

BROOKINGS

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The Economic Consequences of Delay in U.S. Climate Policy

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Part of a broader collaborative project

- Scope of policy
 - » McKibbin W. J., Morris, A., and Wilcoxon P. J. (2014) “Pricing Carbon in the United States: A model-based analysis of power sector only approaches.” *Resource and Energy Economics* vol 36, no 1, pp 130-150. North Holland
 - » Compared a power sector only carbon price with an economy wide carbon price

Part of a broader collaborative project

- Use of tax or permit revenue
 - » McKibbin W. J., Morris, A., Wilcoxon P. J., and Y. Cai (2014) “Carbon taxes and US Fiscal Reform.” Under revision at the *National Tax Journal*
 - » Explored how the revenue from a carbon tax would impact the US economy and individual sectors.

Part of a broader collaborative project

- Timing (today's presentation)
 - » McKibbin, W., A. Morris, and P. Wilcoxon, "The Economic Consequences of Delay in U.S. Climate Policy," The Brookings Institution, June 11, 2015.

Relationship to the Clean Power Plan

- NOT an analysis of EPA's Clean Power Plan
- Key differences:
 - » Targets *economy-wide* carbon emissions
 - » Levies a *carbon price* across all energy not only electric utilities
 - » Price is not chosen to hit the Clean Power Plan target

Why explore delay?

- EPA rulemaking is a protracted process and delay is likely
- Potential benefit of delay
 - » More time to plan, fewer stranded assets
- Cost of delay
 - » Less time to achieve the same reductions

Why impose a carbon price?

- Reduce emissions
- Better than less efficient ways to reduce emissions
 - » Clean Air Act and other regulations
 - » Clean energy and energy efficiency subsidies
- Can raise revenue
 - » Lower the deficit
 - » Reduce other taxes

Three questions to be answered:

- Does delay have net economic costs?
- What is the nature of these costs?
- Which matters more: timing or other climate policy design options?

Four Carbon Price Policy Scenarios

Deficit
Reduction

1. U.S. carbon tax now (S1_now)
 - » Revenue reduces federal deficit
 - » Initially \$15 per ton CO₂ (\$2010), rising at 4% real
2. Delay with higher starting price (S2_step)
3. Delay with higher growth rate (S3_rate)

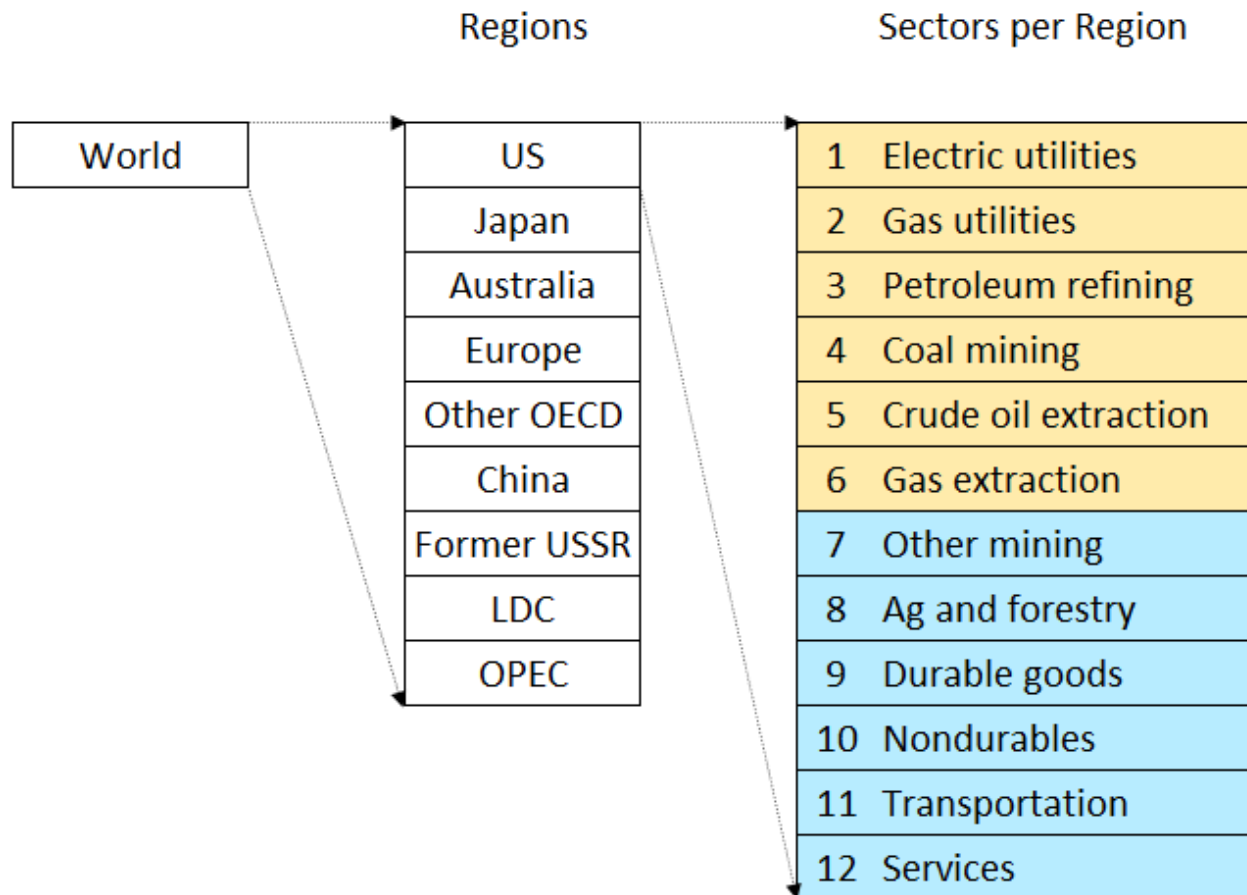
Four Carbon Price Policy Scenarios

- Deficit Reduction
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 2. Delay with higher starting price (S2_step)
 3. Delay with higher growth rate (S3_rate)
 4. Starting now, but lower capital tax rate rather than deficit reduction (S4_taxswap)

Many complex factors interact

- Direct impacts of actual or expected price changes
- Impacts on the budget
- Impacts on trade and investment
- Impacts on different sectors that use energy differently
- Need a well specified model to explore the issue

The G-Cubed model

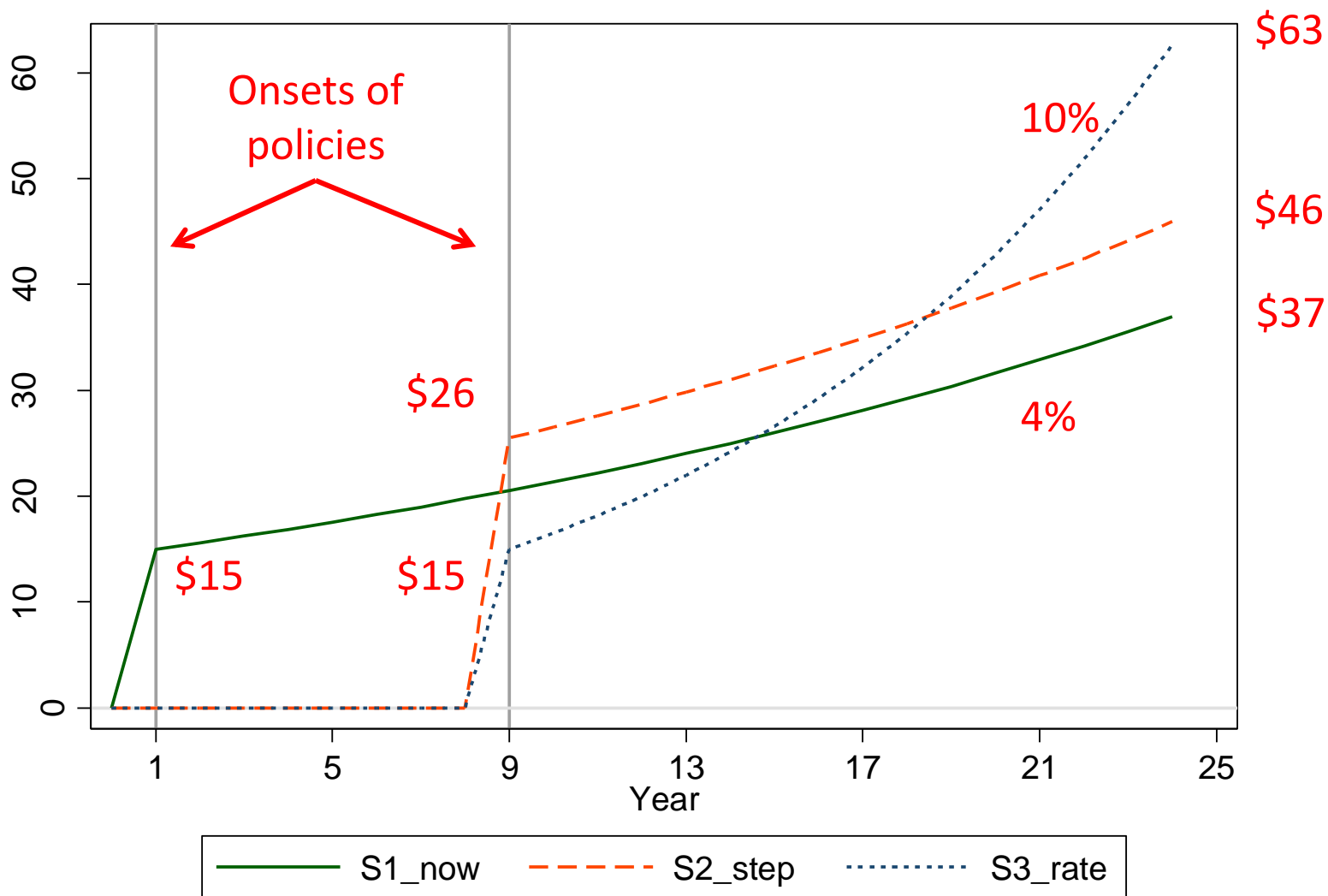


Key features

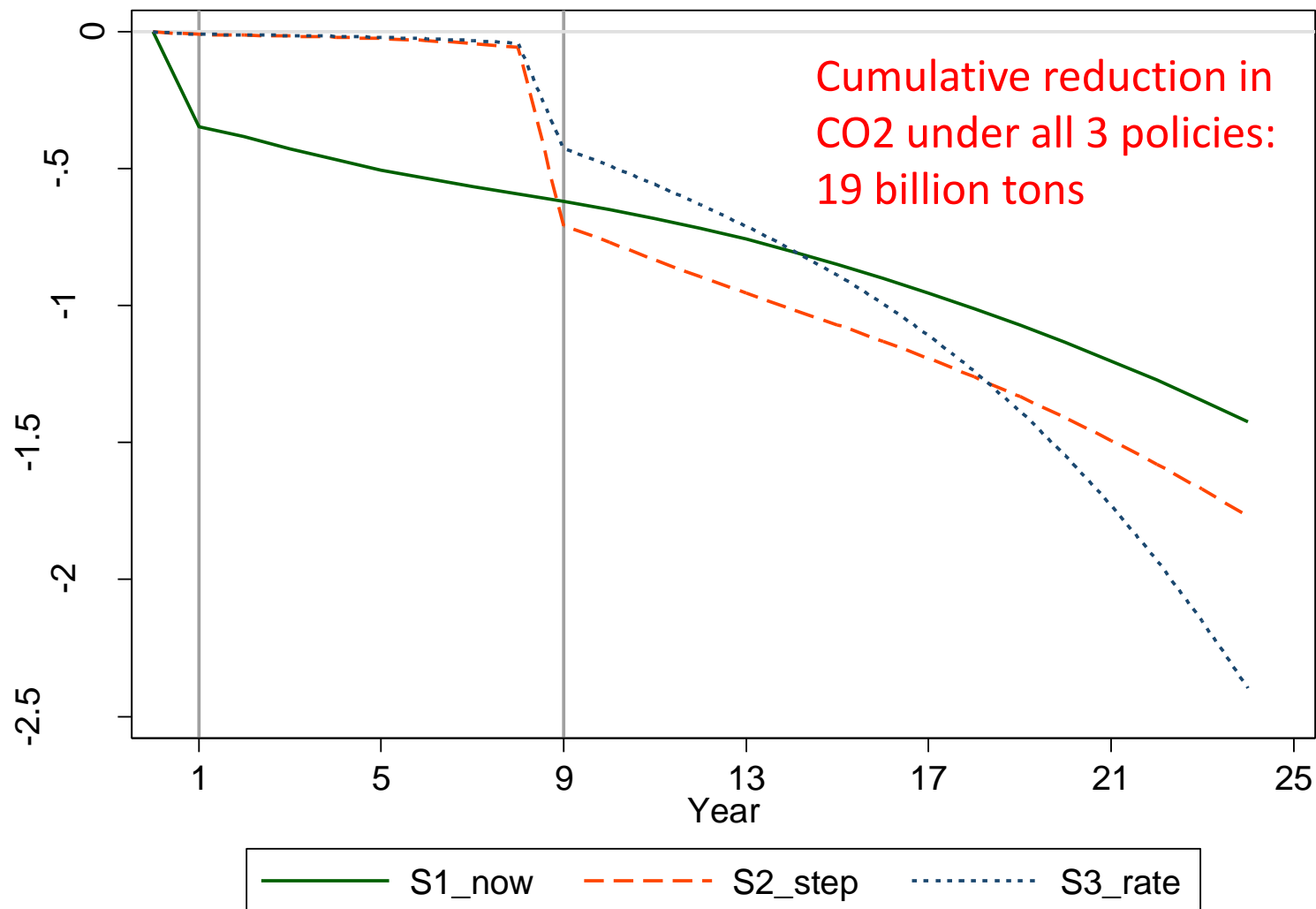
- Hybrid of macro and computable general equilibrium models
- Inter-industry linkages, capital movements, and consumption and investment dynamics.
- Households and firms have partial foresight
- Labor market dynamics with unemployment possible

RESULTS

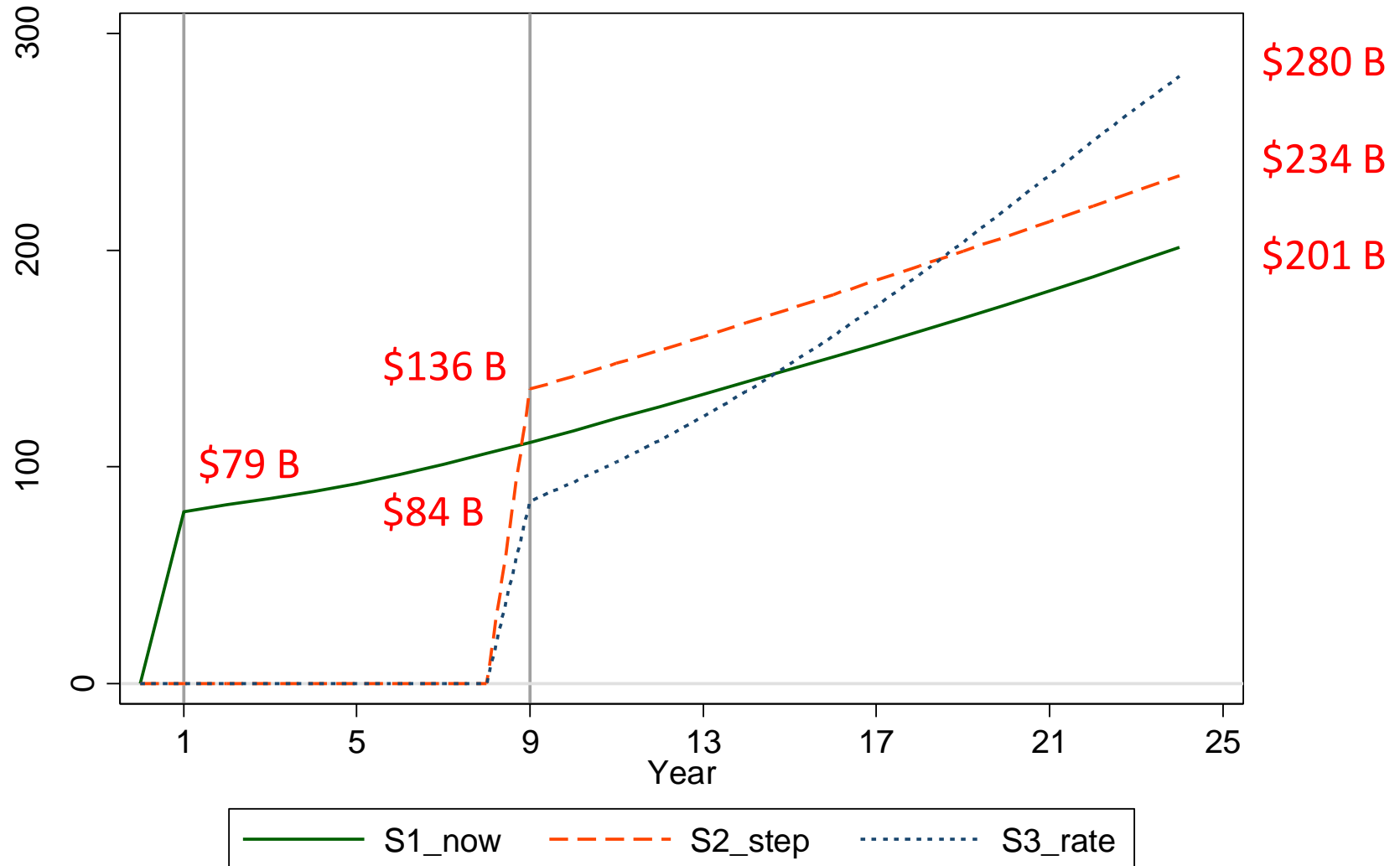
Tax rates on carbon



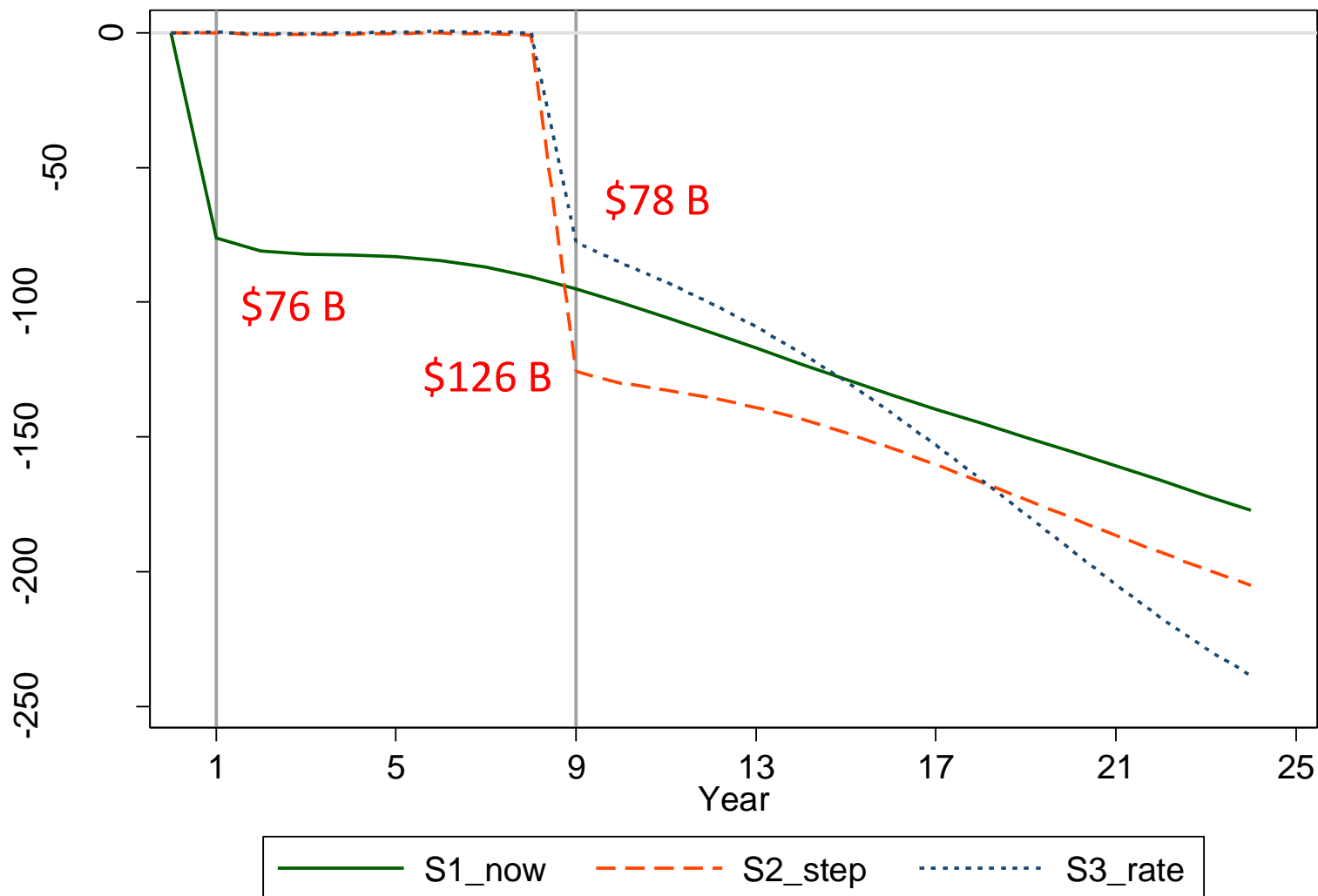
Reduction in national emissions



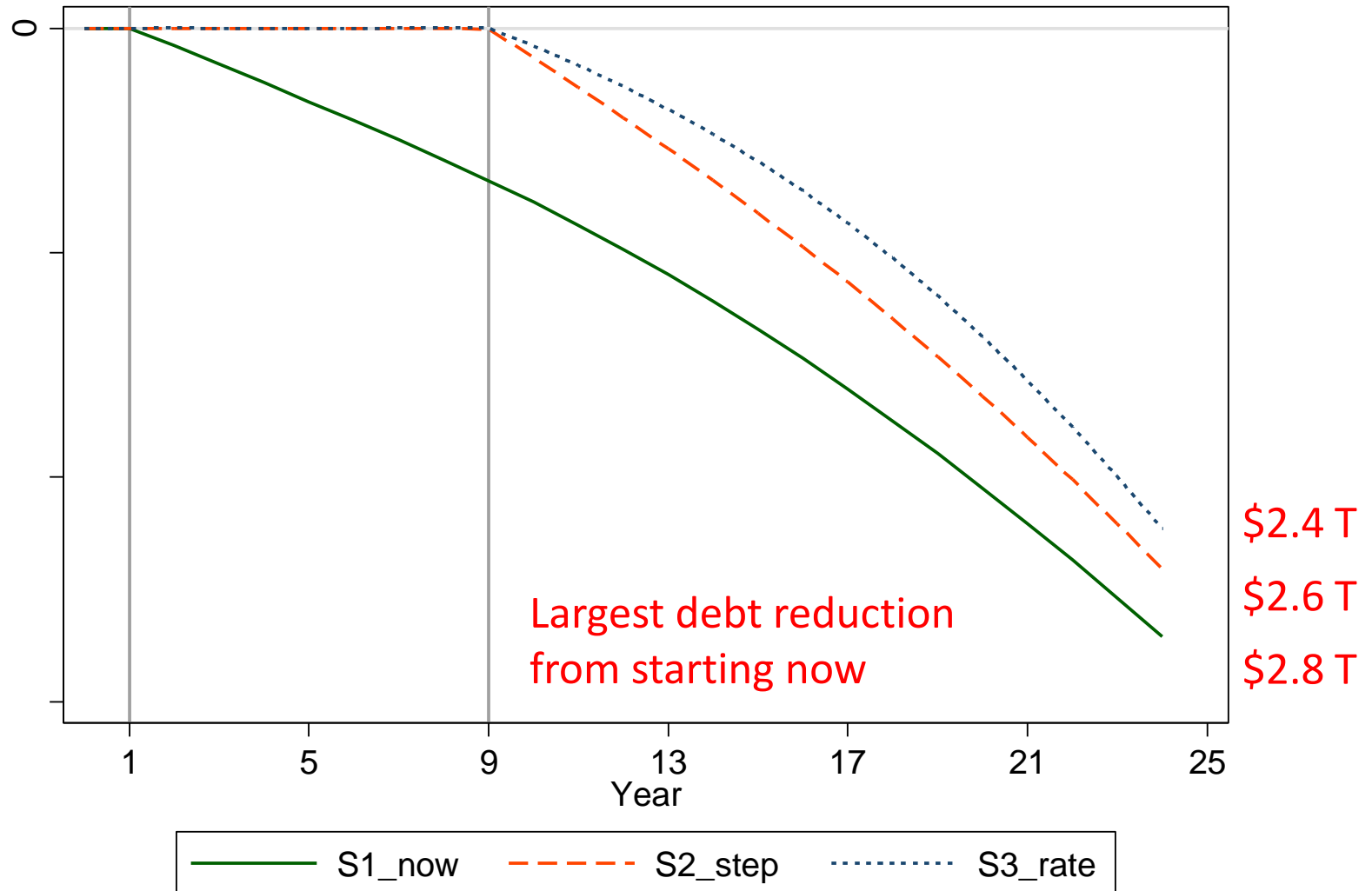
Gross annual carbon tax revenue



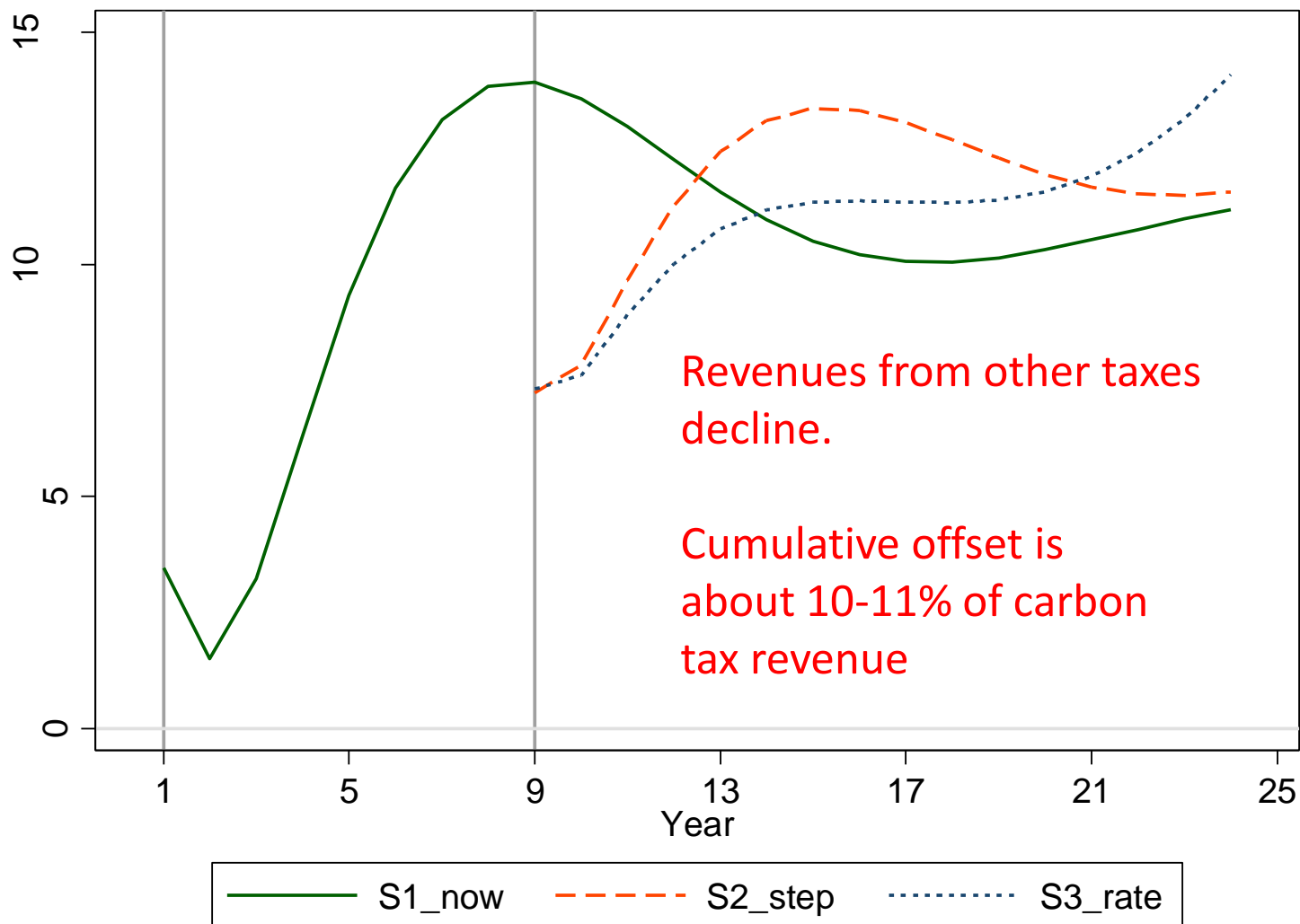
Reduction in the federal deficit



Reduction in government debt

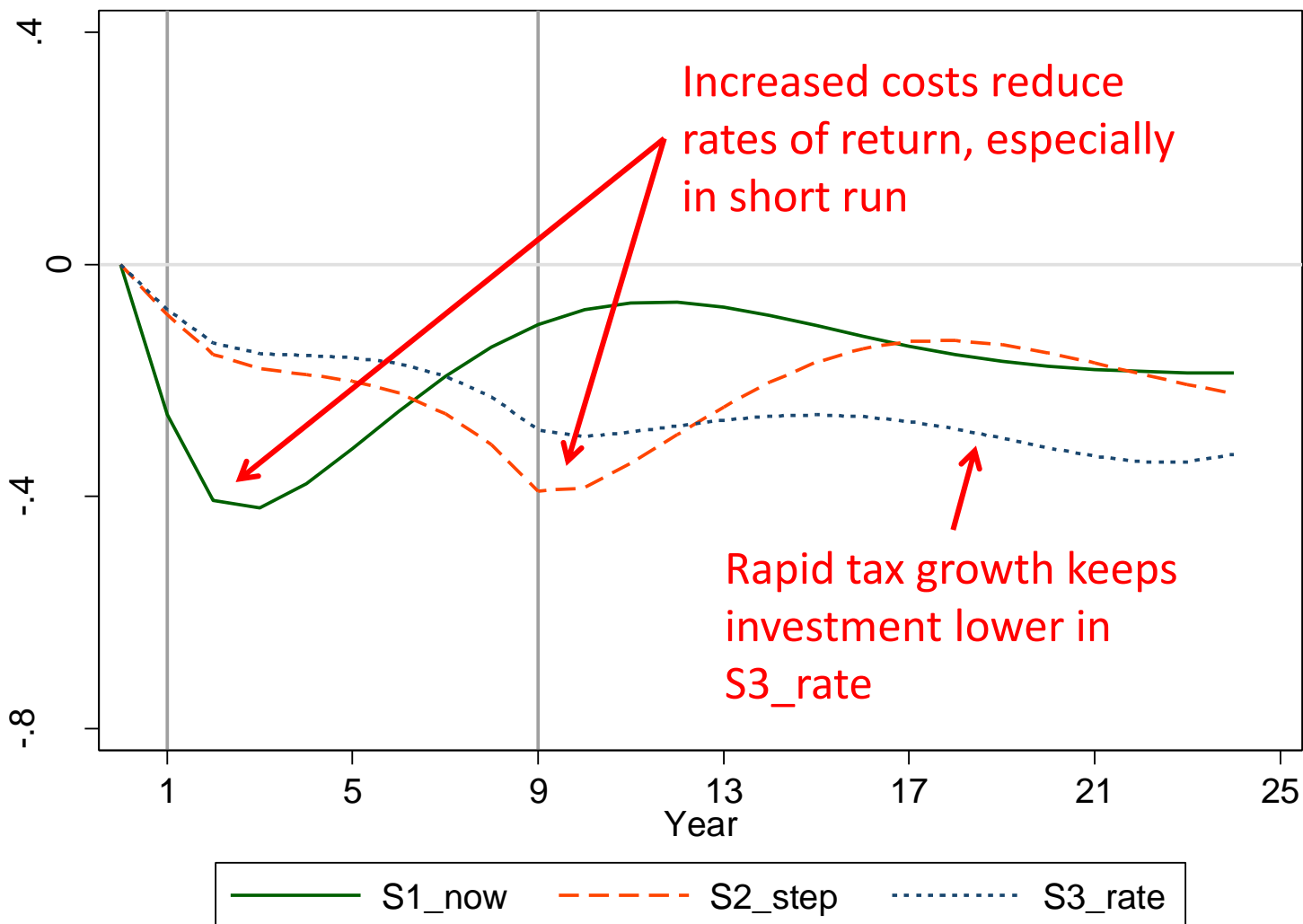


Effect on other tax revenues?

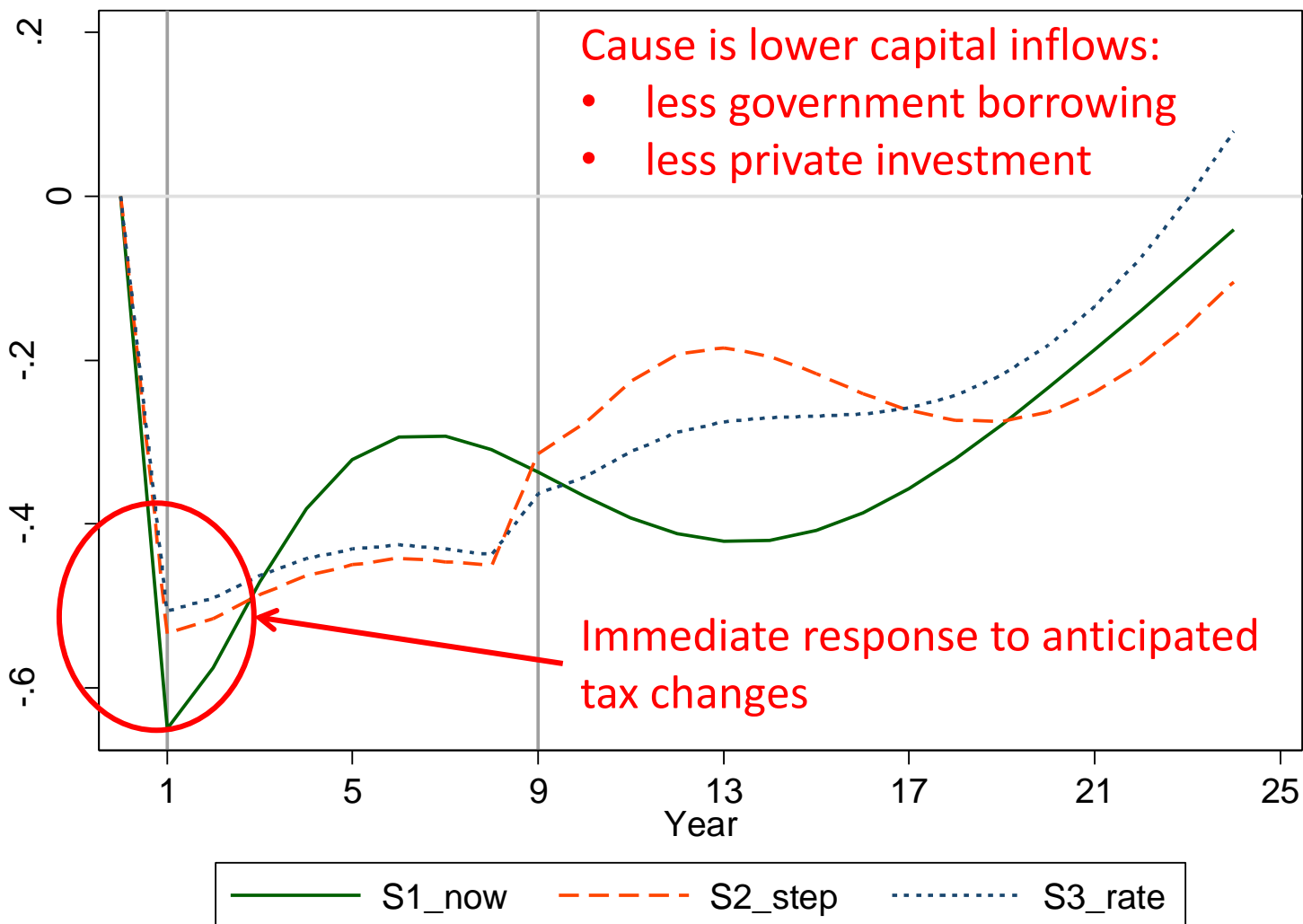


EFFECTS ON THE MACROECONOMY

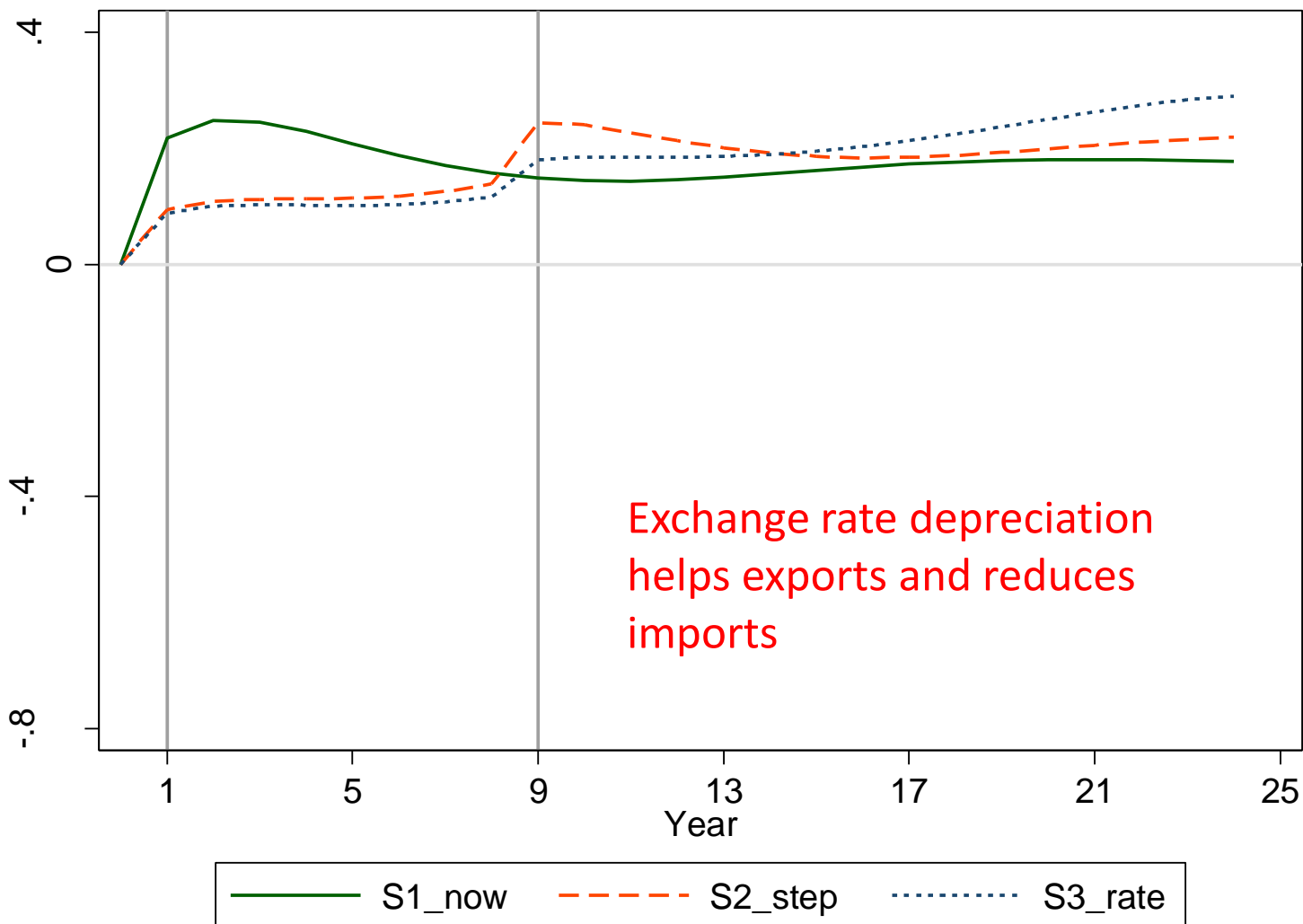
Economy-wide investment falls



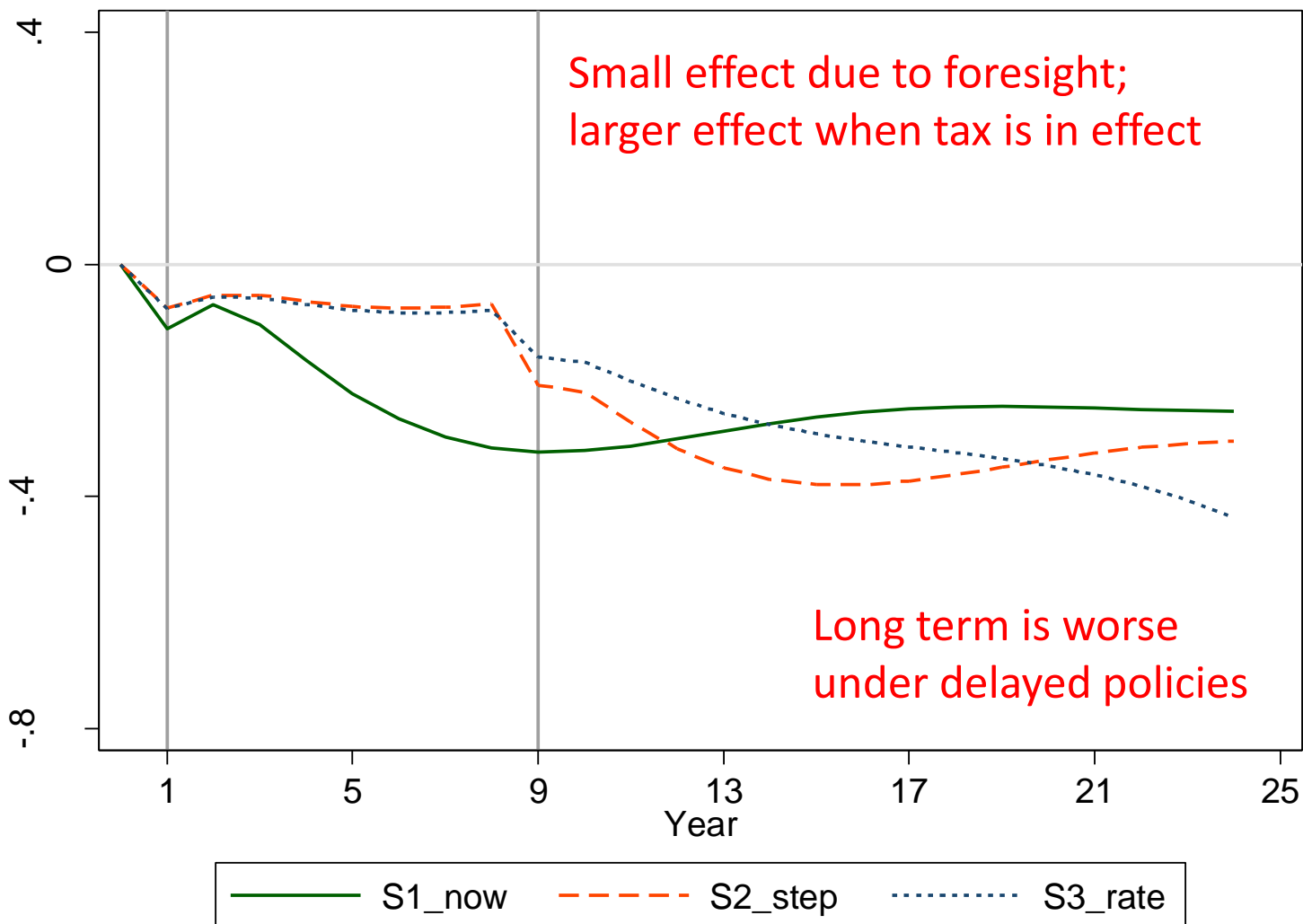
The dollar depreciates slightly



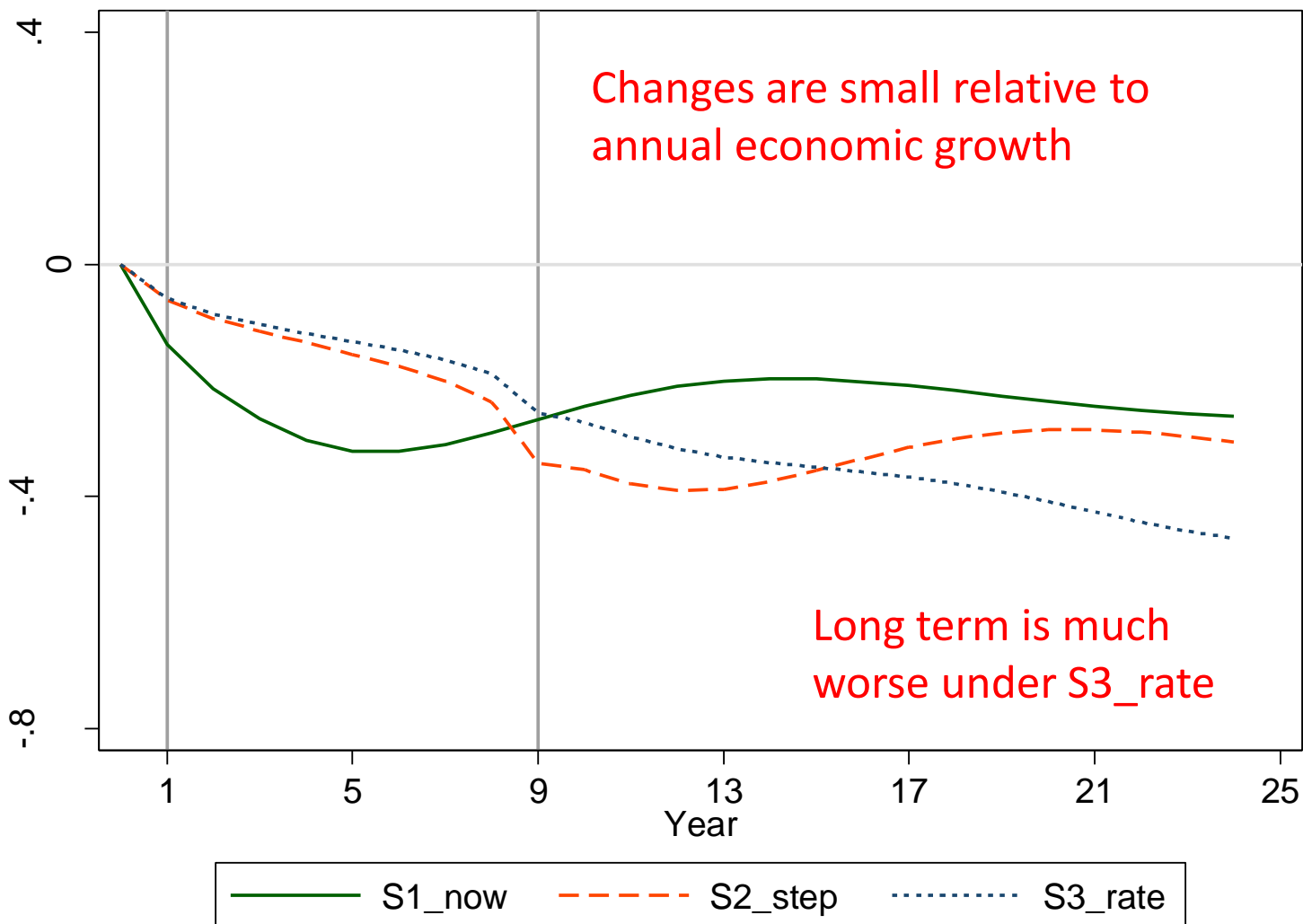
Net exports improve



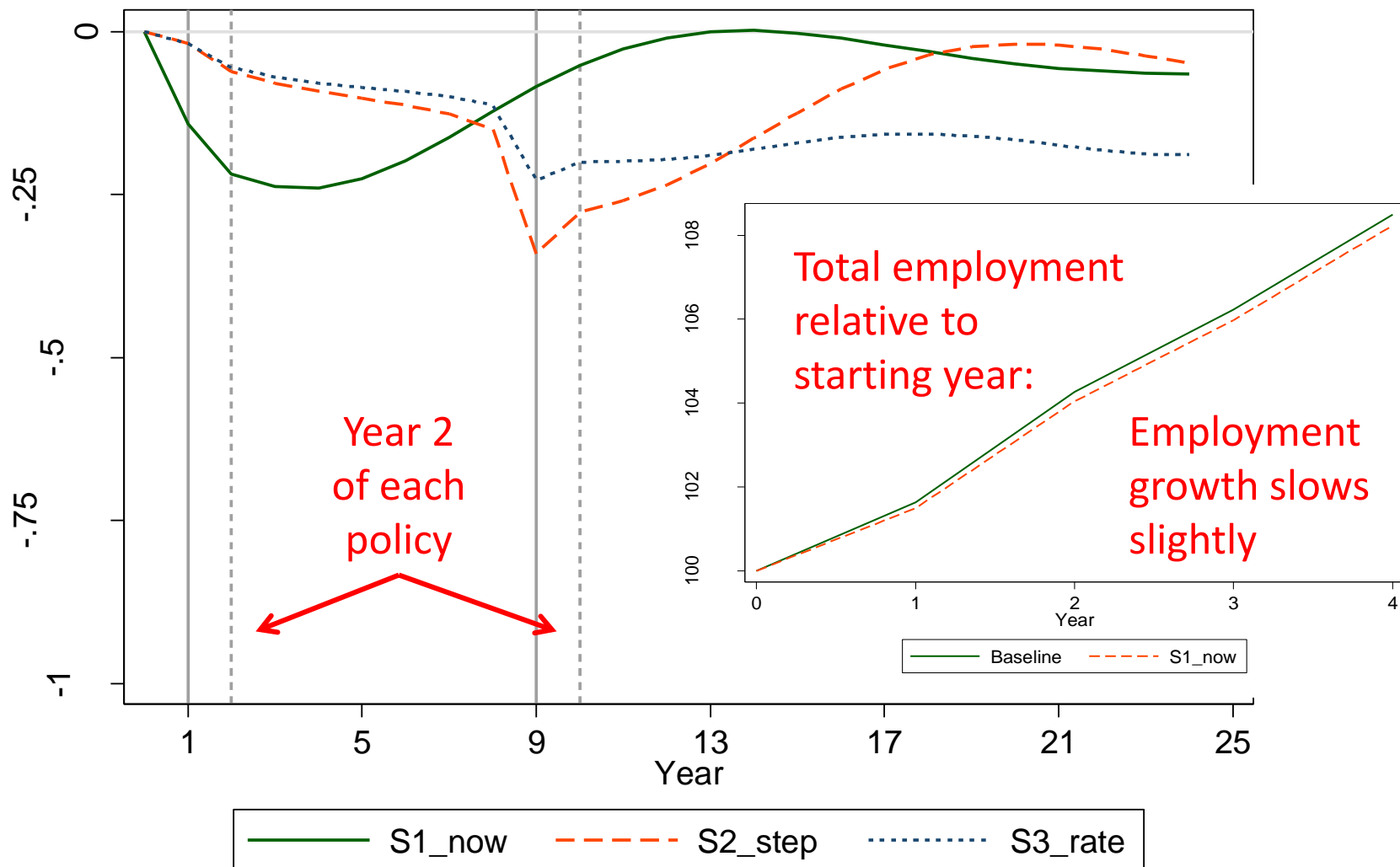
Consumption falls relative to baseline



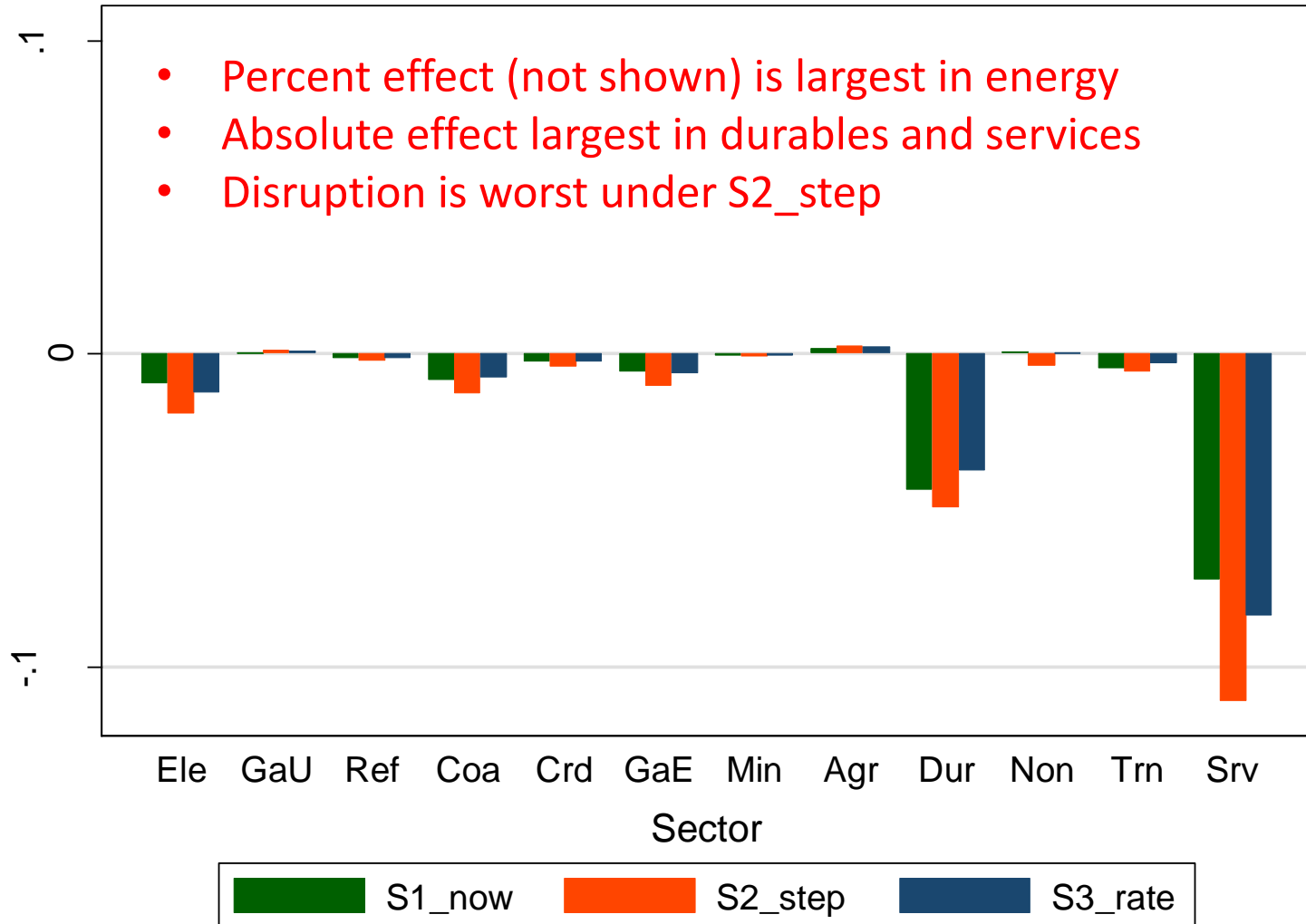
Overall, GDP falls relative to baseline



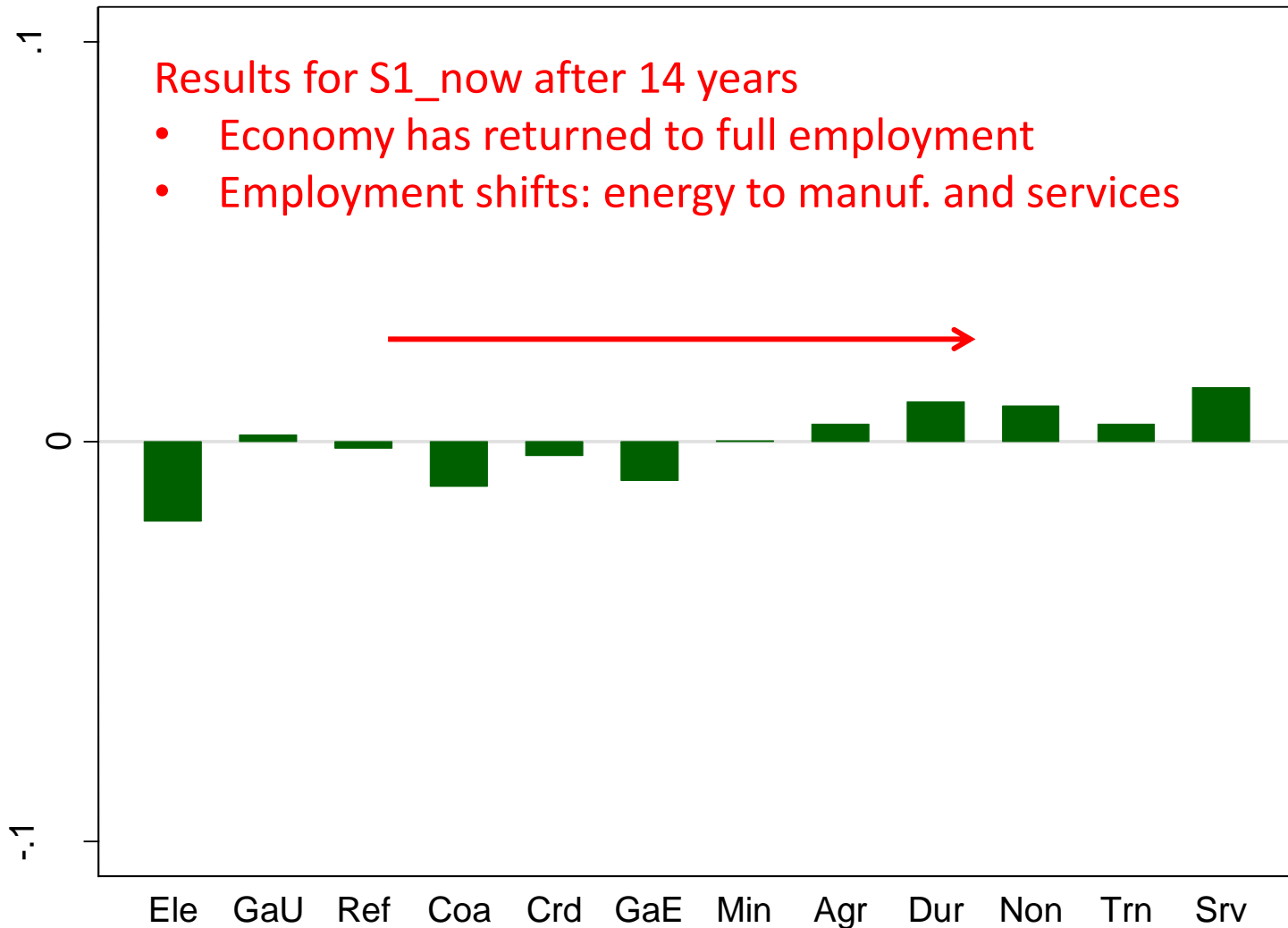
Change in employment



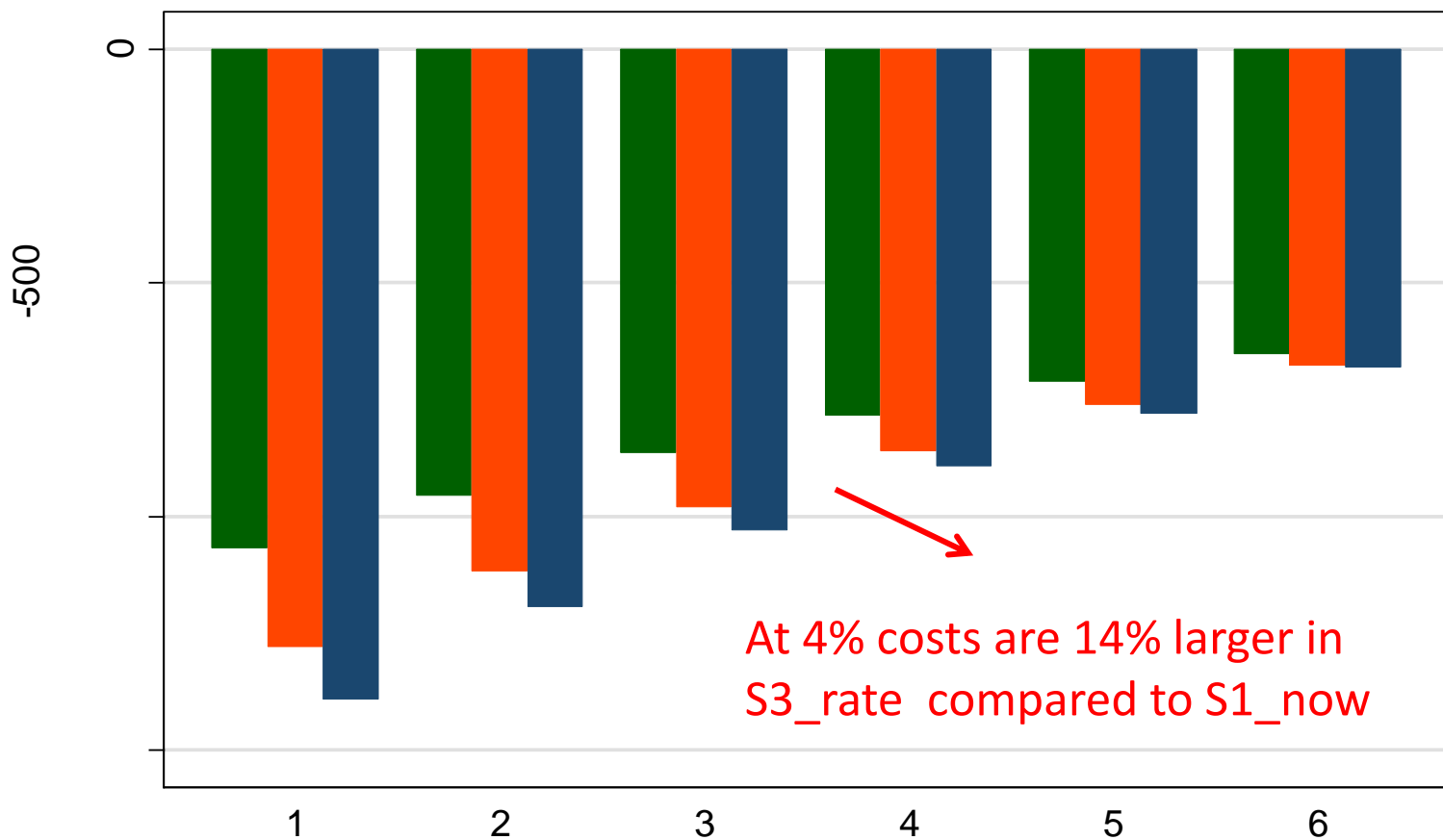
Employment by sector, policy year 2



Long run employment by sector



Net present value of GNP changes

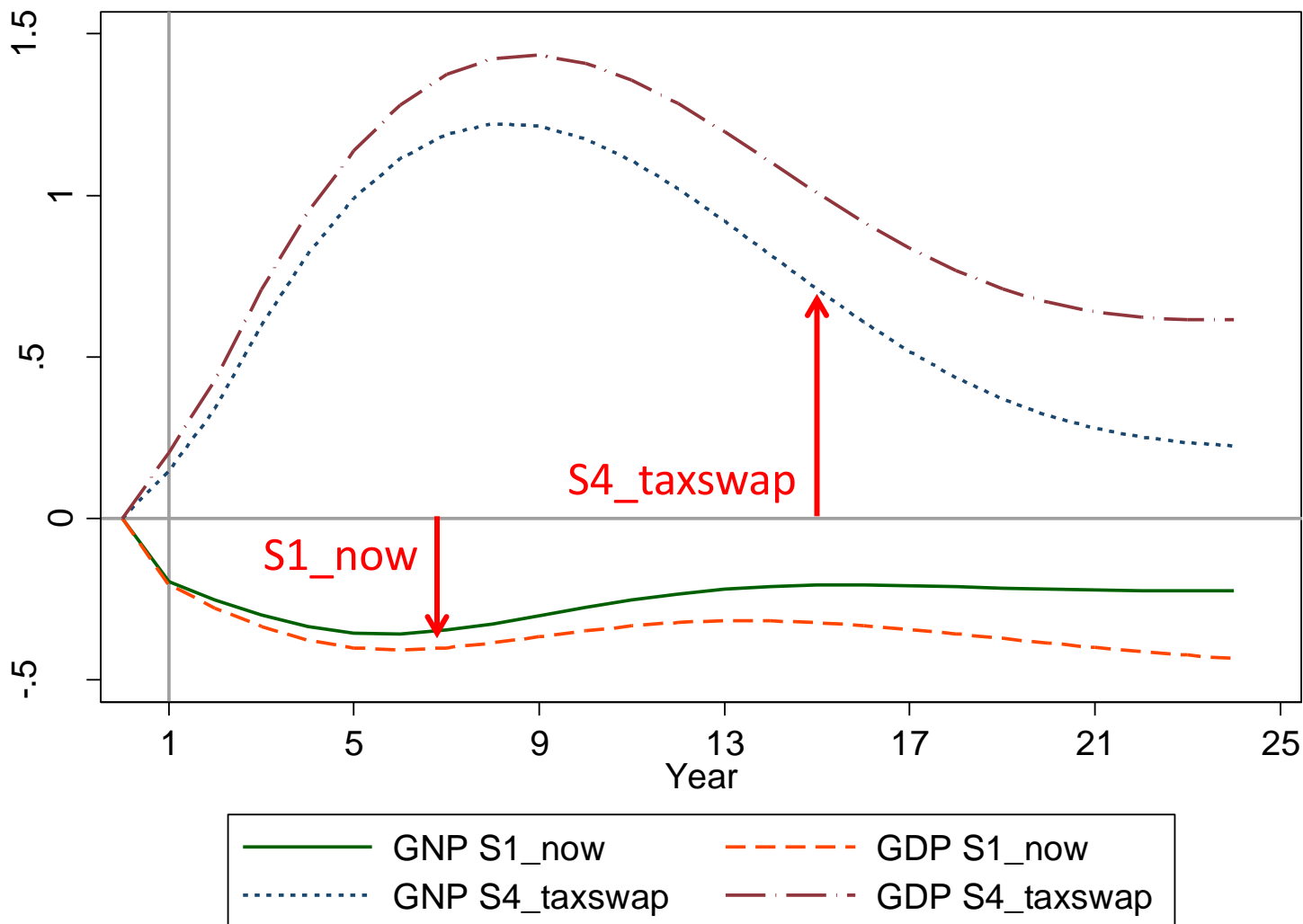


Acting now is least costly
except at high interest
rates

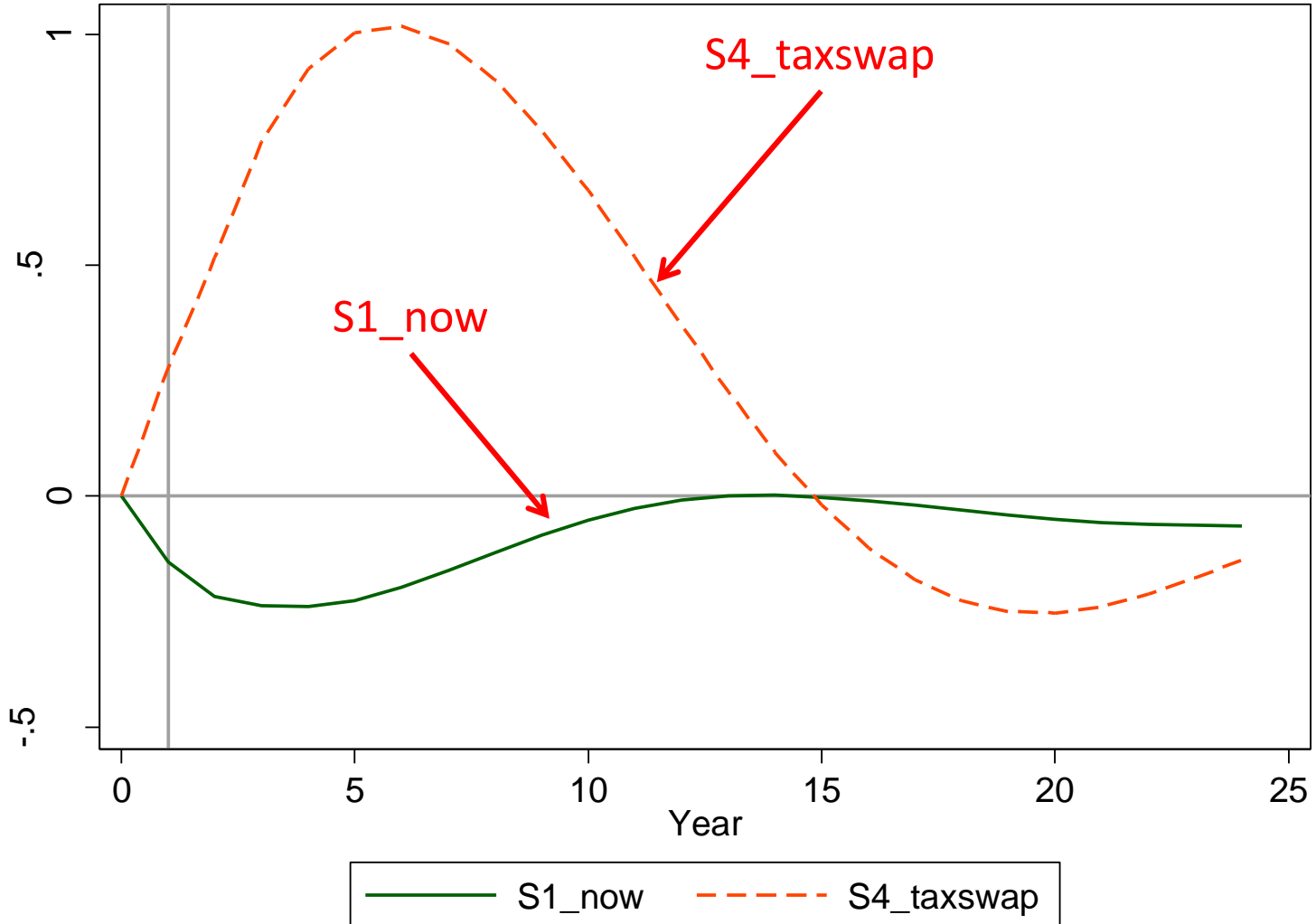


USING THE REVENUE TO REDUCE CAPITAL TAXES

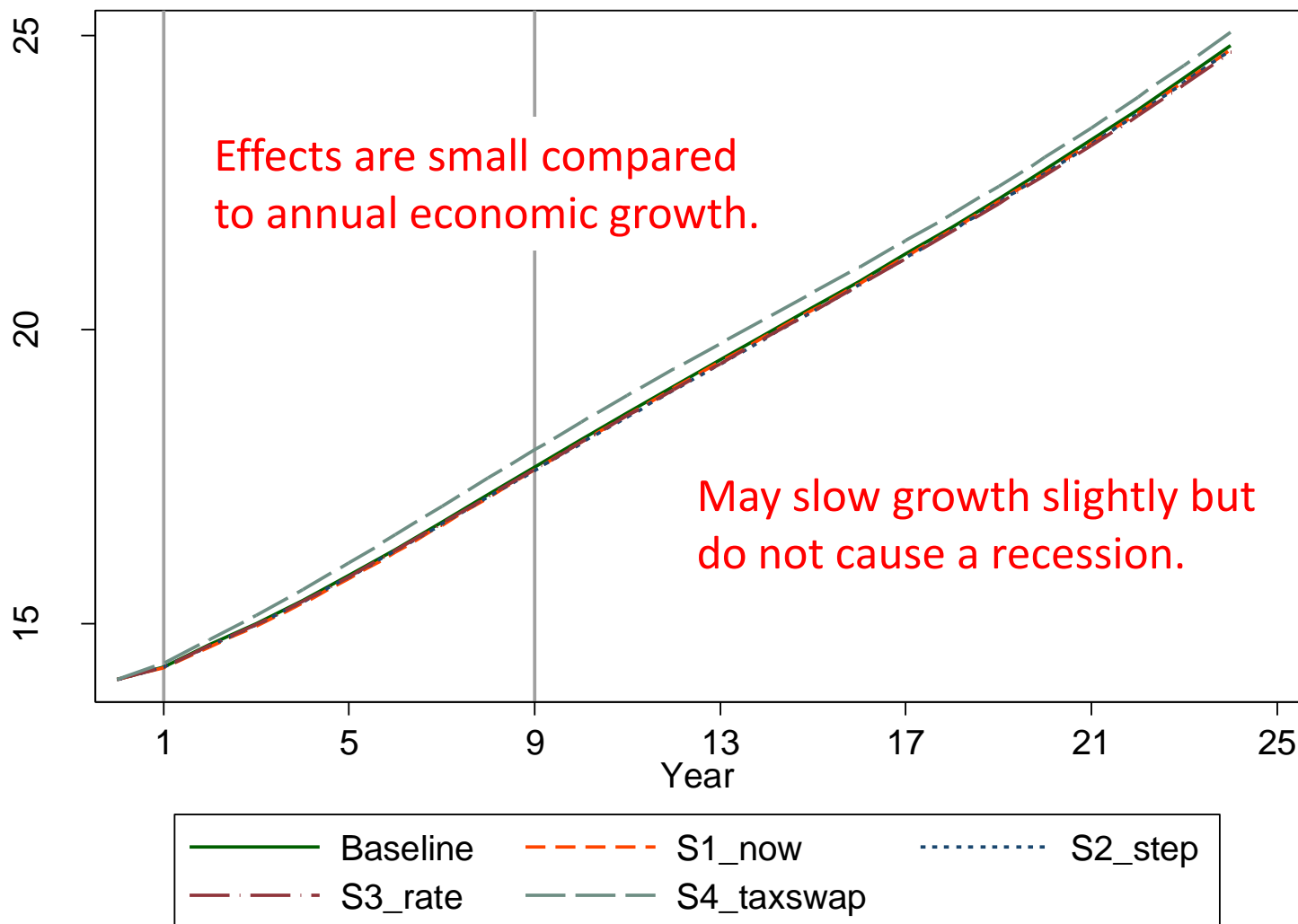
Dramatic differences in GNP and GDP



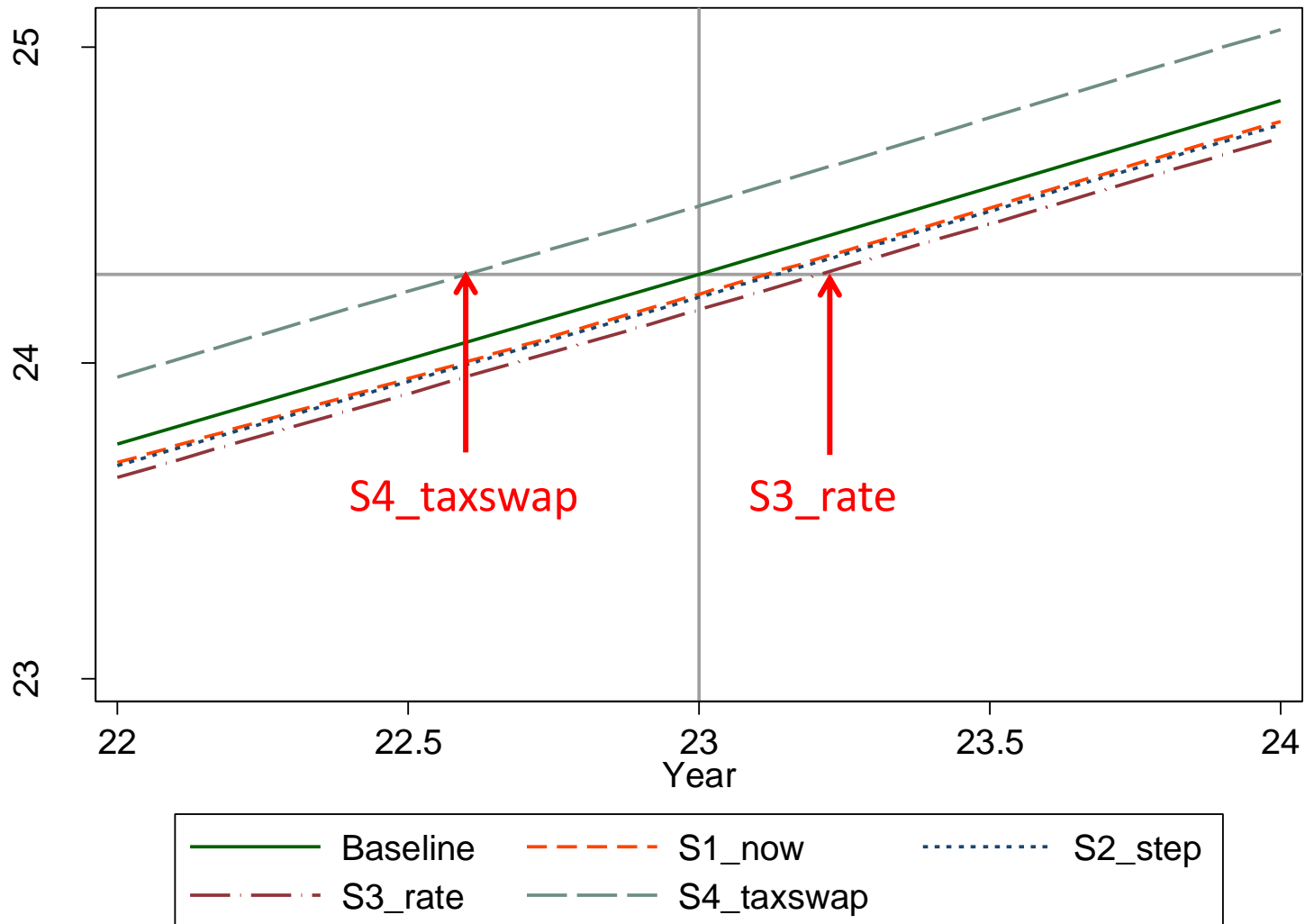
Tax swap raises employment



Level of GDP under all 4 policies



Zooming in on GDP in year 23



Summary

- Delay by 8 years raises the required carbon price by 70% (at 4% growth)
- Delay by 8 years raises the growth rate of the price from 4% to 10% if starting at (\$15 per ton)

Conclusion

- Overall, a carbon price reduces emissions at modest economic costs.
- Delay of a carbon price creates additional costs for the same environmental outcome.
- Timing matters less than other policy design choices such as the way in which revenue might be used.

Caveats and future work

- It is assumed that the policy is implemented in the most cost effective way.
- It is assumed that US policy has no impact on the timing and scale of other countries policies
- Examine the role of monetary policy in the short run adjustment

Background material

- Brookings Climate and Energy Economics Project
- <http://www.brookings.edu/about/projects/climate-energy-economics>