

The Economics of Monetary Unions

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- **EMU management \rightarrow deep roots € crisis.**

Costs-Benefits Monetary Unions

OCA theory

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- 'New' (monetarist) approach focus more on the benefit side \in MU, finding economic, financial and institutional factor driving up trade & B among member States.

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- Effects (asymmetric & permanent shock) on aggregate demand (D) 2 countries in Fig. 1.

Costs-Benefits Monetary Unions

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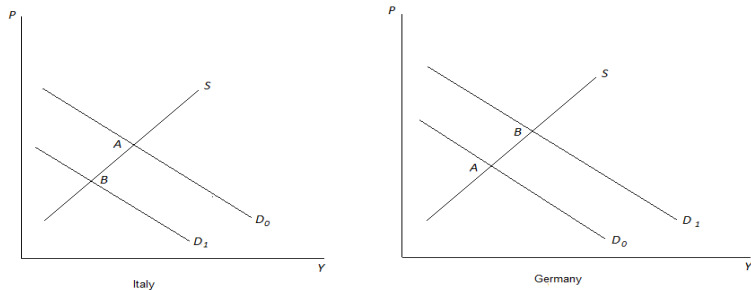


Figure 1. Asymmetric shock in MU

Costs-Benefits Monetary Unions

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- \therefore , if p & w flexible or L mobility high, automatic adjustment process.

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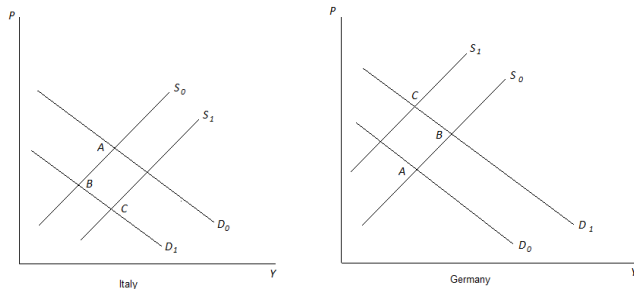


Figure 2. Automatic adjustment

Costs-Benefits Monetary Unions

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- **Fixed rate:** currency price \iff CB (fixed rate, or restricted currency bands, e.g., Denmark, Bosnia-Herzegovina, Kosovo with €; China, South-America, Micronesia States with \$) and counties can change \mathcal{E} (devaluation/revaluation).

Costs-Benefits Monetary Unions

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- **Effects in Fig. 3:** expansionary MP in IT (or devaluation \mathcal{E}) shifts D_I right-upward; restrictive MP in DE (or revaluation \mathcal{E}) shifts D_G left-downward.

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- Effects in Fig. 3: expansionary MP in IT (or devaluation \mathcal{E}) shifts D_I right-upward; restrictive MP in DE (or revaluation \mathcal{E}) shifts D_G left-downward.
- **Result:** IT avoids recession (Y contraction & U increase) and DE inflation.

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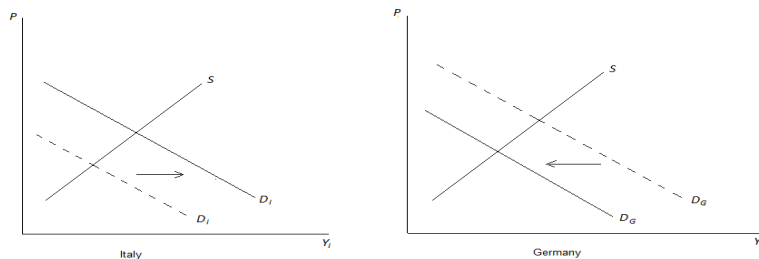


Figure 3. Effects of autonomous monetary policy

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- If so, MUs more advantageous than autonomous State regimes.

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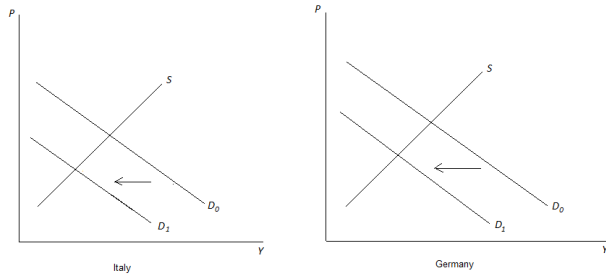


Figure 4. Symmetric shock

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- **Unfeasible strategy under asymmetric shocks.** In such a case, ECB \rightarrow dilemma (\because 1 instrument (i) and 2 problems, i.e., recession IT & expansion DE): if $i \downarrow$ to counteract IT recession, inflationary pressure DE raises; if $i \uparrow$ to prevent DE inflation, IT recession worsens.

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- By contrast, MPs coordination in MUs is formally established.
- **Implication:** under symmetric shocks, MUs emerge as more appealing than autonomous States regimes.

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- **By contrast, countries \notin MUs can always warrant debt repayment at maturity, calling upon the CB to act as a Lender of Last Resort (LLR) in sovereign bond markets and provide the required liquidity.**

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liquidity and solvency crises

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- **Problems with debt rollover at reasonable rates \rightarrow IT government to liquidity crisis Bank of Italy (BoI) cannot solve. ECB could, but Italy has no control on the ECB.**

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- **Nevertheless, UK government can always force the Bank of England (BoE) to buy up government securities and get the required liquidity to finance DP_{UK} .**

- **Implication:** *Markets cannot force stand-alone countries into default.*

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asymmetric shocks and debt dynamics

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- **Implication:** *Markets cannot force stand-alone countries into default.*
- Countries' vulnerability to shifting market sentiments ('animal spirits') downgrades countries \in MUs to the status of emerging economies, which issue debt in a foreign currency and are vulnerable to 'sudden stops' in capital inflows \rightarrow recession, liquidity crisis, debt explosion and insolvency (Calvo, 1988; Eichengreen, Hausmann, Panizza, 2005; Piersanti, 2012, chap. 4).

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- Countries' vulnerability to shifting market sentiments ('animal spirits') downgrades countries \in MUs to the status of emerging economies, which issue debt in a foreign currency and are vulnerable to 'sudden stops' in capital inflows \rightarrow recession, liquidity crisis, debt explosion and insolvency (Calvo, 1988; Eichengreen, Hausmann, Panizza, 2005; Piersanti, 2012, chap. 4).
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Example

asymmetric shocks and debt dynamics

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asymmetric shocks and debt dynamics

- Let asymmetric shock in Fig. 1 be temporary, \rightarrow recession IT & expansion DE.

Costs-Benefits Monetary Unions

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- IT recession $\implies (Y \wedge T) \downarrow, (U \wedge d) \uparrow$; expansion DE $\implies (Y \wedge T) \uparrow, (U \wedge d) \downarrow$.

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- Scenario (*a*) - unchanged trust - investors willing to hold IT government securities in portfolio, i.e., more IT bonds ($\leftarrow \gg d \wedge DP$) with no $\gg i$ (unchanged debt riskiness) to offset \ll DE bonds ($\leftarrow \ll d \wedge PD$).

Costs-Benefits Monetary Unions

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- Scenario $\{(a) \wedge \text{countries} \in \text{MU}\}$, financial markets play a stabilization role: if countries in trouble, investors move funds from surplus countries (\therefore expansion) to deficit countries (\therefore recession) lessening asymmetric shock effects (cyclical displacement).

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- **Outcome:** liquidity outflows from IT \rightarrow DE; interest rate differential (spread) between IT and DE materializes; $(D\&Y)_{IT} \downarrow$, $(D\&Y)_{DE} \uparrow$; fiscal position & recession IT worsen; expected riskiness IT bonds \uparrow and debt rollover hard.

Costs-Benefits Monetary Unions

Costs

- If uncertainty and distrust keep going, country ← adverse shock forced to cut spending and/or raise taxes (austerity) to ↑ investors' trust. But austerity costly: worsens and extend recession phase and → government stopping service the debt & *default*, validating markets expectations sovereign debt unsustainability.

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- IT bond selling → currency (€) depreciation and DM appreciation (bond selling for € and DM buying on FX) → $D_{IT} \uparrow$ & $D_{DE} \downarrow$, lessening effects of cyclical displacement.

Costs-Benefits Monetary Unions

Monetary unions & fiscal union

- OCA theory \rightarrow 2 solutions for lowering costs \in MU: 1) CB role (EU: ECB); 2) Fiscal Union (FU).

Example

FU insurance mechanism

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FU insurance mechanism

- Let national budgets countries \in MU (e.g., IT & DE) be (fully/partly) centralized at EU level (i.e., \exists EU government: T, G, TR fixed \forall EZ).

Costs-Benefits Monetary Unions

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- In budgetary union systems $\{MU \wedge FU\}$: *a)* EU fiscal revenues fall in IT (\because recession) & raise in DE (\because expansion); *b)* EU expenditure increases in IT ($\because \gg U$) and reduces in DE ($\because \ll U$).

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- **Implication:** in $(MU+FU)$, countries give up sovereignty, but get back protection against markets inherent volatility. These can no more \rightarrow countries \in MU to liquidity crisis & insolvency.

Costs-Benefits Monetary Unions

Financial markets' role

- To day, probability to fulfil EMU with FU minimal: EU budget only 1% of its GDP, whereas national budgets take up 40 – 50% of respective GDP. Unwillingness to go → FU means EMU to be an imperfect (fragile) construction with no insurance mechanism against adverse shock.

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- **Vantages:** cutting MH risk; **disadvantages:** benefits only financial assets holders.

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Trade integration & costs

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- **Ratio:** Trade integration \rightarrow similar trade structure (product typology) & economies of scale; financial integration promote capital flows. Trade barriers removal strengthen these forces \rightarrow state where shocks affect similarly member countries, reducing asynchrony.

Costs-Benefits Monetary Unions

Trade integration & costs

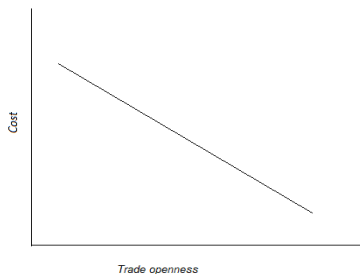


Figure 5. Cost \in MU & trade-openness/GDP

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- **Indirect benefits \Leftarrow greater transparency & competition because prices are in the same currency & easier to compare. In principle, this should boost consumption; in practice, price discrimination still prevalent in Europe and benefits poor. Causes: i) high transaction costs; ii) high price dispersion in retailing (Wolszczak-Derlacz, 2006; Parsley-Wei, 2008, Clementi, et al., 2010).**

Costs-Benefits Monetary Unions

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- Benefits higher if the common currency take on the global reserve currency status: 3 possible benefits

Costs-Benefits Monetary Unions

Benefits

- ① Higher fiscal revenues: if € used in international transactions, profits ECB↑, distributed (pro rata) EZ governments → $\ll T \forall G$ to the benefits of people in EZ . The overall estimated effect, however, small: $\sim 0.5\%$ GDP.

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- **Implication:** positive relationship between benefits & openness degree countries \in MUs (Fig. 6).

Costs-Benefits Monetary Unions

Trade integration & benefits

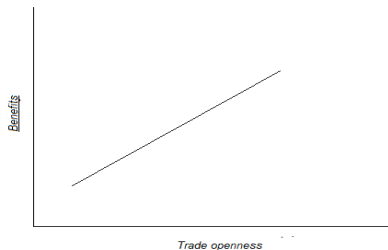


Figure 6. Benefits \in MU & trade-openness/GDP

Costs-Benefits Monetary Unions

Evaluation

- Comparison costs-benefits \in MU in Fig. 7, useful to assess EMU as OCA.

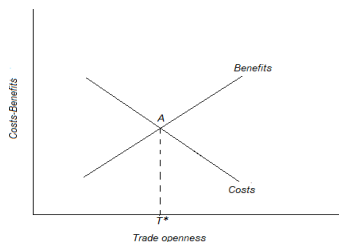


Figure 7. Costs-Benefits \in MU (% GDP)

Costs-Benefits Monetary Unions

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- To go deeper into EMU-OCA issue, consider first the trade size within EU (Tab.1)

Costs-Benefits Monetary Unions

Evaluation

Country	Ratio	Country	Ratio	Country	Ratio	Country	Ratio
SK	71.7	EE	49.5	DE	24.9	IT	13.7
HU	67.2	LT	42.6	DK	22.0	ES	13.5
CZ	65.8	IR	34.0	PT	19.5	FR	12.4
BE	62.5	LV	31.8	SE	19.1	UK	10.8
NL	61.4	AT	30.4	MT	17.3	EL	6.0
SI	52.7	PL	28.5	FI	16.0	CY	5.1

Tab. 1 Exports intra-EU, 2012 (% GDP). Source: European Commission
SK=Slovakia; HU=Hungary; CZ=Czechia; BE=Belgium; NL=Netherlands;
SI=Slovenia; EE=Estonia; LT=Lithuania; IR=Ireland; LV=Latvia; AT=
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Sweden; MT=Malta; FI=Finland; IT=Italy; ES=Spain; FR=France; UK=
United Kingdom; EL=Greece; CY=Cyprus.

Costs-Benefits Monetary Unions

Evaluation

- Data show huge differences in openness degree: Slovakia, Hungary, Netherlands, Czech, Belgium, Slovenia, Estonia, Austria, Ireland and Poland with high ratios & positive net benefits; United Kingdom, Greece, Cyprus (including Italy, Spain, and France) with low ratios & net benefits less obvious.

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- Hard mark a clear-cut line.
- **Reasons:**
 - 1 There are other parameters driving the MU choice, e.g., degree of flexibility, shock asymmetry.
 - 2 Countries with low openness degree could choose MUs to raise international reputation. If monetarist minded, costs \Leftarrow loss monetary autonomy $<$ benefits, \rightarrow MU choice despite low intra-trade: main reason MU or pegged-rate-regime choice for many countries with high & persistent inflation.

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- If (p, w) rigid & L less mobile, costs MU high and less advantageous \in MU $(A' \rightarrow A)$.

Costs-Benefits Monetary Unions

Evaluation

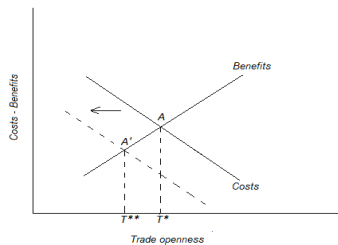


Figure 8. Costs-Benefits and rigidities

Costs-Benefits Monetary Unions

Evaluation

- In addition to flexibility (p, w, L), choice \in MU rests on size and frequency asymmetric shocks. If shock (D & S) dissimilar, MU choice costly (cost curve \rightarrow North-East, Fig. 8).

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- **Inference** \Leftarrow OCA theory: under strong asymmetry, countries \in MUs need high flexibility (p, w & L): \gg flexibility, \ll costs \in MU .

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- Inference \Leftarrow OCA theory: under strong asymmetry, countries \in MUs need high flexibility (p, w & L): \gg flexibility, \ll costs \in MU .
- Downward OCA-line denotes the minimum mix symmetry-flexibility for MUs running as OCA (i.e., $B \geq C$). To the left, flexibility not enough given symmetry (non-OCA zone: $C > B$); to the right, flexibility suited given symmetry (OCA zone: $C < B$).

Costs-Benefits Monetary Unions

Evaluation

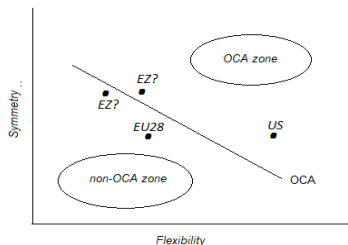


Figure 9. Relationship flexibility-symmetry in MUs

Costs-Benefits Monetary Unions

Evaluation

- Fig. 9 shows (guessed) position countries \in MU, e.g., EU28 \subset $\{DE, FR, IT, BE, LU, NL, IR, EL, PT, ES, AT, FI, SK, CY, MT, SI, EE, LV, LT, UK, DK, SE, PL, CZ, HU, BG, RO, HR\}$ trusted non-OCA zone (Eichengreen, 1990; De Grauwe-Heens, 1993; Korhonen-Fidrmuc, 2001; Beine et al., 2003); minimum subset given by $\{DE, BE, LU, NL, AT, FR\}$ trusted OCA zone; US guessed OCA zone; EZ position uncertain.

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- **Remark:** EU28 and US (same symmetry but different flexibility) \rightarrow US (\gg flexibility) above OCA-line, EU28 (\ll flexibility) below OCA-line. Uncertainty EZ position \leftarrow divergent analysts' opinions and EZ crisis \rightarrow view EZ non-OCA zone.

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- **Key issue:** how move UE28 into OCA zone. Two possible strategies: 1) reduce shock asymmetry; 2) increase flexibility.

Costs-Benefits Monetary Unions

Evaluation

- Troubles with 1) \Leftarrow *a*) factors not quite under policymakers' control (e.g., industrial & regional specialization, resource endowment, etc.); and *b*) political union powerful tool-shrinkage asymmetric shocks.

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- Strategy 2) \rightarrow structural reforms goods & labour markets, i.e., policies $\rightarrow \ggg$ flexibility p, w, L .

Costs-Benefits Monetary Unions

Evaluation

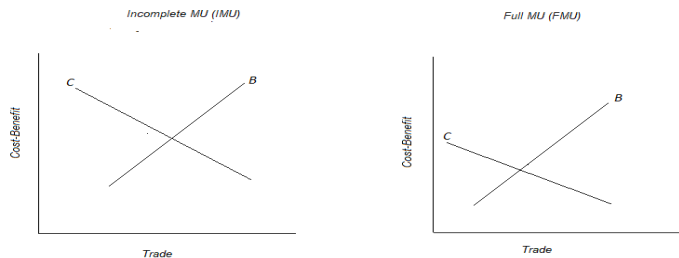


Figure 10. Costs-Benefits complete and incomplete MUs

Costs-Benefits Monetary Unions

Evaluation

- Investigation *C & B* envisages \exists trade-off flexibility-fiscal union in MUs \rightarrow new OCA line.

Costs-Benefits Monetary Unions

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- **Critical point:** flexibility appealing to many economists, CB governors, and firms, but costly for those suffering $\ll w$ and/or \gg mobility. **Result:** $> \text{FU}$ can make it less costly \in MU for large sections of people.

Costs-Benefits Monetary Unions

Evaluation

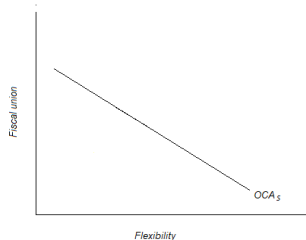


Figure 11. Trade-off FU-Flexibility

Costs-Benefits Monetary Unions

Evaluation

- OCA_5 curve allows to study the relationship between (asymmetric) shocks & policy strategies in MUs (e.g., EZ).

Costs-Benefits Monetary Unions

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- if shock exogenous, optimal reaction EZ \rightarrow OCA zone is on horizontal arrow, i.e., \gg flexibility (structural reforms goods & labour markets);
- if shocks endogenous, optimal reaction EZ \rightarrow OCA is on vertical arrow, i.e., \gg FU (\rightarrow political union).

Costs-Benefits Monetary Unions

Evaluation

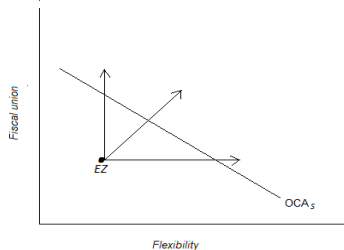


Figure 12. Policies moving EZ in OCA zone

Costs-Benefits Monetary Unions

Evaluation

- Real world under both shocks and actions needful in 2 fronts:
 >>FU; >>flexibility p, w, L .

Costs-Benefits Monetary Unions

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 with slope \leftarrow shock typology:

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- **Remark:** *i*) flexibility managed by national governments (\gg integration not necessary for \gg flexibility); *ii*) fiscal union \implies political union, not under control of the single-member country, but the member countries as a whole.
- **Policy implication:** in EZ, exogenous shocks faced with national strategies, endogenous shocks \longleftarrow EU strategy.

Costs-Benefits Monetary Unions

Evaluation

- The obsessed, single-minded EZ commitment to structural reforms for EMU crisis solution \implies *i*) very low (or no) willingness in EU countries to go in the direction of more fiscal & political union; *ii*) explains persistence & costs EZ crisis (\rightarrow asymmetric adjustment - core vs. periphery).

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- **Combination TT and OCA lines highlights EC hypothesis time evolution costs/benefits in MUs (Fig. 13).**

Costs-Benefits Monetary Unions

Evaluation

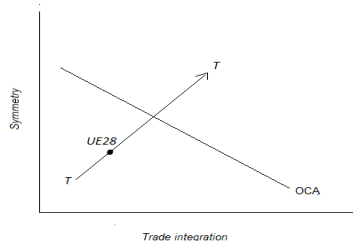


Figure 13. Evolution symmetry-trade integration in MUs.
European Commission theory.

Costs-Benefits Monetary Unions

Evaluation

- Fig. 13 displays UE28 (EZ) progress towards OCA zone as trade integration increase, foreseeing inexorable & gainful ($B > C$) approach to EMU for all EU countries in the long run.

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- Dynamics \rightarrow OCA zone \subset endogenous component helping trade integration if countries choose \in MU.
- **Ratio:** MU choice becomes self-fulfilling, making OCA criteria less binding, i.e., costs-benefits ratio changes, reducing C relative to B , raising convenience \in MU, \Leftarrow 'New' OCA theory (Frankel-Rose, 1998) \subset new classical theory (Lucas, Friedman).

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- 'New' OCA: a) down-plays costs and plays up benefits \in MU (endogeneity monetary & trade integration process: Rose effect); b) provides the theoretical foundations for the current EMU institution & governance (e.g., Treaty of Maastricht, Treaty on the Functioning of EU); c) explains the single-minded stress on supply side (structural reforms) with no regard to demand side (counter-cyclical fiscal policy).

Costs-Benefits Monetary Unions

Evaluation

- Predictions ← ‘new’ OCA & EC too optimistic; others advanced antithetical hypothesis & predictions.

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- Scenario K'K' line (\leftarrow slope $>$ OCA line) \rightarrow opposite result 'New' OCA-EC prediction: probability EU countries \in zona OCA small.

Costs-Benefits Monetary Unions

Evaluation

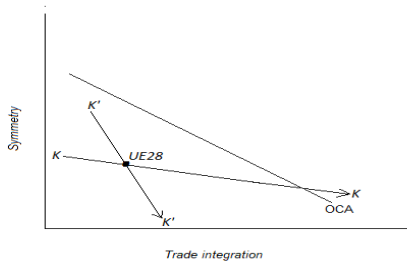


Figure 14. Trade integration-symmetry in MUs. Krugman hypothesis

Costs-Benefits Monetary Unions

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 - ③ Flexibility labour market increased, particularly after 2010 crisis with employment protection indexes \ll many EZ countries (e.g., *IR, EL, PT, ES*).
- **Result:** empirical support 'New' OCA theory (endogenous process monetary & trade integration) poor: only \gg flexibility consistent with 'New' theory; integration not consistent; dubious \gg symmetry. Maybe, sovereign debt crisis 2010 \gg distance among EZ countries.

Fragility Incomplete MUs

Fixed exchange rate regimes as incomplete MUs

- Costs-Benefits analysis MUs \rightarrow partition MUs in full (complete) MU (FMU) and incomplete MU (IMU). FMU \subseteq fiscal union (i.e., MU+FU); IMU $\not\subseteq$ FU (i.e., member countries retain FP autonomy).

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- Factor (1) \longleftarrow partial (or not full) credibility to $\bar{\mathcal{E}}$ commitment \longleftarrow shock unpredictability \rightarrow to change the fixed parity to fulfil other policy targets (e.g., U^F , Y^P , $\Delta Y/Y$).

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- Choice (a) or (b) conditional on threshold shock size $(\bar{s}) \mid B = C \implies (a) = (b)$. Incentives option (a) or (b) in Fig. 15.

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Fixed exchange rate regimes as incomplete MUs

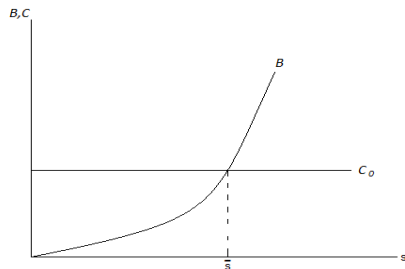


Figure 15. Costs-Benefits devaluation

Fragility Incomplete MUs

Fixed exchange rate regimes as incomplete MUs

- B curve displays relationship between devaluation & shock size (s):
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- Fig. 15 describes a unique equilibrium scenario where $\bar{\mathcal{E}}$ collapse exactly foreseen given \bar{s} (first-generation models).

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- Scenario more complex (Fig.16) if \bar{s} not fixed but linked to market devaluation expectations (second-generation models).

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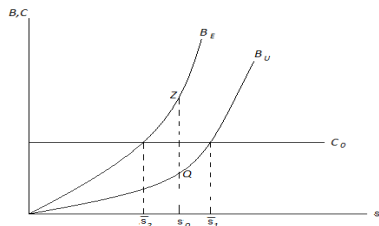


Figure 16. Multiple equilibria in Forex market

Fragility Incomplete MUs

Fixed exchange rate regimes as incomplete MUs

- Fig. 16 \subset 2 curves B : B_U curve \Leftarrow unexpected devaluation hypothesis by markets $\forall s \leq \bar{s}_1$; B_E curve \Leftarrow expected devaluation hypothesis by markets.

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- $s \leq \bar{s}_2$ zone (weak shock): devaluation unlikely ($C > B$); currency not under attack; expectations no devaluation validated. Scenario $\forall s < \bar{s}_2$ *good equilibrium*: devaluation missing and parity $\bar{\mathcal{E}}$ credible & supported by markets expectations. $s < \bar{s}_2$ zone \equiv *heaven*.

Fragility Incomplete MUs

Fixed exchange rate regimes as incomplete MUs

- $s > \bar{s}_1$ zone (severe shock): devaluation sure ($B > C$); CB under attack (parity not credible); FR stock rapidly depleted; parity ($\bar{\mathcal{E}}$) abandoned and devaluation expectation validated. Scenario $s > \bar{s}_1$ *bad equilibrium*: devaluation inescapable & $\bar{\mathcal{E}}$ unsustainable and challenged by markets. $s > \bar{s}_1$ zone \equiv *hell*.

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- Expectations subject to sudden changes, able to let the economy jump from Q to Z for any s . $\forall s_0 \in s : s_0 \rightarrow Q \vee Z$, the economy can jump from Q to Z if markets change the country's trustworthiness:
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- Exchange rate flexibility (option 2) restore MP autonomy but: *i*) does not remove the source of speculative attacks (Aghion et al., 2000, 2004; Piersanti, 2012); *ii*) opens the countries to external shock vulnerability (Calvo-Reinhart, 2002; McKinnon-Schnabl, 2002).

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- EMU/EZ \in IMU (FU $\not\subseteq$ EMU) \subseteq (intrinsic) fragility similar to fixed-rate regimes (Fig. 17).

Fragility Incomplete MUs

The EMU/EZ case

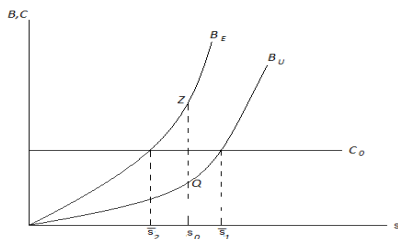


Figure 17. Multiple equilibria in IMUs

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- B_E curve is default benefit if expected by markets. B_E above B_U as default expectation \rightarrow investors selling governments bonds: $i \uparrow \rightarrow (d \wedge PD) \uparrow \implies \gg C$ recession from *austerity* & $\gg B \iff$ defaulting: $\forall s, \gg B \rightarrow \text{curve } B \odot$.

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 - **1) if investors optimistic (default unexpected) equilibrium in Q : net benefit $(B - C) < 0$; government trusted; investors hold sovereign bonds; liquidity sizeable; no-default equilibrium sustainable & self-fulfilling: economy in good equilibrium**

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- **2)** If investor pessimistic (default expected) equilibrium in Z : net benefit $(B - C) > 0$; government in danger of default; investors not willing to hold sovereign bonds; liquidity shortage; default unavoidable & self-fulfilling; economy in *bad equilibrium*.

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- **In *bad equilibrium*, IMUs \subset 2 other negative features: banking crises; lack of automatic stabilizers.**

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- **Banking crises:** investors' exit from sovereign bond market \implies :
 - a) $p \downarrow$ & capital losses \rightarrow banks' balance sheet worsening, being they a major investor in government bonds;
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- Government debt crisis (point Z) affects the banking sectors \rightarrow banking crisis: e.g., *EL*, *PT* in EZ. But link bidirectional, i.e., banking crisis \Leftrightarrow *PD* crisis, e.g., *IR*, (*doom loop* banks-governments).

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- **Automatic stabilizers:** In Z , countries \in IMU without automatic stabilizers (AST) against cyclical fluctuations. AST \Rightarrow recession $\gg d$, expansion $\ll d$, i.e., countercyclical fiscal policy. By contrast, no-AST \implies : recession $\rightarrow \ll T \ \& \ \gg d$; markets' trust future sustainability $PD \downarrow$; liquidity crisis; government forced to austerity policies, i.e. pro-cyclical fiscal policy \rightarrow expansion & recession phases to intensify (*boom-bust* cycle; Eichengreen et al., 2005).

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- Option (1) \implies high default costs & \subset possibility of excluding defaulting countries from MU. Option (2) needed to manage crisis in sovereign bond markets. Option (3) required for MU long-run sustainability.

Changing EMU in FMU

ECB role

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- Power LLR role clear from ECB intervention in 2012: OMT & QE policies.

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- OMT (*Outright Monetary Transaction*) policy: short-term sovereign bond purchases countries \in EMU under severe macroeconomic troubles \rightarrow EZ spreads \downarrow and waned EMU breakup expectations \leftarrow spreads explosion. Unfortunately, ECB conditioned OMT to austerity program by applicant countries, deepening the recession phase.

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- This → to discern: a) MB from M^s ; b) normal phase from adverse occurrence or crisis.

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ECB role: inflation risk

- (a): when CB purchases government bonds $MB (\equiv CO + D) \uparrow$. This \Rightarrow (always) $\gg M^s$ & $\gg \Delta p$ (Figs. 18 & 19). In EZ blatant difference between pre-(2000-08) & post-crisis (2009-13): pre-crisis, MB & $M3 \equiv M^s$ congruent ($m = 100\%$) & inflation $> 2\%$; post crisis relationship broken down ($m \simeq 0$) & inflation $< 2\%$ (01/2015 = -0.6% , 11/2016 = -0.1 , \lll target 2%).

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- Drop $m \implies$ liquidity trap: banks \gg reserves $\longleftarrow \gg$ liquidity from ECB but do not provide \gg credit; \gg uncertainty (\longleftarrow crisis) $\rightarrow \gg$ risk aversion $\rightarrow m \leq 0 \rightarrow$ deflation, not inflation.

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- (b): during a crisis agents \gg liquidity preference. If CB $\neg \gg MB$, crisis \rightarrow bank runs & deep recession; if CB $\gg MB$, no bank runs & deflation avoided.

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- (a): when CB purchases government bonds $MB (\equiv CO + D) \uparrow$. This \nRightarrow (always) $\gg M^s$ & $\gg \Delta p$ (Figs. 18 & 19). In EZ blatant difference between pre-(2000-08) & post-crisis (2009-13): pre-crisis, MB & $M3 \equiv M^s$ congruent ($m = 100\%$) & inflation $> 2\%$; post crisis relationship broken down ($m \simeq 0$) & inflation $< 2\%$ (01/2015 = -0.6% , 11/2016 = -0.1 , \lll target 2%).
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- (b): during a crisis agents \gg liquidity preference. If CB $\neg \gg MB$, crisis \rightarrow bank runs & deep recession; if CB $\gg MB$, no bank runs & deflation avoided.
- **Conclusion:** LLR & inflation not related. Milton Friedman (1963) made clear GFC29 sharpened by FED \neg LLR action. If $\Delta p \uparrow$, CB can \gg MRR or $\ll MB$ selling government bonds to banks (*open-market operations*) and $\rightarrow \Delta p \downarrow$.

Changing EMU in FMU

ECB role: inflation risk

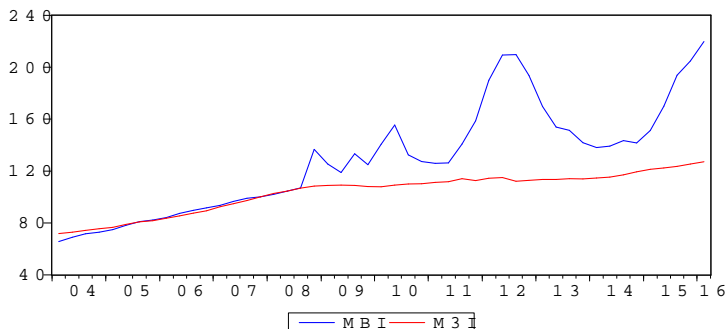


Figure 18 Monetary Base (MB) & money stock (M3) in EZ.
(12/2007=100). Source: ECB

Changing UME in FMU

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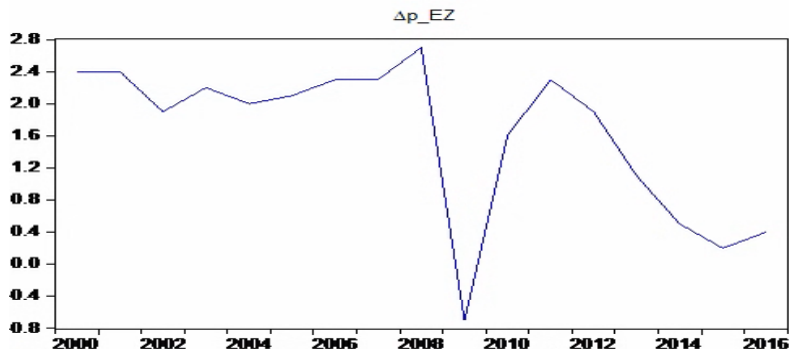


Figure 19. Inflation (Δp) in EZ. Source: AMECO Database

Changing EMU in FMU

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- (b) presumed losses \leftarrow OMO needful and helpful if warrant financial stability (i.e., avoid banking & financial crisis);
- (c) CB cannot default: it can create money and operate with negative equity: no need of positive equity to operate;
- (d) IMU open to *self-fulfilling* dynamics driven by market sentiments \rightarrow debt crises (*bad equilibrium*). CB LLR role can ward off *bad equilibrium*, avoiding losses and fiscal implications.

Changing EMU in FMU

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- (b) SGP rules too inflexible \rightarrow tensions among national States & European institution. Inflexibility \rightarrow sanctions & penalty even in recessions, raising costs & pains of crises and enhancing EU-scepticism.

Changing EMU in FMU

Fiscal union

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- Solution FU \implies surrender sovereignty (total/partial) to European institutions, i.e., political union.
- Today no (poor) willingness in EU \rightarrow FU and EMU remains IMU.
This does not preclude a small step strategy, signaling the willingness EMU \rightarrow FMU.

Changing EMU in FMU

Fiscal & political union

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Fiscal & political union

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- Long-run success EZ depends on the strength PU process. PU variable so far missing in EU, but needed to lower: *(a)* effects of asymmetric shock; *(b)* structural fragility IMU; *(c)* bring in firm links among member countries to counteract diverging forces in EZ, i.e., long-run viability EMU.