



The impact of macroeconomic closures on long run trade projections and trade policy experiments

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Introduction

- In CGE-simulations scholars use different types of macroeconomic closures
- This will affect the results of both:
 - Baseline projections
 - Policy experiments
- Little is known about how they will affect results
- In this paper we extend the analysis in Bekkers et al. (2020, JGEA) exploring the impact of the macroeconomic closure on baseline projections also assessing how the outcomes of policy experiments are affected:
 - Global trade war
 - Trade conflict between the US and China
- Assess impact on:
 - Aggregate trade balances
 - Global trade shares
 - Bilateral trade balances
 - Total and bilateral export growth

Description of model and scenarios

- WTO Global Trade Model, recursive dynamic CGE model
- Data: GTAP10 version A (Jan 2020)

Scenarios:

- Baseline
 - Report long-run change between 2040 and 2015 under different closures
- Policy experiment: Trade War: Rising tariffs based on trade war scenario (implemented gradually from years 2020-2030) explored in Bekkers and Teh (2019) and based on Nicita, Olearraga and Silva (2018, JPE)
 - Report long-run difference between experiment and baseline in 2040
- Policy experiment: US-China Trade Tensions: Rising tariffs of trade conflict between United States and China (year 2019), based on scenario explored in Bekkers and Schroeter (2020)
 - Report medium-run difference between experiment and baseline in 2023

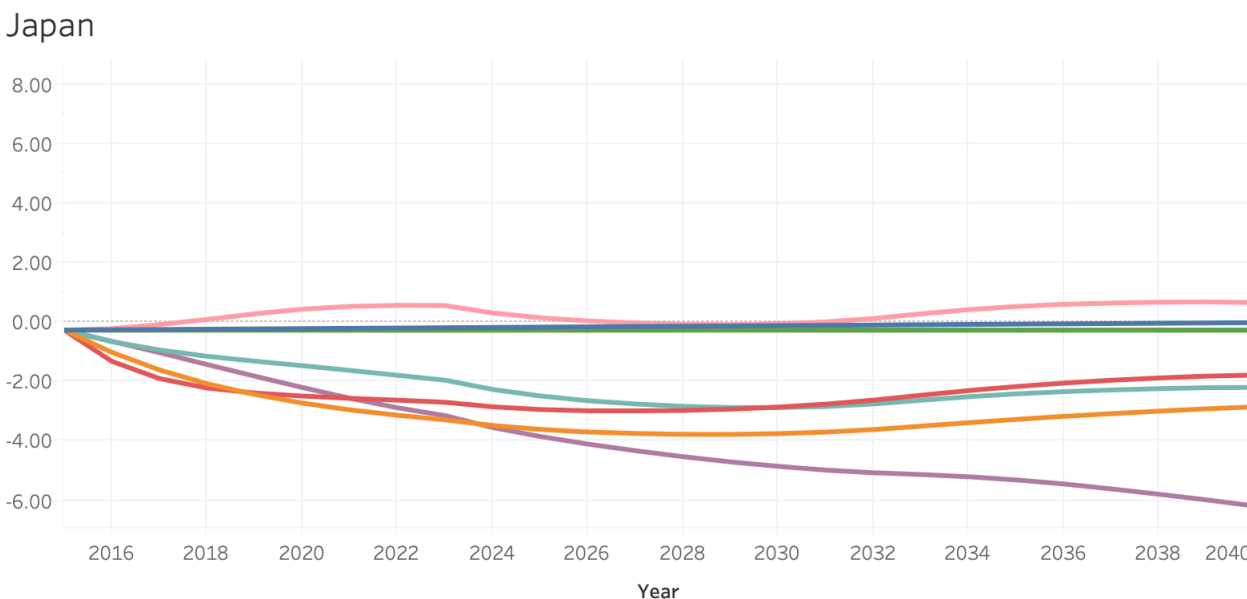
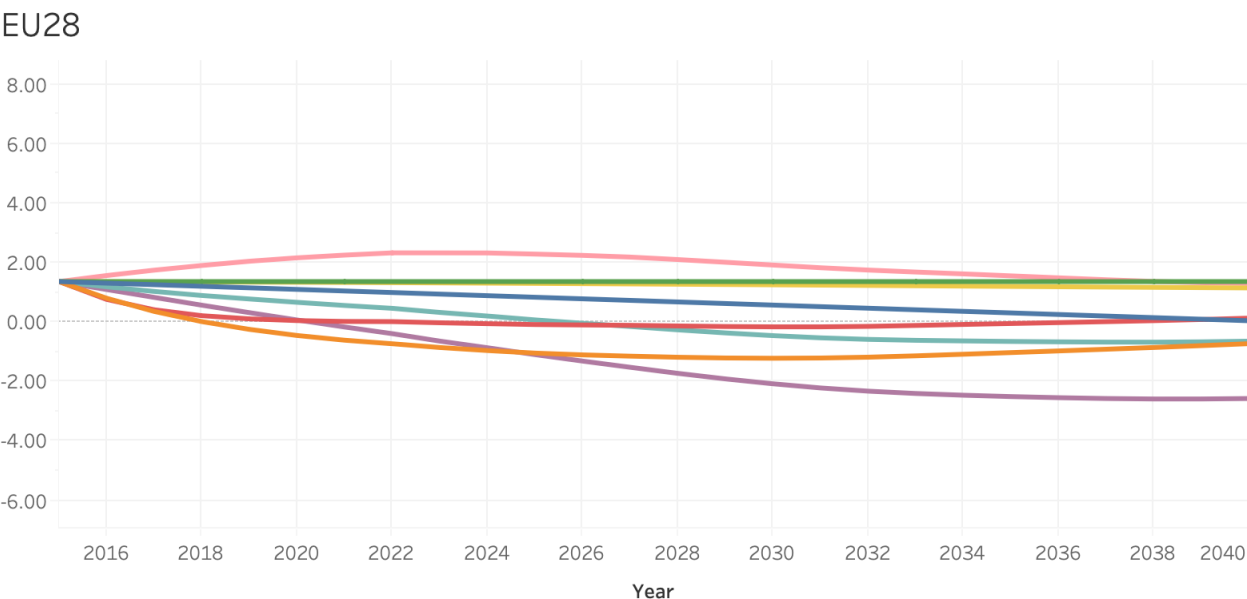
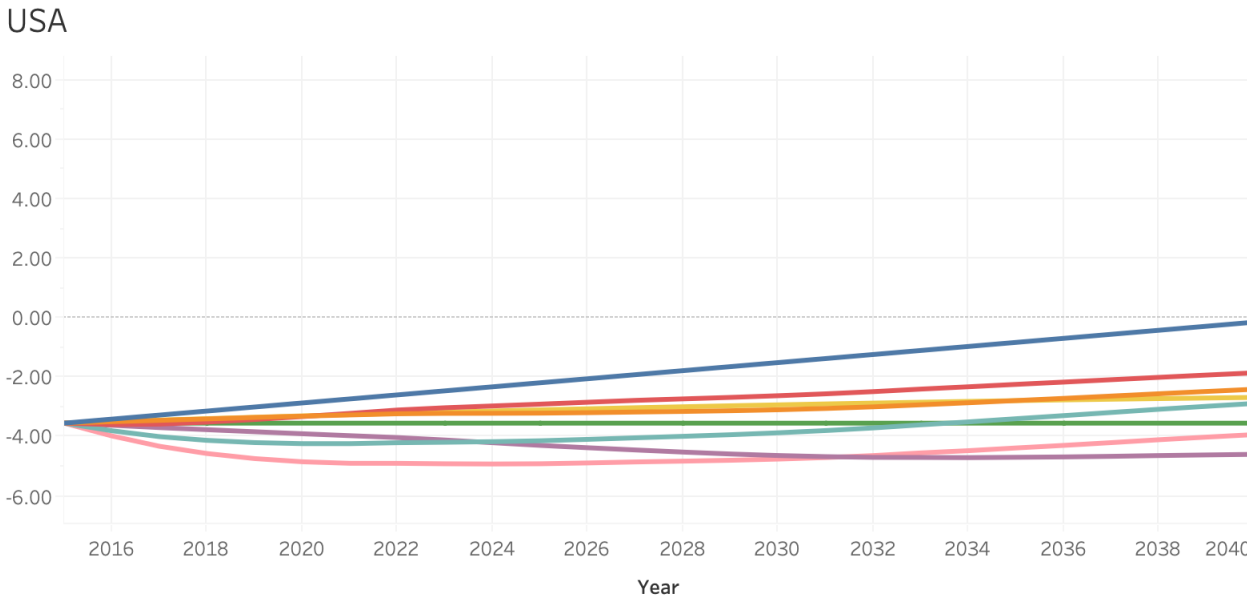
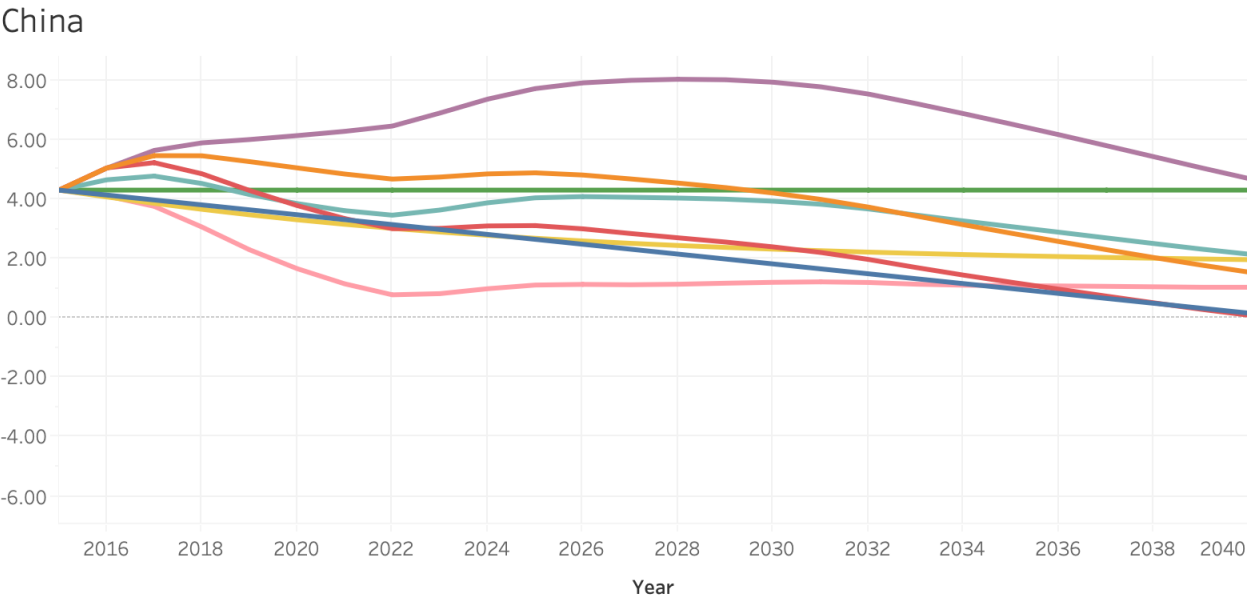
Description of closures (coding details in the paper)

1. Converging trade balance ratio
The ratio of the trade balance to GDP converges to 0 in 2040 in equal steps
2. Rate of return rule
Investment flows to regions with higher than average (change in) expected rate of return, such that (changes in) expected rates of return equalize
3. Initial shares rule
Global investment is allocated proportionally across regions
4. Fixed value trade balance
The value of the trade balance is fixed, such that with growing income the trade balance ratio tends to converge
5. Fixed ratio trade balance
The ratio of the trade balance to GDP is constant
6. Feldstein-Horioka rule
The change in the investment rate follows the change in the savings rate imperfectly with an additional adjustment (cointegration) term to converge to the long-run relation between the investment rate and savings rate
7. FH and ROR, no adjustment in Feldstein-Horioka coefficients (no coeff adj)
Combination of Feldstein-Horioka closure and rate of return closure with share of the two such that R2 of estimated Feldstein-Horioka equation is equal based on historical data and based on simulation data
8. FH and ROR, adjustment Feldstein-Horioka coefficients (coeff adj)
Like closure 7 but with adjustment of the Feldstein-Horioka coefficients such that also the estimated coefficients (besides the R2) of the Feldstein-Horioka equation are close to equal based on historical data and based on simulation data

Trade imbalance per country

Closure

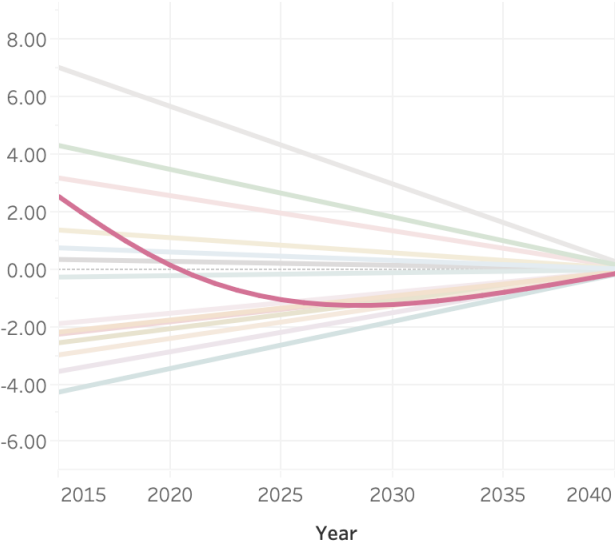
Converging trade balance ... Feldstein-Horioka rule FH and ROR, coeff adj FH and ROR, no coeff adj Fixed ratio trade balance Fixed value trade balance Initial shares rule Rate of return rule



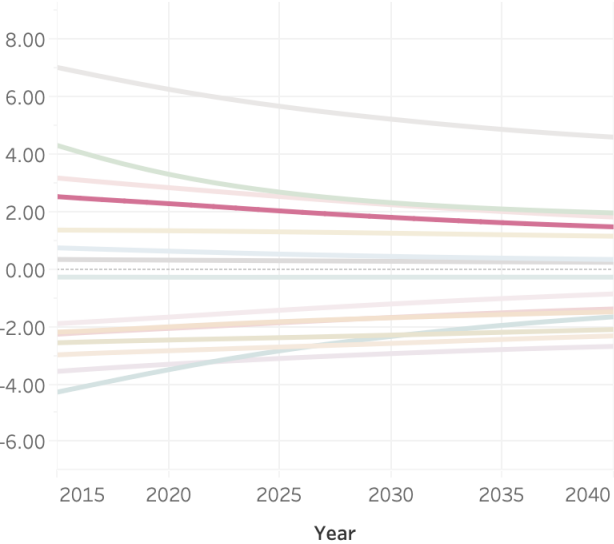
Rest of the world adjustment over closures



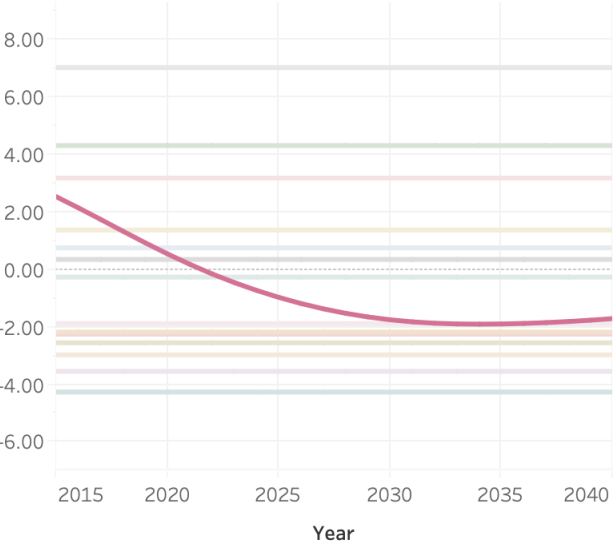
Converging trade balance ratio



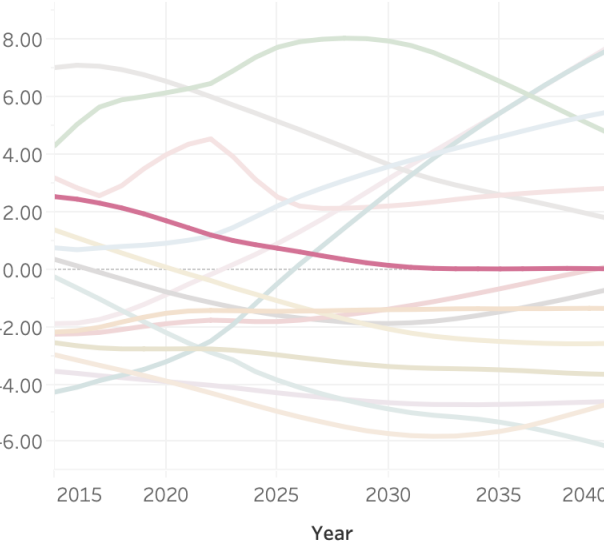
Fixed Value trade balance



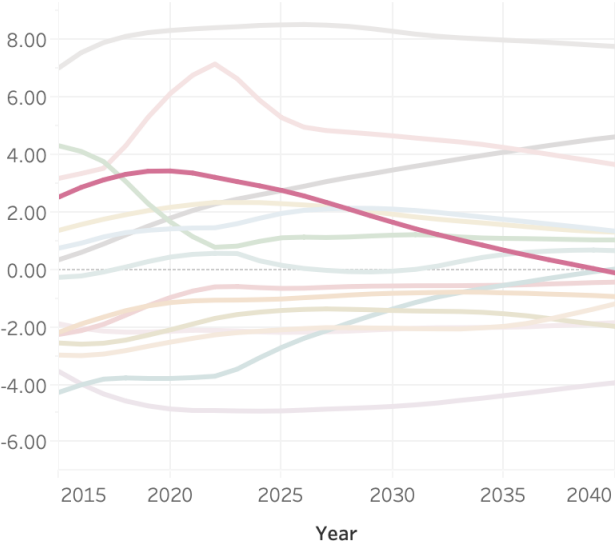
Fixed Ratio trade balance



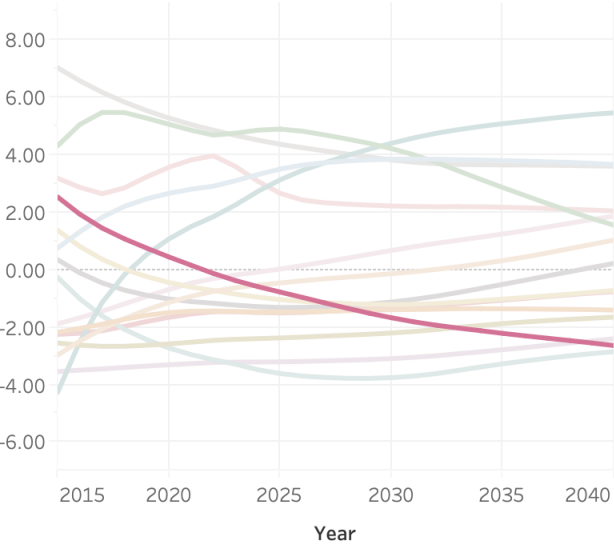
Initial shares rule



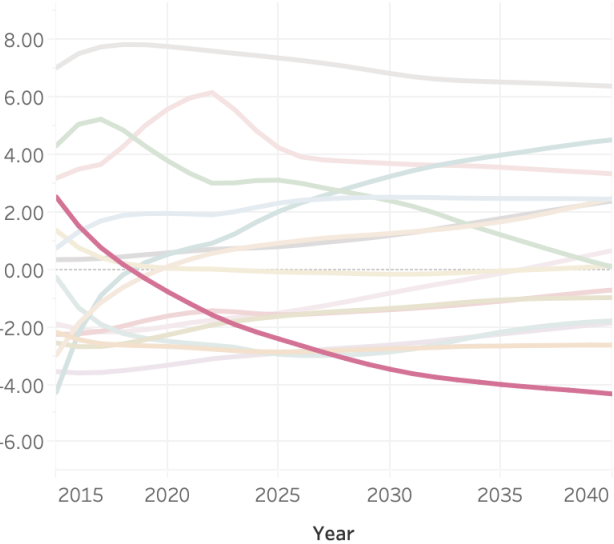
Rate of Return rule



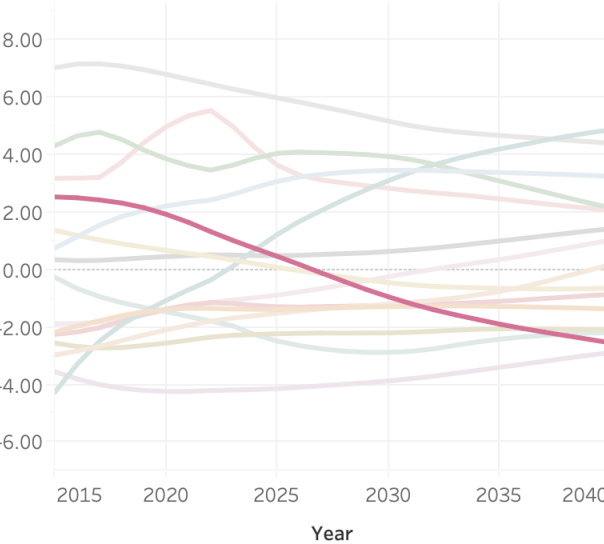
Feldstein-Horioka rule



FH & ROR, coeff adjustment



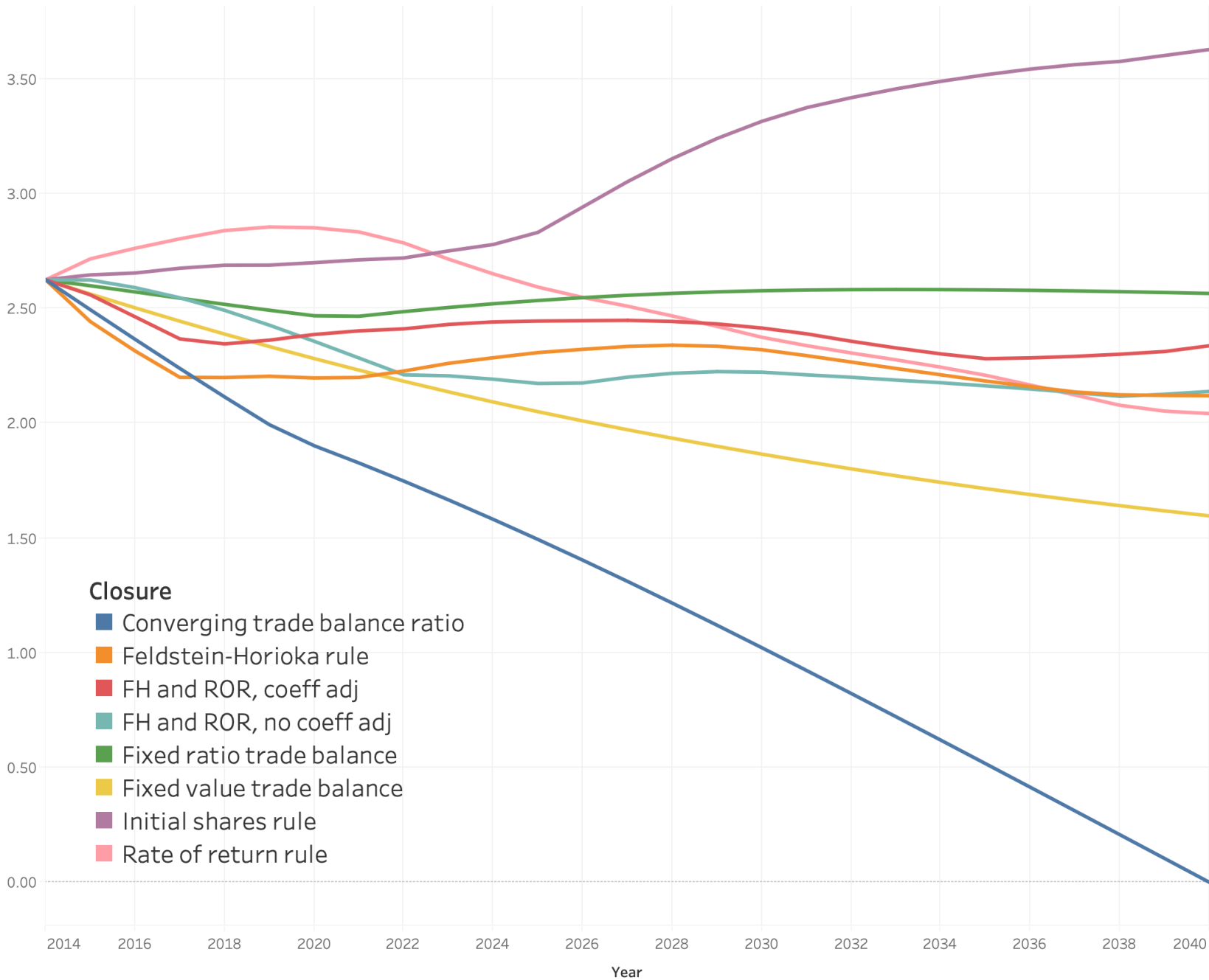
FH & ROR, no coeff adjustment



Interpretation of results: baseline simulations

- The trade balance of China varies much more across closures than in the US and the EU, from persisting at +4% under the initial shares and fixed ratios rule to falling to almost 0% under the rate of return and converging trade balance rules
- Except for the converging trade balance closure, the trade deficit of the US is projected to remain in place in the different closures
- Potentially erratic behaviour in n-th region, because n-th region has to absorb difference between global savings and investment under all closures except for rates-of-return and initial-shares rule
 - Under most closures the trade surplus of the ROW is falling, suggesting that savings in other regions rise relative to investment such that they run a bigger trade surplus, to be compensated by a smaller surplus in ROW

Average global trade imbalance GDP weighted



- The average global trade balance converges for most closures, except for the initial-shares rule (also visible in different regions)
- Also for the rate-of-return rule the average trade balance tends to converge,
 - In principle investment flows according to changes in rates of return with disconnect between savings and investment. But investment moves broadly in line with savings

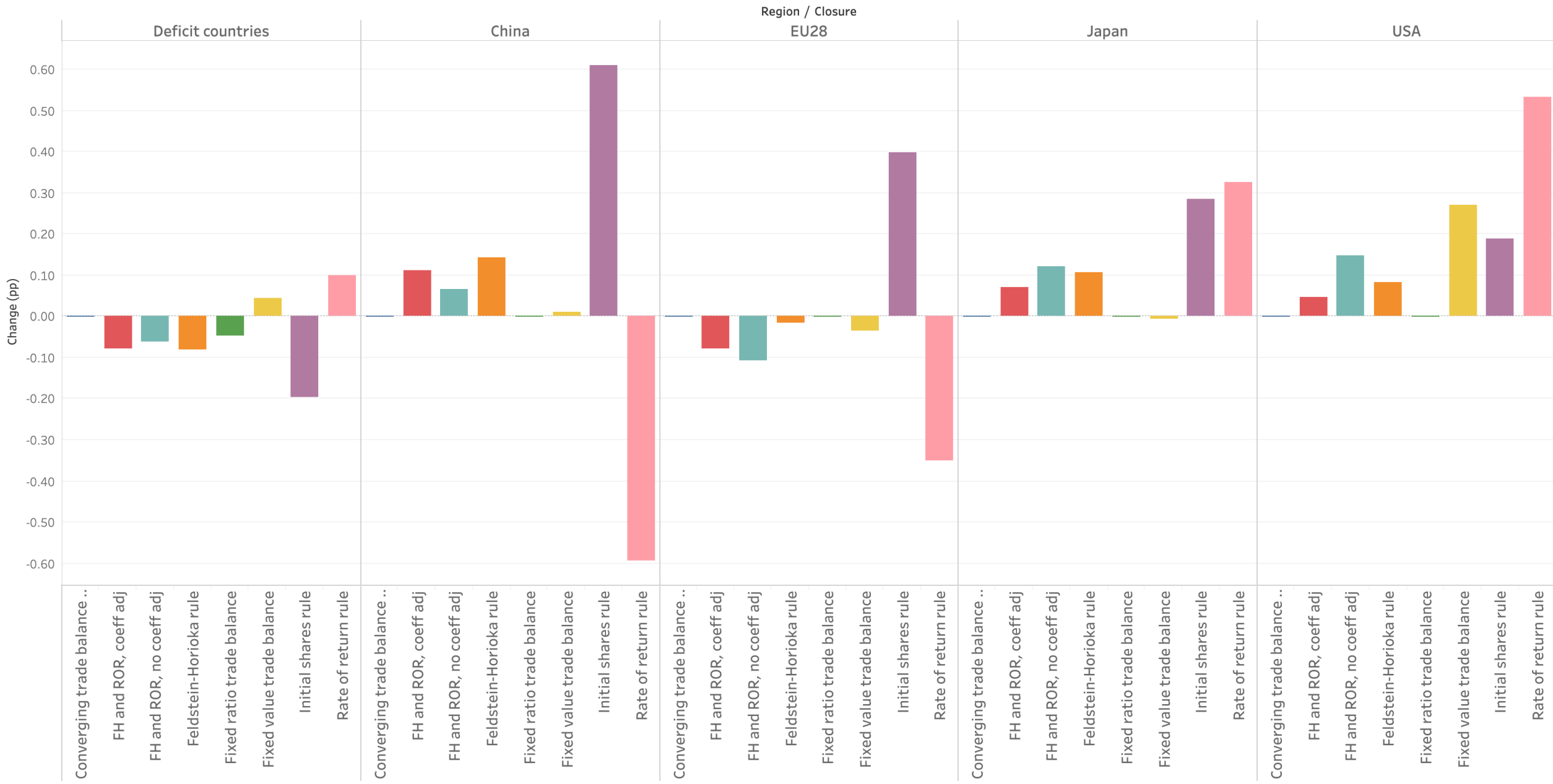
Trade surplus - Baseline (Year 2040-Year2015)



Trade surplus - Trade War (Policy 2040 - Baseline 2040)

Closure

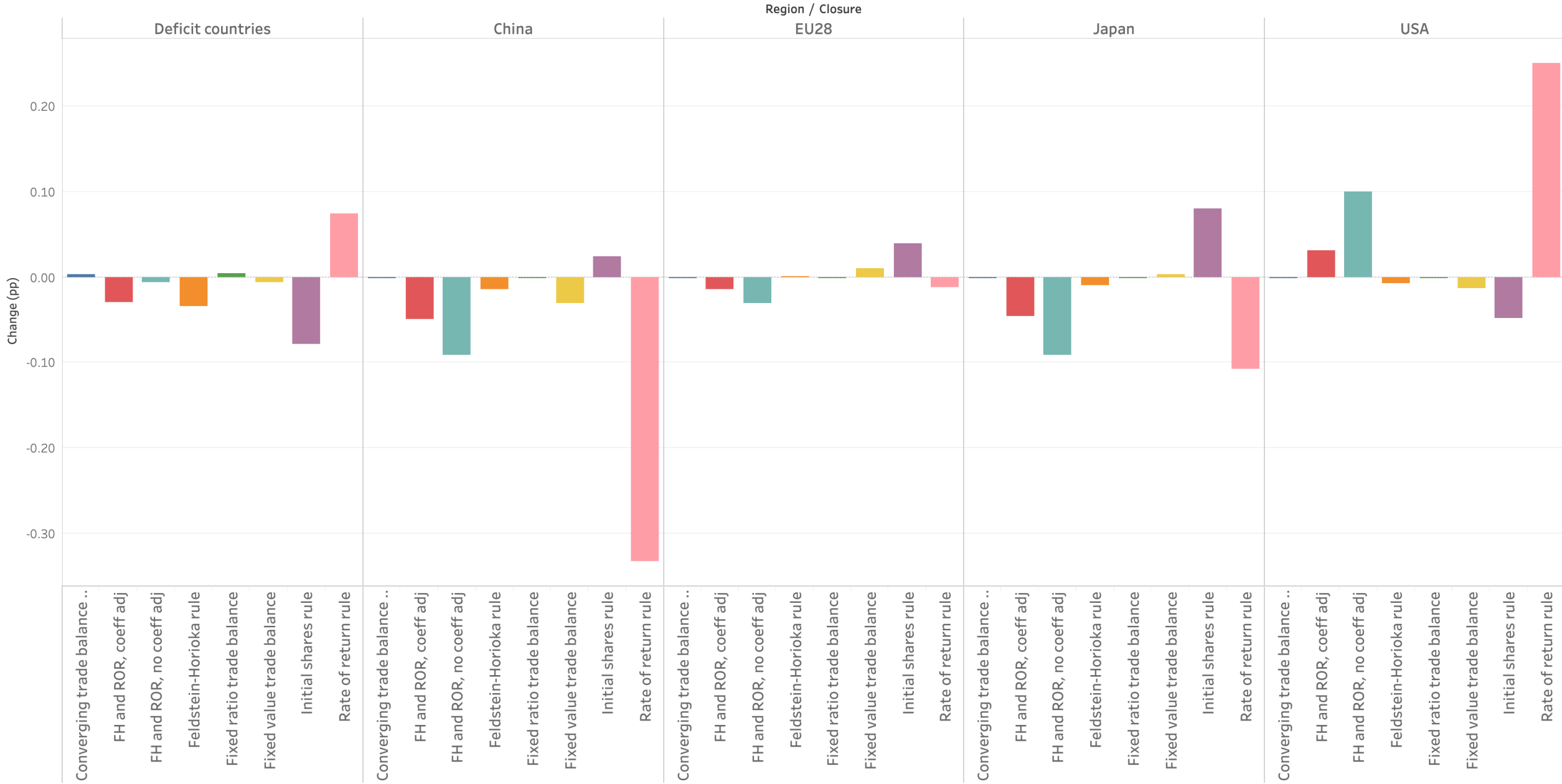
- Converging trade balance ..
- FH and ROR, coeff adj
- FH and ROR, no coeff adj
- Feldstein-Horioka rule
- Fixed ratio trade balance
- Fixed value trade balance
- Initial shares rule
- Rate of return rule



Trade surplus - Trade Tensions (Policy 2023 - Baseline 2023)

Closure

- Converging trade balance ..
- FH and ROR, coeff adj
- FH and ROR, no coeff adj
- Feldstein-Horioka rule
- Fixed ratio trade balance
- Fixed value trade balance
- Initial shares rule
- Rate of return rule



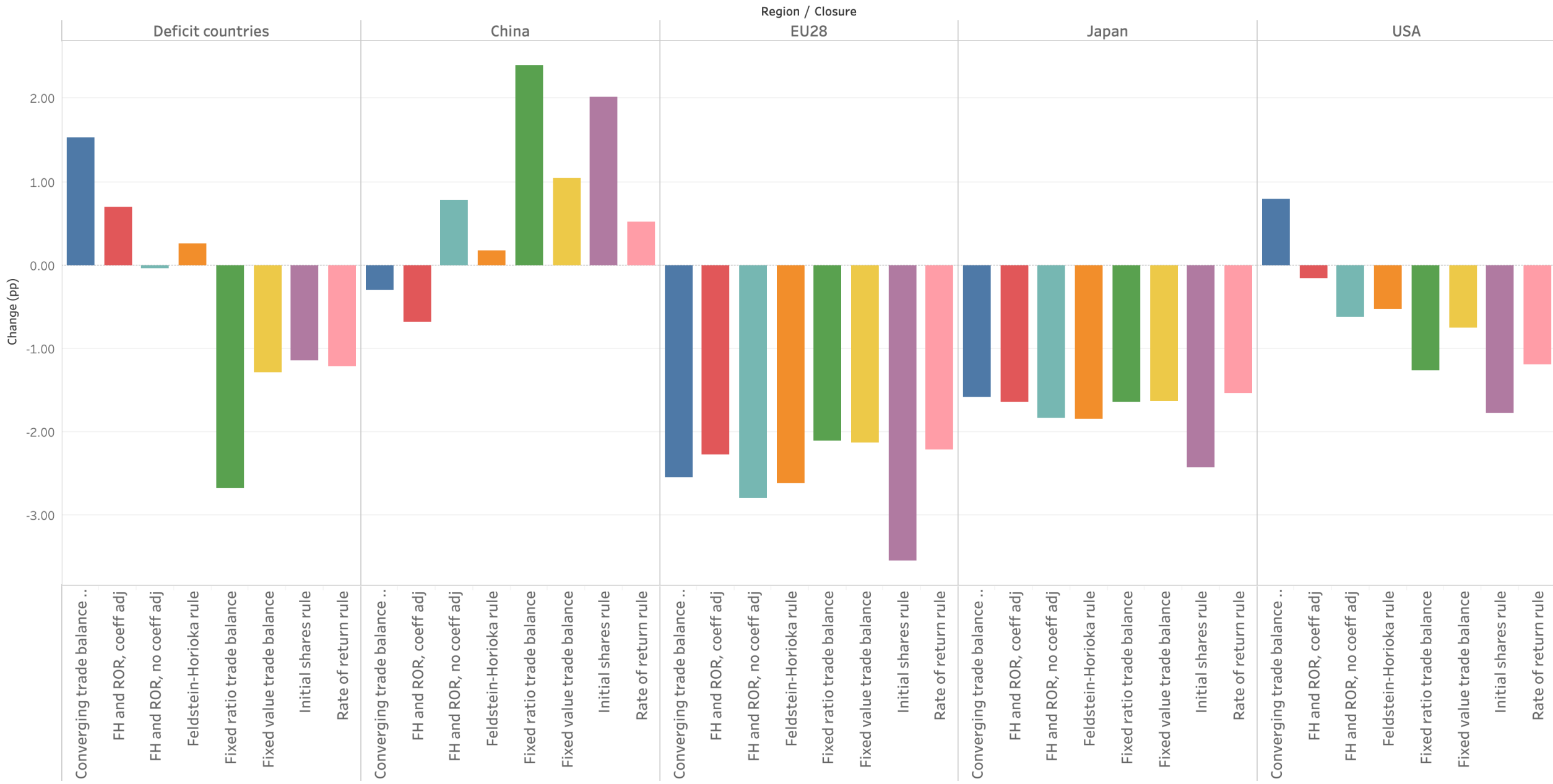
Interpretation of results: changes trade surplus

- The trade surplus of initial deficit countries improves in the baseline, although much more for the converging trade balance closure than for the rate of return rule
 - Especially for the US the difference is large between closures
 - For China both the rate of return rule and the converging and Feldstein-Horioka closures generates a large reduction in the trade surplus
 - For the rate-of-return rule less investment is moving to China because (changes in) rates of return becomes less favourable as growth rates decline
 - For the converging and Feldstein-Horioka closures the excess of savings over investment is declining over time
- For the (global) trade war scenario, the difference between the rate of return rule and the other rules (particularly the initial shares rule) is relatively large in China: deteriorating trade balance with the rate of return rule and improving with the other rules
- For the (US-China) trade conflict scenario, changes in the trade balance of the US and China are much larger under the rate of return rule than under the other closures:
 - For China the trade balance deteriorates (reflecting net investment inflows and thus increasing rates of return relative to other regions) and for the US the trade balance improves (reflecting net investment outflows and thus falling rates of return)
 - Magnitude of effects is limited: for China the trade balance deteriorates about 0.3 percentage points and for the US it improves about 0.2 percentage points

Trade shares - Baseline (Year 2040-Year2015)

Closure

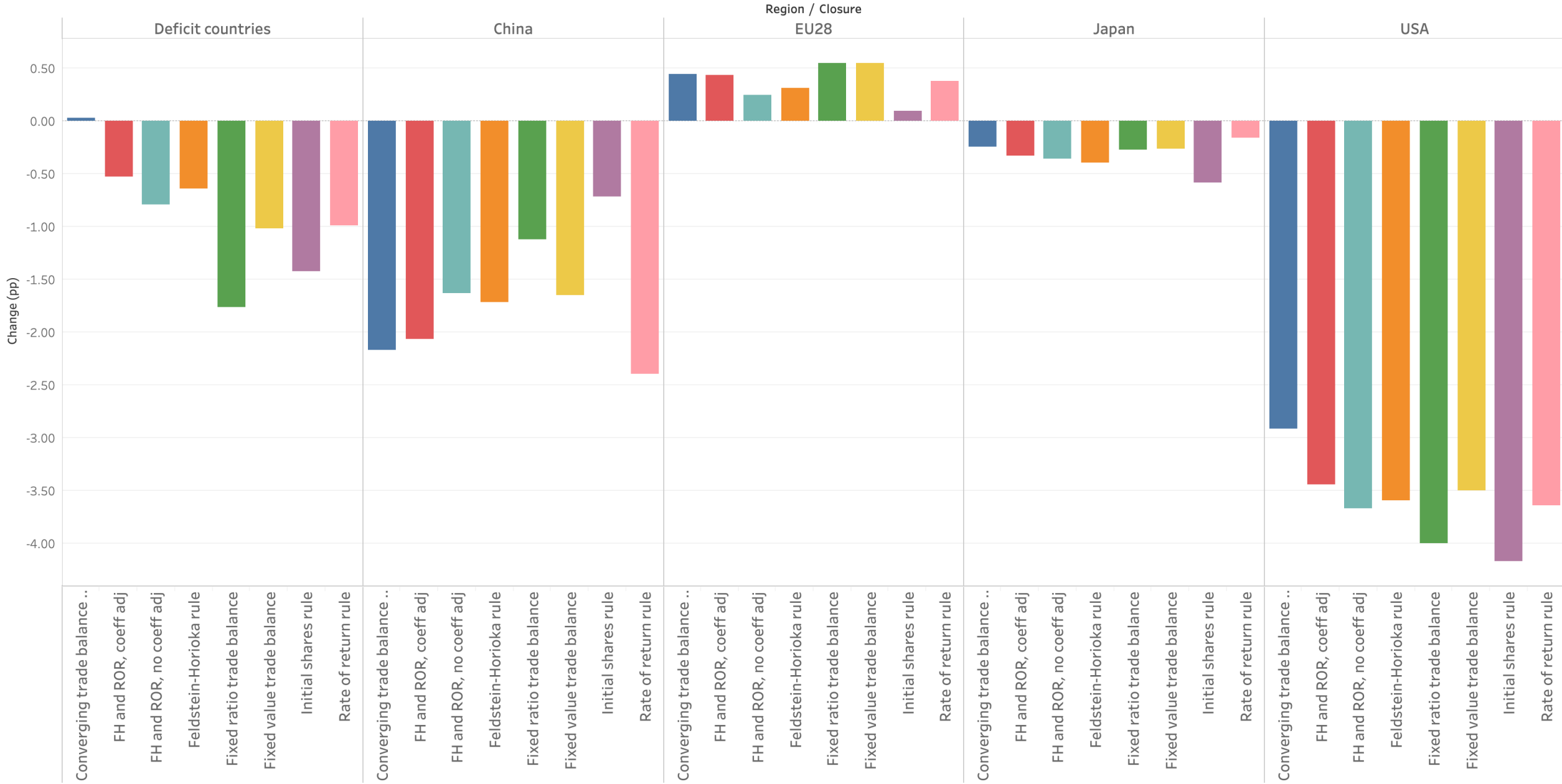
Converging trade balance ... FH and ROR, coeff adj FH and ROR, no coeff adj Feldstein-Horioka rule Fixed ratio trade balance Fixed value trade balance Initial shares rule Rate of return rule



Trade shares - Trade War (Policy 2040 - Baseline 2040)

Closure

- Converging trade balance ..
- FH and ROR, coeff adj
- FH and ROR, no coeff adj
- Feldstein-Horioka rule
- Fixed ratio trade balance
- Fixed value trade balance
- Initial shares rule
- Rate of return rule



Interpretation of results: changes in trade shares

- The change in trade share of the deficit countries varies significantly with the closure:
 - Under converging trade balance and Feldstein-Horioka the trade share of deficit countries rises (driven by improving trade balances), whereas under the other closures (fixed ratio and rates of return for example) the trade share of deficit countries deteriorates
 - In particular for China and the US the closure matters:
 - For China the trade share fall with a converging trade balance and FH/ROR coeff adj and improves with the other closures
 - For the US the trade share rises with a converging trade balance and falls with the other closures
 - Quantitatively important: difference of the US global trade share between the converging trade share rule and the fixed ratio rule is over 2 percentage points (from 12.11% under converging to 9.96% under fixed ratio rule in 2040)
- The impact of the closure on the trade shares under the trade war is sizeable for the deficit countries as a group and also for China
 - With a fixed-ratio closure, the trade shares of deficit countries fall by more than 1.5 percentage point, whereas with a converging trade balance they stay constant

Bilateral trade surplus - Baseline (Year 2040 - Year 2015)

Closure

- Converging trade balance..
- FH and ROR, coeff adj
- FH and ROR, no coeff adj
- Feldstein-Horioka rule
- Fixed ratio trade balance
- Fixed value trade balance
- Initial shares rule
- Rate of return rule

China



USA



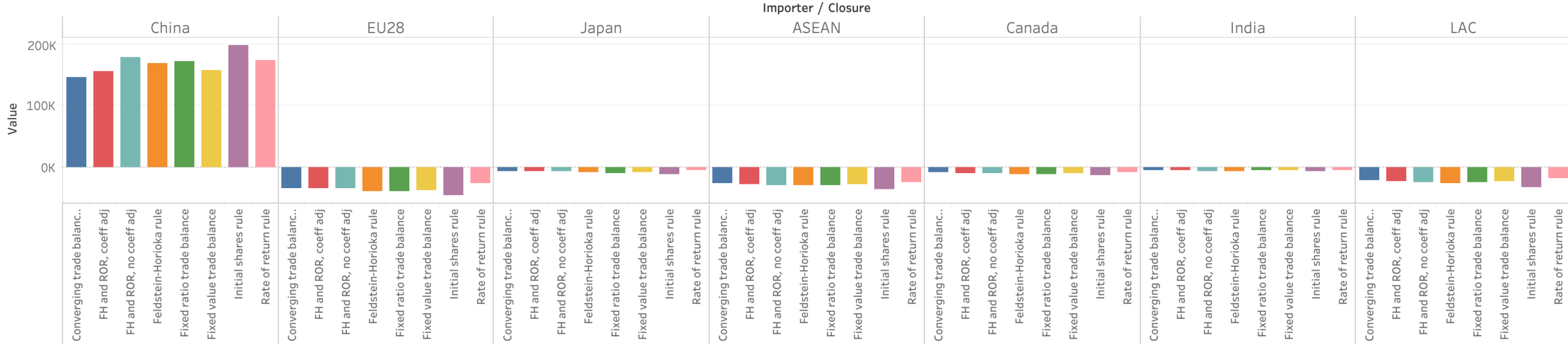
Bilateral trade surplus - Trade tensions (Policy 2023 - Baseline 2023)



China



USA



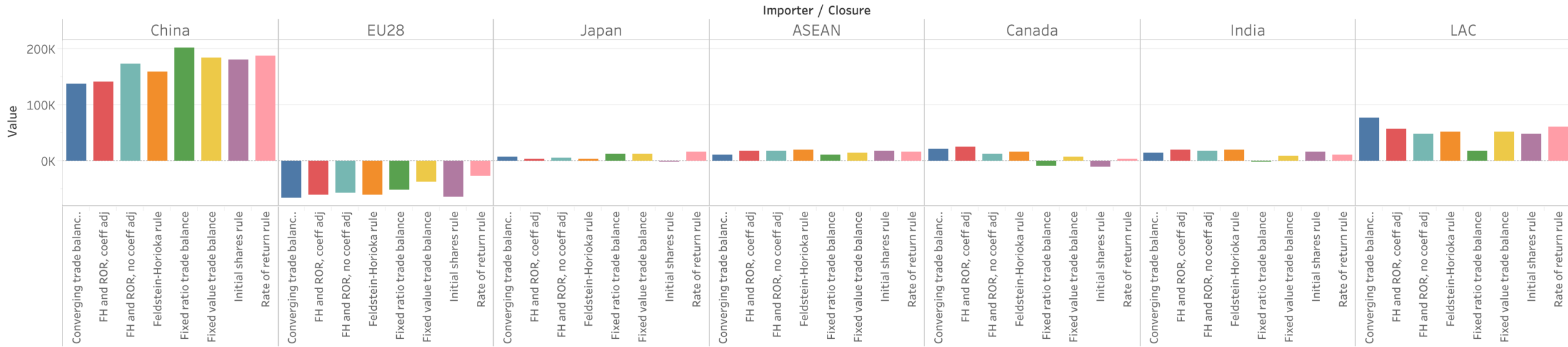
Bilateral trade surplus - Trade war (Policy 2040 - Baseline 2040)



China



USA



Interpretation: changes in bilateral trade deficits

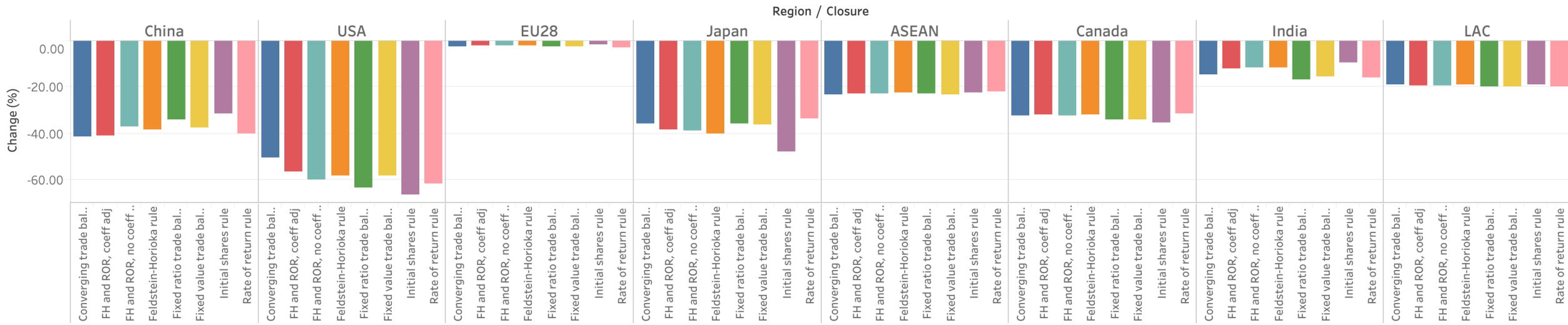
- The closure has a big impact on the change in the bilateral trade balance between the US and China from 2015 to 2040 in the baseline
 - The converging trade balance and Feldstein-Horioka closures strongly improve the bilateral trade balance of the US vis-à-vis China
 - The fixed ratio closure would further deteriorate the US-China trade balance
 - Under the rate of return closure the bilateral trade balance would stay constant
- The fixed trade balance ratio closure would improve the bilateral trade balance of China vis-à-vis many other regions, whereas the rate of return rule generates more modest changes in bilateral balances
 - Thus, the fixed trade balance ratio has strong impact on bilateral balances
- Closure has less impact on changes in bilateral trade balances after global trade war or US-China trade conflict

Change in real exports

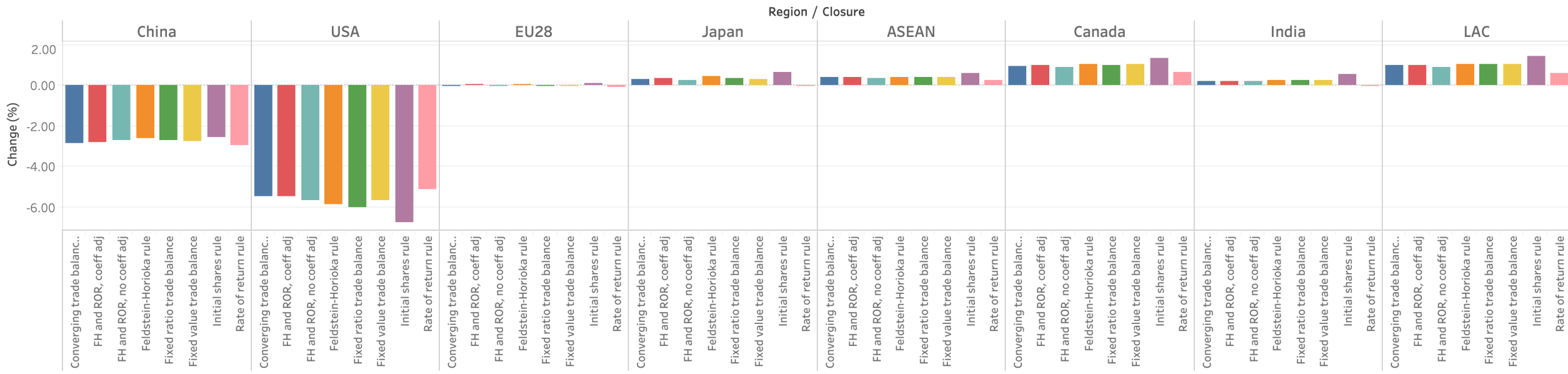
Closure



Trade war scenario (Policy 2040 - Baseline 2040)



Trade tensions scenario (Policy 2023 - Baseline 2023)



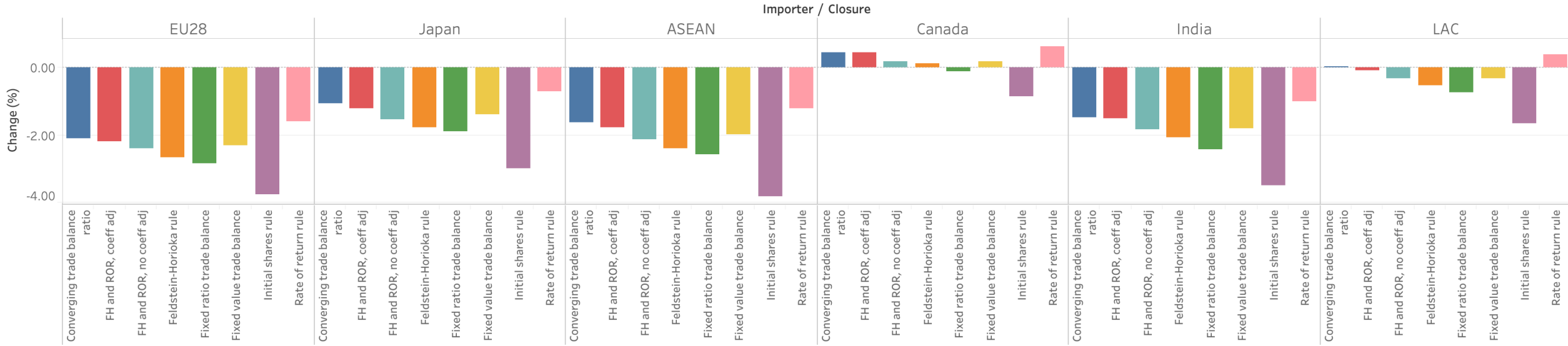
Change in real bilateral exports - Trade tensions (Policy 2023 - Baseline 2023)



China (USA excluded)



USA (China excluded)



Interpretation: changes in real (bilateral) exports

- Closure also has little impact on change in real exports after global trade war or US-China trade conflict
- Also the patterns of trade diversion (changes in bilateral real exports) are hardly affected by the macroeconomic closures

Summary and concluding remarks

- Macroeconomic closure has large impact on baseline projections
 - Trade balance of countries
 - Global trade shares
 - US-China trade balance
- The impact of the closure on the effect of trade policy experiments is more limited
 - Similar impact on total exports, bilateral exports, and exports to third countries
 - Impact on change in aggregate trade balances order of magnitude smaller than baseline change from 2015 to 2040.
 - Impact on bilateral trade balances also very similar across closures
 - Only impact on global trade shares varies considerably across closures

Further developments

- Modellers often use a fixed trade balance for short-run policy experiments such as a US-China trade conflict and Feldstein-Horioka/converging trade balance/rate of return rule for long-run projections and long-run scenarios such as a trade war
 - When does short-run changes become long-run?
 - Macroeconomic closure would have to change which changes the impact on outcome variables like global trade shares
- Future research:
 - The trade balance closure will matter a lot for natural resource (oil) exporting countries subject to shocks to natural resource prices
 - Re-estimation of Feldstein-Horioka equation coefficients with recent empirical data