JEB026 - European Economic Integration

Monetary theory and the EURO

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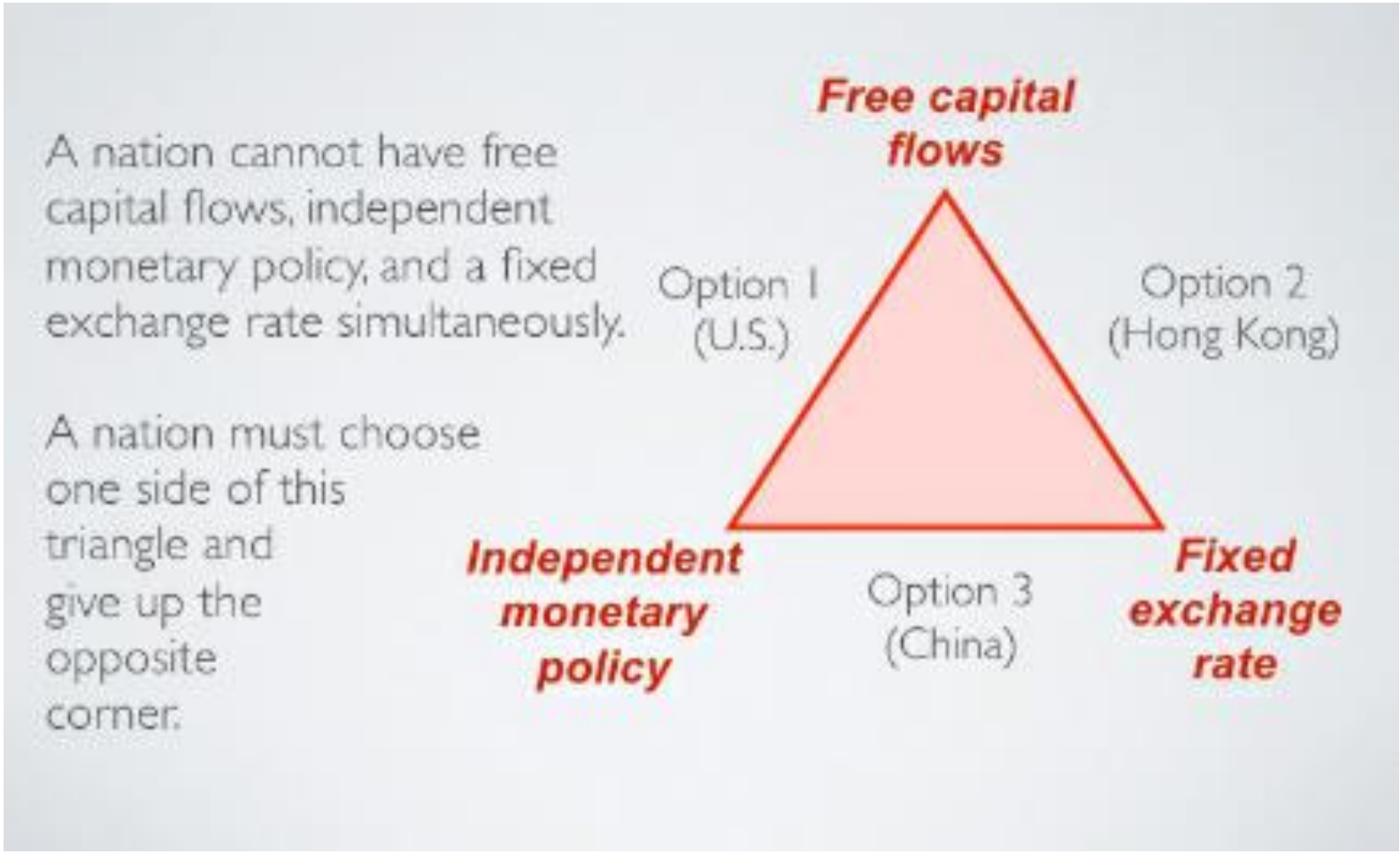
OUTLINE

- I. Monetary authority and impossible trinity
- II. The theory of optimum currency areas (OCA)
- III.Euro area – enlargement and principles of joining
- IV. Maastricht criteria (monetary)
- V. Costs and benefits of the €
- VI. Effectiveness of currency depreciation

Readings: Baldwin, Wyplosz (Chapter 14,15).

I. Monetary authority and impossible trinity

Impossible trinity



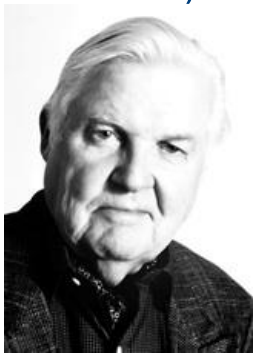
Impossible Trinity means that no monetary arrangement can reconcile simultaneously

II. Theory of optimum currency areas (OCA)

Theory of optimum currency areas (OCA)

- OCA is theoretical basis of whether countries should form monetary union = one authority responsible for conduct of monetary policy
- The author of OCA theory is Robert Mundell (Nobel prize winner in 1999)

  Other contributors: Peter Kenen, Ronald McKinnon, Jacob Frenkel

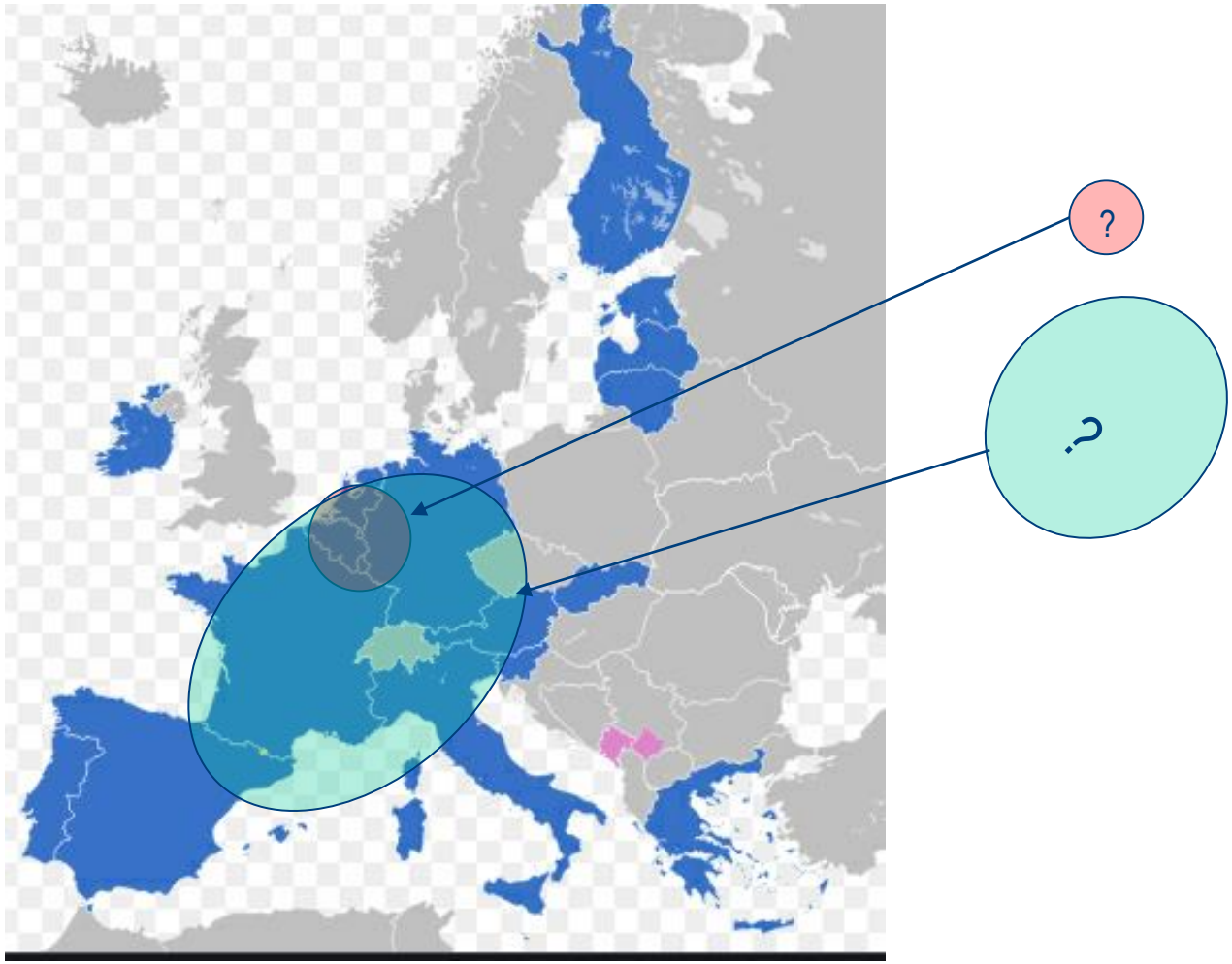


R. Mundell

- **OCA properties:**
  - **(i) symmetry of shocks:** countries in MU should experience macroeconomic shocks that are sufficiently correlated with those experienced in the rest of MU
  - **(ii) flexibility**: countries in MU should have sufficient flexibility in the labour markets to be able to adjust to asymmetric shocks one they are in the MU
  - **(iii) integration and degree of openness:** countries in MU should have a sufficient degree of trade integration with the members of the MU so as to generate benefits of using the same currency.

Theory of optimum currency areas (OCA)

- Generally, two major streams of the optimum currency area literature:
- **The first stream** tries to find the crucial economic characteristics to determine where the (illusionary) borders for MU (exchange rates) should be drawn (1960s-1970s).



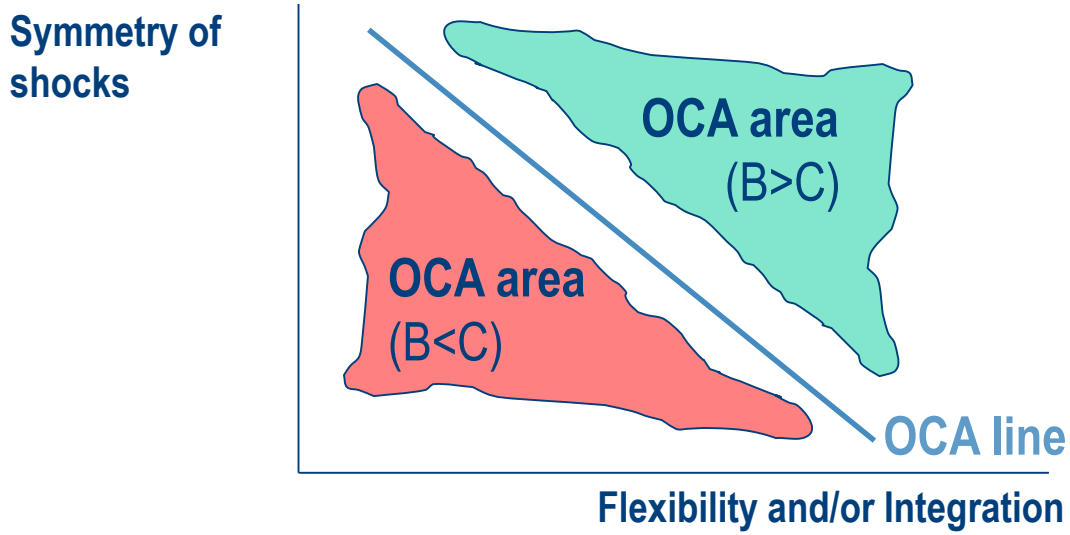
Theory of optimum currency areas (OCA)

- **The second stream** (1970s-till now) assumes that any single country fulfills completely the requirements to make it an optimal member of a monetary union.

- The early discussions about the OCA theory concentrated on the choice of the exchange rate regime (this idea was not central in the1970s and 1980s).

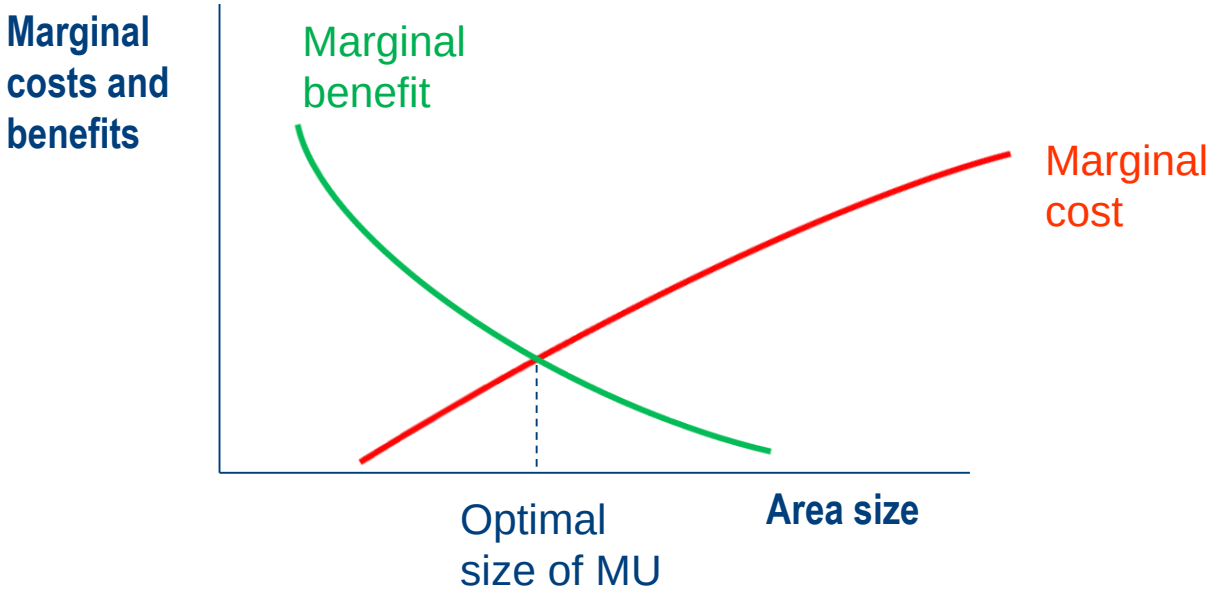
- McKinnon (1963) argued that the more the country is open to the world the lower the benefits of flexible exchange rates. Any exchange rates variation in a highly open country is without any impact on the terms of trade and real wages, because the change in the price of the currency will affect both the export price of domestic products and the import price of foreign products.
- Kenen (1969) suggested that the higher the product diversification is the lower the extent of asymmetric shocks occurrence (shock would affect a relatively small part of the economy).

The logic of tha OCA theory



- **OCA line:** combinations of symmetry and flexibility for which the costs and the benefits of a monetary union just balance.
- **Slope of the OCA line:** negatively sloped because a decline in symmetry of shocks raises the cost of monetary union. Integration is a source of benefits of a monetary union, i.e., the greater the degree of integration the more the member countries benefit from the efficiency gains of a monetary union.
- **To the right of the OCA line:** the degree of flexibility is sufficiently large given the degree of symmetry (benefits of the monetary union > costs of the monetary union)
- **To the left of the OCA line:** insufficient flexibility for any given level of symmetry => (benefits of the monetary union < costs of the monetary union)

The logic of the OCA theory

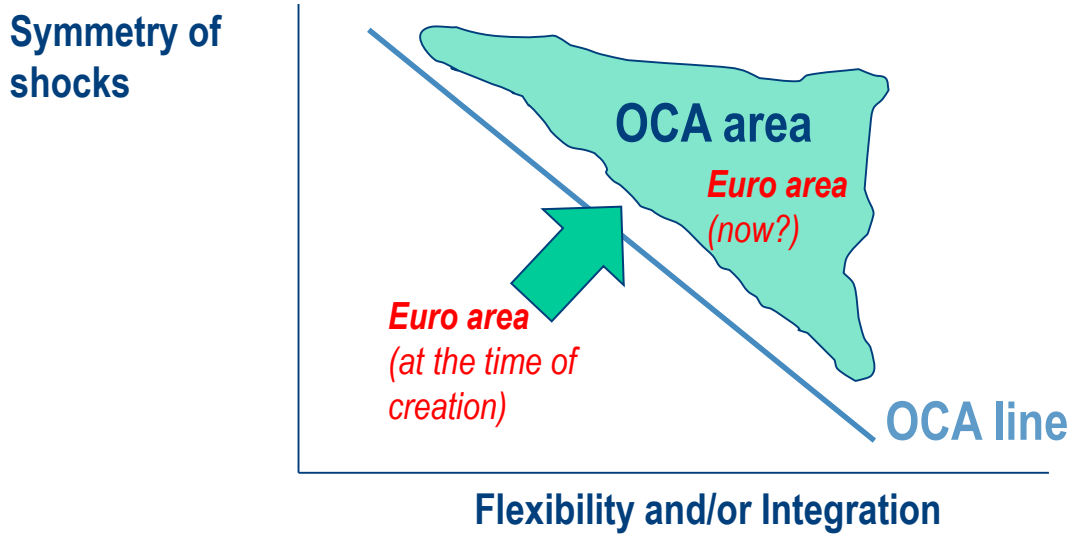


- **MB:** measures the added advantage of increasing a currency area by one unit (for example one unit of GDP or one more country). It is declining as the area expands because the extra benefit form adding one more country to an already large currency area is smaller than when the initial area was small.
- **MC:** as currency area grows larger, it becomes more diverse (for example in standards of living) => more diversity means more cost when sharing a common currency. It is rising with the size of the area.

Endogenous OCA

- **Endogenity principle** (Frankel and Rose, 1998)
  - Creation and maintenance of monetary union among countries which do not form OCA accelerates integration processes and contributes to achieving OCA faster => countries that before the start of the MU fail to satisfy the OCA criteria may, by the very fact that they form a monetary union, change economic conditions in such a way that these conditions get satisfied (synergies).
  - Countries may form a monetary union even though they do not form optimum currency area
- Elimination of exchange rate risk boosts mutual trade
  - Exchange rate stability improves efficiency of investment decisions
  - Costly hedging with financial instruments (lack of long-term contracts)
- Absence of exchange rate risk leads to deeper integration
  - Price transparency enhances competition in product markets (complications due to price regulation, different tax system, consumer preferences)
  - Easier capital mobility contributes to easier overcoming of asymmetric shocks
  - Asymmetric shocks are made more symmetric (through more diversified ownership of assets)

The logic of tha OCA theory



- **The endogenous mechanism** have the effect of moving the euro area towards the OCA line/area. This happens because the monetary union increases the degree of economic (trade) integration.
- **The endogenous mechanism:**
  - (i) MU can affect trade flows and intensify trade integration
  - (ii) MU leads to more intense financial integration thereby facilitating the emergence of insurance mechanism (the later reduce the costs of asymmetric shocks)
  - (iii) MU affects the functioning of the labour markets and can potentially increase their flexibility, i.e. reducing the costs of adjusting to asymmetric shocks in the MU

The OCA-index

- **The OCA-index**:
- tries to assess the benefit-cost ratio for implementing a common currency between the pair of the countries based on the structural characteristics of the economies.

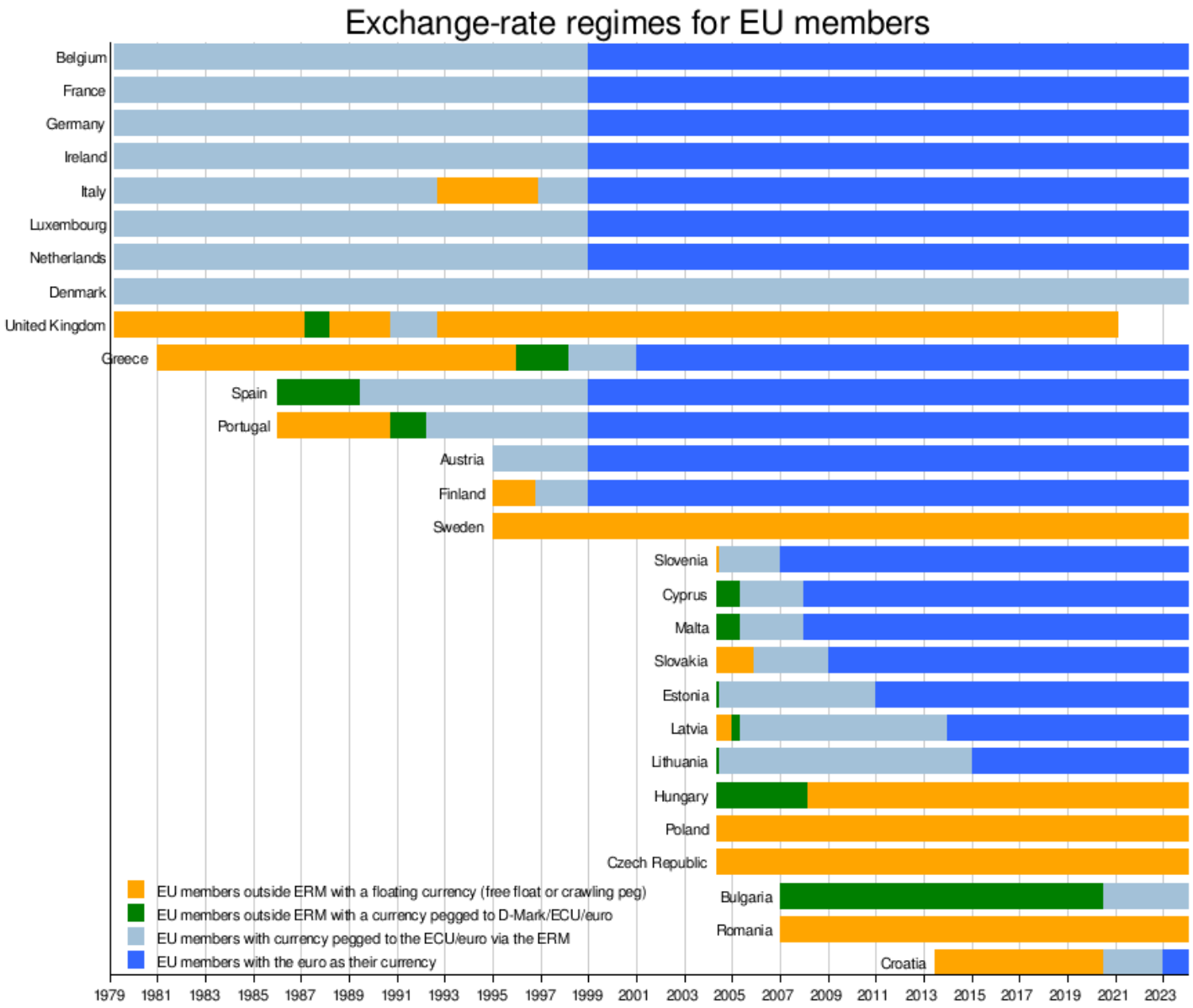
$$SD(e_{ij}) = \underset{(0.02)}{-0.09} + \underset{(0.21)}{1.46}SD(\Delta y_i - \Delta y_j) + \underset{(0.006)}{0.022}DISSIM_{ij} - \underset{(0.006)}{0.054}TRADE_{ij} + \underset{(0.001)}{0.012}SIZE_{ij}$$

$$n = 210 \quad R^2 = 0.51 \quad S.E. = 0.027$$

- **$SD(e_{ij})$** is the standard deviation of the change in the logarithm of the end year bilateral exchange rate between countries i and j,
- **$SD(\Delta y_i - \Delta y_j)$** is the standard deviation of the difference in the logarithm of real output between i and j,
- **$DISSIM_{ij}$** is the sum of the absolute differences in the shares of agricultural, mineral, and manufacturing trade in total merchandise trade,
- **$TRADE_{ij}$** is the mean of the ratio of bilateral exports to domestic GDP for the two countries,
- **$SIZE_{ij}$** is the mean of the logarithm of the two GDPs

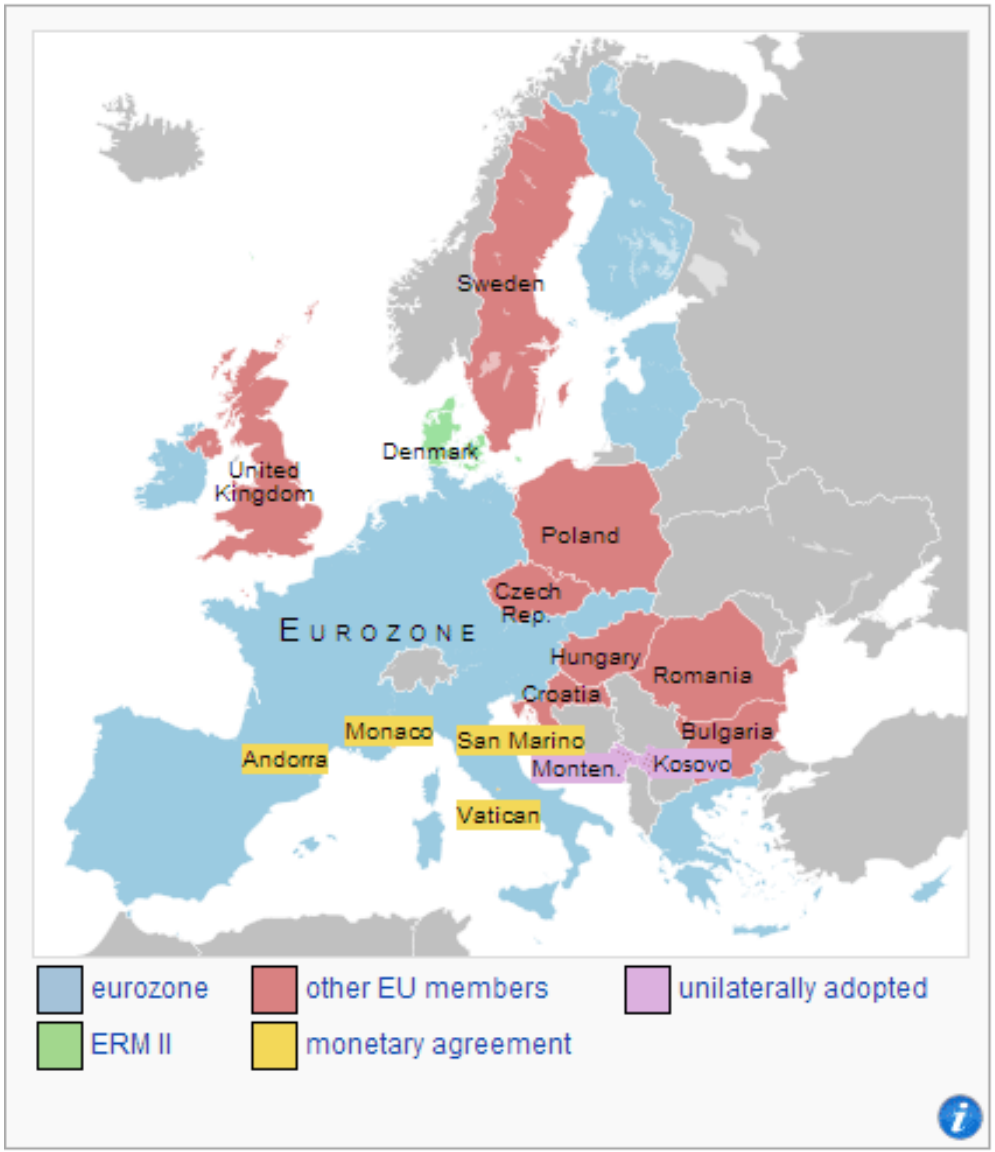
III. Euro Area – Enlargement and Principles of Joining

Historical EA enlargements



Euro Area enlargement

1999
Belgium
Germany
Ireland
Spain
France
Italy
Luxembourg
Netherlands
Austria
Portugal
Finland



2001
Greece
2007
Slovenia
2008
Cyprus
Malta
2009
Slovakia
2011
Estonia
2014
Latvia
2015
Lithuania
2023
Croatia

Bulgaria?

Joining the euro area

An obligation to adopt euro is set by the Europe treaties

- All member states of the EU are obliged to adopt the euro and join the euro area – to do so they must meet convergence criteria
  - permanent exceptions: Denmark and before brexit the UK ("opt-outs" from the time of the Maastricht treaty)
  - new EU member states (2004 and 2007) and Sweden are granted "derogations" (temporary exceptions)

- Member states with derogations are assessed in Convergence Report by EC and ECB at least once every two years or at the request
  - latest Convergence report: 2022 – 7 countries assessed (BG, CZ, HR, HU, PL, RO, SE), see: https://www.ecb.europa.eu/pub/convergence/html/ecb.cr202206~e0fe4e1874.en.html

Joining the euro area

see:
https://www.ecb.europa.eu/pub/convergence/html/ecb.cr202206~e0fe4e1874.en.html

Maastricht convergence criteria

Economic criteria

- Price stability
- Exchange rate stability
- Long-term interest rates convergence
- Sustainability of public finance (debt and deficit)

Legal convergence

- Independence of National Central Banks (NCBs), provisions on confidentiality
- Prohibition on monetary financing, on privileged access
- Legal integration of the NCBs into the Eurosystem

IV. Maastricht criteria (monetary)

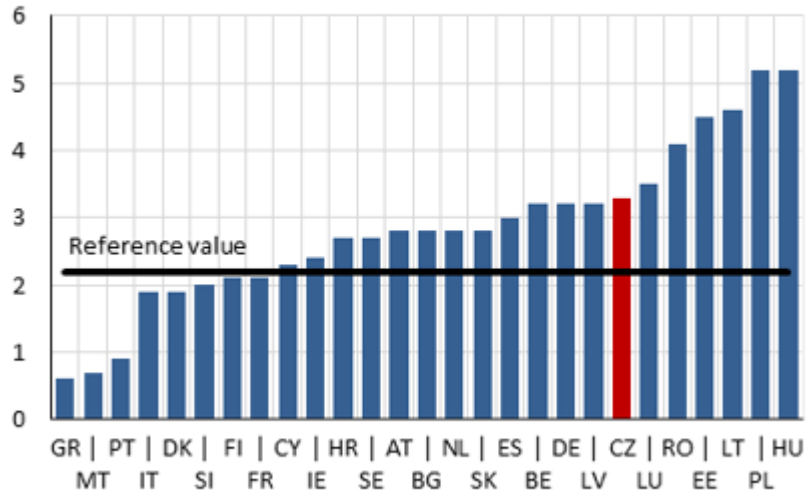
Convergence criteria – inflation

- **Maximum admissible limit:** average of three lowest inflations in EU countries plus 1.5 percentage points
- **Indicator:** Twelve month average HICP (*Harmonised Index of Consumer Prices*)
- **Motivation**
  - Substantial inflation differentials make single monetary policy difficult to operate
  - Erosion of price competitiveness without recourse to realignments
  - "Value of price stability" adhered to by all Eurozone members (guarantee for Germany)
- **Objections**
  - Why inflation in countries outside Eurozone?
  - Who are outliers (countries with extremely low inflation)?
  - Too restrictive for catching-up countries (Balassa-Samuelson effect)?

Convergence criteria – HICP inflation (case of the CR)

Chart 1.1: Average inflation rate in 2021

harmonised index of consumer prices; in %



Source: Eurostat (2022a).

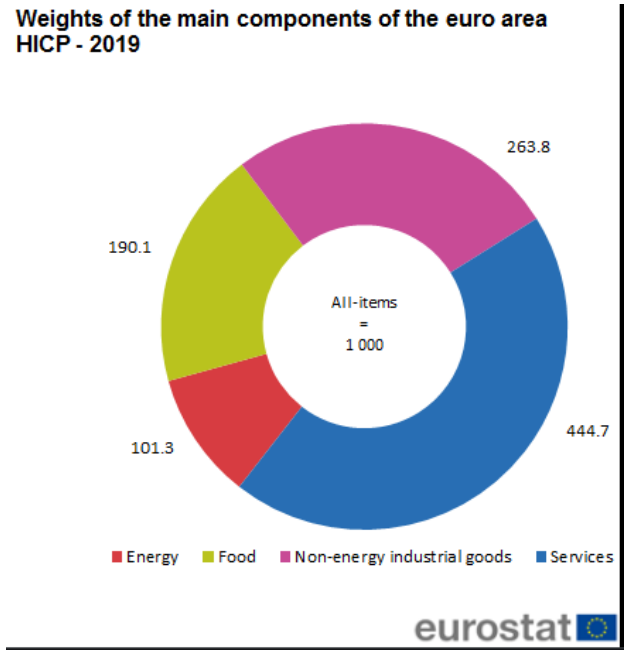


Table 1.1: Consumer prices

harmonised index of consumer prices; average for last 12 months vs. average for previous 12 months as of end of period; growth in %

	2014	2015	2016	2017	2018	2019	2020	2021	2022 Forecast	2023 Forecast
Average for 3 EU countries with lowest inflation*	-0.2	-0.9	-0.8	0.6	0.7	0.4	-1.0	0.7	7.0	3.8
Reference value	1.3	0.6	0.7	2.1	2.2	1.9	0.5	2.2	8.5	5.3
Czech Republic	0.4	0.3	0.6	2.4	2.0	2.6	3.3	3.3	14.4	9.5

*Note: * More precisely, the three best performing Member States in terms of price stability (see Appendix A). These were Denmark, Finland and France for 2022 and Denmark, Luxembourg and Malta for 2023. Malta and Portugal were excluded from the calculation of the criterion in 2022 according to the ECB methodology on 'outliers' used in the ECB's Convergence Reports (ECB, 2022a).*

Source: Eurostat (2022a). Forecasts for 2022 and 2023 according to the EC (2022a) and the MF CR (2022a).

22

Convergence criteria – long-term interest rates

- **Maximum admissible limit:** average of interest rates in three EU countries with lowest inflation plus 2 percentage points
- **Indicator:** Average monthly yield on 10-year government bonds

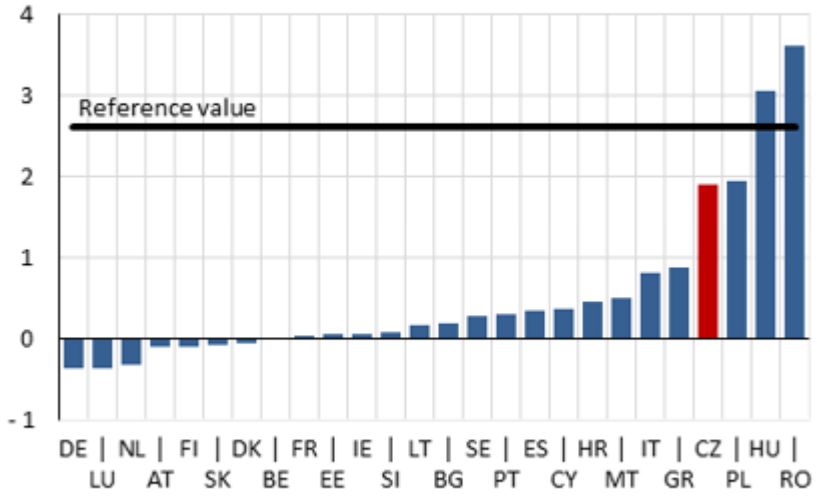
- **Motivation**
  - Sustainability test of low inflation and healthy public finances in longer term
  - Avoiding large instability in pricing debt securities when they are converted from national currency to euro

- **Objections**
  - Elimination of exchange rate risk in monetary union triggers convergence of bond yields (consequence of uncovered interest rate parity)
  - Caveat: elimination of exchange rate risk does not eliminate credit risk

Convergence criteria – long-term IR

Chart 1.3: Long-term interest rates in 2021

in %



Source: Eurostat (2022b).

Table 1.3: Long-term interest rates on government bonds

yields on government bonds with residual maturity of 10 years; 12 month average; in %

	2014	2015	2016	2017	2018	2019	2020	2021	2022 *Forecast*	2023 *Forecast*
Average for 3 EU countries with lowest inflation*	1.8	1.8	2.1	1.3	2.1	1.3	0.7	0.6	1.3	1.2
Reference value	3.8	3.8	4.1	3.3	4.1	3.3	2.7	2.6	3.3	3.2
Czech Republic	1.6	0.6	0.4	1.0	2.0	1.6	1.1	1.9	4.5	5.2

*Note: * More precisely, the three best performing Member States in terms of price stability (see Appendix A).*

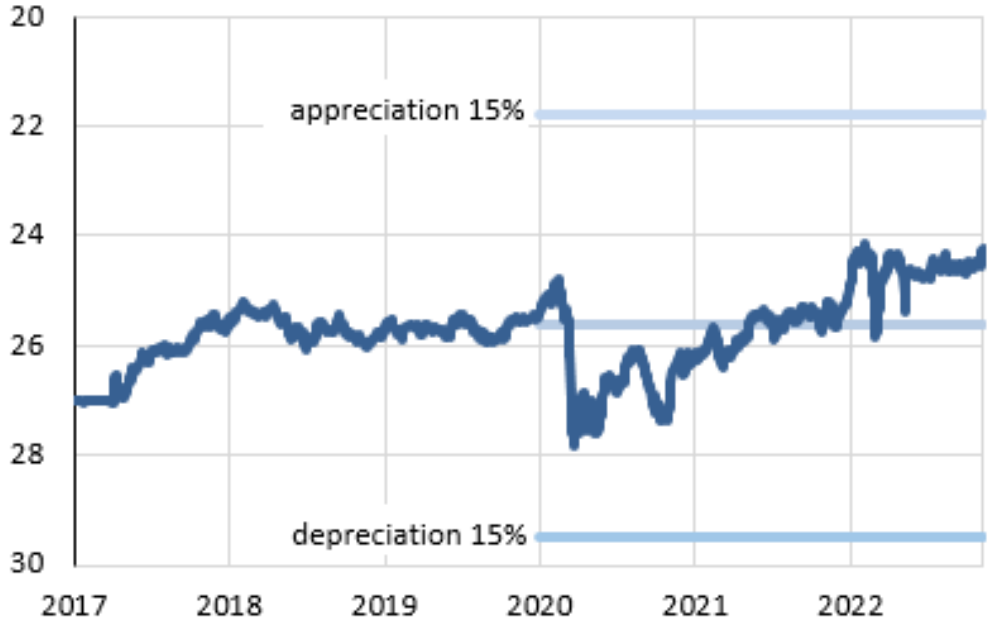
Source: Eurostat (2022b), EC (2022a, 2022b). MF CR (2022a) calculations and forecasts.

Convergence criteria – exchange rate

- **Content:** Membership for at least two years in ERM II, keeping exchange rate within normal bands without severe tensions and devaluation of central parity
- **Motivation**
  - Test of appropriateness of central parity before it is irrevocably fixed (ERM II as a training field)
  - Preventing competitive devaluations prior to fixing (conversion rate should be close to market exchange rate)
- **Objections**
  - Outdated concept of a normal band (former narrow bands ±2¼% were abolished during 1992-93 crisis)
  - ERM II as a compulsory waiting room
  - Exchange rate stability assessed from the perspective of more criteria
- **Properties of ERM II**
  - Central rates are defined bilaterally in terms of euro
  - Fluctuation margins ±15%, narrower margins can be negotiated with ECB or set unilaterally
  - Automatic interventions on the margin provided they do not jeopardize price stability in Euro Area
  - Exchange rate regimes incompatible with ERM II membership: free or managed float, unilateral euroization, exchange rate pegged to other currencies than euro

Convergence criteria – exchange rate

Chart 1.4: Nominal CZK/EUR exchange rate



Note: The hypothetical central rate is simulated by the average exchange rate for 2020 Q1. Data up to 11 November 2022.
Source: CNB (2022b). MF CR calculations.

- The exchange rate stability cannot be fulfilled ex post (and thus formally assessed), i.e. without ERM II participation.

V. Costs and Benefits of the €

Costs of the euro

- **(1) Loss of independent monetary policy:** if the national central bank stand to do a better job
- **(2) Limited reaction to asymmetric shocks:** only internal devaluation (flexible wages, labour market mobility), no exchange rate channel
- **(3) Loss of exchange rate adjustment mechanism**
- **(4) Costs associated with the change-over**

Benefits of the euro

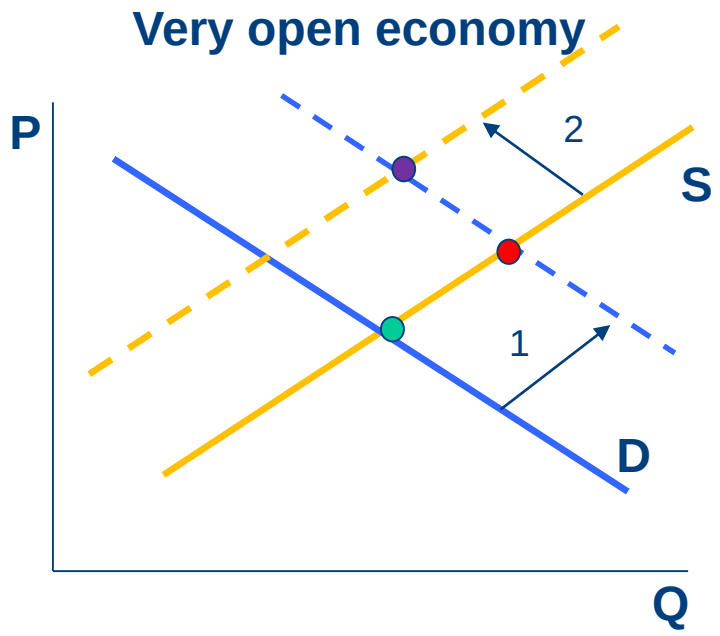
- **(1) Reduction in transaction costs**

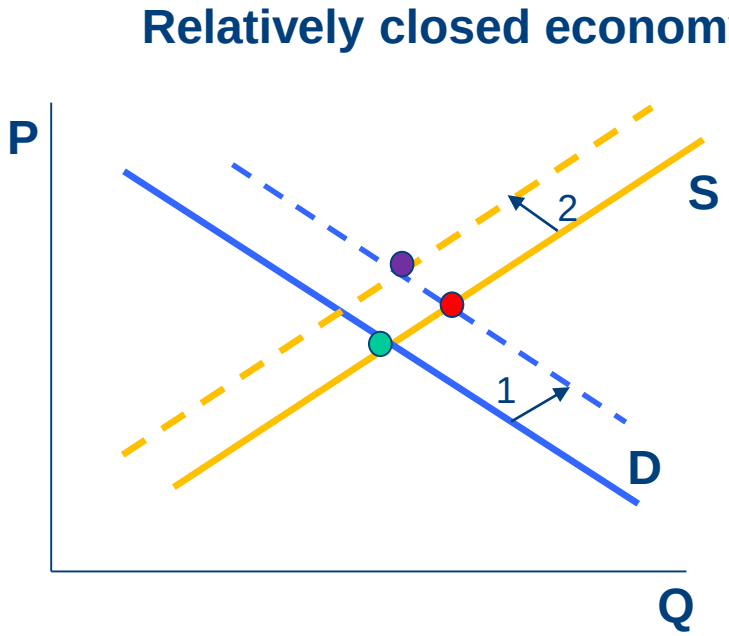
  Before euro the exporters and their costumers had to negotiate which currency would be used => many transactions => value of fees is rising

- **(2) Elimination of exchange rate risk and costs of hedging against it**
- **(3) Greater price transparency:** good prices become directly comparable across countries, which are the part of monetary union.
- **(4) Possibility of increased macroeconomic and financial stability, reflected in a more favourable environment for investment**
- **(5) Quality of monetary policy (?):** if the collective central bank stand to do a better job
- *(6) No airport useless spending of pocket money ☺*

VI. Effectiveness of currency depreciation

Effectiveness of currency depreciation (openness)





- How openness affects the cost of monetary union?*(effectiveness of the exchange rate in dealing with asymmetric shocks)*
- **Demand-side effects:** The same depreciation / devaluation of the exchange rate has a stronger effect to more open economy – more open economy exports more. (consider country which export 10 % of GDP with the country which export 90 % of GDP).
- **Supply-side effects:** The same depreciation / devaluation of the exchange rate has a stronger effect to more open economy – more open economy imports more, so that the CPI increases more (stronger wage-price spiral).
- Weakening of the exchange rate will be felt more strongly on the aggregate price level than output => the systematic use of the exchange rate instrument will lead to more price variability in the more open economy than in the relative close one => McKinnon (1963)

Readings (for whom who are interested)**:**

- Readings:

De Grauwe, P.: „Economics of Monetary Union“, Oxford.

Zestos, G. K.: European Monetary Integration – The Euro. Thompson South Western.

Chang, M.: Monetary Integration in the European Union. Palgrave.

De Grauwe, P.: Exchange Rates and Global Financial Policies. World Scientific.

- Additional Readings:

Mongeli, F. P. (2002): „New“ views on the OCA theory: What is EMU telling us? ECB Working paper no. 138. https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp138.pdf

Komárek, L. – Horváth, R. (2002): OPTIMUM CURRENCY AREA THEORY: AN APPROACH FOR THINKING ABOUT MONETARY INTEGRATION. The University of Warwick, Working paper No 647 (https://www2.warwick.ac.uk/fac/soc/economics/research/workingpapers/2008/twerp647.pdf)

Komárek, L. (2017): The real exchange rate phenomenon: What does it tell us about EU countries? Global Economic Outlook, Czech National Bank (http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/en/monetary_policy/geo/geo_2017/gev_2017_09_en.pdf)

Thank you for your attention!

before monetary union (EA)

monetary union (EA)

OCA properties:

- **Mundel I** – provided the basis for widespread scepticism about the desirability of a monetary union in Europe (1960s)
- **Mundel II** – was used by the proponents of monetary union (1970s) => joining a monetary union should not be seen as a cost arising form the loss of the exchange rate as an adjustment mechanism, but as a benefit of eliminating a source of asymmetric shocks; AND only in a MU can capital markets be fully integrated so that they can be used as an insurance mechanism against asymmetric shocks (Asdrubali et al., 1996).

Voluntary topic: R-star decreased

- The decline in the equilibrium real interest rate (r*)
  - has reduced the space available for monetary easing by conventional interest rate policy in the face of disinflationary shocks.
  - „big topic in academia“, see for exapmle **Jackson Hole Economic Symposium** https://www.kansascityfed.org/research/jackson-hole-economic-symposium/macroeconomic-policy-in-an-uneven-economy/

CNB – Analyses of alignment with the EA

Analyses of the Czech Republic's current economic alignment with the EA

- a section on the EA
  (economic alignment, institutional changes as a response to the debt crisis...)
- analyses of the Czech Republic's preparedness for euro adoption
  - cyclical and structural alignment with the EA
    (how our economic developments differ from those of the EA = what is the risk of the single monetary policy being highly suboptimal for the Czech economy?)
  - adjustment mechanisms
    (is our economy capable of absorbing the impacts of potential asymmetric shocks using its own adjustment mechanisms?)
  - plus new aspects, i.e. participation in new mechanisms (ESM, SRM)
- See: https://www.cnb.cz/export/sites/cnb/en/monetary-policy/.galleries/strategic_documents/analyses_of_alignment_2020.pdf