

*Policy Interdependence in a Unifying Framework  
for a Monetary and Fiscal Union*

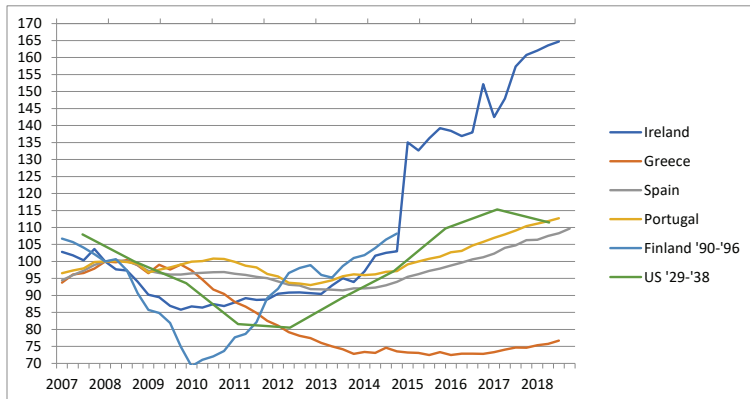
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  - Multipliers and Spillovers
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# Key Facts



Evolution of GDP in EZ crisis countries, Comparison with Finland, 1990-1996, and USA, 1929-1938

Greece: singularly weak performance, due to many factors, unique isolation. Geography, and economic complexity?

# Does the EU pay off? Does the EZ pay off?

- Whereas for the UK EU membership is a divisive question, that is not generally so. Consider this:



Eurozone country	Impact of euro-introduction on prosperity 1999-2017 per inhabitant	Impact of euro-introduction on prosperity 1999-2017 overall
Germany	+ 23,116 euro	+ 1,893 billion euro
Netherlands	+ 21,003 euro	+ 346 billion euro
Greece	+ 190 euro	+ 2 billion euro
Spain	- 5,031 euro	- 224 billion euro
Belgium	- 6,370 euro	- 69 billion euro
Portugal	- 40,604 euro	- 424 billion euro
France	- 55,996 euro	- 3,591 billion euro
Italy	- 73,605 euro	- 4,325 billion euro

20 years since its introduction and the euro remains controversial. cep has used the synthetic control method to analyse which countries have gained from the euro and which ones have lost out.

# What is wrong with such a calculation?

Gasparotti and Matthias. “20 Years of the Euro: Winners and Losers.” CEP February 2019

- “Synthetic method involves matching countries with “control group:”  
Greece: Bahrain, Israel, Barbados, New Zealand, Gabon, Singapore
- Obviously, a Straw Man. To see impact one must account
  - for interconnectedness via trade and financial flows
  - for institutional underpinnings of joint policy determination

# National policy options

- 1 Structural reforms improving productivity and external competitiveness
- 2 Fiscal policy
- 3 Countries interconnected through trade and common currency pose special policy questions:

National fiscal policy generates cross-country spillovers

- 1 monetary policy interconnectedness:  
Sensitivity of aggregate policy objective to country size determines attractiveness to currency union
- 2 fiscal policy interconnectedness  
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# Size heterogeneity

- 1 Seats in the European Parliament proportional to size: *c.f.* US House of Representatives
- 2 European Commission represents states: *c.f.* US Senate
- 3 Qualified majority rules sensitive to relative populations, to account for size, heeding the criticism of democratic deficit

# Size heterogeneity, cont'd

- 1 Fiscal multipliers and spillovers across countries vary and hard to estimate.

But: 1% increase in German government spending:  
impact ranges from 0.05% increase in Greek GDP to 0.4% in Belgian GDP.

A somewhat overlooked aspect of interdependence:  
benefit to a country from another country's fiscal policy looks like free lunch, to the recipient, but may cost the "source" economy.

- 2 This has not been as well researched, but the attractiveness of macro policy coordination during the Great Recession and during the Euro Zone sovereign debt crisis renewed interest.

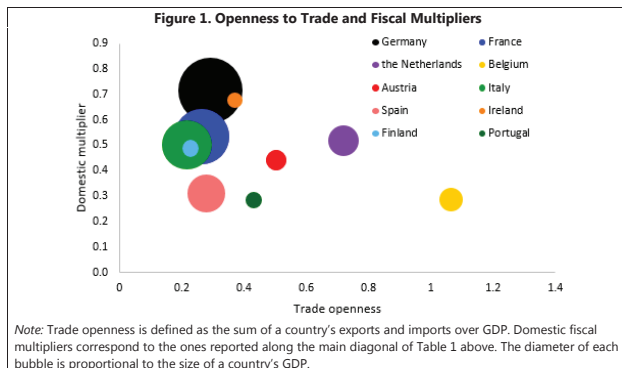
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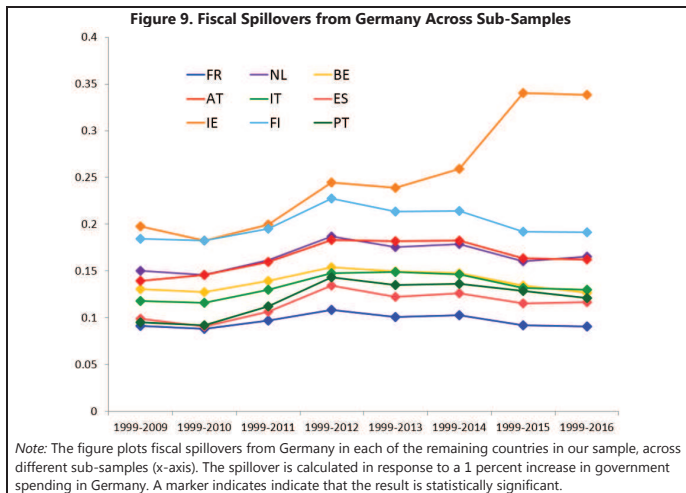
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# Domestic Fiscal Multipliers



More trade openness associated with lower domestic multiplier.  
 EU trade openness = .19! Thus Paul Krugman's argument in favor  
 of *EU-wide* fiscal policy to fight the Great Recession.

# Fiscal Spillovers



Vary substantially, depend on mutual trade and financial flows.

# Evidence from 10 EZ countries

Dabla-Norris et al. (2017)

- Inverse relationship between the size of domestic fiscal multipliers and trade openness.
- Fiscal spillovers are larger:
  - when the source economy is large;
  - among countries that are highly integrated through trade or financial linkages;
  - when the spillover-receiving economy is small and has a narrow export base.

# An argument

Blanchard et al. (2016): in conditions of liquidity trap, core fiscal expansion to offset austerity effects in periphery.

Reis (2016) adds: must have a negative relationship between net exports and the real exchange rate. Then:

increasing core spending will increase its real exchange rate, boosting exports and output in the periphery.

German fiscal expansion would have been procyclical.

Crisis countries not in liquidity trap: hints of spending increases would have increased the interest rates.

Uhlig (2016): dismisses these arguments as politically irrelevant.

However, fiscal expansion did take place due to refugee crisis.

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# This paper: different sizes and strategic interactions

- Back to Cassela (1992): Two countries in a currency union: monetary policies operate as *strategic substitutes*, and the cooperative Nash equilibria require that the smaller of the two countries be given larger, relative to its population, weight in aggregate welfare.
- Extended Casella (1992), allow for a fiscal system [Sibert (1992); Farhi and Werning (2016), Ioannides (2016); (2017)] Model accommodates market reforms and technological progress of the TFP growth type.
- Allow for a fiscal union in the form of international fiscal policy coordination  
Then fiscal policies, assuming currency union, may be *strategic substitutes* or *complements*.

# Digression on Strategic Aspects of Spillovers

Uncoordinated national macro policy creates spillovers (externalities): each country takes the other country's policy as given. *Coordinated* policy, by a common central bank or fiscal authority (compact), *recognizes* spillovers.

- Policies are strategic substitutes, if the other country's policy decreases the marginal effectiveness of your own.
- Policies are strategic complements, if the other country's policy increases the marginal effectiveness of your own.
- Thus: if policies are strategic substitutes, policy setting by the authority that improves one country harms the other. So, if the relative weights for the two countries are too asymmetrical, the smaller country might find it unattractive to participate. Strategic substitutability a sufficient condition for this.

It is an important feature of EU/EZ policy interdependence.

# This paper: cont'd

- If fiscal policies are strategic *substitutes*, we are back to giving smaller country greater weight in aggregate welfare.
- If they are strategic *complements*, then the policies are unrestricted.

Define fiscal policy is defined in terms of proportional wage income tax, and efficiency of taxation differs across countries.

Condition depends crucially on the elasticity of substitution between different varieties of the private tradeable good in the economy, equal to the elasticity of demand when the number of varieties is large.

When this parameter tends to its upper bound, the economies approach perfect competition, international trade vanishes, opportunity from international cooperation becomes irrelevant.

# Model specifics

- Countries A, B; sizes  $2 - \sigma, \sigma$  Policy weights  $2 - \gamma, \gamma$ .

$$U_j = (1 - g) \ln \left( \sum_{i=1}^n c_{ij}^\theta \right)^{1/\theta} + g \ln \Gamma_j, \quad , j = A, B, \quad 0 < \theta < 1,$$

Composite good, tradeable varieties, IRS using labor. Terms of trade do not depend on size, benefits from trade do.  
Benefits from from common monetary policy?

- if cross-country spillovers are strategic *complements*, all cooperative equilibria may be Pareto-superior to the Nash, the outcome of uncoordinated actions.
- if cross-country spillovers are strategic *substitutes*, cooperative equilibria would be Pareto-superior to the Nash equilibrium, the outcome of uncoordinated actions , only if smaller country is given *more* than proportional power.

# Model: Currency Union

- Currency union involves transfer of seignorage: population weights,  $2 - \sigma, \sigma$ , vs policy weights  $2 - \gamma, \gamma$ .

$$\max_{m_A, m_B} : (2 - \gamma)U_A(m_A, m_B) + \gamma U_B(m_A, m_B)$$

subject to: free trade, international monetary equilibrium with fixed exchange rate, public good financed by seignorage.

- Optimal monetary policy:

$$m_A = \min \left\{ 2 - \sigma, (2 - \gamma) \frac{g\theta}{1 - g + g\theta} \right\}, \quad m_B = \min \left\{ \sigma, \gamma \frac{g\theta}{1 - g + g\theta} \right\}.$$

- See Fig. 3A:  $\frac{\gamma}{2} \left( \frac{\sigma}{2} \right)$  minimum weight in monetary union, as function of size.
- With national currencies, per capita public good greater in B. If  $\gamma = \sigma$ , public good per capita equalized, country suffers more the cost of coordination.

# Model: Currency Union with National Fiscal Systems

- Public good financed from national tax and seignorage:

$$\Gamma_j = m_j + (2 - \sigma)\kappa_j\tau_j, j = A, B.$$

- Governments  $j$  sets, given monetary policy,

$$\tau_j = \operatorname{argmax} : U_j(m_A, \tau_A; m_B, \tau_B)$$

- Central bank, taking national fiscal policies as given, sets:

$$\max_{m_A, m_B} : (2 - \gamma)U_A(m_A, m_B) + \gamma U_B(m_A, m_B).$$

- Optimal monetary policy satisfies:

$$\Gamma_A = m_A + (2 - \sigma)\kappa_A\tau_A = \min \left\{ 2 - \sigma, (2 - \gamma) \frac{g\theta}{1 - g + g\theta} \right\},$$

$$\Gamma_B = m_B + \sigma\kappa_B\tau_B = \min \left\{ \sigma, \gamma \frac{g\theta}{1 - g + g\theta} \right\}.$$

- Optimal national fiscal policies

# Model: Currency Union with National Fiscal Systems, cont.

- Public good financed from national tax and seignorage:

$$\Gamma_j = m_j + (2 - \sigma)\kappa_j\tau_j, j = A, B.$$

- Governments  $j$  sets, given monetary policy,

$$\tau_j = \operatorname{argmax} : U_j(m_A, \tau_A; m_B, \tau_B)$$

- Optimal national fiscal policies, taking monetary policy as given:

$$\frac{1}{2 - \sigma} \frac{1}{1 - \tau_A} - \frac{1}{2 - (2 - \sigma)\tau_A - \sigma\tau_B} = \frac{\kappa_A(1 - g + g\theta)}{(1 - g)\theta} \left[ \frac{1}{2 - \gamma} - \frac{1}{2} \right];$$

$$\frac{1}{\sigma} \frac{1}{1 - \tau_B} - \frac{1}{2 - (2 - \sigma)\tau_A - \sigma\tau_B} = \frac{\kappa_B(1 - g + g\theta)}{(1 - g)\theta} \left[ \frac{1}{\gamma} - \frac{1}{2} \right].$$

Can establish properties of optimum national tax rates at Nash equilibrium.

- Interactions between monetary policy and national fiscal policies
- Can define union-wide fiscal policy as fiscal policy coordination.



# Model: Currency Union with Fiscal Union as Fiscal Policy Coordination

Let  $(2 - \varpi, \varpi)$  fiscal policy weights:

$$\frac{2 - \varpi}{2 - \sigma} \frac{1}{1 - \tau_A} - \frac{2}{2 - (2 - \sigma)\tau_A - \sigma\tau_B} = \frac{\kappa_A(1 - g + g\theta)}{(1 - g)\theta} \left[ \frac{2 - \varpi}{2 - \gamma} - 1 \right];$$

$$\frac{\varpi}{\sigma} \frac{1}{1 - \tau_B} - \frac{2}{2 - (2 - \sigma)\tau_A - \sigma\tau_B} = \frac{\kappa_B(1 - g + g\theta)}{(1 - g)\theta} \left[ \frac{\varpi}{\gamma} - 1 \right].$$

Condition, if positive: strategic complements; if negative: strategic substitutes:

$$(2 - \sigma)\sigma(1 - g) \left[ -\frac{1}{\theta} \frac{(2 - \sigma)\kappa_A\sigma\kappa_B(1 - g + g\theta)^2}{4(1 - g)^2} + \frac{1}{(2 - (2 - \sigma)\tau_A - \sigma\tau_B)^2} \geq (<) 0 \right].$$

# Model cont'd

- Allow for debt finance: Provision of the public good:

$$\Gamma_A = \ell_{\Gamma_A} = m_A + (2 - \sigma)[\kappa_A \tau_A + \delta_A d_A - \rho_A D_{A,-1}];$$

$$\Gamma_B = \ell_{\Gamma_B} = m_B + \sigma[\kappa_B \tau_B + \delta_B d_B - \rho_B D_{B,-1}].$$

Tax revenue and borrowing enter as substitutes. Strategic considerations hold.

- Allow for structural reforms:
  - Market reforms: remove arbitrary restrictions on the number of varieties, let free entry: level effect on welfare
  - Model growth in TFP via improvements in fixed and variable costs of production: growth effect on welfare
 Catastrophic failure of current account unless move in tandem.

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# Summary

- In absence of federal budget, spillovers must be recognized as a tool.
- They are not well understood, even across US states, and in presence of a federal fiscal system.
- If recognized, they must heed the size argument: more influence to a smaller country.

# References

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