

Occasional Paper on Medium-Term Fiscal Projections

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EXECUTIVE SUMMARY

- 1 Over the past few decades, Singapore has enjoyed steady and inclusive economic growth, and improvements in social well-being. We have weathered a series of crises and storms, including financial and public health crises. A strong economy has, in turn, created conducive conditions for fiscal policy, with tax revenue rising in step with growth. We have invested these revenues in building the capabilities of our people, enhancing the competitiveness of our economy, and strengthening our social cohesion. This has created a virtuous circle of inclusive growth and fiscal strength.
- 2 Sound and prudent fiscal policies have enabled us to build up fiscal reserves that act as our national crisis fund, and in normal times provide a steady stream of non-tax revenue to complement our tax revenue. Over the years, we have updated and refreshed our fiscal policies to ensure that they remain relevant to our needs. In the last 20 years, we have adjusted tax rates, introduced the Net Investment Returns framework to draw a sustainable and steady stream of income from our reserves, and instituted borrowing for long-term, nationally significant infrastructure. These innovations have enabled us to meet the growing needs of our people, while keeping our overall tax burden low.
- 3 We will face new challenges in the road ahead:
 - a. Externally, we are seeing rising geopolitical tensions and a shift from global economic integration towards a more contentious and fragmented world. These will have significant spill-over effects on Singapore's economy and public finances.
 - b. Domestically, we will need to stay competitive amidst a changing international order. At the same time, we will need more resources to address our growing needs, including taking care of a rapidly ageing population, refreshing and updating our infrastructure, strengthening our social compact, and responding to climate change. All these will drive structural increases in Government expenditure in this decade and beyond.

- 4 As a small and open economy with no natural resources, Singapore must find innovative solutions to resource our growing needs, while keeping taxes competitive and our overall fiscal system fair and progressive.
- 5 This Occasional Paper examines the fiscal implications of our medium-term challenges, and projects the Government's expenditure and revenue up to Financial Year 2030 (FY2030). These projections provide a forward view of likely fiscal trends for the rest of this decade. They are derived by projecting major drivers of our expenditure and revenue, assuming current policy settings. They are not meant to be precise forecasts or predictions. Instead, their value lies in providing the context for policy reviews or adjustments, and serving as a common starting point for discourse on fiscal policy.
- 6 Government spending now stands at around 18% of GDP. **We expect it to increase to around 19%–20% of GDP in the FY2026–2030 period, and possibly exceed 20% of GDP by FY2030.**
- 7 A key driver for this increase is Government Health Expenditure. This is due to our ageing population, rising utilisation of healthcare, and medical inflation. Besides healthcare, we also factored in the fiscal impact of spending moves that the Government has already committed to, such as uplifting lower-wage workers and improving early childhood education.
- 8 Our operating revenue is now about 15% of GDP. We expect this to grow slightly more slowly than GDP¹. We also enjoy additional non-tax revenues through the Net Investment Returns Contribution (NIRC). The NIRC has averaged around 3.5% of GDP and we expect it to remain at about the same share of GDP over the coming years.
- 9 Therefore, our total revenue is now about 18.5% of GDP. This would not have been sufficient to cover the increase in Government spending expected over the coming years. That is why the tax changes announced in Budget 2022, including the Goods and Services Tax increase, were necessary to close the funding gap.

¹ Our analysis (see [Annex A](#)) shows that the buoyancy of operating revenue with respect to GDP is around 0.8–1.0. A buoyancy of one implies that for a one percent increase in GDP, revenue would also increase by one percent, thus leaving the revenue-to-GDP ratio unchanged. A buoyancy below one means that revenue increases by less than the increase in GDP, and hence revenue growth will lag GDP growth over time.

- 10 The expenditure projections do not take into account future policy moves, such as additional spending to strengthen our social compact and economic competitiveness. If there are such further spending increases, we will need additional revenues to balance the budget in the medium term.
- 11 Singapore's fiscal strength is a key competitive advantage for our nation. As our spending needs continue to rise, we must make sure that our revenues grow at a comparable pace, to maintain a sound and sustainable fiscal system. The Government will continue to review and adjust our fiscal strategies to support our shared aspirations in a way that is fair to both present and future generations of Singaporeans.

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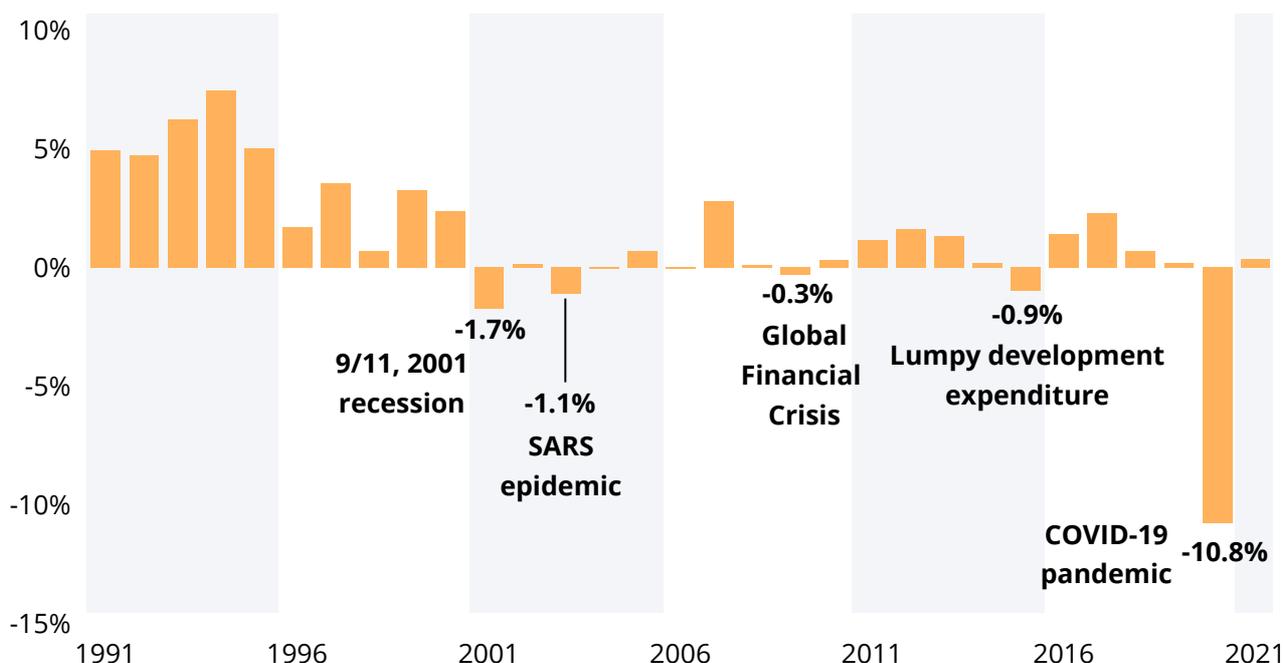
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- 1.1 Singapore's fiscal policies have supported our progress over the years. They are designed to support economic growth and promote social equity, while ensuring fiscal sustainability. Our key fiscal strategies include:
- a. Running balanced budgets by funding recurrent needs, such as healthcare and education, from recurrent revenue sources.
 - b. Focusing on cost-effective spending to achieve better policy outcomes with comparatively less expenditure.
 - c. Maintaining a sustainable, competitive, and fair revenue system through a diversified revenue base, comparatively low tax rates, and progressive tax schedules.
 - d. Ensuring a progressive system of taxes and transfers, with lower-income households receiving proportionately more benefits compared to taxes paid.
 - e. Striking an equitable balance between the needs of current and future generations.
 - f. Maintaining a broadly countercyclical fiscal stance to achieve stable growth and price stability.
- 1.2 Our prudent fiscal stewardship, coupled with Singapore's rapid economic growth, enabled us to run surpluses especially in the 1990s ([Figure 1](#)) and build up our reserves. Today, our reserves serve as a rainy-day fund and generate investment returns that fund about 20% of Government expenditure. This allows us to maintain a low tax burden, especially on the middle class, while achieving good outcomes.

1.3 Going forward, Singapore is unlikely to experience the high economic growth and large fiscal surpluses of the 1990s. Instead, we face multiple challenges that will shrink our fiscal space.

Fiscal balance from FY1991–2021 (% GDP)

FIGURE 1



Source: MOF

Note: Fiscal balance refers to Budget Surplus/Deficit in the 1990s; Budget Surplus/Deficit from FY2000–2002 (after introduction of Net Investment Income Contribution); Overall Budget Surplus/Deficit from FY2003–2020; and Overall Fiscal Position from FY2021 onwards (which includes capitalisation under the Significant Infrastructure Government Loan Act (SINGA), depreciation, and SINGA interest costs and loan expenses).

Challenging External Environment

1.4 The world is likely to face an extended period of sluggish labour productivity growth, as ageing in advanced economies saps economic dynamism, and re-shoring of industries hinders the development of new technologies and more efficient business practices. Against this backdrop, global competition for investments will intensify, with more countries turning to industrial policies at greater scale.

- 1.5 Singapore is vulnerable to these economic headwinds. We expect our own growth to slow, arising from these external trends and as our economy matures. This will slow down our tax revenue growth.
- 1.6 The geopolitical environment has become more volatile, with Russia's invasion of Ukraine being a timely reminder of the ever-present security threats. Singapore will need to maintain significant investments in security and invest more in resilience. This includes strengthening our preparedness for the next pandemic, and securing critical supplies like food and energy, to buffer ourselves against more frequent disruptions.

Domestic Challenges and Trends

- 1.7 Singapore's population is ageing more rapidly than most advanced economies. By 2030, one in four citizens will be aged 65 and above. Coupled with rising life expectancy, our healthcare and retirement needs will rise. Singapore's low resident Total Fertility Rate (1.1 in 2021)² will worsen its old-age support ratio, which has already declined from 7.4 in 2010 to 3.8 in 2022³. As the resident income tax base shrinks, each senior will be supported by fewer working-age taxpayers.
- 1.8 To accommodate the different needs of a rapidly ageing population and support economic growth, Singapore is undertaking a generational infrastructure upgrade to enhance connectivity, liveability, and sustainability. This includes investing in new MRT lines such as the Jurong Region Line and Cross Island Line to achieve our vision of a 45-minute city by 2040, and the Deep Tunnel Sewerage System to meet our long-term needs for used water collection, treatment, reclamation, and disposal.
- 1.9 In a world of greater uncertainties and disruptions, we will need to do more to strengthen social support, uplift lower-wage workers, and help Singaporeans bounce back from setbacks. We also have to enhance training and job placement, especially for mid-career and mature workers.

² Source: Singapore Department of Statistics.

³ Source: Singapore Department of Statistics. The old-age support ratio refers to the number of residents aged 20–64 years for each resident aged 65 years and over.

PROJECTIONS OF GOVERNMENT EXPENDITURE AND REVENUE

02
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- 2.1 This chapter analyses historical trends in Government expenditure and revenue, and sketches out fiscal projections up to FY2030. These are not precise estimates or predictions, but provide the context for policy reviews and a starting point for discourse on fiscal policy.
- 2.2 The projections are derived by projecting major drivers of spending and revenue, assuming current policy settings. They do not account for future policy changes.

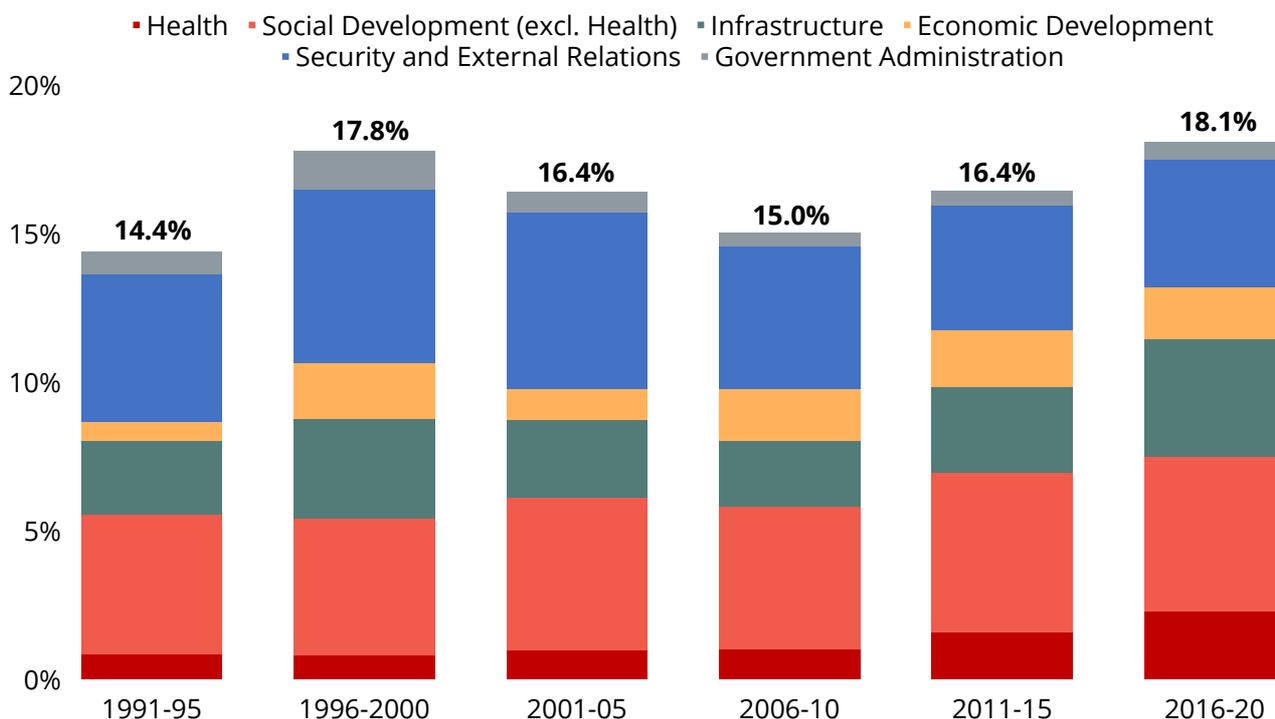
Historical Trends in Government Expenditure

- 2.3 As a percentage of GDP, Government spending has been increasing over the past three decades. There was a noticeable hump in FY1996–2005 due to higher:
- Security-related spending, including for redevelopment projects in Pulau Tekong and Changi Naval Base.
 - Infrastructure spending for the development of Jurong Island, Pulau Semakau landfill, new MRT lines, as well as HDB upgrading.
 - Economic spending, in particular, on research and development.

2.4 Since FY2010, the key drivers for Government spending have been social and infrastructure spending (Figure 2). Over FY2010–2019, social spending has almost doubled, and become the largest component of annual Government expenditure. To meet the housing and transport needs of our population and in preparation for a generational infrastructural upgrade, infrastructure spending has also ramped up over the past decade.

Components of Government Spending (% GDP) (FY1991–2020)

FIGURE 2



Source: MOF

Notes:

- COVID-19 expenditure has been excluded for comparability. Specifically, we used Government spending figures as at the Unity Budget in February 2020 to proxy for Government spending in the absence of COVID-19.
- Inclusive of Special Transfers.

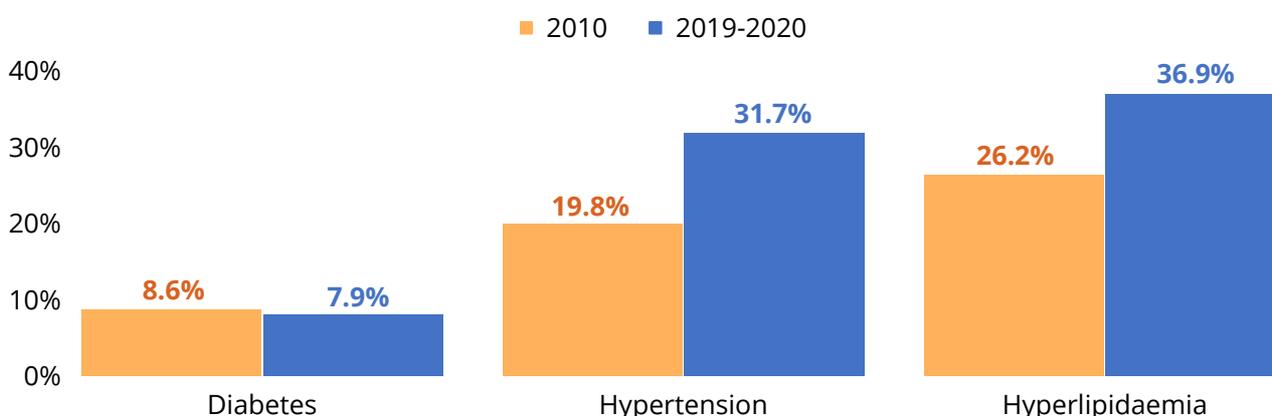
Healthcare Expenditure

2.5 Three major factors are driving increases in expenditure in Singapore’s healthcare system.

- a. Ageing population. Older patients are more likely to have more co-morbidities and complications, and require more medical attention and longer hospital stays⁴. Between 2013 and 2018, the Ministry of Health’s (MOH’s) expenditure on the long-term care sector increased from \$296 million to \$723 million — a Compound Annual Growth Rate of 20%.
- b. Higher age-standardised utilisation rates. These represent healthcare utilisation rates after normalising for the impact of ageing. First, changing lifestyles plus increased screening leading to earlier diagnoses have contributed to rising age-standardised prevalence of chronic diseases. For instance, the age-standardised prevalence of Singapore residents living with hypertension (high blood pressure) or hyperlipidaemia (high blood cholesterol) has risen over the past decade (Figure 3). Second, rising incomes and greater accessibility of high-quality healthcare services have also led to higher utilisation rates⁵.

Age-standardised prevalence of chronic diseases

FIGURE 3



Source: MOH National Health Survey 2010 and National Population Health Survey 2020.

⁴ In 2019, the average stay in public hospitals for patients aged 65 and above was 6.9 days, which was almost double of the 3.9 days for patients below the age of 65.

⁵ Over the past two decades, the number of Total Knee Replacement surgeries has risen from 187 patients for every 100,000 people aged 65 and above in 1999 to 499 patients in 2019 — a multiple of 2.7 times in the prevalence rate.

- c. Higher cost per unit of healthcare. First, medical advancements have made available newer treatments that improve lifespan and quality of life but cost more per treatment. For example, in medical oncology, public sector spending on cancer drugs has more than doubled, from \$110 million in 2016 to \$275 million in 2021. Second, manpower costs of healthcare staff are expected to continue increasing, to ensure that healthcare workers are appropriately recognised and remunerated⁶.

2.6 There are some things we can do to moderate the increases in healthcare costs:

- a. Right-siting of care. The Government has made significant investments in the primary care and intermediate- and long-term care sectors to anchor care in the community⁷. In addition, MOH recently launched the Healthier SG strategy to shift the emphasis of Singapore's healthcare system towards preventive care. This will help to prevent or delay the deterioration of health, which hopefully will in turn moderate the growth of healthcare spending⁸.
- b. Improving care while ensuring value for money. The Agency for Care Effectiveness was established in 2015 to evaluate the cost-effectiveness of novel drugs and therapies, and negotiate with manufacturers for fair procurement prices. This has delivered cost savings of more than \$400 million to date. In 2022, MOH introduced the Cancer Drug List and revised the coverage for cancer drug treatments under MediShield Life, MediSave, and Integrated Shield Plans. These changes will enable MOH to negotiate better prices, extend subsidies for more cancer drugs, and check the increase in cancer drug spending.

⁶ In 2021, MOH announced base salary increases of between 5% to 14% for public healthcare nurses to further enhance the competitiveness of the nursing profession.

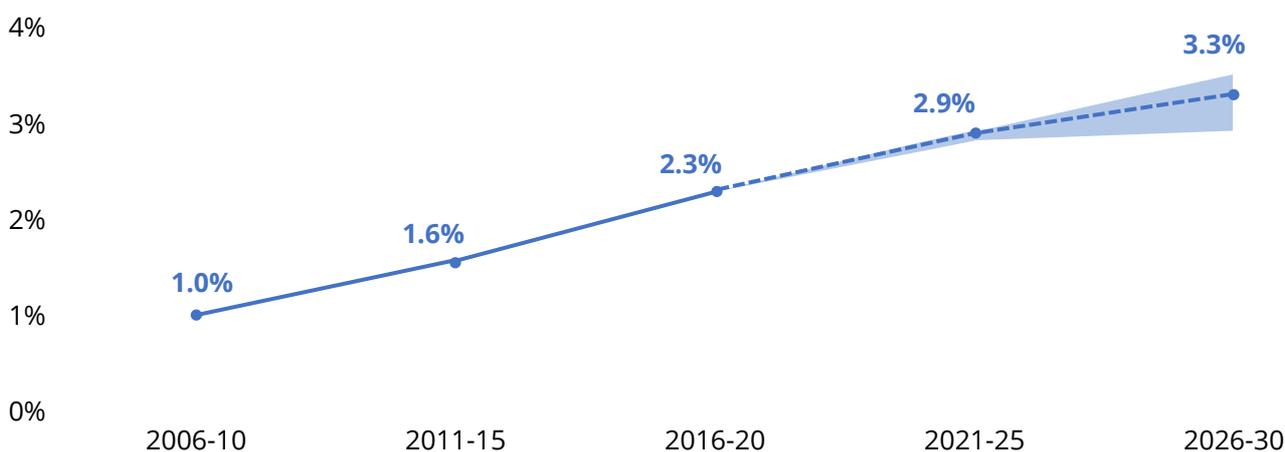
⁷ Total Government spending in primary care and intermediate- and long-term care sectors increased from \$1.3 billion in FY2007–2011 to \$5.1 billion in FY2012–2016.

⁸ See MOH's Healthier SG White Paper (healthiersg.gov.sg/resources/white-paper/).

2.7 Notwithstanding these efforts, our overall healthcare spending is still expected to increase. In particular, Government Healthcare Expenditure (GHE), currently around 2.3% of GDP (excluding COVID-related spending), is expected to increase to around 2.9%–3.5% of GDP in the FY2026–2030 period (Figure 4). While our ageing trends are relatively certain, changes in the age-standardised utilisation of healthcare services and the costs of these healthcare services are subject to significant uncertainty⁹. The upper bound scenario assumes growth to be the same as the past decade. The lower bound scenario assumes that our cost management strategies succeed in moderating the rise in healthcare costs. But given the underlying trends, this will be challenging to achieve.

Historical and projected GHE (% GDP)

FIGURE 4



Source: MOH, MOF estimates.

Infrastructure Spending

2.8 Singapore’s generational upgrade of infrastructure will cost a substantial sum. Infrastructure spending¹⁰ has already increased to around 4.0% of GDP per annum, driven by major, long-term infrastructure projects such as new MRT lines. With the current slate of projects, infrastructure spending is expected to rise further to around 4.4% of GDP per annum by FY2026–2030.

⁹ This would depend on the effectiveness of our preventive and primary care strategies at managing chronic disease, future medical advances, and changes in operating costs.

¹⁰ This includes spending by the infrastructure Ministries — Ministry of Sustainability and the Environment, Ministry of National Development, and Ministry of Transport — as well as top-ups to infrastructure funds, such as the Rail Infrastructure Fund and the Changi Airport Development Fund.

2.9 The Government introduced borrowing under the Significant Infrastructure Government Loan Act (SINGA) in 2021 to spread out the costs of major, long-term infrastructure more equitably across the generations. With SINGA¹¹, we expect the fiscal impact of infrastructure projects to remain at around 4.0% of GDP per annum in FY2026–2030. However, this is subject to some uncertainty, as higher medium-term interest rates could increase borrowing costs and hence projected infrastructure spending (net of SINGA).

Other Expenditure Components

2.10 Assuming no major policy changes, we expect the remaining expenditure components apart from healthcare and infrastructure to grow at least as fast as GDP. For these projections, we assumed that these spending components remain at the same percentage of GDP as the FY2016–2020 period (excluding COVID-related spending).

2.11 We also took into account the fiscal impact of further spending moves that the Government has already committed to, which will be disbursed over the coming years. In particular, we will spend more than \$9 billion over FY2022–2026 on the Progressive Wage Credit Scheme and the enhanced Workfare Income Supplement to uplift lower-wage workers and support employers who hire these workers. The Government has also committed to more than double the annual spending on early childhood education within the next few years, from around \$1 billion in 2018. These moves are expected to cost an additional 0.2% of GDP per annum.

Projections of Government Expenditure

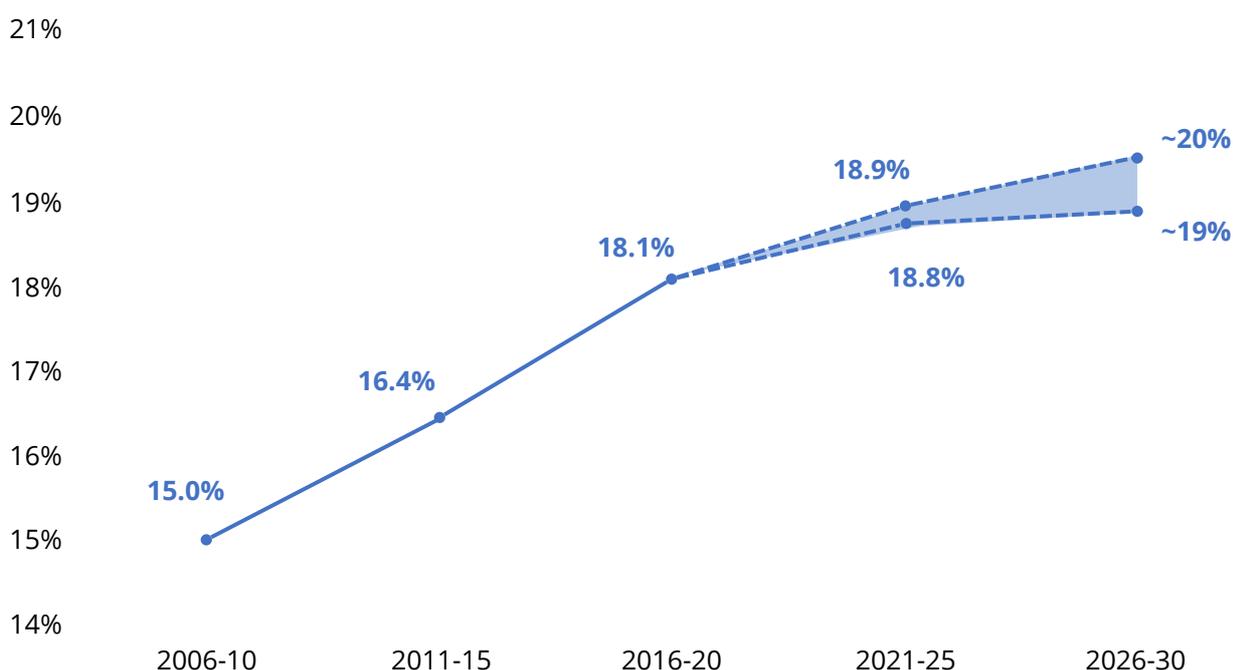
2.12 Based on the above components (paragraphs 2.5–2.11), we expect Government expenditure to increase to around 19%–20% of GDP in the FY2026–2030 period ([Figure 5](#)).

¹¹ The projections also account for the fiscal impact of SINGA interest costs and loan expenses, and depreciation of assets.

2.13 These projections do not take into account any further policy moves that the Government may make between now and 2030, to enhance Singapore’s economic competitiveness and strengthen our social compact. To fund these policy moves, we will either require more resources, or have to cut back in some existing areas and re-allocate funds to these new priority areas.

Historical and projected Government Expenditure (% GDP)

FIGURE 5



Source: MOF Estimates

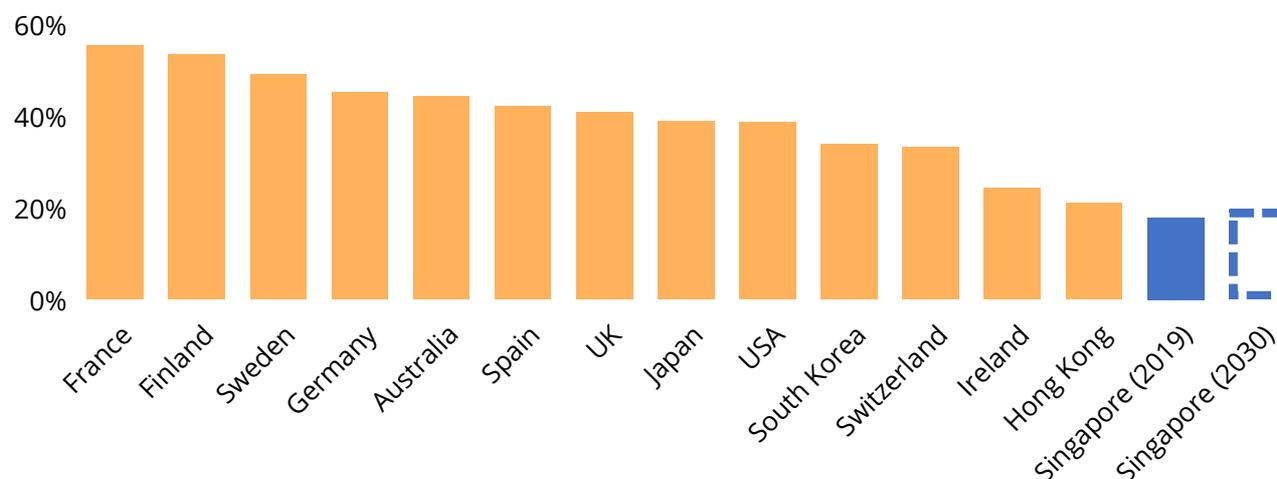
Notes:

- a. COVID-19 spending is excluded for comparability.
- b. Figures are inclusive of Special Transfers.

2.14 On the whole, Singapore’s Government spending is relatively small compared to other advanced economies ([Figure 6](#)). This will remain the case even with the projected increases between now and 2030. This reflects our focus on fiscal prudence and cost-effective spending. The Government intervenes upstream and invests for the long term to build capabilities and achieve policy outcomes with comparatively less spending.

Overall Government Expenditure (% GDP, 2019)

FIGURE 6



Source: OECD database, Hong Kong Census and Statistics Department, and MOF.

Note: Singapore (2030) assumes the projected upper bound for Government Expenditure.

Historical Trends in Operating Revenue

2.15 Operating revenue as a percentage of GDP fell from the 1990s to the 2000s (Figure 7) as the Government reduced the tax burden to ensure economic competitiveness:

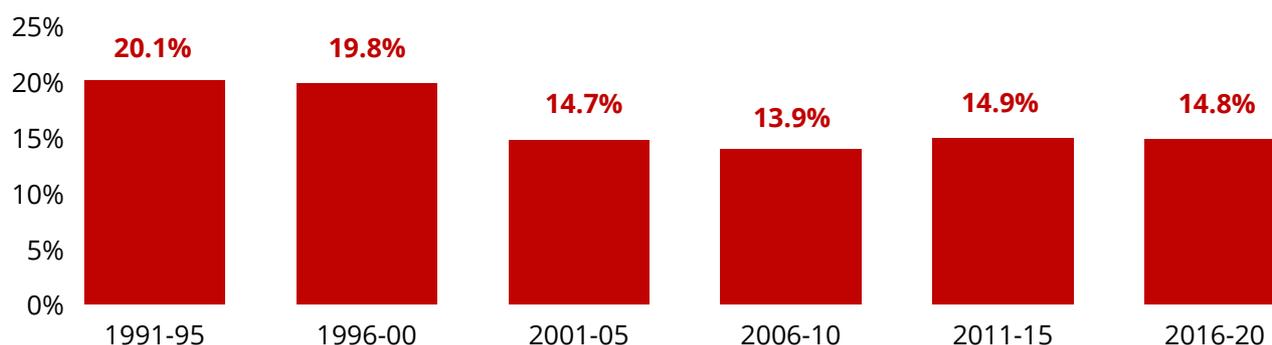
- a. Income tax rates were progressively reduced in Singapore¹², in line with the recommendations of the Economic Committee in 1986 to bring Singapore out of the 1985/1986 recession, and the Economic Review Committee in 2002 to sustain long-term growth in the midst of intensifying global competition. This helped Singapore attract and retain global investments and talent during a period in which other advanced economies also implemented significant income tax reductions.
- b. Singapore saw strong economic growth during this period, with nominal GDP increasing by about 8% per annum. Revenue collection did not keep pace with the robust GDP growth, and hence operating revenue as a percentage of GDP declined.

¹² For example, the Corporate Income Tax rate was reduced over 9 rounds from 31% in Year of Assessment (YA) 1991 to 17% in YA2010, and the top marginal Personal Income Tax (PIT) rate was reduced over 6 rounds from 33% in YA1991 to 20% in YA2007. See Figure B-1, and Tables B-5/B-6/B-7 for Singapore's historical tax rates.

- c. While the Government implemented the Goods and Services Tax (GST) in 1994 to diversify our revenue sources and progressively increased it over the 1990s and 2000s, the additional revenue collected was insufficient to offset the overall decline in operating revenue as a percentage of GDP during this period.

Historical Operating Revenue from FY1991–2020 (% GDP)

FIGURE 7



Source: MOF

2.16 Since FY2010, operating revenue as a percentage of GDP has risen, because of revenue moves made by the Government to fund the increases in expenditure¹³.

2.17 Looking ahead, in the absence of revenue policy changes, operating revenue is likely to grow slightly slower than GDP. We estimate a long-run buoyancy of around 0.8–1.0¹⁴ for operating revenue with respect to GDP (see [Annex A](#)). This means that periodic moves to increase revenue would be needed if expenditures continue to grow faster than GDP.

Projections of Operating Revenue

2.18 To meet the expected increase in recurrent expenditure in the coming years, the Government announced a suite of revenue moves in Budget 2022¹⁵. These moves include:

¹³ For example, the Government raised the top marginal PIT rate from 20% to 22% in YA2017.

¹⁴ This range is derived by taking two standard errors of the estimated historical long-run operating revenue buoyancy of 0.86.

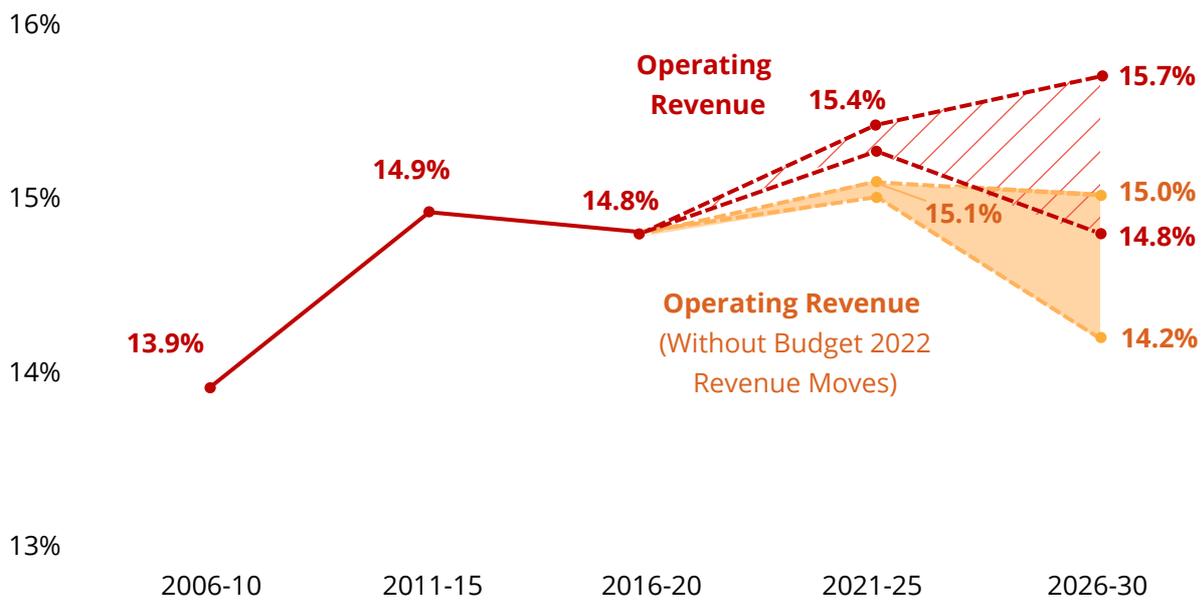
¹⁵ This does not include the planned increase in carbon tax, as revenues collected from carbon tax will not be used to meet recurrent expenditure needs, but will be used to fund Singapore's decarbonisation efforts. The full slate of Budget 2022 revenue moves will take effect from YA2024.

- a. The increase in GST rate from 7% to 9%, which is expected to yield additional revenues of ~0.7% of GDP per annum.
- b. Increases in the top marginal Personal Income Tax rate, and residential property tax rates for higher-end and non-owner-occupied properties.
- c. A new Additional Registration Fee tier for luxury cars.

2.19 The combined impact of these revenue moves is an estimated increase of our operating revenue as a percentage of GDP to 14.8%–15.7% in FY2026–2030 (Figure 8). Without the Budget 2022 revenue moves, operating revenue is expected to be around 0.7% of GDP lower by FY2026–2030.

Historical and projected Operating Revenue (% GDP)

FIGURE 8



Source: MOF Estimates

Note: Operating revenues were projected by applying a revenue buoyancy estimate of 0.8–1.0 to an underlying nominal GDP growth rate of 4%–6%.

Net Investment Returns Contribution (NIRC)

- 2.20 The NIRC comprises up to 50% of the Net Investment Returns (NIR)¹⁶ on the net assets invested by Singapore's investment entities, and up to 50% of the Net Investment Income (NII) derived from past reserves from the remaining assets. Our current NIR spending framework strikes a fair balance between the interests of today and tomorrow. It underlines the Government's commitment to continue managing our reserves for the benefit of current and future generations of Singaporeans, while allowing the Government to draw on part of the investment returns for current spending.
- 2.21 NIRC is one of the largest components of Government revenue, and currently supports about one-fifth of Government spending.
- 2.22 NIRC has averaged around 3.5% of GDP per annum over the last five years. Looking ahead, with the current spending rule, the NIRC is projected to keep pace with economic growth at around 3.5% of GDP. We expect future investment returns to continue to grow but more slowly than before, due to headwinds in the investment environment, including slower global economic and productivity growth, higher inflation, as well as heightened geopolitical and trade tensions. Likewise, Singapore's economic growth is expected to taper in the coming years, amidst a challenging global outlook and structural domestic challenges. On the whole, we do not expect NIRC/GDP to deviate too far from current levels over the medium term, though it may fluctuate somewhat from year to year.

¹⁶ The NIR represents the expected long-term real rate of return on our reserves. This differs from the NII, as it includes capital gains (both realised and unrealised), on top of dividends and interest.

Impact of Base Erosion and Profit Shifting (BEPS) 2.0

- 2.23 Our projections do not factor in the overall fiscal impact of the Base Erosion and Profit Shifting (BEPS) 2.0 Action Plan:
- a. Under Pillar 1, which re-allocates profits of the largest and most profitable Multinational Enterprises (MNEs) from where economic activities are conducted to where consumers are located, Singapore will lose revenue given our small market size.
 - b. Under Pillar 2, which effectively introduces a global minimum effective tax rate of 15% for large MNEs, the long-term revenue impact is uncertain and would depend on how governments and companies respond. We also expect to use any additional revenues that we may collect from Pillar 2 to enhance our economic competitiveness, as competition for quality investments through non-tax measures, such as grants, intensifies.

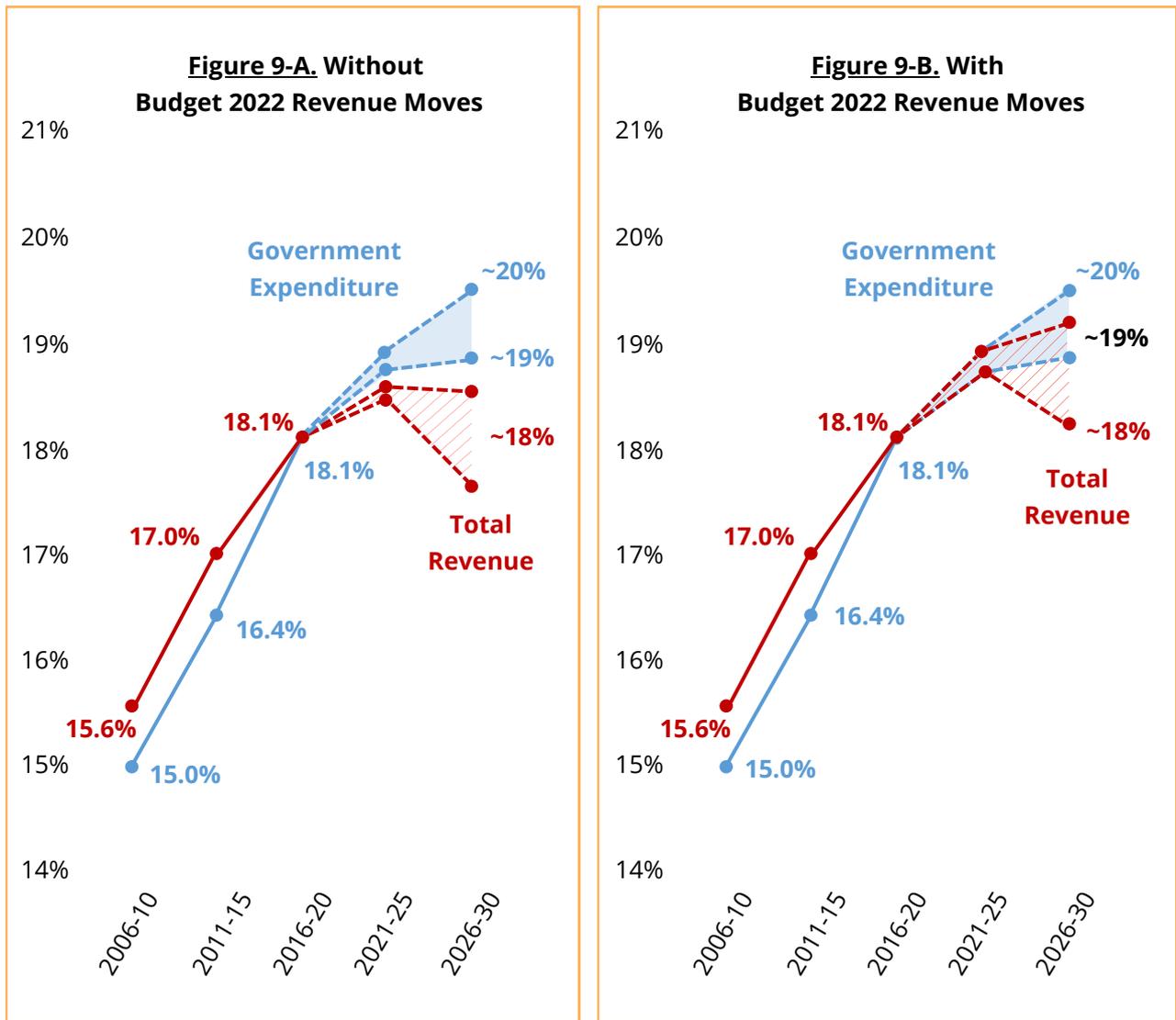
Hence, the net fiscal impact of BEPS 2.0 on Singapore may not be favourable. Given the uncertainties outlined above, we have not factored in the impact of BEPS 2.0 on revenue and expenditure in this set of fiscal projections.

Overall Fiscal Picture

- 2.24 Putting the projections on Government expenditure, operating revenue, and NIRC together, we get a picture of rising Government spending being balanced by total revenue in the coming years ([Figure 9](#)). Without the revenue moves made in Budget 2022, total revenue would have fallen below the projected level of Government spending within this decade.

Medium-term Government Expenditure and Revenue trends (% GDP)

FIGURE 9



Source: MOF Estimates

- Notes:
- a. COVID-19 expenditure excluded for comparability.
 - b. Total Revenue = Operating Revenue + NIRC.

2.25 Overall, our fiscal space is now much tighter compared to the past few decades. In the near term, revenues should be sufficient to cover the higher spending. But we have not taken into account possible further policy moves that the Government may make between now and 2030, for which the resource requirements are yet to be determined. Depending on the final design and scale of these moves, we may need additional revenues to balance the budget in the medium term.

- 3.1 This Occasional Paper outlines the fiscal impact of Singapore's medium-term challenges.
- 3.2 The fiscal projections in this paper are derived by projecting major drivers of our expenditure and revenue, assuming current policy settings. They may therefore differ from the actual trends that materialise in the coming decade. This paper has identified several factors which could affect Singapore's fiscal space and make it more challenging to maintain a balanced budget. A range of uncertainty is inherent in these projections. Hence, the paper is not meant to provide precise estimates, but rather, to provide context for future policy reviews and inform public discourse.
- 3.3 Through prudent fiscal policy and careful investment of our surpluses, we have built up a nest egg of reserves that is a rainy-day fund, and provides a steady stream of NIRC to complement operating revenues. The Government will continue to review and adjust our fiscal strategies to resource our shared aspirations sustainably, and ensure that future generations of Singaporeans continue to have the wherewithal to meet their needs.

REVENUE BUOYANCY ESTIMATES FOR SINGAPORE (FY1997-2021)



Introduction

- 1 To measure how much revenue fluctuates with GDP, we estimate *revenue buoyancy*. This is the percentage change in revenue for a given percentage change in GDP. A buoyancy of one implies that for a one percent increase in GDP, revenue would also increase by one percent, thus leaving the revenue-to-GDP ratio unchanged. A buoyancy exceeding one means that revenue changes by more than the change in GDP.

Methodology

- 2 To estimate Singapore's historical long-run (LR) and short-run (SR) buoyancies (FY1997-2021) for headline revenue and key revenue components, an Error Correction Model (ECM)¹⁷ was used. First, the long-run relationship between revenue and GDP, β_{LR} was estimated.

$$\ln(\text{Revenue}_t) = \mu + \beta_{LR} \ln(\text{GDP}_t) + \text{TaxRate}_t + \varepsilon_t \quad (1)$$

¹⁷ The ECM was also used in IMF working papers "Tax Buoyancy in OECD Countries" (Belinga et al., 2014) and "How Buoyant is the Tax System? New Evidence from a Large Heterogeneous Panel" (Dudine and Jalles, 2017) to estimate long-run and short-run buoyancies.

- 3 In the second equation below, the coefficient θ_{SR} measures the short-run effect of a change in GDP on revenue (i.e. the short-run buoyancy). The speed of adjustment λ measures how fast buoyancy converges to its long-run equilibrium value.

$$\Delta \ln(\text{Revenue}_t) = \mu + \lambda \left(\frac{\ln \text{Rev}_{t-1} - \beta_{LR} \ln \text{GDP}_{t-1}}{\text{residuals from (1)}} \right) + \theta_{SR} \Delta \ln(\text{GDP}_t) + \text{TaxRate}_t + \varepsilon_t \quad (2)$$

Where:

Revenue_t = the relevant revenue in year t

GDP_t = nominal GDP in year t

TaxRate_t controls for changes in tax rates for select revenues (in the case of Personal Income Tax, the top marginal rate) in year t . It is not applicable to headline operating revenue/taxes.

μ = constant term

ε_t = error term

Key Results

- 4 At the headline level, the long-run buoyancy estimates for operating revenue (which includes Fees and Charges) and tax revenue are 0.86 and 0.94 respectively (Table A-1). The lower long-run buoyancy for operating revenue compared to tax revenue could be due to contributions from Fees and Charges and Vehicle Quota Premiums, which are revenues that do not track the business cycle as closely. In the long run, our buoyancy estimates imply that revenue has generally grown at a rate slightly slower than GDP. If expenditures outpace GDP growth over time, periodic moves to raise revenues may be needed to keep pace with expenditure needs.

- 5 Our short-run operating and tax revenue buoyancy estimates are 0.88 and 0.86 respectively, meaning that tax revenues may fluctuate by less than GDP fluctuations. This suggests that taxes offer less of a cushion (also known as an automatic stabilising effect) over the business cycle. For example, the fall in taxes collected during a downturn may not keep pace with the fall in GDP, and hence the economic shock to households and individuals may not be adequately absorbed. However, taxes are not the only way to buffer households and businesses during downturns, and would need to be supplemented by transfers. This is especially important in Singapore’s case, given that our income tax burden is relatively lower than many other advanced economies. For instance, during the COVID-19 pandemic, the Government rolled out significant broad-based social support to households and individuals that were tilted towards the lower-income.

Headline buoyancy estimates (FY1997-2021)

TABLE A-1

	LR buoyancy estimate	SR buoyancy estimate
Operating Revenue¹	0.86	0.88
Tax Revenue²	0.94	0.86

Source: MOF Estimates

¹ The standard errors for Operating Revenue’s LR and SR buoyancy estimates are 0.05 and 0.26 respectively.

² The standard errors for Tax Revenue’s LR and SR buoyancy estimates are at 0.03 and 0.23 respectively.

- 6 We also looked at the top three tax revenue sources, Corporate Income Tax (CIT), Personal Income Tax (PIT), and Goods and Services Tax (GST), which are relatively buoyant, especially in the long run ([Table A-2](#)).
- a. The short-run buoyancy of less than one for CIT could be due to tax offsets and carry-forwards, which reduce the responsiveness of tax collections to changes in GDP.

- b. The long-run buoyancy of more than one for PIT could be due to its progressive structure. Existing studies expect that more progressive taxes tend to have higher buoyancies¹⁸. With wage growth, PIT revenues would grow faster as people move into higher income brackets with higher marginal tax rates. On the other hand, the low short-run buoyancy of PIT (0.56) could be due to the lower share of Compensation of Employees (CoE), and its weaker correlation with GDP¹⁹.

Buoyancy estimates by major revenue sources (FY1997-2021)

TABLE A-2

	LR buoyancy estimate	SR buoyancy estimate
CIT^{1,2}	1.00	0.84
PIT^{1,2}	1.36	0.56
GST¹	0.92	1.40

Source: MOF Estimates

¹ Tax rate controls were included in both the LR and SR equations.

² Uses lagged nominal GDP as base due to the nature of income taxes.

¹⁸ See IMF working paper "Tax Buoyancy in OECD Countries" (Belinga et al., 2014) and "Dynamic tax revenue buoyancy estimates for a panel of OECD countries" (Deli et al., 2018).

¹⁹ While Singapore's labour share of GDP (or CoE) showed a gradual increasing trend from 2010 onwards, it is still generally lower than for the Advanced Economies (AEs). Our labour share averaged 48% of GDP over 2004-2019, compared to the average labour share of 58% across select AEs such as the US, UK, Germany, Sweden and Hong Kong over the same period (Source: Our World in Data). The labour share of GDP reflects the economic structure, and is not a measure of the standard of living of workers.

Conclusion

- 7 Overall, this study estimates Singapore's long-run operating revenue buoyancy to be about 0.86, which suggests that operating revenue generally grows at a pace slightly slower than GDP in the long run. When using the buoyancy estimates to project revenue, we have adopted a range around this point estimate, to take into account uncertainties. If expenditures grow at a faster rate than GDP, periodic revenue increases may be needed to keep pace with expenditure needs. The short-run buoyancy is also slightly less than one, which likely reflects how Singapore's lower income tax burden²⁰ naturally offers a smaller cushion in downturns. Instead, Singapore cushions individuals and businesses from economic shocks through Government transfers.

²⁰ Singapore's tax-to-GDP ratio was at 13.2% of GDP in FY2019, compared to the OECD average of 21.9% of GDP. Data for OECD countries were extracted from OECD.stat in January 2023.

STATISTICAL APPENDICES

B

Average historical Government Expenditure FY1991–2020 (\$ billion)

TABLE B-1

	FY1991–95	FY1996–2000	FY2001–05	FY2006–10	FY2011–15	FY2016–20
Government Expenditure¹	14.8	26.6	30.1	42.7	64.0	94.3
Total Ministry Expenditure	13.7	25.3	28.1	37.6	54.3	76.8
Social Development ²	4.6	6.7	9.2	13.3	21.6	30.8
Security and External Relations ³	5.1	8.8	10.9	13.7	16.4	20.6
Economic Development ⁴	0.7	2.8	1.9	3.1	4.0	6.4
Infrastructure ⁵	2.6	5.0	4.8	6.3	10.4	16.3
Government Administration ⁶	0.8	1.9	1.3	1.2	1.9	2.7
Special Transfers⁷	1.1	1.4	2.0	5.1	9.7	17.5

Source: MOF

Notes:

Figures may not add up due to rounding.

¹ Government Expenditure sums up Total Ministry Expenditure and Special Transfers, and includes COVID-19 spending in FY2020.

² Social Development includes spending from Ministry of Education, Ministry of Health, Ministry of Culture, Community and Youth, Ministry of Social and Family Development, Ministry of Communications and Information (excl. Info-Communications and Media Development), and Ministry of Manpower (Financial Security and Lifelong Employability). Inclusive of pension payments to pensionable public officers before the establishment of the Pension Fund in 1995.

³ Security and External Relations includes spending from Ministry of Defence, Ministry of Home Affairs, and Ministry of Foreign Affairs.

⁴ Economic Development includes spending from Ministry of Trade and Industry, Ministry of Manpower (excl. Financial Security and Lifelong Employability), and Ministry of Communications and Information (Info-Communications and Media Development).

⁵ Infrastructure includes spending from Ministry of Sustainability and the Environment, Ministry of National Development, and Ministry of Transport.

⁶ Government Administration includes spending from Ministry of Finance, Ministry of Law, Organs of State, and Prime Minister's Office.

⁷ Special Transfers include top-ups to endowment and trust funds.

Historical Government Expenditure FY1991–2020 (% GDP⁸)

TABLE B-2

	FY1991–95	FY1996–2000	FY2001–05	FY2006–10	FY2011–15	FY2016–20
Government Expenditure¹	14.4	17.8	16.4	15.0	16.4	19.4
Total Ministry Expenditure	13.3	16.9	15.3	13.2	13.9	15.8
Social Development ²	4.4	4.5	5.0	4.7	5.5	6.3
Security and External Relations ³	4.9	5.9	5.9	4.8	4.2	4.2
Economic Development ⁴	0.7	1.9	1.1	1.1	1.0	1.3
Infrastructure ⁵	2.5	3.4	2.6	2.2	2.7	3.3
Government Administration ⁶	0.8	1.3	0.7	0.4	0.5	0.6
Special Transfers⁷	1.1	0.9	1.1	1.8	2.5	3.6

Source: MOF

Notes:

Figures may not add up due to rounding.

¹ Government Expenditure sums up Total Ministry Expenditure and Special Transfers, and includes COVID-19 spending in FY2020.

² Social Development includes spending from Ministry of Education, Ministry of Health, Ministry of Culture, Community and Youth, Ministry of Social and Family Development, Ministry of Communications and Information (excl. Info-Communications and Media Development), and Ministry of Manpower (Financial Security and Lifelong Employability). Inclusive of pension payments to pensionable public officers before the establishment of the Pension Fund in 1995.

³ Security and External Relations includes spending from Ministry of Defence, Ministry of Home Affairs, and Ministry of Foreign Affairs.

⁴ Economic Development includes spending from Ministry of Trade and Industry, Ministry of Manpower (excl. Financial Security and Lifelong Employability), and Ministry of Communications and Information (Info-Communications and Media Development).

⁵ Infrastructure includes spending from Ministry of Sustainability and the Environment, Ministry of National Development, and Ministry of Transport.

⁶ Government Administration includes spending from Ministry of Finance, Ministry of Law, Organs of State, and Prime Minister's Office.

⁷ Special Transfers include top-ups to endowment and trust funds.

⁸ Data as at January 2023. Some statistics, particularly those for the most recent time periods, are provisional and may be subject to revision at a later date.

Average historical Operating Revenue FY1991–2020 (\$ billion)

TABLE B-3

	FY1991–95	FY1996–2000	FY2001–05	FY2006–10	FY2011–15	FY2016–20
Operating Revenue	20.6	29.6	27.0	39.7	57.9	72.0
Income Taxes ¹	7.6	11.5	11.9	17.2	22.8	31.0
Consumption Taxes ²	3.0	4.9	6.3	10.2	14.4	16.6
Property-related Taxes ³	2.6	3.2	2.5	5.0	7.5	8.4
Vehicle-related revenues ⁴	3.0	3.9	2.9	2.6	5.0	6.5
Other Taxes ⁵	1.3	1.8	1.1	2.0	5.0	5.8
Fees and Charges (excluding VQP)	1.9	2.2	2.0	2.5	2.9	3.3
Others	1.2	2.2	0.2	0.2	0.4	0.4

Source: MOF

Notes:

Figures may not add up due to rounding.

¹ Income Taxes refer to Corporate Income Tax, Personal Income Tax, Statutory Boards' Contributions, and Withholding Tax.

² Consumption Taxes refer to Goods and Services Tax, Customs and Excise Taxes, and Betting Taxes.

³ Property-related Taxes refer to Assets Taxes and Stamp Duty.

⁴ Vehicle-related revenues refer to Vehicle Quota Premiums (VQP) and Motor Vehicle Taxes.

⁵ Other Taxes refer to Foreign Worker Levy, Water Conservation Tax, Annual Tonnage Tax, and Development Charge.

Historical Operating Revenue FY1991–2020 (% GDP⁶)

TABLE B-4

	FY1991–95	FY1996–2000	FY2001–05	FY2006–10	FY2011–15	FY2016–20
Operating Revenue	20.1	19.8	14.7	13.9	14.9	14.8
Income Taxes ¹	7.4	7.7	6.5	6.0	5.8	6.4
Consumption Taxes ²	2.9	3.3	3.4	3.6	3.7	3.4
Property-related Taxes ³	2.6	2.1	1.4	1.8	1.9	1.7
Vehicle-related revenues ⁴	2.9	2.6	1.6	0.9	1.3	1.3
Other Taxes ⁵	1.3	1.2	0.6	0.7	1.3	1.2
Fees and Charges (excluding VQP)	1.8	1.5	1.1	0.9	0.7	0.7
Others	1.2	1.5	0.1	0.1	0.1	0.1

Source: MOF

Notes:

Figures may not add up due to rounding.

¹ Income Taxes refer to Corporate Income Tax, Personal Income Tax, Statutory Boards' Contributions, and Withholding Tax.

² Consumption Taxes refer to Goods and Services Tax, Customs and Excise Taxes, and Betting Taxes.

³ Property-related Taxes refer to Assets Taxes and Stamp Duty.

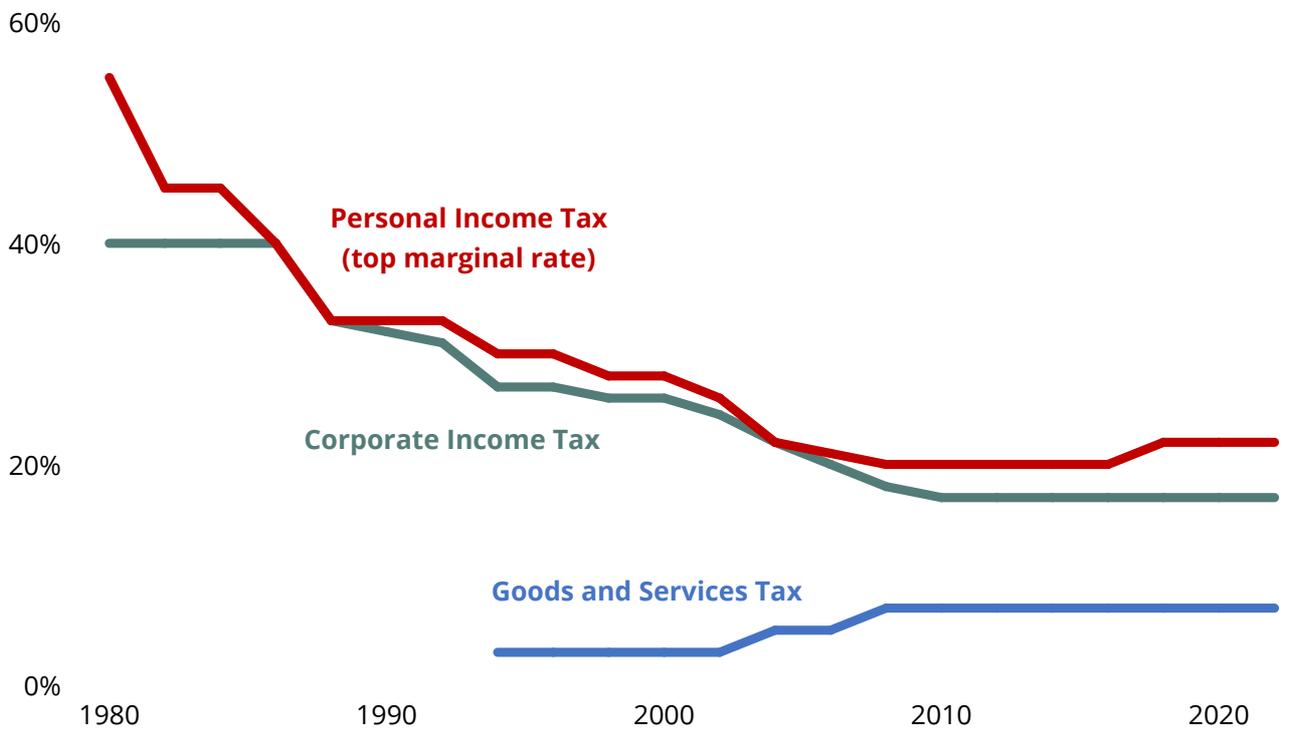
⁴ Vehicle-related revenues refer to Vehicle Quota Premiums (VQP) and Motor Vehicle Taxes.

⁵ Other Taxes refer to Foreign Worker Levy, Water Conservation Tax, Annual Tonnage Tax, and Development Charge.

⁶ Data as at January 2023. Some statistics, particularly those for the most recent time periods, are provisional and may be subject to revision at a later date.

Singapore's historical tax rates

FIGURE B-1



Source: MOF

Singapore's historical Corporate Income Tax rate

TABLE B-5

Year of Assessment	Tax Rate (%)
1991 to 1992	31.0
1993	30.0
1994 to 1996	27.0
1997 to 2000	26.0
2001	25.5
2002	24.5
2003 to 2004	22.0
2005 to 2007	20.0
2008 to 2009	18.0
2010 to 2022	17.0

Source: MOF

Singapore's historical top marginal Personal Income Tax rate

TABLE B-6

Year of Assessment	Top Marginal Tax Rate for Tax Resident Individuals (%)
1991 to 1993	33
1994 to 1996	30
1997 to 2001	28
2002	26
2003 to 2005	22
2006	21
2007 to 2016	20
2017 to 2022	22

Source: MOF

Singapore's historical Goods and Services Tax rate

TABLE B-7

Calendar Year	Tax Rate (%)
Before 1994	-
1994 to 2002	3
2003	4
2004 to 2007 ¹	5
2007 ¹ to 2022	7

Source: MOF

¹ The tax rate was increased from 5% to 7% on 1 July 2007.