International Unions

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The Importance of International Unions

- Established to remove barriers to trade and create a single market:
  - Beyond classic free-trade agreements (GATT, WTO)
  - Contract enforcement, regulation, monetary and fiscal policy, ...
- Economic integration has been quite successful, especially in Europe
  - But (often shallower) international unions exist on every continent
  - CARICOM, Mercosur, CEMAC, ASEAN, ...
- But there now seems to be a backlash
  - Economic integration has become increasingly controversial
  - Distributional consequences are not negligible

Modelling International Unions

1. Policy-specific models
   - Currency unions: focus on optimality (Alesina and Barro 2002)
   - Fiscal unions: focus on distribution (Persson and Tabellini 1996)
2. The lens of fiscal federalism
   - Key insights from Oates (1972)
   - But with endogenous members (Alesina, Angeloni and Etro 2005)
3. Why multi-level governance?
   - Response to globalization (Gancia, Ponzetto and Ventura 2022)
   - Endogenous accountability (Boffa, Piolatto and Ponzetto 2016)
4. What next?
   - Return to distributional issues (Gancia, Pozetto and Ventura 2020)
   - Quantitative analysis (Caliendo et al. 2021; Yesilbayraktar 2023)

Currency Unions

- The most common international unions after customs union
  - Special because unilateral adoption is possible
- Cost intituitively known since Mundell (1961)
  - Downard wage rigidity hinders balance-of-payment adjustment

1. The currency of the surplus country must appreciate
2. Or the surplus country must suffer inflation
3. Or the deficit country must suffer unemployment

- Alesina and Barro (2002) model two offsetting benefits

1. Sharing a currency promotes international trade
2. A shared currency may be a commitment to monetary stability

Currency Unions and Trade

- The forgotten first half of Alesina and Barro (2002)
  - Probably forgotten because it is very clunky
- Main ingredients of a classic trade model
  1. Differentiated varieties with markup pricing
  2. Iceberg transport costs

$\Rightarrow$ Monetary surprises have real effects

  1. Undoing intendend markups is expansionary
  2. It also manipulates the terms of trade

Currency Unions and Credibility

- The justly celebrated second half of Alesina and Barro (2002)
- Loss function from a classic monetary model

$$\mathcal{L}_i = a\pi_i + \frac{\gamma}{2}\pi_i^2 + \frac{\theta}{2}\left[\phi\left(\pi_i - \mathbb{E}\pi_i\right) - z_i - \eta_i\right]^2$$

  1. Convex costs of realized inflation: $a \geq 0$, $\gamma > 0$
  2. Target for inflation surprise: $z_i > 0$ (increasing in intended markups)
  3. Stochastic mean-zero i.i.d. markup shock η_i

Discretionary Monetary Policy

- The central bank observes η_i and $\mathbb{E}\pi_i$. Thus, it chooses

$$\pi_i = \frac{\theta\phi\left(\phi\mathbb{E}\pi_i + z_i + \eta_i\right) - a}{\gamma + \theta\phi^2}$$

- Price-setting firms have rational expectation $\mathbb{E}\eta_i = 0$ and

$$\mathbb{E}\pi_i = \frac{\theta\phi z_i - a}{\gamma}$$

- Rational-expectation equilibrium

$$\pi_i = \frac{\theta\phi z_i - a}{\gamma} + \frac{\theta\phi}{\gamma + \theta\phi^2}\eta_i$$

- Inflation bias $\theta\phi z_i/\gamma$
  - Vain attempt to produce inflation surprises every period
  - Frustrated by sufficiently high expectations and high costs

The Quest for Credibility

- Expected loss from discretionary policy

$$\mathbb{E}\mathcal{L}_i = \frac{1}{2}\left[\frac{(\theta\phi z_i)^2 - a^2}{\gamma} + \theta z_i^2 + \frac{\gamma\theta}{\gamma + \theta\phi^2}\mathbb{E}\eta_i^2\right]$$

- The central bank would like to precommit instead to

$$\pi_i^* = -\frac{a}{\gamma} + \frac{\theta\phi}{\gamma + \theta\phi^2}\eta_i$$

- Removing inflation bias would reduce the loss by $(\theta\phi z_i)^2/\gamma$
- But the country lacks credibility to do this

Outsourcing Credibility

- Another country j has credibility and can precommit to

$$\pi_j^* = -\frac{a}{\gamma} + \frac{\theta\phi}{\gamma + \theta\phi^2}\eta_j$$

- Country i can adopt country j's currency
  - Credible commitment: costly to bring back an obsolete currency

1. The credible country stabilizes its own i.i.d. markup shock η_j
2. Different consumption baskets imply different inflation rates

$$\pi_i^j = -\frac{a}{\gamma} + \frac{\theta\phi}{\gamma + \theta\phi^2}\eta_j + \varepsilon_{ij}$$

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  - Mean-zero i.i.d. error term ε_{ij}

Who Wants an Anchor?

- Net gain from adopting j's currency

$$2\left(\mathbb{E}\mathcal{L}_i - \mathbb{E}\mathcal{L}_i^j\right) = \frac{\left(\theta\phi z_i\right)^2}{\gamma} - \left(\gamma + \theta\phi^2\right)\sigma_\varepsilon^2 - \frac{\theta^2\phi^2}{\gamma + \theta\phi^2}\mathbb{E}\left[\left(\eta_i - \eta_j\right)^2\right]$$

- High for a country i with
  1. a large commitment problem: high z_i (non-competitive market)
  2. a similar inflation basket: low σ_ε^2
  3. similar markup shocks: low $\mathbb{E}\left[\left(\eta_i - \eta_j\right)^2\right]$

Dollarization vs. Currency Union

- The anchor country adapts policy because there are transfers
  - If only seignorage transfers
- With transferable utility: jointly optimal monetary policy
  - But utility is probably not transferable across governments
- Avoiding terms-of-trade manipulation
  - Beggar-thy-neighbour policy makes inflation even more desirable
  - A currency union should remove this force in all members
  - Pro-competitive instead of manipulative policy, even for the anchor
  - But Alesina and Barro (2002) themselves fail to discuss this

Fiscal Unions

- You can study fiscal policy just like monetary policy
  - One reading of Farhi and Werning's (2017) constrained optima
- But you could (should) pay more attention to political economy
- Well worth rediscovering Persson and Tabellini (1996a, b)
  - Cross-cutting divides by country and by class

1. Moral hazard
   - Insured countries will run worse macro policies
2. "Adverse selection" (not precisely, but same logic)
   - Insurance redistributes from good to bad risks

Unemployment Risk

- Continuum of individuals indexed by i
- Common concave utility function $U(.)$
- Uninsurable stochastic income realization
  - With probability p^i the agent is employed and earns 1
  - With probability $1 - p^i$ they are unemployed and earn 0

1. Aggregate country risk: employment rate p
   - $p = \gamma$ with probability Q
   - $p = \beta < \gamma$ with probability $1 - Q$
2. Idiosyncratic individual risk: $p^i = p\pi^i$
   - π^i has mean 1 and median $\pi^m \geq 1$
   - Each agent's π^i is their private information

Policy Instruments

1. Social insurance
   - Consumption $c(p)$ for the employed and $b(p)$ for the unemployed
   - Lump-sum transfers and anonymous taxes (e.g., VAT)
2. Public investment g
   - Probability of good state: $Q(g)$ increasing and concave in g

- Aggregate budget constraint

$$p = pc(p) + (1-p)\, b(p) + g$$

- Individual expected utility
  - Unconditional

$$v^i \equiv Q(g)\, V^i(\gamma) + [1 - Q(g)]\, V^i(\beta)$$

  - Conditional

$$V^i(p) \equiv \pi^i p U(c(p)) + \left(1 - \pi^i p\right) U(b(p))$$

The Median Voter Theorem

- Unidimensional heterogeneity π^i
- Additively separable preferences

$$v^i = QU\left(b\left(\gamma\right)\right) + \left(1-Q\right)U\left(b\left(\beta\right)\right) + \pi^i\left[Q\gamma\Delta_U\left(\gamma\right) + \left(1-Q\right)\beta\Delta_U\left(\beta\right)\right]$$

  - Endogenous value of employment

$$\Delta_U\left(p\right) \equiv U\left(c\left(p\right)\right) - U\left(b\left(p\right)\right)$$

$\Rightarrow$ The median-voter theorem applies

  - Projection of three-dimensional policy on one-dimensional preferences

- This property keeps holding at the union level too

Domestic Social Insurance

- The median voter's first-order condition for consumption

$$\frac{\pi^m p}{p} U'(c(p)) = \frac{1-\pi^m p}{1-p} U'(b(p))$$

- Full social insurance if and only if $\pi^m = 1$:

$$c(p) = b(p) = p - g$$

- Underinsurance if $\pi^m > 1$
  - Probably true, certainly important across countries
  - But start considering $\pi^m = 1$: local welfare maximization

Public Investment

- With full social insurance, everyone has expected utility

$$\bar{v} = Q(g)\, U(\gamma - g) + [1 - Q(g)]\, U(\beta - g)$$

- Thus, everyone desires investment g such that

$$Q'(g)\,[U(\gamma - g) - U(\beta - g)] = Q(g)\, U'(\gamma - g) + [1 - Q(g)]\, U'(\beta - g)$$

  - Assume a unique interior maximum

Two Countries with Independent Shocks

- Symmetric foreign country, denoted by asterisks as usual
- Four possible states for aggregate output
  1. Unionwide expansion: 2γ with probability $Q(g)\,Q(g^*)$
  2. Foreign recession: $\gamma+\beta$ with probability $Q(g)\,[1-Q(g^*)]$
  3. Domestic recession: $\beta+\gamma$ with probability $[1-Q(g)]\,Q(g^*)$
  4. Unionwide recession: 2β with probability $[1-Q(g)]\,[1-Q(g^*)]$
- Obvious scope for international insurance in states (2) and (3)
- But then how do g and g^* respond?

Alternative Institutional Arrangements

- How policy is chosen matters crucially

1. Does the union transfer to countries or to individuals?
   - A stylized representation of the EU vs. the US
   - Though in reality both use both systems (to different extents)
2. Does the union have commitment power?
   - Can it set policy before the two countries do?

Inter-Governmental Transfers

- Union policy $\tau \in [0,1]$: net transfer from home to foreign

$$\frac{\tau}{2}\left(p - p^*\right)$$

1. Not state-contigent $\Rightarrow$ no ex-ante redistribution
   - Also because of symmetry: wait for "adverse selection"
2. Not contingent on investment g or g^*
   - Not verifiable by the union: hence moral hazard
3. Only influences national policy choices via resource constraints

$\Rightarrow$ Domestic social insurance

$$c\left(g,\tau;p,p^*\right) = b\left(g,\tau;p,p^*\right) = p - g - \frac{\tau}{2}\left(p - p^*\right)$$

Utopian Cooperation

- Utilitarian welfare maximization = cooperative decision-making

$\Rightarrow$ Full international risk-sharing: $\tau = 1$

$\Rightarrow$ First-best investment $g = g^* = g_1$ such that

$$2Q'(g_1)\,\delta(g_1, g_1, 1) = \lambda(g_1, g_1, 1)$$

1. Marginal domestic benefit of public investment: $Q'(g)\,\delta(g, g^*, \tau)$
2. Marginal (domestic) cost of public investment $\lambda(g, g^*, \tau)$

- Symmetric investment + full risk-sharing = symmetric benefits
  - True at the first best, but not for other values
  - Beware of Equation (3.6) in the article: misleading if not wrong

Neither Cooperation Nor Commitment

- Simultaneous non-cooperative game between benevolent governments
  - Domestic government sets g to maximize domestic welfare v
  - Foreign government sets g^* to maximize foreign welfare v^*
  - Union government sets τ to maximize union welfare $v + v^*$

$\Rightarrow$ Full international risk-sharing: $\tau = 1$

- Everyone wants this, so it happens without cooperation

$\Rightarrow$ Insufficient investment $g = g^* = g_3$ such that

$$Q'(g_3)\,\delta(g_3, g_3, 1) = \lambda(g_3, g_3, 1)$$

- Moral hazard $\Rightarrow$ free riding on each other's investment

Commitment without Cooperation

- Can the union do better? With commitment, yes
- If the union sets τ first, countries will set $g = H(\tau)$ such that

$$Q'(g)\,\delta(g, g, \tau) - \lambda(g, g, \tau) = 0$$

  - The assumptions that made v well behaved ensure $H'(\tau) < 0$
- Anticipating this behavior, the union sets τ such that

$$v_{g^*}(H(\tau), H(\tau), \tau)\,H(\tau) + v_\tau(H(\tau), H(\tau), \tau) = 0$$

$\Rightarrow$ Imperfect international insurance: $\tau < 1 \Rightarrow H(\tau) > H(1) = g_3$

  - Reduce international insurance a little: second-order loss
  - Induce countries to invest more: first-order gain
- Since the union is benevolent, this is the true second best

Federal Social Insurance

- Can the union commit not to implement full insurance ex post?
  - Hard when everyone in every country wants it
  - Think about solemnly forbidden Eurozone bailouts
- There is scope for commitment in heterogeneity
  - But how can a constitutional designer exploit it?
- Direct federal taxes and transfers such that

$$c\left(p,p^{*}\right)=1-t\left(p,p^{*}\right)\left(1-p\right)-\tau\left(1-\frac{p+p^{*}}{2}\right)-g$$

$$b\left(p,p^{*}\right)=t\left(p,p^{*}\right)p+\tau\frac{p+p^{*}}{2}-g$$

  - As before, only national policy can be state-contingent

Partisan Federal Politicians

- Benevolent governments are in the same bind as before
- But what if the union government is not benevolent?
- The federal president cannot discriminate across countries
  - So it does not matter which country they come from
- But with social insurance they can redistribute across individuals
- Let them maximize the welfare of agents with idiosyncratic risk π^F
  - Comes from and represents a social group with type π^F
  - E.g., rich/poor, urban/rural, manufacturing/services

$\Rightarrow$ If $\pi^F > 1$ the elite does not want full insurance given (g, g^*)

  - That would redistribute from the elite group to less favored ones

Strategic Delegation

- Simultaneous game with a partisan federal president setting τ

1. Benevolent country governments complete social insurance

$$t\left(p,p^{*}\right)=t^{*}\left(p,p^{*}\right)=1-\tau$$

2. They're forced to do it locally, so they also invest

$$\pi^{F}>1\Rightarrow\tau<1\Rightarrow g=H\left(t\right)>H\left(1\right)=g_{3}$$

$\Rightarrow$ Implement the commitment outcome by choosing the right $\pi^{F}>1$

- Conservative bias in federal politics
  - A pretty common result: also monetary policy, capital taxation
  - Harder to come up with strategic delegation to progressives

Fitting the Same Model to a Different Problem

- You cannot tractably study everything at once

1. Return to the general case $\pi^i > 1$
   - Unemployment risk is concentrated in a vulnerable group
   - The median voter is not a benevolent welfare maximizer
2. Disregard investment g in macroeconomic stability
   - Formally, $Q(g) = Q$ for all g, so $g = 0$ is always optimal
3. Assume there is no unionwide uncertainty
   - When one country booms the other slumps
   - Thus, $Q = 1 - Q^*$ and unionwide output is always $\beta + \gamma$
4. Allow a fully general net transfer from home to foreign

$$\frac{\tau}{2}(p - p^*) - \kappa$$

   - Two parameters are enough because there are only two states

State-Contingent Inter-Governmental Transfers

- Simultaneous policy setting
  - The median voter sets $b^m(p, p^*)$ expecting equilibrium τ and κ
  - The union sets τ and κ expecting equilbrium $b^m(p, p^*)$

$\Rightarrow$ Off equilibrium, federal policy determines

$$c(p, p^*) = \frac{1}{p}\left[p - \frac{\tau}{2}(p - p^*) + \kappa - (1 - p)\, b^m(p, p^*)\right]$$

- Thus, for marginal deviations from equilibrium

$$\frac{\partial v^i}{\partial \tau} = \pi^i \frac{\gamma - \beta}{2}\left[(1 - Q)\, U'(c^m(\beta, \gamma)) - QU'(c^m(\gamma, \beta))\right]$$

$$\frac{\partial v^i}{\partial \kappa} = \pi^i \left[QU'(c^m(\gamma, \beta)) + (1 - Q)\, U'(c^m(\beta, \gamma))\right]$$

Efficient State-Contingent Transfers

- Domestic heterogeneity does not matter at the union stage
  - Marginal effect of deviations from equilibrium proportional to π^i

$\Rightarrow$ Any Pareto-efficient policy sets

$$\frac{U'\left(c^m\left(\beta,\gamma\right)\right)}{U'\left(c^{*m}\left(\beta,\gamma\right)\right)}=\frac{U'\left(c^m\left(\gamma,\beta\right)\right)}{U'\left(c^{*m}\left(\gamma,\beta\right)\right)}=\delta$$

for some relative weight δ of the foreign country

- Interregional insurance: complete markets conditional on employment
  - Common marginal rate of substitution across states
  - As if facing Arrow-Debreu securities with a common price
- But the unemployed may be victim of a non-benevolent median voter

Constrained v. Unconstrained Efficiency

- If $\pi^m = 1$, there is unconstrained efficiency and full insurance

$\Rightarrow$ Individuals have perfect consumption smoothing

$$c^m(\gamma, \beta) = c^m(\beta, \gamma) = b^m(\gamma, \beta) = b^m(\beta, \gamma)$$

- If $\pi^m > 1$, there is only constrained efficiency
  - imperfect insurance within country spoils cross-country insurance

$\Rightarrow$ With log utility: consumption smoothing conditional on employment

$$c^m(\gamma, \beta) = c^m(\beta, \gamma) > b^m(\beta, \gamma) > b^m(\gamma, \beta)$$

  - The median voter is very stingy to losers in good times
  - Even the privileged may get fired in recessions, but otherwise ...

Efficiency and Distribution

- Efficiency (even unconstrained) $\neq$ utilitarian welfare maximization
- One country may have higher consumption than the other throughout
- Why would this happen?

1. Intergovernmental bargaining
   - The country facing the greatest risk is keener on insurance
   - Thus, it has a weaker bargaining hand
   - It ends up paying an "insurance premium"
2. Voting
   - The less politically influential country gets exploited
   - Ravenously if by the median voter $\Rightarrow$ a welfare disaster
   - Other models of voting are less pessimistic here

Simple Inter-Governmental Transfers

- What if the union does not allow regressive redistribution? $\kappa = 0$
- Then all that is left is

$$\frac{\partial v^i}{\partial \tau} = \pi^i \frac{\gamma - \beta}{2} \left[(1 - Q) U' \left(c^m (\beta, \gamma) \right) - Q U' \left(c^m (\gamma, \beta) \right) \right]$$

1. All voters in the home country want τ such that

$$\frac{U' \left(c^m (\beta, \gamma) \right)}{U' \left(c^m (\gamma, \beta) \right)} = \frac{Q}{1 - Q}$$

2. All voters in the foreign country want τ such that

$$\frac{U' \left(c^m (\beta, \gamma) \right)}{U' \left(c^m (\gamma, \beta) \right)} = \frac{1 - Q}{Q}$$

   - Identical medians and $\kappa = 0$ imply $c^m (x, y) = c^{*m} (y, x)$
   - No unionwide uncertainty means $Q^* = 1 - Q$

A Distributive Fight Across States

- Everyone wants to consume more in the more common state
  - More aggressively the more common it is (high $|Q - 1/2|$)
- With log utility we can solve explicitly

$$c^m(p, p^*) = \pi^m \left[p - \frac{\tau}{2}(p - p^*) \right]$$
$$\geq b^m(p, p^*) = \frac{1 - \pi^m p}{1 - p} \left[p - \frac{\tau}{2}(p - p^*) \right]$$

- So the desired transfer rates are

$$\tau = 1 - 2\frac{\beta + \gamma}{\gamma - \beta}\left(Q - \frac{1}{2}\right) \text{ and } \tau^* = 1 + 2\frac{\beta + \gamma}{\gamma - \beta}\left(Q - \frac{1}{2}\right)$$

Underinsurance

- Iff $Q = 1/2$ there is symmetry and full international insurance
  - In the sense of complete markets conditional on employment
- Otherwise, let's go back to the bargaining table
- The safest, richest country used to provide full insurance
  - But it could extract an insurance premium $\kappa > 0$
- If insurance is the only policy on the table, it will be underprovided

$$c^m(\gamma, \beta) > c^m(\beta, \gamma) > b^m(\beta, \gamma) > b^m(\gamma, \beta)$$

  - With log utility, so $c^m(\gamma, \beta) = c^m(\beta, \gamma)$ under full insurance
- The more asymmetric the countries, the less insurance is provided
  - The equilibrium value of τ is declining in $|Q - 1/2|$

Federal Social Insurance

- Direct federal taxes and transfers such that

$$c\left(p,p^{*}\right)=1-t\left(p,p^{*}\right)\left(1-p\right)-\tau\left(1-\frac{p+p^{*}}{2}\right)-g$$

$$b\left(p,p^{*}\right)=t\left(p,p^{*}\right)p+\tau\frac{p+p^{*}}{2}-g$$

- No improvement in inter-governmental bargaining
  - Just as in the case of moral hazard
- But with a union-wide vote, cross-country coalitions will form
  - Essentially, voting by class rather than by country
  - *Proletarier aller Länder vereinigt Euch!*

Preferences over Federal Taxes

- Domestic policy set by the median voter $\pi^m \Rightarrow$ there is a voter

$$\pi^i = \Pi\left(\tau, Q; \pi^m\right)$$

whose favorite federal policy is exactly τ

1. Voters with greater idiosyncratic risk prefer higher taxes: $\partial\Pi/\partial\tau < 0$
2. Voters living in riskier countries prefer higher taxes: $\partial\Pi/\partial Q < 0$
3. The median voter wants full international insurance iff $Q = 1/2$
   - In particular $1 = \Pi\left(1, 1/2; 1\right)$; if $\pi^m > 1$ the relevant tax rate is not 1

The Median Federal Voter

- As Q rises above $1/2$
  1. Some high-risk voters at home stop supporting high taxes
  2. Some low-risk voters abroad start supporting them
- Equilibrium taxes are intermediate between the median bliss points
  - The median federal voter must be in between the two local medians
- Low-risk voters gained abroad $>$ high-risk voters lost at home
  1. Skewed risk distribution: there are more low-risk voters
  2. Concave welfare function: losers react more than winners

$\Rightarrow$ Federal taxes rise above the full-insurance level

- A move in the direction of utilitarian welfare maximization
- The larger the greater $|Q - 1/2|$

The Problem with Welfare Maximization

- A single federal election tends to benefit the poor and at risk
  - At least relative to inter-governmental bargaining
- This is probably true even with intergovernmental transfers
  - Intensive margin: the needy care more and vote more for transfers
  - Not quite true empirically of poor people, but poor regions maybe
- A tension emerges with participation of the low-risk region
  - Its median voter may lose from the equilibrium policy
- Then a participation constraint becomes binding
  - The low-risk region reduces redistribution by threatening to secede
  - But if the threat is not credible ex post, it won't join the union ex ante

Classic Theory of Fiscal Federalism

- Oates (1972): seminal economic theory of shared policymaking

1. Centralization allows coordination in the presence of externalities
   - By assumption governments are local welfare-maximizers
   - Why can't local government cooperate effectively?
2. Centralization yields cost savings from economies of scale
   - If there are economies of scale: public goods vs. public services
3. Decentralization allows policies tailored to local preferences
   - By assumption the central government sets uniform policies
   - Why can't it provide locally differentiated public goods?

The Decentralization Theorem

1. No externalities in costs or benefits, homogeneous preferences
   $\Rightarrow$ Centralization and decentralization are equally efficient
2. No externalities in costs or benefits, heterogeneous preferences
   $\Rightarrow$ Decentralization is more efficient than centralization
3. Externalities in costs or benefits, homogeneous preferences
   $\Rightarrow$ Centralization is more efficient than decentralization

- Remarkably general statement more than a narrow formal theorem

From Fiscal Federalism to Political Geography

- Classic question on fiscal federalism: how?
  - How a given country is organized, or manages one policy
- Additional question on an international scale: who?
  - Which regions form a country?
  - Which countries form a union?
- Alesina's models based on Oates's trade-off
  - Alesina and Spolaore (1997, 2003) on country size
  - Alesina, Angeloni and Etro (2005) on international unions

Public-Good Provision with Spillovers

- A group of equally sized countries
  - Unit population and income y
  - Heterogeneous preferences for public goods
- Welfare in an independent country i:

$$U_i = y - g_i + \alpha_i \ln g_i$$

  - Preference parameter $\alpha_i > 0$
- Spillovers $\beta \in (0, 1)$ in a union with N members:

$$U_i = y - g_i + \alpha_i \ln \left((1 - \beta) g_i + \beta \sum_{j=1}^{N} g_j \right)$$

  - Identically economies of scale

Policy Uniformity

- Classic constraint: rigid union $g_i = g$ for all $i = 1, 2, ..., N$
- Welfare in member i:

$$U_i = y - g + \alpha_i \ln \left[(1 - \beta + \beta N) g \right]$$

- Bliss point:

$$g_i^* = \alpha_i$$

  - Independent of β and N with log utility
  - Substitution and income effects cancel out

The Value of a Rigid Union

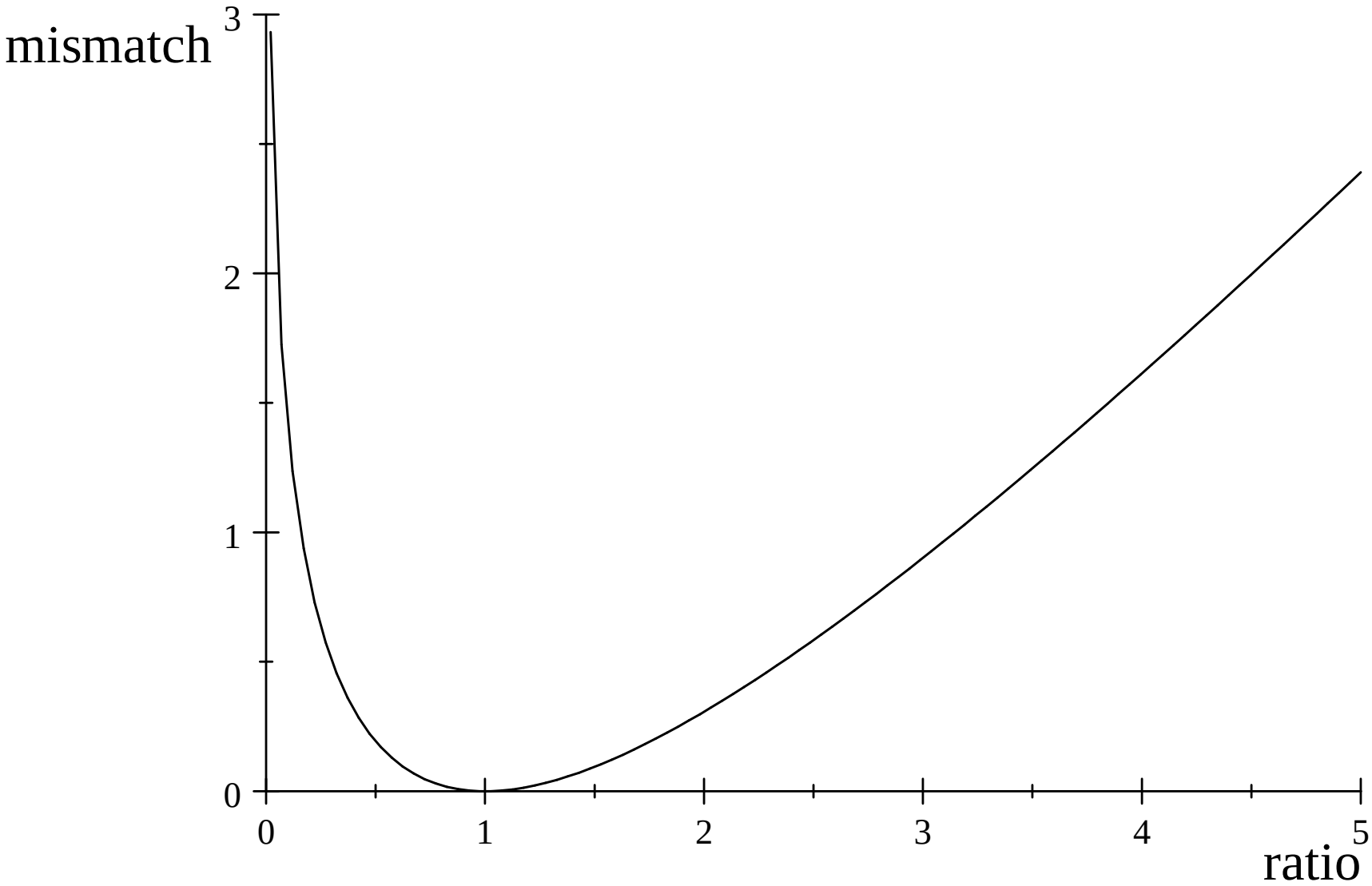
- Union policy is set by the median voter: $g = \alpha_m$
- Value of union membership for country i:

$$\Delta_i \equiv y - \alpha_m + \alpha_i \ln\left[\left(1 - \beta + \beta N\right)\alpha_m\right] - \left(y - \alpha_i + \alpha_i \ln \alpha_i\right)$$

$$\frac{\Delta_i}{\alpha_i} = \underbrace{\ln\left(1 - \beta + \beta N\right)}_{\text{spillovers}} - \underbrace{\left(\frac{\alpha_m}{\alpha_i} - \ln\frac{\alpha_m}{\alpha_i} - 1\right)}_{\text{preference mismatch}}$$

- Spillovers: monotone increasing in β and N
- Preference mismatch: convex, unique minimum at $\alpha_i = \alpha_m$

Preference Mismatch



Formation of a Rigid Union

- Initial union formation: unilateral membership

  $\Rightarrow$ In if $\Delta_i > 0$, out if $\Delta_i < 0$

1. Countries with contiguous preferences
2. Greater spillovers $\beta \Rightarrow$ larger union N

- In general, multiple equilibria with self-fulfilling α_m
  - No theory of equilibrium selection: historical chance?

Closing the Union Door

- Suppose a union has been formed
- Then it votes on admitting a new member
  - By simple majority; easily extended to other rules

1. Greater spillovers $\Rightarrow$ good for everyone
2. But the old median member yields to a new one
   - Good for the minority closer to the new median
   - Bad for the majority closer to the old median

Status Quo Bias

- Suppose the would-be entrant is to the right of the old median

1. The old median must be willing to yield power

$$\ln(1+\beta N) - \left(\frac{\alpha_{m'}}{\alpha_m} - \ln\frac{\alpha_{m'}}{\alpha_m} - 1\right) \geq \ln(1-\beta+\beta N)$$

   - Everyone to its right will be doubly happy

2. The left-most member must be willing to stay

$$\ln(1+\beta N) - \left(\frac{\alpha_{m'}}{\alpha_{\min}} - \ln\frac{\alpha_{m'}}{\alpha_{\min}} - 1\right) \geq 0$$

   - Or else the old median would have nothing to gain

$\Rightarrow$ The median voter cannot change too much

   - More leeway for large β, opposite effects of large N

A Veto Player

- Suppose the left-most member was indifferent:

$$\ln\left(1-\beta+\beta N\right)=\frac{\alpha_m}{\alpha_{\min}}-\ln\frac{\alpha_m}{\alpha_{\min}}-1$$

- Then he is the veto player: majority rule = unanimity
  - Convexity of preference mismatch
  - If the left-most member doesn't lose, everyone else gains
- Admission of a new member if and only if:

$$\ln\frac{1+\beta N}{1-\beta+\beta N}\geq\frac{\alpha_m}{\alpha_{\min}}\left(\frac{\alpha_{m'}}{\alpha_m}-1\right)-\ln\frac{\alpha_{m'}}{\alpha_m}$$

1. The union is initially small (LHS decreasing in N)
2. The union is initially homogeneous (RHS increasing in $\alpha_m/\alpha_{\min}$)

Multiple Public Goods

- Additively separable utility:

$$U_i = y - \sum_{k=1}^{F} g_i^k + \alpha_i \sum_{k=1}^{F} \ln\left((1-\beta_k)\, g_i^k + \beta \sum_{j=1}^{N} g_j^k \right)$$

- Crucially different union decision rules

1. Every policy set by majority rule
2. Sequantial voting by majority rule
    1. Which public goods the union can provide
    2. How much of each of them it should provide

The Value of Enumerated Powers

- The value of entrusting policy k to the union is

$$\frac{\Delta_i^k}{\alpha_i} = \ln\left(1-\beta^k+\beta^k N\right) - \left(\frac{\alpha_m}{\alpha_i} - \ln\frac{\alpha_m}{\alpha_i} - 1\right)$$

- Many countries are willing to entrust high-β^k policies
- But few are willing to let the median voter decide everything

$\Rightarrow$ Sequential voting induces a union

1. with more members
2. with fewer centralized policies
3. that a majority of members prefer to an unconstrained union

- Classic time-inconsistency bias
  - Enumerated powers may even be Pareto dominant

Shared Responsibility

- What if both countries and the union can provide the public good?

$$U_i = y - g_i - g_U + \alpha_i \ln \left[(1-\beta)(g_i + g_U) + \beta \sum_{j=1}^{N} (g_j + g_U) \right]$$

- Policy differentiation vs. free riding
- The timing of policy choice matters: who's the free rider?
  1. Countries set g_i first, the union mandates g_U later
  2. The union mandates g_U first, countries can add g_i later

Subsidiarity

- Suppose the union moves last
- Once $\{g_i\}$ has been set, the median voter tops up to α_m:

$$g_U = \alpha_m - \frac{(1-\beta)\, g_m + \beta \sum_{j=1}^{N} g_j}{1-\beta+\beta N}$$

- The median voter sets $g_m = 0$ and uses g_U instead
  - Why do it alone when you can force others too?
- Country $i \neq m$ anticipates

$$\frac{\partial g_U}{\partial g_i} = -\frac{\beta}{1-\beta+\beta N}$$

- Free-riding incentive: provide less, let the union do it
  - Marginal benefit scales by $1-\beta$
  - Marginal cost by $1-\beta/\left(1-\beta+\beta N\right) > 1-\beta$

Equilibrium with Subsidiarity

- Countries that really care about public goods provide them

$$g_i = \left(1 + \frac{\beta N}{1-\beta}\right)\left(\frac{1-\beta}{1-2\beta+\beta N}\alpha_i - \alpha_m\right)$$

- Threshold α_i/α_m for provision: increasing in N and β
  - Stronger incentives to free ride
- A majority of countries loves subsidiarity
  - They get the same by paying less and free riding
- But those that do use flexibility may hate being exploited
  - Then again they need not: e.g., everyone likes it for $N = 3$

Federal Mandates

- Suppose the union moves first
- Once g_U has been set, some countries top up to α_i:

$$g_i = \alpha_i - (1 - \beta + \beta N)\, g_U - \beta \sum_{j \neq i} g_j$$

- The union shades g_U to force them to top up

$\Rightarrow$ They are even more exploited than with subsidiarity

- Low α_i: federal mandates $\succ_i$ subsidiarity $\succ_i$ rigid union
- High α_i: subsidiarity $\succ_i$ federal mandates

Implementing the First Best?

- A flexible union can attain the first best if it wants to
  - It yields spillovers without imposing policy uniformity
- But will it want to? Probably not
- One special structure in which it does
  1. Median α_m = average $\bar{\alpha}$
  2. Policy restricted to a uniform Pigouvian subsidy

  - Then the union chooses the optimal Pigouvian subsidy
  - But how do countries agree on that policy lever?

Endogenous Countries in Endogenous Unions

- Endogenous formation of both unions and countries
  - Membership in both is a choice: ask the United Kingdom
  - Gancia, Ponzetto and Ventura (2022)
- Globalization makes trade-hampering borders costlier
  - Growing mismatch: global markets, local public goods
- Political structure reacts non-monotonically

1. First, remove costly borders by increasing country size
   - Tempting to do it in a violent and exploitative way
2. Then, remove cost of borders by creating international unions
   - Reduction in efficient country size
   - Greater appeal of peaceful and equitable methods

A Symmetric World

- Continuum of atomistic localities $l \in [0, 1]$
- Welfare of locality l's representative agent:

$$W_l = W_l^M + W_l^G$$

1. Utility W_l^M from consumption of market-traded goods
2. Utility W_l^G from government-provided services

- Political structure (P, R)
  - Public-service partition P with elements P_n
  - Regulation partition R with elements R_n
- Single-level governance: $P = R$
  - Countries provide both public services and market regulation
- Multi-level governance: $P < R$
  - Countries provide public services, international unions regulate markets

Markets: Production and Trade

1. "Ricardian" gains from trade
   - Each place is good at making place-specific varieties
     - ★ Spanish wine, Belgian beer
   - Ersatz varieties are worse: $e^{-\eta} < 1$
2. Physical transport costs
   - Harder to sell at a distance: $e^{-\tau} < 1$
   - Getting easier with globalization: $\gamma = \eta - \tau \in [0, \eta]$
3. Policy-induced border effects $\beta \in (0, 1)$
   - Share β of industries can be traded only with common regulation
   - Cost of borders: lost gains from trade γ in share β of industries

- Utility from consumption of market-traded goods

$$W_l^M = -\eta + \gamma \left(1 - \beta + \beta \int_0^1 I_{l=m}^R dm \right)$$

Governments: Public Services

- Public services
  - Differentiated varieties $x \in [0,1]$
  - Basket described by density $g_l(x)$

1. Heterogeneous preferences
   - Locality l desires only its ideal variety
   - Preference mismatch δ : $u(g_l(l)) = -\delta / g_l(l)$
2. Economies of scale: fixed cost ϕ of a government
3. Economies of scope: cost κ of union membership

- Utility from government-provided services

$$W_l^G = -\frac{\delta}{g_l(l)} - \frac{\phi}{\int_0^1 I_{l=m}^P dm} - \kappa I_l^U$$

Efficient Political Structures

- Efficient symmetric bargaining

$$(P, R) = \arg\max \int_0^1 W_l dl$$

1. Uniform provision of public services

$$g_l(x) = \frac{I^P_{l=x}}{\int_0^1 I^P_{l=m} dm}$$

2. Equal-sized elements of P and R
   - Respective sizes S and U
3. Unions comprise entire countries (P is a refinement of R)

$$W_l = W^F(S, U) = -\eta + \gamma(1 - \beta + \beta U) - \delta S - \frac{\phi}{S} - \kappa \mathbf{1}_{S \neq U}$$

Equilibrium Political Structure with Diplomacy

1. Without international unions $P = R$: welfare

$$W^F\left(S_1^*, S_1^*\right) = -\eta + \gamma\left[1 - \beta(1 - S_1^*)\right] - \delta S_1^* - \frac{\phi}{S_1^*}$$

size of countries

$$S_1^* = \sqrt{\frac{\phi}{\delta - \beta\gamma}}$$

2. With a world union $P < R = \{[0,1]\}$: welfare

$$W^F\left(S_2^*, 1\right) = -\eta + \gamma - \delta S_2^* - \frac{\phi}{S_2^*} - \kappa$$

size of countries

$$S_2^* = \sqrt{\frac{\phi}{\delta}}$$

- Peaceful equilibrium: $W_I^* = \max\left\{W^F\left(S_1^*, S_1^*\right), W^F\left(S_2^*, 1\right)\right\}$

The Evolution of Political Structure

- No reason for unions in autarky

$$\gamma = 0 \Rightarrow W^F\left(S_1^*, S_1^*\right) - W^F\left(S_2^*, 1\right) = \kappa > 0$$

- Globalization makes multi-level governance more attractive

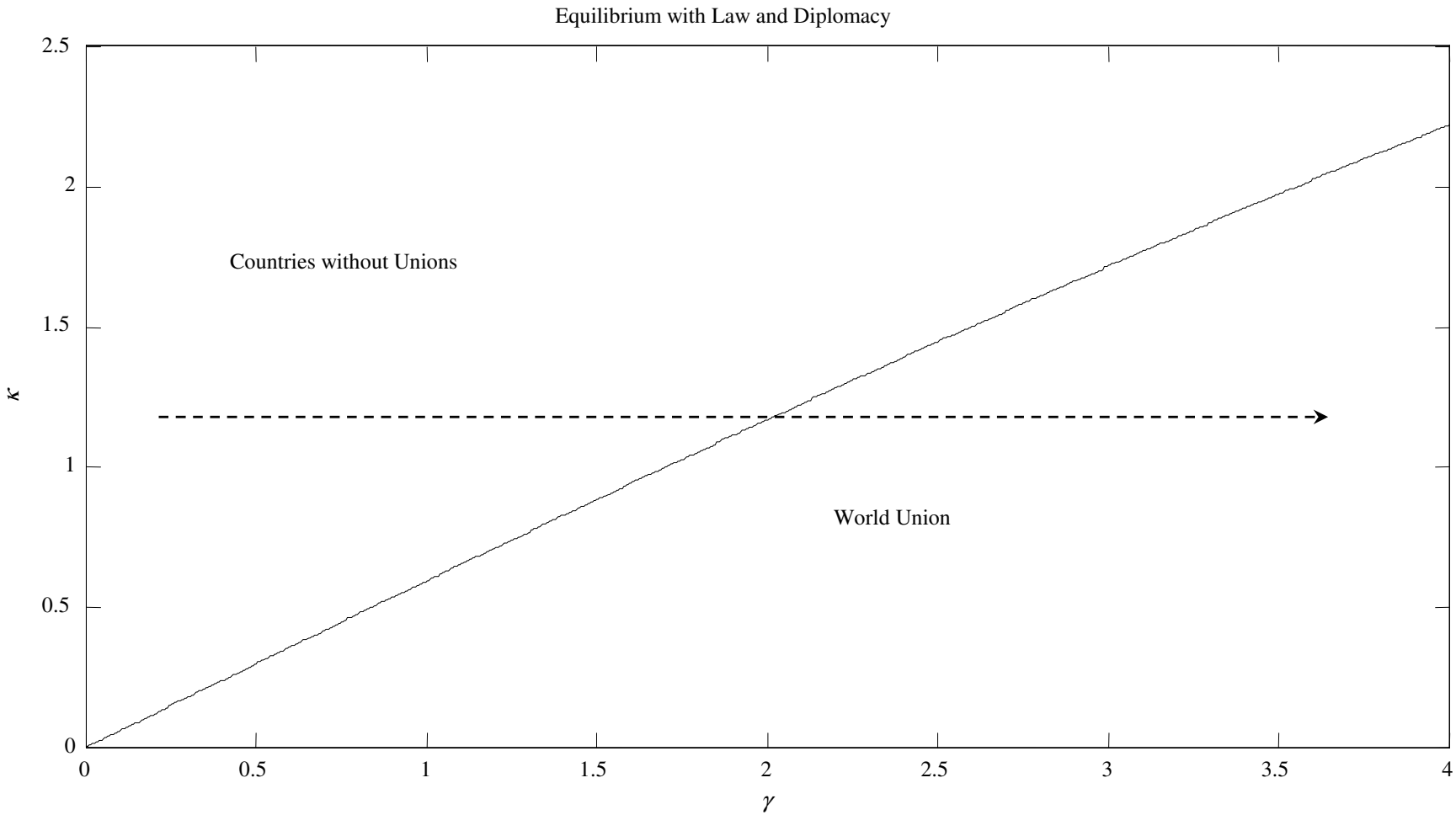
$$\frac{\partial}{\partial \gamma} W^F\left(S_2^*, 1\right) - \frac{\partial}{\partial \gamma} W^F\left(S_1^*, S_1^*\right) = \beta\left(1 - S_1^*\right) > 0$$

1. First wave of globalization:
   - Expanding countries: $\partial S_1^* / \partial \gamma > 0$
2. Second wave of globalization (with intermediate economies of scope)
   - Shift from single-level to two-level governance when $\gamma \geq \gamma_U$

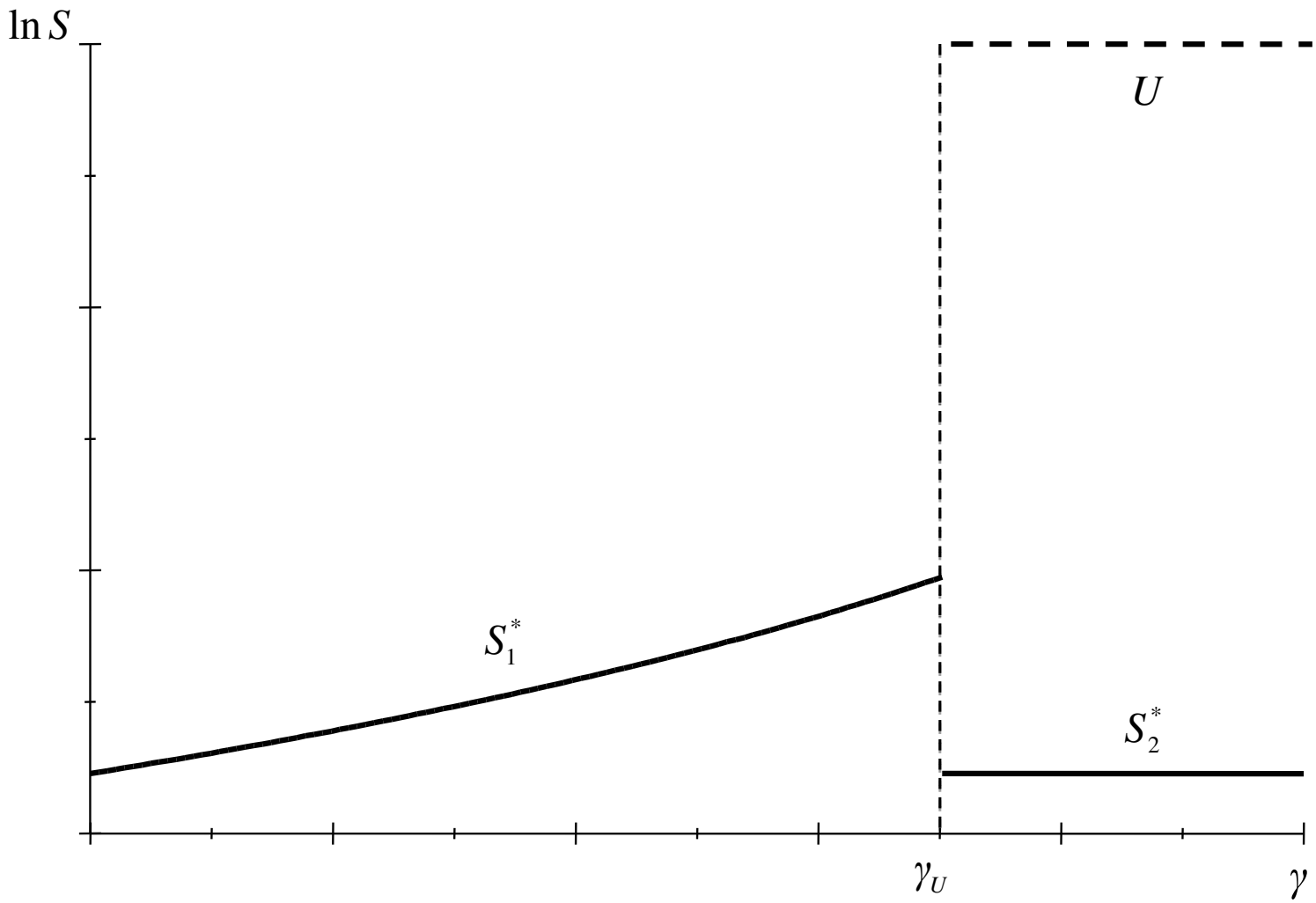
$$\frac{\partial \gamma_U}{\partial \beta} < 0, \frac{\partial \gamma_U}{\partial \delta} < 0, \frac{\partial \gamma_U}{\partial \phi} > 0, \frac{\partial \gamma_U}{\partial \kappa} > 0$$

   - Countries return to their pre-globalization size: $S_2^* = \lim_{\gamma=0} S_1^*$

Globalization and Equilibrium Political Structure



Globalization and the Size of Countries and Unions



Empire Building

- Measure π of "core" localities have the ability to conquer empires
- Technology to build an empire of size E
  1. Assemble a metropolis of size $M \geq \mu E$ for $\mu \in (\pi, 1)$
     - ★ Provide uniformly the desired public services of metropolis localities
     - ★ Impose their government on conquered colonies
  2. Pay cost of war ω
- Welfare of an empire-building core locality

$$W_I = W^E(E) = -\eta + \gamma(1 - \beta + \beta E) - \delta\mu E - \frac{\phi}{E} - \omega$$

- Empires are larger than peaceful countries

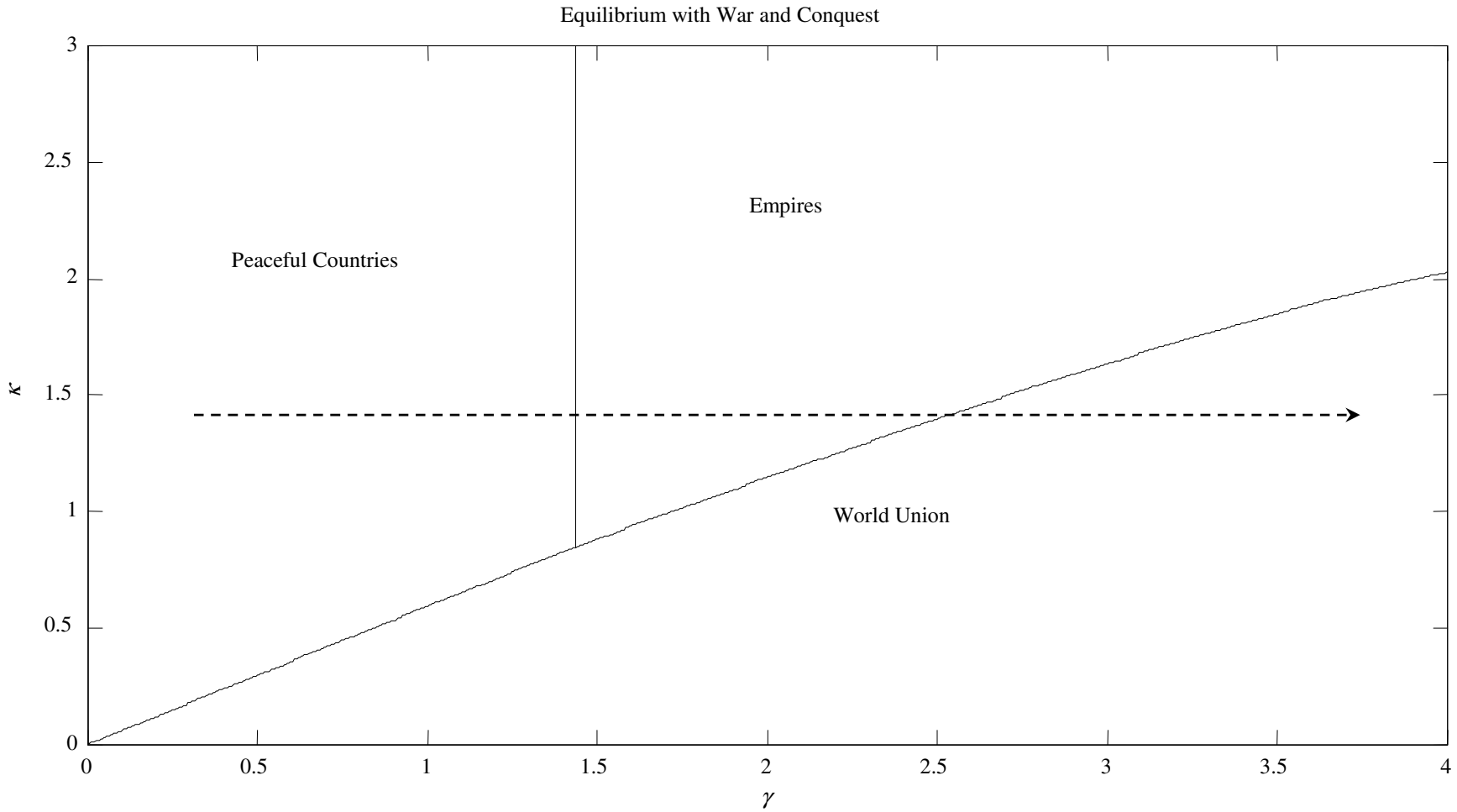
$$E^* = \sqrt{\frac{\phi}{\delta\mu - \beta\gamma}} > S_1^*$$

The Age of Empires

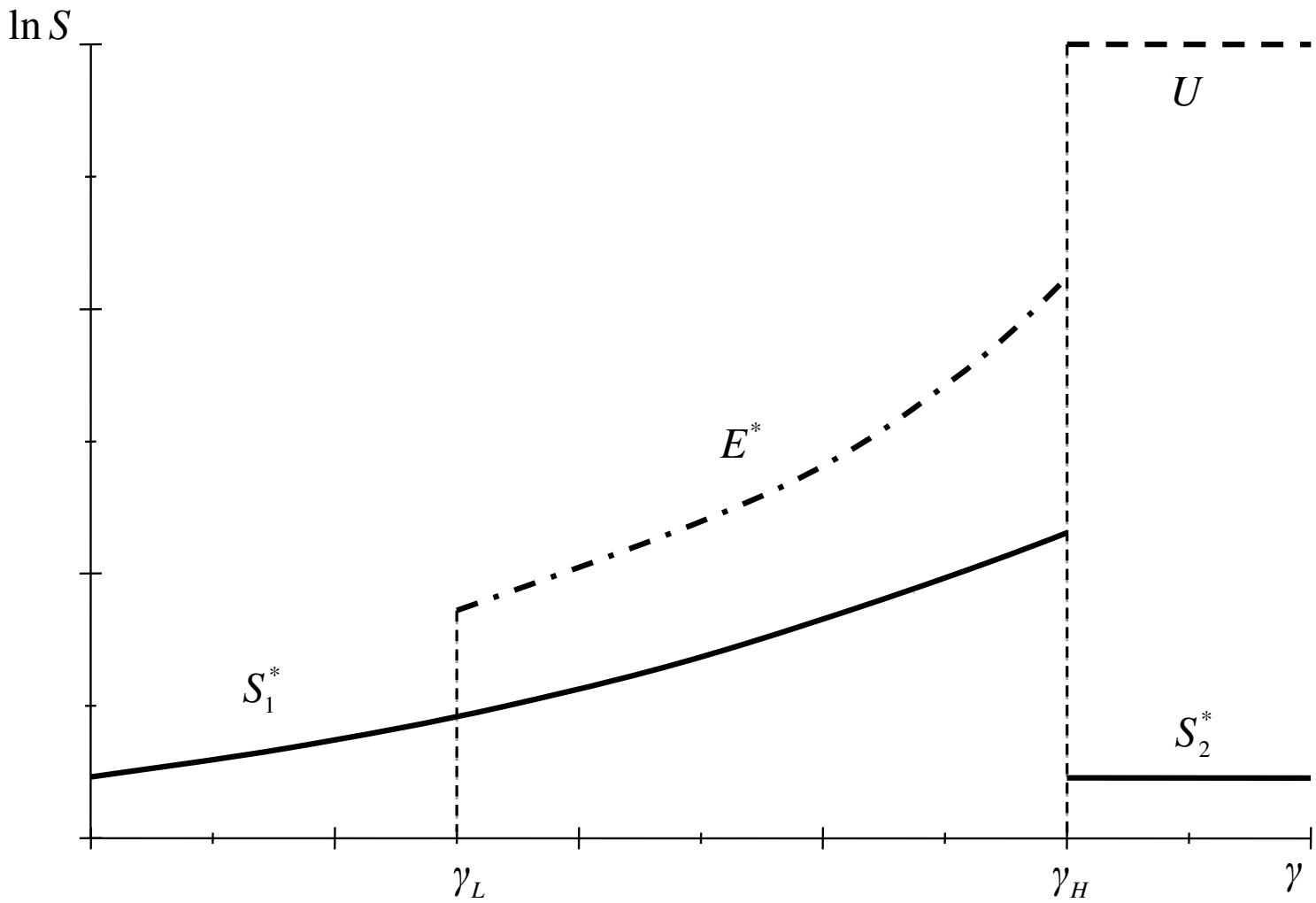
- Imperialism is an intermediate stage of globalization

1. Countries: small and slowly growing
   - Sharing fixed costs is not worth a war
2. Empires: large and quickly growing
   - Benefit from trade, sacrifice the colonies' preferences
3. World union
   - Return to peaceful small countries
   - Empires delay the emergence of the world union
   - Free countries may create their own union first

Diplomacy, Conquest and Welfare



Countries, Empires and Unions



Trade and Territorial Expansion

Dependent variable: Expansion dummy								
	All	All	All	All	All	All	Pre1945	Post1945
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Trade	0.818***	0.285*	0.463*	0.607**	0.545**	0.650*	0.577**	-0.179
	[0.189]	[0.176]	[0.257]	[0.239]	[0.269]	[0.335]	[0.290]	[0.142]
Δ Trade × Post1945	-1.294***	-0.287*	-0.580*	-0.896***	-0.776**	-1.636**		
	[0.314]	[0.177]	[0.300]	[0.314]	[0.318]	[0.819]		
Post1945		-2.724***	-5.262***	-5.626***	-4.850***	-2.859		
		[0.472]	[1.242]	[1.566]	[1.353]	[2.405]		
Log Population				0.595***	0.599***	-2.053	0.640***	0.460*
				[0.141]	[0.141]	[1.702]	[0.161]	[0.271]
Urbanization Rate				0.002	0.002*	0.003	0.003	0.001
				[0.001]	[0.001]	[0.004]	[0.002]	[0.002]
Δ Democracy					-0.166**	-0.159	-0.267**	0.113
					[0.076]	[0.132]	[0.111]	[0.103]
Country FE	No	No	No	No	No	Yes	No	No
Time FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	822	822	822	799	651	227	212	439
R^2	0.090	0.218	0.260	0.362	0.326	0.386	0.214	0.102

Notes: All observations refer to 10-year periods. The dependent variable is a dummy taking value 1 if the country's land area expanded over the decade and 0 otherwise. Δ Trade and Δ Democracy are changes over the previous decade. Post1945 is a dummy for decades after 1945. All other variables are measured at the beginning of each decade. Constant always included and Pseudo-R^2 reported. Standard errors, clustered by country, are in brackets. *, ** and *** denote significance at 10%, 5% and 1% respectively.

Trade, Unions and Territorial Contraction

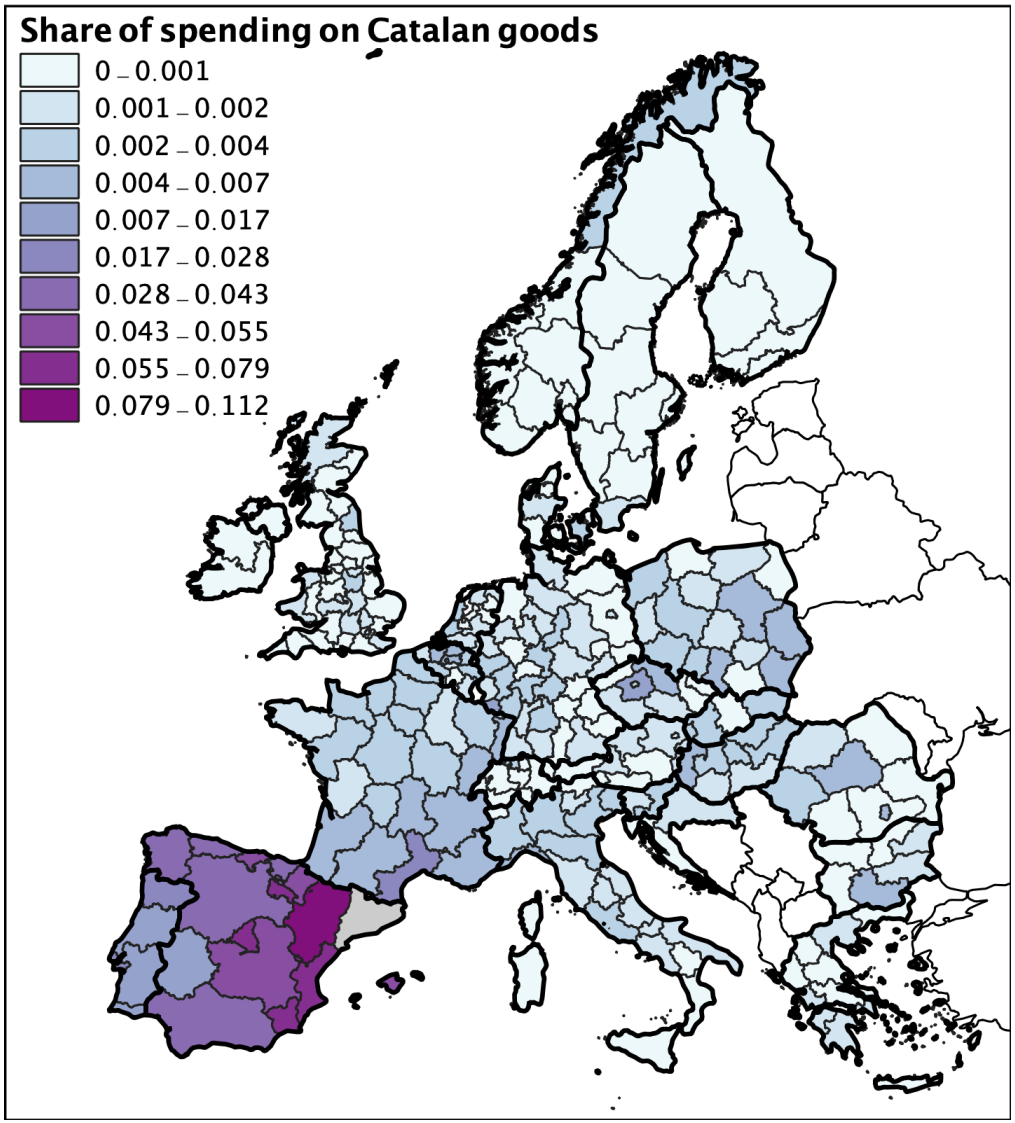
Dependent variable: Contraction dummy						
	Post1945 (1)	Post1945 (2)	Post1945 (3)	Post1945 (4)	Post1945 (5)	Post1945 (6)
Δ Trade	-0.003	0.097*	0.146***	0.105**	0.104**	0.080
	[0.011]	[0.055]	[0.051]	[0.052]	[0.052]	[0.058]
WTO	1.555**	1.594**	2.120***	1.744**	1.785**	2.423**
	[0.724]	[0.760]	[0.754]	[0.884]	[0.886]	[1.139]
Δ Trade × WTO		-0.113	-0.146**	-0.234	-0.251	-0.468
		[0.072]	[0.057]	[0.284]	[0.287]	[0.355]
Log Population				0.503***	0.490***	0.558***
				[0.143]	[0.150]	[0.210]
Log GDP per capita				0.549***	0.557***	0.140
				[0.188]	[0.205]	[0.412]
Δ Democracy					-0.106	-0.166
					[0.139]	[0.220]
Region FE	No	No	No	No	No	Yes
Time FE	No	No	Yes	Yes	Yes	Yes
Observations	588	532	532	530	486	355
R^2	0.038	0.032	0.155	0.248	0.239	0.255

Notes: All observations refer to 10-year periods. The dependent variable is a dummy equal to 1 if the country's land area contracted over the decade and 0 otherwise. WTO is a dummy for WTO/GATT membership. Δ Trade and Δ Democracy are changes over the previous decade. All other variables are measured at the beginning of each decade. Constant always included and Pseudo-R^2 reported. Standard errors, clustered by country, in brackets. *, ** and *** denote significance at 10%, 5% and 1% respectively.

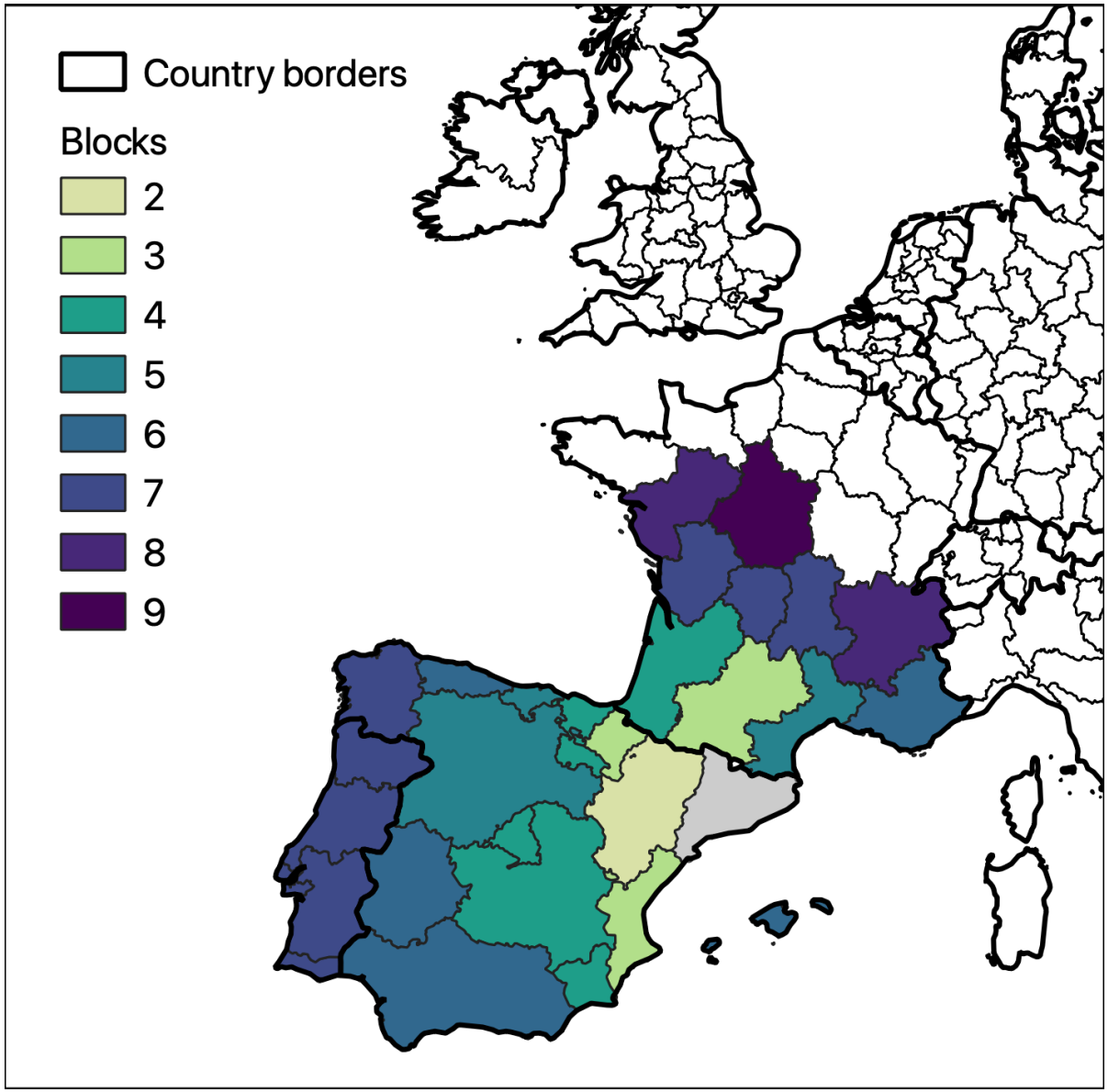
Yet Countries Matter

- What's so special about a country?
  - Or is it a state? Wales is a country, Wyoming is a state ...
- Sovereignty over what?
  - Supranational trade, monetary, immigration policy
  - Coordinated defence, foreign policy
  - Ease of secession? Brexit vs. Scottish independence
- But country borders are empirically different
  - Intra-EU goods trade (Santamaria, Ventura and Yesilbayratkar 2022)
  - Market shares reduced to to 17.5% of potential
  - Post-1910 borders (Germany, Austria-Hungary) to 28.3%
  - Trade in services surely even more country-specific

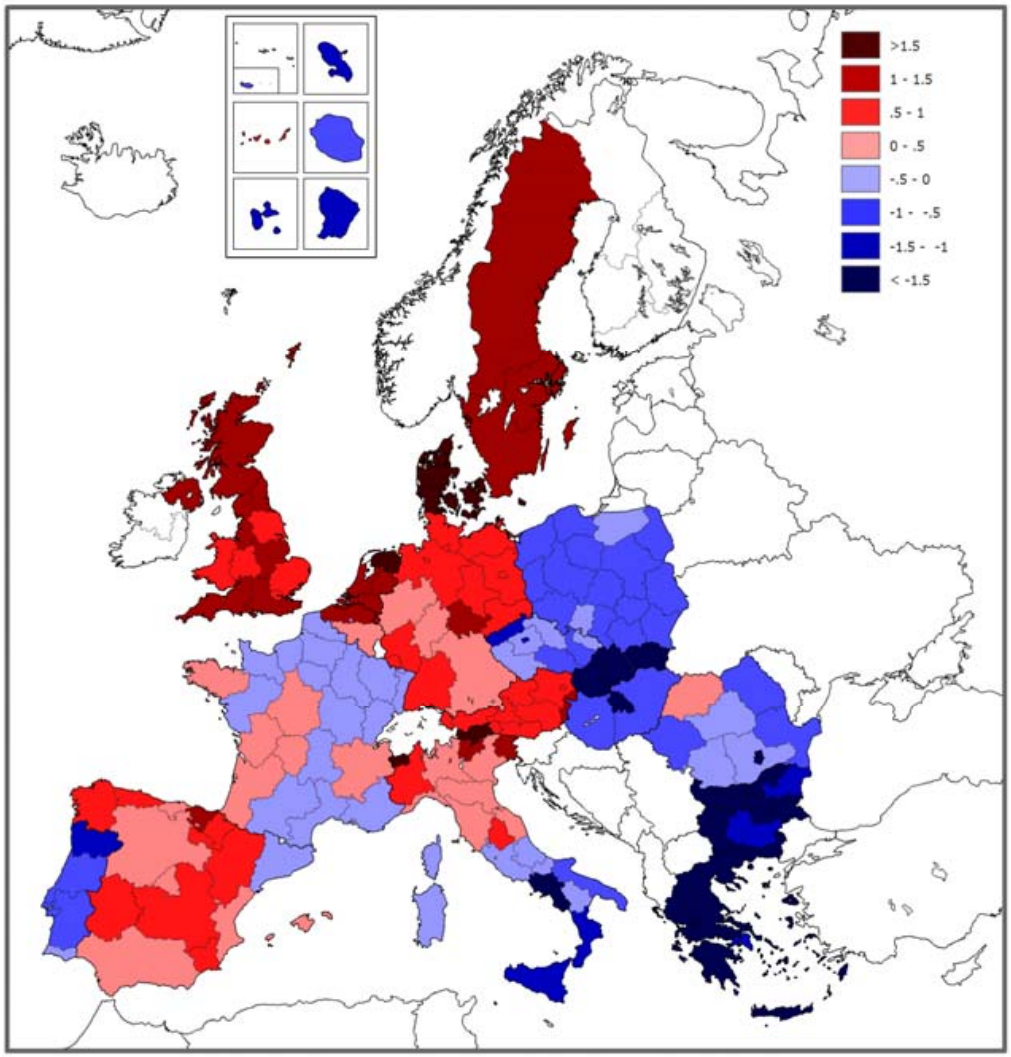
Borders and Regional Trade Flows



Propensity Score Matching



Endogenous Government Accountability



Charron, Dijkstra and Lapuente (2010): Regional survey data 2009-10

Multiple Public Goods

- Individual i's utility

$$u_t^i = \sum_{g=1}^{G} \alpha_g^i \ln y_{g,t}$$

  - Ideal shares $\alpha_g^i \geq 0$ such that $\sum_{g=1}^{G} \alpha_g^i = 1$
- J homogeneous groups of voters: size λ_j, preferences $\boldsymbol{\alpha}^j$
- Public-good provision

$$y_{g,t} = e^{\eta_{g,t}} x_{g,t}$$

- Stochastic government productivity

$$\eta_{g,t} = \varepsilon_{g,t} + \varepsilon_{g,t-1}$$

  - Mean-zero shocks $\varepsilon_{g,t}$ i.i.d. across goods, politicians and periods
- Rent extraction: politicians' objective

$$r_t = b - \sum_{g=1}^{G} x_{g,t}$$

Timeline of Each Period

1. The incumbent's past ε_{t-1} becomes common knowledge
2. The incumbent chooses $\mathbf{x}_t$ and r_t (without knowing ε_t)
3. ε_t is realized and $\mathbf{y}_t$ is determined
4. A share θ_j of members of group j observe $\mathbf{y}_t$
   - The remainder do not observe (understand) $\mathbf{y}_t$ at all
5. An election is held pitting the incumbent against a random challenger

Probabilistic Voting

1. Preferences over policy outcomes

$$\sum_{g=1}^{G} \alpha_g^i \mathbb{E}_i \left(\log y_{g,t+1}^I - \log y_{g,t+1}^C \right) = \sum_{g=1}^{G} \alpha_g^i \mathbb{E}_i \varepsilon_{g,t}$$

2. Non-policy preferences: personal likability, party ideology, etc.
   - Aggregate component $\Psi_t \sim U\left[-1/\left(2\phi\right), 1/\left(2\phi\right)\right]$
   - Idiosyncratic component $\psi_t^i \sim U\left[-\bar{\psi}, \bar{\psi}\right]$

- Voter i supports the incumbent if

$$\sum_{g=1}^{G} \alpha_g^i \mathbb{E}_i \varepsilon_{g,t} \geq \Psi_t + \psi_t^i$$

- Votes and elections are never perfectly predictable
  - $\bar{\psi}$ is large enough and ϕ small enough

Career Concerns with Probabilistic Voting

- Fraction of group j that votes for the incumbent given $\mathbf{y}_t$ and Ψ_t

$$v_j^I(\mathbf{y}_t, \Psi_t) = \frac{1}{2} + \frac{1}{2\bar{\psi}}\left[\theta_j \sum_{g=1}^{G} \alpha_g^j \mathbb{E}\left(\varepsilon_{g,t} | y_{g,t}\right) - \Psi_t\right]$$

$$= \frac{1}{2} + \frac{1}{2\bar{\psi}}\left[\theta_j \sum_{g=1}^{G} \alpha_g^j \left(\log y_{g,t} - \log \bar{x}_g - \varepsilon_{g,t-1}\right) - \Psi_t\right]$$

- Probability of re-election given public-good provision

$$p(\mathbf{y}_t) = \frac{1}{2} + \phi \sum_{j=1}^{J} \lambda_j \theta_j \sum_{g=1}^{G} \alpha_g^j \left(\log y_{g,t} - \log \bar{x}_g - \varepsilon_{g,t-1}\right)$$

- Probability of re-election given budget allocation

$$p(\mathbf{x}_t) = \mathbb{E}\left[p(\mathbf{y}_t) | \mathbf{x}_t\right] = \frac{1}{2} + \phi \sum_{j=1}^{J} \lambda_j \theta_j \sum_{g=1}^{G} \alpha_g^j \left(\log x_{g,t} - \log \bar{x}_g\right)$$

Multidimensional Budget Allocation

- The incumbent has a multidimensional optimization problem

$$\max_{\mathbf{x}_t} \left\{ b - \sum_{g=1}^{G} x_{g,t} + Rp\left(\mathbf{x}_t\right) \right\}$$

- First-order conditions

$$x_{g,t} = R\phi \sum_{j=1}^{J} \lambda_j \theta_j \alpha_g^j$$

- Rent extraction

$$r_t = b - \sum_{g=1}^{G} x_{g,t} = b - R\phi \sum_{j=1}^{J} \lambda_j \theta_j$$

  - Independent of voter preferences

Knowledge is Power

- Suppose public goods are perfectly group specific
  - $G = J$ and $\alpha_g^j = 1$ if $g = j$, $\alpha_g^j = 0$ if $g \neq j$
- Expenditure targeted to groups j and k is

$$\frac{x_{j,t}}{x_{k,t}} = \frac{\lambda_j \theta_j}{\lambda_k \theta_k}$$

- A utilitarian welfare planner would allocate in proportion to size λ_j
- Instead, a self-interested politician caters to more informed voters

Quality of Government: Incentives

- Rational expectations equilibrium

$$\mathbf{x}_t = \overline{\mathbf{x}} \Rightarrow p = 1/2 \Rightarrow R = \frac{2\delta}{2-\delta} r$$

- Stationary rent extraction

$$\rho = \left(1 + \frac{2\delta}{2-\delta} \phi \sum_{j=1}^{J} \theta_j \lambda_j\right)^{-1} b$$

1. Tighter monitoring by voters: higher $\sum_{j=1}^{J} \theta_j \lambda_j$
2. Less uncertainty from random popularity shocks: higher ϕ
3. Greater patience of politicians: higher δ

Quality of Government: Selection

- The incumbent is re-elected if and only if

$$\Psi_t \leq \sum_{j=1}^{J} \lambda_j \theta_j \sum_{g=1}^{G} \alpha_g^j \varepsilon_{g,t}$$

- Expected ability of ruling politicians

$$\mathbb{E}\left(\eta_{g,t}^{I}\right) = \mathbb{E}\left(\varepsilon_{g,t-1}^{I}\right) = \mathbb{E}\left[\varepsilon_g \left(\frac{1}{2} + \phi \sum_{j=1}^{J} \lambda_j \theta_j \sum_{h=1}^{G} \alpha_h^j \varepsilon_h\right)\right]$$

$$= \phi \sigma_g^2 \sum_{j=1}^{J} \lambda_j \theta_j \alpha_g^j$$

- First-order stochastic dominance as θ_j increases

Decreasing Returns to Monitoring

- Monitoring has decreasing returns in a dynamic environment

1. Consider a temporary increase in voter information
   - The reduction in rents is linear $r = b - \bar{\theta}\phi R$
   - Politicians behave today because they won't tomorrow
2. Suppose instead the increase is permanent
   - Politicians know the voters are always watching them
   - They like re-election less than they used to: $\partial R / \partial \bar{\theta} < 0$
   - Hence, they don't reduce rents as much: $\partial^2 r / \partial \bar{\theta}^2 > 0$

Centralization and Decentralization

- Many regions $l = 1, ..., L$
- Identical size: unit population and government budget b

Decentralization: L independent politicians

- Ability $\eta_{l,t}$ and rent extraction $r_{l,t} = b - \mathbf{x}_t^l$

Centralization: a single common politician

- Ability η_t and rent extraction $r_t = bL - \sum_{l=1}^{L} \mathbf{x}_t^l$

- Can the central government treat different regions differently?

Accountability Benefits of Centralization

- Rent is a constant fraction of the budget

$$\rho(\theta) = \frac{r}{b} = \left(1 + \frac{2\delta}{2-\delta}\phi\theta\right)^{-1}$$

- Let region l have a fraction θ_l of informed voters
- Let there be any heterogeneity in θ_l across regions
- Then centralization reduces rent extraction

$$\rho\left(\frac{1}{L}\sum_{l=1}^{L}\theta_l\right) < \frac{1}{L}\sum_{l=1}^{L}\rho(\theta_l)$$

- By Jensen's inequality since $\rho(\theta)$ is decreasing and convex

Harmful Discretionality

- Voters want spending in their own region
- Power flows from the uninformed to the informed
- Regressive redistribution $\Rightarrow$ welfare loss
- Uniformity is often imposed in reality
  - Even if needs are not uniform (*café para todos*)

$\Rightarrow$ Centralization necessarily reduces preference-matching

Should Government Be Decentralized?

- Centralization without a uniformity constraint is welfare reducing
- Centralization with a uniformity constraint is welfare maximizing if

1. Differences in preferences are small
2. Differences in information are large
3. Differences in politicians' skill are small

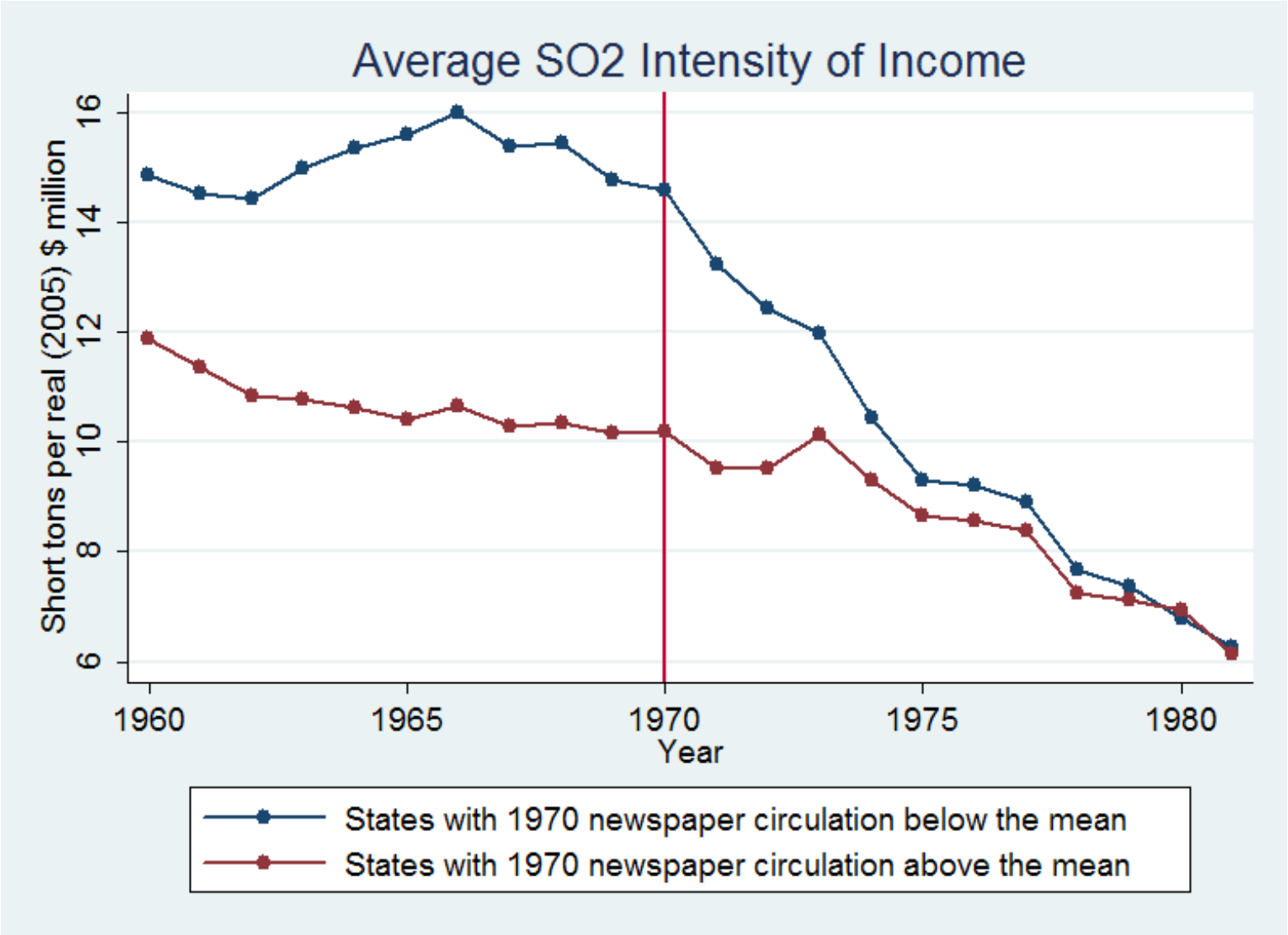
- Federal Germany vs. unitary Italy (Ziblatt '06)

Benefits to the Uninformed

- Uniformity transfers accountability from informed to uninformed
- Positive-sum and progressive transfer
- Prediction consistent with evidence on transfer of powers

1. School decentralization in Argentina (Galiani, Gertler, Schargrodsky '08)
   - Higher test scores for the rich, lower for the poor
2. Decentralized university hiring in Italy (Durante, Labartino, Perotti '11)
   - Higher nepotism in provinces with less informed voters
3. Centralization of US environmental policy: 1970 Clean Air Act
   - Faster decline in pollution in states with less informed voters

Information and the Effects of the Clean Air Act



Division of Powers

- Two kinds of public goods

$$u_t^l = \alpha_0 \log y_{0,t}^l + (1 - \alpha_0) \log y_{l,t}^l$$

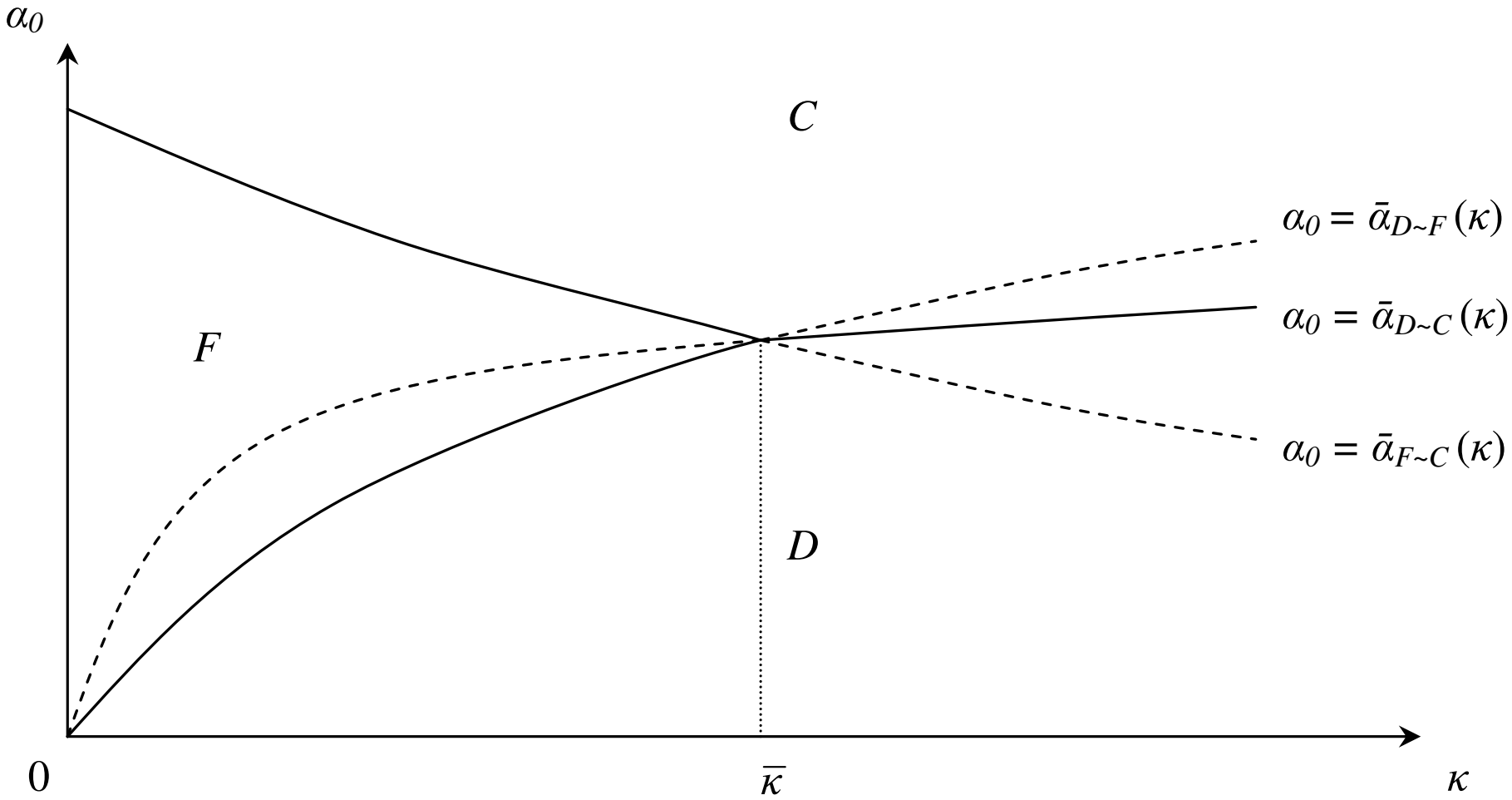
  1. Good 0 is homogeneously desired by all regions
  2. L idiosyncratic varieties of the other good: region l only likes variety l

- Three possible structures of government
  1. Full decentralization: local governments only
  2. Full centralization: central government only
  3. Federal system: two levels of government
     - ★ Local governments provide y_l
     - ★ Federal government provides y_0 with uniformity

When Is Federalism Desirable?

1. A federal system is welfare maximizing if and only if
   1. Voter information is sufficiently heterogeneous
   2. Preference heterogeneity is intermediate $\alpha_0 \in (\bar{\alpha}_{D\sim F}, \bar{\alpha}_{F\sim C})$
      - ★ The range expands with differences in information
2. If preferences are more homogeneous full centralization is optimal
   - Uniform y_0, discretionary y_I^I
3. If preferences are less homogeneous decentralization is optimal

Optimal Federalism



Economies of Scope in Government Accountability

- The fraction of each government's budget that is dissipated as rents is decreasing in the scope of the government's powers
- Prediction supported by empirical evidence
  - Simplification of government tiers in France, Germany and Italy
  - Higher corruption in countries with more tiers (Fan, Lin Treisman 2009)
  - Inefficient, corrupt special purpose governments in the US (Berry 2009)

Who Benefits from Federalism?

- Optimal federalism is a form of progressive redistribution
- Low-information regions (with bad local governments) gain twice

1. From having the federal government be responsible for y_0
   - The high-information regions provide accountability
2. From having the local government be responsible for y_l^l
   - The high-information regions do not seize power

- Worth sacrificing economies of scope if information varies enough

A Closer Look at Political Economy

- Most models we have seen have no domestic political economy
  - Representative agent, representative government
- Models of fiscal federalism have become much more nuanced
  - Long before Boffa, Piolatto and Ponzetto (2016)
- Restart from Persson and Tabellini (1996)?
- Another building block: Gancia, Pozetto and Ventura (2020)

Winners and Losers from the Single Market

- Different kinds of gains from trade in a single market
  1. Gains from intra-industry, horizontally differentiated trade
  2. Gains from inter-industry or vertically differentiated trade
- Old intuition (New Trade Theory)
  - Less distributive impact of intra-industry trade $\Rightarrow$ less controversy
- How is an economic union different from a customs union?
  - Imperfect ability to pick and choose which industries are covered
- Stylized model of all-or-nothing non-tariff barriers
  - Union-wide market in some industries
  - Choice of how many, no choice of which

Mercantilist Redistribution

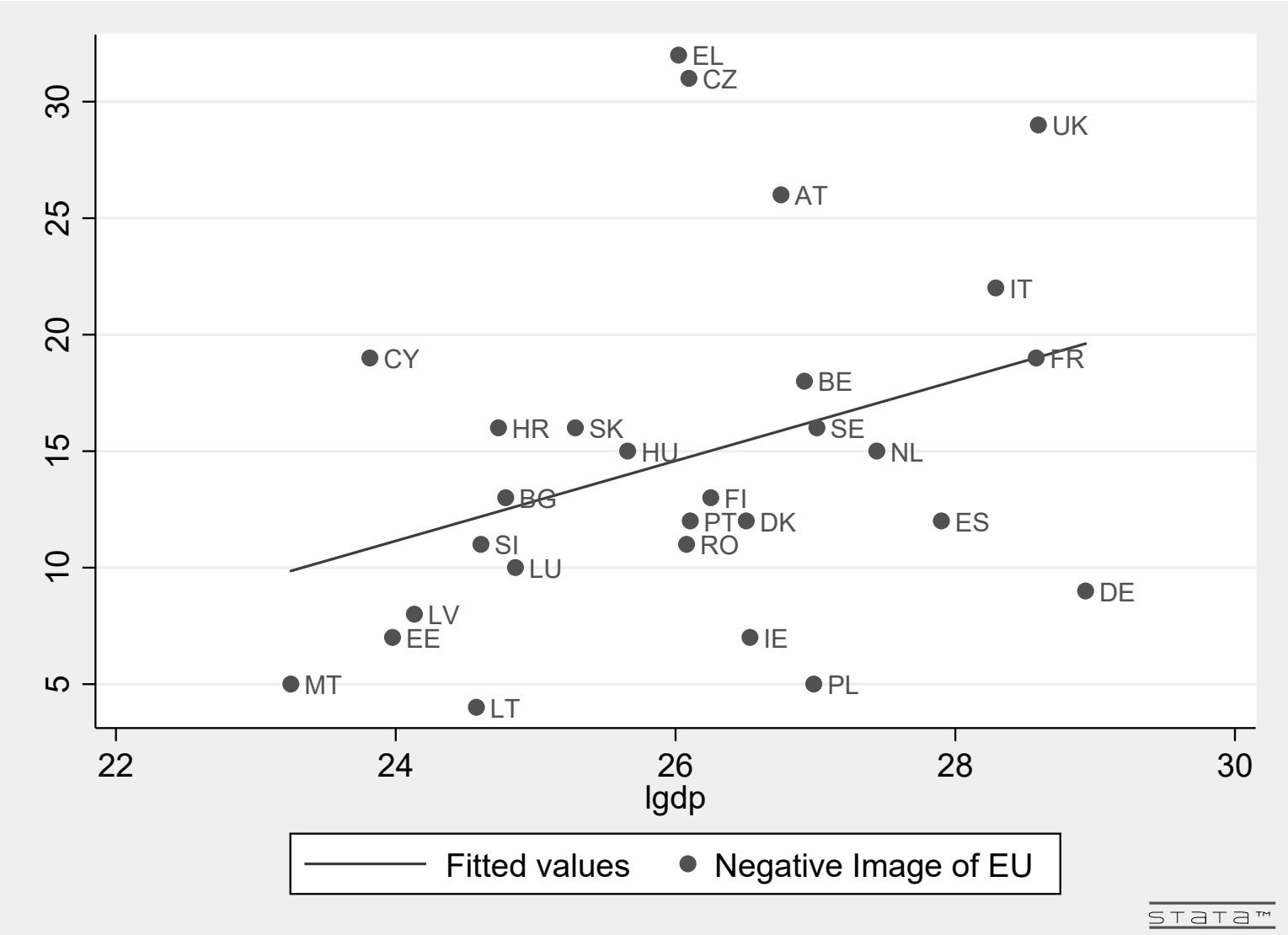
1. Exporting sectors gain from accessing union markets
2. Import-competing ones lose as union competitors access the local market

- Zero-sum redistribution within each country
- But even importers still enjoy the consumption benefits of the union
  - So all sectors that were already open to trade like further integration

Some Lessons

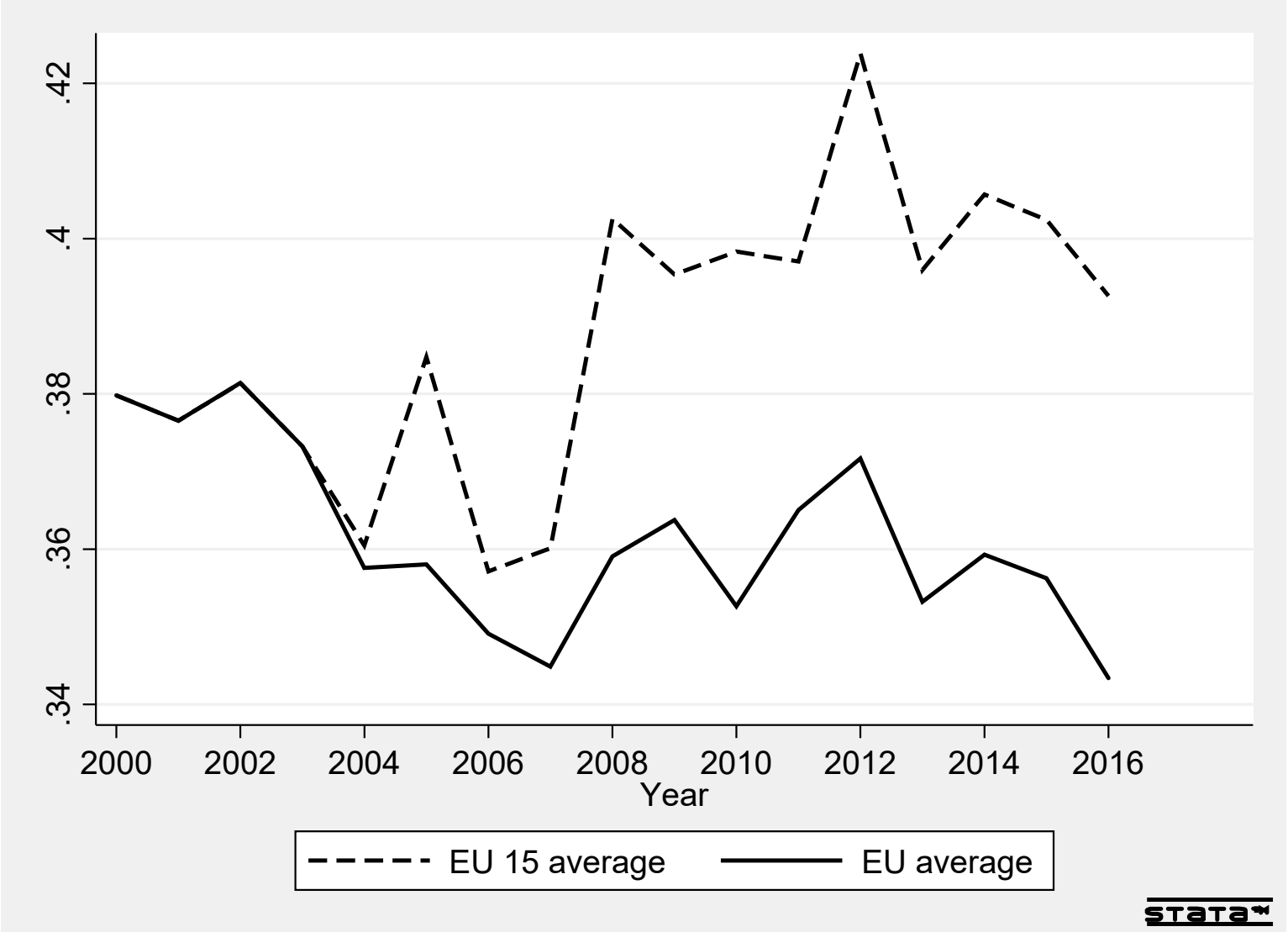
1. More opposition to more hetorogeneous unions
   - Enlargement fatigue reflects inter-industry trade
2. More opposition to the union in larger economies
   - Smaller consumer benefits, same distributional tensions
3. Less where more people work in industries exporting to the union
4. Scope for a "big push"
   - Deeper integration $\Rightarrow$ more industries have earnings losses
   - But more of those have net welfare gains
   - Second effect may eventually dominate

Negative Image of the EU by Economic Size



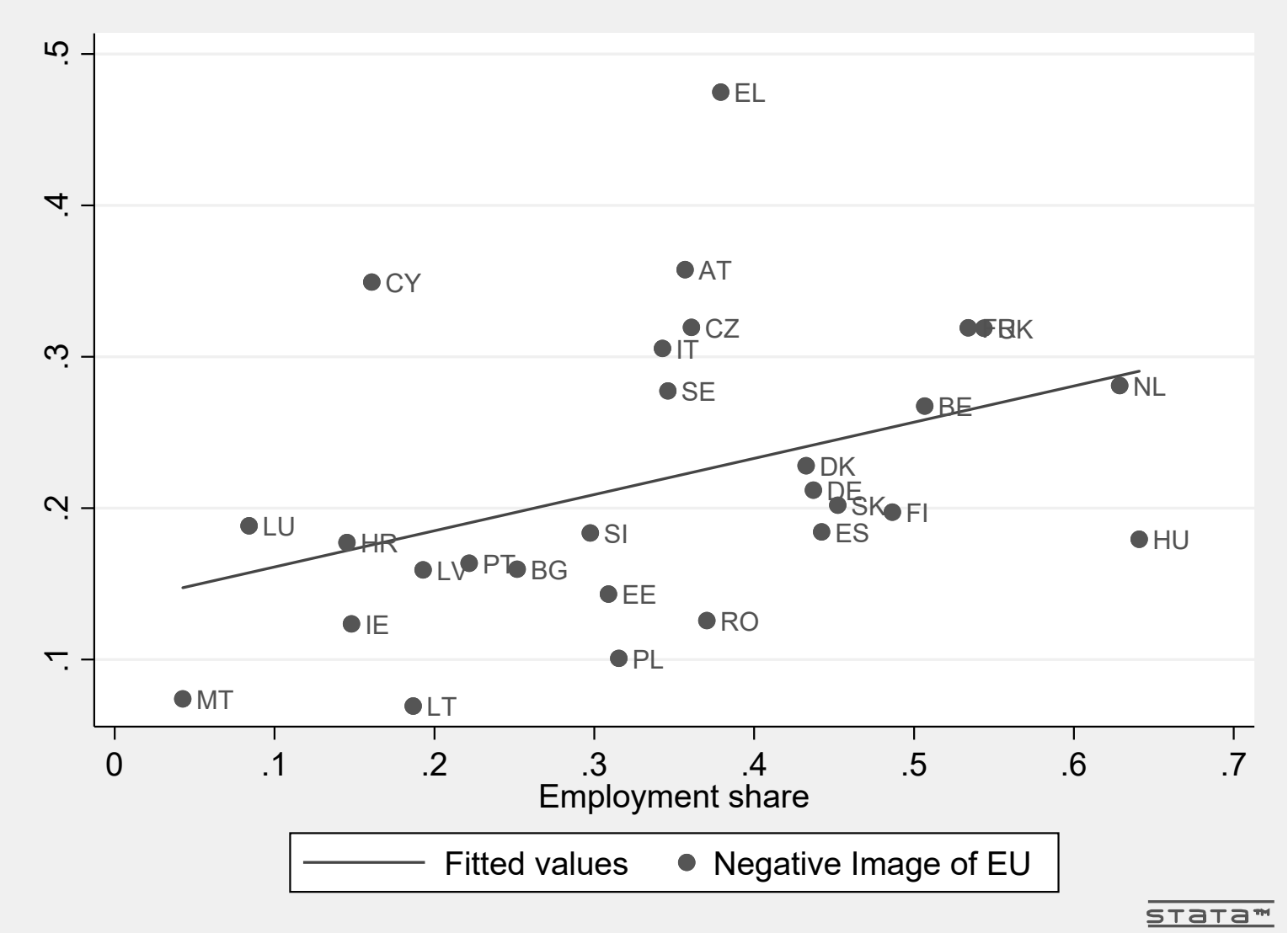
Eurobarometer and Eurostat data for 2017

Employment Share Exposed to EU Import Competition



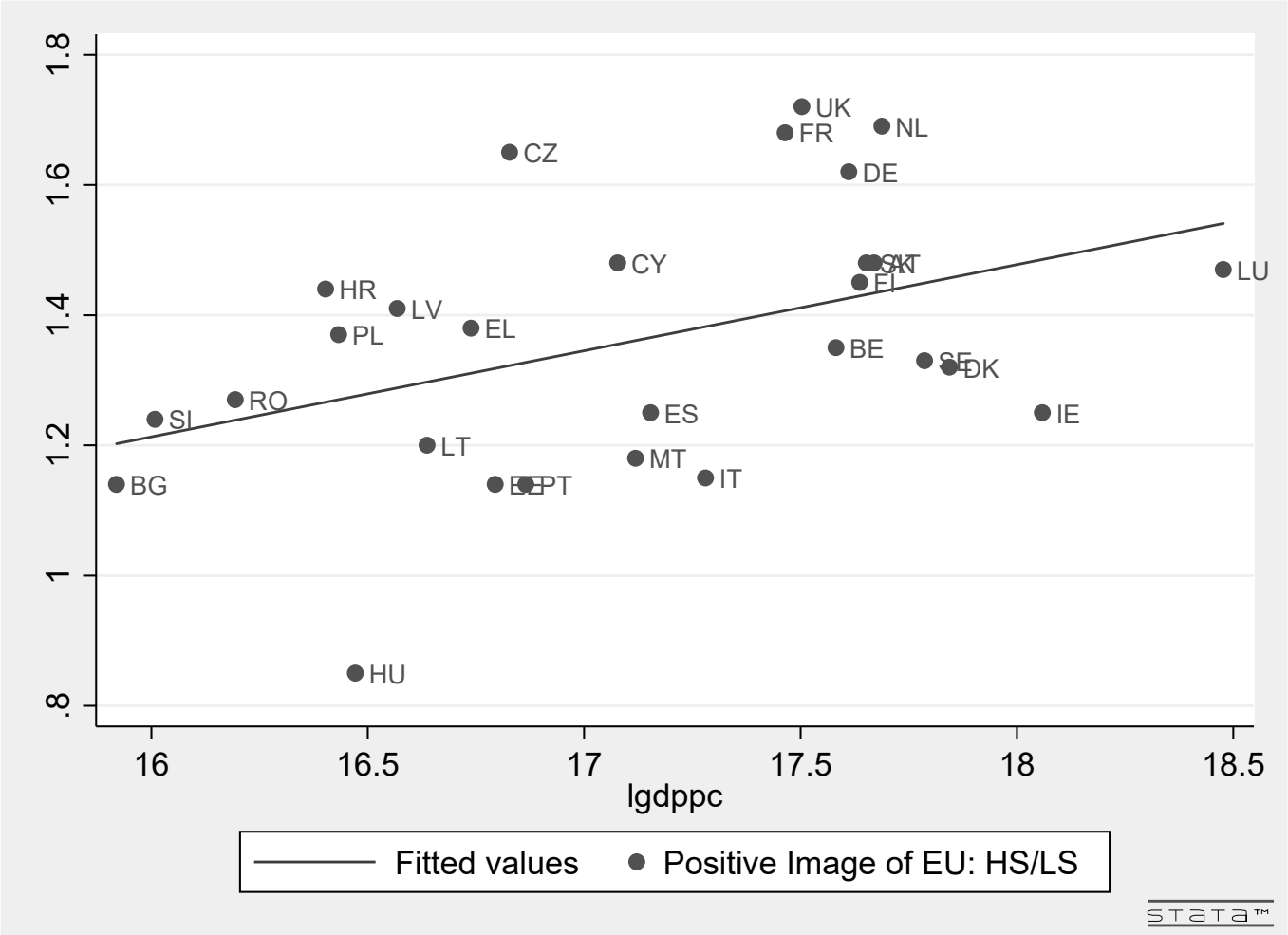
Eurostat structural business statistics

Negative Image of the EU by EU Import Exposure



Eurobarometer and Eurostat (SBS) data for 2016

Economic Size and Support for the EU by Education



Positive image of the EU among high-skill respondents (who left education at age 20+) relative to low-skill respondents (who left education at age 16-19). Eurobarometer and Eurostat data for 2017

More Empirics

- This is still mostly a theoretical literature
  - Albeit applied and strongly tied to suggestive evidence
- Is there scope for an empirical breakthrough?
  - Surely the big prize at this point
- Unlikely from the qualitative front
  - Too few observations
  - What is ever exogenous at such a macro level?
- Promising quantitative evaluations: EU enlargement
  - Welfare analysis (Caliendo et al. 2021)
  - Observable spatial concentration (Yesilbayraktar 2023)