International Unions and Integration

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Motivation. International Unions

Economic and Political Globalization

- **International unions (e.g. EU, NATO) play a chief role in world economy and politics.**
  - Trade policy (EU, WTO)
  - Regulation (EU)
  - Financial integration (Basel, G-7)
  - Defense (NATO, Council of Europe)
- **Understanding the composition of the union, determination of union/integration policies and its relationship with non-members is becoming more important.**

European Union

Economic Integration in Europe

1. **EU Integration** [member states, initial integration and deepening]
2. **Integration (and relations) with non-members**
   - Candidate countries: Turkey (1999, 2005), North Macedonia (2005, 2019), Montenegro (2008, 2010), Serbia (2009, 2012), and Albania (2009, 2014)
   - Potential candidate countries. Bosnia and Herzegovina, Kosovo
3. **Enlargement** [various rounds, future rounds?]
4. **Exit** [BREXIT, Hungary?]

International Unions and the European Union

Key Joint Considerations

1. **Integration. Level and Areas** ⏩ Evolution of EU Integration
   - 1950s. Steel and Iron
   - 1960s. Agriculture
   - 1980s. Single Market (Goods and Services), Regulation of Product Markets
   - 1990s. Financial Integration
   - 2000s. Monetary Union
   - 2010s. Banking Union
   - 2020s. Energy, Environment?

2. **Membership & Relations with Non-members** ⏩ Timeline
   - 1950s. Union Formation. EU 6
   - 1970s. First Enlargement [UK, Ireland, and Denmark]
   - 1980s. Enlargement in the South [Greece, Portugal, and Spain]
   - 1990s. Enlargement in Scandinavia [Finland, Sweden] and Austria
   - 2000s. Enlargement in Eastern Europe [plus Malta and Cyprus]
   - 2010s. Exit. BREXIT
   - 2020s. Enlargement in the Balkans and/or the East?

European Union Membership. Substitutes or Complements

Notes

EU Budget

- **Size.** 148 billion. about 2% of the combined national budgets of all EU countries (€7,524 billion)
- **Composition.** about 37% in farming (CAP); in 1985, 70% was on farming.
- **Limited amounts for "classic public goods"**, like defense, police, roads-railroads, schools, hospitals. about 6% in administration

EU Functions

- Regulation and Standardization in Product Markets
- Trade; International Trade Agreements
- Financial Integration, Legislative Harmonization
- Environmental Policy

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European Union Membership. Substitutes or Complements. Dynamics

Facts and Dynamic Considerations

Resilience

- The EU has proved very resilient despite political and economic crises
  - *"Europe will be forged in crises and will be the sum of the solutions adopted for those crises."* Jean Monnet
- The euro has also proved very resilient in spite of a deep crisis
  - see Lane (2022) see Feldstein (1997) for a critique

Why?

- Hard to reconcile EU's stability, deeper integration in an increasing set of areas, and enlargement with "standard" economic theory, Optimum Currency Area [Mundell (1961), Mc Kinnon (1963), Kennen (1969), Feldsetin (1997), see Dellas and Tavlas (2009) for an overview, and Farhi and Werning (2016, 2018) for modern macro treatments]
- Political rather than economic considerations could explain this [partly yes]
- **Dynamic complementartities from integration** [our focus]

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Stylized Facts about the EU

Policy and Theoretical Explorations

1. **Integration is more important than public goods provision.** ⏩ EU Budget
   - Single market for goods, services, capital and labor, standardization of regulations and safety protocols, financial sector legislative harmonization, and legal convergence
   - EU budget is small compared to the combined budget of the members (around 2% of the EU public spending); traditional public goods, like education, health, policing, at the national level.
2. **Deeper and flexible integration and enlargement to periphery is spearheaded by the core**
   - Industrial countries (Germany, France, Netherlands) integrate in more areas (Schengen, Eurozone) than periphery nations (Bulgaria, Hungary, Romania)
   - *Many core countries were in favor of enlargement*
3. **Integration increased, rather than fallen, after admitting countries from the periphery**
4. **Non-member countries are allowed, even encouraged, to integrate**
   - Customs Union with Turkey, EEA countries
   - UK after Brexit

EU. Relationship with Non-Members

EEA, Candidate Countries

- **Relations with Non-Members**
  - **1994. European Economic Area.**
  - **2020. EU-UK Special Agreement**.
- **Relations with Potential Members**
  - Albania (2009), Montenegro (2008), Serbia (2009), North Macedonia (2004)
  - Turkey (1987)
  - Bosnia, Kosovo

Current European Union Issues

Integration in Europe. Looking Forward

1. **Even Deeper Union**.
   - Integration is becoming deeper on services, banking, product markets, single market, insurance etc
2. **New Integration Areas**.
   - Health, Environmental, Energy
3. **Fiscal Union?**
   - Unemployment Insurance, Covid-19 Recovery Plan for Europe, Next Generation EU

Literature

Strands

- **Union and country size and scope**
  - Fiscal Federalism: Oates (1972)
  - Country size: Bolton and Roland (1997), Alesina, Spolaore, and Wacziarg (1999), Alesina and Spolaore
  - International trade: Gancia, Ponzetto and Ventura (2020)
  - **International unions: Casella (2001, 2005), Alesina et al. (2005), Kobielarz (2022)**
  - Flexible Integration & Sub-unions: Harstad (2006), Bordignon and Brusco (2006)
- **Supermodular Games**
  - Topkis (1979), Vives (1990), Milgrom and Roberts (1990)
  - applications in various settings, but not to understand international unions and integration
- **Coalitions and Clubs**
  - Chwe (1994), Roberts (1999), Acemoglu, Egorov, and Sonin (2012)
- **Political Economy of the European Union**
  - Eichengreen (2006); Gilbert (2012); Sapir (2011); Spolaore (2013)

Literature

Earlier Theoretical Work

- **Develops and gets insights from public goods models** [Alesina, et al. (2005)]
  - Member-country actions (investments to the public good) are strategic substitutes
  - Free-riding emerges as the central consideration
  - Neat insights of trade-offs and helpful analogy
- **But not a very realistic model for EU.** Theoretical predictions not in line with stylized facts
  - Investment to common public goods (integration) decreases after enlargement to periphery
  - Flexible protocols create free riding, not preferred by the core countries
  - EU budget not very large; not focused on core public goods
- **Besides, public goods games not very useful**
  - Integration with non-members
  - Exit

This Paper

Results

- Unions **facilitate integration and cooperation** rather than **centralized provision of public goods. Actions (integration levels) are strategic complements**
  - Fits better to the EU' focus on single market, standardization of products, legislative harmonization, and common regulations
- **Characterize countries' preferences over flexible and rigid integration protocols, with option of outside integration**
  - A majority of countries prefer flexible protocols
  - Integration can increase after the admission of lower type countries and moving to flexible protocols
  - Enlargement and flexible integration can be spearheaded by the "core" countries
- **Study the joint determination of integration across members and non-members**
  - Restrictions on the integration of non-members are necessary for the effectiveness of the union
  - Restrictions on the integration of exiting countries are necessary for the robustness of the union
  - Higher integration type countries prefer more restrictive exit policies

Structure

Model

Model. Preliminaries

General Set-Up

- Countries, finite set U
- Types, $\gamma_i \in \mathbb{R}_+$ with $\gamma_1 < \gamma_2 < ... < \gamma_{|U|}$ and $\gamma = \{\gamma_i\}_{i \in U}$.
- Integration levels, $t_i \in \mathbb{R}_+$ with $t = \{t_i\}_{i \in U}$
- Utilities, $u_i(t, \gamma) = u(t_i, t_{-i}, \gamma_i)$.

Assumption 1

u satisfies the following conditions

1. **[Complementarity]** *u is strictly increasing in γ_i, increasing in t_{-i} and satisfies increasing differences in t_i and t_{-i}. u satisfies strictly increasing differences in γ_i and t_i and γ_i and t_{-i}.*
2. **[Costly integration]** *For all γ_i and t_{-i}, $u(0, t_{-i}, \gamma_i) = 0$. There exists $t(\gamma_i)$ such that u is decreasing for all $t_i > t(\gamma_i)$.*
3. **[Concavity]** *u is strictly concave in t_i for any t_{-i}, γ.*

Integration Protocols

Non-Union, Rigid Union, Flexible Union

1. **Non-Union Integration:** Countries choose their level of integration without any explicit negotiation or centralized enforcement.
   - An integration profile t^* is a *non-union integration equilibrium* if

$$t_i^* \in \arg\max_{t_i} u(t_i, t_{-i}^*, \gamma_i), \quad \forall i. \tag{1}$$

2. **Rigid Union:** All members integrate at the same level r, determined by majority voting.
3. **Flexible Union:** Countries choose their level of integration which must be higher than the lower bound b, determined by majority voting.
   - Given the union policy b, an integration profile $T(b)$ is a *flexible union equilibrium* if

$$T_i(b) \in \arg\max_{t_i \geqslant b} u_i(t_i, T_{-i}(b), \gamma_i) \quad \forall i. \tag{2}$$

   - Break ties in favor of the lower type country

Equilibrium Characterization

Propositions. Different Integration Protocols

Proposition 1.A

In non-union integration, there is a maximum and a minimum equilibria $\overline{t}^*(\gamma)$ *and* $\underline{t}^*(\gamma)$ *that are increasing in* γ_i *for all* i *and* $\overline{t}^*$ *is the pareto dominant equilibrium.*

Proposition 1.B

In rigid union, the most preferred policy of the median country is the Condorcet winner. That is, $r^* = \arg\max_r u_m(r, \ldots, r, \gamma_m)$

Proposition 1.C

In flexible union, given b*, there is a maximum and minimum equilibrium* $\overline{T}(b, \gamma)$ *and* $\underline{T}(b, \gamma)$*.* $\overline{T}(b, \gamma)$ *is the pareto dominant equilibrium. Under extremal equilibrium selection, the most preferred policy of the median country is the Condorcet winner. That is,* $b^* = \arg\max_b u(\overline{T}(b, \gamma), \gamma_m)$

Comparison of Integration Protocols

Comparison of Integration Policies (Examples)

Trade-Offs of Integration Types

Example 1

There are five countries, $U = \{h, h', l, l', l''\}$, with types $\gamma_h = \gamma_{h'} = 2.5$, $\gamma_l = \gamma_{l'} = \gamma_{l''} = 1$. The common utility function is:

$$u(t_i, t_{-i}, \gamma_i) = \gamma_i \sum_{j \in U \setminus \{i\}} t_i t_j - \frac{t_i^3}{\gamma_i} \tag{3}$$

Comparison of Integration Policies.

Example, cont.

	Integration Levels		Utilities	
	h,h'	l,l',l''	h,h'	l,l',l''
Rigid Union	2.7	2.7	63	9
Non-union Integration	5	2	65	15
Flexible Union	5.5	3	132	23

Table: **Integration levels and utilities under different integration methods.**

Comparison of Policies. Flexible Union vs Non-Union Integration

Proposition 2

1. *All countries choose a (weakly) higher integration level under flexible union as compared to non-union integration.*
2. *A majority of countries prefer flexible union.*
3. *There is a cut-off country - with type lower than the median - such that all countries with higher types prefer flexible union to non-union integration while all countries with lower types prefer non-union integration.*

- The median country never chooses a bound that is lower than t_m^*, its non-union integration level.
- **The enforcement power of flexible union increases integration.**

Comparison of Integration Policies. Flexible Union vs Rigid Union

Proposition 3

The comparison between b^* and r^* is ambiguous. A majority of countries prefers flexible union to rigid union.

- *If $b^* \geqslant r^*$, then (at least) the median country and all countries with higher types prefer flexible union.*
- *If $b^* < r^*$, then (at least) median country and all countries with lower types prefer flexible union.*

Comparison of Integration Policies, Summary

Theoretical Results. Distinction with previous public goods models (e.g., Alesina et al. (2005))

- **Effect of flexibility**
  1. Fewer countries' actions (directly) depend on the equilibrium policy
     - Substitutes: indirect effect on high types is negative
     - Complements: indirect effect on high types can be positive/negative
  2. Countries with higher types actions towards integration.
     - Substitutes: decreases the incentive of the median to choose a higher action and results in a lower equilibrium policy.
     - Complements: increases the incentive of the median to choose a higher action and results in a higher equilibrium policy.
- Substitutes $\Longrightarrow$ both effects decrease equilibrium policy.
  - Lower type countries prefer flexibility. (Proposition 4 in Alesina et al. (2005))
- Complements $\Longrightarrow$ effects are ambiguous.
- Which countries prefer flexibility depends on the resulting policy.
- Model can explain how the flexible arrangements in the EU (adoption of Euro, Schengen Area) are spearheaded by "higher type" countries, such as Germany and France.

Enlargement

Enlargement

- $I \subset N$ are initial members, $C = N \backslash I$ are the candidate countries, where $|C| < |I|$
- We study the SPE of the following game:
  1. Candidate countries decide whether or not to apply for membership.
  2. Each union member decides whether to admit or reject each candidate.
  3. Equilibrium union U is the initial union plus the countries admitted unanimously.
  4. The new union, U, chooses the integration policy (r^* or b^*) by majority voting.
- An equilibrium is an *initial union optimal equilibrium* if all initial union members (weakly) prefer it to all other equilibria.

Proposition 4

Suppose that the initial union members have higher types than candidates (EU). Then there is a set of initial union optimal equilibria. These equilibria have same number members, same integration levels for all initial members and are the equilibria with most members.

Illustrative Example

Enlargement

Example 2

There are five members, $I = \{2, 3, 4, 5, 6\}$, and two candidates, $C = \{1, 0\}$. Integration policy is rigid union. The types of the countries are: $\gamma_6 = 1.7$ $\gamma_5 = \gamma_4 = 1.37$, $\gamma_3 = \gamma_2 = 1.2$, and $\gamma_1 = \gamma_0 = 1.1$. The utility function is

$$\hat{u}(t_i, t_{-i}, \gamma_i) = \sum_{j \neq i} (t_i t_j)^{\frac{\gamma_i}{2}} - t_i^2 \tag{4}$$

Union	Equilibrium Policy	u_6	u_5	u_4	u_3	u_2	u_1	u_0
$\{2, 3, 4, 5, 6\}$	4.95	36.18						
$\{1, 2, 3, 4, 5, 6\}$	3.94	36.03					7.05	
$\{0, 1, 2, 3, 4, 5, 6\}$	4.95	66.67					10.32	10.32

Table: **Equilibrium integration levels and utilities for Example 2**

Discussion

Enlargement Example

- If $C = \{1\}$, then enlargement is blocked
  - The median moves from 4 to 3, the equilibrium policy decreases
  - Country 6 is worse off under this new union
- If $C = \{0, 1\}$, then enlargement happens in equilibrium
  - Due to complementarities, accession of 2 countries offsets the decrease in the type of median
- Under strategic complements
  - Integration can increase even if enlargement results in a lower type median country
  - High type countries can become proponents of enlargement and flexible protocols

Proposition 5

Integration increases after enlargement if difference between the types of the median countries in I and U are small enough.

- With strategic substitutes, union accepts new members if the change in type of the median is small.
- In our set-up, this change determines the integration, but not enlargement. Example

Non-member Integration and Exit

Union Integration with Non-Members

Key Issues

- **The relationship of international unions, like the EU, with non-members is important but understudied topic**. [absent from Alesina et al. (2005) and Casella (2005).]
  - Trade agreements with other countries. [EU-Canada (2016), EU-Japan (2018), EU-Vietnam (2020)]
  - Candidate countries. Albania, Turkey, Serbia, Montenegro, and North Macedonia are currently integrating with the EU on various domains (economics, institutions, regulation)
  - Not yet candidate. Bosnia, Kosovo.
  - EEA Countries. Norway, Switzerland and Iceland.
  - United Kingdom Special Relationship with the United Kingdom (2020)
- **Integration without giving up voting rights.** Integration with countries with lower types, who do not prefer to join.

- Non-member integration allows the union to integrate with more countries without losing voting rights and some non-members to integrate if they do not want to reach the equilibrium policy level.

Union Formation and Integration with Non-member Countries

Restrictions

Assumption 2

$u_i(t_i, t_{-i}, \gamma) = \sum_{j \neq i} \tilde{u}(\min\{t_i, t_j\}, \gamma_i) - c(t_i, \gamma_i)$ *where* $\tilde{u}$ *and* c *satisfy differentiability and supermodularity conditions.* Conditions

- Integration as set of successive policies that countries decide to implement.
- **Non-member integration bound** $\overline{o}$: maximum integration non-member countries can choose.
- We analyze the Subgame Perfect Equilibrium (SPE) of the following union formation game.
  1. Countries decide to become a member or not.
  2. Members decide the equilibrium union policy b with majority voting.
  3. Countries choose their actions.
     - If $i \in U$ [member country], then i chooses an integration level $t_i \in [b, \infty)$.
     - If $i \notin U$ [non-member], then i chooses an integration level $t_i \in [0, \overline{o}]$.

Non-member Integration Restriction and Effective Unions

- Union U is *ineffective* if the integration levels and payoffs of all countries under non-union integration is weakly higher than their payoff under the union.

Proposition 6

Let U be an equilibrium union under policy level b^*. If $\overline{o} \geqslant b^*$, then U is ineffective.

- Non-member integration must be restricted ($\overline{o} < b$) for a union to increase integration within members.

Union Formation and Integration with Non-member Countries

Efficiency

- In an equilibrium with non-member integration bound $\overline{o}$ and union U, *membership incentive constraint binds* if the lowest type member of U is indifferent between joining the union and integrating as a non-member.

Proposition 7

Let U be a union where membership incentive constraint does not bind. Then there exists $\overline{o}' > \overline{o}$ such that U is an equilibrium union under $\overline{o}'$ and all countries are better off under $\overline{o}'$.

- It is without loss of optimality to restrict attention to $\overline{o}$ that makes the lowest type non-member indifferent between becoming a member or integrating as a non-member.

Exit

Set-Up

- Let U denote a union with country types γ.
- $\overline{e}$ denotes the upper bound for integration of exiting counties.
- We analyze the following extensive form game:
  1. The Union members vote over integration policy b and decide their integration levels $t_i \geqslant b$.
  2. With probability ϵ, a country gets a shock that reduces its type to γ_l.
  3. The country that gets the preference shock decides whether or not to exit the union and its integration level.
  4. All members get an extra disutility of $-\kappa$ (where $\kappa \geqslant 0$) if a country exits.
- A union U is *stable* under $\overline{e}$ if all members staying members without a shock is an equilibrium.
- A union U is *robust* under $\overline{e}$ if all members staying members after a shock is an equilibrium.

Exit, cont

Proposition 8

Let U denote a union under $\overline{e}$ with $|U| > 2$.

1. *There is a $\tilde{\gamma}$ such that if $\gamma_I < \tilde{\gamma}$, then U is not robust under any $\overline{e}$.*
2. *If $\gamma_I \geqslant \tilde{\gamma}$, there exists $e(\gamma_I)$ where U is robust under $\overline{e}$ if and only if $\overline{e} \leqslant e(\gamma_I)$, i.e., the exiting country is restricted to have an integration level below $e(\gamma_I)$.*
3. *The exit restriction that makes the union robust, $e(\gamma_I)$, is decreasing in γ_I.*

Exit, cont.

- $e(U)$ denotes the weakest exit restriction such that U is stable under $e(U)$.
- A country *prefers exit restriction* if its expected utility is greater under $e(\gamma_I) < e(U)$

Proposition 9

If country i prefers exit restriction and $\gamma_j > \gamma_i$, then j prefers exit restriction.

Corollary 1

There is a cut-off country $k(\gamma_I, c)$ such that all countries with higher types prefer exit restriction. Exit restriction is Pareto improving if lowest type country prefers it and is adopted in majority voting if median member prefers it.

Proposition 10

$k(\gamma_I, c)$ is decreasing in c (i.e. more countries prefer exit restriction under higher c) and increasing in γ_I (fewer countries prefer exit restriction if shock is greater).

Extensions

1. **Enlargement of an initial union under majority and unanimity admission policies.**
   - **"Relaxing" admission requirements from unanimity to majority may result a smaller union.**
2. **Enlargement with non-member integration**
   - Characterize efficient non-member integration policies
   - **Additional mechanism: weaker incentive for high-type countries to admit candidates under higher non-member integration bound due to loss of voting power**
3. Lower bound $\underline{o}$ for non-member integration.

Conclusion

Contribution and Next Steps

Contribution

- International unions focusing on integration (complements) rather than public goods (substitutes)
- Explain/accommodate important aspects of EU's enlargement and flexible protocols
- Integration with non-member countries
  - Relationship between union composition and policies towards non-members, including those that leave.

Follow-Up Research

- **Tiered Union.** Flexible Union with multiple bounds
- **Endogenize integration preferences** ("types")
  - Domestic (member-state) features [polarization, inequality]
  - EU policies [European identity, transfers]
- **Multi-Dimensional Policy Space**
- **Punishments**

Motivation. The European Union

Evolution of Integration

1. **1949. Council of Europe**. to promote democracy and protect human rights. 1957.
   - 1950-1953. European Convention of Human Rights
   - 1959. European Court of Human Rights
2. **1952. European Coal and Steel Community.** "putting the war behind." "a first step in the Federation of Europe" "The common market for coal and iron ore is put into place."
3. **1957. Treaty of Rome. European Economic Community.** Estbl. 4 Freedoms. Common Market allowing people, capital, goods, and services to move freely across borders.
   - 1962. Common Agricultural Policy
   - 1968. "free cross-border trade for the first time. apply the same taxes on the goods they import from other countries."
   - 1973. First Environment Action Programme
   - 1979. First European Elections
   - 1984. 'ESPRIT' (European Strategic Programme for Research and Development in Information Technology) Programme.
   - Erasmus Programme

Motivation. The European Union.

Evolution of Integration, cont.

4. **1986. Single European Act.** "basis for a vast six-year programme aimed at sorting out the problems with the free flow of trade across EU borders and thus creates the 'Single Market'.
5. **1992. Maastricht Treaty. Completion of the 'Single Market'. 1999-2002. European Monetary Union (EMU)**.
6. **1995. European Medicines Agency**
7. **2017-8. Banking Union (SSM, SRM)**

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Motivation. EU. Enlargement and Exit

Evolution of EU

- **1952-57, EU 6.** Union Formation. France, Netherlands, Germany, Belgium, Luxembourg, and Italy.
- **1973. EU 9**. Denmark, Ireland and the United Kingdom
- **1981. EU 10**. Greece
- **1982 (1985)**. Greenland leaves the EC
- **1986, EU 12**. Spain and Portugal
- **1995, EU 15**. Austria, Finland, and Sweden
- **2004, EU 25**. Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.
- **2007, EU 27**. Bulgaria and Romania
- **2013. EU 28**. Croatia
- **2016 (2020), EU 27**. BREXIT Referendum (2016). UK leaves the EU (2020) Back

Flexible Union with Non-member Integration

In flexible union U with policy b and non-member integration bound $\overline{o}$, an integration vector $T(b,\overline{o})$ is an equilibrium if

$$T_i(b,\overline{o}) \in \begin{cases} \arg\max_{t_i \in [b,\infty]} u_i(t_i, T_{-i}(b,\overline{o}), \gamma_i) & \forall i \in U. \\ \arg\max_{t_i \in [0,\overline{o}]} u_i(t_i, T_{-i}(b,\overline{o}), \gamma_i) & \forall i \notin U. \end{cases} \tag{5}$$

Corollary 2

For any b and $\overline{o}$, there is a maximum and minimum equilibrium $\overline{T}(b,\overline{o})$ and $\underline{T}(b,\overline{o})$. For any equilibrium $T(b,\overline{o})$, we have $\underline{T}_i(b,\overline{o}) < T_i(b) < \overline{T}_i(b,\overline{o})$.

Corollary 3

For each $\overline{o}$, the most preferred policy of the median country, $b^* = \arg\max_b u(\overline{T}(b,\overline{o}), \gamma_m)$, is the Condorcet winner.

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Same Median, No Enlargement

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Example 3

$I = \{2, 3, 4, 5\}$ and $C = \{1\}$. The types are $\gamma_5 = \gamma_4 = 1.6$, $\gamma_3 = 1.5$, $\gamma_2 = 1.38$ and $\gamma_1 = 1.37$. The utility function is

$$\hat{u}(t_i, t_{-i}, \gamma_i) = \sum_{j \neq i} (t_i t_j)^{\frac{\gamma_i}{2}} - t_i^2 \tag{6}$$

Union	Equilibrium Policy	u_5	u_4	u_3	u_2	u_1
$\{2, 3, 4, 5\}$	5.06				2.5	
$\{1, 2, 3, 4, 5\}$	9				1.96	0.16

Table: **Equilibrium integration levels and (relevant) utilities for Example 3**

After enlargement, the median stays the same but the integration increases, which is not preferred by the lower type country 2.

Conditions for u

Assumption 3

$\tilde{u}$ is concave, differentiable and satisfies increasing differences, strictly increasing in both arguments and $u(t_i, t_{-i}, 0) = 0$ for all t. c is strictly convex, differentiable, satisfies strictly decreasing differences and strictly increasing in t_i and strictly decreasing in γ_i.

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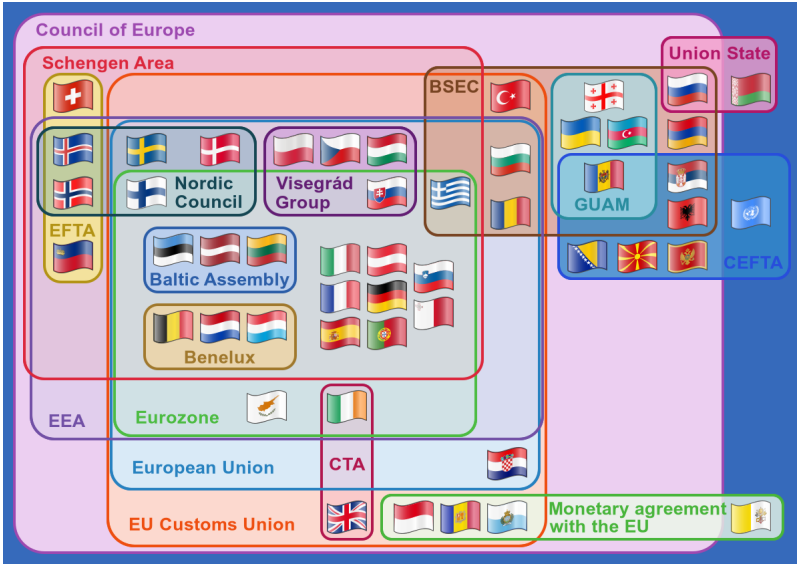
Council of Europe
Schengen Area
Union State
BSEC
Nordic Council
Visegrád Group
GUAM
EFTA
CEFTA
Baltic Assembly
Benelux
EEA
Eurozone
European Union
CTA
EU Customs Union
Monetary agreement with the EU

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