Institute of Policy Studies

ENGAGING MINDS, EXCHANGING IDEAS

IPS Working Paper No. 38: Public Debt & Intergenerational Equity in Singapore

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Public Debt and Intergenerational Equity in Singapore

- Objective: Examine if the Government can issue and manage debt while maintaining intergenerational equity.
- Structure:

1. Public Debt and Intergenerational Equity in Singapore
2. Economics, Public Debt and Intergenerational Welfare
3. Debt Issuance Framework
4. Debt Issuance Simulation (SINGA and Flexible Model)

SECTION 1

Public Debt & Intergenerational Equity

IPS Working Paper 32: Four Principles of Intergenerational Equity relevant to Singapore

Intergenerational Equity: Fairness in the distribution and allocation of economic resources across generations.

1. Sufficientarian Principle:

Each generation's obligation is to provide a minimum threshold of resources sufficient for the basic needs or liberties of the next generation.

2. Intergenerational Equality:

Each generation's obligations are to ensure every generation achieves equality within its respective generation.

3. Reciprocity Principle:

Current generation has obligation to return to the next generation what it received from the previous generation.

4. Benefit Principle:

Each generation should pay for what it benefits from, and not pay for what it does not benefit from.

Public Debt and the Benefit Principle

- We infer that Government's current position on public debt follows simple application of benefit principle:

Borrowing for long-term infrastructure permitted because infrastructure has direct intergenerational benefits. Current spending should be funded by recurrent revenues such as taxes for it benefits current generation.

- **Our Argument**: **Relying on the benefit principle alone is problematic.**
- Comprehensive application of the benefit principle would recognize that all forms of expenditure *can* have intergenerational benefits.
- Some forms of current expenditures (eg. Education, healthcare) develop human, social and cultural capital. "Indirect" benefits to future generations.
- Non-infrastructural capital expenditures (eg. National Cancer Center) can have direct and indirect benefits to future generations.
- **Benefit principle best supported by other underlying conceptions of justice: equality, welfare, etc. (Thompson, 2003)**

Public Debt and Intergenerational Equity

- The relationship between debt and intergenerational equity is not straightforward or simple.
- If Singapore issues debt for consumption vouchers (direct fiscal stimulus), violates reciprocity principle as previous generations have saved.
- If debt issued for current social spending targeted at less well off, can improve social mobility and therefore intergenerational equality.
- **Government should adopt a holistic principle towards public debt: an approach that incorporates benefits but also intergenerational equality, welfare, reciprocity.**

SECTION 2

Economics, Public Debt and Intergenerational Welfare

Economic Theory on Public Debt and Intergenerational Welfare

- Conventional Economic view of Government Debt (Elmendorf & Mankiw, 1998):
- Short-run effect: boost consumption and therefore aggregate demand;
- Long-run effect: government debt crowds out private investment.
- Alternative view: Ricardian Equivalence: Reduction in public savings will be equalized by rise in private savings.

Economics, Public Debt and Intergenerational Welfare

- Contemporary Research into Government Debt:

1) Fiscal Cost argument:

- As long as $r < g$, debt can be rolled over.
- Governments can achieve decreasing debt-to-GDP ratio without having to raise taxes; no intergenerational tax burden transfer.

2) Secular stagnation:

- Interest rates persistently low reflecting high supply of savings, low demand for investment in advanced economies.
- Governments should borrow more for expansionary fiscal policy to improve GDP growth trajectory

Source: Den Haan (2020)

Blanchard (2019): Public Debt and Low Interest Rates

- Public debt has two costs: fiscal costs and welfare costs.
- Fiscal cost is low or negligible if interest rates below growth rates (r<g); debt rollovers are feasible.
- Reduced capital accumulation affects welfare *given* and *through* the prices of capital and labour.
- Intergenerational Welfare effect of government debt depends on risk-free interest rate *(r),* growth rate of economy *(g),* and marginal product of capital *(MPK).*
- Intuition: Government debt crowds out capital accumulation in long run. But what matters is how productive or valuable the returns to capital.
- Both *r* and *MPK* matter because they reflect the different risk in investing in private capital
- Conclusion: Debt effect on welfare is positive if safe rates below growth rates; negative if growth rates below MPK.

Section 2: Summary and Analysis

- Economic arguments presented so far concerned with government debt in general. More attention needs to be paid to what debt is used for.
- Fiscal Cost and Secular stagnation argument - If debt is used to fund consumption, future growth may not be stimulated sufficiently. Argument is stronger if debt used for investments that increase productivity.
- Empirical Evidence: Government debt can be good if used to finance lumpy expenditures (tax smoothing), if asset yields financial or social rate of return higher than cost. (Fatas et al 2019)
- Blanchard (2019): If public debt used to fund public investment, then what matters for intergenerational welfare is the risk-adjusted *social* rate of return on public investment versus risk-adjusted rate of return on private capital (risk-free rate).
- Conclusion: Debt can be welfare improving if investments earn more than its opportunity cost.

SECTION 3

Debt Issuance Framework

Policy Suggestion: Debt Issuance Framework

- Most common Fiscal Rule: Debt Ceiling (Limit on Debt/GDP ratio)
- We suggest a Debt Issuance Framework that outlines how debt should be issued, spent and paid back:

1) **Issuance**: Preference for 30-year bonds or longer (younger generations will contribute)

2) **Expenditure**:

- Debt issued exclusively for Development Expenditures
- Capital expenditures that have long useful lives – can have direct and indirect benefits to future generations
- Assuming positive social rates of return on investment => intergenerational welfare improving
- Examples of Development Expenditures:

1. National Cancer Centre (NCCS) ($610m), SIT ($430m), Climate Change Mitigation Infrastructure

Debt Issuance Framework

3) Repayment:

Intergenerational equitable repayment.

Debt should be repaid according to priority framework:

1. User Fees – To the extent it is feasible, those that directly benefit should pay for servicing debt
2. Taxes – Current and younger generations of taxpayers should pay for investments.
3. Amortization - Amortize debt over maturity of bond to smoothen tax burden of servicing debt.

- Repayment of Debt ensures no accumulation or rolling over of debt which leaves future generations with insurmountable levels of debt.

SECTION 4

Debt Issuance Simulation

Debt Simulation

- Simulate a model of SGS (Infrastructure) Debt Framework (15-year) vs IPS Debt Framework (Flexible) in Singapore (2021-2050)
- **Objectives / Constraints**:

1. SGS (Infrastructure) bonds issued to finance qualifying Significant Infrastructure projects ($4b minimum project value, useful life 50 years).
2. Development expenditures financed with debt will be depreciated/amortised over 30 years. Recorded as amortisation expense in the budget.
3. 2 Models:

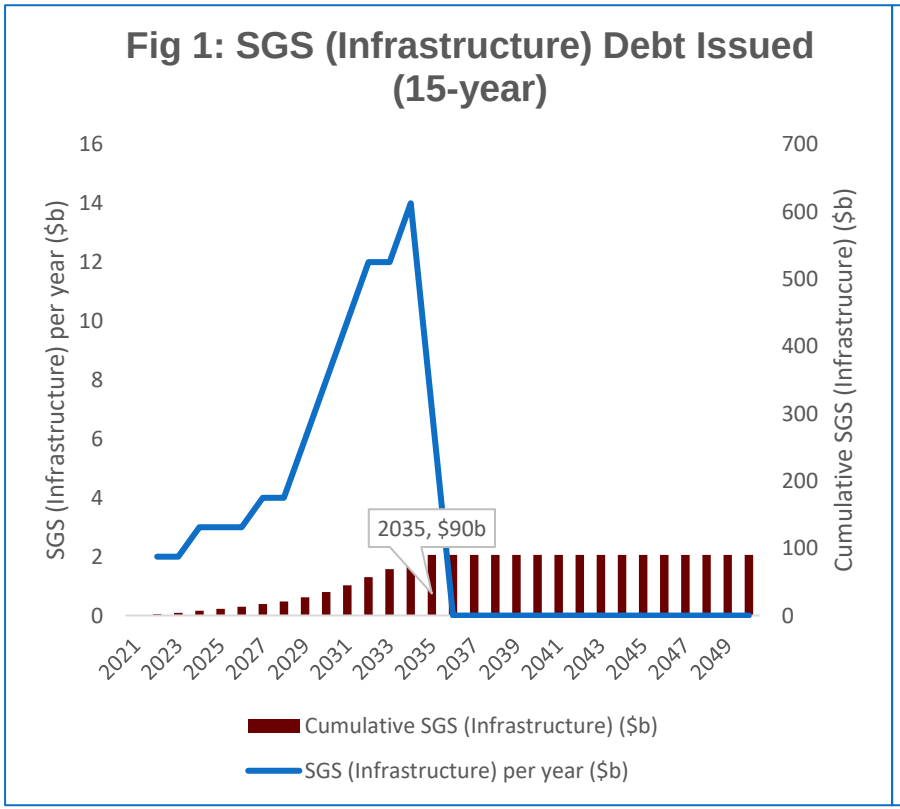
- "15 year" Model - Government framework where debt issued cannot exceed $90b over 15 years; Interest expense p.a. cannot exceed $5b.
- "Flexible" Model where debt continues to be issued after $90b constraint.
- In both models, debt issued cannot exceed total development expenditure.

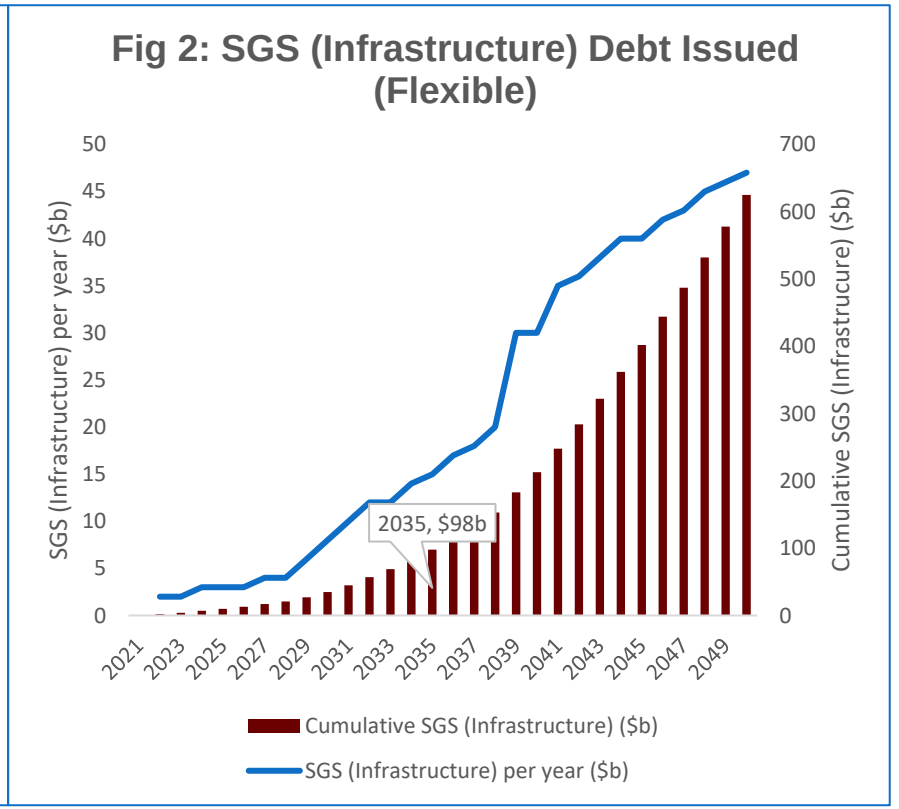
Debt Simulation

Assumptions:

1. GDP nominal growth at 2% p.a.
2. Tax revenue growth in line with GDP growth (2% p.a., 2021-2050). Maintain existing tax structure (no GST hike).
3. Total expenditure growth grows quicker in 2022-2025 due to post-pandemic recovery; 3% p.a. from 2026-2050 for ageing population and climate change needs.
4. Development expenditures grow to above 5% of GDP in line with Budget guidance.
5. 30-year fixed coupon (Bullet) bonds of 2.27% p.a.
6. Transfers for depreciation of infrastructure placed in sinking fund earning long term rate of return (2.7%). Investment returns from sinking fund used to fund debt servicing expenditure.

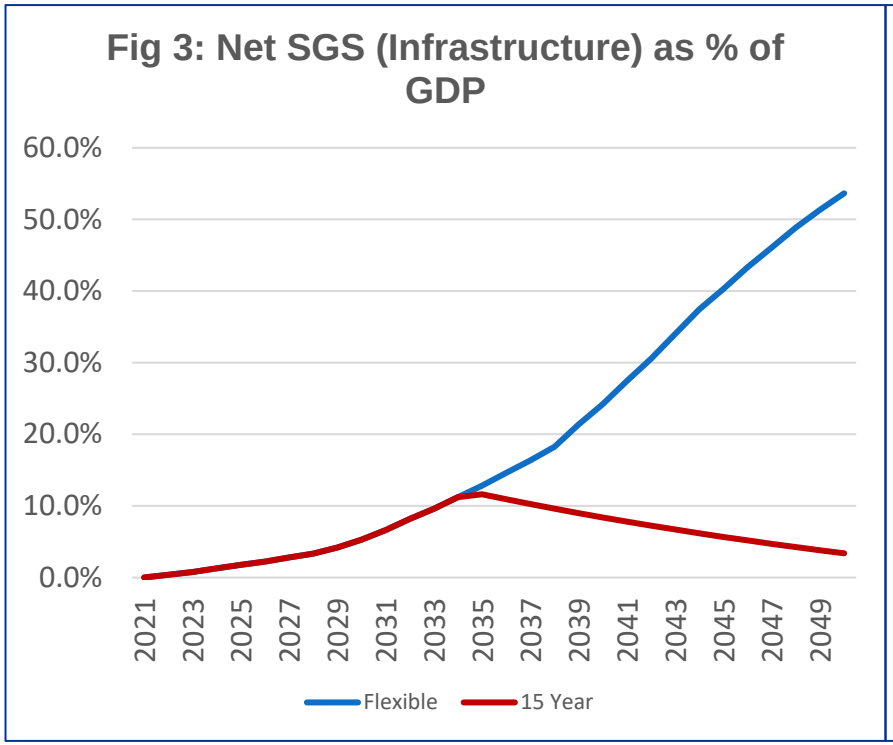
Debt Issuance

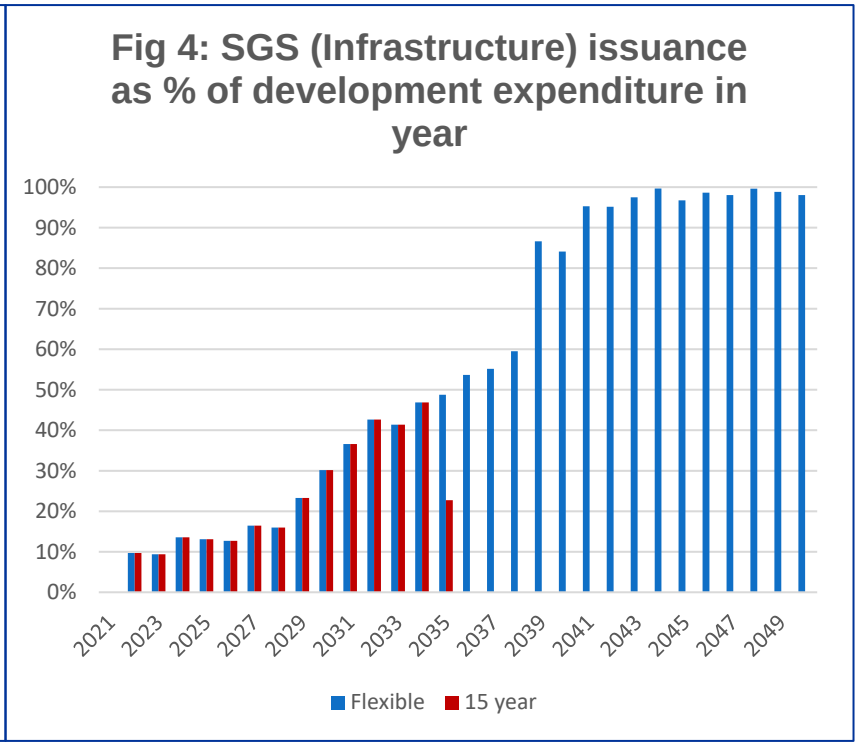




- Fig 1 & 2: SGS (Infrastructure) bonds issued in 2022-2050. $90b constraint exceeded in 2035 in both models.
- Fig 2: “Flexible” Model: Debt issued annually after 2035 grows significantly due to deficits.

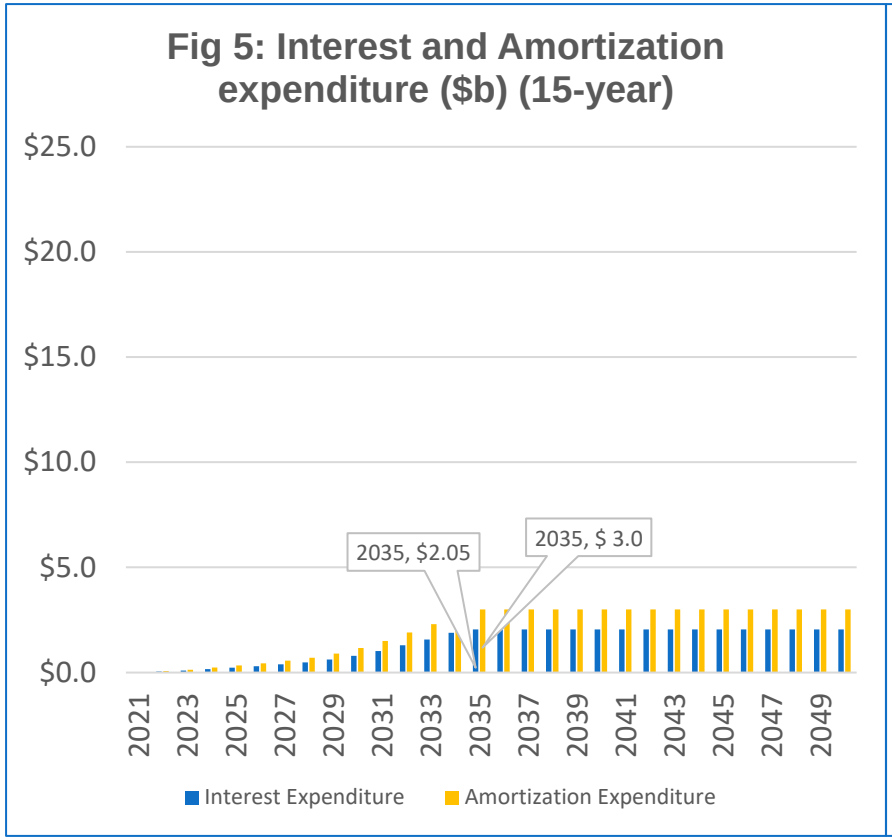
Debt Issuance

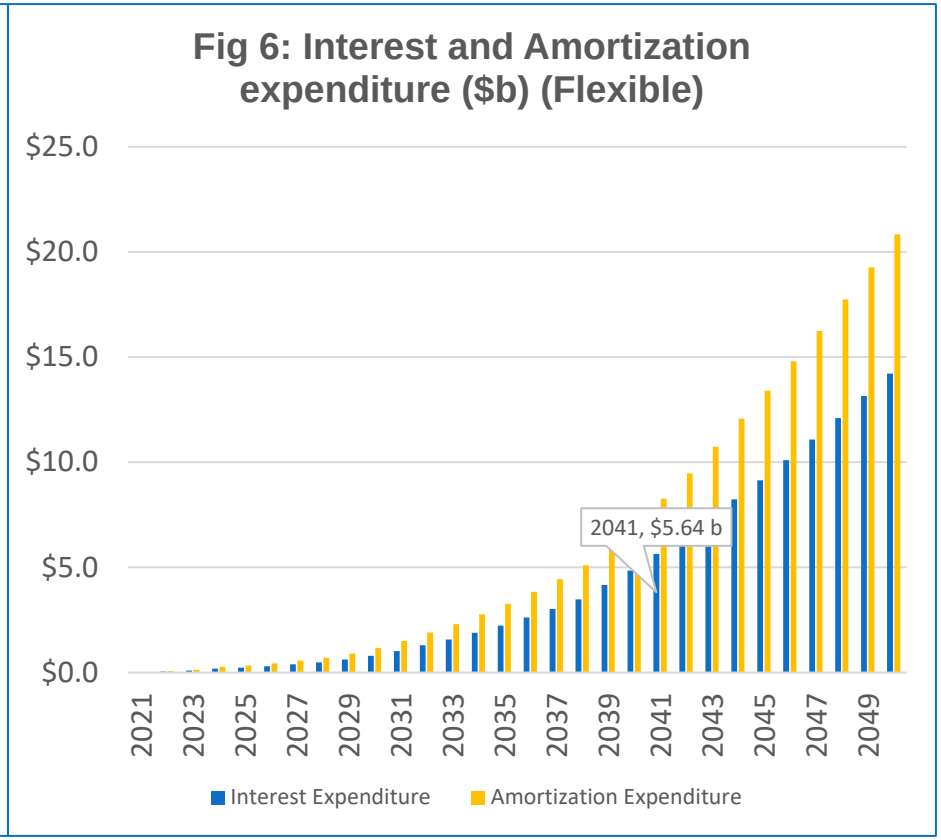




- Fig 3: Net SGS (Infrastructure) is debt due after sinking fund transfers. “15 year” model net debt decreases after 2035 as debt is amortized with no further issuance.
- Fig 4: “Flexible” Model. Constraint of not exceeding development expenditures met in 2043.

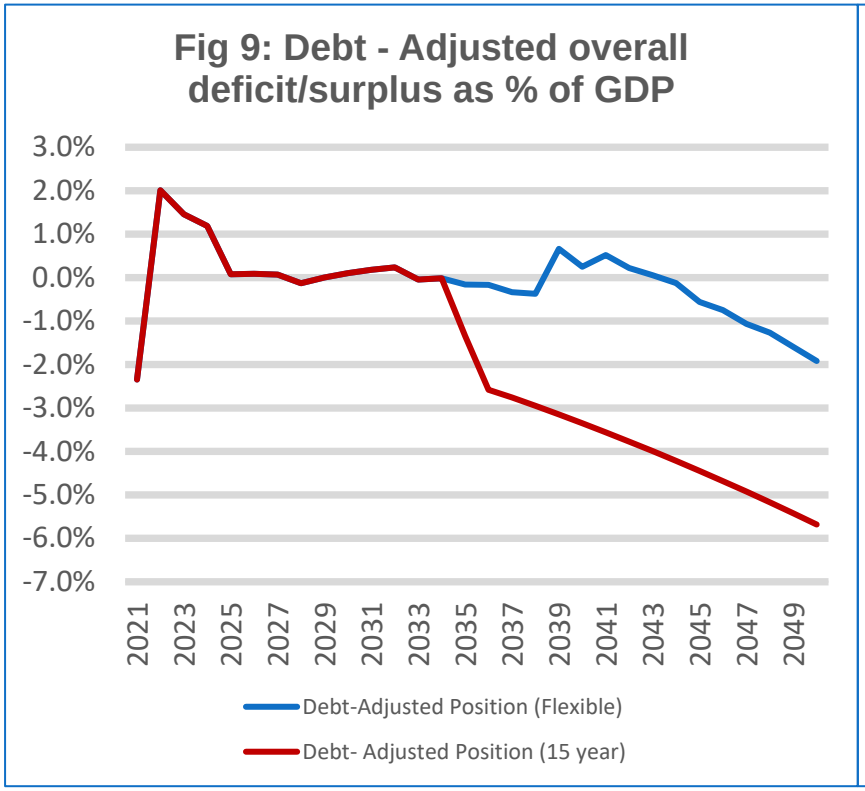
Interest & Amortization Expenditure

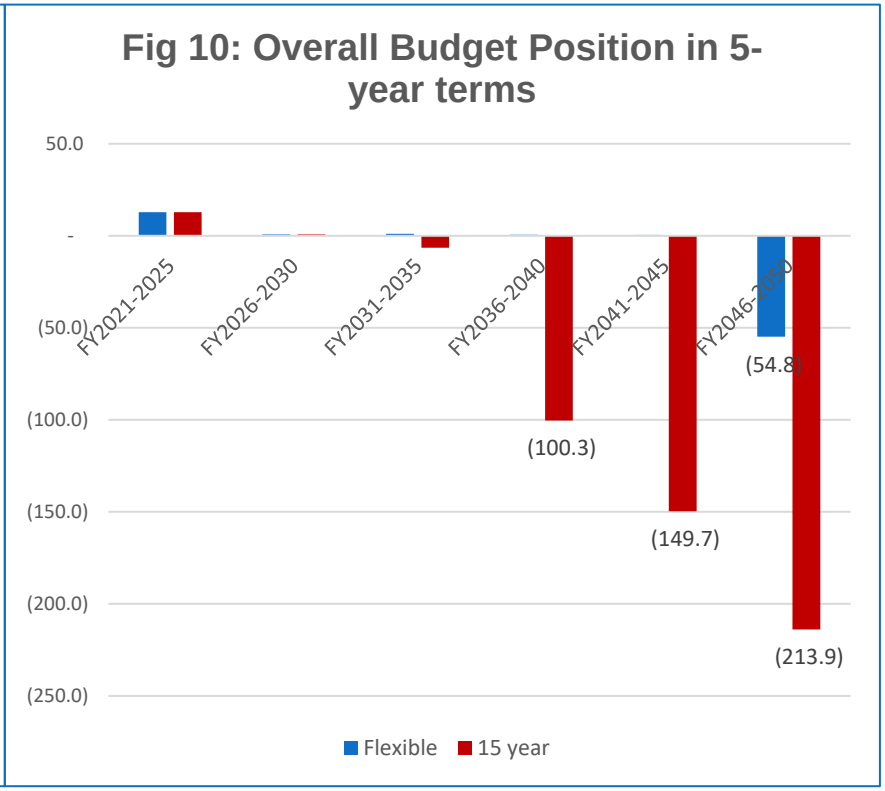




- Fig 5: “15-year” Model, interest and amortization expenditures plateaus in 2035 at $2.05b and $3b respectively.
- Fig 6: “Flexible” Model: Interest and amortization expenditure grows rapidly later as more debt issued in later years. Interest expenditure of $5.64b reached in 2041 when cumulative debt issued is $248b.

Budget Positions





- Fig 9: Debt-Adjusted Overall Positions in “Flexible” and “15-year” models. Deficits after 2034 in “15-year” model as only $90b debt issued.
- Fig 10: “15 year” Model – Total funding shortfall to 2050 is $470b. “Flexible” Model – Debt can finance deficits until 2046 when constraint of debt not exceeding development expenditures limits ability to balance overall position.

Conclusions

- Under our model, SGS (Infrastructure) Debt issued to finance development expenditure. Portion of development expenditure financed by debt is capitalized and amortized (depreciated) over 30 years.
- In “15-year” model, $90b constraint hit in 2035 with no further debt issued after. Under our model assumptions, this results in shortfall of $470b by 2050 which would have to be raised by taxes if no further debt issued.
- “Flexible” model – Debt can be used to finance deficits up to the constraint of not exceeding development expenditures until 2046.
- Avoid unfairness of current generation funding development expenditures entirely even though they have long useful lives. Current generations still pay for development expenditures through debt servicing (amortization and interest).
- Fair for future generations to pay for development expenditures because they yield future benefits and also improve GDP and welfare with positive social rates of return.

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Thank you!

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