



# Regional Adjustments and Macroeconomic Implications

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***3<sup>rd</sup> SEEK Conference- Engines for More and Better Jobs in Europe***

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The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF or IMF policy.



# Outline

1. Aim of the study and key results
2. Data and methodology
3. Results US
4. Results Europe
5. Conclusions and issues for further research



## Aim of the study

- How regional employment, unemployment and labor force participation adjust to state (region)-specific labor demand shocks?
  - Were other jobs created to replace those jobs created by the shocks?
  - Did workers move out of the state (region) or drop out of the labor force?
- Did the nature and the strength of the adjustment mechanisms change over time?
- What are the implications in the context of the OCA framework?



# Contributions

Aim of the study and key results

## US

- Identification of labor demand shocks
- Evolution of the nature and strength of adjustment mechanisms

## Europe

- Extending coverage to 21 EU (OECD) countries
- Different adjustment mechanisms within/across countries?



## Key results: US

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- The long-run effect of a state shock on the state employment level has decreased over time, suggesting less overall net migration in response to a regional shock;
- The participation rate has been playing larger role for regional adjustment to shocks, while the opposite is true for net migration;
- The response of net migration to regional labor demand shocks has started declining in early 2000s, but increased during the great recession



## Key results: Europe

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- The short-term response of participation (migration) rates to regional labor demand shocks is typically larger (lower) in Europe than in the US, but..
- ...the role of migration for adjustment to shocks has been increasing over time;
- On average, the response of participation rates to regional labor demand shocks is larger within (particularly in France, Italy, Spain and Italy) than across countries



# Unemployment and labor force participation rates

Data

- US states: BLS from 1976 to 2011
- Europe: OECD regional statistics (last update 2011) from 1999 to 2009
  - Regions classified according to Territorial Level 2 ( corresponding to Eurostat NUTS1 for many EU countries)
  - 173 macro regions
  - 21 EU (OECD) countries



# Dynamic response of employment, unemployment and participation

- Blanchard and Katz (1992)

$$\Delta e_{it} = \alpha_{i10} + \alpha_{i11}(L)\Delta e_{it-1} + \alpha_{i12}(L)le_{it-1} + \alpha_{i13}(L)lp_{it-1} + \varepsilon_{it}^e$$

$$le_{it} = \alpha_{i20} + \alpha_{i21}(L)\Delta e_{it} + \alpha_{i22}(L)le_{it-1} + \alpha_{i23}(L)lp_{it-1} + \varepsilon_{it}^{le}$$

$$lp_{it} = \alpha_{i30} + \alpha_{i31}(L)\Delta e_{it} + \alpha_{i32}(L)le_{it-1} + \alpha_{i33}(L)lp_{it-1} + \varepsilon_{it}^e$$

$e$  = log of employment in state (region)  $i$  minus log of US (Europe) aggregate employment

$le$  = log of the ratio of employment to labor force in state (region)  $i$  minus that for US (Europe)

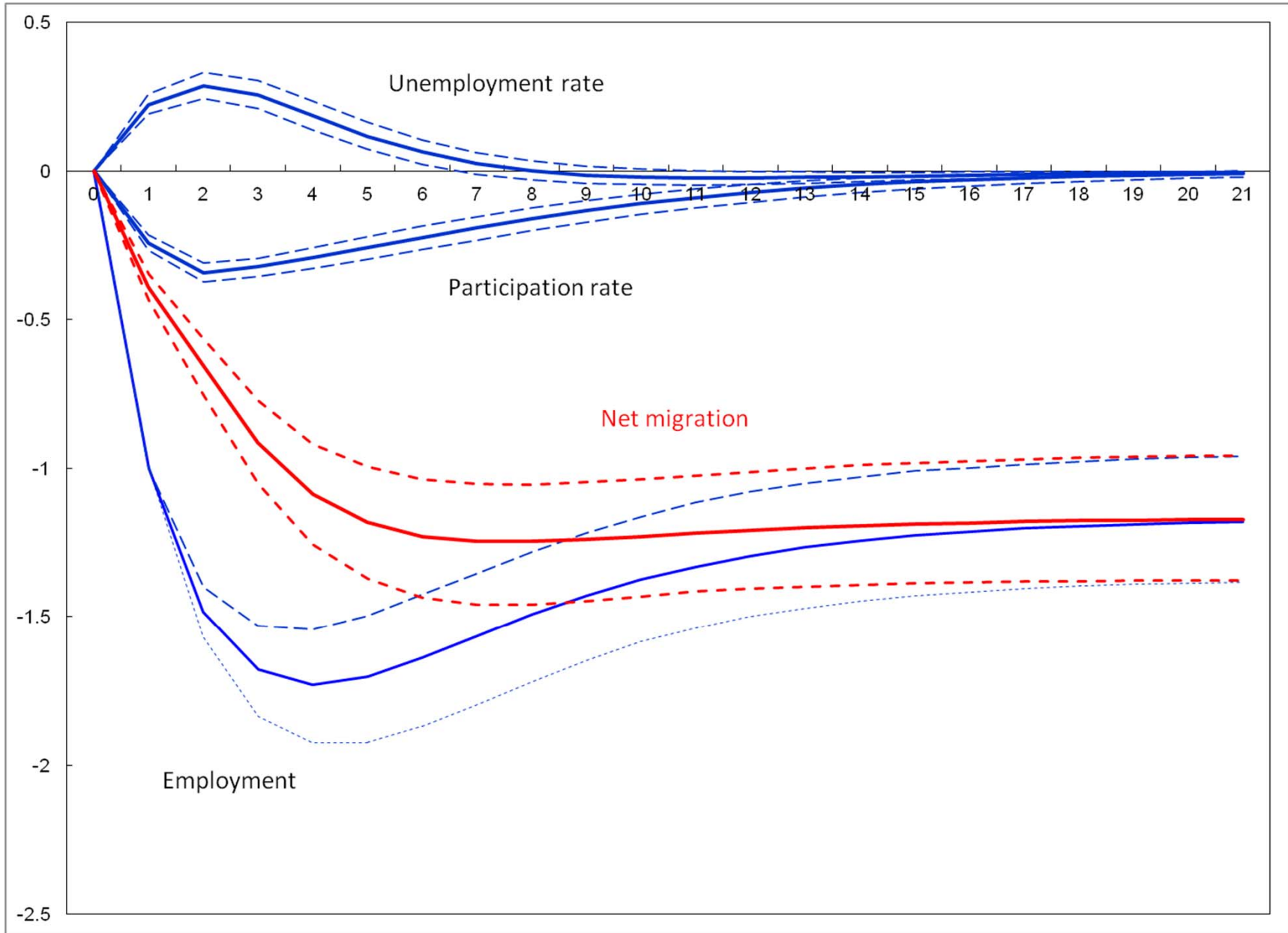
$lp$  = log of employment in state (region)  $i$  minus log of US (Europe) aggregate employment





# US- Baseline (IRF)

Results US





## US- IV

### Results US

- Industry mix: weighted average of national industry-level employment growth rate (e.g. Bartik, 1991)
- Oil price change: oil price index/ppi index interacted with average share of employment in oil and gas extraction for each state (Saks and Wozniak, JLE2011)

Table 1: Endogeneity and 2SLS: ER equation

	OLS		2SLS	
$\Delta \ln e_t$	0.241*** (0.023)	0.656*** (0.080)	0.438*** (0.114)	0.645*** (0.082)
Hausman test (p)	0.00	0.07	0.00	0.00
1st Stage				
imix		0.88*** (0.118)		0.776*** (0.146)
oil			0.405*** (0.087)	0.283*** (0.087)
F stat	-	55.76	21.38	31.29
N	1736	1683	1460	1409

Table 2: Endogeneity and 2SLS: PR equation

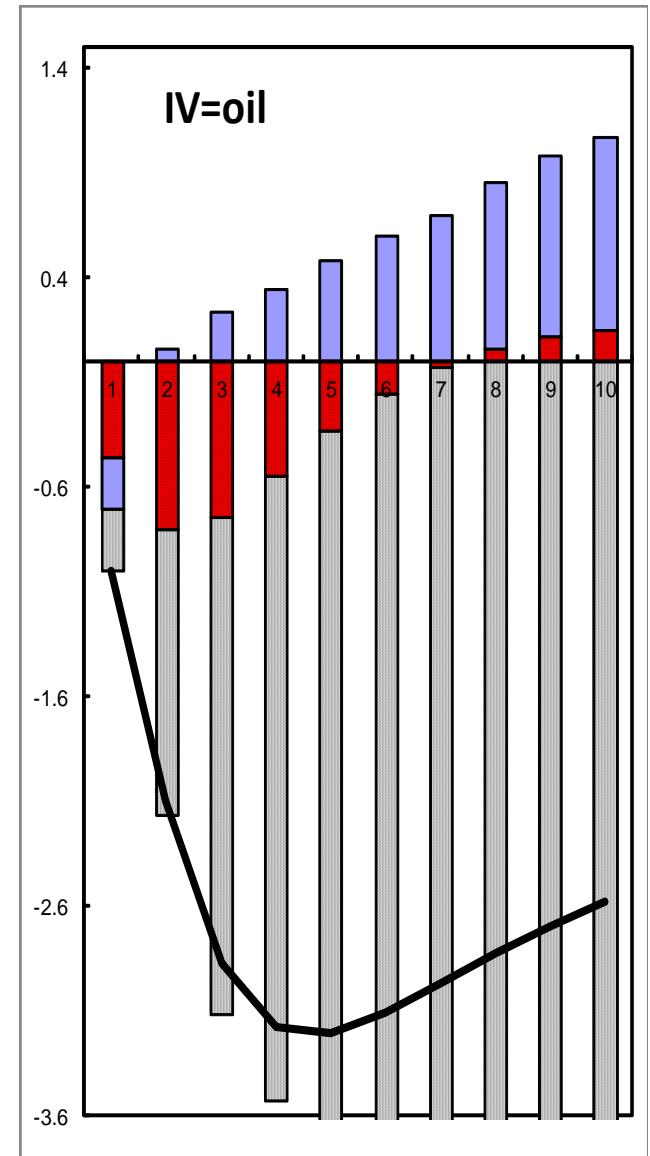
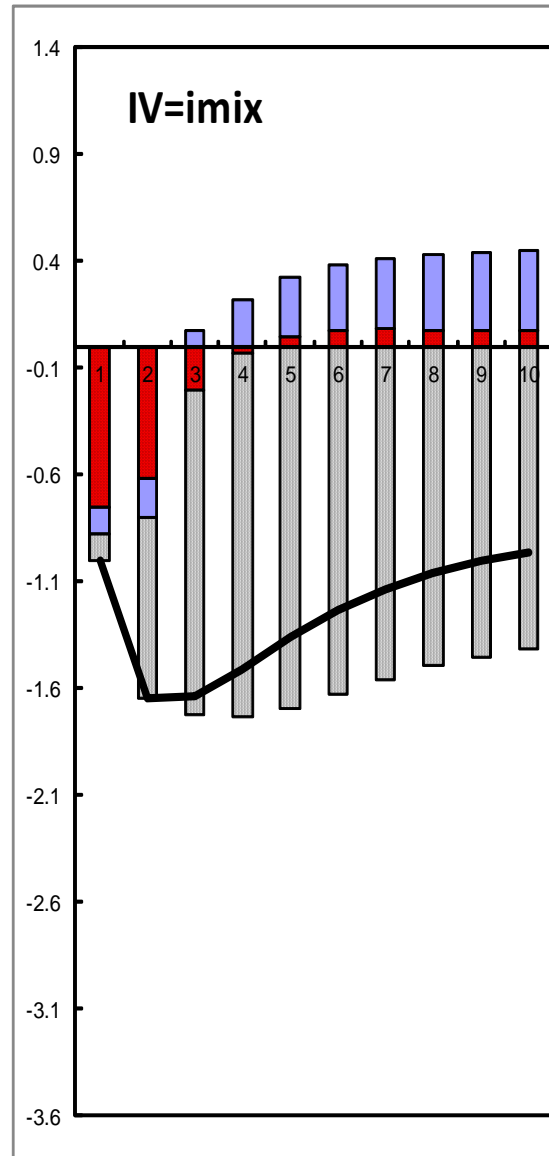
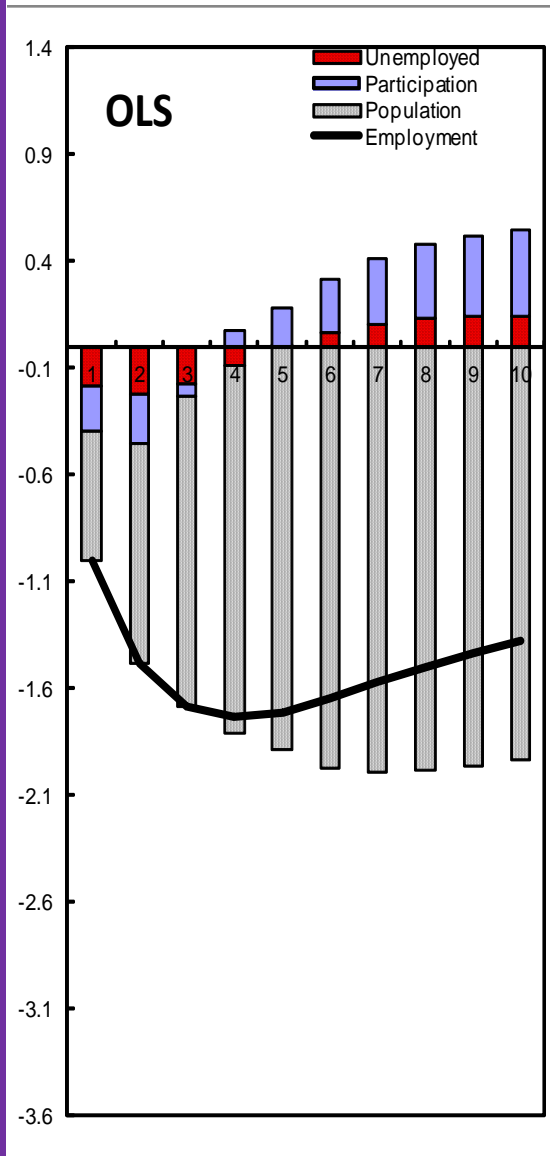
	OLS		2SLS	
$\Delta \ln(e_t)$	0.387*** (0.025)	0.154* (0.084)	0.380*** (0.116)	0.180*** (0.077)
Hausman test (p)		0.00	0.78	0.00
1st Stage				
imix		0.88*** (0.118)		0.776*** (0.146)
oil			0.405*** (0.087)	0.283*** (0.087)
F stat		55.76	21.38	31.29
N	1736	1683	1460	1409

The instruments are, for state  $s$  and year  $t$ :  
 $imix_{s,t} = \sum_{j=1}^J [(e_{sjt} + \dots + e_{sjt-4}) / (e_{st} + \dots + e_{st-4})] \Delta \ln(\bar{e}_{jt})$ ,  
 $oil_{s,t} = [(e_{st}^{o\&g} + \dots + e_{st-4}^{o\&g}) / (e_{st} + \dots + e_{st-4})] \Delta \ln(\frac{P_{oil}}{PPI})_t$



# US- OLS vs. IV decomposition

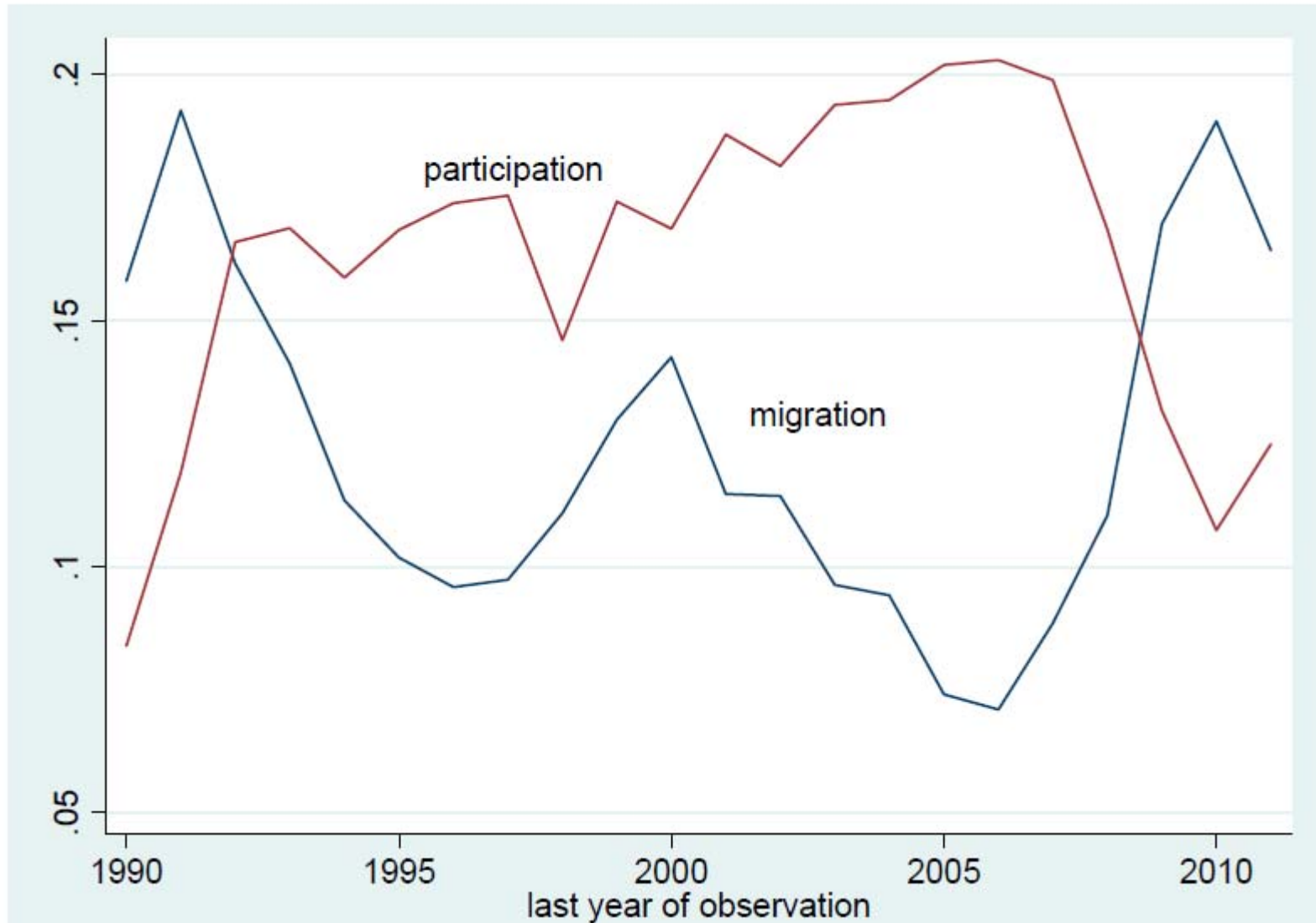
Results US





# US- Evolution over time

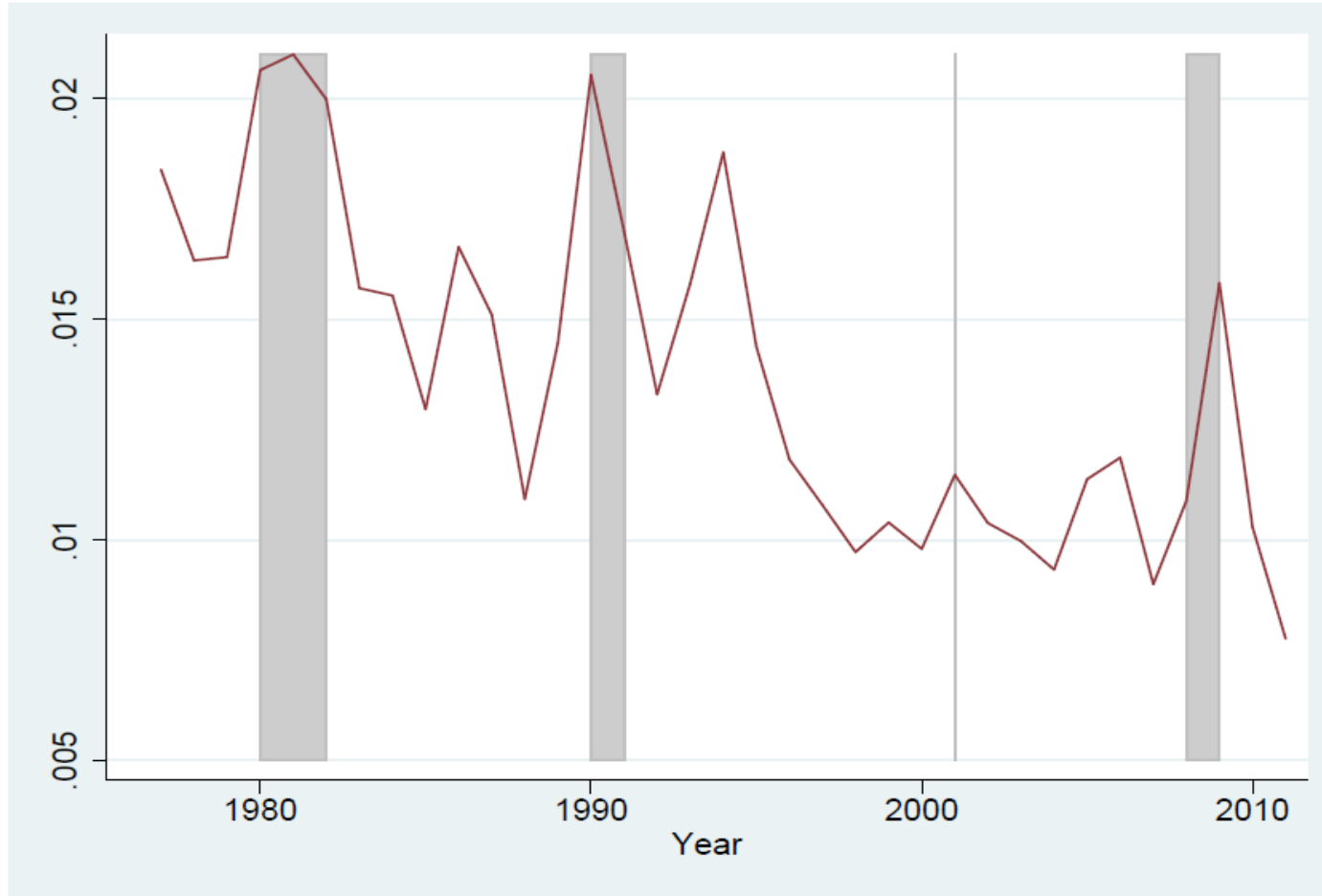
Results US





# US-evolution over time

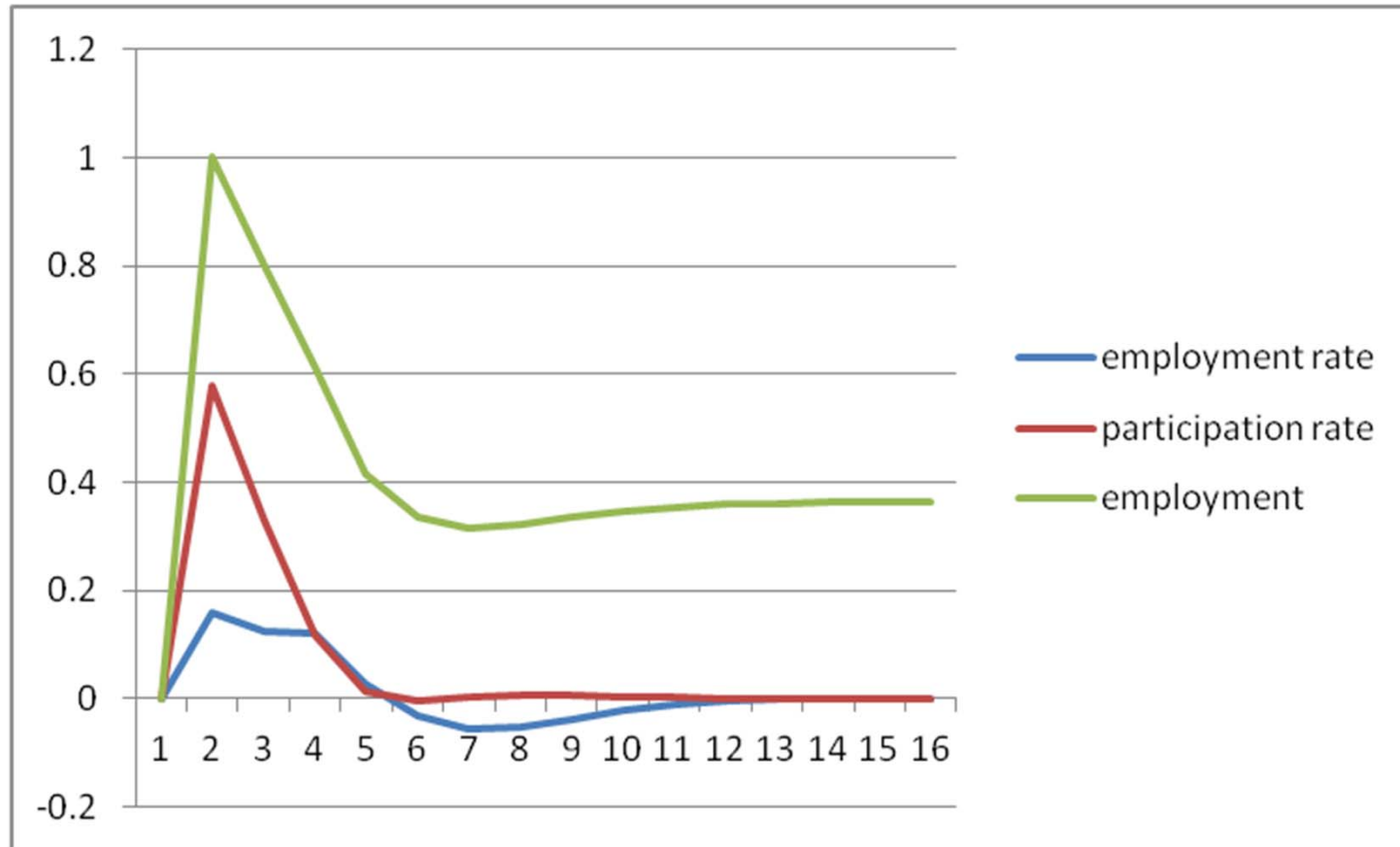
Figure 2: Dispersion of Employment Growth Rates across US States, 1976-2011



Source: Authors' calculations based on data from the BLS, with shaded areas representing NBER recession episodes.



# EU21- IRFs

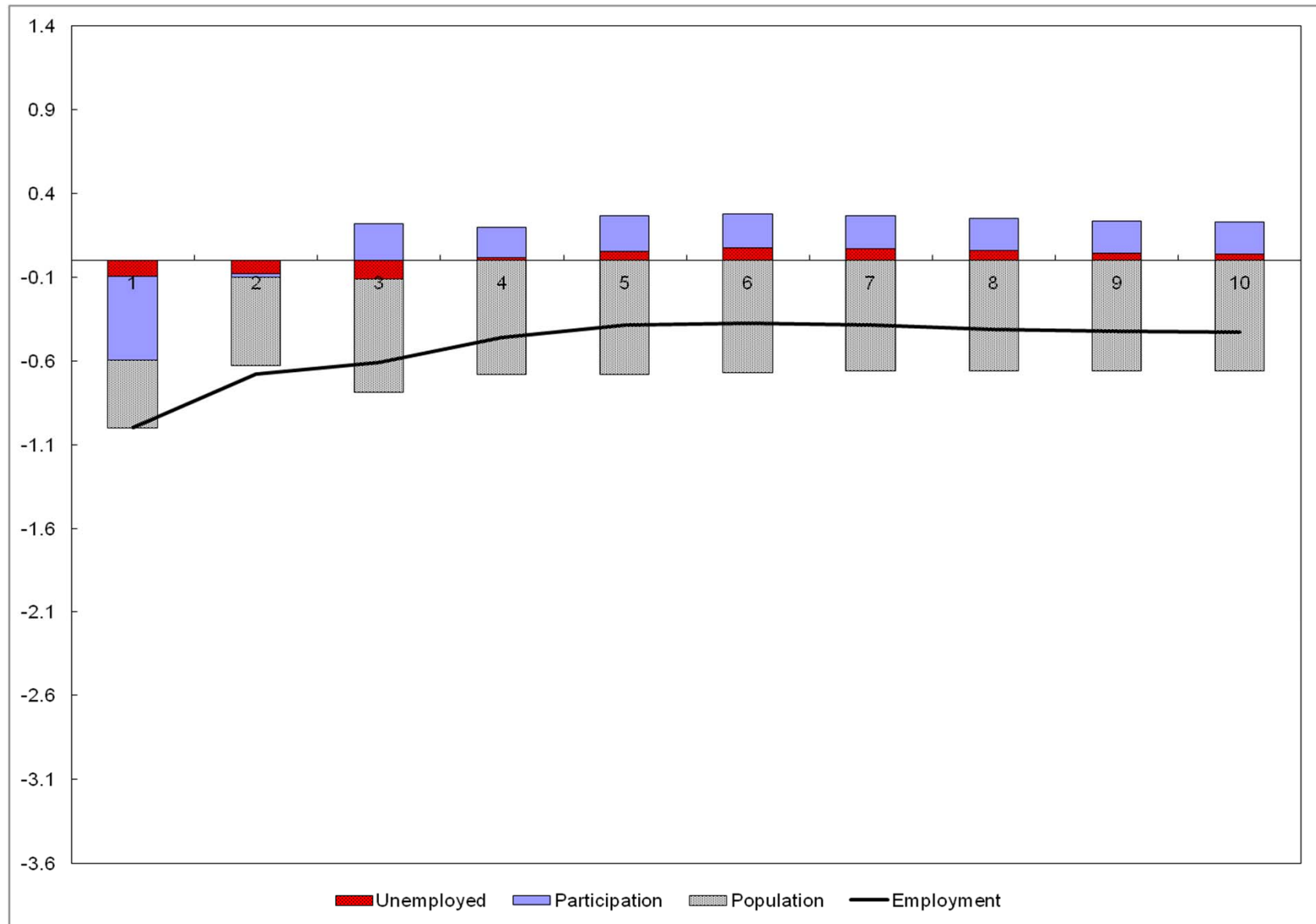


Response to 1% region-specific labor demand shock.



# EU21- decomposition

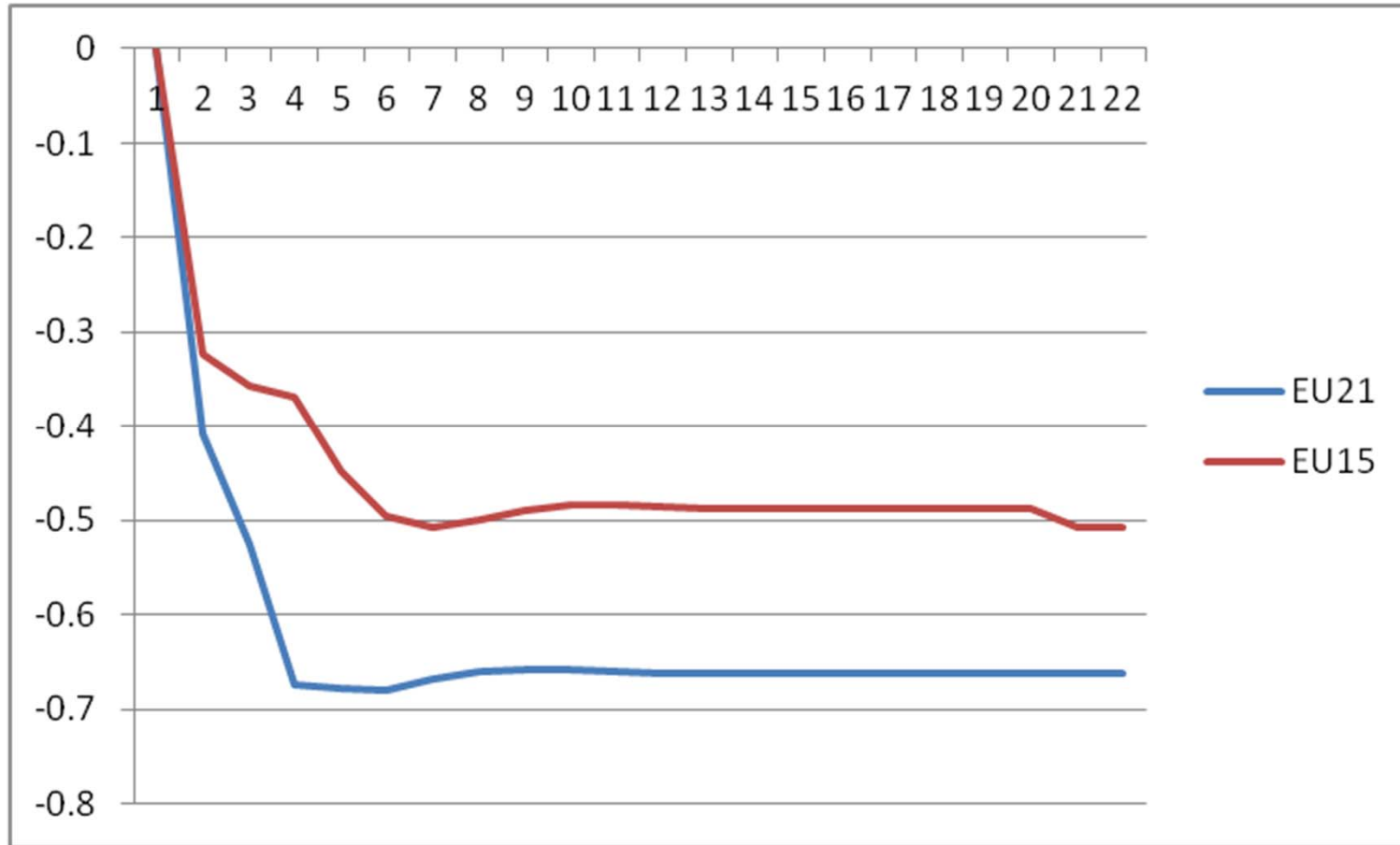
Results EU





# EU 21 vs. EU 15- role of migration

Results EU



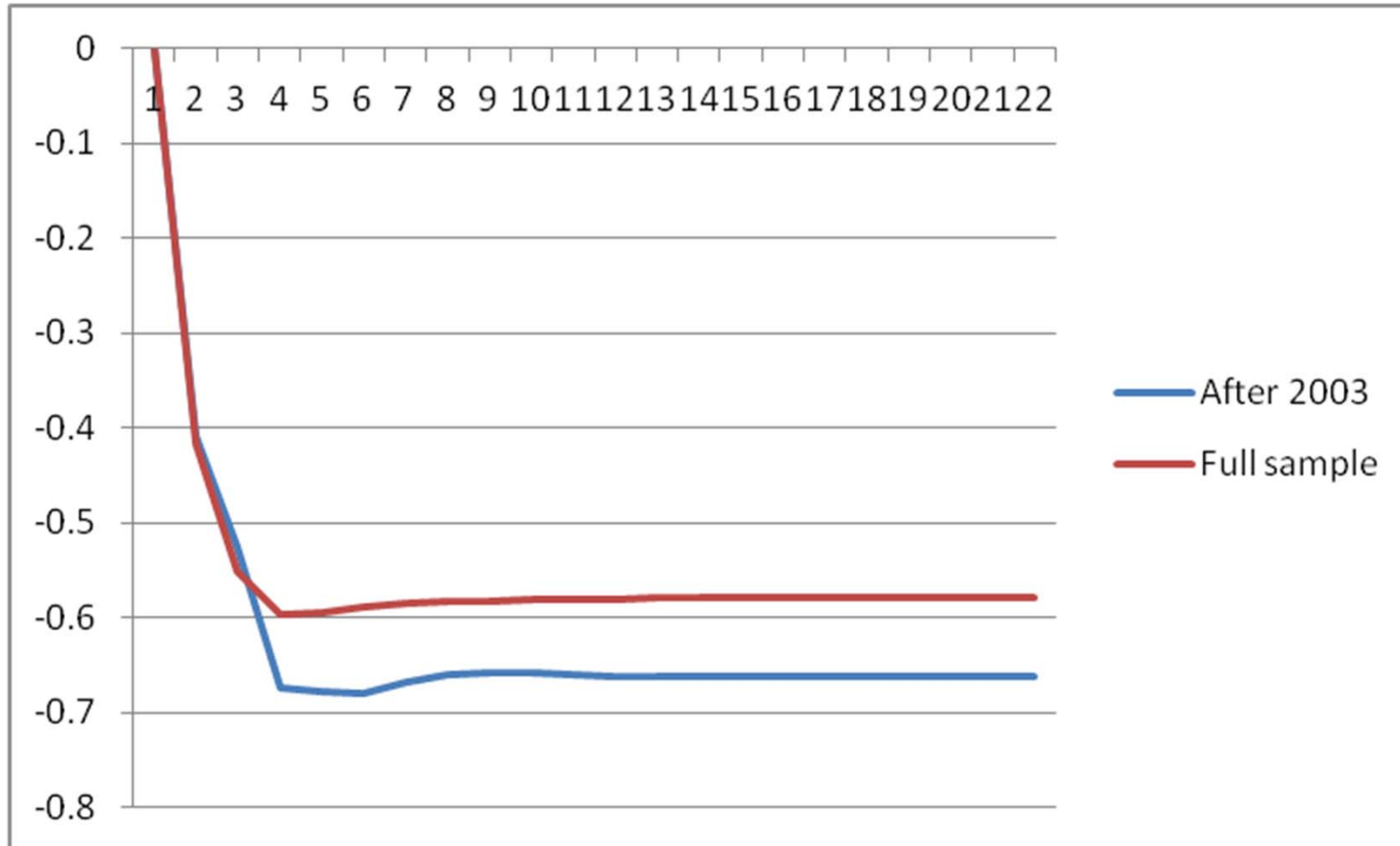
Response to 1% region-specific labor demand shock.





# EU 21 over time- role of migration

Results EU



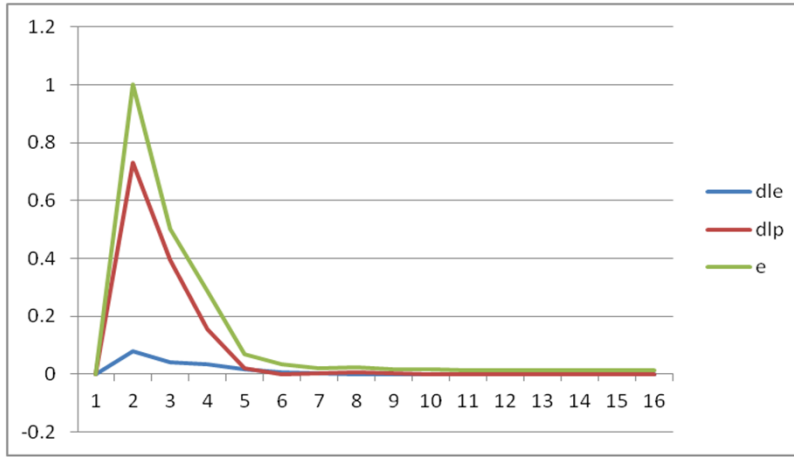
Response to 1% region-specific labor demand shock.



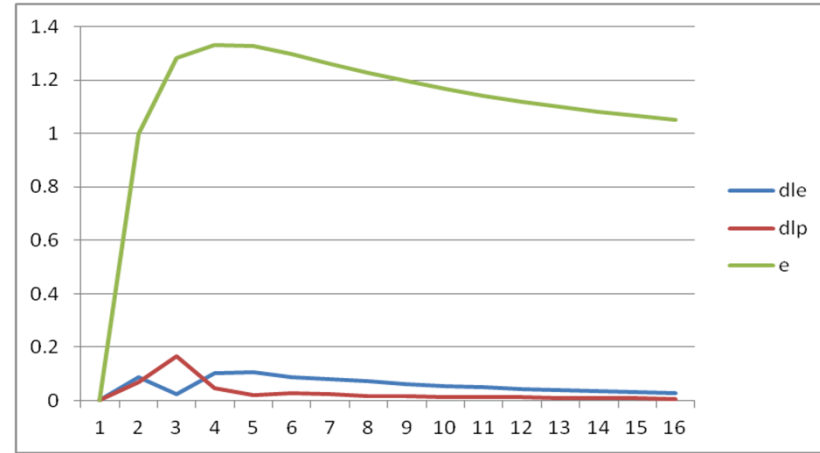
# EU 21 within countries - largest economies

Results EU

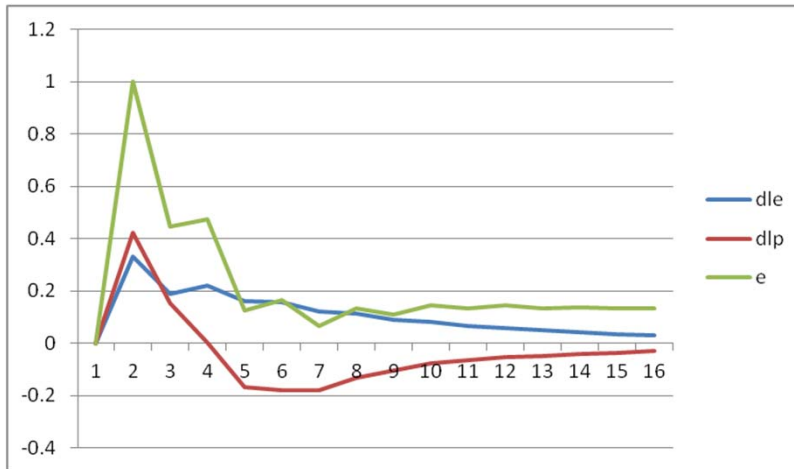
### France



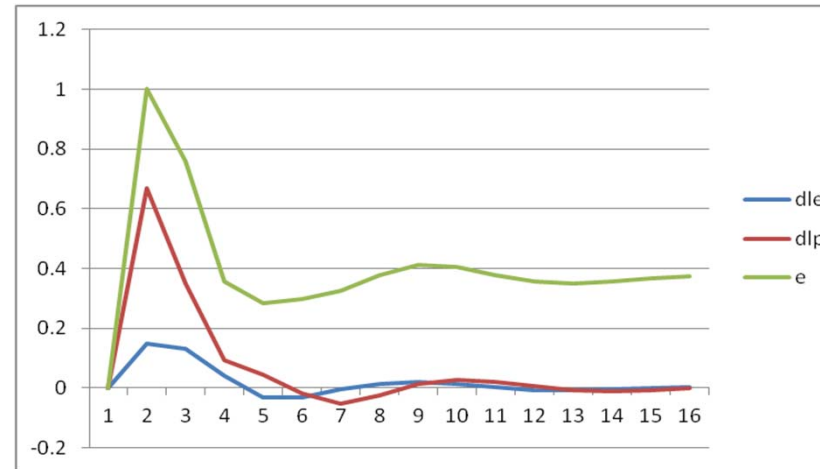
### Germany



### Italy



### United Kingdom

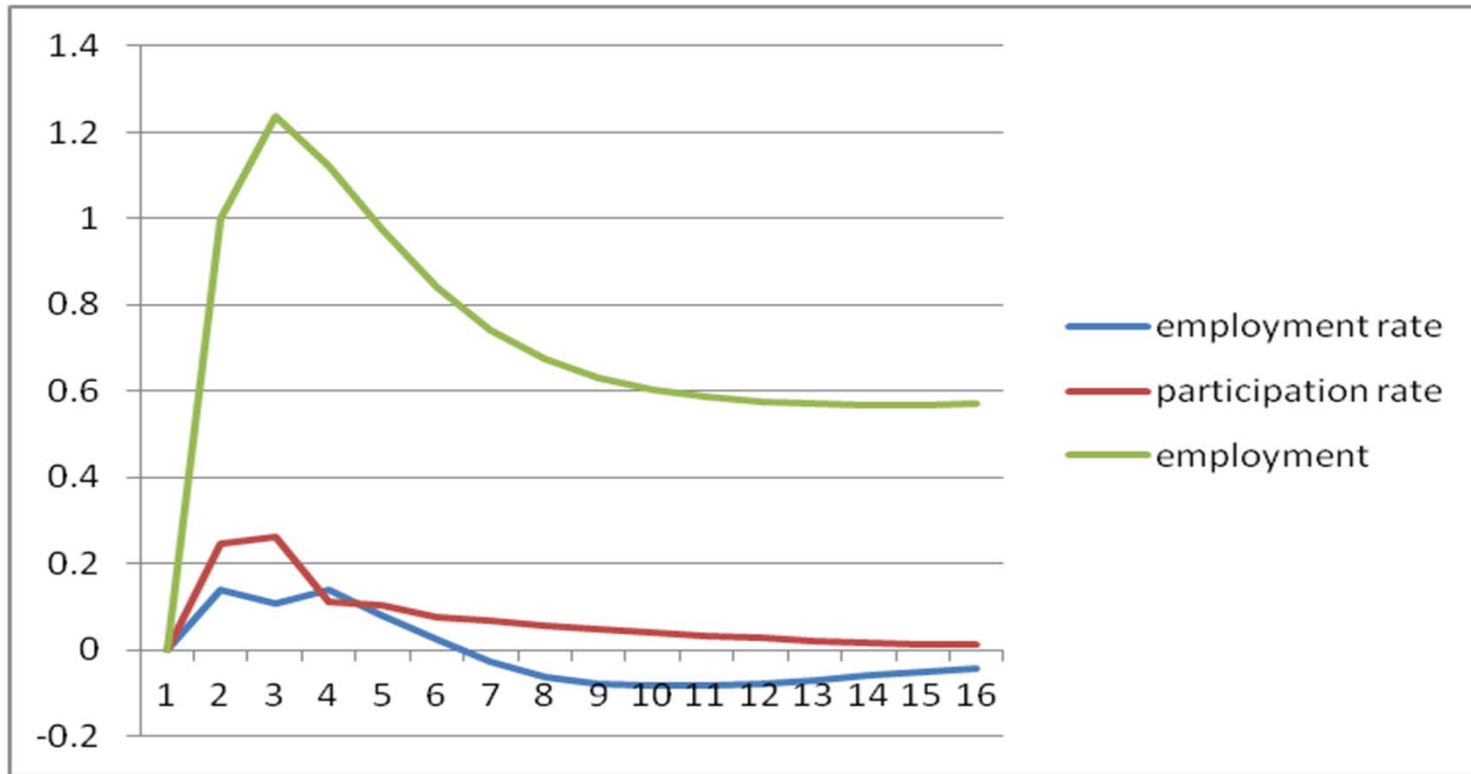


Response to 1% region-specific labor demand shock.



# EU 21 across countries

## Results EU



Response to 1% region-specific labor demand shock.



## EU21-within vs. between countries response

- Using local projections method (Jorda, AER2005) to use linear decomposition of OLS estimates:

$$\Delta e_{it} = \alpha_{i10} + \alpha_{i11}(L)\Delta e_{it-1} + \alpha_{i12}(L)le_{it-1} + \alpha_{i3}(L)lp_{it-1} + \varepsilon_{it}^e$$

$$le_{it+k} - le_{it} = \alpha_{i20}^k + \alpha_{i21}^k \varepsilon_{it}^e + \alpha_{i21}^k(L)\Delta le_{it-1} + \varepsilon_{it}^{le}$$

$$lp_{it+k} - lp = \alpha_{i30}^k + \alpha_{i31}^k \varepsilon_{it}^e + \alpha_{i32}^k(L)\Delta lp_{it-1} + \varepsilon_{it}^{lp}$$

- Decomposing response within and across countries

$$le_{it} = le_{rt} - le_t^{EU} = \underbrace{(le_{rt} - le_{ct})}_{\text{within}} + \underbrace{(le_{ct} - l_t^{EU})}_{\text{between}}$$



## EU21-within vs. between countries response

- Peak effect response of labor force participation and employment rates to labor demand shocks:

	Total	Within countries	Across countries
Labor force participation rates	0.58	0.54	0.04
Employment rates	0.16	0.09	0.07

Response to 1% region-specific labor demand shock.



## Key results: US

### Conclusions

- The long-run effect of a state shock on the state employment level has decreased over time, suggesting less overall net migration in response to a regional shock;
- The participation rate has been playing larger role for regional adjustment to shocks, while the opposite is true for net migration;
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## Key results: Europe

### Conclusions

- The short-term response of participation (migration) rates to regional labor demand shocks is typically larger (lower) in Europe than in the US, but..
- ...the role of migration for adjustment to shocks has been increasing over time;
- On average, the response of participation rates to regional labor demand shocks is larger within (particularly in France, Italy, Spain and Italy) than across countries



## Implications for Europe

### Conclusions

- The experience of the US shows that in response to an adverse shock in demand adjustment factors do not prevent increases in unemployment
- Labor mobility in Europe, even though increasing, is likely to remain lower than mobility across US States
- Risk-sharing mechanism in EMU are significantly less effective than in the US
- In the absence of other adjustment mechanism (e.g. higher wage flexibility), the adjustment to relative shocks in EMU may be a costly and protracted process





## Issues for further research

### Conclusions

- The role of wages as adjustment mechanism
- Non-linearity (severity and type of shock matters?)
- Extending EU time dimension of EU sample (before vs. after European Single Act), and constructing IV
- Identifying different patterns across different country groups (e.g. CEE migration to Germany, UK etc; role of borders, language, etc;)



## Issues for further research

- Why adjustment mechanisms differ across countries?

$$\Delta e_{it} = \alpha_{i10} + \alpha_{i11}(L)\Delta e_{it-1} + \alpha_{i12}(L)le_{it-1} + \alpha_{i3}(L)lp_{it-1} + \varepsilon_{it}^e$$

$$le_{it+k} - le_{it} = \alpha_{i20}^k + \alpha_{i21}^k \varepsilon_{it}^e + \delta_{i21}^k X_c \cdot \varepsilon_{it}^e + \alpha_{i21}^k(L)\Delta le_{it-1} + \varepsilon_{it}^{le}$$

$$lp_{it+k} - lp = \alpha_{i30}^k + \alpha_{i31}^k \varepsilon_{it}^e + \delta_{i31}^k X_c \cdot \varepsilon_{it}^e + \alpha_{i32}^k(L)\Delta lp_{it-1} + \varepsilon_{it}^{lp}$$

- $X_i$ =country-specific factors



**Thank you!**



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