Cyclical budgetary policy and its effects on growth

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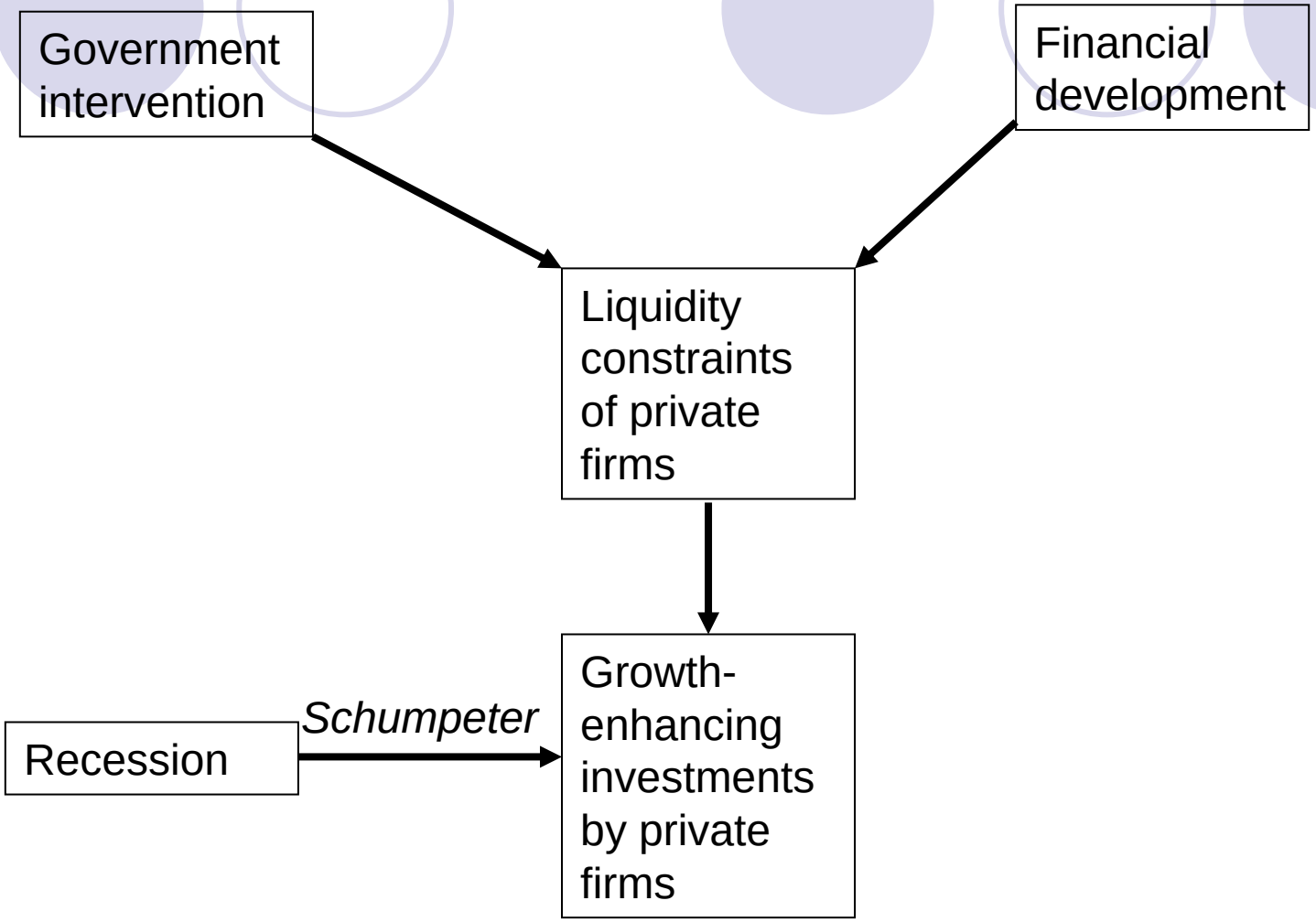
Does macroeconomic policy (budget deficit, interest rates, taxation,...) matter for (long-run) growth?

- Debate on ECB policy and the Stability and Growth Pact.
- Does it matter for growth that Eurozone shows less countercyclical deficit than US/UK?
- How does the degree of development, and in particular financial development, affect the efficiency of macro policy?

Recessions, investment and growth



<u>Hypothesis</u>: Countercyclical fiscal and budgetary policy should be more growth enhancing when a country is less financially developed.

Previous literature

- Calderon et al. (2004): institutions (ICRG).
- Alesina-Tabellini(2005): corrupt democracies.
- Lane (2003): growth volatility, trade openness and political divisions.

Preview of results

- We use OECD *panel* data.
- Public deficit in the OECD gets more countercylical over time, but less so in the EMU.
- Lower financial development is associated with a less countercyclical fiscal and budgetary policy.
- More countercyclical public deficit, investment and consumption increase growth; but this effect is lessened when financial development is higher.

Outline

- First stage: the cyclicality of public debt and spending and its determinants.
- Second stage: the effect of the cyclicality of public debt and spending on growth.

Data used

- OECD Economic Outlook.
- Ross Levine’s dataset on financial development: private credit/GDP.
- Penn World Tables.

First stage: theory

- The variation of public debt (or spending) is determined by (Barro 1979 tax smoothing theory):
  - the size of government and the variation in government spending
  - the stock of debt at the previous period
  - **GDP gap (tax revenues)**

Econometric specification

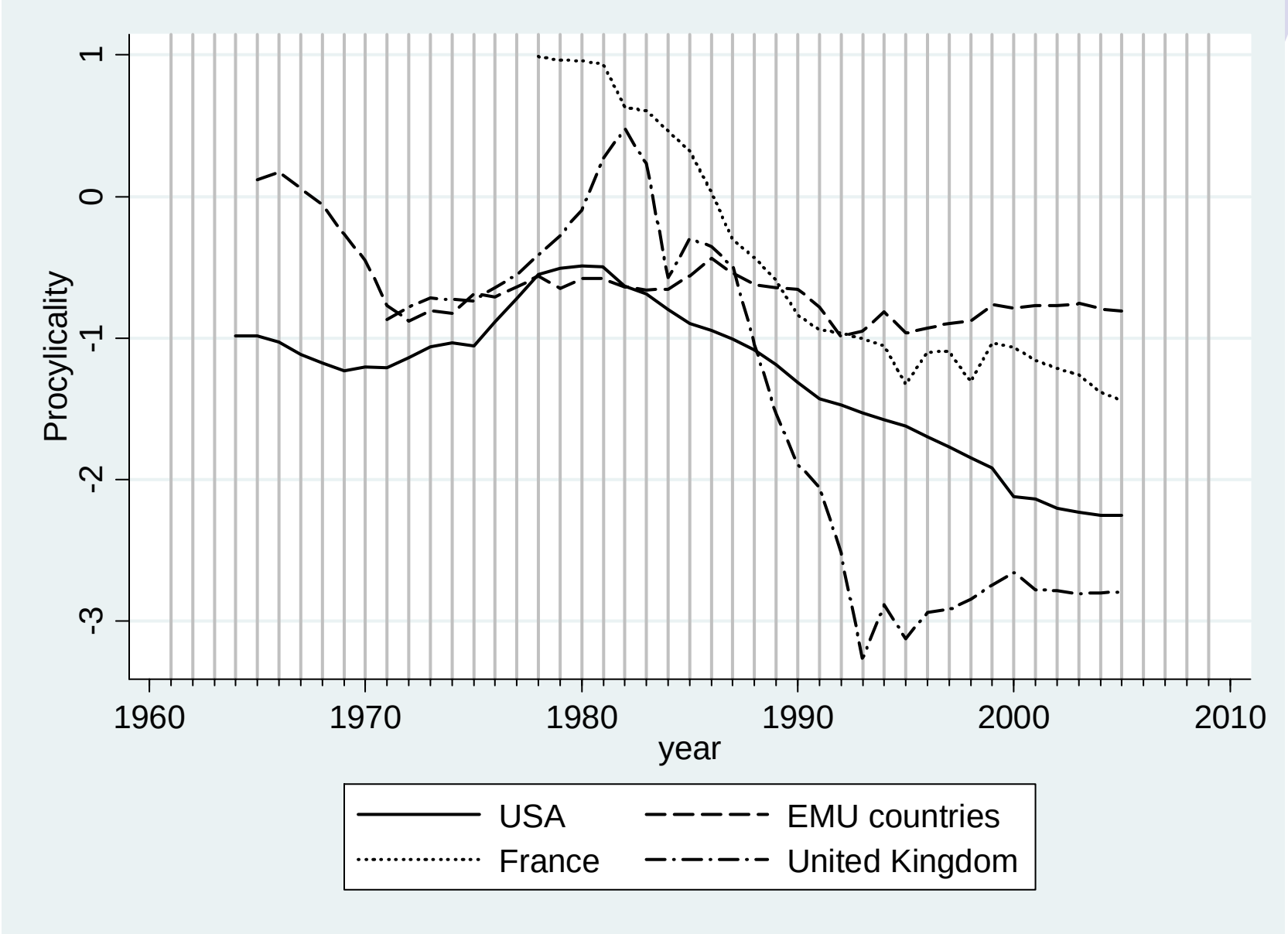
- Correlation won't do (panel).
- Problem: how do we estimate a time-varying coefficient on the GDP gap?
- First method: Coefficient in the linear regression assumed to follow an AR(1) process for each country i at time t:

$$\forall i, a_{i,t} = a_{i,t-1} + \varepsilon_t^{a_i}, \varepsilon_t^{a_i} \sim N(0, \sigma_{a_i}^2)$$

- Second method (check): OLS 10-years rolling window:

$$y_t = \sum_i a_{i\tau} x_{it} + \varepsilon_t, t \in [\tau - 4, \tau + 5]$$

Procyclicality of government debt (AR(1))



Determinants of the procyclicality of fiscal and budgetary policy

	Public Debt		Public Investment		Public Consumption	
	Year f.e.	Year & Country f.e.	Year f.e.	Year & Country f.e.	Year f.e.	Year & Country f.e.
Private credit/GDP	0.175	-0.638	0.010	-0.029	0.053	0.065
	(0.186)	(0.193)***	(0.010)	(0.008)***	(0.014)***	(0.016)***
Standard error	-1.979		1.019		0.785	
of GDP growth	(1.873)		(0.104)***		(0.186)***	
Openness	0.016	0.028	0.000	0.002	0.000	0.000
	(0.002)***	(0.007)***	(0.000)	(0.000)***	(0.000)	(0.000)
Observations	486	486	453	453	453	453
R-squared	0.26	0.70	0.41	0.87	0.29	0.86

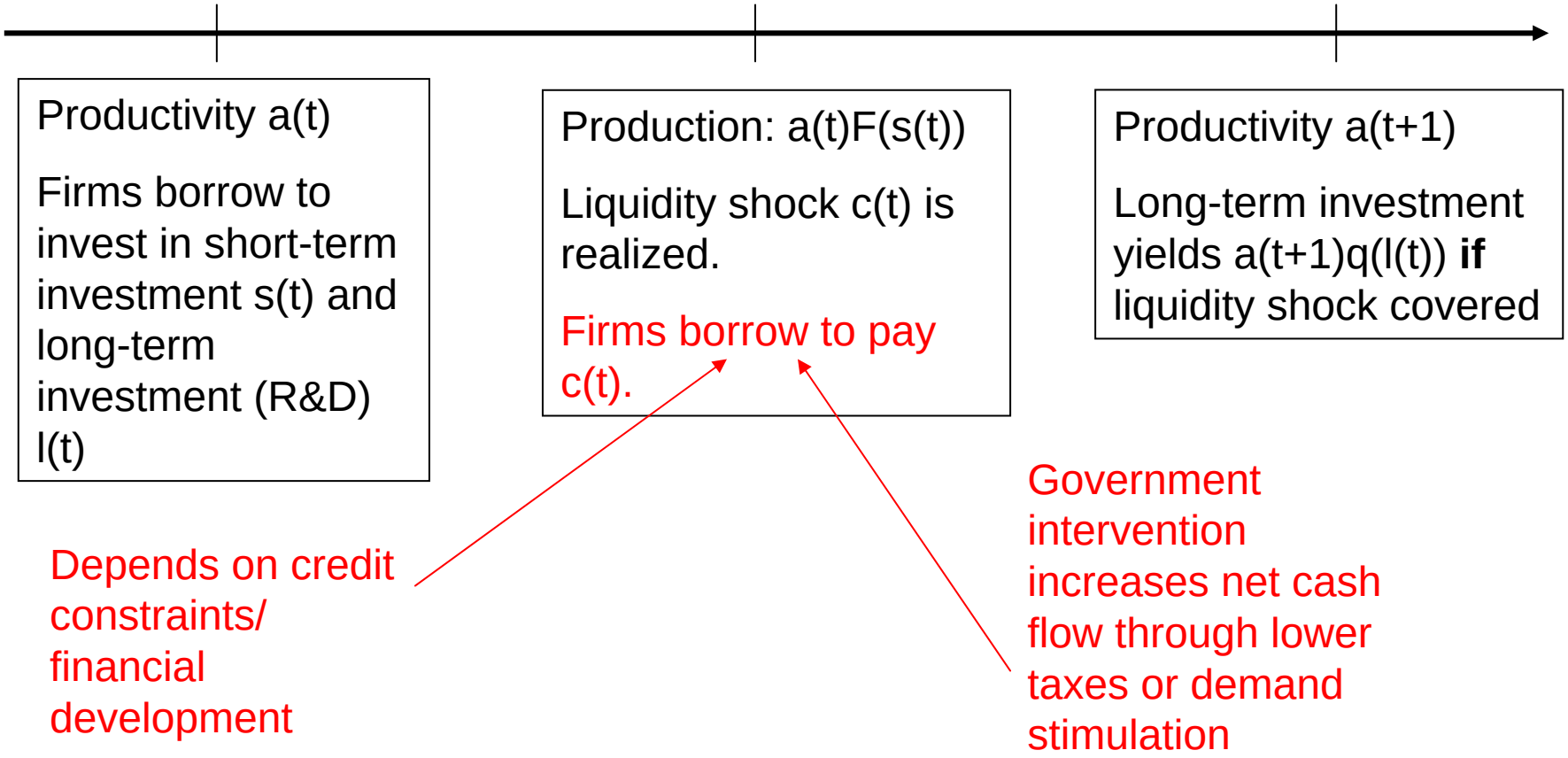
Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Explained variable: procyclicality as estimated by the AR(1) method. All regressions also control for EMU country status, government share of GDP, relative GDP per capita.

Second stage: theory

- Aghion, Angeletos, Banerjee, Manova, 2005.



GDP growth and government investment and consumption procyclicality

	Country f.e.		Year f.e.	Country year f.e.
	AR(1)	10YRW	AR(1)	AR(1)
	(1)	(2)	(3)	(4)
lag(Procyclicality of government investment)	-0.239	-0.043	-0.064	-0.180
	(0.069)***	(0.022)**	(0.034)*	(0.065)***
lag(Procyclicality of government consumption)	-0.058	-0.038	-0.014	-0.056
	(0.032)*	(0.020)*	(0.019)	(0.030)*
lag(Private credit/GDP)	-0.017	-0.022	-0.007	0.003
	(0.010)*	(0.009)**	(0.004)*	(0.010)
lag(Procyclicality of government investment*Private credit/GDP)	0.156	0.029	0.081	0.164
	(0.043)***	(0.017)*	(0.034)**	(0.043)***
Observations	370	304	370	370
R-squared	0.30	0.26	0.43	0.53

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

The explained variable is the growth of GDP per capita. All regressions include the following controls: relative GDP per capita, average years of schooling for the population over 25 years old, trade openness, inflation, population growth, government share of GDP (in %), investment/GDP (in%), terms of trade shock, price shock.

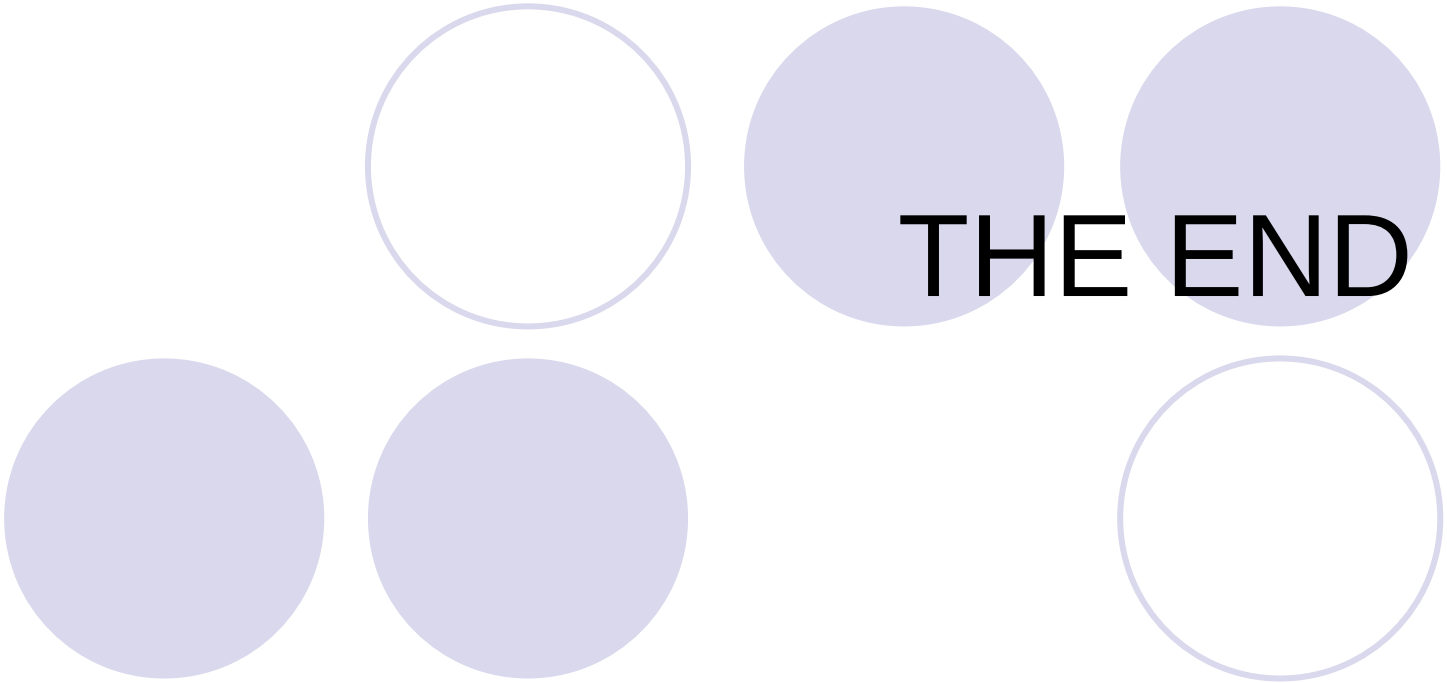
Implied growth effects of the procyclicality of government investment

Region	Estimated coef. on lag (Procyclicality of government investment)		-Average (lag (Procyclicality of government investment))		Estimated coef. lag(Procyclicality of government investment*private credit/GDP)		-Average (lag (Procyclicality of government investment))		Average(lag (private credit/ GDP))		Implied effect on growth
Panel A: AR(1)											
EMU	-0.1799	*	-0.0748	+	0.1642	*	-0.0748	*	0.7951	=	**0.0037**
US	-0.1799	*	-0.0841	+	0.1642	*	-0.0841	*	1.2094	=	**-0.0016**
EMU with US private credit	-0.1799	*	-0.0748	+	0.1642	*	-0.0748	*	1.2094	=	**-0.0014**

Table calculates the implied growth effect of the government investment becoming acyclical.

Conclusion

- Macro policy over the cycle matters for growth.
- Procyclicality of government investment, and to a lesser extent consumption, is harmful to growth of GDP per capita.
- Less financially developed countries could increase growth substantially by reducing procyclicality of government investment.
- Effect is particularly strong for EMU.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Econometric specification

$$\frac{(b_t - b_{t-1}) - i_t}{y_t} = a_1 y_{gap,t} \overline{\left(\frac{g_t}{y_t}\right)} + a_2 \{\ln(g_t) - \overline{\ln(g_t)}\} \frac{g_t}{y_t} + a_3 \frac{b_{t-1}}{y_t} + a_4 + \varepsilon_t$$

- Problem: how do we estimate a time-varying coefficient on the GDP gap?

GDP growth and government investment and consumption procyclicality

	Country f.e.		Year f.e.		Country year f.e.	
	AR(1)	10YRW	AR(1)	10YRW	AR(1)	10YRW
	(1)	(2)	(3)	(4)	(5)	(6)
lag(Procyclicality of government investment)	-0.239	-0.043	-0.064	-0.062	-0.180	-0.057
	(0.069)***	(0.022)**	(0.034)*	(0.023)***	(0.065)***	(0.023)**
lag(Procyclicality of government consumption)	-0.058	-0.038	-0.014	0.004	-0.056	-0.036
	(0.032)*	(0.020)*	(0.019)	(0.018)	(0.030)*	(0.018)**
lag(Private credit/GDP)	-0.017	-0.022	-0.007	-0.003	0.003	-0.002
	(0.010)*	(0.009)**	(0.004)*	(0.003)	(0.010)	(0.008)
lag(Procyclicality of government investment*Private credit/GDP)	0.156	0.029	0.081	0.052	0.164	0.043
	(0.043)***	(0.017)*	(0.034)**	(0.018)***	(0.043)***	(0.018)**
Observations	370	304	370	304	370	304
R-squared	0.30	0.26	0.43	0.41	0.53	0.52

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