

# EXITS & BAILOUTS IN A MONETARY UNION

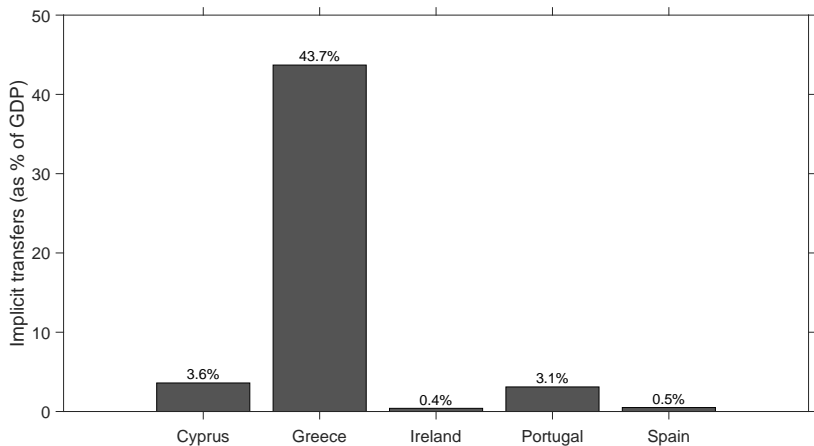
Michał Kobielarz  
KU Leuven

NBP Summer Workshop  
Warsaw, 29 June, 2021

# EUROZONE CRISIS & BAILOUTS

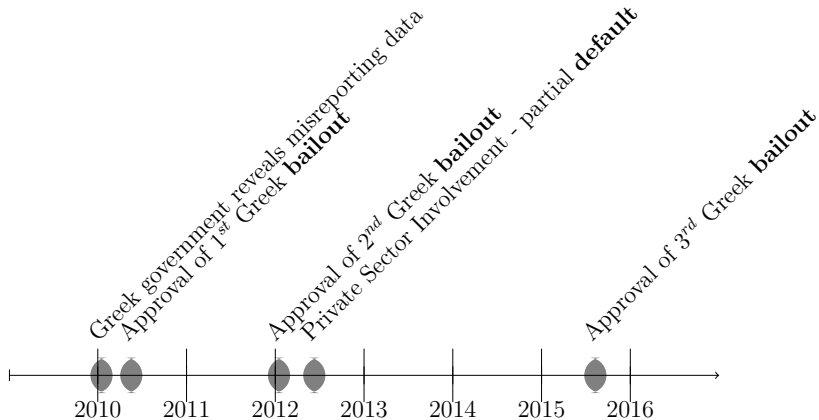
- ▶ Eurozone Crisis - sovereign debt trouble in advanced economies
- ▶ Bailouts from the Eurozone:
  - ▶ typically done by IMF
  - ▶ credit lines vs (implicit) fiscal transfers
  - ▶ Greece received equivalent of 40% GDP in (implicit) transfers

# IMPLICIT TRANSFERS (AS % GDP)



*source: Gourinchas, Martin & Messer (2020)*

# CRISIS TIMELINE



# RESEARCH QUESTION

- ▶ Why bail out countries in a Monetary Union?
- ▶ How large can fiscal transfers be?
- ▶ What are the dynamic effects of bailouts?

## BRIEF SUMMARY

- ▶ Sovereign default and Exit from union - two decisions
- ▶ Exit has information spillovers - main motivation for bailout
- ▶ Quantitative analysis
  - ▶ Bailouts do not resolve the crisis
  - ▶ Negligible moral hazard effects

# SIMPLE FRAMEWORK

- ▶ Monetary union:
  - ▶  $N + 1$  member countries
  - ▶ each values the membership of others,  $m_{ij}$
  - ▶ decide optimally on a bail-out (fiscal transfer)
- ▶ Individual countries:
  - ▶ decides to stay or exit the monetary union
  - ▶ can incorporate a richer framework

# MONETARY UNION

- ▶ Consists of  $N + 1$  symmetric small open economies
- ▶ They all value each others membership in the union  $m_{ij}$  (fully symmetric,  $m_{ij} = m$ )
- ▶ The total expected NPV of the union to country  $i$ :

$$M^i(k+1; p^E) = \sum_{j \neq i} \sum_{t=0}^{\infty} \beta^t (1 - p^E)^t m_{ij}$$

$p^E$  - exit probability of other countries



# MONETARY UNION

- ▶ Fully symmetric union,  $m_{ij} = m$
- ▶ Simplified value of union to country  $i$

$$M^i(k+1; p^E) = \frac{km}{1 - \beta(1 - p^E)},$$

- ▶ Summing up for the whole union

$$M(k+1; p^E) = \frac{(k+1)km}{1 - \beta(1 - p^E)}$$

## MU EXIT DECISION

- ▶ Country  $i$  compares the welfare inside and outside the union with the exit cost

$$\underbrace{V_i^{\text{Exit}}(\mathcal{S}_t^i)}_{\text{Welfare after Exit}} - \underbrace{V_i^{\text{Union}}(\mathcal{S}_t^i)}_{\text{Welfare inside Union}} > \underbrace{C}_{\text{exit cost}}$$

- ▶ So  $p^E$  depends on:
  - ▶  $\mathcal{S}_t^i$  - current state
  - ▶  $C$  - cost of exit

## EXIT COST

- ▶ Exit cost  $C$  is unknown

- ▶ Common beliefs about  $C$

$$C = \begin{cases} C^L & \text{with probability } \pi \\ C^H & \text{with probability } 1 - \pi \end{cases}$$

- ▶ Expected exit cost  $\mathbb{E}[C]$  keeps countries from exiting (most of time)
- ▶ Low cost ( $C^L$ ) - low enough to observe exits
- ▶ First exit reveals true  $C \Rightarrow$  may generate more exits

## LOSSES FROM FIRST EXIT

- ▶ Union loses a member: from  $N + 1$  to  $N$
- ▶ Exit cost gets revealed  $\Rightarrow$  low cost triggers more exits

$$\underbrace{M^{-i}(N+1;0)}_{\text{value of the union}} \cdot \left[ \underbrace{\frac{1}{N}}_{\substack{\text{marginal value} \\ \text{of the exiter}}} + \underbrace{\pi \cdot \frac{N-1}{N} \cdot \frac{p^E(C^L)}{p^E(C^L) + \frac{1-\beta}{\beta}}}_{\text{value of revealed information}} \right]$$

- ▶ large  $N \Rightarrow$  marginal value of exiter  $\rightarrow 0$
- ▶  $\beta \rightarrow 1 \Rightarrow$  value of information  $\rightarrow \pi \cdot M^{-i}(N+1;0)$

## BAILOUT DETERMINATION

Minimum required bailout

- ▶ Transfer to make country indifferent between exit and second-best option

$$T = V^{\text{EXIT}}(\cdot) - V^{\text{UNION}}(\cdot) - M^i(N + 1) - C$$

Bail-out takes place:

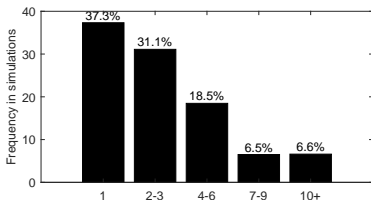
- ▶ When a country wants to exit
- ▶ When the costs of exit to other members are higher than required transfer

$$M^{-i}(N + 1; p^E(\mathbb{E}[C])) - \mathbb{E}[M^{-i}(N; p^E(C))] > T$$

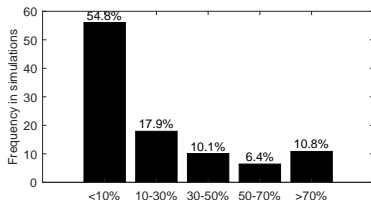
## QUANTITATIVE ANALYSIS

- ▶ A small open economy as member of a MU (Eijffinger, Kobielarz and Uras, JIE 2018)
- ▶ Borrows and makes repayment/default decisions
- ▶ Default:
  - + eliminate past debt
  - no access to financial markets
- ▶ Downward nominal wage rigidity  $\Rightarrow$  unemployment
- ▶ Monetary Union - fixed exchange rate
- ▶ Exit
  - + flexible exchange rate - eliminates unemployment
  - + reduces foreign debt
  - cost of exiting

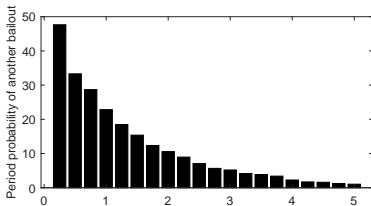
# SIMULATIONS - BAILOUTS



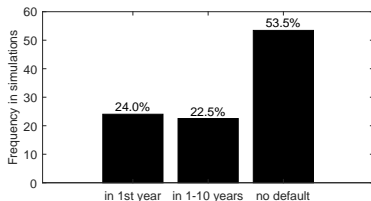
(a) Number of bailout transfers in one crisis



(b) Total size of bailout transfers relative to GDP



(c) Follow-up bailouts in the years following the first bailout



(d) Defaults in 10 years following the last bailout

# CONSEQUENCES OF BAILOUTS

		No bailouts	Unlimited bailouts
$\tilde{C} = 1.6$	Default probability	1.40	1.33
	Exit probability	0.004	0.004
	Average debt-to-GDP	0.77	0.78
$\tilde{C} = 2.0$	Default probability	1.38	1.37
	Exit probability	0.000	0.000
	Average debt-to-GDP	0.71	0.71



# CONCLUSIONS

- ▶ Microfounded theory of spillovers in a monetary union
- ▶ Bailouts driven by risk of exit (not default)
- ▶ Bailouts exceed the marginal value of the country
- ▶ Bailouts do not resolve the crisis
- ▶ No moral hazard effects