

Singapore Economic Policy

# The Twenty-Fourth Singapore Economic Roundtable

November 2015

*Jointly organised by*  
Institute of Policy Studies  
& The Business Times

*Edited by*  
Manu Bhaskaran  
Faizal bin Yahya  
Wilfred Lau

## **The Singapore Economic Roundtable**

The Singapore Economic Roundtable (SER) is a forum of leading economists, policy makers and business leaders who gather twice a year to discuss important issues that affect Singapore's position in the global economy. It deliberates on the role that government agencies and the private sector in Singapore should play in meeting new challenges facing the Singapore economy.

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# Foreword

**Manu Bhaskaran**

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# 1. Recent Economic Developments<sup>1</sup>

**Ms Deborah Tan**

Senior Economist, Domestic Economy Division  
Economic Surveillance and Forecasting Department  
Monetary Authority of Singapore (MAS)

## 1.1 External Developments and Outlook

Global economic growth slackened in the second quarter of 2015. Emerging economies saw a weakening in their growth momentum, while the rebound in the US was unable to fully compensate for more subdued outturns in the Eurozone and Japan (Figure 1.1).

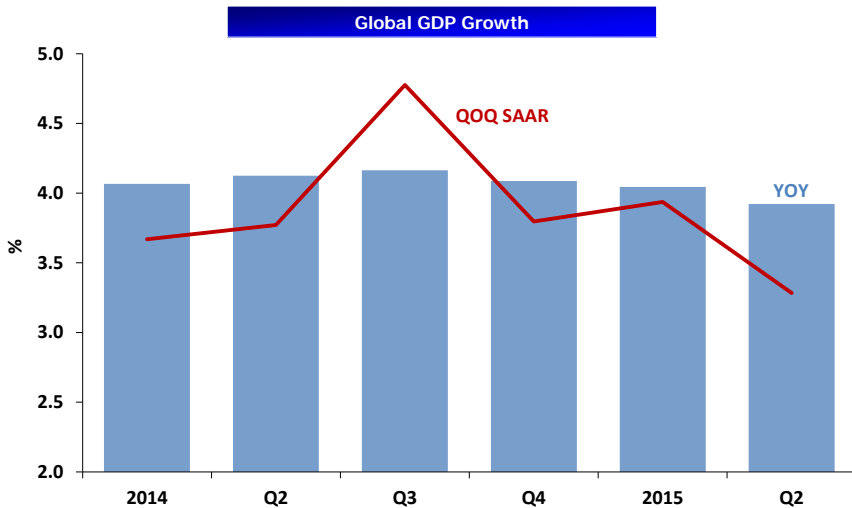


Figure 1.1

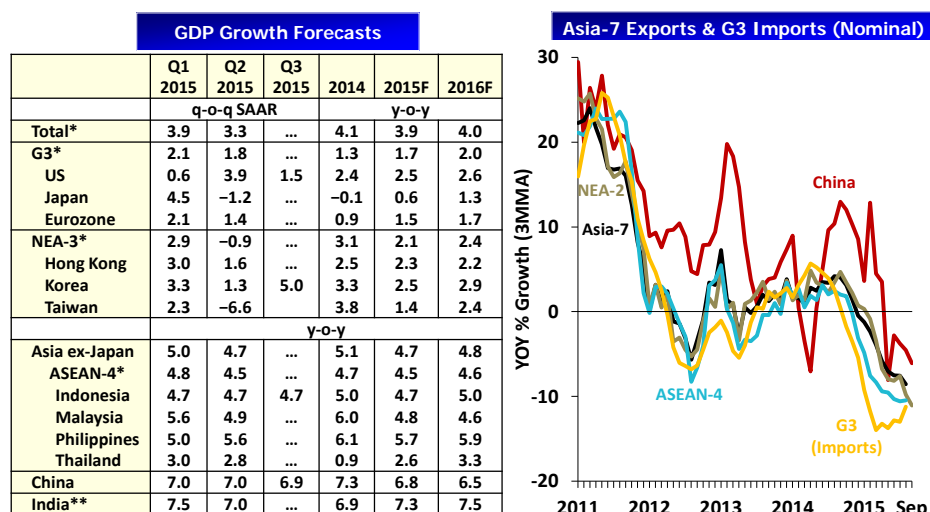
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<sup>1</sup> The views and analyses contained in this presentation are the author's and should not be attributed to MAS.



## RECENT ECONOMIC DEVELOPMENTS

Growth in the G3 economies is expected to rise to 1.7% in 2015, and further to 2.0% in 2016 (Figure 1.2, left). However, this is unlikely to provide the same support to global growth as in previous upturns, as the improvement will be driven more by consumption of services, which have lower import content. Notably, there has been a significant fall in the nominal value of merchandise imports into the G3 since late 2014 (Figure 1.2, right).



Asia ex-Japan will also have to contend with the downward momentum in China's economy and tightening financial conditions accompanied by rising borrowing risks. Consequently, the immediate growth outlook for

the region has dimmed, with growth projected to come in lower at 4.7% in 2015, before rising to 4.8% in 2016.

In real (price-adjusted) terms, Asia ex-Japan's export growth has also contracted, even though G3 real import growth was steady (Figure 1.3, left). Over the medium term, the outlook for Asia ex-Japan's exports has downshifted due to several factors, amid a generalised slowdown in global trade.

First, less robust investment activity in the G3 is likely to continue depressing Asia ex-Japan's exports, as investment tends to be more trade-intensive than other type of expenditures.

Second, there are tentative signs of shifts in the region's cross-border production networks. As China continues to move up the technological ladder, Chinese manufacturers may have intensified the vertical integration of their domestic production processes and accordingly, depend less on imported components from the region. In turn, the share of imports that went into China's processing and assembly plants for subsequent export has fallen steadily over time (Figure 1.3, right).

## RECENT ECONOMIC DEVELOPMENTS

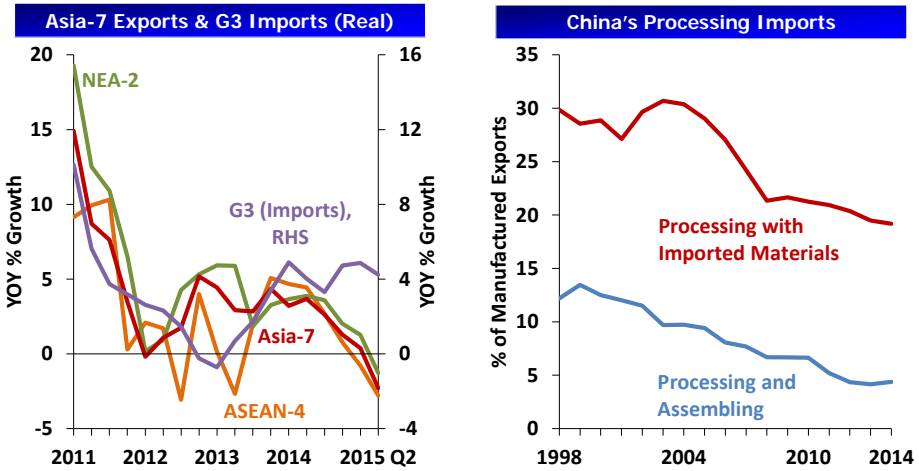


Figure 1.3

### 1.2 Domestic Developments and Outlook

Against the weaker external backdrop, domestic economic activity has been lacklustre over the last six months, with the Singapore economy registering a marginal expansion of 0.1% on a QoQ SAAR basis in Q3, after contracting by 2.5% in Q2. On a year ago basis growth has averaged 2.3% in the first six months of the year (Figure 1.4, left).

The trade-related sectors bore the brunt of the slowdown in the region over the past quarters, while activity in the domestic-oriented sectors generally held up (Figure 1.4, right).

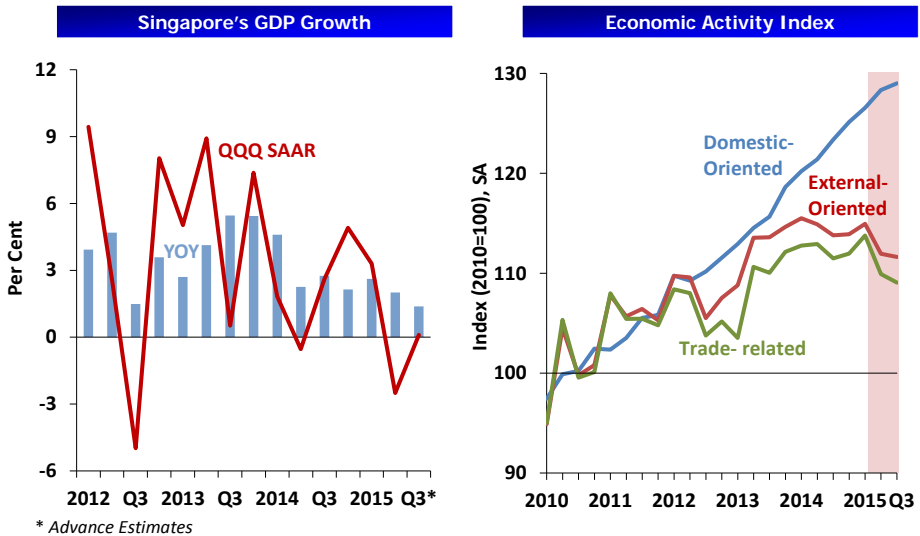


Figure 1.4

Looking ahead, weakness in the external environment is like to persist and weigh on the domestic outlook.

The slowdown across our major regional trading partners, in particular Malaysia, Indonesia and China, is expected to impinge on Singapore's near term growth, given our strong economic linkages with these economies (Figure 1.5, left).

While the regional economies are expected to remain weak, the G3 could provide some countervailing support in the near term. However, the step-up in US GDP growth has been largely consumption-driven, while imports of goods and services have been weak (Figure 1.5, right). As a result,

RECENT ECONOMIC DEVELOPMENTS

relative to previous recoveries, the positive spillovers to Singapore’s trade-related sectors are likely to be capped.

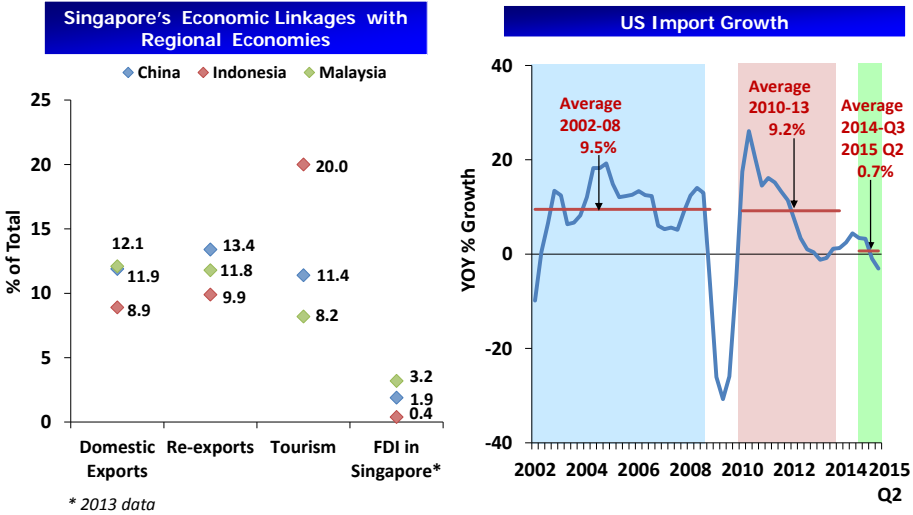


Figure 1.5

There are, however, some pockets of strength within the economy, for instance, in the oil-related industry.

In the midstream segment, stockpiling by oil traders, as well as the accumulation of China’s strategic crude oil reserves, could lead to an intermittent increase in activity of oil trading, transport and storage.

Supply-side expansions, particularly in the chemicals segment, should also augment the uplift from improving demand conditions in the G3,

even as the upstream oil and gas segment continues to face challenging conditions (Figure 1.6, left).

Meanwhile, the domestic oriented sectors as a whole is expected to remain firm. Essential services — such as healthcare and education — will be supported by structurally higher demand and increased government expenditure (Figure 1.6, right).

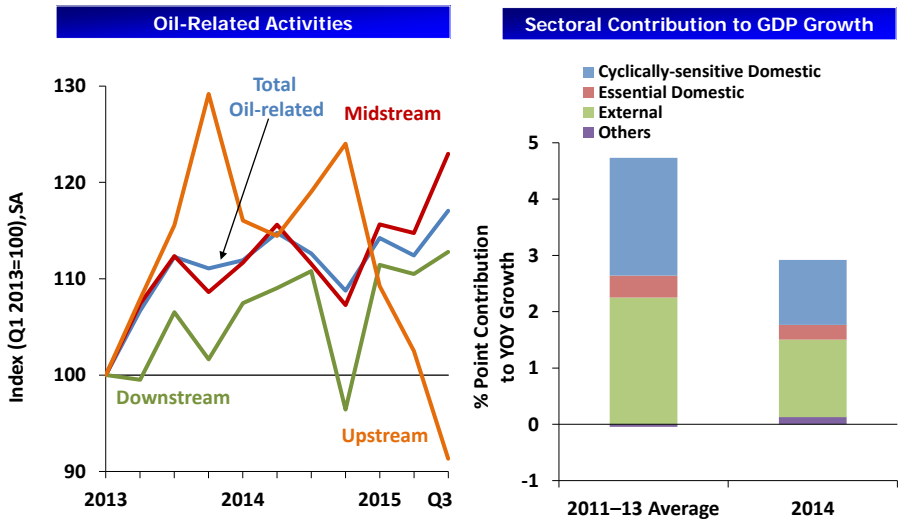


Figure 1.6

On balance, Singapore’s GDP growth is likely to come in at around 2–2.5% for 2015 as a whole, with risks tilted towards the downside. The economy is expected to expand at a broadly similar pace in 2016.

## RECENT ECONOMIC DEVELOPMENTS

More broadly, the Singapore economy is adapting to ongoing reconfigurations in global supply chains. In recent years, the rise in China's capabilities in the IT intermediate goods space has led to some slowdown in imports of such products from the rest of the region. However, the impact of this development could be mitigated by strengthening trade linkages with emerging nodes in the regional supply chains.

During the first three quarters of 2015, Singapore's exports to the CLMV economies were the main source of support (Figure 1.7, left). In the electronics space, Singapore's semiconductor exporters have benefited from the surge, especially in Vietnam's tech trade, with both domestic and re-exports to Vietnam increasing significantly over the past few years.

Moreover, Vietnam's growing dominance as an electronics assembly hub does not pose direct competition to Singapore's IT manufacturers, given the low degree of product similarity (Figure 1.7, right).

Going forward, deeper economic integration among the ASEAN member states will herald new opportunities for Singapore's exporters. For instance, increased investment activity in the CLMV could support greater demand for refined oil exports, due to greater energy requirements in their industrialisation drives.

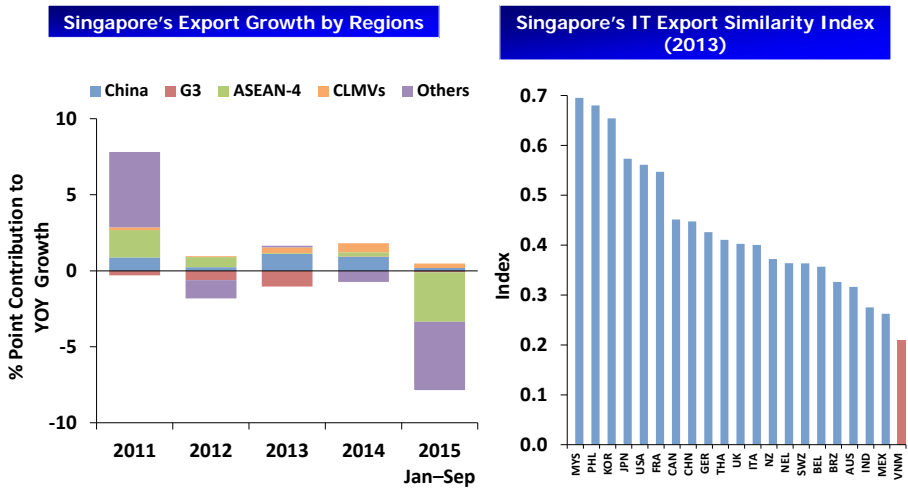


Figure 1.7

Looking further ahead, the next phase of economic development will be characterised by a knowledge- and skills-based economy, with the associated productivity gains overcoming Singapore’s supply-side constraints. In this regard, the development of the technology & innovation cluster is critical in supporting the economy’s upgrade to a new production frontier.

Over the last decade, Asia has made significant headway as the production base for high-tech products, as shown by the increase in technological intensity of Asia’s share of manufacturing exports between 2005 and 2013 (Figure 1.8, left). This trend is likely to persist, with Singapore contributing to the high-tech and high-value goods and services space.



## RECENT ECONOMIC DEVELOPMENTS

The Singapore government has also pledged its commitment to supporting the development of R&D and innovation capabilities. As such, domestic R&D activities, such as total R&D expenditure and manpower employed, have seen steady growth over the past decade (Figure 1.8, right).

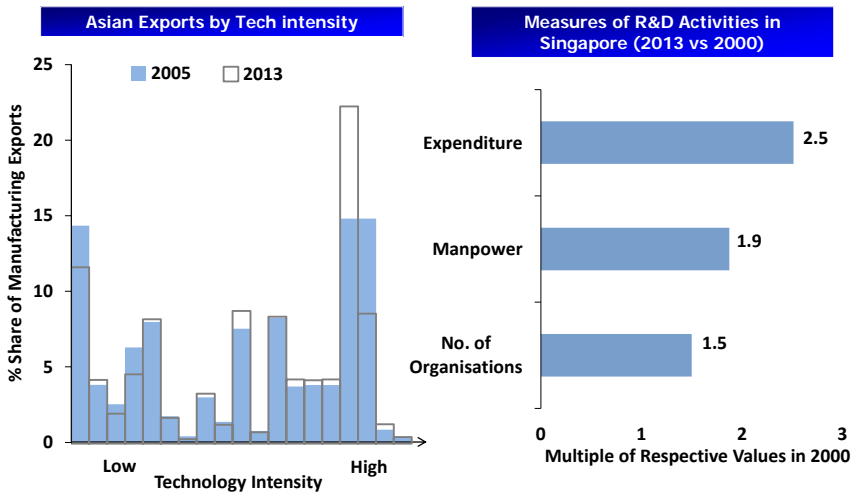


Figure 1.8

Against this backdrop, capital inputs associated with the digital revolution, such as ICT hardware, software and R&D, will be the key drivers of the future Singapore economy.

On the capital front, Singapore already has one of the highest capital-to-labour ratios in the world, but there is further room to improve the current adoption of ICT capital in the corporate sector (Figure 1.9, left). A number of government initiatives, such as the Smart Nation programme,

THE TWENTY-FOURTH SINGAPORE ECONOMIC ROUNDTABLE

have been rolled out to provide support towards achieving this objective. There is also a growing emphasis on intellectual property, which is prevalent among major US IT firms, spanning both IT manufacturing and services.

A similar trend can also be observed in Singapore at the macro level, where the share of intellectual property products in total real capital stock (excluding construction & works) has gradually increased to just over 20% (Figure 1.9, right).

Given the crucial role of intellectual capital, R&D and ICT, a complementary labour force with the relevant technical expertise for these frontier industries will also be critical.

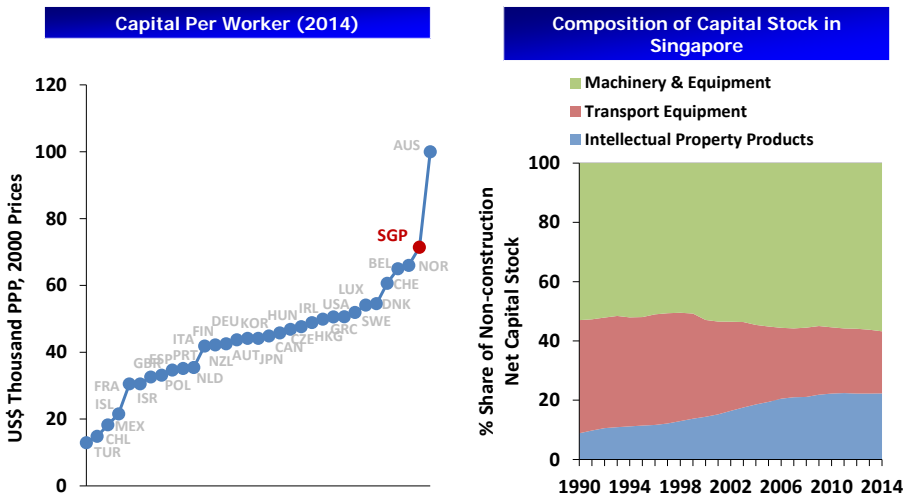


Figure 1.9

### 1.3 Wage-Price Developments and Outlook

Overall net employment gains fell in the first half of 2015, reflecting the softer economic backdrop and ongoing structural reconfigurations in the economy. Led by this slowdown, EPG’s labour market pressure indicator suggested that labour market tightness at the economy-wide level has eased slightly (Figure 1.10, left).

However, the vacancy rates for some industries including retail trade, information & communications and financial & insurance increased further. This suggests that firms in these sectors continued to face significant difficulty in filling positions. As a result, underlying wage pressures remained firm, with resident wage growth rising to 3.4% in H1 2015, from 1.6% in the preceding half-year period (Figure 1.10, right).

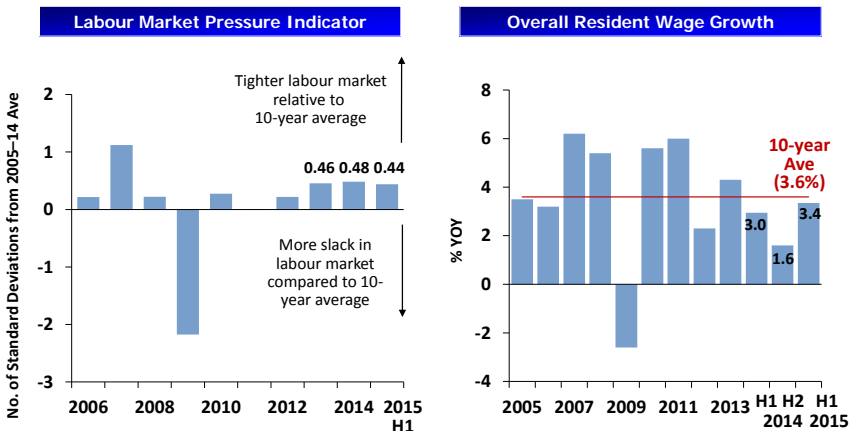


Figure 1.10

Both MAS Core Inflation and CPI-All Items inflation have remained subdued in the past two quarters, largely due to lower oil prices, as well as budgetary and other one-off measures (Figure 1.11, left).

MAS Core Inflation, which excludes the costs of accommodation and private road transport, has been on a downtrend since the middle of 2014 but stabilised more recently, averaging 0.3% in Q2–Q3 2015, compared to 1.1% in Q1. Meanwhile, CPI-All Items inflation continued to ease due to further declines in housing rentals and car prices, falling to -0.6% in Q3 from -0.3% in Q1 (Figure 1.11, right).

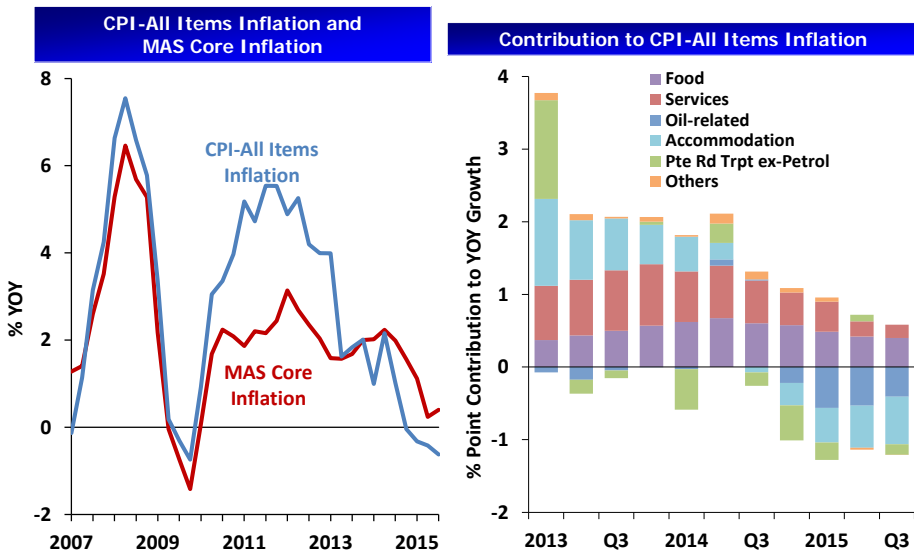


Figure 1.11

## RECENT ECONOMIC DEVELOPMENTS

Going forward, the labour market is expected to settle at a lower level of job creation. This is in tandem with the step-down in real GDP growth, as well as the slower rise in resident labour force (Figure 1.12).

Nevertheless, even as job creation moderates, headcount gains will still be firm in the essential domestic-oriented sectors such as community, social and personal services, where demand is resilient.

Accordingly, pockets of labour market tightness will persist in these segments, supporting higher pay increments. Overall resident wage growth is expected to pick up from the 2.3% in 2014, and come in at close to its 10-year historical average of 3.6% in 2015 and 2016.

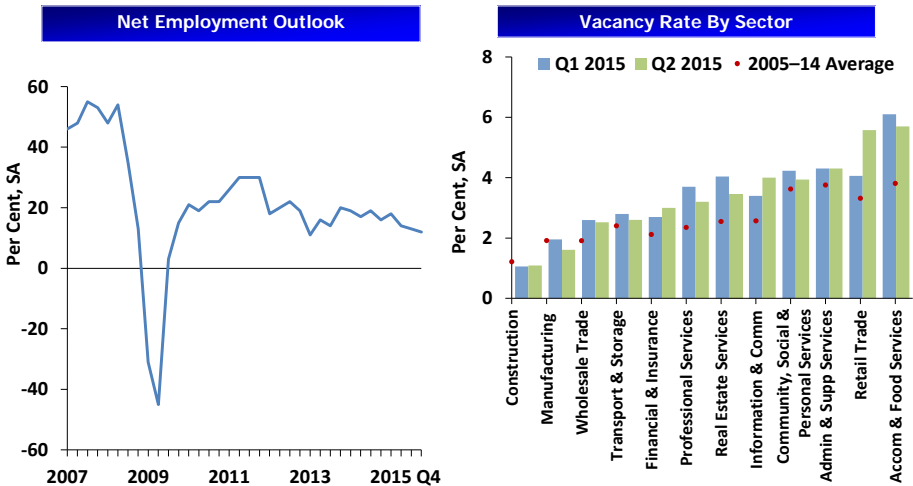


Figure 1.12

Domestic cost pressures, particularly due to higher wages, are expected to remain. A range of indicators which proximate “domestically-generated cost inflation” suggests that domestic cost increases was centred at a stable but firm 3% YoY in the first half of 2015. This trend is likely to persist going forward, given binding labour supply constraints (Figure 1.13, left).

However, the overall pass-through of higher domestic costs to inflation will likely be modest against a backdrop of subdued economic growth.

Nevertheless, there will be varying degrees of cost pass-through across the categories. For healthcare and education services, which have a higher labour share and relatively inelastic demand, the cost pass-through is likely to be stronger.

Meanwhile, external sources of inflation should be generally benign, given ample supply buffers in the major commodity markets and weak global demand conditions. We expect oil prices to now stay “lower for longer”, as the supply overhang is likely to persist. Oil prices are projected to increase only slightly in 2016 (Figure 1.13, right). Global food commodity prices could face some upward pressure due to the ongoing El Niño phenomenon, though this would be tempered by abundant food stockpiles.

## RECENT ECONOMIC DEVELOPMENTS

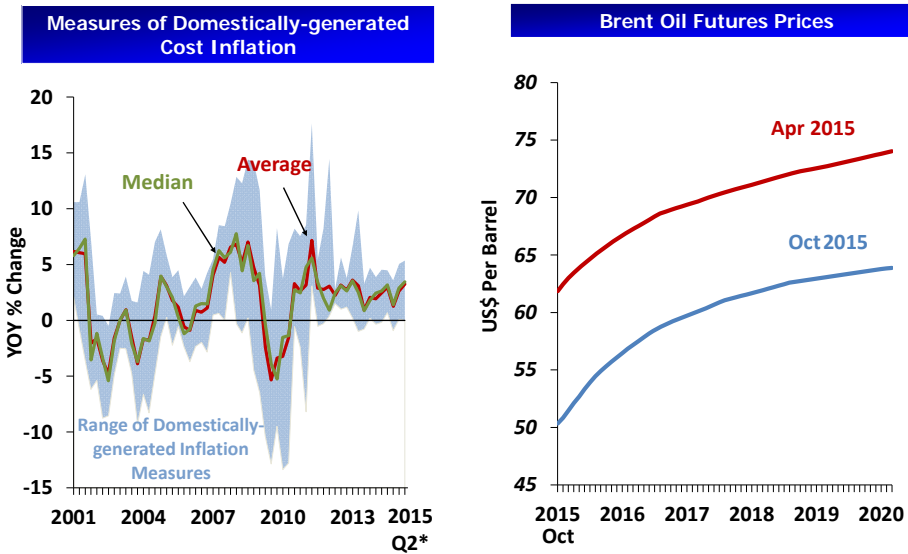


Figure 1.13

Against this backdrop, MAS Core Inflation is expected to pick up gradually over the course of 2016 towards its historical average as the disinflationary effects of lower oil prices, as well as budgetary and other one-off measures dissipate. For the year as a whole, it is expected to come in between 0.5–1.5% in 2016, up from 0.5% in 2015 (Figure 1.14, left).

CPI-All Items inflation could continue to be dampened by lower car prices and imputed rentals on owner-occupied accommodation (Figure 1.14, right), given an expected increase in the supply of COEs and newly completed housing units. For 2016 as a whole, CPI-All Items inflation is projected to come in between -0.5 and 0.5%, compared to around -0.5% in 2015.

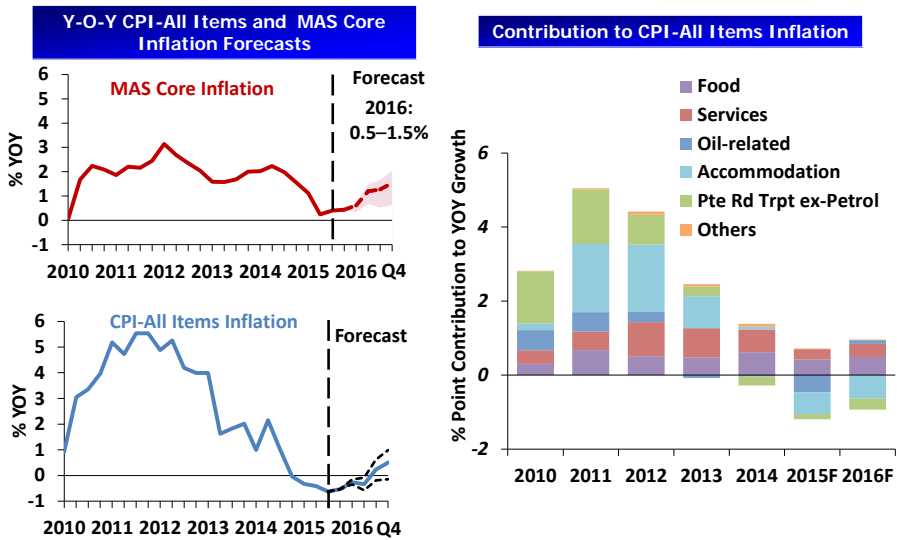


Figure 1.14

### 1.3 Monetary Policy Stance

In October 2015, MAS reduced the S\$NEER policy band slightly, while keeping it on a modest and gradual appreciation path (Figure 1.15). This measured adjustment took into account weakened expected growth output for the Singapore economy, even as MAS core inflation is expected to pick up gradually. Together with the unscheduled policy easing in January 2015, the October policy move will be supportive of economic growth going into 2016, while ensuring price stability over the medium term.



## RECENT ECONOMIC DEVELOPMENTS

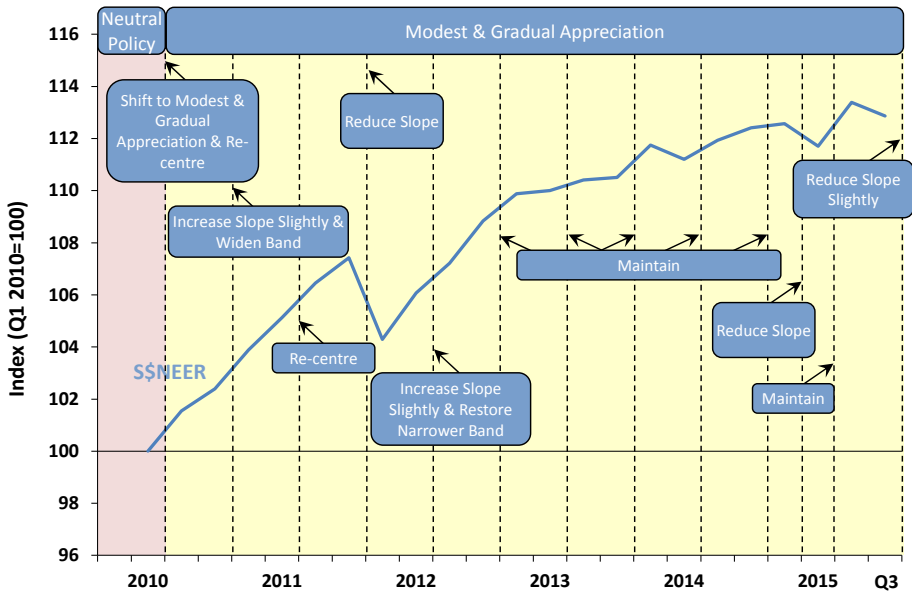


Figure 1.15

## 2. **Macro-Economic Outlook for Singapore and Implications for Policy**

**Ms Deyi Tan**  
Executive Director, Research  
Morgan Stanley

### **2.1 Introduction**

The presentation examines Singapore's growth model over the past 50 years. It highlights the emerged challenges in the form of the 3Ds — Demographics, Debt and Deflation — that Singapore faces, and suggests that the possible solutions to these challenges come in the form of productivity growth and a macro-rebalancing strategy. It concludes with the implications of slower structural growth for Singapore's currency policy.

### **2.2 Singapore's Growth Model**

Singapore has seen a tremendous growth supercycle over the past 40 to 50 years in a mostly low-inflation environment, uplifting it to one of the richest countries in the world. This growth was achieved through a unique growth model that combined market elements with a high level of state involvement.

The growth model comprised four building blocks (Figure 2.1). The first building block was the successful creation of an effective operating

## MACRO-ECONOMIC OUTLOOK FOR SINGAPORE AND IMPLICATIONS FOR POLICY

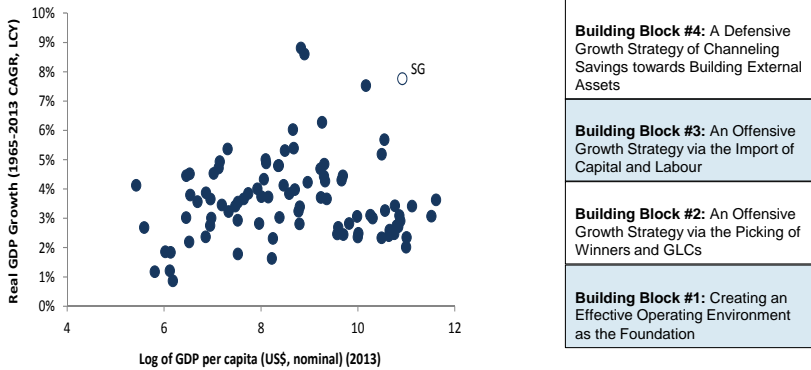
environment, which laid the foundation for growth. This entailed the institutional and regulatory frameworks, as well as the hard and soft infrastructure.

The second building block was an offensive growth strategy via actively picking winners and growth sectors, which was complemented by the development of GLCs in sectors where there was a lack of private sector expertise or capital.

The third building block was the offensive growth strategy via the import of capital and labour, of which Singapore had been aggressively attracting FDI and MNCs as well as enlarging its foreign workforce.

And finally, in order to mitigate the volatility from an export-oriented strategy, Singapore at the same time undertook a defensive growth strategy, by channelling its savings towards building external assets via sovereign wealth funds.

A Growth Supercycle and a Mostly Lowflation-type Environment



Sources: CEIC, Morgan Stanley Research

Figure 2.1

**2.3 Challenges: The 3Ds**

However, macro-challenges that have since emerged compel a reconsideration of the growth strategy. Singapore now faces a 3D problem of debt, demographics and deflation, which together is a potent force to reckon with (Figure 2.2).

# MACRO-ECONOMIC OUTLOOK FOR SINGAPORE AND IMPLICATIONS FOR POLICY

## A 3D Problem of Debt, Demographics and Deflation

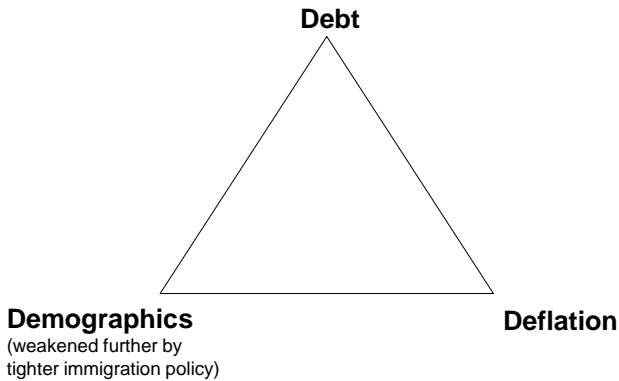


Figure 2.2

High leverage in the system is partly a consequence of loose monetary policy by central banks around the world, in particular the US Fed, and Singapore's open capital account. The extraordinarily loose global monetary policy of major central banks such as the US Fed caused Singapore to import unintended and unproductive capital in the form of a credit boom. High leverage frontloads growth, but not without an expense of future growth as the resultant debt will be a drag on growth for an extended period of time.

This development comes alongside a greying demographics trend as well, which is further compounded by the fact that policymakers' past attempts to cope with low local population growth through immigration policy has now been reversed. Added to these two issues is deflation in the economy.

### ***Demographics***

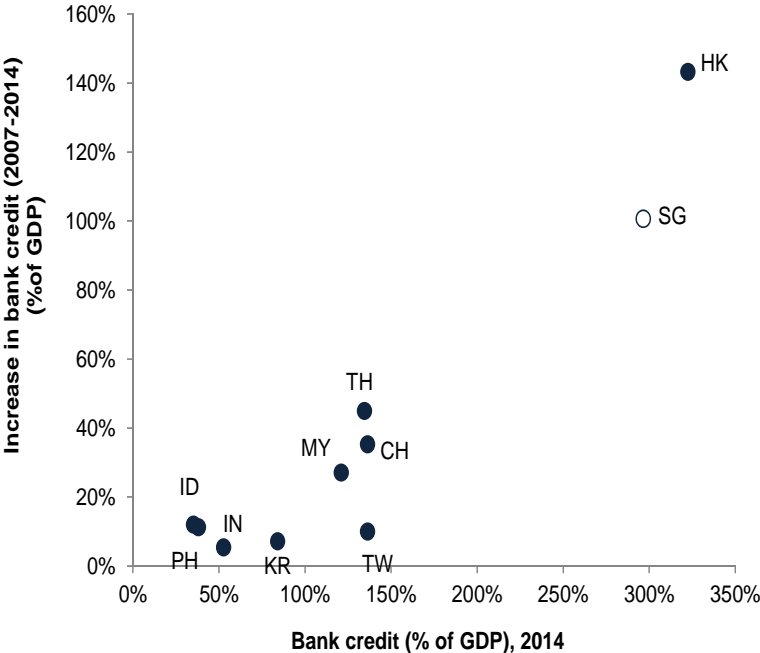
Given that slower growth has begun to bite, it has been questioned if policymakers would return to looser immigration policy. It is likely that immigration will settle at a low rate, as the government is unlikely to backtrack aggressively on immigration policy.

At the same time, Singapore's low total fertility rate (TFR) means that zero net immigration is not a realistic scenario either. Singapore has the fourth lowest TFR in the world. Assuming that the current demographic trend persists, the working age population growth in the next few years is likely to be flat, and from 2020 onwards, will contract at about 0.5% per year. This essentially poses a negative growth shock to Singapore, weighing down on potential growth. Keeping an open immigration policy is important not just for economic growth but also to fund the growing fiscal outlay of a greying population for healthcare and social needs amongst others.

However, a return to an aggressive immigration policy is unlikely. First, a five-year political cycle is too short a timeframe for policymakers to tinker with immigration policy. Second, the government's determination to push for productivity growth will place a curb on immigration as well as foreign manpower, leading to lower growth conditions in the interim period. While previous national productivity drives had faltered along the way, the experience this time is likely to be different given the lack of other policy options to address socioeconomic considerations.

**Debt**

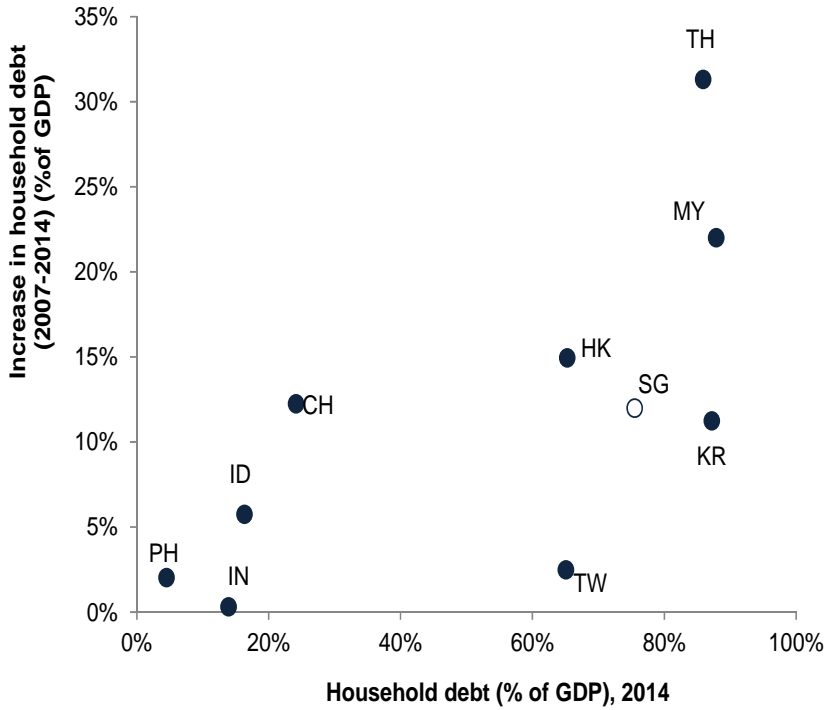
Slowing growth and rising interest rates, combined with high leverage rates in Singapore raise the risk of a cathartic boom-bust cycle. Figure 2.3 plots, for Asia ex-Japan countries, bank credit as percentage of GDP in 2014 against increase in bank credit as percentage of GDP from 2007–2014. Figures 2.4 and 2.5 show household and corporate debt as percentage of GDP and the change from 2007–2014, respectively. These charts reveal Singapore’s high debt to GDP ratio and high delta relative to peer countries in the past few years.



Sources: CEIC; various central banks; Morgan Stanley Research

Figure 2.3

### Asian Ex-Japan Household Debt

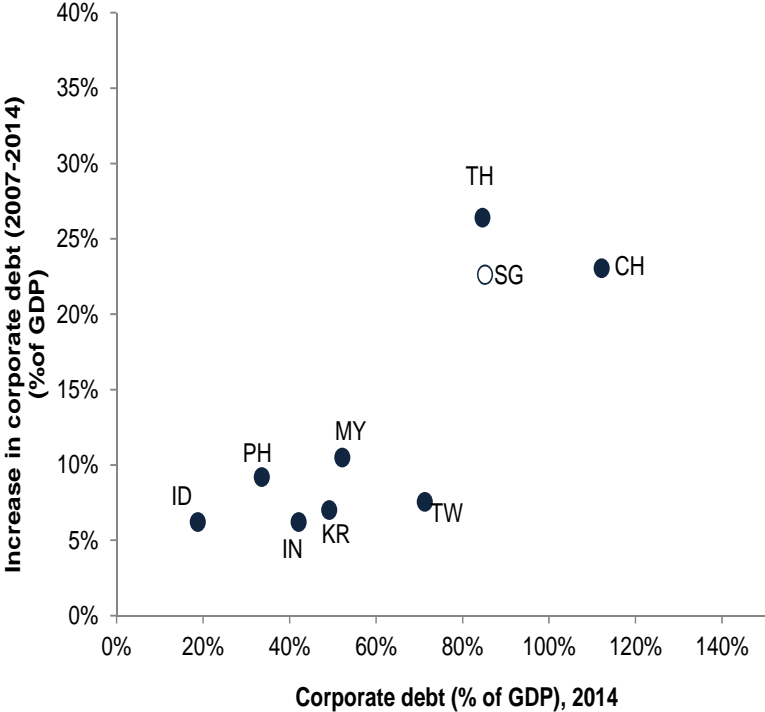


Sources: CEIC; various central banks; Morgan Stanley Research

Figure 2.4



**AxJ Corporate Debt**



Sources: CEIC; various central banks; Morgan Stanley Research

Figure 2.5

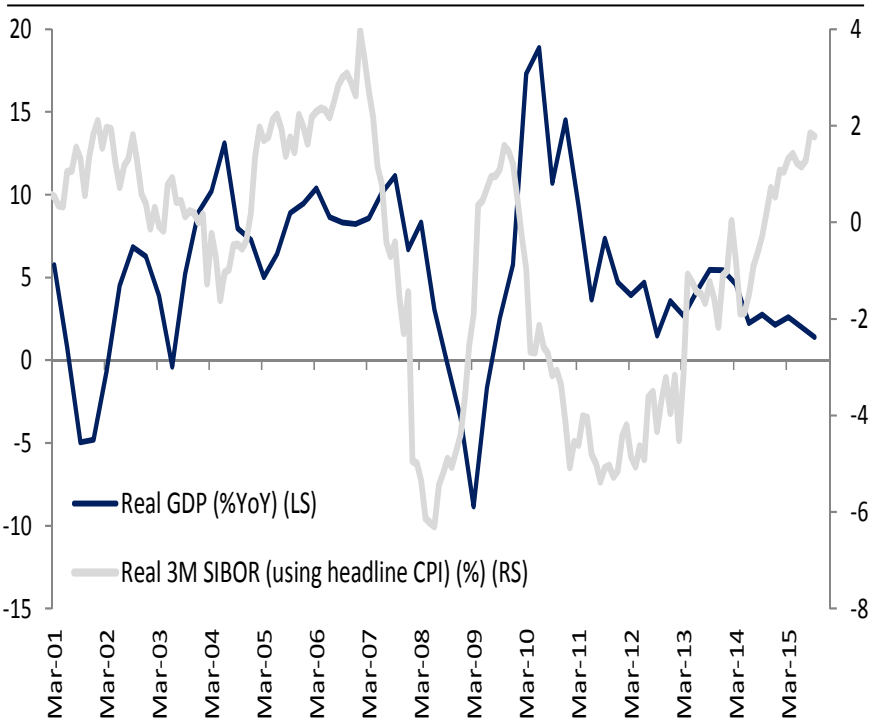
While under the right macroeconomic conditions, high leverage can be tolerated for an extended period time, high leverage also invariably increases the vulnerability of the economy to rising interest rates, declining asset prices and slowing growth — conditions that are all starting to manifest in the current milieu, generating downside risks for Singapore.

Furthermore, as a regional financial hub, a large share of the credit intermediation conducted by Singapore in recent times is for emerging Asia, which at present is suffering from reductions in growth rate. Insofar as bank loan portfolios are exposed to neighbouring emerging market risks, it is crucial to keep a close watch on signs of looming problems.

The high leverage situation in Singapore requires the economy to deleverage, bringing down the debt to GDP ratio, in order to recharge for the next growth cycle. However, a look at previous episodes of deleveraging process — with the exception of the disorderly deleveraging seen in the 1998 Asian Financial Crisis — shows that deleveraging normally happens not through a decline in debt, but through a rapid increase in income. For instance, despite a significant property downward cycle between 1996 and 2003, household debt still rose for that period. It was only via faster income growth that Singapore was able to deleverage.

Hence, in the current prolonged environment rising interest rates and secular slowdown (Figure 2.6), it is unlikely that deleveraging will be seen in Singapore for the next few years. High leverage in Singapore is expected stay, and it will be an elongated adjustment process with credit growth staying lower for longer alongside a more subdued GDP growth.

**Real GDP Growth Decelerating; Real Rates Rising**



Sources: CEIC; Morgan Stanley Research

Figure 2.6

On the other hand, a cathartic boom-bust cycle is unlikely to happen in Singapore, because such a scenario requires external negative triggers, either in the form of a global demand shock or a property hard landing, both of which are not imminent.

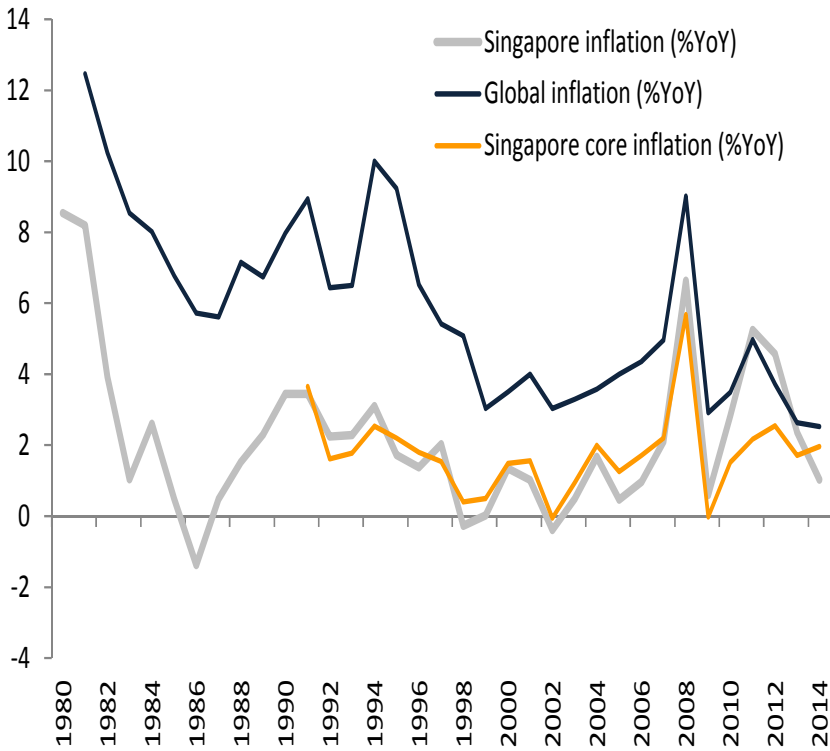
A case could be made that Singapore is currently somewhat similar to Japan or China, both highly leveraged economies but possessing huge

current account surpluses. The large current account surplus enables the central bank to have more control over domestic liquidity conditions even as the economy deleverages and makes adjustments, which essentially allows the government better chances of engineering a soft landing. This is in contrast with countries with current account deficits such as Indonesia, which tend to be more susceptible to market vagaries.

### ***Deflation***

Inflation in Singapore has tapered sequentially in the last few quarters (Figure 2.7). Given that the tight labour market is often cited as a source of price inflation, the absence of inflation going forward in Singapore could turn out to be a big surprise.

MACRO-ECONOMIC OUTLOOK FOR SINGAPORE AND IMPLICATIONS FOR POLICY



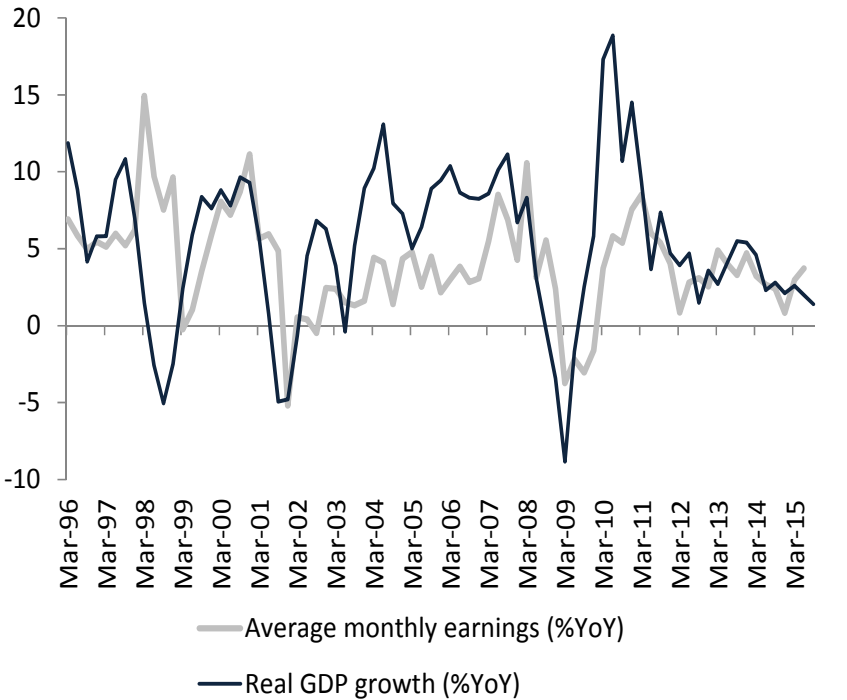
Sources: World Bank; CEIC; Morgan Stanley Research

Figure 2.7

One reason for this lack of inflationary pressure could be that a tight labour market by itself is a necessary but insufficient condition to drive inflation higher — if that is the case Japan should have long since experienced a rise in inflation. Based on historical evidence, real GDP growth tends to lead wage growth (Figure 2.8), and wage growth tends to lead CPI growth (Figure 2.9). In the absence of a pickup in real GDP growth, wage growth is unlikely to increase in a material way, and hence

a tight labour market would not lead to the kind of upward pressure expected on overall inflation.

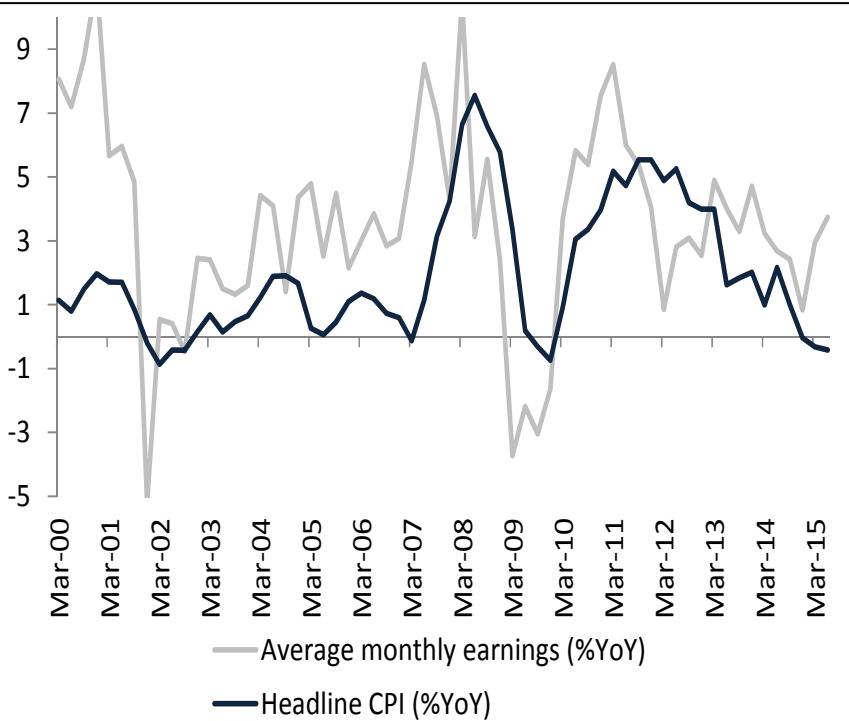
**Real GDP Growth Leads Wage Growth**



Sources: CEIC; Morgan Stanley Research

Figure 2.8

**Wage Growth Leads Inflation**



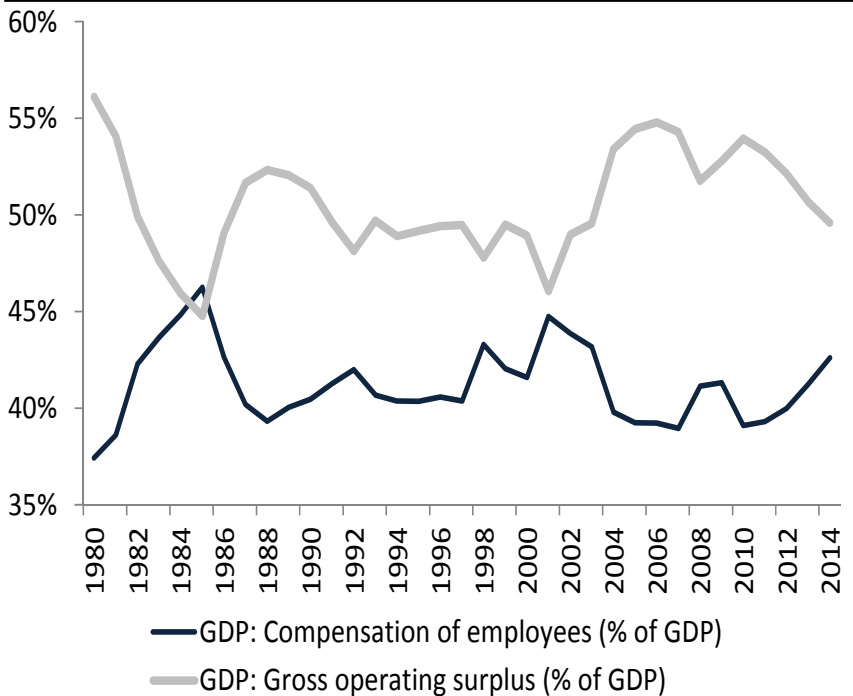
Sources: CEIC; Morgan Stanley Research

Figure 2.9

Tight labour market conditions are however still likely to manifest itself in the form of higher labour share income and a corresponding decline in capital share of income as reflected in Figure 2.10. Amid limited revenue growth, corporate profitability is crimped as firms are forced to offer higher wages because of the tight labour market.

In view of this, it is possible that a decrease in corporate profitability rather than higher inflation is observed as the long-term result of reduced labour supply growth and flatlining income growth.

### Tight Labour Market Shows Up in the Form of Rising Labour Share of Income



Sources: CEIC; Morgan Stanley Research

Figure 2.10



## **2.4 Raising Productivity, Re-Thinking Growth Models**

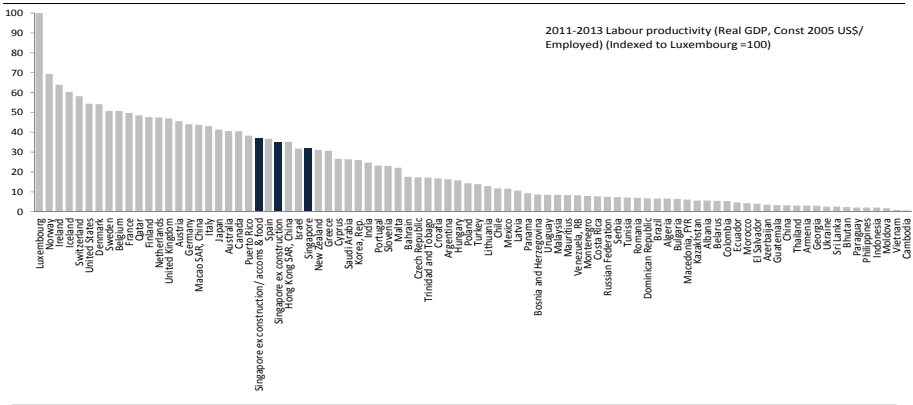
Raising productivity is a solution to the problems posed by the 3Ds. Figure 2.11 shows the relative labour productivity of different countries. Singapore lies somewhat in the middle, behind countries such as Japan, Hong Kong and Australia. Stripping out the construction sector and food and accommodation sector, the numbers improve slightly but still lie behind major developed countries.

The Nordic countries of Norway, Denmark, Finland, Iceland and Sweden all have labour productivity ranked at the top of the list. This group of countries offers lessons to Singapore on productivity improvement as they have somewhat similar small populations of 5–10 million, a relatively high median age of about 37–40 years, and comparable GDP per capita to Singapore; yet they deliver higher labour productivity than Singapore, despite having a working age population growth of less than 1%, which is lower than that of Singapore.

Despite being viewed as welfare states, the reality is that unemployment is low in these countries and labour force participation rates are higher than that of Singapore. In other words, the Nordic countries have been able to achieve more with less without sacrificing income inequality.

# THE TWENTY-FOURTH SINGAPORE ECONOMIC ROUNDTABLE

Singapore Labour Productivity Has Room to Improve: What Lessons Do Nordic Countries Offer Singapore?



Sources: World Bank; ILO; CEIC; Morgan Stanley Research

Figure 2.11

## Improving the Education System

On the education front, Finland’s education system may offer some insights to Singapore. It comes up very well in most education ranking indexes. Teaching is a very competitive and highly regarded profession in Finland where only the best and brightest individuals become teachers. Classroom sizes are kept small, and teachers are given significant autonomy in designing the education curriculum and catering to students of different learning abilities. In addition, there is a focus on collaboration over competition in Finland’s education, which is quite different from the situation in Singapore. Some would argue that collaboration, more so than competition, drives results.

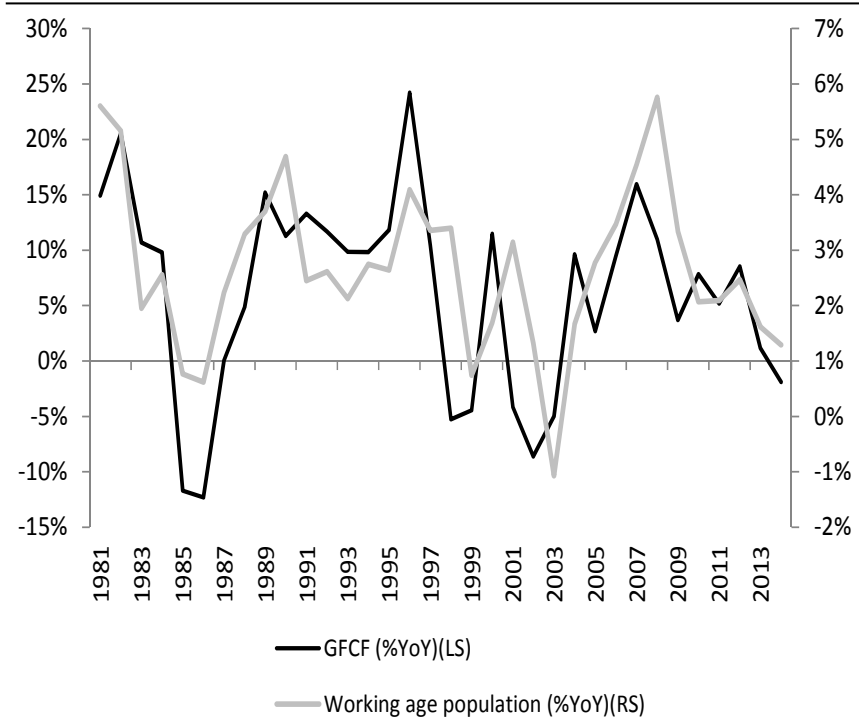
When it comes to labour market policies, there is a strong emphasis on lifelong learning and competency-based qualifications. The negative bias

associated with a vocational education is overcome by making it easy for students with a vocational education to advance to universities, which is similar to what Germany does under its dual track education system. While Singapore is moving in that direction, more work on this front can probably be done.

***Re-Thinking FDI-Driven Growth Model***

The ageing demographic trend observed in Singapore also means that the existing growth model needs to change. A workforce growing at a slower pace tends to generate diminishing marginal returns to additional capital investment. Figure 2.12 shows the strong correlation between working age population growth and gross fixed capital expenditure (CAPEX) growth.

### It's All Correlated: A Slowdown in Working Age Population Slows Capex Momentum



Sources: UN Population; CEIC; Morgan Stanley Research

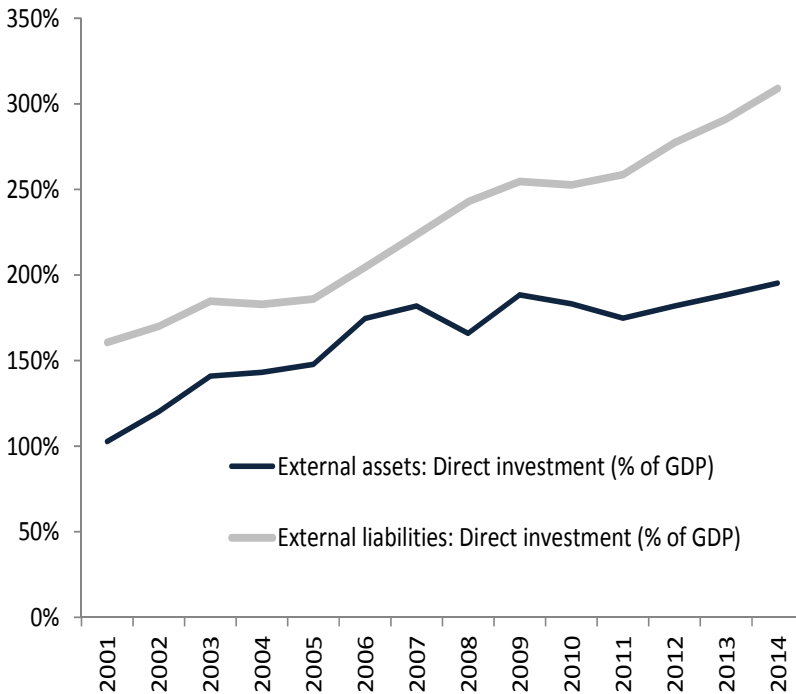
Figure 2.12

The strategy in the past has been to import FDI through MNCs, as reflected in the excess of external liabilities over external assets in direct investments (Figure 2.13). But if the prevailing demographic trends of an ageing population and shrinking workforce are here to stay, it implies a diminishing return to investment in Singapore, which would warrant a shift in the national growth strategy from attracting MNCs into Singapore,

MACRO-ECONOMIC OUTLOOK FOR SINGAPORE AND IMPLICATIONS FOR POLICY

towards internationalising more domestic firms, which requires a vibrant local private sector. A direct consequence of this development is the need to move away from tracking GDP growth to GNI growth.

**FDI Investors Have More Direct Investment Assets in Singapore than Singaporeans Have Abroad**



Sources: CEIC; Morgan Stanley Research

Figure 2.13

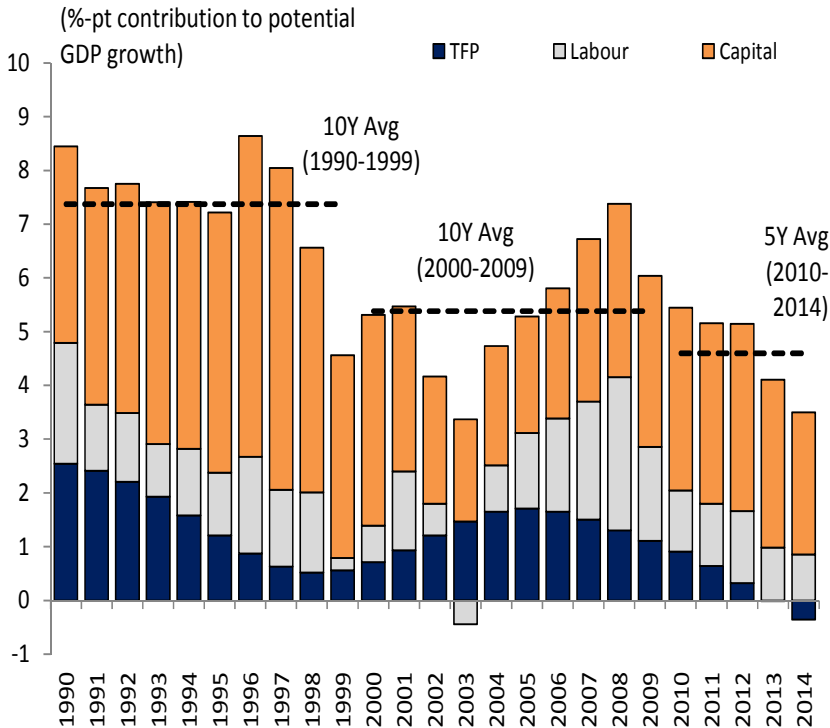
In order to achieve a more vibrant private sector in Singapore, it is necessary to understand the integral factors. In the case of Silicon Valley,

there are three critical factors: a deep talent base; a deep funding pool, as well as strong collaboration between universities and industry.

### 2.5 Currency Policy in a Slow Growth World

It is clear from the aforementioned points that lower structural growth in Singapore is a hard to avoid (Figure 2.14). In addition, moving forward Singapore’s growth premium in terms of the margin between Singapore’s GDP growth and global GDP growth is likely to shrink (Figure 2.15).

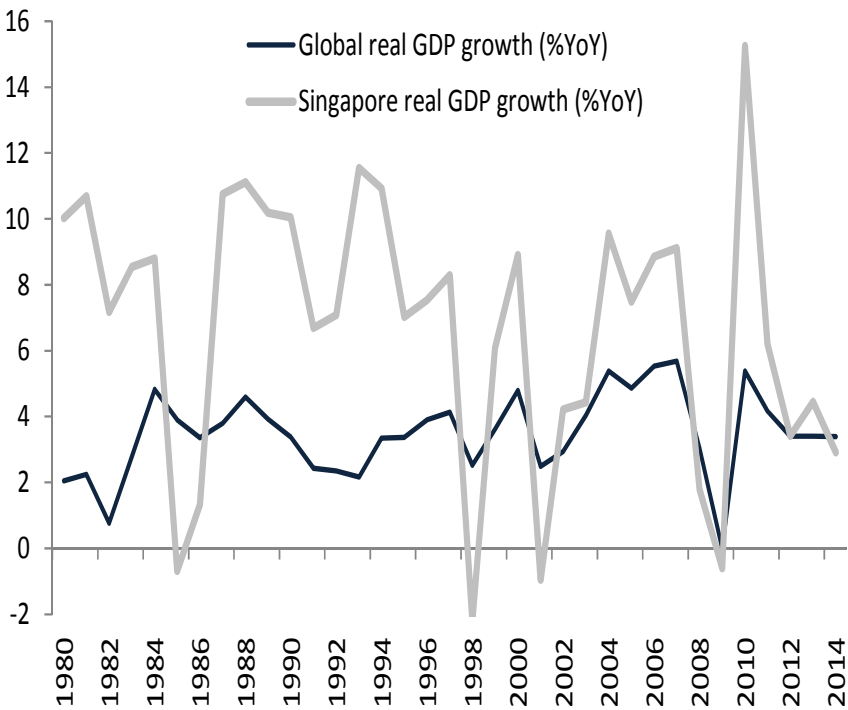
#### Lower Structural Growth Is A Given



Sources: CEIC; Morgan Stanley Research

Figure 2.14

### From Growth Premium To Growth Convergence

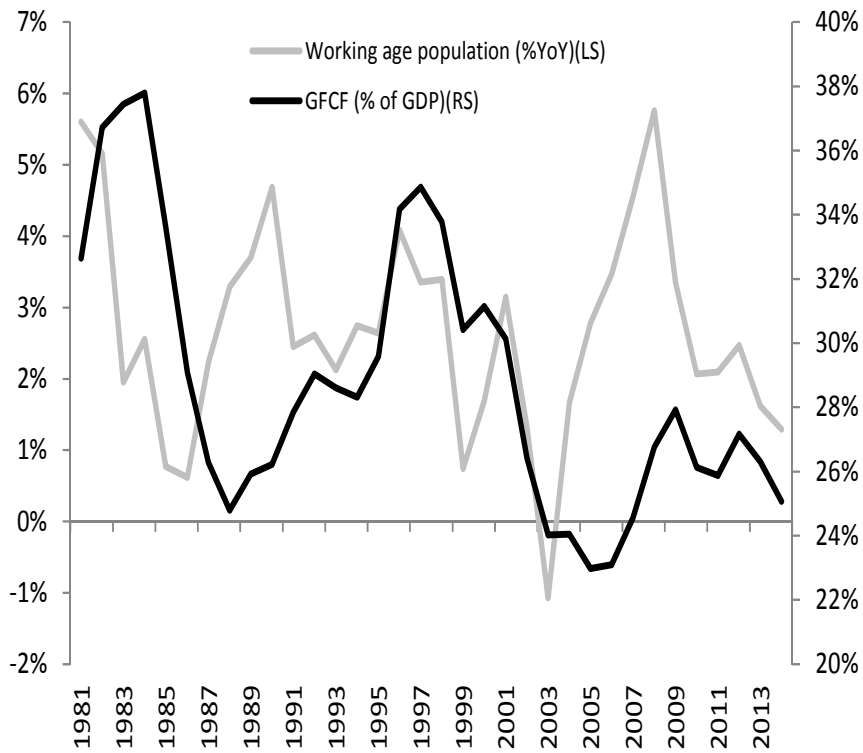


Sources: IMF; CEIC; Morgan Stanley Research

Figure 2.15

In thinking about growth and productivity trends over the longer run, it is should be noted that labour input, capital input and productivity — the three drivers of growth — are intertwined. Working age population and capital investments appear to correlate closely (Figure 2.16). One possible explanation is that greying demographics reduce both the amount of savings available for investments and the returns to capital investments. .

### Capex Share of GDP Likely to Weaken With Greying Demographics



Sources: CEIC; Morgan Stanley Research

Figure 2.16

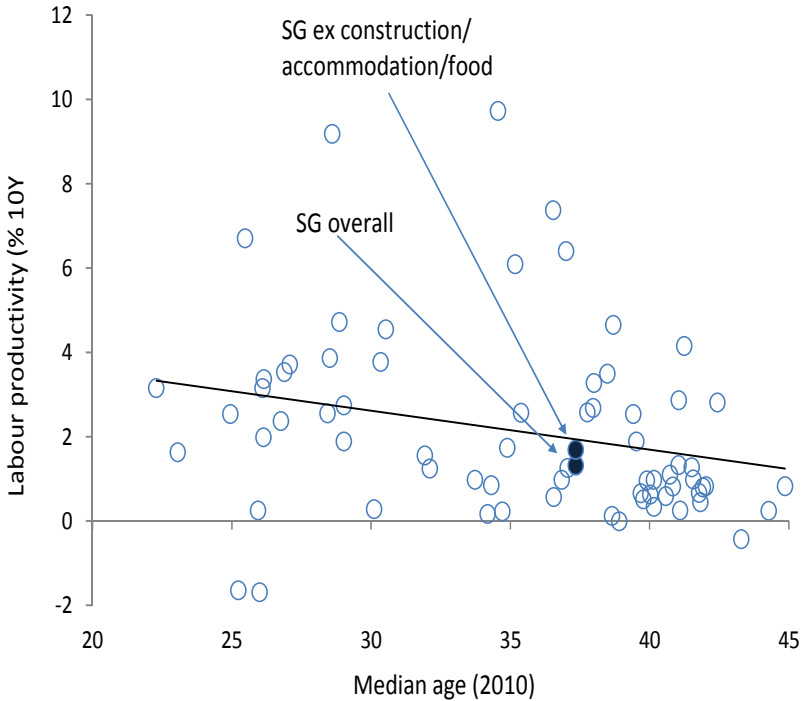
Figure 2.17 suggests that productivity and demographic growth has a negative correlation; as a population ages, labour productivity growth tends to slow down as well, although technological adoption may be able to mitigate this. To the extent that greying demographics induces lower productivity, it does suggest that Singapore will experience structurally



MACRO-ECONOMIC OUTLOOK FOR SINGAPORE AND IMPLICATIONS FOR POLICY

lower growth unless the underlying growth structure of Singapore changes.

**Labour Productivity Growth Tends to Correlate Negatively With Median Age**



Source: World Bank; CEIC; Morgan Stanley Research

Figure 2.17

Lower structural growth, reduced corporate profitability, and low inflation imply that the slower slope of appreciation is probably here to stay. However, the policy scenario of an outright depreciation is unlikely

because first, given a large current account surplus one cannot argue that the currency is severely overvalued; and second, the government's stance has consistently been to push for higher value-add rather than to exploit cheap currency to strengthen exports and support growth.

### 3.

## **Presentation by Discussant: Musings about Monetary Policy**

**Mr Vishnu Varathan**  
Senior Economist and Head  
Economics, Market and Strategy, Singapore Treasury Division  
Mizuho Bank Ltd

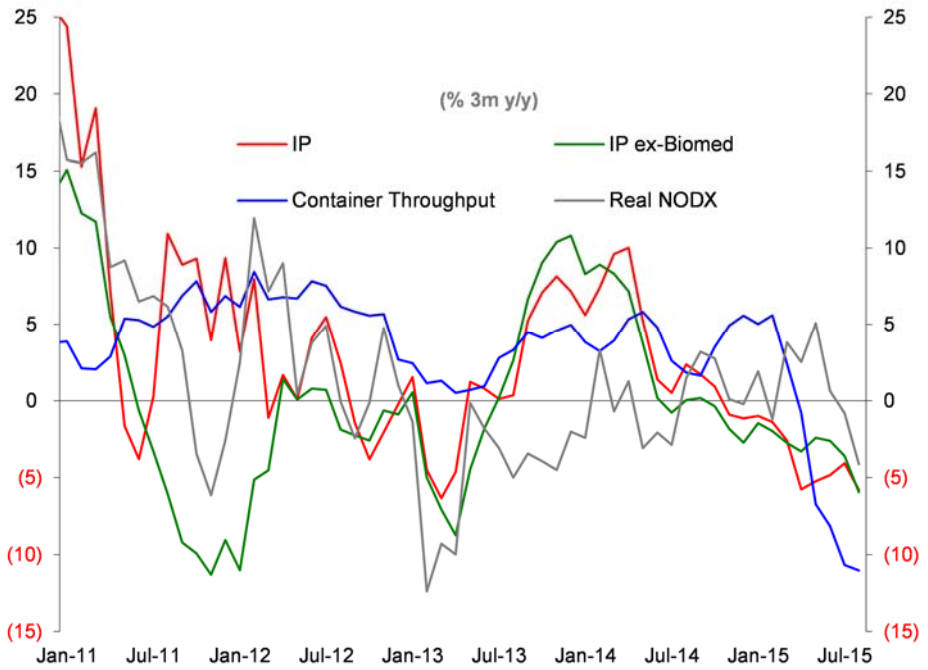
### **3.1 Introduction**

The presentation suggests that Singapore's policy elasticity of demand may have declined compared to previous global recovery cycles. It examines and discusses the implications of monetary policy and structural reforms on the economy. Lastly, the presentation underscores the importance of keeping abreast with the changes in relationships of macroeconomic variables, and understanding what is driving these changes.

### **3.2 Reduced Policy Elasticity of Demand**

The global economy, by most measures, is not in a great shape. The sharp pullback in external demand, especially as seen in the plunge in container throughput, makes hollow any consolation of averting technical recession (Figure 3.1). In addition, despite slight improvements in the latest PMI data, manufacturing activity in China remains weak (Figure 3.2), suggesting that external demand-led pickup in Singapore will not materialise in the near future.

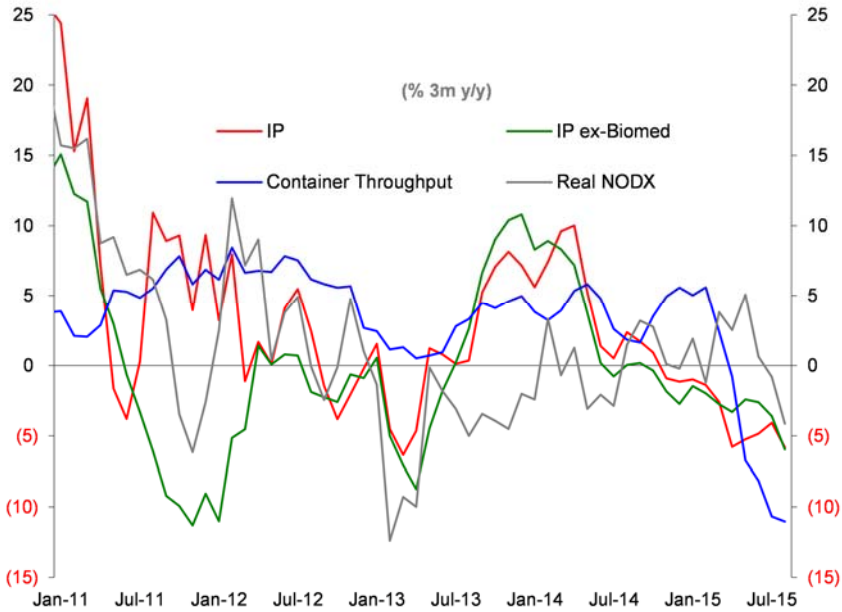
THE TWENTY-FOURTH SINGAPORE ECONOMIC ROUNDTABLE



Sources: CEIC; Mizuho Bank Singapore Treasury Division

Figure 3.1

PRESENTATION BY DISCUSSANT: FINANCIALISATION OF THE ECONOMY AND ONGOING EXISTENTIAL CRISIS



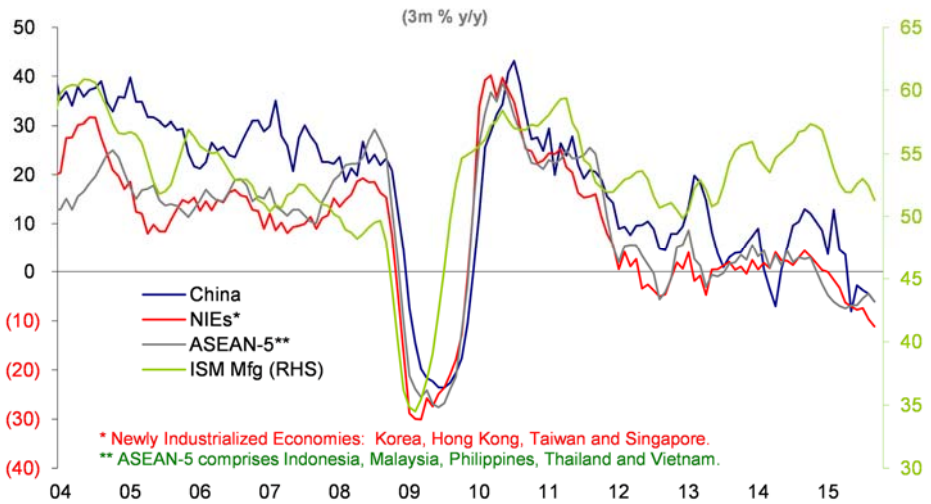
Sources: Bloomberg; CEIC; Mizuho Bank Singapore Treasury Division

Figure 3.2

However, Singapore is not alone in this. Figure 3.3 shows a diminished pickup in Asian exports (China, NIEs, ASEAN-5) despite a recovery in the US ISM manufacturing index. This suggests that a much more sustained recovery is needed in the US before demand would feed through to manufacturing and exports of the region, Singapore included.

Nonetheless, the difficulty in identifying a bottom for the current economic lethargy in the region raises the overall level of uncertainty about the current environment for policy making. In addition, given that monetary policy in Singapore works mainly through the export channel,

this raises the question of how effective currency policy would be moving forward.

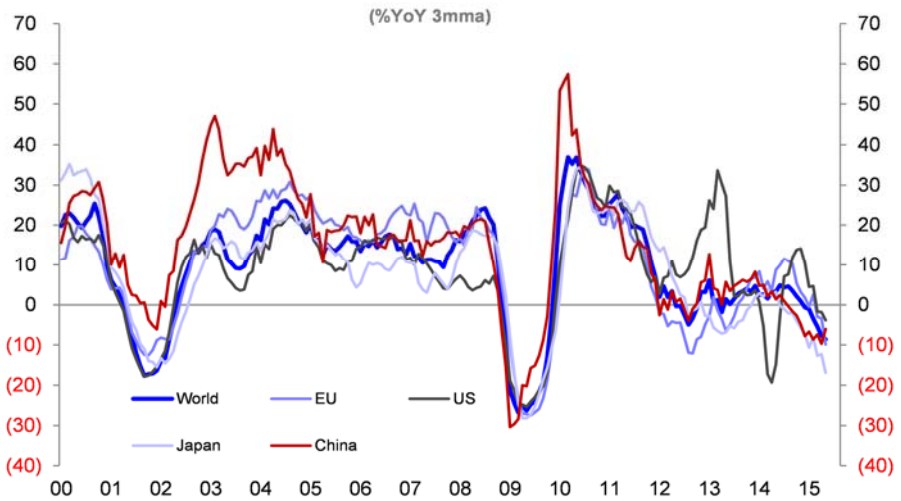


Sources: CEIC; Mizuho Bank Singapore Treasury Division

Figure 3.3

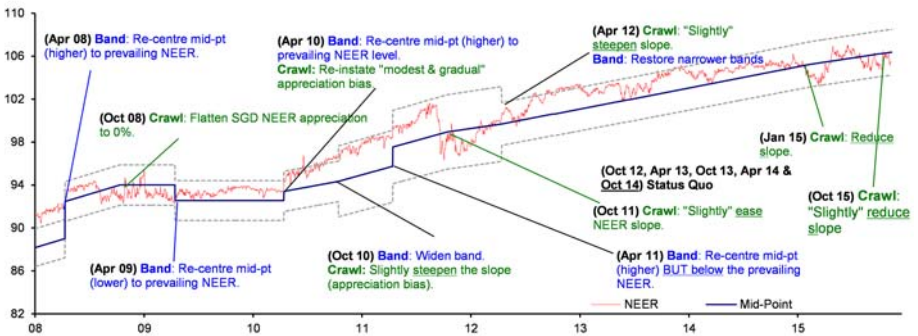
In particular, external headwinds beg the question of monetary policy elasticity. Asia exports by destination reveals a deficient aggregate demand (Figure 3.4). Vertical integration of economic activities in China has led to declining trade volume in the region, which could weaken the economic boost provided by monetary policy via the exports channel. These factors may buckle the long-term trend of S\$NEER gradual appreciation (Figure 3.5). The slope reduction of S\$NEER in October was the second easing decision in this year, and reflects the policy response to weaker than expected external conditions.

PRESENTATION BY DISCUSSANT: FINANCIALISATION OF THE ECONOMY AND ONGOING EXISTENTIAL CRISIS



Sources: CEIC; Mizuho Bank Singapore Treasury Division

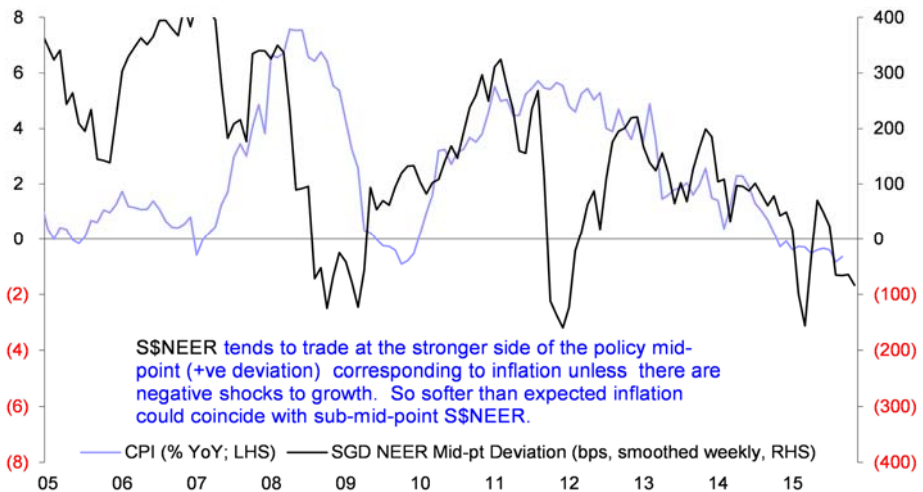
Figure 3.4



Sources: MAS; Bloomberg; CEIC; Mizuho Bank Singapore Treasury Division

Figure 3.5

The S\$NEER has historically tended to correspond positively to inflation unless there are significant shock to growth. Hence, as long as inflation remains under wraps, the S\$NEER may have scope to be below the default appreciation pace (Figure 3.6).



Sources: Bloomberg; Mizuho Bank Singapore Treasury Division

Figure 3.6

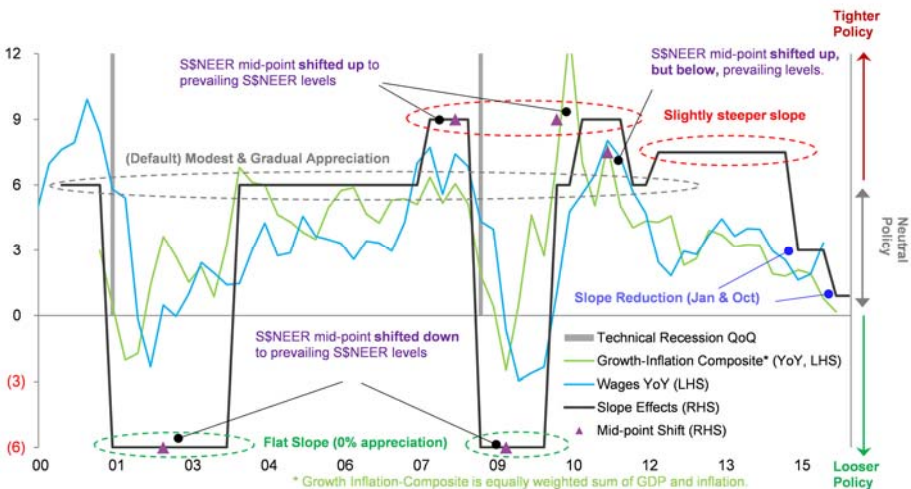
### 3.3 Wage Pressures Likely to be Capped

While fairly tight labour market conditions ostensibly pose further constraints on policy, this is mostly overstated. Aggregate demand slack in the global environment blunts the effect of monetary policy easing on stimulating export demand. The resultant weaker growth coupled with the current property market correction should by and large keep wage pressures in check.



PRESENTATION BY DISCUSSANT: FINANCIALISATION OF THE ECONOMY AND ONGOING EXISTENTIAL CRISIS

Figure 3.7 shows that softer growth-inflation outcome (represented by the green line) is correlated with looser monetary policy. Although the figure also shows a positive correlation between wage and monetary policy, the current tepid economic conditions warrant more accommodation, and present no compelling reason for tightening monetary policy.

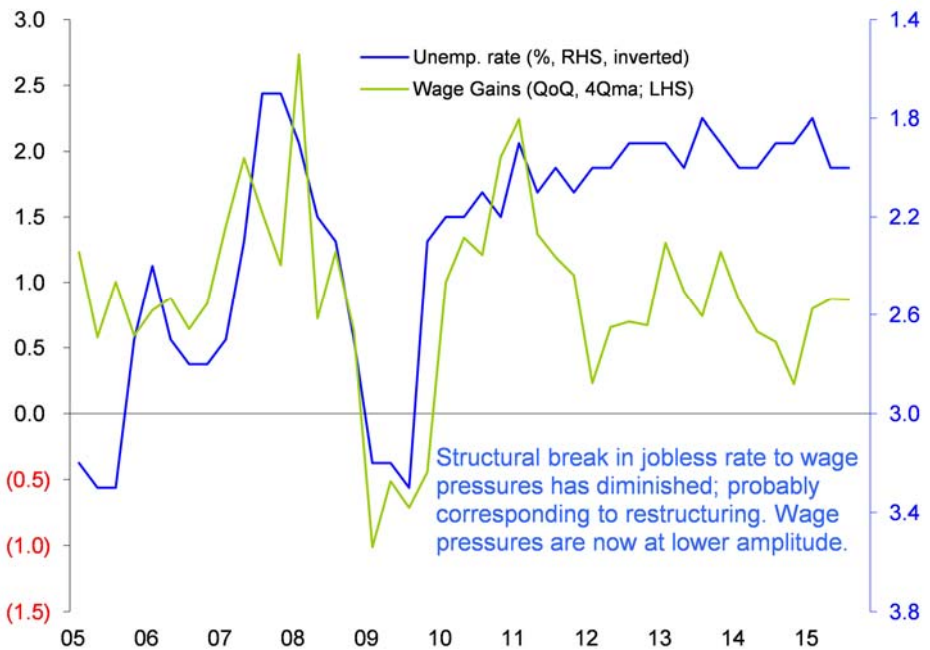


Sources: CEIC; Mizuho Bank Singapore Treasury Division

Figure 3.7

But this policy stance invariably forces a dilemma. What can be done about the tight labour market if monetary policy is to remain accommodative? To address this question, it is pertinent to recognise that a tight labour market can be defined and measure in various ways, depending on the metrics used.

Based on media reports and anecdotal accounts on the ground, it seems that the labour market is not as tight as what the broad numbers suggest. The tight labour market as indicated by headline jobless rate overstates overheating risks given supply-side distortion. Despite the current level of output and strong employment numbers, wage pressures do not seem to be showing up as much. In fact, as shown in Figure 3.8, there appears to be a structural break in relationship between unemployment and wage gains.

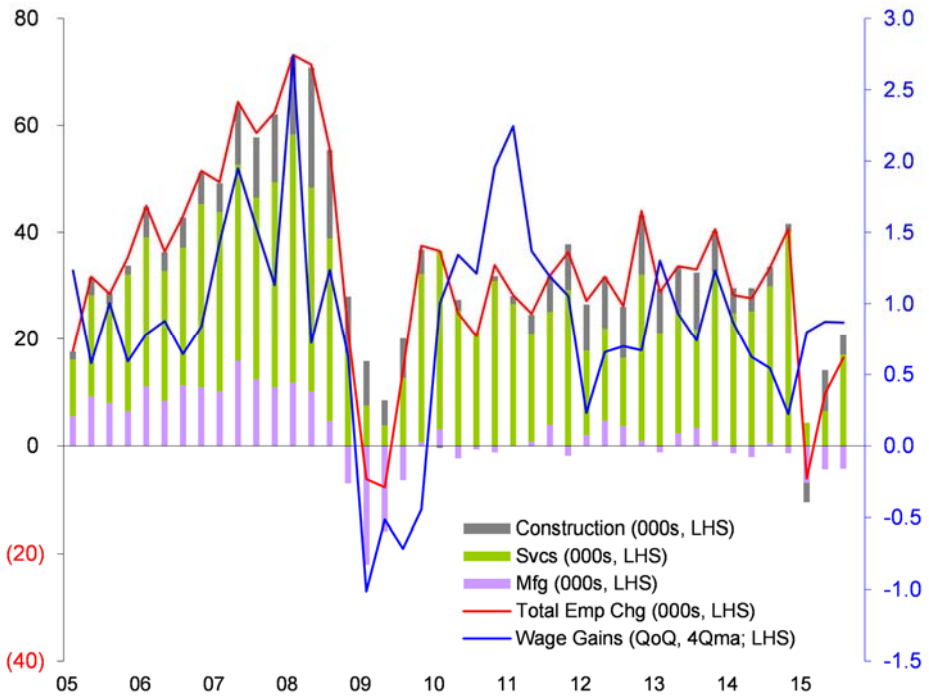


Sources: CEIC; Mizuho Bank Singapore Treasury Division

Figure 3.8

PRESENTATION BY DISCUSSANT: FINANCIALISATION OF THE ECONOMY AND ONGOING EXISTENTIAL CRISIS

This could be explained partly because wage gains tend to have a more proximate relationship with number of jobs created (Figure 3.9), which recently has settled at a lower level. Softer job creation is admittedly matched with reduced labour supply — both organic and inorganic, and the upshot is that monetary policy need not respond to the tight labour market with “full force” in consideration of the supply distortions and deficient external demand conditions.



Source: CEIC; Mizuho Bank Singapore Treasury Division

Figure 3.9

Nonetheless, the current situation raises questions about the type of jobs being created. It is clear that the step-up in levies from 2012 have translated into higher local wages and greater wage share of income. This could explain some but not all of the divergence between GDP growth and the job vacancy ratio (Figure 3.10). Other possible factors driving this divergence include a mismatch of supply and demand in the labour market and lower quality jobs being created. Hence, information on the type of jobs created and the terms of contract among others matters in interpreting the situation of the labour market.

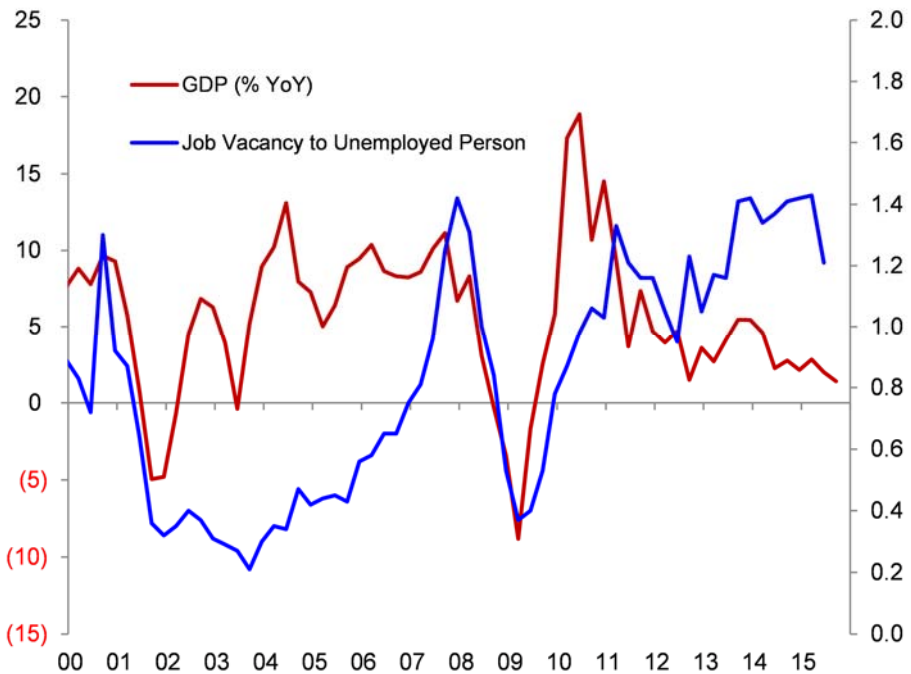


Figure 3.10

PRESENTATION BY DISCUSSANT: FINANCIALISATION OF THE ECONOMY AND ONGOING EXISTENTIAL CRISIS

In conjunction, as the property cycle appears to influence wages too, a prolonged softening in the property market is likely to “de-pressurise” wages further as job losses in the property sector show up more broadly (Figure 3.11). All these factors grant policymakers room for further accommodation in this difficult restructuring period without having to jump the gun on inflationary pressures from wages.

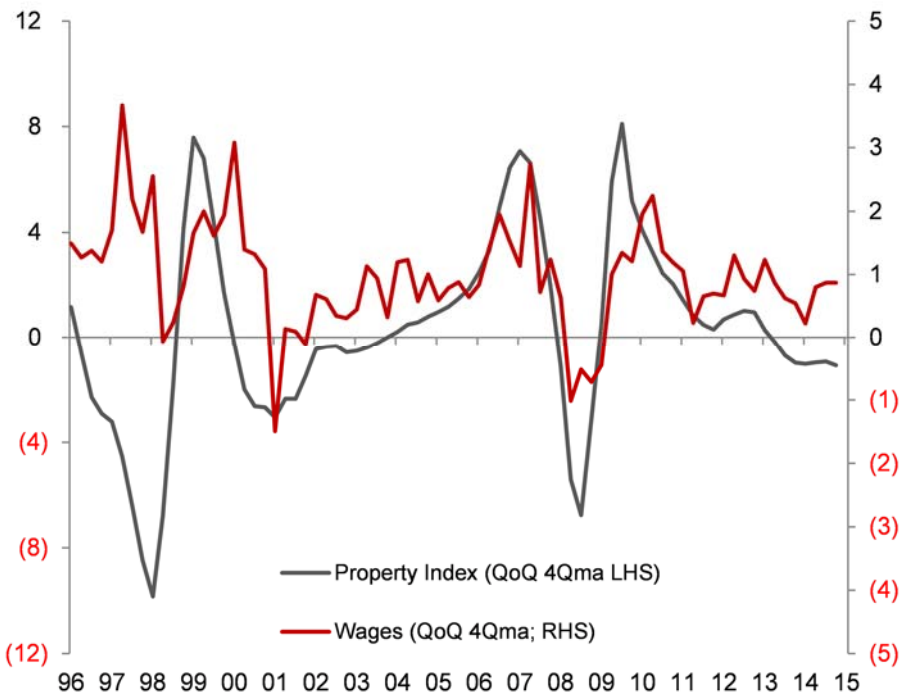
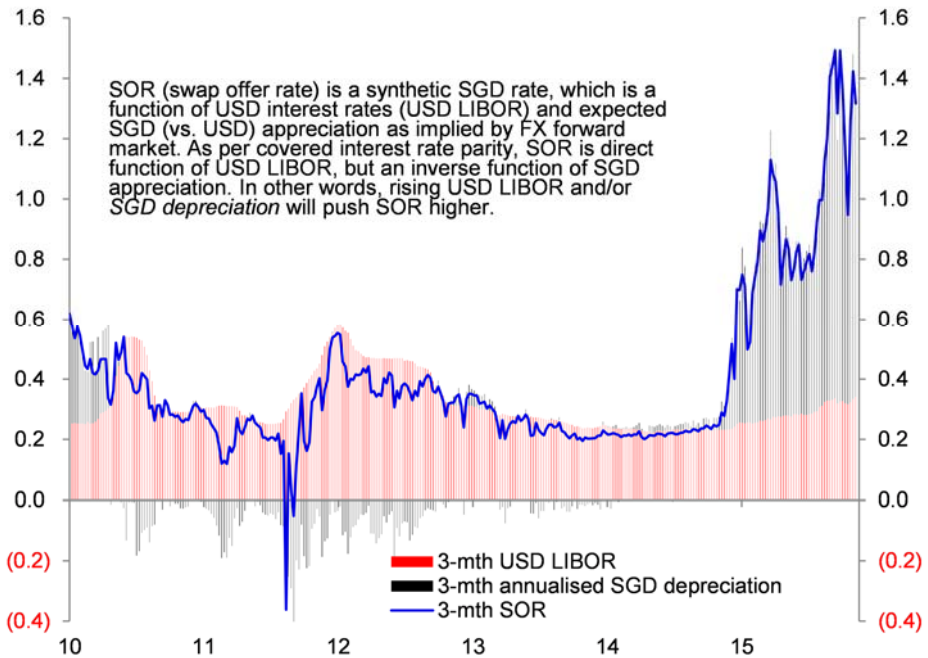


Figure 3.11

### 3.4 Interest Rate, Exchange Rate Trade-off

Admittedly, the aforementioned mitigating factors on the wage front suggest more flexibility to ease amid downside risks from external headwinds. But a more accommodative monetary policy will probably be limited by the trade-off between exchange rate effects and the unintended interest rate effects, which could pose a build-up of balance sheet risk. For instance, the recent surge in the SOR (Swap Offer Rate) was mainly driven by depreciation expectations on the Singapore dollar (Figure 3.12).

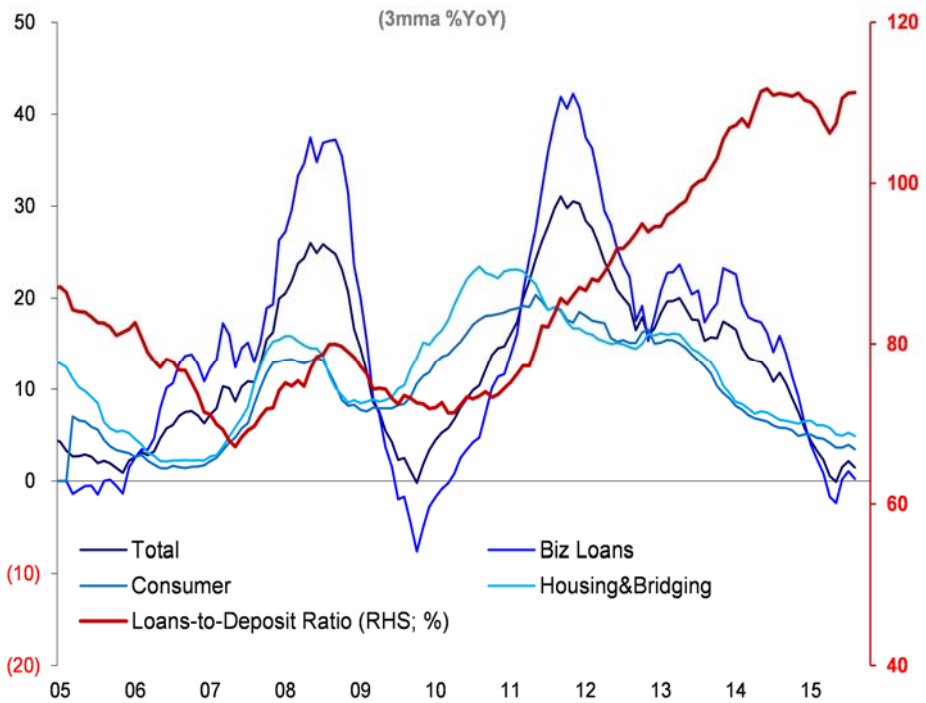


Sources: Bloomberg; CEIC, Mizuho Bank Singapore Treasury Division

Figure 3.12

PRESENTATION BY DISCUSSANT: FINANCIALISATION OF THE ECONOMY AND ONGOING EXISTENTIAL CRISIS

A strengthening USD and entrenched depreciation expectations about the Singapore dollar could further push up the SOR and SIBOR (Singapore Interbank Offered Rate), which are closely correlated. Stretched loan books and the property slowdown is already stifling growth impetus from credit channels (Figure 3.13), and higher interest rates would only exacerbate the situation by raising balance sheet risks. This notable trade-off coupled with a diminished “policy elasticity” of monetary policy (in terms of spurring demand) make the case for cautious balance, which adds another layer of complexity to short-term monetary policy.

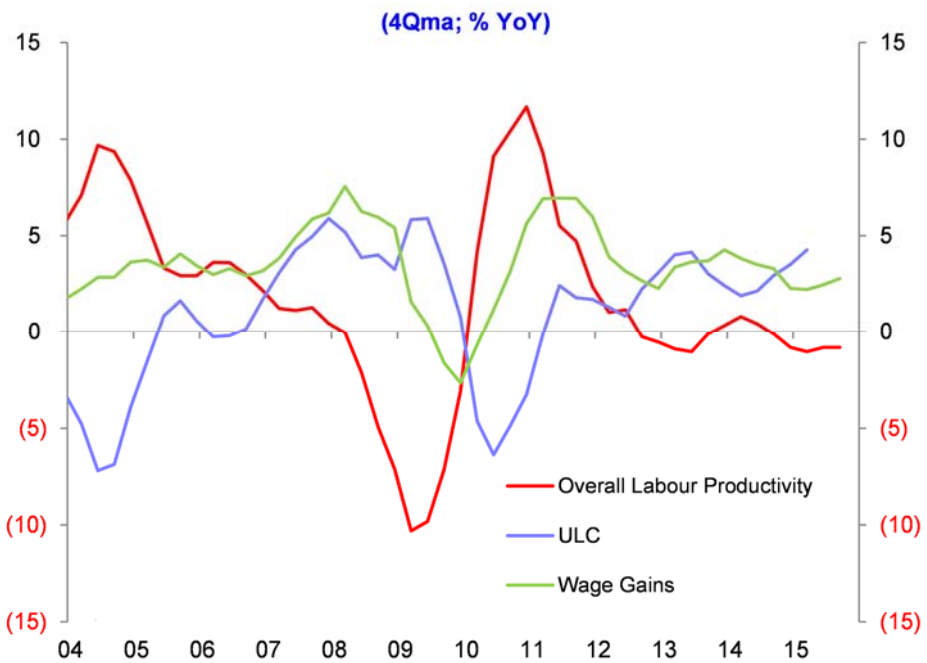


Source: CEIC, Mizuho Bank Singapore Treasury Division

Figure 3.13

### 3.5 Structural and Fiscal Factors

Structural reforms to lift productivity are a critical complement to monetary policy accommodation. Tackling productivity is the sustainable approach to keeping unit labour costs (ULC) competitive. In the 2000s, wage rises followed productivity gains, and this can be sustained quite easily. More recently, wage gains have gotten ahead of productivity gains causing some erosion in business competitiveness in Singapore (Figure 3.14).



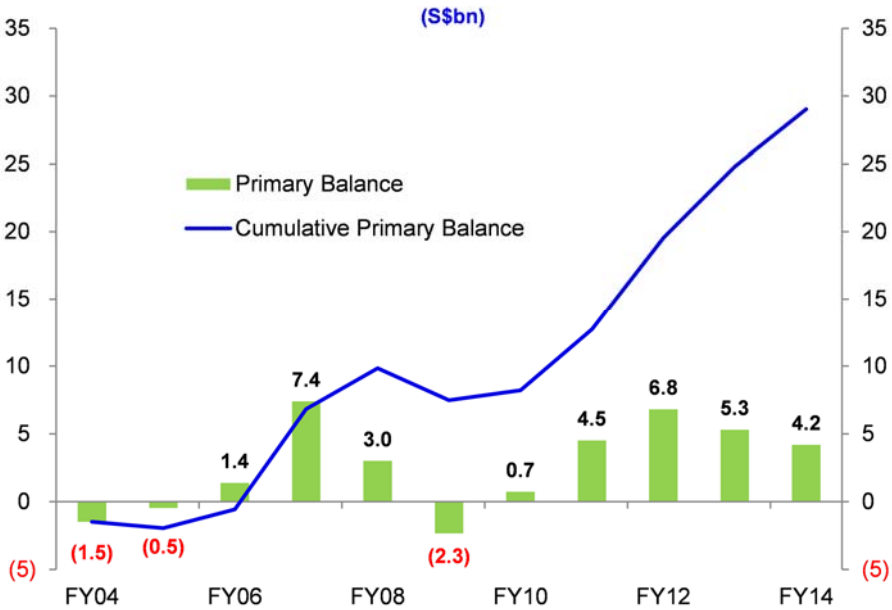
Sources: CEIC; Mizuho Bank Singapore Treasury Division

Figure 3.14



PRESENTATION BY DISCUSSANT: FINANCIALISATION OF THE ECONOMY AND ONGOING EXISTENTIAL CRISIS

Nonetheless, the present cyclical dampeners to wage growth such as a demand deficit ought to buy some time without undue policy consternation. In addition, Singapore’s strong primary balance position provides a comfortable fiscal cushion to support the activities to achieve the desired transformation (Figure 3.15). Monetary policy provides both income effect and a wealth effect. Over the medium to long term, greater wealth augmenting effects of monetary policy may begin to take effect, raising the growth outlook.



Sources: CEIC; MOF; Mizuho Bank Singapore Treasury Division

Figure 3.15

## 4.

### **Discussion on Macro-Economic Outlook for Singapore and Implications for Policy**

Participants of the roundtable noted the increasing risks of deflation and raised questions about the monetary policy response. The issue of wage pressures was also discussed, as well as reform of the education system to support the transition to an economy driven by innovation and productivity.

#### **4.1 Deflationary Economic Conditions**

Participants were bearish on the growth outlook and discussed the worsening outlook for the domestic economy, the prospect of deflation, and the possibility of a hard landing. Ms Deyi Tan noted that fundamental demand for property based on population growth over the next few years was projected to be 25% of upcoming supply. This demand supply mismatch would be a major drag on the CPI, as property formed about 20–23% of the CPI basket.

A participant noted that the past few years had seen a slow growth trajectory characterised by weak demand and high leverage, but jobs creation had slowed very dramatically, with 20,000 jobs created in the first three quarters of 2015, compared to 90,000 jobs in the same period of the preceding year, while the resident unemployment rate had risen. This was compounded by the feedback loop of rising unemployment and the domestic debt deleveraging cycle, with the potential for a more

## DISCUSSION ON MACRO-ECONOMIC OUTLOOK FOR SINGAPORE AND IMPLICATIONS FOR POLICY

dramatic vicious cycle to develop clearly building up, given a rising interest rate environment.

In addition, it was pointed out that based on ground observations of trade and human capital flows through port activity, airports and ferry terminals, and looking at orders on the technological front, as well as receivable days and building activities, consumer spending and aggregate demand did not seem to pick up despite a nascent recovery in developed markets, heralding tough times ahead.

However, it was argued that the problem was not unique to Singapore, and that it related to the fact that a larger part of emerging markets was in a deleveraging phase; and insofar as the global trade flow had been driven by global emerging market growth with Singapore being at the heart of global trade, it was to be expected that the external demand picture was slowing down.

Another participant added that price deflation for industrial goods was becoming more evident as China exported its surplus capacity. For example, the world was seeing an accelerating pace of steel price deflation because the behavioural change in the Chinese side was to offer very sharp discounts to foreign buyers due to oversupply, overspilling China's deflation to other countries.

This had filtered through as SME sentiment based on the latest Singapore Business Federation survey was at the lowest in the last three years, and that more than half were facing stagnant growth or negative growth.

This raised risks of a hard landing. However, a participant said that a hard landing in Singapore would require either of the following: a huge negative external shock, or if the domestic economy builds up so much leverage and imbalances that it collapses as growth slows down. The prognosis was for a mild global recovery, while the latter scenario was unlikely to happen as long as domestic liquidity conditions remained under control by MAS.

## **4.2 Monetary Policy Response**

Questions were raised about the policy response by the MAS to reduce the slope slightly in October 2015 while retaining the modest and gradual appreciation of the S\$NEER. A participant said that the current policy effectively depreciated the Singapore Real Effective Exchange Rate (REER) via internal depreciation, or deflation, and that this course had two disadvantages: first, it may lengthen the deleveraging phase by reducing nominal growth and raising servicing costs as well as the real cost of debt; and second, it leads to greater financial stability risks due to higher interest rates and asset deflation.

The participant also noted that a bigger uncertainty was the change in interaction between the exchange rate and the interest rate, where historically, measures by MAS to slow the rate of appreciation also led to

## DISCUSSION ON MACRO-ECONOMIC OUTLOOK FOR SINGAPORE AND IMPLICATIONS FOR POLICY

some degree of domestic interest rates easing as well. However, this relationship seemed to have reversed: in the current cycle, any hint of currency depreciation causes a tightening in the domestic money markets, leading to higher interest rates.

In addition, under the conditions of slowing growth, deflation and rising unemployment, gradual monetary policy may be self-defeating by encouraging markets to expect further action to come, when alternatively, the better thing to do might be to boldly move the S\$NEER policy band downwards to stabilise capital outflows. However, not everyone agreed with this view, with a participant pointing out that interest rates are very much a function of exchange rate policy, and that the relationship between interest rates and exchange rate had moved in a predictable inverse manner. In addition, having an explicit and stable exchange rate policy helps maintain currency stability. For instance, when the PBOC announced an exchange rate regime change in August 2015, speculation about a 10–15% competitive devaluation became widespread, leading to severe capital outflows that adversely impacted financial stability. In reply, the first participant noted that unlike China, Singapore has an open and highly credible policy framework, although he accepted the uncertainty about how effectively Singapore could ease the real exchange rate under the current regime.

A few points were made to explain the monetary policy stance. First, given that global growth and inflation had been below trend since 2008, central banks, including Singapore, had adopted accommodative

monetary policies for an extended period, and the current stance was to maintain it on the loose end. Second, barring one-off fiscal measures, core inflation was creeping up, while the estimate of the output gap in the economy was about zero, which meant the economy was growing at roughly about the same pace as the potential, in terms of levels. Based on these two fronts, the conclusion was that there was no immediate urgency to do further on monetary policy. Third, the labour market remained fairly tight, with vacancy rates for some industries quite high, and with firms in various industries indicating that they were facing difficulty securing sufficient manpower. Fourth, since Singapore was a small economy, its exports were mainly determined by income effects rather than price effects, and exchange rates were limited in this regard. Finally, monetary policy was only one of several policy tools, and economic strategies had to be multi-pronged, incorporating monetary policy, fiscal policy, supply-side adjustments and other measures to help the economy adjust and undergo the necessary restructuring. Hence, the burden of adjustment should not fall on exchange rates alone.

### **4.3 Views on Wage Pressures**

Participants had mixed views about the prospects for higher wages in Singapore going forward. One participant noted that higher wages required growth, which came from demographics, productivity or leverage. The demographics and leverage components had been exhausted, and hence any wage gains were sustainable only if driven by productivity gains. Another participant reiterated the point that labour market tightness did not automatically lead to wage inflation as it

## DISCUSSION ON MACRO-ECONOMIC OUTLOOK FOR SINGAPORE AND IMPLICATIONS FOR POLICY

depended on structural features of the labour market. Japan was an example where labour laws against firing employees lead to depressed wages.

However, other participants noted that in the long run the Phillips curve would re-assert itself and a tight labour market would lead to rising wages. This was in line with the underlying concern driving the overall strategy of the government to shift the focus away from cheap labour inputs into more productive capital inputs. However, this may only come after a deep restructuring in the corporate sector. In this context, a participant noted that initiatives such as the SkillsFuture movement constituted a robust continuing education strategy to mitigate labour market frictions and manage disruptions in the labour markets.

### **4.4 Availability of Timely Information on the Economy**

Participants highlighted data gaps in several areas of the economy, and discussed the need for indicators to improve monitoring and forecasting, as well as to support a more targeted policy approach. One participant noted the lack of timely indicators on the services sector in Singapore, making it hard to gauge the impacts of external developments on this part of the economy, while another participant said that MTI releases composite indicators on a quarterly, as opposed to a monthly basis which made it difficult to get a sense of where the economy was heading.

Other participants added that fine-grained sectoral data was required to drill down into the structural shifts in Singapore in terms of

retrenchment, structural unemployment and corporate relocation amongst others. Credit conditions faced by SMEs also need to be studied more closely. The findings may be used to develop a more targeted policy approach by the government, as the government moves away from broad support schemes like the Productivity Innovation Credit (PIC) scheme in assisting the development of the private sector.

#### **4.5 Education as a Key Component of Structural Reform**

As participants discussed the rebalancing from the FDI-import growth model and the development of Singapore-based companies, as well as the transition from an input driven to an innovation driven economy, a theme that came into play was the role of the education system. In particular, participants called for the need for further reform to the education system to help spur creativity and incentivise risk-taking.

Some participants noted that the fixation on tests and exams in Singapore seem to cause students to be overly concerned with the “one right answer”, as opposed to developing an understanding of multiple interpretations of problems. Finland on the other hand has had a successful education system that relies on minimal standardised testing. In this sense, this raised questions about the need for balance between a “traditional” and “progressive” education model for Singapore.

However, other participants replied that the economic and policy context of the Finland education system differed greatly from Singapore. First, in Finland, the healthy balance between the technical and academic



## DISCUSSION ON MACRO-ECONOMIC OUTLOOK FOR SINGAPORE AND IMPLICATIONS FOR POLICY

institutions, with high take-up rates for vocational education, arose out of a higher education system under which generous living subsidies incentivised university students to delay graduation, thus clogging up the higher education system and increasing the competition for university places. Second, high taxation led to greater equalisation of income between technical and professional fields, thus increasing the attraction of technical education. These circumstances were markedly different from Singapore.

Nevertheless, a participant noted that changes in teaching and approach to education were currently underway in both the education system of schools and continuing education. These were beginning to show in the PISA test scores for the past five years, whereby Singapore's component scores on how individuals process and creatively assimilate information had seen improvement

However, it was noted that education might not be the main obstacle to restructuring the economy as Singapore remains open to foreign human capital flows. Instead, understanding and taking advantage of broader external developments, such as structural changes in global supply chains and the emergence of new technologies, will be crucial for future growth.

## 5. **Singapore's Economy Beyond 50**

**Dr Alex Mourmouras**  
Division Chief  
Asia and Pacific Department  
International Monetary Fund

### **5.1 Historical Background**

Singapore has made a remarkable transition from third world to first in 50 years, in the city-state with few natural resources. Growth rate in GDP over a 50-year period is an impressive 7.6%, through accumulation of human capital and physical capital and growth in total factor productivity.

Three features stand out: first, Singapore's growth rate is characterised by the large variability and higher standard deviation than a typical closed economy. The openness of Singapore's economy has been its hallmark, with its strategic location and positioning as hub of logistics and trade in the centre of ASEAN. Second, Singapore has relied heavily on inputs to drive growth through most of its history, and foreign workers and immigration have driven growth in the past years. With that growth, profits for the corporate and business sector have been steady. Third, alongside the global phenomenon, is the increase in inequality over time. In the midst of skills-biased technical change and the de-materialisation of production, worker skills have not gone up, while immigration of foreign workers have put downward pressure on non-skilled wages.

“A Contribution to the Empirics of Economic Growth” by N. Gregory Mankiw, David Romer and David N. Weil, published in the *Quarterly Journal of Economics* in 1992, discussed the real convergence to a steady state from the accumulation of physical and human capital, and this is a good way to think about the kind of structural transition that is happening in Singapore’s economy. The rate of growth of unskilled labour is being dialled down and this is causing profound changes in Singapore with a growing emphasis on additional capital and additional technological change as the future drivers of growth in the economy.

There is also the political economy and the shift to a new equilibrium with regard to immigration, based on the median voter in Singapore having expressed his preference for lower immigration rates. In his paper published in the *American Economic Review*, Wolfgang Meyer examined the median voter who is endowed with both capital and labour. The capital-labour ratio of each individual is determined by his endowment, which in turn determines whether each individual benefits or loses from more raw labour flowing into the economy. For example, for citizen-agents who have higher-than-average capital-to-labour ratios, having more immigration benefits them because this would push up the relative reward of capital. On the other hand, a citizen-agent endowed with very little capital would have to compete more with foreign workers, hence dragging wages down. The median voter, based on his endowed capital-to-labour ratio, would decide how much foreign labour into the country is acceptable. In Singapore’s case, the endowment of the median voter of today calls for tighter immigration policy.

## 5.2 Prospects for Future Growth

In IMF's Staff Report, the reasonable potential growth rate of Singapore's economy is about 3%. This takes into account a likely change in the labour force structure, which is a function of fertility, labour force participation, employment rates and foreign worker inflow — about 20,000–40,000 each year. However, as a high-income nation, is 3% an overly ambitious target?

Growth of 1% would be derived from total factor productivity (TFP) growth, which when compared to the 2% average TFP growth achieved by the US for the past 200 years, does not appear to be overly ambitious. However, as seen in recent times, the growth pessimists and the growth optimists are engaged in a debate on whether the world has run out of transformative innovations against the view that there is no diminishing return to innovation and technological change. Either way, 1% for a country at the production possibility frontier in today's world seems to be a reasonable target.

Another 1% of growth would likely be achieved through capital accumulation and savings into fixed investment and physical capital. Labour input will contribute the remaining 1% of growth in the next five years via two components: first, the increase in raw labour through immigration and foreign workers; and second, the improvement of labour

input quality. While these figures are not large, they are not insignificant either for a country already with one of the highest national incomes.

### **5.3 Challenges in Singapore and the Global Economy**

There are less sanguine developments in the global economy. The IMF frequently discusses about the multiple transitions that the world is undergoing. One particular transition is the rebalancing of China's growth model from exports and real estate investment to consumption and services. The other transition is in commodity prices, now that the supercycle driven in part by China for the past 15 years is over. The decline in oil and energy commodities prices is here to stay. At the same time, there is also stress in emerging markets stemming from leverage issues, compounded by the impending interest rate hike by the US Fed — which in itself is appropriate as the US economy is close to full employment. Another global development is the reconfiguration of supply chain and the reshoring of manufacturing activities back to countries such as the US, which affects trade growth in the post-global financial crisis world.

As a highly open economy, Singapore is invariably affected by these external forces. Coupled with domestic constraints such as ageing demographics and socio-political considerations, these factors place a drag on future growth.

### **5.4 Developing the Smart State**

Notwithstanding the above challenges, Singapore has several strengths that place it in a positive position for future development. It has strong endowments of human capital, highly developed institutions such as property rights, and first-class infrastructure. In his discussion on the smart state, economist Phillippe Aghion, looked at the core pillars of an innovation-based economy, namely, competition, education, labour market flexibility, finance, democracy and countercyclical macroeconomic policy. Based on these driving factors, Singapore may have epitomised the smart state in its attempt to overcome the challenges facing it.

Singapore's response choice to its challenges are shaped by the fact that it is at the production possibility frontier, that the growth strategy has to go beyond imitating, adapting and adopting foreign technology, calling for a specific set of education and industrial policies.

In addition, Aghion also identified that in order for a country to be a Smart State, it needs to be an investor, insurer as well as redistributor.

With regard to redistribution, while Singapore espouses a culture of personal responsibility as the primary social principle, a look at the budget documents and government policies would inform that some allowance is made for the provision of welfare support. More importantly, redistribution has to be balanced with competition, where the latter is used to sort out winners from losers but with the presence of an adequate social safety net to support the losers. In Singapore's case, the Schumpeterian growth model is of relevance as the economy is already

near the production possibility frontier. The country has to embrace a culture of positive competition that fosters innovation and incentivises investments in research and development with the understanding that this is a dynamic process in which old ideas, blueprints, processes and goods could be jettisoned for more innovative, productive and relevant ones.

How can Singapore be a strategic investor? While Singapore should continue to emphasise fiscal prudence and discipline, it should not hesitate to give support to investments in the areas of health, education and SMEs as long as they do not compromise on competition. Countries such as Taiwan and South Korea have shown that industrial policy can work if it is infused with the element of competition. Another area to look at is universities, where reforms to governance structure to encourage more competition in securing grants and public investments could spur greater innovative activities.

What can the state do as an insurer? During times of low animal spirits, the state should intervene in a smart way if it has the means to alleviate the trough of the business cycle. This involves an active pursuit of fiscal and monetary policies not just for short-term stability but also for long-term growth objectives. Such policy measures should target SME development, education reforms and labour market restructuring.

Support to education, particularly graduate education, is also important. For economies in the earlier phases of development, elementary and

college education impact growth potential significantly. As the economy continues to develop and approaches the production frontier, graduate education becomes increasingly important for generating the type of productive innovation through first class research that can help sustain growth. Crucially important in this process are the linkages between tertiary institutions and industry, which is needed for the commercialisation of fundamental research outcomes. Israel, for example, has done very well in this respect.

### **5.5 Future Growth Opportunities**

Despite the slowdown in China, the sheer size of its economy means that it is still going to contribute significantly to global growth. Moreover, many of the advanced economies are struggling to sustain growth, and hence the next major growth driver in the global economy is expected to come from emerging markets, which include ASEAN. Notwithstanding, growth would not occur automatically, as structural reforms are needed to unleash the growth potential of this markets. But a key challenge for many places, ASEAN included, is pushing through structural reforms because they go into the heart of the political, the economy, the history and sometimes even the customs of the country.

Putting that constraint aside, Singapore is well placed in the region where the promise of growth lies. The close proximity to neighbouring emerging markets and further economic integration through the ASEAN Economic Community (AEC) provide low-hanging economic fruits. High-quality multilateral trade agreements, including the yet to be ratified Trans-



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Pacific Partnership (TPP), further present great opportunities for the Singapore economy and businesses to benefit from the region's rapid development.

## **6. Presentation by Discussant**

**Associate Professor Toh Mun Heng**  
Department of Strategy and Policy  
NUS Business School  
National University of Singapore

### **6.1 Restructuring Drives: Past and Present**

Singapore is evolving from an input-driven, investment-driven growth model to a productivity-driven growth model. However, the restructuring process aimed at raising productivity needs to be carefully calibrated given several features of the present economy.

First, as Singapore shifts from a developing economy to a developed economy, it moves towards the production possibility frontier, where opportunities to grow through imitation of other countries are exhausted. As it is very difficult to expand the frontier, the restructuring process has to be managed in a way to ensure that enough companies remain here rather than relocate overseas, and that they are able to cope with the new regulations and plans that the government has in order to uplift productivity. Hence, it is important to have the right data and statistics available to monitor and understand the situation on the ground in a timely manner.

Second, the present drive to increase productivity is not entirely different from the first industrialisation drive of 1980s in Singapore where

companies were encouraged to be more capital and technology-intensive. The main difference is that the current productivity drive has to cope with a significant constraint on manpower due to greying demographics and a slowdown in foreign workforce growth that have been managed through the tightening of employment quotas and rise in foreign worker levies since 2012.

## **6.2 Low Substitutability of Foreign Workers**

The success of the productivity drive hinges on the substitutability between foreign labour and the local labour, and between labour and automation or mechanisation. If the space for substitution is low, the quality of outcomes will be low and major changes will not materialise despite the amount of effort and resources committed to it through support schemes like the Productivity Innovation Credit or Capability Development Grant. Limited preliminary data from a productivity study I have conducted indicates that substitutability between local labour and foreign labour is relatively weak. Based on the findings, there a lack of evidence to support the view that productivity would increase if the foreign workforce is capped or reduced.

The experience of the productivity drive in 1980s offers important lessons. During that period, wages were raised by 20% over three years under the guidance of the National Wage Council with the intention of raising productivity by incentivising firms to invest more in capital. However, the productivity drive was not very successful. Instead of rising productivity, it led to a profit squeeze — mirroring the profit compression

currently seen in Ms Deyi Tan's presentation, and a subsequent exodus of companies during the 1985 recession. If not managed well, the current productivity campaign could lead to similar unintended consequences.

### **6.3 Factors that Inhibit Productivity Gains**

The push to make Singapore's companies adopt new technology and to become more capital-intensive has fallen into a lethargy due to various factors that include limited scale, overcapacity, overproduction and to some extent a block in mindset.

While new technologies to improve productivity such as self-service technology in supermarkets, centralised kitchen services, and delivery drones are available, their adoption may not be that pervasive, and may be feasible only for a few frontline companies that have the operational capabilities and business scale to absorb them. Moreover, ground feedback suggests that there are many business ideas but many firms do not have the scale to implement them, even with the help of government funding.

Second, some local firms seem to be unable to deal with new challenges. Case in point is how local private transport incumbents tried to push the government to adopt certain regulation and rules against new and disruptive private hire services just as Uber and GrabTaxi. This indicates a hindrance, or perhaps mental block in terms of reacting to new problems. Furthermore, firms seem to lack the know-how to exploit new technologies for their businesses. For instance, e-commerce presents a

channel for retail businesses to access new markets, but few brick-and-mortar firms have capitalised on this opportunity. Instead, many of them are increasingly challenged by new online businesses, which are taking away their market share.

In contrast, the government has recognised that the new growth areas for the economy lie in ICT-based businesses, and efforts are being made to transform the country into a Smart Nation through investments in ICT infrastructure and industry initiatives. However, this risks creating a big gap in the business transaction side, with lots of supply-side capacity but limited absorption capability to match up. Returning to the example of the local retail industry, the low market penetration rate of e-services such as e-commerce in Singapore means that e-commerce related infrastructure such as fibre-optic communication and advanced logistic services will not be optimally utilised.

Third, it seems that the world is facing a general problem of overproduction, with China for example producing enough shirts to dress the world two times over, hence exporting deflation by selling goods at vast discounts. This supply-side problem and the attendant deflationary effects are unlikely to dissipate in the near future.

In this context, it is imperative to focus on developing the technical and business capabilities of local SMEs to ensure quality growth over the next 10 years.

## 7.

### **Discussion on Singapore's Economy Beyond 50**

Participants discussed the global growth outlook in light of the recent trends in the global economy, including the definancialisation of the global economy, and the ongoing debate between secular stagnation theorists and techno-optimists. Matters relating to productivity, inequality and immigration were also raised and discussed together.

#### **8.1 Global and Local Growth Drivers**

A participant raised the issue of tightening regulation in the financial sector in terms of capital requirements, anti-money laundering and tax transparency, and the possible negative impact on Singapore given its status as a financial hub in the region. Other participants questioned the prospect of low growth due to deleveraging in the short term and secular stagnation over the longer run.

A participant said that the world currently faced the problem of having to cope with a high volume of private and public debt. The process of getting national accounts in order would depend on the political economy of individual countries. In the US, raising taxes and reducing fiscal transfer payments was unpopular, and after seven years of deleveraging the median voter still had an incentive to see interest rates remain low. If inflation remains subdued, "financial repression" as noted by Carmen Reinhart of Harvard University could be a solution, albeit a slow one

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with growth remaining low for a prolonged period. “Financial repression” may include directed lending to government by captive domestic audiences (such as pension funds), explicit or implicit caps on interest rates, regulation of cross-border capital movements, and generally, a tighter connection between government and banks<sup>2</sup>.

Over the longer term, policy upgrades and structural reforms were necessary to raise potential growth. For example, studies had shown that the national border, as an obstacle to trade, was equivalent to 5,000 kilometres in transportation costs, and freer trade would present opportunities for growth. With regard to secular stagnation, the view offered was that there were no diminishing returns to technology, which if true would prove techno-optimists right.

With regard to Singapore, a participant declared that the IMF projection of 1% TFP growth going forward was based on historical data and unadjusted for varying factor utilisation over business cycles. In addition, he noted that both legal and technological barriers to trade and services were declining, which implied that white-collar workers were no longer shielded from international competition. This could be another element of disruption to existing economic structures.

However, in Singapore’s case, it stood to gain from the resultant increase in liberalisation and volume of service trade, given its high level of human

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<sup>2</sup> See “The Liquidation of Government Debt” by Carmen M. Reinhart and M. Belen Sbrancia, *NBER Working Paper Series*, 2011, abstract.

capital, deep financial pockets and strategic location within South-East Asia. In addition, the dematerialisation of production could be a boon to Singapore, as production now required less physical space. The potential growth of Singapore would then be conditional on its willingness and strategies to expand its human capital through immigration and the improvement of regional cooperation and connectivity.

## **8.2 Productivity in Singapore**

In response to concerns on productivity raised by Prof. Toh Mun Heng, a participant noted that Singapore was not yet at the production possibility frontier for a number of sectors such as in construction and retail, which at present are overly reliant on foreign workers. In addition, technological adoption in these sectors was generally lagging behind developed countries, which meant that there was significant room for productivity improvements. The participant also noted that the substitutability of local and foreign labour would depend on the ability of companies to leverage on technology to make traditionally blue-collar jobs more attractive and better paid.

In a related note, participants identified several obstacles to raising productivity. It was noted that Singapore's performance as an R&D location was lacking; an INSEAD study showed that the innovation efficiency of Singapore was low compared to other countries, and other studies showed that while Singapore was good in mobilising resources for innovation, it had fared poorly in translating inputs into outputs. In addition, with economies across the world predominately driven by firms



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that could translate global innovations into tangible economic outcomes, this raised questions about the fundamental weaknesses of Singapore's local firms, especially if, as projected in the presentations at the roundtable, MNCs were going to be less evident in the future economy.

A participant said that it was the ability to be competitive, defined as the ability to sell one's product and command market share, that provided the revenue and resources to firms needed for innovation and productivity. Without the skillset to become competitive and to access larger markets, long-term productivity gains were unlikely to materialise. Adding on, it was suggested that Singapore should find ways to leverage on its base of large companies that were plugged into global networks to form new linkages and platforms with small companies for them to grow.

Another participant felt that Singaporeans faced an aspiration deficit, lacking the drive, ambition and motivation to think beyond what they had been taught. This could be due to the fact that Singaporeans felt pigeonholed according to their level and kind of education. Furthermore, if students felt compartmentalised based on their achievements within the education system, it may foster greater risk-aversion that retards innovation and productivity.

It was stated that old business models based on low wages and rising property prices should give way to high tech start-ups, which would form the new growth engine. However, another participant argued that venture capitalists tend to go to markets with high potential for unicorns

(start-up firms valuations exceeding 1 billion USD) due to the high risks of start-up investing, and as a small country with a small market Singapore was not a natural candidate for these venture capitalists. Another participant said that while the government had a huge tranche of money earmarked under the Research & Innovation Enterprise plan, the question was where and how to direct those funds efficiently to generate substantial economic value.

### **8.3 Addressing Inequality**

Participants considered the structural developments in the economy that was affecting inequality. Over the past 50 years, inequality fell due to strong growth, but with slower growth expected going forward, inequality in Singapore could creep back up. One optimistic view offered at the roundtable was that Singapore might transit to a smaller but more productive economy for both the manufacturing sector and services sector. This would increase the wage share of GDP from 40% currently to about 50%, similar to Hong Kong's economy, and would create a narrowing of inequality effect. However, Prof. Toh said that the relatively low wage share of income in Singapore was characteristic of an economy that had to remain attractive to foreign investment through lower wages. Unless local SMEs become a major part of the economy as in the developed countries, a 60–70% wage share of GDP was unlikely to materialise.

Another participant added that the objective to reduce intergenerational inequalities seemed to have been the thrust of several budgetary

measures introduced recent years. Singapore had the benefit of ample fiscal space to do it in a measured way, and the policies boded well for Singapore's society. On the international monetary front, it also had the benefit of reducing an excessive current account surplus, as fiscal demands from these welfare measures would drive the surplus down. With regard to ensuring equality of opportunity, Singapore had undeniably done a better job than many other countries.

#### **8.4 Issue of Immigration**

On immigration policy, several participants emphasised the need to maintain flexibility, to adapt and adjust the limits of foreign labour and other regulations in a pragmatic way. In addition, keeping immigration open was in the interest of Singapore, as the economic success experienced by the US lay in its ability to attract talented immigrants. Looking at the great US firms that were started by immigrants, it was clear that they bring great benefits their host economies. Besides, without immigration the local labour force in Singapore was expected to shrink in the near future as a result of greying demographics. Hence, the policy emphasis should be on assimilating immigrants more effectively.

Seen from a global perspective, the influx of cheap labour was potentially a win-win outcome. Tightening immigration policy, while rationalisable in terms of the domestic political economy, was not the global first-best outcome, especially as higher immigration could lead to better potential growth projections.

## **8.5 Balance in Policy Measures**

The need for a balance in policy measures was discussed. A participant said that while regulations played an important role in ensuring safety and fairness, they should be reviewed to ensure that they were not impeding productivity growth. Another participant added that while the government aimed to free up resources for more productive firms to grow in the current restructuring drive, this had to be balanced with letting the markets function by themselves, and giving every firm a fair chance. In other words, the government should not over-regulate, or step in too much to interfere with market forces.

Participants spoke about the role bankruptcy laws in Singapore played in disincentivising entrepreneurship and risk-taking. A participant said that the harsh penalties of bankruptcy in Singapore and social stigma attached to it made Singapore a risk-averse society. In contrast, bankruptcy laws in other countries like the US were less harsh, and failure was seen as a rite of passage for entrepreneurs in innovation driven places like the Silicon Valley. In reply, it was noted that bankruptcy laws were changing, and for the first time since May 2015, Singapore had introduced a structured bankruptcy process with mechanisms to ensure a less onerous exit from bankruptcy.

Participants also noted that well-coordinated multifaceted policy interventions were needed across the entire spectrum of policy in order to position Singapore for future growth. However, the short-term limits of policy actions were acknowledged especially in the presence of conflicting

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social norms and local culture. For instance, even with a reformed bankruptcy law, entrepreneurship and risk aversion would still persist if the social stigma of failure remains and traditional forms of career success continue to be aspired by the population.

# Conclusions

The 24th Singapore Economic Roundtable examined how external and domestic constraints affect the future growth of Singapore. While changes in the global supply chain production and international trade order place a drag on the short-term growth prospect of the country, Singapore is well placed to benefit from the new emerging economic and social structures, with its emphasis on building a Smart Nation based on a knowledge economy. However social issues such as immigration and inequality would require the government to stay vigilant and be proactive in identifying and addressing the concerns of the citizens, in addition to pursuing growth and productivity improvements.

## **1. Macro-Economic Outlook and Implications for Policy**

### ***Adapting to changes in global trade dynamics***

The immediate growth outlook for the region around Singapore has dimmed. Export growth has shifted downwards due to a general slowdown in global trade. In addition, as China continues to move up the technological ladder, the vertical integration of its production process will intensify. As a result, its dependence on intermediate goods imports from the ASEAN region will decrease accordingly. Singapore's economic activity, due to the weak external backdrop, has been lacklustre in the past few months. Added to that is the weak positive spillover from a consumption led recovery in the US, as the import of goods and services remains weak.

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However, Singapore is adapting to the on-going changes of global supply chains. Although China's rising capabilities in the IT-intermediated goods space has led to some slowdown in related exports from the Asia region, the impact of this development could be mitigated by the strengthening trade linkages of emerging nodes in regional supply chains. Singapore's exports to CMLV economies are main sources of support. In the electronics space, Singapore's semi-conductors have benefited from a surge in demand from the region, especially in Vietnam tech-trade. Deeper economic integration among ASEAN countries will herald new opportunities for Singapore's exporters.

Singapore's next phase of economic development drive will be characterised by a knowledge-based economy, where productivity gains will help overcome supply side constraints. Research and development (R&D) capabilities are important in a knowledge-based economy, and Singapore's government has pledged to invest heavily in it, both in terms of capital and manpower. Government initiatives such as the Smart Nation programme will drive the corporate sector to adopt more ICT solutions. There is also an emphasis on increasing intellectual property (IP) assets, which is prevalent among major US IT firms. Given the importance of R&D, ICT and IP, ensuring a competent labour force of relevant technical expertise in these frontier industries will be critical for growth.

***Singapore's 3-D problem of debt, demographics and deflation***

Both household debt and corporate debt ratio in Singapore are high, contributed by the openness of Singapore's capital account in a loose global credit environment, which drove rapid credit expansion in both the household and corporate sectors. While high leverage can be sustained as long as macroeconomic conditions remain supportive, it increases the vulnerability of an economy from interest rate changes and declining asset price, both of which are happening in Singapore. This vulnerability is compounded by demographic trends of an ageing population and tighter immigration policy that limits workforce growth.

Deleveraging in the economy, which is required to prepare the economy for the next cycle of growth, typically happens through income growth and not debt decline. This was the experience of Singapore after the Asian Financial Crisis, whereby the country pared down its debt-to-GDP level by boosting its income. However, the current weak external backdrop of secular stagnation coupled with impending interest rate increases will limit economic growth, and elongate the whole adjustment process. With inflation expected to trend flat or even negative, the option of shaving off debt through inflation is not available either. Nonetheless, the risk of a cathartic boom bust cycle is low, given that the risk of global external shocks required for it to materialise is improbable.

The macro-economic strategy for Singapore to drive economic development is to boost productivity. However, with demographics and productivity appearing to correlate — labour productivity tends to decline with age — an ageing population in Singapore could depress



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structural growth despite an intensifying productivity drive. Innovation through technology could nonetheless offer some solutions to overcome this challenge.

Singapore could also look to the Nordic countries for some lessons. Notwithstanding their small populations, high median age, high GDP per capita, and lower working age population growth, the Nordic countries are still able to achieve high productivity level. Education could be a key factor driving this outcome. Finland's education system, for example, is highly rated and promotes creativity. Teaching in Finland is a highly regarded profession, and a large amount of resources is committed to the national education system. The system focuses much more on collaboration instead of competition, unlike in Singapore.

### ***Monetary policy space under evolving labour market structure***

Headline unemployment rates appear to overstate labour market tightness. Correspondingly, the worries about resultant wage pressures may have been overdone. Anecdotal evidence paints a different picture, hinting at a weaker correlation between unemployment rate and wage growth.

There is strong need to extend the focus on jobs beyond quantity to quality as well. A skills mismatch in the labour market leading to inefficiencies in terms of job expectations may not be captured in headline employment figures, thus overstating the health of the job market. When examining labour market conditions, the exact contract terms of jobs have

to be taken into account too. Lastly, as the correlation between GDP and job vacancy appears to be holding up better, recent GDP growth weakness could suggest that job vacancy could be set for a decline, either in quantity or quality terms.

This, together with external economic headwinds, raises the question of the growth and inflation effects of monetary policy. Singapore may have more room for more subdued exchange rate policy as long as inflation is kept under wrap. Nonetheless, the trade-off between short-term interest rates and looser monetary policy is notable. For example, SOR rates have recently been driven up by the expectations of Singapore dollar depreciation, and on balance, diminished policy elasticity (in terms of spurring demand) could be used to argue for more policy cautiousness. Risk emanating from the balance sheet is also increasingly factored into monetary policy decisions. Hence, structural reforms to lift productivity and the fiscal cushion Singapore enjoys are critical complements to monetary policy accommodation

### ***Keeping check on the economy's health***

There was some concern over the lack of public data to measure the health of Singapore's economy, especially in view that the economy could be at tipping point. It was pointed out that the few that exist might not even be reported on a timely basis. For example, the Singapore's Composite Leading Index is often released a few months late, which renders the indicator ineffective. However, other participants were more sanguine, noting that several predictive indicators exist, although they

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also acknowledged that these indicators might not be sufficiently reliable. One suggestion was to combine ground feedback and observations with quantitative metrics to get a better sense of the state of the economy.

### **2. Special Session: Singapore's Economy Beyond 50**

#### ***Determinants of future growth***

Singapore has historically relied on the input of foreign labour for development. The current structural transition is partly due to a moderation of unskilled labour growth in Singapore, which affects the composition of the labour force. In addition, the openness of the economy contributes to the volatility of growth. Being an open economy, developments in the global economy such as China's structural reform transition to consumption led economy, the end of the commodity super cycle, stresses in the financial markets of emerging economies, and slow down of trade growth will have a tangible impact on Singapore.

Singapore has to respond to these challenges. However, as an economy near the production possibility frontier, technology imitation or adoption cannot remain as a strategy for growth. Instead, the Schumpeterian growth paradigm, undergirded by a culture of competition and continuous innovation, is more appropriate for Singapore's developed economy. Investment in education, especially postgraduate research, is key to support a vibrant research environment, which is required to expand the production possibly frontier.

In addition, growth is expected to come increasingly from emerging markets in the region. However, this growth is conditional on countries successfully carrying out the necessary structural reforms, which require both political will and technical expertise. Given its location within ASEAN, Singapore can benefit economically by providing the technical expertise to help countries in the region carry out the necessary structural reforms to achieve growth.

In terms of specific growth drivers, it was commented that the current global environment of disruption, whereby services are becoming more tradable and trade barriers are rapidly being dismantled, provided both economic opportunities and challenges for Singapore. However, while the world stands to benefit in the long run, this global phenomenon would render short- to mid-term headwinds as economies carry out necessary structural reforms that could upend the current order in order to transit to new paradigms of growth. While it is difficult to identify with precision the next big driver of growth and demand, digital technology seems to be the right frontier of development for Singapore.

### ***Singapore's productivity drive***

The substitutability of input resources has an impact on economic restructuring. Low input substitutability could reduce the efficacy of government grants and programmes to raise productivity. Preliminary studies appear to show that the substitutability of local labour for foreign labour is low. Similarly, the substitutability of capital for labour is low. These findings have implications for the government's push for

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companies to embrace technology. It could indicate that technology adoption is not pervasive among companies, and that companies cannot adapt their business models quickly even when generous government support is available. More importantly, it could suggest that local companies lack the ability to think of solutions themselves to survive new competition and other business challenges.

Nonetheless, it was noted that Singapore is still away from the production possibility frontier for certain sectors such as the construction sector and retail sector. These sectors can boost productivity easily by importing new techniques and technology from other countries. For example, the retail sector could raise its productivity by adopting self-service technology more widely.

Notwithstanding, as pointed out by a participant, the fact remains that Singapore faces binding input constraints on both labour and capital fronts. Hence, it is important to reinvent the content and image of some jobs to make them more attractive as a whole to Singaporeans. Part of the approach is to leverage technology to improve the quality of such jobs. If successful, this would help increase inputs substitutability.

Another participant said that the old business profit model of low-cost labour and real estate price appreciation still seem to prevail in Singapore. He predicted that until the local corporate sector changes its business model, inroads on productivity would be limited. Adding on, he said that government policies should focus on drawing more

Singaporeans into the start-up sector, which has been identified as a source of future growth. At present, the high tech start-up clusters in Singapore such as Block 71 in Ayer Rajah consisted mostly of foreign start-ups.

***Explaining citizen sentiments toward immigration***

The political economy in Singapore has shifted to a new equilibrium since the last few years, resulting in a moderation of immigration. Citizen sentiment towards immigration could be explained by their endowment shares of capital and labour resource. Citizens with high capital resource relative to labour resources tend to be more supportive of immigration as it provides higher return on capital and vice versa. The medium voter in Singapore today has a higher share of labour resource. If the composition of resources changes in future, public sentiment towards immigration may evolve too, which would have attendant impact on the imperatives of economic development.

# Appendix 1: List of Participants

## Chairperson

Mr Manu BHASKARAN  
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## Speakers

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## THE TWENTY-SECOND SINGAPORE ECONOMIC ROUNDTABLE

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## THE TWENTY-SECOND SINGAPORE ECONOMIC ROUNDTABLE

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## **Appendix 2: Curricula Vitae of Presenters, Discussants & Chairperson**

### **Presenters and Discussants**

**Alex MOURMOURAS** is the Division Chief in the International Monetary Fund's (IMF) Asia Pacific Department and Mission Chief for Malaysia and Singapore. Previously, he served as Chief of the European and Middle Eastern Division in the IMF's Institute for Capacity Development, as Senior Economist in the Policy Development and Review Department, and as Economist in the Fiscal Affairs Department. Prior to joining the IMF, Dr Mourmouras was an Associate Professor of Economics and Director of Graduate Studies at the University of Cincinnati. He obtained his PhD in Economics at the University of Minnesota and his Bachelor's Degree in Applied Mathematics from Harvard College.

**Deborah TAN** is a Senior Economist at the Monetary Authority of Singapore (MAS). She covers developments in the Singapore economy, with a primary focus on the surveillance and analysis of economic trends and their impact on the economy. Prior to joining MAS, Ms Tan was an Economic Consultant in PricewaterhouseCoopers London, where she worked on a range of projects advising blue-chip clients such as major European investment banks and telecoms operators on micro and macroeconomic issues. Ms Tan holds a M.Phil (Economics) from the University of Cambridge and a BSc (Economics) from the University College London.

**Deyi TAN** is an Executive Director at Morgan Stanley and she covers the ASEAN economies. She is part of the Asia Pacific Economics team that is ranked Top 3 by the Institutional Investor Survey in 2009 to 2011 and 2013 to 2015. Ms Tan joined Morgan Stanley after graduating with a degree in Economics and Government from London School of Economics.

**TOH Mun Heng** is an Associate Professor in the Department of Strategy and Policy at the National University of Singapore Business School. He obtained his doctorate degree in Economics and Econometrics from London School of Economics. His research interests and publications focus on econometric modelling, input-output analysis, international trade and investment, productivity measurement, and development strategies of emerging economies in the Asia Pacific. He has co-authored and edited several titles such as *Challenge and Response: Thirty Years of the Economic Development Board; Public Policies in Singapore: A Decade of Changes; Competitiveness of the Singapore Economy: A Strategic Perspective*, among many others.

Between 2003 and 2005, he served as a Lead Economist at the Ministry of Trade and Industry. Associate Professor Toh has been invited to be member and resource person in several government committees, including the Public Transport Council and the Committee for Singapore's Competitiveness. He has been engaged as a consultant in various economic projects sponsored by agencies in the private and public

## APPENDIX 3: ABBREVIATIONS

sectors. In 2009, Associate Professor Toh was awarded the Public Service Medal in the National Day Award.

**Vishnu VARATHAN** is a Senior Economist, as part of the Singapore Treasury Division, with Mizuho Bank, where he oversees pan-Asia (ex-Japan) coverage of macro-economic and FX/interest rate market analysis. Apart from publishing reports on a regular basis, Mr Varathan frequently engages Mizuho's Multinational Corporation clients globally as part of client outreach. He also regularly visits regional central banks to exchange views and share observations. Prior to joining Mizuho in 2011, Mr Varathan was Asia Economist with Capital Economics from 2010 to 2011 and Regional Economist with 4CAST from 2006 to 2010; both independent macroeconomic research houses. After graduating from Nanyang Technological University with a Degree in Accountancy, Mr Varathan started his career as an Auditor with PricewaterhouseCoopers before pursuing a Masters in Economic from the University of Sydney.

### **Chairperson**

**Manu BHASKARAN** is an Adjunct Senior Research Fellow at the Institute of Policy Studies. He is also concurrently Partner and Member of the Board, Centennial Group Inc, a policy advisory group based in Washington DC where he heads the Group's economic research practice. Mr Bhaskaran co-leads the Institute's work in the area of economics. His major area of research interest is the Singapore economy and the policy options it faces. Prior to his current positions, he worked for 13 years at the investment banking arm of Société Générale as its Chief Economist for

Asia. He began his professional career at Singapore's Ministry of Defence, focusing on regional security and strategic issues. Mr Bhaskaran graduated from Cambridge University with a Masters of Arts and also has a Masters in Public Administration from Harvard University.

## Appendix 3: Abbreviations

AEC	ASEAN Economic Community
ASEAN	Association of Southeast Asian Nations
CAPEX	Capital Expenditure
CDG	Capability Development Grant
CLMV	Cambodia, Lao PDR, Myanmar and Vietnam
COE	Certificate of Entitlement
CPI	Consumer Price Index
EPG	Economic Policy Group
FDI	Foreign Direct Investment
G3	Group of Three
GDP	Gross Domestic Product
GLCs	Government Linked Companies
GNI	Gross National Income
ICT	Information and Communication Technology
IMF	International Monetary Fund
IP	Intellectual Property
IT	Information Technology
MAS	Monetary Authority of Singapore
MNC	Multinational Corporation
NIE	Newly Industrialised Economies
NODX	Non-Oil Domestic Export
PMI	Purchasing Manager Index
QoQ	Quarter-on-Quarter
R&D	Research and Development
SAAR	Seasonally Adjusted Annual Rate
SME	Small and Medium Enterprise
SOR	Swap Offer Rate
S\$NEER	Singapore Dollar Nominal Effective Exchange Rate
TFP	Total Factor Productivity
TFR	Total Fertility Rate
TPP	Trans-Pacific Partnership

THE TWENTY-SECOND SINGAPORE ECONOMIC ROUNDTABLE

US	United States
YoY	Year-on-Year
3Ds	Demographics, Debt and Deflation