	-0.3	-0.2	-1.3	-4.4	-7.2	-14.5	-2.5	-0.7	-1.7
Q4	-2.9	-5.1	-2.5	0.2	-4.2	-12.5	0.6	-8.1	-0.4	-0.1	3.0	6.3	1.0	-3.8	4.8
2013 Q1	-9.0	-8.7	-10.7	-7.7	-12.5	-17.2	-10.1	-6.1	-9.3	-4.0	-5.2	2.2	-9.3	-2.4	-3.9
Q2	-2.0	-0.2	-7.3	-10.7	-5.2	-11.5	-1.9	9.1	-4.0	4.3	-2.3	-3.0	-1.8	12.8	0.2
Q3	6.0	6.1	4.2	17.9	-3.3	-8.7	-0.6	8.3	5.9	7.7	5.7	21.3	-3.0	10.2	7.5

Source: International Enterprise Singapore

TABLE 6: NON-OIL DOMESTIC EXPORTS by Selected Countries

Period	All Countries	ASEAN				NIEs				China	EU	Japan	US
		Total	of which			Total	Hong Kong	Korea	Taiwan				
			Indonesia	Malaysia	Thailand								
	Year-on-Year % Change												
2011	2.2	2.3	-1.2	0.1	0.7	-6.4	-11.5	-2.7	-0.6	7.1	0.2	1.9	-11.6
2012	0.5	0.8	6.3	-6.0	7.5	10.8	11.6	12.0	8.7	2.2	-3.8	2.2	-1.1
2012 Q1	6.0	7.7	4.0	-0.7	29.7	18.0	19.1	37.0	2.4	3.4	0.5	9.1	12.2
Q2	3.7	8.1	18.3	1.7	0.1	20.4	30.5	20.0	8.5	-0.9	2.4	6.1	-11.3
Q3	-3.2	-6.4	4.5	-10.1	-5.0	11.7	8.2	6.7	22.2	1.4	-16.5	0.7	-7.5
Q4	-4.2	-5.7	-1.6	-14.5	6.1	-5.2	-6.4	-10.9	2.0	4.7	0.1	-6.0	2.2
2013 Q1	-12.5	-8.3	-4.1	-14.4	-25.9	-9.8	-17.2	-16.2	9.5	2.1	-30.0	-3.1	-28.3
Q2	-5.2	-7.8	-16.7	-17.2	5.6	-7.4	1.6	-31.5	-0.2	5.8	-19.8	-13.8	-4.1
Q3	-3.3	2.9	-5.7	-4.5	2.8	-9.6	4.7	-33.4	-13.3	13.2	-29.1	-7.7	11.0
	% Share of All Countries												
2011	100.0	22.6	6.2	8.2	4.0	18.0	8.3	4.4	5.4	11.6	15.2	6.1	9.5
2012	100.0	22.6	6.6	7.7	4.3	19.9	9.2	4.9	5.8	11.8	14.5	6.2	9.3

Source: International Enterprise Singapore

TABLE 7: ELECTRONICS LEADING INDEX

Period	Original			Smoothed		
	1999 = 100	Year-on-Year % Change	Quarter-on-Quarter % Change	1999 = 100	Year-on-Year % Change	Quarter-on-Quarter % Change
2011	54.8	-8.3		55.1	-8.4	
2012	51.2	-6.4		51.4	-6.6	
2012 Q1	52.4	-6.9	-0.6	52.4	-6.9	-1.6
Q2	52.2	-6.0	-0.3	52.4	-6.0	0.0
Q3	50.1	-8.2	-4.1	50.7	-7.6	-3.2
Q4	50.3	-4.5	0.5	50.2	-5.8	-1.1
2013 Q1	51.2	-2.2	1.8	51.0	-2.7	1.6
Q2	50.2	-4.0	-2.0	50.5	-3.6	-0.9

Source: Monetary Authority of Singapore

TABLE 8: CONSUMER PRICE INDEX

Period	All Items	Food	Housing	Clothing & Footwear	Trans-port	Comm-unications	Education & Stationery	Health Care	Recrea-tion & Others	All Items	Food	Housing	Clothing & Footwear	Trans-port	Comm-unications	Education & Stationery	Health Care	Recrea-tion & Others
	2009 = 100									Year-on-Year % Change								
2011	108.2	104.4	110.5	100.5	123.5	96.2	105.7	104.3	102.5	5.2	3.1	8.3	0.2	11.9	-1.5	2.9	2.4	1.4
2012	113.1	106.9	119.0	102.0	132.2	96.1	109.3	109.0	104.4	4.6	2.3	7.8	1.4	7.1	-0.1	3.4	4.5	1.8
2012 Q1	111.5	106.6	116.6	101.6	127.6	96.2	108.3	107.5	103.9	4.9	3.0	9.4	1.4	5.5	-0.3	3.0	3.6	2.8
Q2	112.7	106.5	118.8	101.0	131.5	96.2	109.2	108.5	103.8	5.3	2.4	9.7	1.0	8.5	0.1	3.6	4.4	1.5
Q3	113.8	107.0	119.9	102.8	134.0	96.4	109.6	109.7	104.2	4.2	2.2	6.3	2.0	7.1	0.3	3.4	5.1	1.3
Q4	114.6	107.4	120.8	102.6	135.7	95.8	110.0	110.3	105.6	4.0	1.7	5.9	1.4	7.3	-0.4	3.5	4.9	1.7
2013 Q1	116.0	108.4	121.5	102.7	140.1	95.0	112.1	111.3	106.4	4.0	1.7	4.2	1.1	9.7	-1.2	3.5	3.6	2.4
Q2	114.6	108.6	121.7	101.6	129.8	94.9	112.3	112.9	106.6	1.6	2.0	2.5	0.5	-1.3	-1.4	2.9	4.0	2.7
Q3	115.8	109.4	122.4	102.2	134.1	94.7	113.1	114.1	107.3	1.8	2.3	2.1	-0.6	0.1	-1.7	3.2	4.0	3.0

Source: Singapore Department of Statistics

TABLE 9: MAS CORE INFLATION

Index (2009=100)

Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	85.4	85.8	85.5	85.5	85.4	85.5	86.0	86.5	86.4	86.4	86.9	87.0
2001	87.5	87.4	87.4	87.7	87.3	87.1	87.6	87.5	87.3	87.2	87.2	87.0
2002	86.9	87.2	87.0	87.1	87.3	87.3	87.4	87.4	87.4	87.4	87.7	87.7
2003	88.0	87.8	87.9	88.4	87.8	87.4	88.1	88.2	88.4	88.4	88.5	88.7
2004	89.5	89.6	89.7	89.8	89.9	89.7	89.9	89.8	90.2	90.2	90.3	90.2
2005	90.4	90.5	90.7	90.7	90.6	90.4	90.9	91.2	91.2	91.7	91.9	92.0
2006	92.5	92.3	92.3	92.3	92.1	92.0	92.5	92.6	92.6	93.0	93.2	93.5
2007	93.6	93.6	93.5	93.4	93.5	93.5	94.8	95.0	95.2	95.7	96.3	97.6
2008	98.2	98.6	98.7	99.4	99.5	99.5	100.1	100.5	100.5	101.6	101.6	101.7
2009	100.9	100.5	100.6	99.6	99.4	99.3	99.6	99.6	99.6	100.1	100.1	100.2
2010	100.3	100.9	101.0	101.2	101.1	101.0	101.6	102.0	102.0	102.1	102.3	102.3
2011	102.3	102.7	102.8	103.4	103.3	103.3	103.8	104.2	104.2	104.5	104.8	105.0
2012	105.9	105.7	105.8	106.2	106.1	106.0	106.3	106.5	106.6	106.8	106.8	107.0
2013	107.2	107.7	107.6	107.6	107.8	107.8	107.9	108.4	108.5			

Note: MAS Core Inflation is the CPI less the costs of accommodation and private road transport.

Source: Monetary Authority of Singapore

TABLE 10: BALANCE OF PAYMENTS – Current Account

	Current Account Balance		Goods Account			Services Account Balance							Primary Income Balance	Secondary Income Balance
	$ Million	% of GDP	Exports	Imports	Balance	Total	Maintenance & Repairs	Transport	Travel	Financial	Intellectual Property	Others		
			$ Million											
2011	82,162	24.6	546,103	454,707	91,396	873	8,515	8,654	-4,219	14,831	-18,557	-8,351	-2,746	-7,361
2012	64,280	18.6	544,588	468,460	76,127	485	7,614	8,952	-3,938	14,769	-18,573	-8,341	-3,920	-8,412
2012 Q1	17,875	20.8	139,579	120,389	19,191	924	2,097	2,696	-458	3,298	-4,643	-2,066	-141	-2,099
Q2	16,614	19.3	139,400	119,308	20,092	-425	2,182	1,920	-1,322	3,740	-4,796	-2,147	-1,147	-1,907
Q3	16,977	19.9	133,657	113,043	20,614	113	1,715	2,134	-657	3,477	-4,546	-2,010	-1,641	-2,109
Q4	12,815	14.5	131,951	115,721	16,231	-128	1,620	2,203	-1,500	4,255	-4,587	-2,118	-991	-2,297
2013 Q1	14,104	16.2	127,277	110,468	16,808	768	1,542	2,681	-740	4,039	-4,713	-2,042	-1,177	-2,295
Q2	18,000	20.0	138,151	116,322	21,829	-560	1,663	1,918	-1,248	4,187	-4,807	-2,272	-879	-2,390

Source: Singapore Department of Statistics

TABLE 11: BALANCE OF PAYMENTS – Capital & Financial Accounts

$ Million

Period	Capital and Financial Account Balance					Net Errors & Omissions	Overall Balance	Official Foreign Reserves (End of Period)
	Total	Direct Investment	Portfolio Investment	Financial Derivatives	Other Investment			
2011	-55,600	37,322	-16,086	-14,945	-61,891	-5,074	21,488	308,403
2012	-35,586	41,953	-61,447	-19,961	3,869	3,912	32,606	316,744
2012 Q1	-13,212	10,714	-12,010	-4,245	-7,671	1,709	6,372	306,232
Q2	-12,949	9,211	-8,845	-4,332	-8,983	1,177	4,843	308,295
Q3	-8,898	11,479	-17,375	-5,309	2,307	-230	7,849	309,135
Q4	-528	10,548	-23,217	-6,075	18,216	1,256	13,542	316,744
2013 Q1	-4,697	11,597	-15,423	-5,587	4,716	-689	8,718	320,225
Q2	-13,866	6,667	-3,785	-4,789	-11,960	1,252	5,386	329,634

Source: Singapore Department of Statistics/Monetary Authority of Singapore

TABLE 12: EXCHANGE RATES

End of Period	Singapore Dollar Per									
	US Dollar	Pound Sterling	EURO	100 Swiss Franc	100 Japanese Yen	Malaysian Ringgit	Hong Kong Dollar	100 New Taiwan Dollar	100 Korean Won	Australian Dollar
2011	1.3007	2.0048	1.6835	138.20	1.6777	0.4094	0.1674	4.2920	0.1124	1.3200
2012	1.2221	1.9752	1.6151	133.80	1.4214	0.3995	0.1577	4.2091	0.1145	1.2711
2012 Q1	1.2572	2.0083	1.6782	139.19	1.5321	0.4098	0.1619	4.2587	0.1107	1.3074
Q2	1.2737	1.9889	1.6023	133.36	1.6056	0.3994	0.1642	4.2649	0.1107	1.2915
Q3	1.2254	1.9915	1.5844	130.92	1.5799	0.3997	0.1580	4.1798	0.1101	1.2819
Q4	1.2221	1.9752	1.6151	133.80	1.4214	0.3995	0.1577	4.2091	0.1145	1.2711
2013 Q1	1.2436	1.8823	1.5892	130.38	1.3205	0.4007	0.1602	4.1550	0.1117	1.2966
Q2	1.2652	1.9320	1.6535	134.07	1.2797	0.3980	0.1631	4.2201	0.1104	1.1712
Q3	1.2572	2.0325	1.6975	138.95	1.2834	0.3859	0.1621	4.2520	0.1169	1.1700

Source: Monetary Authority of Singapore

TABLE 13: SINGAPORE DOLLAR NOMINAL EFFECTIVE EXCHANGE RATE INDEX

Index (2-5 Apr 2012 Average=100)

Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER
2012 Apr 5	100.00	2012 Jul 6	100.62	2012 Oct 5	101.96	2013 Jan 4	102.99	2013 Apr 5	103.44	2013 Jul 5	102.91
13	100.04	13	100.87	12	102.18	11	102.69	12	103.59	12	102.99
20	100.46	20	101.32	19	102.61	18	102.63	19	103.59	19	103.32
27	100.81	27	101.70	25	102.63	25	102.59	26	103.52	26	103.12
May 4	100.97	Aug 3	102.10	Nov 2	102.69	Feb 1	102.27	May 3	103.61	Aug 2	102.91
11	100.67	10	102.11	9	102.69	8	102.63	10	103.66	7	103.12
18	100.21	17	101.87	16	102.71	15	102.89	17	103.41	16	103.12
25	99.80	24	101.57	23	102.78	22	103.01	23	102.61	23	102.67
Jun 1	99.74	31	101.36	30	102.81	Mar 1	103.14	31	102.44	30	103.04
8	99.61	Sep 7	101.74	Dec 7	102.88	8	102.75	Jun 7	103.33	Sep 6	103.44
15	99.78	14	102.28	14	102.87	15	102.89	14	102.83	13	103.67
22	100.26	21	102.33	21	102.95	22	102.69	21	102.39	20	104.07
29	100.04	28	102.13	28	103.01	28	103.15	28	102.71	27	104.00
										Oct 4	104.07
										11	104.03

Source: Monetary Authority of Singapore

TABLE 14: DOMESTIC LIQUIDITY INDICATOR

Change from 3 Months Ago

Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	0.028	-0.122	-0.064	0.167	0.380	0.346	0.168	0.214	0.338	0.460	0.463	0.300
2011	0.380	0.288	0.329	0.331	0.384	0.434	0.473	0.388	-0.207	-0.839	-1.031	-0.517
2012	0.102	0.515	0.615	0.571	0.294	0.103	0.255	0.417	0.637	0.344	0.279	0.190
2013	0.003	-0.081	-0.169	0.076	-0.044	-0.031	-0.059	0.109	0.385			

Note: The DLI is a measure of overall monetary conditions, reflecting changes in the S$NEER and domestic 3-month interbank rate.
A positive (negative) number indicates a tightening (easing) monetary policy stance from the previous quarter.
Please refer to the June 2001 issue of the MAS ED *Quarterly Bulletin* for more information.

Source: Monetary Authority of Singapore

TABLE 15: MONETARY

End of Period	Money Supply								Interest Rates				
	Narrow Money M1	Broad Money M2	Broad Money M3	Reserve Money	Narrow Money M1	Broad Money M2	Broad Money M3	Reserve Money	Prime Lending Rate	3-month Interbank Rate	3-month SIBOR (US$)	Banks	
												Savings Rate	12-month Fixed Deposit Rate
	$ Billion				Year-on-Year % Change				% Per Annum				
2011	130.6	443.4	451.7	45.4	16.1	10.0	10.1	12.1	5.38	0.38	0.58	0.11	0.32
2012	140.7	475.4	485.9	48.7	7.7	7.2	7.6	7.2	5.38	0.38	0.31	0.11	0.32
2012 Q1	130.3	453.5	462.5	45.4	11.4	9.7	10.0	8.3	5.38	0.38	0.47	0.11	0.29
Q2	131.8	451.1	460.7	46.6	6.6	6.5	6.9	6.9	5.38	0.38	0.46	0.11	0.30
Q3	133.6	461.2	471.5	47.8	3.1	6.1	6.5	8.7	5.38	0.38	0.37	0.11	0.32
Q4	140.7	475.4	485.9	48.7	7.7	7.2	7.6	7.2	5.38	0.38	0.31	0.11	0.32
2013 Q1	148.9	492.3	503.1	51.7	14.2	8.5	8.8	13.9	5.38	0.38	0.28	0.11	0.32
Q2	155.9	492.1	503.1	56.4	18.3	9.1	9.2	21.0	5.38	0.38	0.28	0.10	0.32

Source: Monetary Authority of Singapore

TABLE 16: FISCAL

Period	Operating Revenue							Expenditure			Primary Surplus (+)/ Deficit (–)	Less: Special Transfers	Add: Net Investment Returns Contribution	Budget Surplus (+)/ Deficit (–)
	Total	Tax Revenue					Non-tax Revenue	Total	Operating	Development				
		Total	of which											
			Income Tax	Assets Taxes	Stamp Duty	GST								
	$ Million													
FY2010	46,060	41,848	18,687	2,803	3,277	8,198	4,212	45,338	33,270	12,068	722	7,095	7,352	980
FY2011	51,077	46,076	20,579	3,902	3,175	8,687	5,001	46,563	35,150	11,413	4,514	8,427	7,916	4,003
FY2012 (Revised)	55,178	49,488	22,214	3,791	4,176	8,820	5,691	50,105	37,207	12,899	5,073	8,867	7,653	3,858
FY2013 (Budgeted)	55,028	49,574	21,970	4,092	3,082	9,309	5,453	53,410	40,627	12,783	1,618	6,896	7,703	2,425
	% of Nominal GDP													
FY2010	14.2	12.9	5.8	0.9	1.0	2.5	1.3	14.0	10.3	3.7	0.2	2.2	2.3	0.3
FY2011	15.2	13.7	6.1	1.2	0.9	2.6	1.5	13.8	10.4	3.4	1.3	2.5	2.4	1.2
FY2012 (Revised)	16.1	14.4	6.5	1.1	1.2	2.6	1.7	14.6	10.8	3.8	1.5	2.6	2.2	1.1
FY2013 (Budgeted)	14.9	13.4	5.9	1.1	0.8	2.5	1.5	14.5	11.0	3.5	0.4	1.9	2.1	0.7

Source: Ministry of Finance

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Title	Frequency	Web Links
Consumer Price Developments	Monthly	http://www.mas.gov.sg/Monetary-Policy-and-Economics/The-Singapore-Economy/Inflation-Monthly.aspx
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