Fiscal Policy and Long-Term Growth

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Motivation

The Channels: How Can Fiscal Policy Affect Medium- to Long-Term Growth?

Empirical Evidence: Results of a Multi-Pronged Analysis
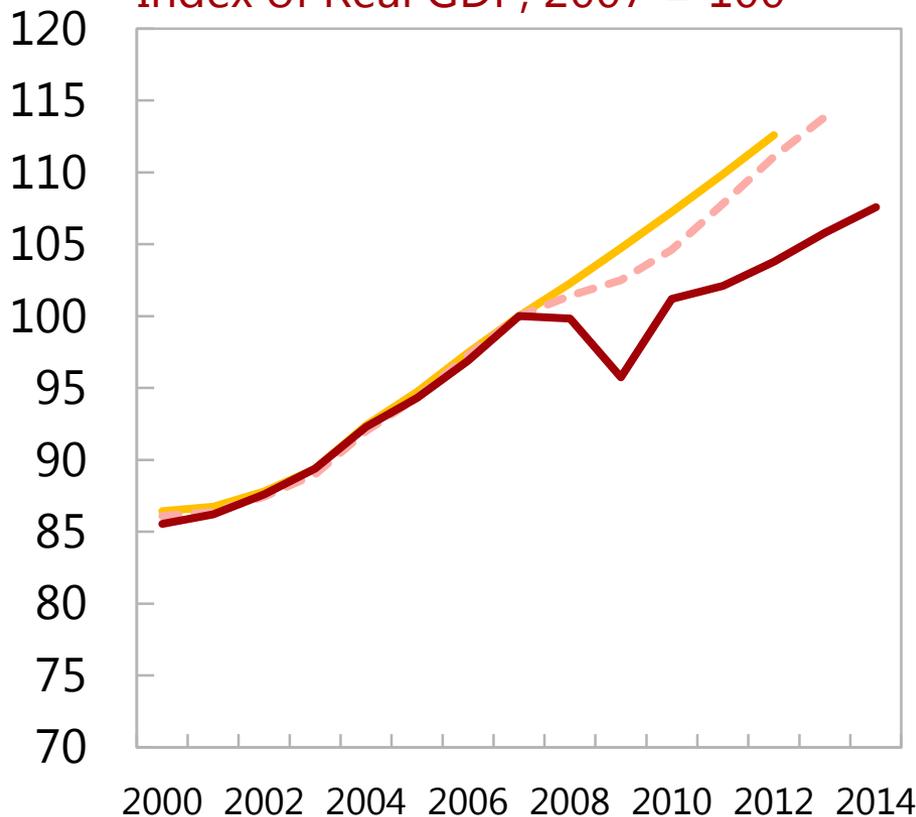
Other Key Lessons: Equity and Reform Design

Conclusions

Output across advanced and emerging market economies remains below expectations

Advanced Asia 1/
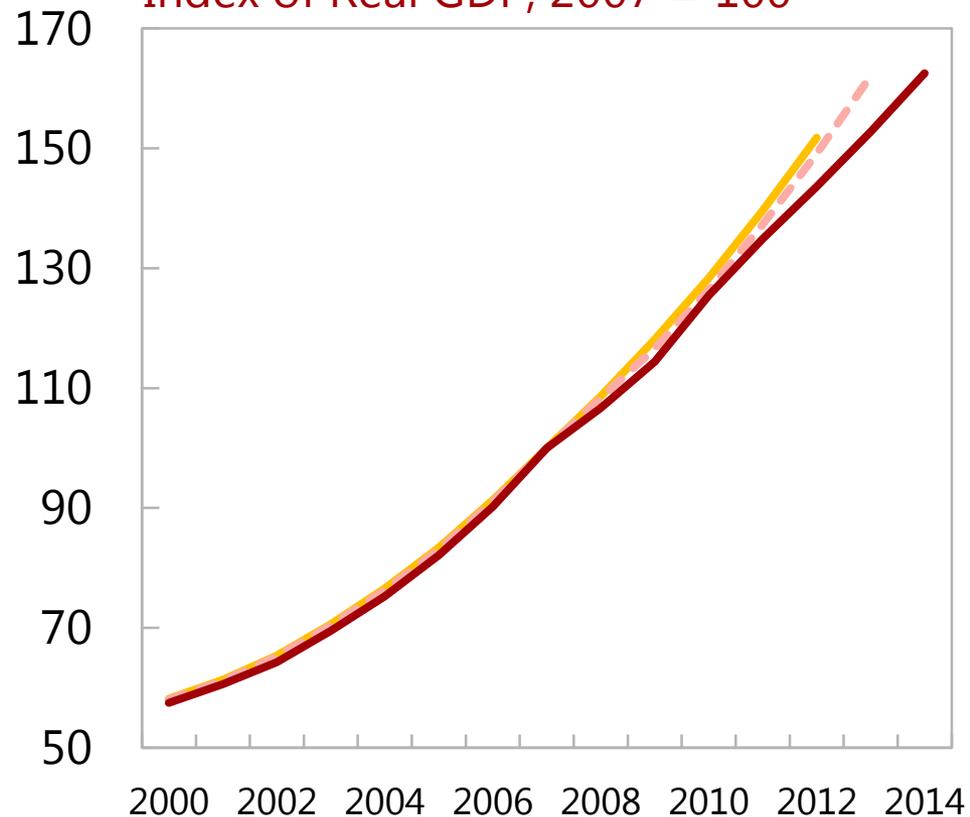### Index of Real GDP, 2007 = 100

Emerging Asia 2/
Index of Real GDP, 2007 = 100

—— Fall 2007   – – – Fall 2008   —— Fall 2014
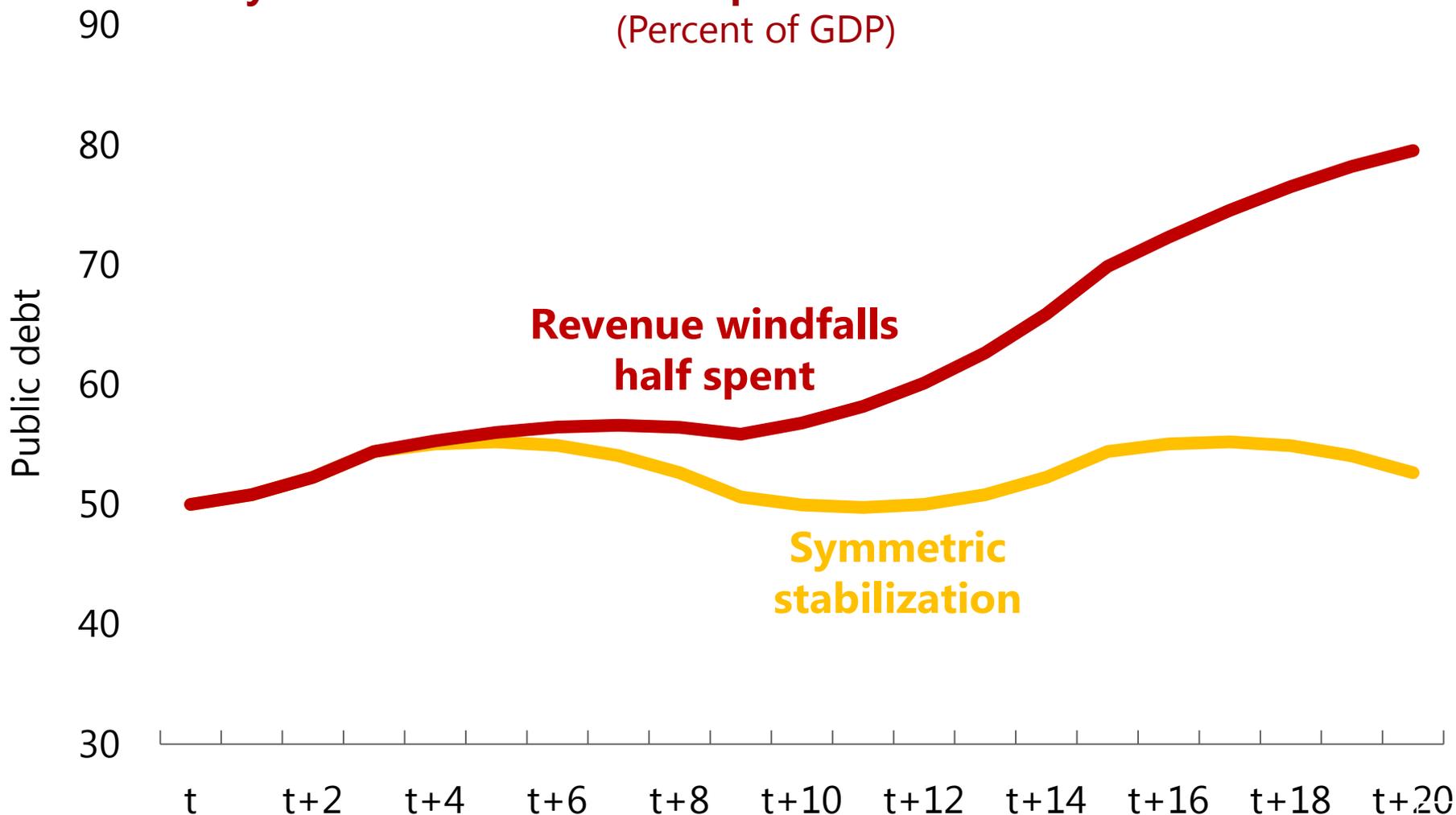
Source: WEO.
1/ Hong Kong, Japan, Korea, Singapore, and Taiwan.
2/ China, India, Indonesia, Malaysia, Philippines, Sri Lanka, and Thailand.

3

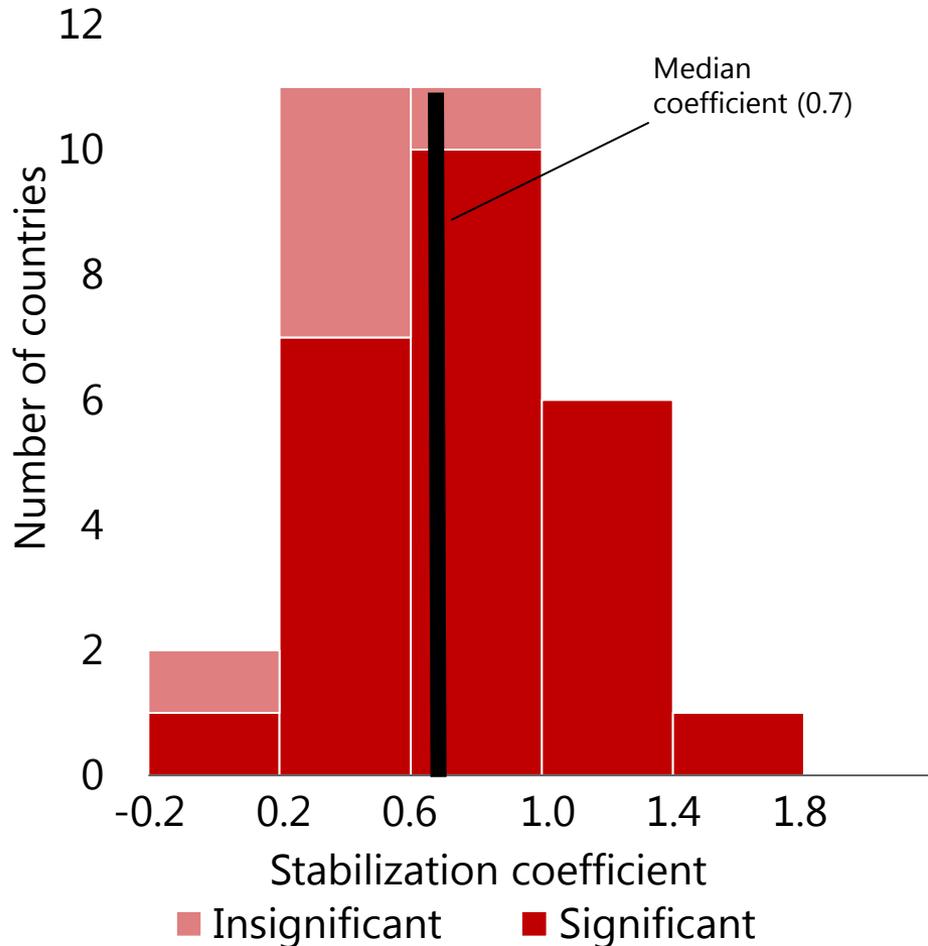# How Can Fiscal Policy Affect Medium- to Long-Term Growth?

Fiscal Stabilization Coefficient vs Output Volatility

Correlation = −0.40

Fiscal Stabilization Coefficient vs RGDP Growth

Asymmetric Stabilization: Unpleasant Public Debt Arithmetic
(Percent of GDP)

Public debt

Revenue windfalls half spent

Symmetric stabilization

90
80
70
60
50
40
30

t   t+2   t+4   t+6   t+8   t+10   t+12   t+14   t+16   t+18   t+20

6
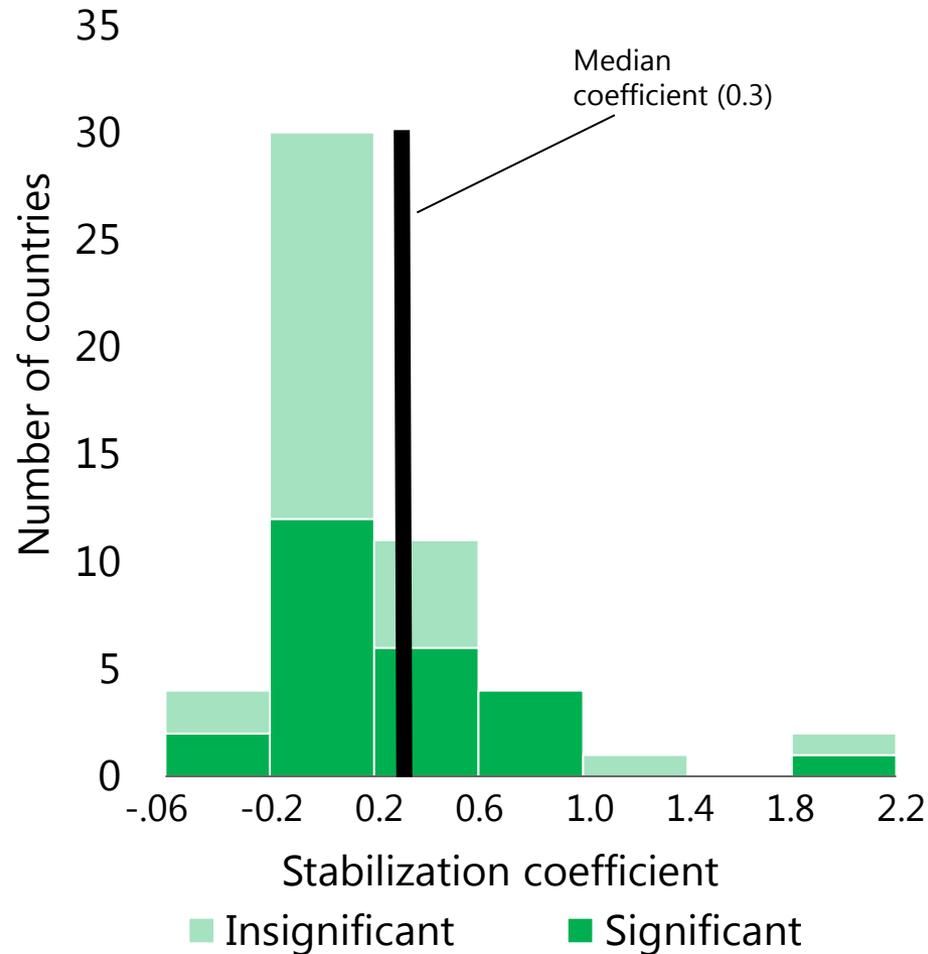
Labor supply

Human capital

Physical capital

Productivity/ Innovation

Fiscal Policies to Encourage Labor Supply

- Lowering the labor tax wedge increases after-tax earnings and the supply of labor (succeeded in Ireland, and the Netherlands)

- Use of in-work benefits can strengthen work incentives (used in Germany, the UK, Sweden)

- Targeted measures may be needed to increase LFP:

→ Women: closing the gender gap in education (e.g., in India); or providing better child care and flexible work options (e.g., in Japan)

→ Older workers: financial incentives (e.g., through tax rates); and increasing the retirement age;

→ Low-skilled workers: in-work tax credits; hiring subsidies; targeted reductions social contributions.
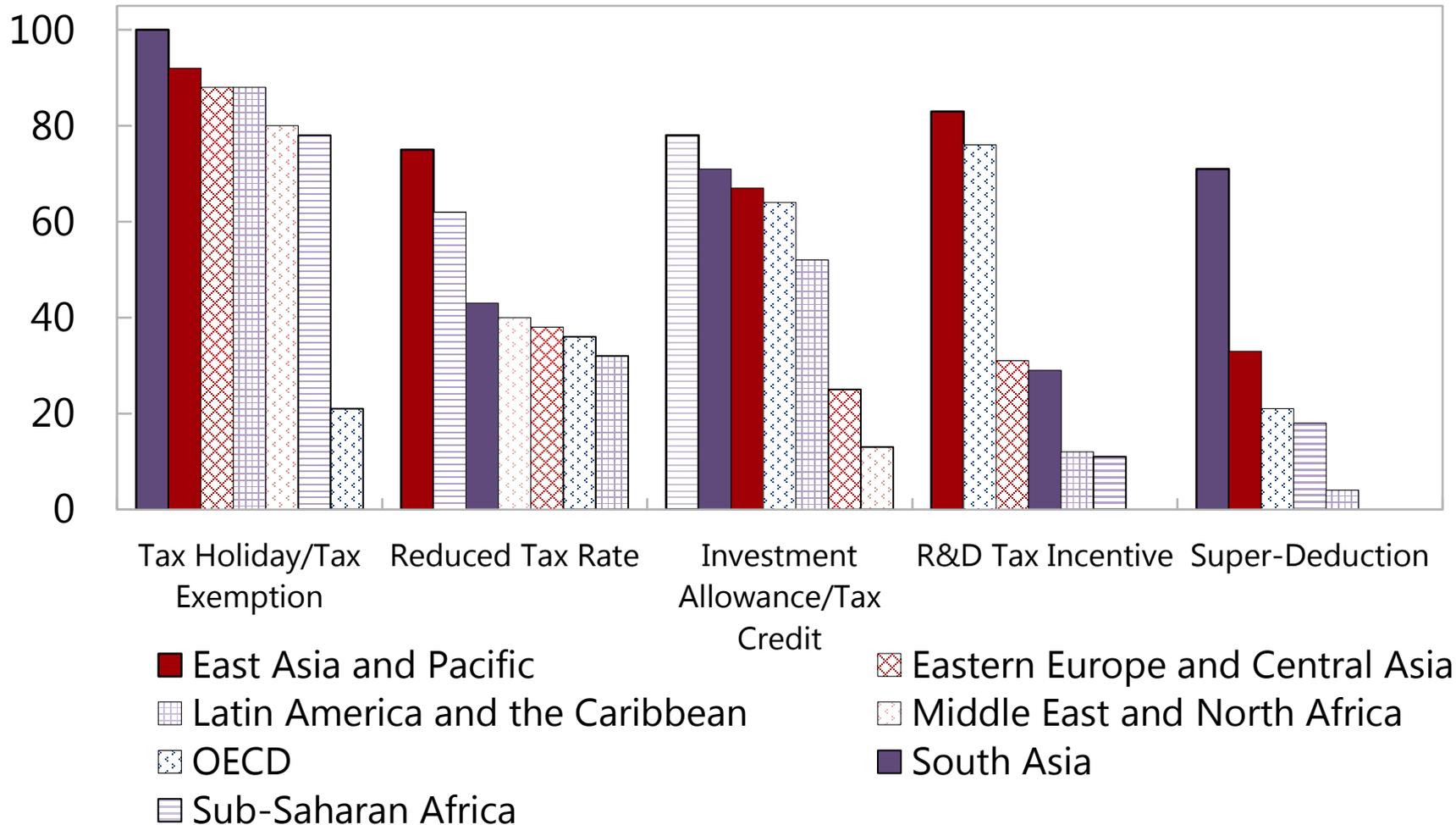
- In AEs, taxing "excess returns" or rents can reduce distortions from CITs

- Infrastructure investment can boost growth directly and indirectly by raising the productivity of private capital: but efficiency is key:

→ The most efficient countries get *twice the growth dividend* from investment compared with the least efficient countries

- In developing economies, targeted and transparent incentives that reduce the cost of capital can promote investment

- Tax incentives can erode the revenue base without achieving any benefits from higher investment unless they are properly designed and limited

Regional Prevalence of Tax Incentives
(Percent)

Legend:
- East Asia and Pacific
- Eastern Europe and Central Asia
- Latin America and the Caribbean
- Middle East and North Africa
- OECD
- South Asia
- Sub-Saharan Africa

Categories: Tax Holiday/Tax Exemption, Reduced Tax Rate, Investment Allowance/Tax Credit, R&D Tax Incentive, Super-Deduction

Source: James (2013).

- Improving access to education and health for disadvantaged groups is a priority, including by:

→ Increasing investment at lower levels of education and increasing cost-recovery in tertiary education (while protecting the poor)

→ Providing a basic health package; expanding services to remote areas; and reducing user charges for poor households

→ Conditioning cash transfers on school attendance and preventive health visits

- In AEs, allowing for the deductibility of education expenses can mitigate the adverse impact of progressive taxation

R&D Expenditures and Growth, 2001-2012
(Percent)

Average Real R&D Expenditure Per Capita Growth

Average Real GDP Per Capita Growth
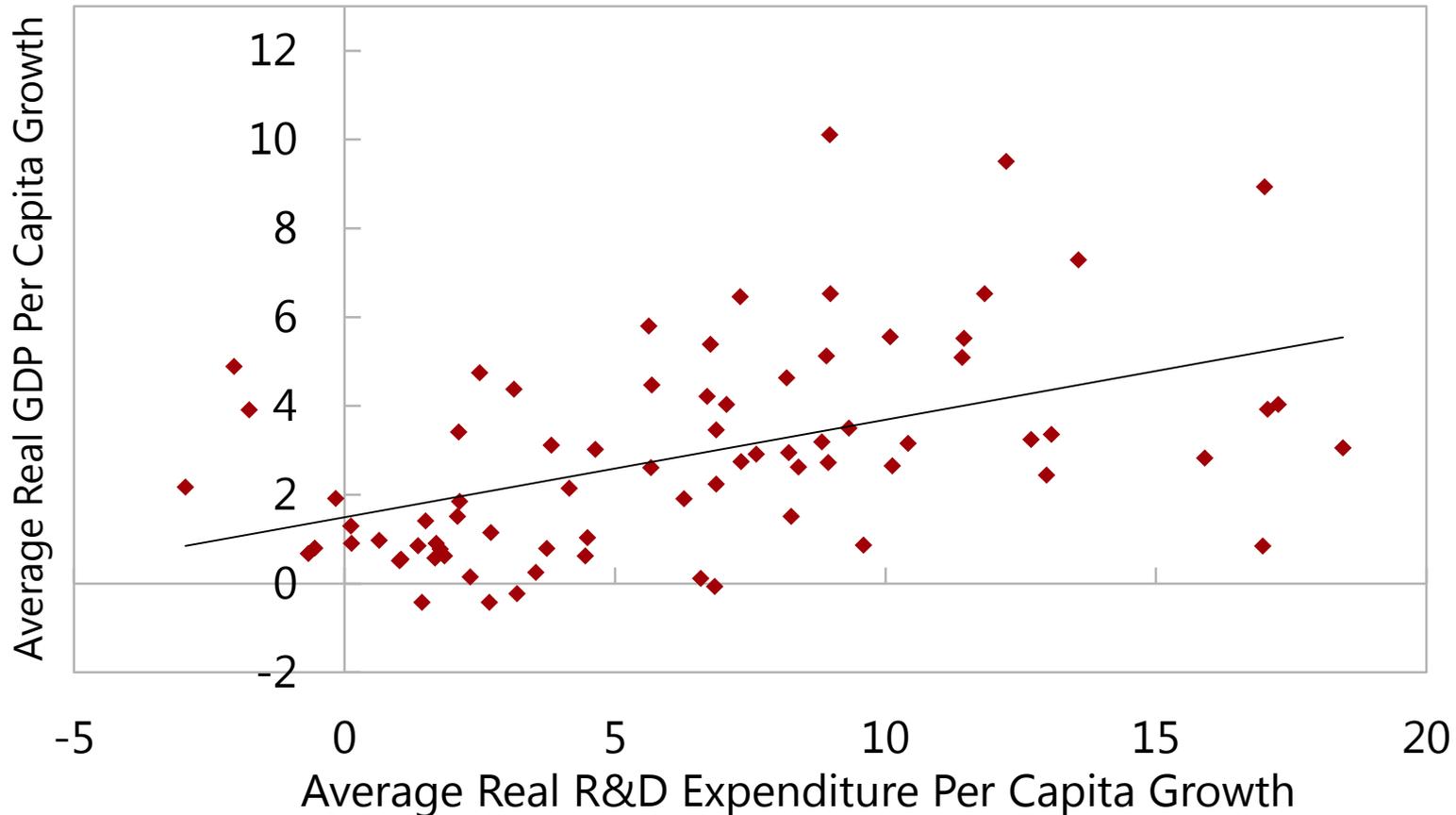
Source: WDI.
Note: Excludes countries with fewer than five observations during the

Empirical Evidence: Results of our Multi-Pronged Analysis

Estimated Growth Gain
(Percent, GDP per capita, 10-year average 1/ 2/)
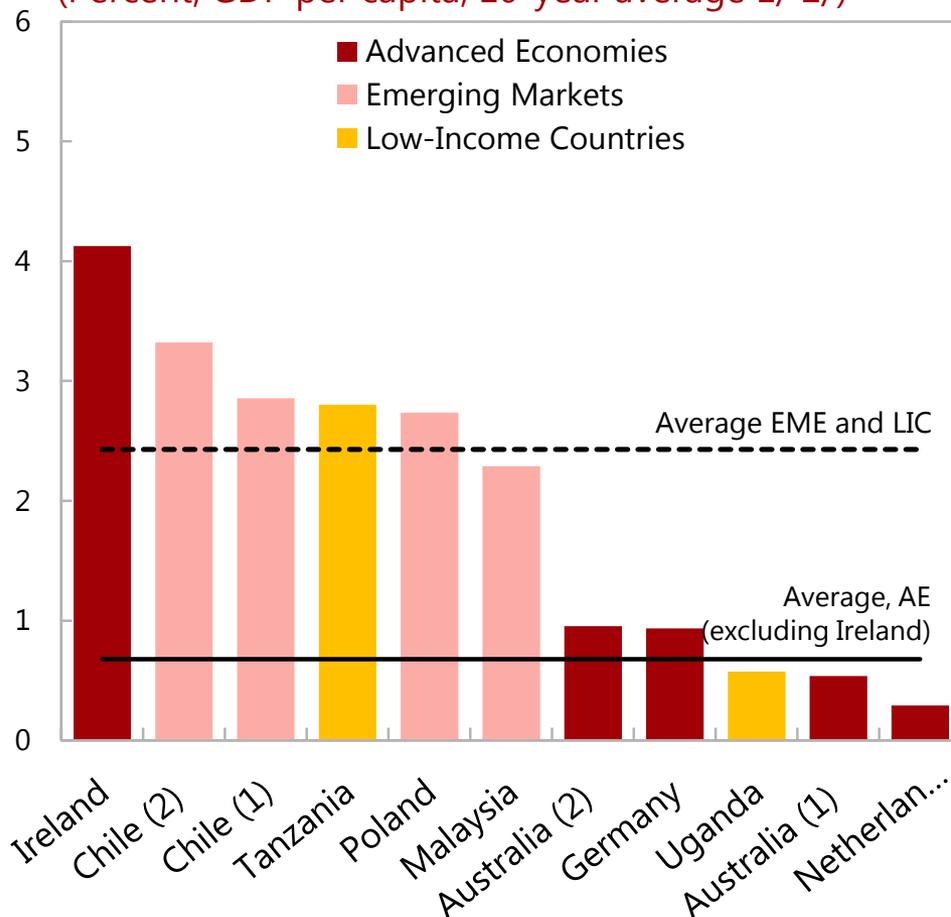
Source: IMF staff calculations; Supplement 1.
1/ 5-year averages for Germany and Poland.
2/ Chile (1) refers to the first reform episode (1974); Chile (2) to the second reform
 episode (1983); Australia (1) to the first reform episode (1985); and Australia (2)
to the second reform episode (1998).

Country Focus: Malaysia

- Malaysia's reform period from 1986-90 chosen based on quantitative selection criteria;

- A large expenditure-based fiscal adjustment, reduction in the size of the public sector, and economic deregulation were key elements of the reforms;

- Growth picked up markedly in the period following fiscal reforms, increasing by 2 percentage points vis-à-vis the counterfactual;

- Fiscal policy appears to have contributed to boosting Malaysia's growth by promoting private investment, job creation and gains in TFP.

Annual GDP Growth, 1986-1990
(Percent, 10-year average)
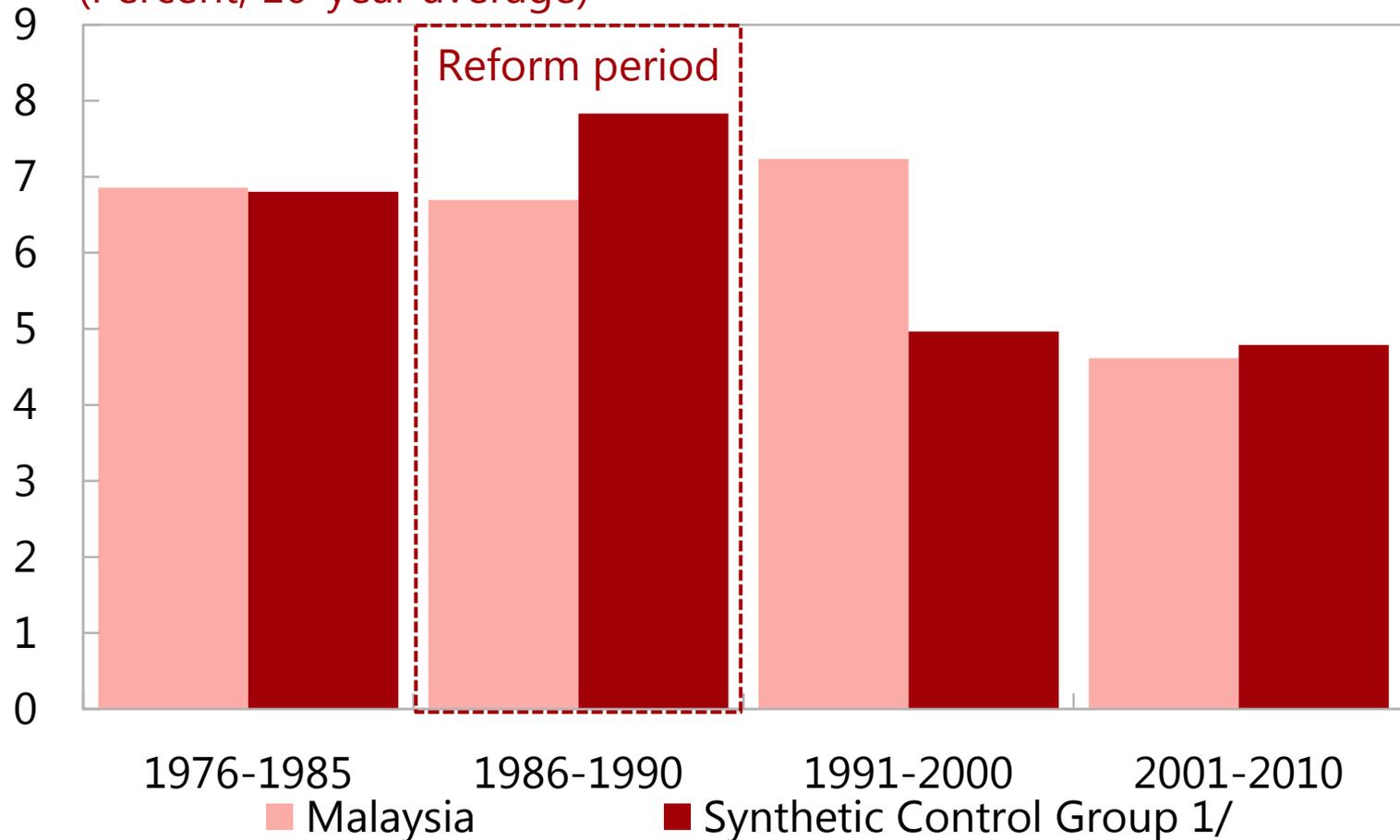
1/ Indonesia, Korea, and Philippines.

Type of Reforms and Conditional Probability of Growth Accelerations
(Percent)
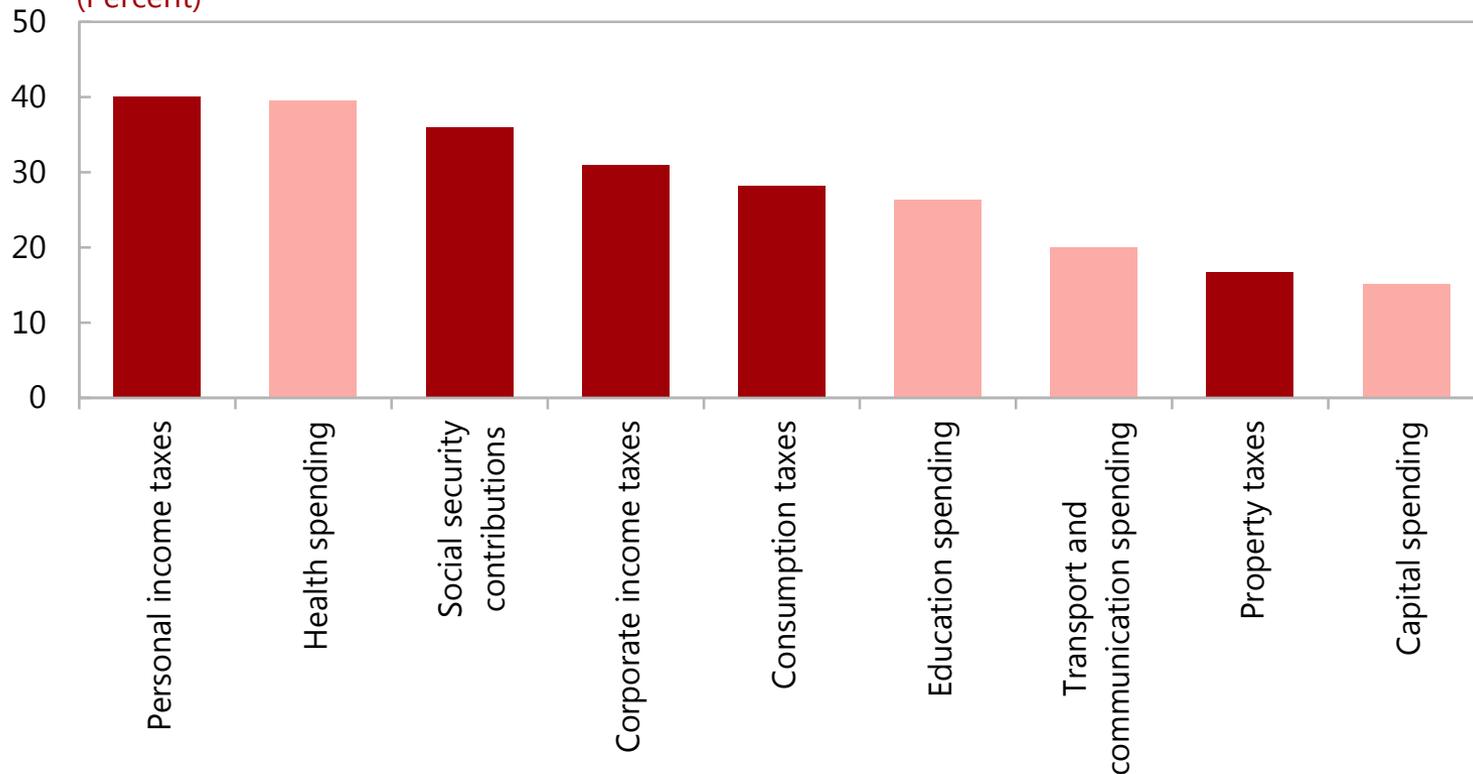
Source: IMF staff calculations.
Note: Reported are the ratios of fiscal reforms followed by a growth accelerations within a 5-year period to the total number of fiscal reforms (in percent).

Other Key Lessons

Cumulative Change in the Public Wage Bill
(Percent of GDP)
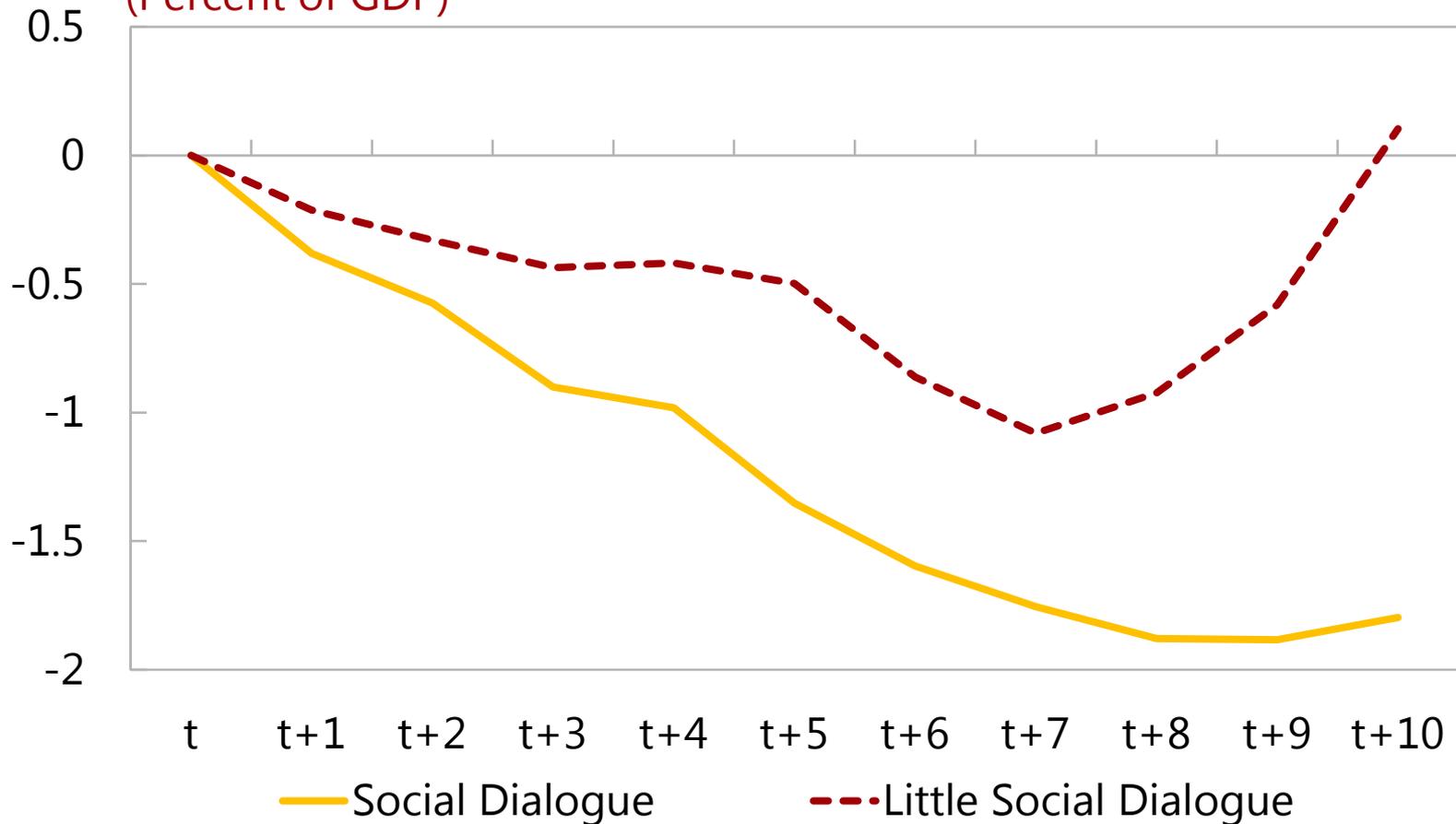
Legend: Social Dialogue, Little Social Dialogue

Source: IMF staff calculations.

Net Inequality 1/
(10-year avg. post-reform minus 10-year avg. pre-reform)
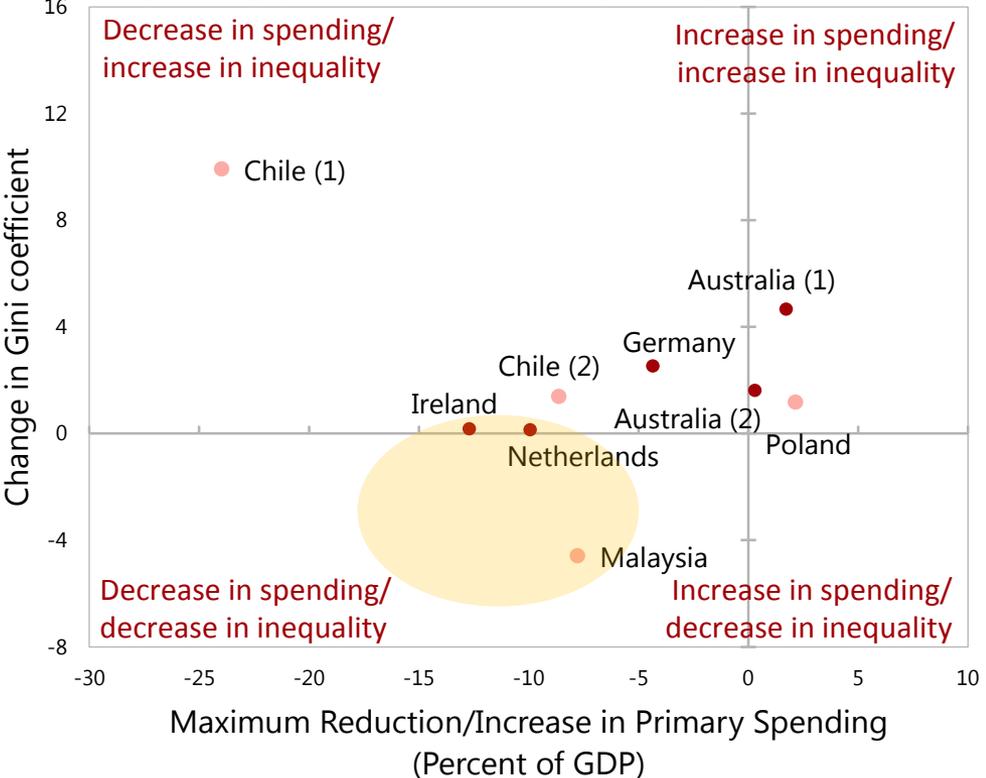
Source: IMF staff calculations, SWIID 5.0.
1/ Refers to Gini coefficient after taxes and transfers.

Conclusions

Conclusions

- Fiscal policy can be an effective tool for supporting medium- to long-run growth.

- The mix of fiscal policy options should be tailored to country-specific conditions, administrative capacities and preferences.

- The growth dividends of fiscal reforms depend to a large degree on complementary structural reforms and supportive macroeconomic policies.

- Strategies—such as effective communication with stakeholders and compensatory measures for those made worse off— can help foster public support for fiscal reforms.

- Both growth and equity objectives can be achieved when fiscal reform packages are appropriately designed.

Thank you

Annex Slides

Methodology	Growth impact
Synthetic control method	¾ pp for AEs and even higher for DCs
Endogenous growth simulations	½ pp from budget neutral tax reforms + ¼ pp for enhancing composition of spending
Statistical analysis	Increased likelihood of growth following fiscal reform

- Formal data-drive procedure to quantify the effect of fiscal policy on long-run growth.

- Removes discretion in selection of countries.

- The effect of fiscal policy is difference between growth in the country and its synthetic counterpart.

- Results should be treated with caution due to potential biases.

Synthetic Control Method
Intuition

- **Goal**: Evaluate the impact of fiscal reforms on long-run growth in a country of interest

- **Issue**: Difficult to find counterfactual showing what the long-run growth would be if the country did not implement the reform

- How does synthetic control method address this issue?
  - Use a panel data of countries (synthetic control) that did not implement fiscal reforms around the same time as the country of interest, but have similar observable characteristics (region, level of development, etc.)

  - Assess the impact of fiscal reforms by taking the difference between the post-reform growth rate in the country of interest and weighted-average growth rate of synthetic control group

  - Countries with more similar observable characteristics with the country of interest in the pre-reform period carry higher weights

Synthetic Control Method
Formal implementation

- **Units**: $j = 0, 1, 2, \ldots J$ countries, where $j=0$ is the treated or reforming country, and $j = 1, 2, \ldots J$ are control countries

- **Time**: $t = 1, 2, \ldots T_1$ periods, where *pre-reform* period is $t = 1, 2, \ldots T_0$; *post-reform* period is $t = T_0+1, \ldots T_1$

- **Variables of interest**:
  - Y^I_{0t} : GDP growth in treated country *0* at time *t* assuming reforms were implemented at T_0
  - Y^N_{0t} : GDP growth in treated country *0* at time *t* assuming reforms were not implemented at T_0

- **Effect of fiscal reform**: $Y^I_{0t} - Y^N_{0t} = \alpha_{0t}$ (for $t > T_0$), where $\mathbf{Y^N_{0t}}$ is not observable and needs to be estimated

Regression model:

$$Y_{jt} = \delta_t + \theta_t Z_{jt} + \lambda_t \mu_j + \varepsilon_{jt}$$

where:

Z: observed covariates of growth (GDP per capita, trade openness, inflation rate, terms of trade index, human capital per person)

δ: unobserved time effects

μ: unobserved country effects

λ, θ: time-varying coefficients (λ is constant in dif-in-dif regressions)

- Counterfactual growth rate is $Y_{0t}^N = \sum_{j=1}^{J} w_j^* Y_{jt}^N$, where vector of non-negative weights w^* is chosen to minimize the difference between observable characteristics of treated and control groups

Synthetic Control Method
Advantages and Disadvantages

Main advantages	Main limitations
Allows selection of control group based on a transparent and flexible statistical procedure, rather than ad-hoc reasoning	Can lead to over-fitting if initial sample of control group is not selected based on similarity to the reforming country
Allows for a study of the dynamic impact of reforms.	SCM suffers from reverse causation bias if reforms depend on expected future growth.
Robust to endogeneity bias due to time-varying omitted variables.	Tests of statistical significance are difficult with SCM

Synthetic Control Method
Literature

- Abadie, A. and Gardeazabal, J. (2003) "The Economic Costs of Conflict: A Case Study of the Basque Country", *American Economic Review*, 93(1): pp. 113-132 – impact of terrorism on output in the Basque Country

- Abadie, A., Diamond, A., and Hainmueller, J. (2010) "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program" *Journal of the American Statistical Association*, 105 (490): pp. 493-505 - effect of California's 1988 tobacco control program on tobacco consumption

- Cavallo, E., Galiani, S., Noy, I., and Pantano, J. (2013) "Catastrophic Natural Disasters and Economic Growth" *Review of Economics and Statistics*, 95(5): pp. 1549-1561 - effect of large natural disasters on economic growth

- Billmeier, A. and Nannicini, T. (2013) "Assessing Economic Liberalization Episodes: A Synthetic Control Approach", *Review of Economics and Statistics*, 95 (3): pp. 983-1001 – impact of economic liberalization on real GDP per capita growth

- Abadie, A., Diamond, A., and Hainmueller, J. (2014) "Comparative Politics and the Synthetic Control Method", *American Journal of Political Science* (*forthcoming*) – impact of Germany's 1990 unification on real GDP per capita

Key Features:

- o Two sectors: final output and human capital

- o Government investment in productive public capital

- o Endogenous labor supply

- o Constant returns to scale in public and private capital

- o Accumulation of public and human capital offsets diminishing returns to physical capital accumulation

Budget-neutral experiments

Fiscal Reform	Increase in LT Growth Relative to Benchmark	Offsetting Measures
Δ Capital tax -5% Δ Labor tax -5%	0.4-0.5 pp	↑ consumption tax
Δ public investment +1% of GDP	0.15-0.2 pp	↓ unproductive spending by 1 pp of GDP