# Fiscal Policy and Debt Dynamics in Developing Countries

Ethan Ilzetzki
London School of Economics

IGC

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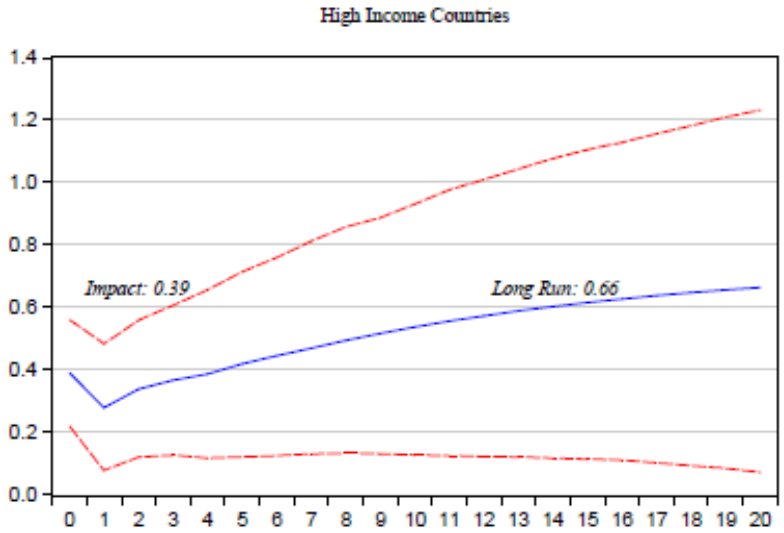
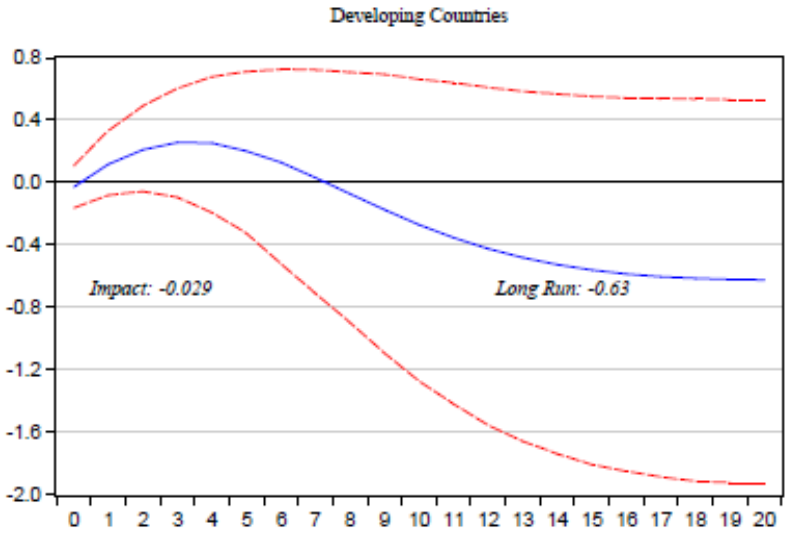
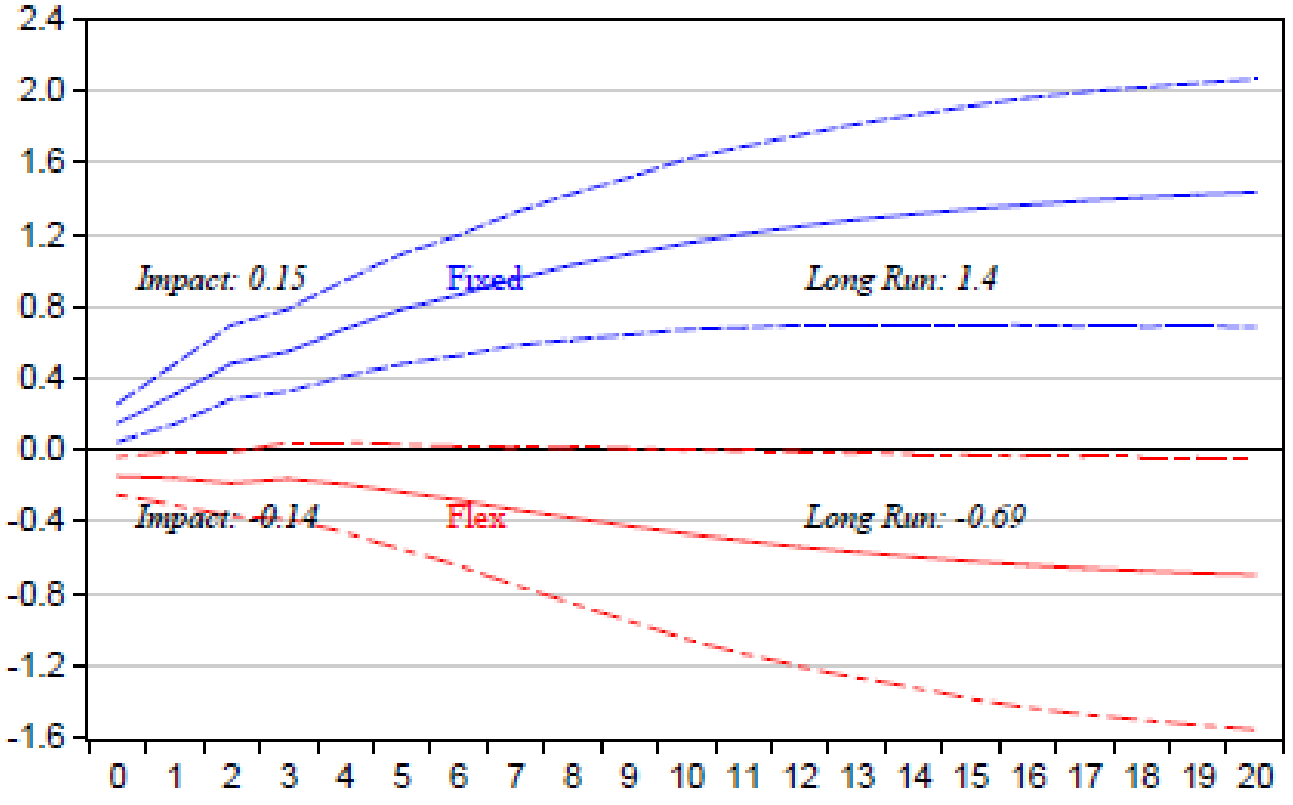
# Ilzetzki, Mendoza and Vegh (2012)

- Ilzetzki, Mendoza and Vegh (2012) evidence on the government purchases multiplier.
  - Rather small (0 to 0.4) in the short-run
  - Magnitude in the long run depends crucially on country characteristics
    - Degree of monetary accomodation
    - Openness to international trade
    - Sovereign debt
    - In developing countries importance of composition (consumption/investment).


High Income Countries
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Impact: 0.39
Long Run: 0.66
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20


Developing Countries
0.8
0.4
0.0
-0.4
-0.8
-1.2
-1.6
-2.0
Impact: -0.029
Long Run: -0.63
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20


2.4
2.0
1.6
1.2
0.8
0.4
0.0
-0.4
-0.8
-1.2
-1.6
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Impact: 0.15
Fixed
Long Run: 1.4
Impact: -0.14
Flex
Long Run: -0.69

# Tax Cuts as Stimulus

- During the recent downturn fiscal stimulus utilized both sides of the government balance sheet
- While debate has largely focused on government expenditure,
  - only half of the ARRA (US stimulus of 2009) was in the form of government purchases;
  - government purchases in the UK increased roughly along their (quadratic) trend of the Labour parliaments.
- Tax revenues declined significantly
  - Mainly due to an endogenous decline in the tax base
  - But also due to discretionary measures:
    - \$288 billion in tax measures in the US, primarily personal income tax credit; some corporate tax incentives
    - VAT cut in the UK from 17.5% to 15%.

# Importance of Debt

- Have also ignored the dynamic aspect of debt accumulation.
- Fiscal stimulus causes an increase in debt, which may have effects on GDP.
- Simple linear VAR may not account for this (may be along an unsustainable debt path).

# Outline

- Description of dataset
- The growth impact of tax policy: panel analysis
- SVAR analysis
- Accounting for debt dynamics

# Data

- New comprehensive datset of marginal tax rates
- 28 countries: 7 high-income, 21 developing
- Calculated from tax codes taken from OECD and Pricewaterhouse Coopers

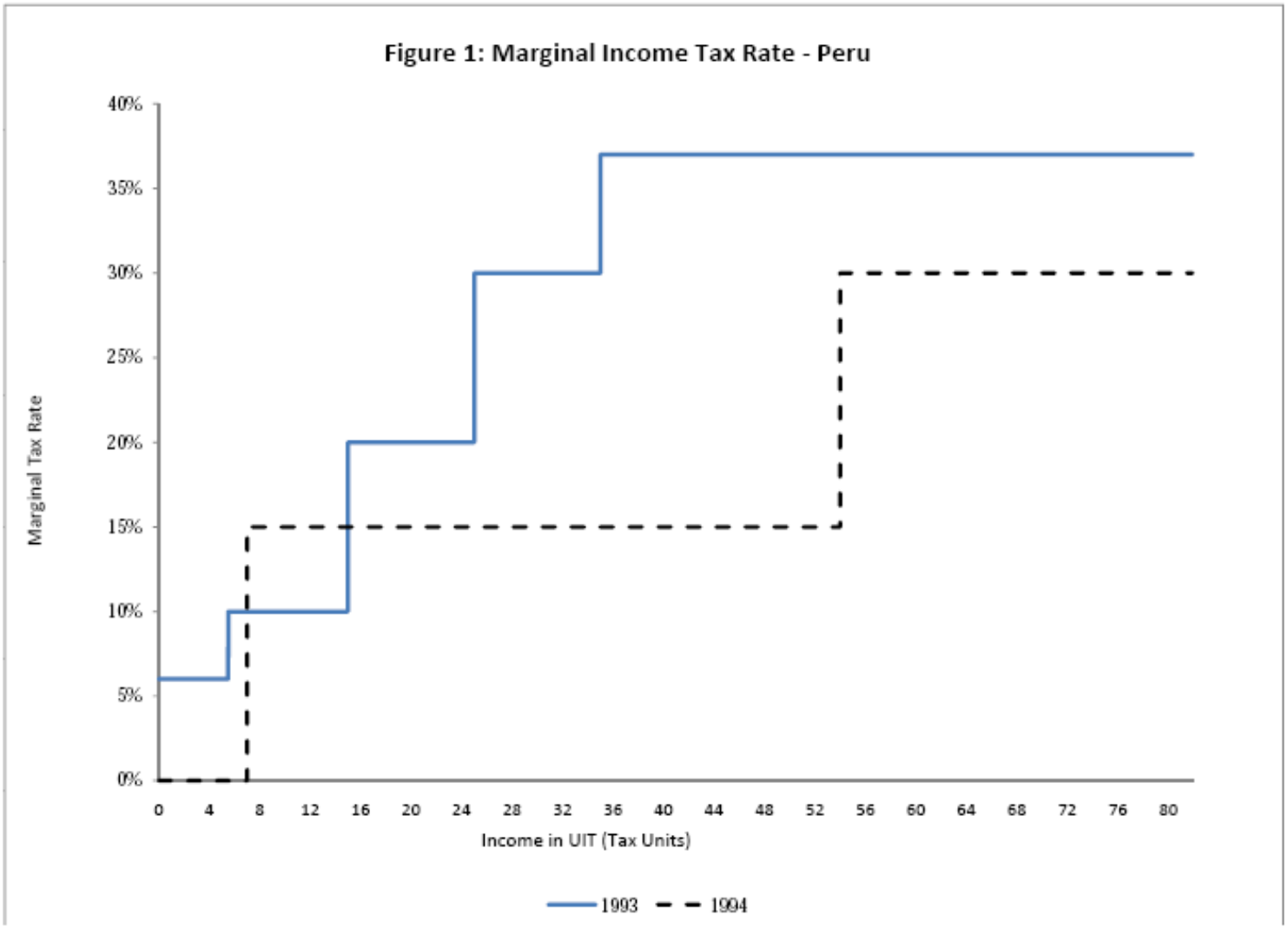


Figure 1: Marginal Income Tax Rate - Peru
40%
35%
30%
25%
20%
15%
10%
5%
0%
Marginal Tax Rate
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
68
72
76
80
Income in UIT (Tax Units)
1993
1994

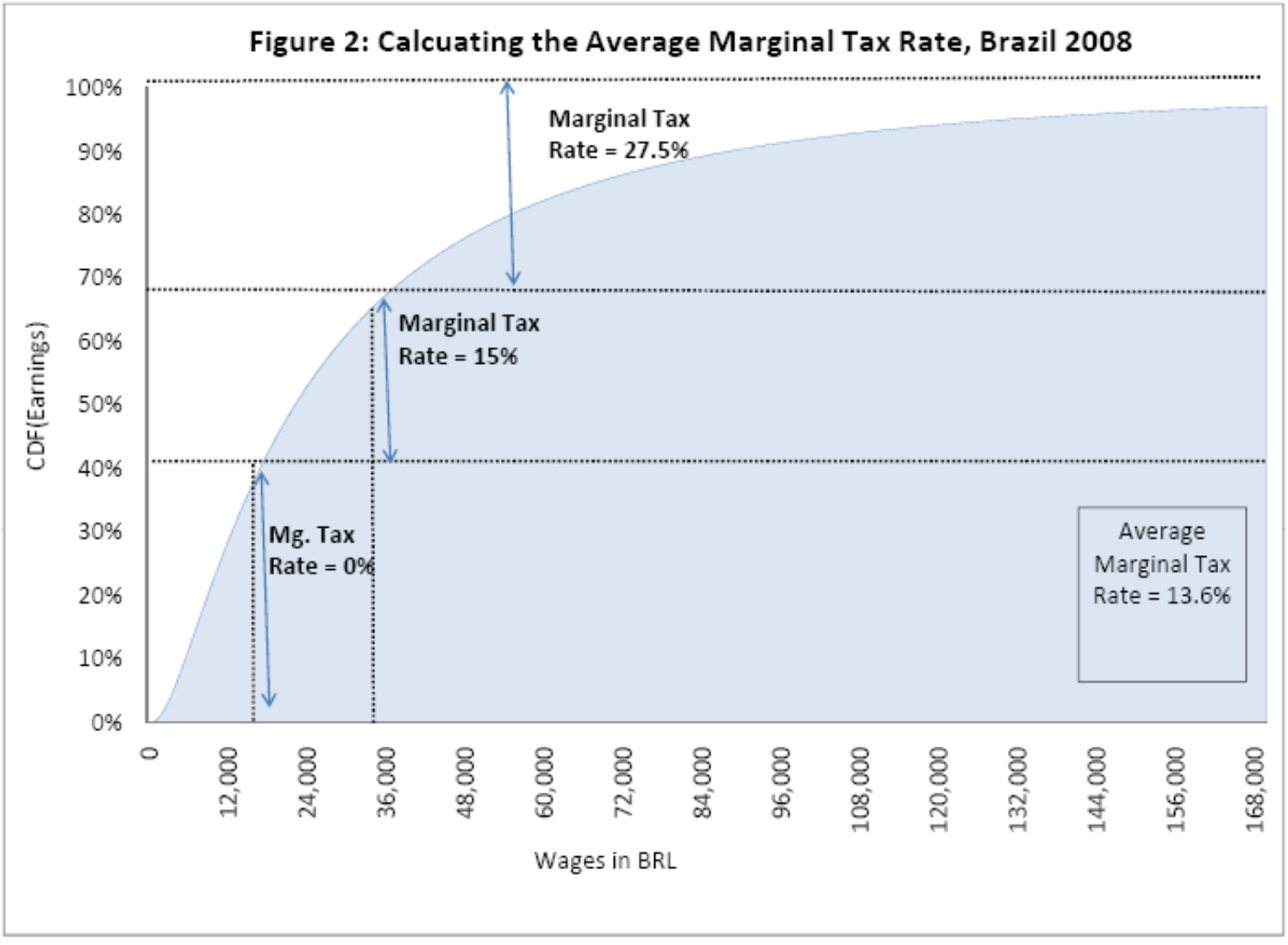
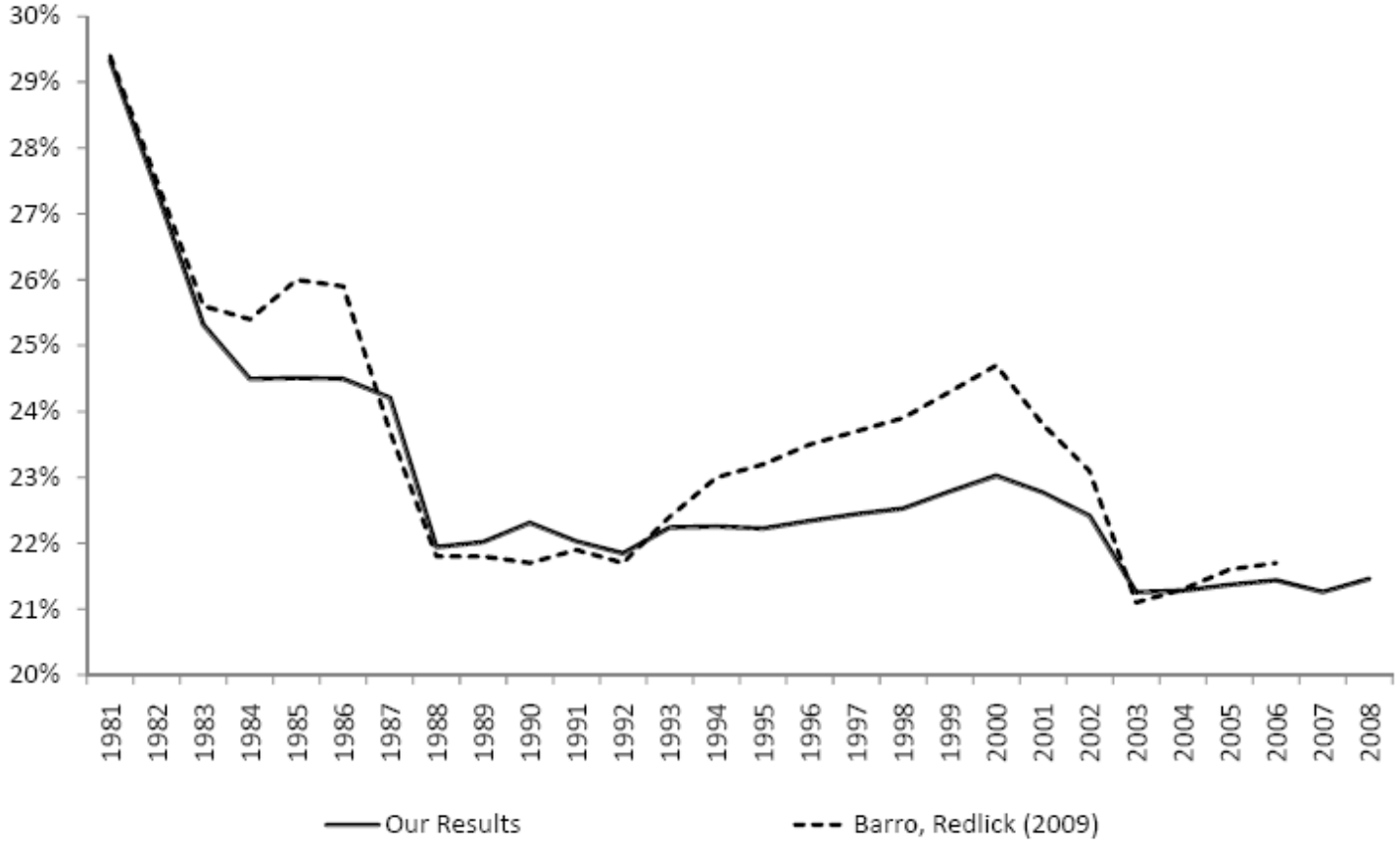


Figure 2: Calcuating the Average Marginal Tax Rate, Brazil 2008
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
CDF(Earnings)
Marginal Tax
Rate = 27.5%
Marginal Tax
Rate = 15%
Mg. Tax
Rate = 0%
Average
Marginal Tax
Rate = 13.6%
0
12,000
24,000
36,000
48,000
60,000
72,000
84,000
96,000
108,000
120,000
132,000
144,000
156,000
168,000
Wages in BRL

**Figure 3: Average Marginal Personal Income Tax Rate**
**Comparison with Barro and Redlick (2009)**



# Econometric Model

- PVAR, including GDP, government consumption, government expenditures

- $$AY_{n,t} = \sum_{k=1}^{K} C_k Y_{n,t-k} + Bu_{t,k},$$

- Identifying assumption: Blanchard and Perotti (2002)
  - (Excluding transfers) government expenditures cannot respond to innovations within a quarter
  - Tax elasticities estimated from institutional information.

# Simple OLS/GMM Estimation

- Regress GDP growth on (lagged) changes in past tax rates.
  - Following Barro and Redlick (2010) also include lagged unemployment rate.
- Alternatively: Arellano-Bond GMM to address autocorrelation in GDP growth and (to some extent) reverse causation from GDP to tax rates.

**Table 4: Tax Changes and GDP**

Dependent Variable: Change in GDP

| | Full Sample | | Developing countries | |
|---|---|---|---|---|
| | OLS | Arellano-Bond | OLS | Arellano-Bond |
| PIT | -0.14<br>(.055) | -0.16<br>(.081) | -0.20<br>(.080) | -0.37<br>(.091) |
| CIT | 0.043<br>(.028) | -0.084<br>(.063) | 0.018<br>(.060) | 0.034<br>(.061) |
| VAT | 0.38<br>(.129) | 0.51<br>(.55) | 0.44<br>(.24) | 0.55<br>(.33) |
| Lagged GDP | | 0.35<br>(.043) | | 0.37<br>(.10) |
| UR | -00079<br>(.00036) | 0.0035<br>(0.0011) | -0.015<br>(.0012) | 0.003 (.0017) |
| Trading Partners' Growth | 1.52 (.31) | 2.95 (.23) | 1.62<br>(.34) | 2.77<br>(.44) |
| n | 335 | 308 | 188 | 166 |

Significant at 1%

Significant at 5%

Significant at 10%

# Debt Dynamics

$$AY_t = \sum_{k=1}^{K} \left[ C_k \, Y_{t-k} + D_k \, d_{t-k} \right] + B u_t ,$$

Favero-Giavazzi:

$$d_t \equiv \frac{1 + i_t}{(1 + \Delta p_t)(1 + \Delta y_t)} d_{t-1} + \frac{\exp g_t - \exp T_t}{\exp y_t},$$

Ilzetzki:

$$d_t \equiv \frac{(1 + i_t)\left[\delta (1 + \Delta s_t) + 1 - \delta\right]}{(1 + \Delta p_t)(1 + \Delta y_t)} d_{t-1} + \frac{\exp g_t - \exp T_t}{\exp y_t},$$

# Why does sovereign debt matter?

1. Current fiscal stimulus implies future fiscal austerity.
2. Higher debt increases real interest rates.
3. Higher debt causes inflationary pressures.
4. Direct effects of sovereign debt on GDP growth?

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1. Current fiscal stimulus implies future fiscal austerity.
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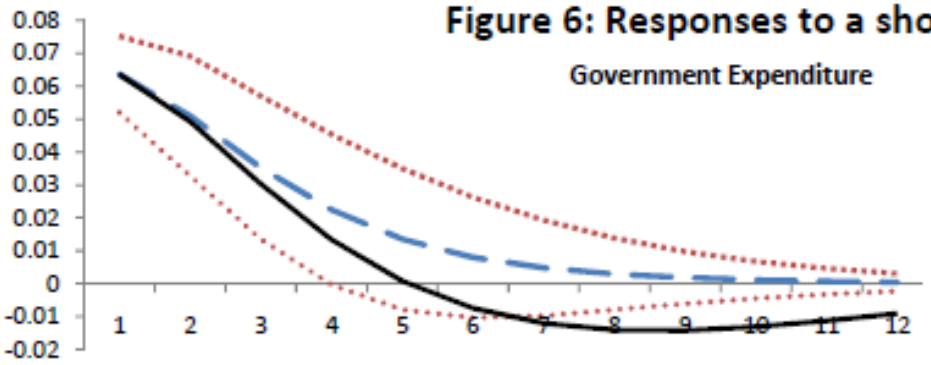
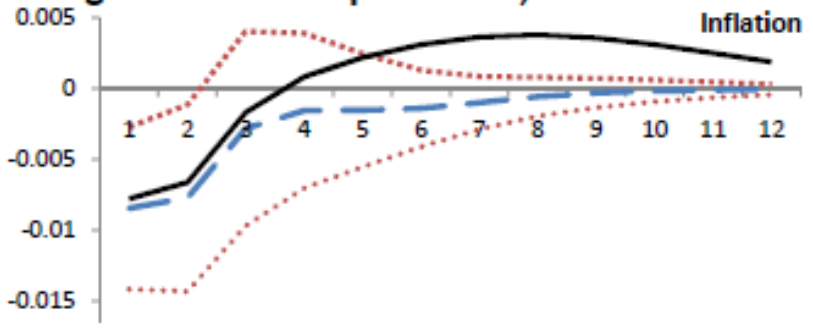
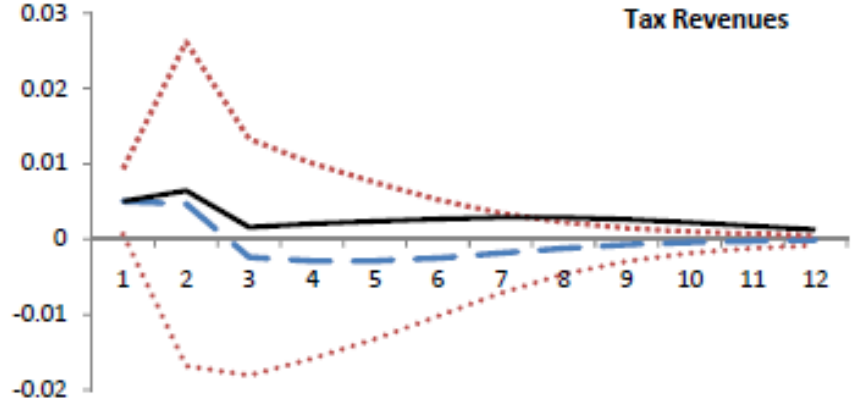
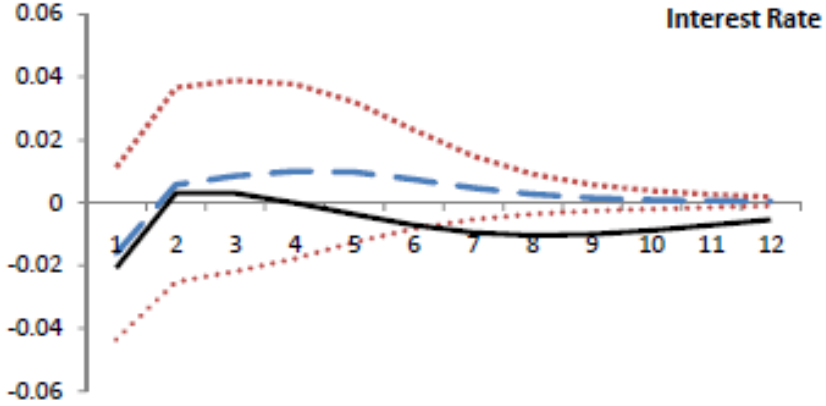
3. ~~Higher debt causes inflationary pressures.~~
4. ~~Direct effects of sovereign debt on GDP growth?~~

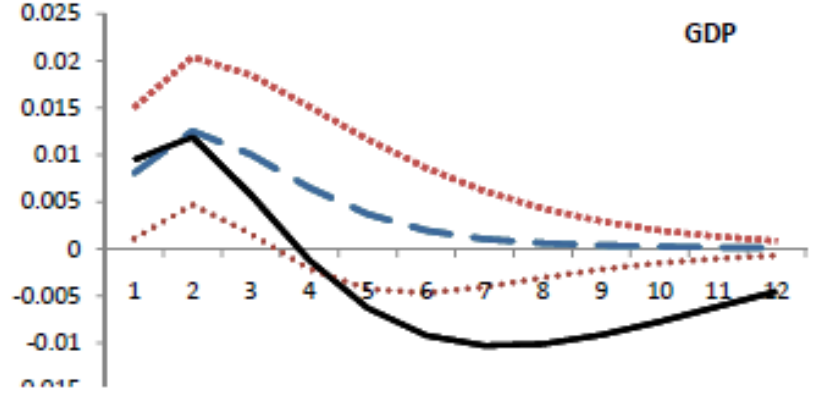
## Figure 6: Responses to a shock to government expenditure, Brazil

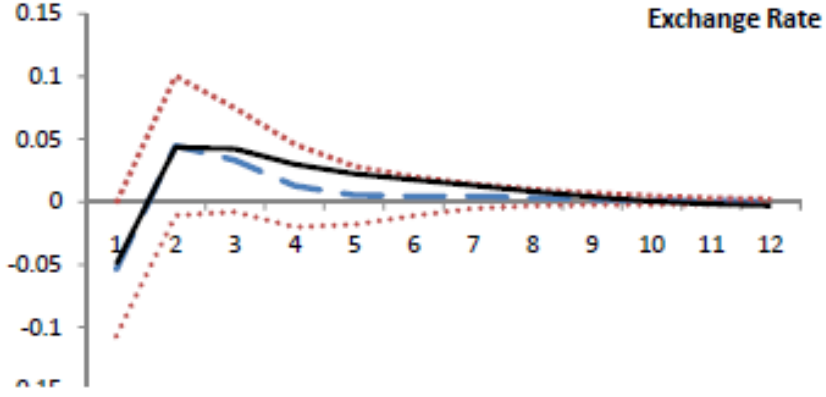


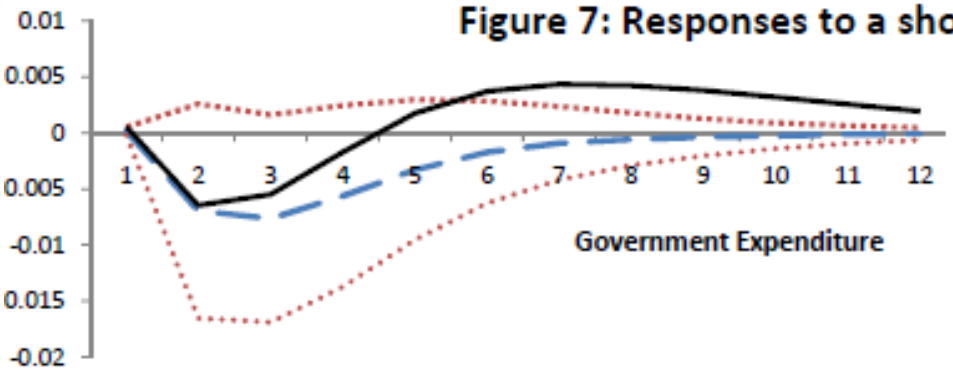



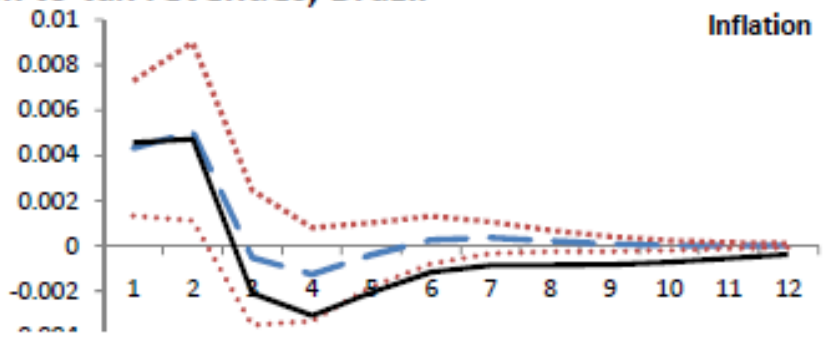



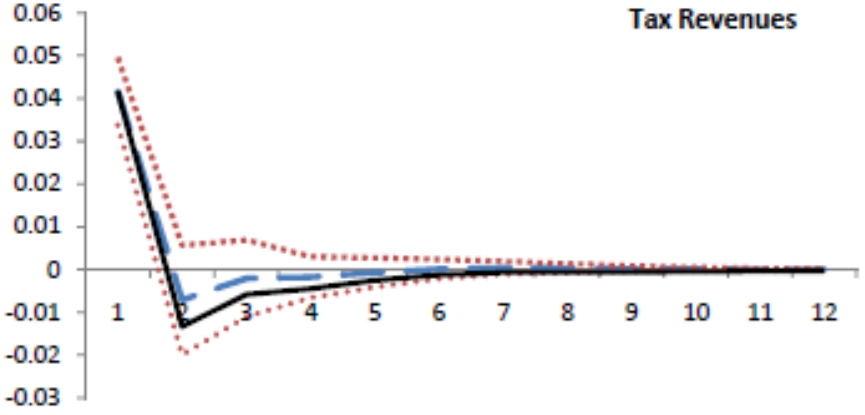



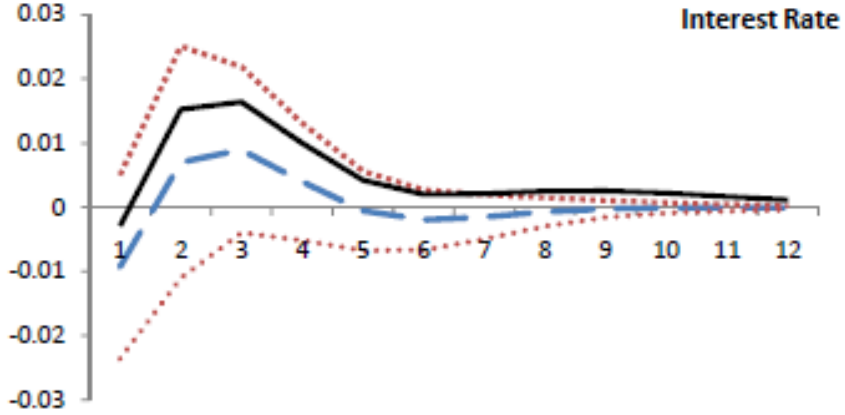



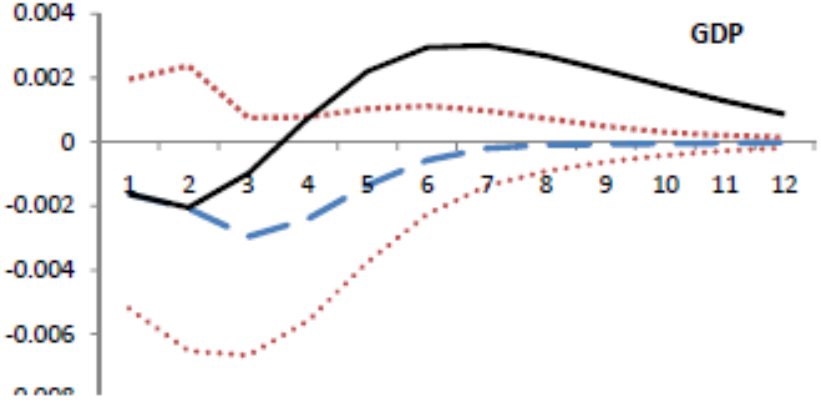
## Figure 7: Responses to a shock to tax revenues, Brazil

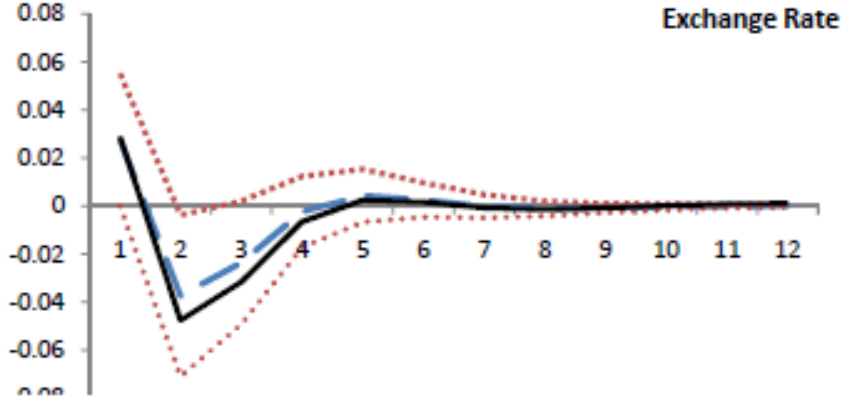


# Research in progress

1. Debt dynamics in a panel of developing countries
   - 1.1 Greater empirical power.
   - 1.2 Non-linearities, regime switching.

2. Narrative approach to estimate effects of taxes.