Has Mobility Decreased? Reassessing Regional Labour Markets in Europe and the US

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Motivation

- Strong and increasing regional heterogeneity in European labour markets
  - Unemployment rates in Campania and Sardinia three times higher than in Veneto
  - Also in France and Spain highest regional rates more than twice as high as lowest
- Labour migration as crucial adjustment mechanism
  - Cross-country migration has increased in Europe (Beine et al., 2013)
  - Migration has decreased in the US (Molloy, Smith & Wozniak, 2011)

$\Rightarrow$ How do European and US labour markets adjust to regional labour demand shocks?

$\Rightarrow$ Has the role of labour mobility and migration changed?

General Approach

- We employ the framework of Blanchard and Katz (1992)
  - Regional labour markets differ permanently
  - Shocks to regional labour demand have permanent effects on the employment level but only temporary on unemployment and participation rates
  - Unexplained employment change must be due to migration
  - Identified VAR to trace out the role of migration
- Recent paper employing that framework
  - Greenaway-McGrevy and Hood (2013)
  - Dao, Furceri and Loungani (2014)
- We update and refine Decressin and Fatás (1995)
  - With longer sample
  - With comparable data for Europe and the US
  - With alternative normalisation for region-specific variables (which allows us to differentiate between different adjustments)
  - With country effects in Europe

Data

	Europe	US
Frequency/Period	Annual from 1976 to 2011	
Variables	Working-age Population (P_{it}) Labour Force (L_{it}) Employment (E_{it})	
# of Regions	47[a]	51[b]
Main Data Sources	National LFS	CPS and LAUS
Total Population 2011	240 Million	214 Million
Average Population 2011	4.6 Million	4.7 Million

[a] 8 French, 7 (West)German, 11 Italian, 7 Spanish, 8 British, Belgium, Denmark, Greece, Ireland, The Netherlands, Portugal

[b] All States plus the District of Columbia

VAR with Employment Growth, Employment Rate, and Participation Rate

$$\Delta \log E_{it} = \phi_{i10} + \phi_{11}(L)\Delta \log E_{it-1} + \phi_{12}(L) \log \frac{E_{it-1}}{L_{it-1}} + \phi_{13}(L) \log \frac{L_{it-1}}{P_{it-1}} + \phi_{14}\Gamma_{it} + \epsilon_{iet} \quad (1)$$

$$\log \frac{E_{it}}{L_{it}} = \phi_{i20} + \phi_{21}(L)\Delta \log E_{it} + \phi_{22}(L) \log \frac{E_{it-1}}{L_{it-1}} + \phi_{23}(L) \log \frac{L_{it-1}}{P_{it-1}} + \phi_{24}\Gamma_{it} + \epsilon_{irt} \quad (2)$$

$$\log \frac{L_{it}}{P_{it}} = \phi_{i30} + \phi_{31}(L)\Delta \log E_{it} + \phi_{32}(L) \log \frac{E_{it-1}}{L_{it-1}} + \phi_{33}(L) \log \frac{L_{it-1}}{P_{it-1}} + \phi_{34}\Gamma_{it} + \epsilon_{ipt} \quad (3)$$

- Identification: unexpected changes of the year-to-year employment change are due to changes of the labour demand
- Pooled over different sub-samples, using different time periods and projecting on different exogenous variables Γ_{it}
- Indirect approach to study labour migration

$$\frac{\Delta \text{Employment}}{\text{Employment}} = \frac{\Delta \text{Employment Rate}}{\text{Employment Rate}} + \frac{\Delta \text{Participation Rate}}{\text{Participation Rate}} + \frac{\Delta \text{Population}}{\text{Population}} \quad (4)$$

Region-Specific Variables

- Simple Differences (Blanchard and Katz, 1992)

$$x_{it} = X_{it} - X_{at} \tag{5}$$

  - Regions react homogeneously to aggregate shocks
  - 1 common factor per series (=aggregate) and coefficients equal to 1
- Residuals from factor model

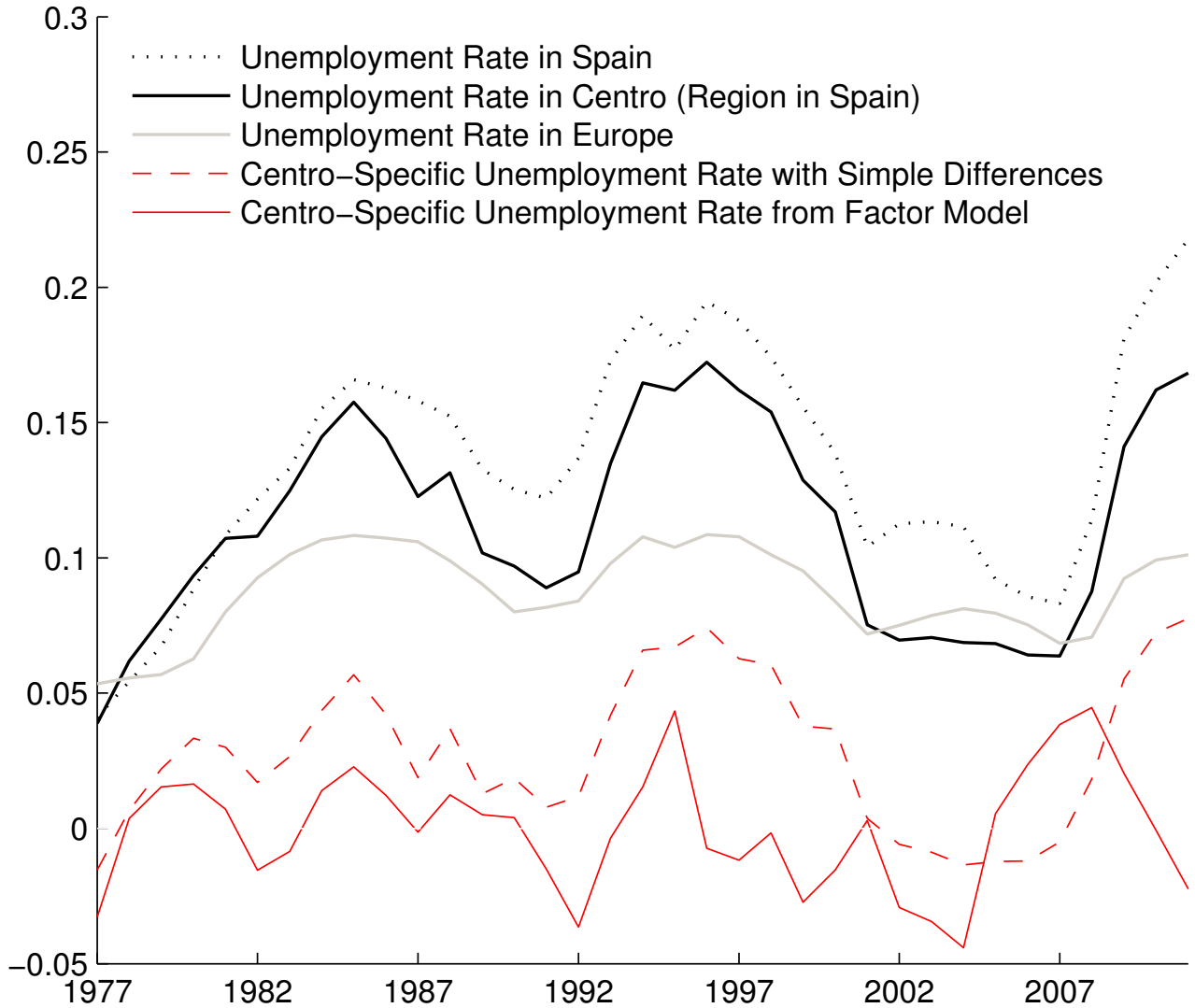
$$z_{it} = X_{it} - f_t^{'} \lambda_i \tag{6}$$

  - Regions react heterogeneously (λ_i) to different factors ($f_t^{'}$)
  - Very flexible regarding number of factors and their structure
  - Baseline: 3 global, 2 continental, 9 country/area factors

$$X_{it} = z_{it} + L_i^{g,1} f_t^{g,1} + L_i^{g,2} f_t^{g,2} + L_i^{g,3} f_t^{g,3} + L_i^{cont} f_t^{cont} + L_i^{a} f_t^{a} \tag{7}$$

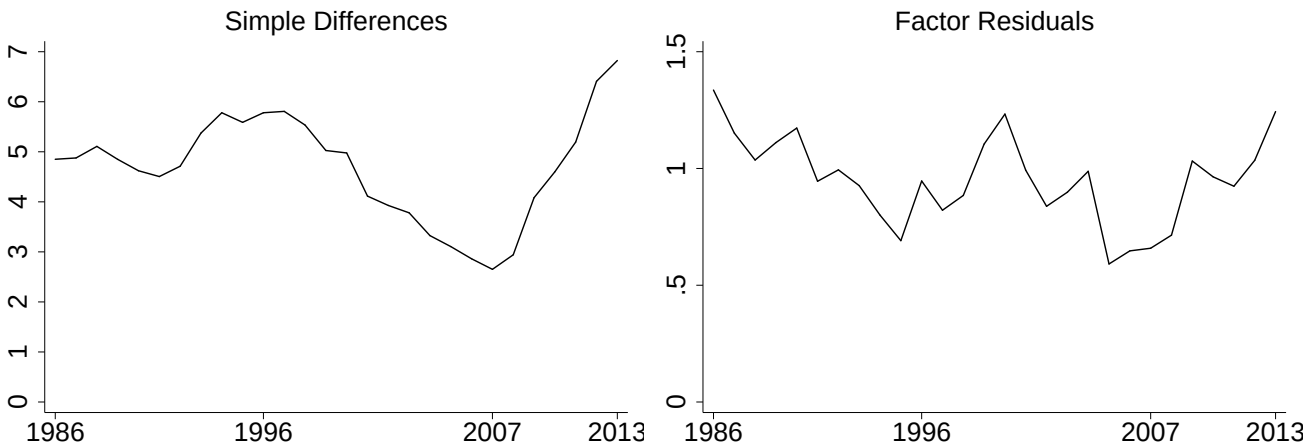
  - Estimated with QML Approach of Doz, Giannone, and Reichlin (2012)

Different Normalisations Intuitively

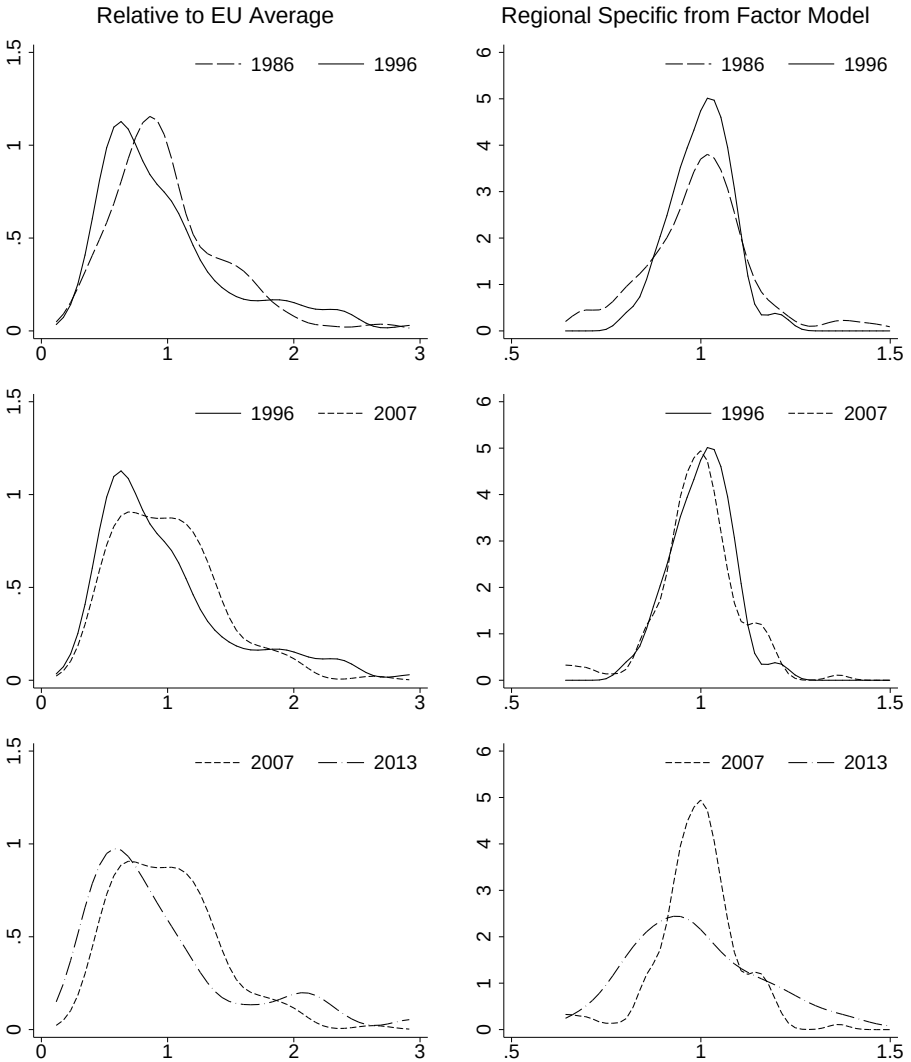


Distribution of Regional Unemployment Rates in Europe

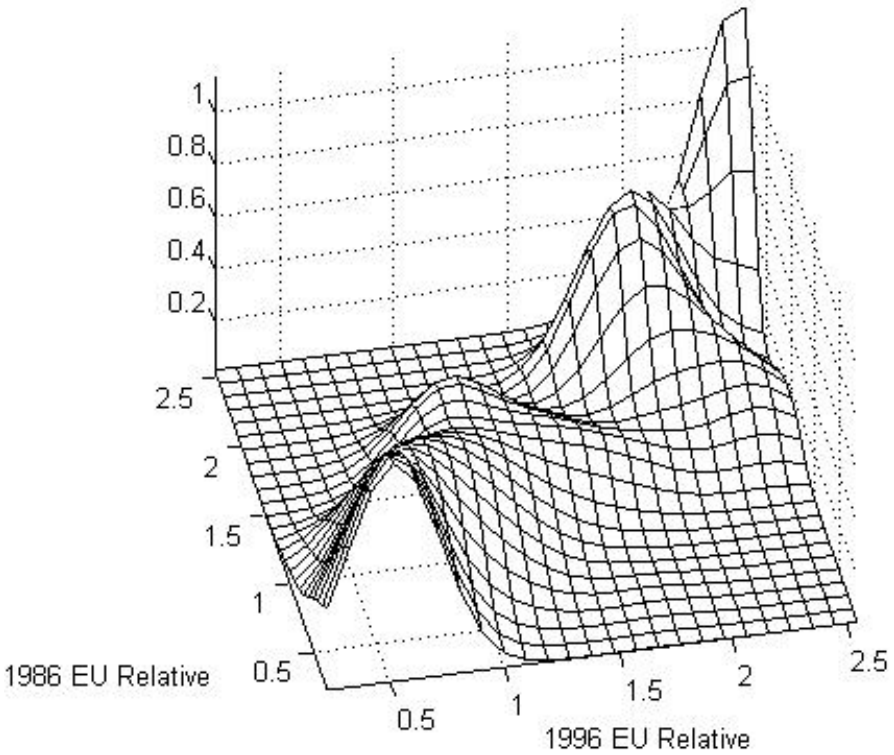
- Work in progress (with M. Stemmer); will become a separate note
- How do the results from Overman and Puga (2002) change with alternative filtering? How did the distribution change over time, in particular before and during the financial crisis?
- Methodology & Data
  - distributional analysis using kernel densities and stochastic kernels
  - 132 of 150 regions included in Overman and Puga (2002): 1986-2013
- Standard Deviations

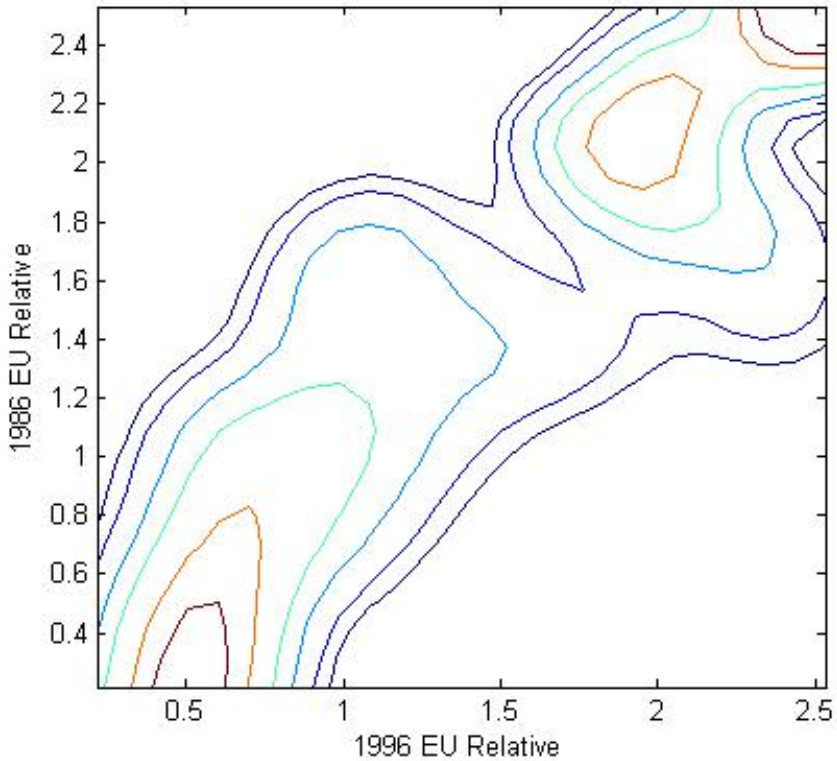


Distribution of Regional Unemployment Rates in Europe I



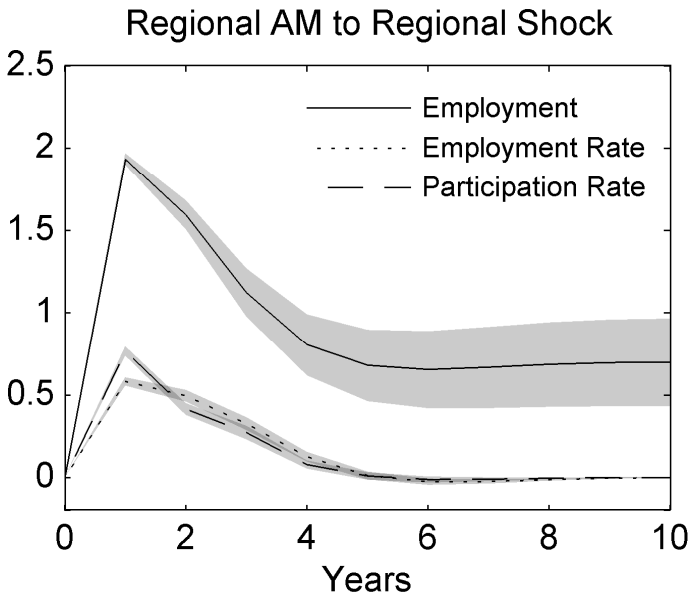
Distribution of Regional Unemployment Rates in Europe II

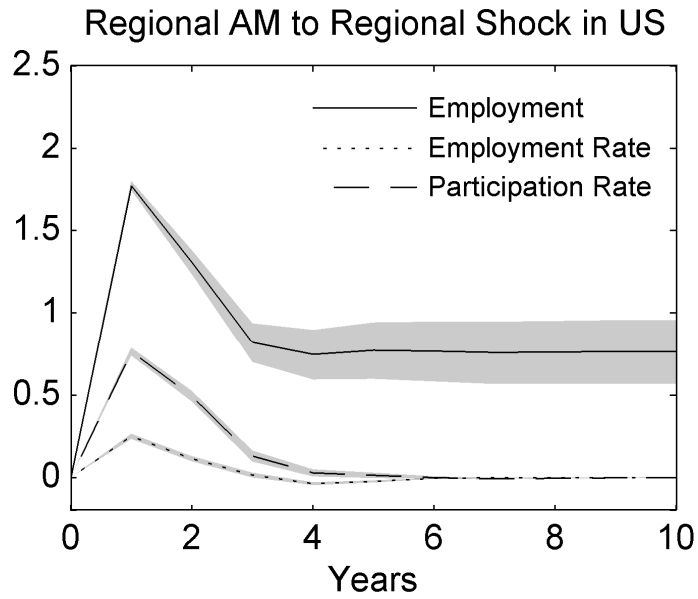




Comparing the Regional AM after Regional Shock

- Impulse Responses



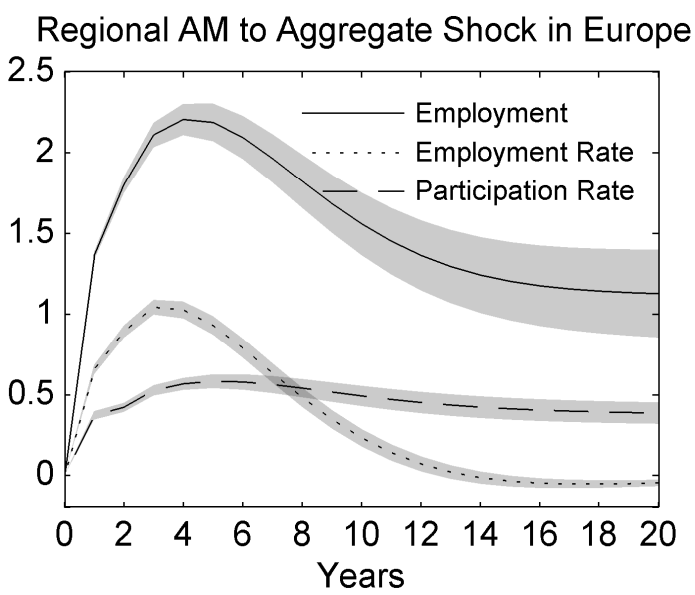


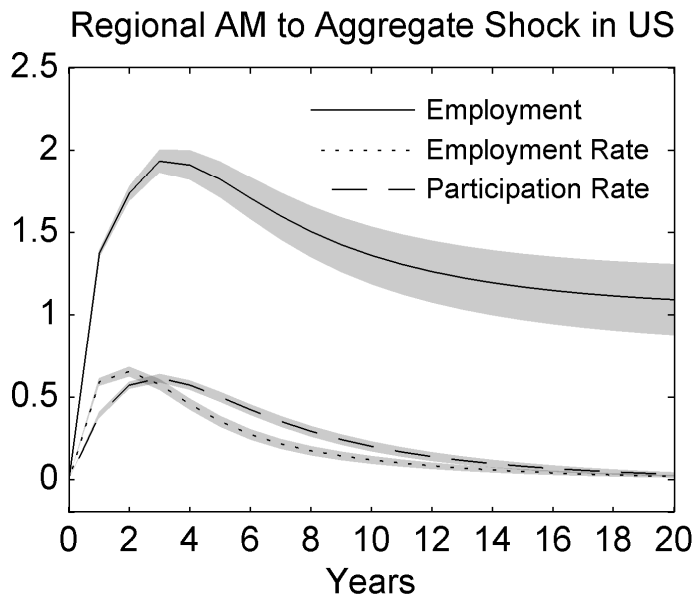
- Decomposition

	Europe						US					
Years	1	2	3	4	5	15	1	2	3	4	5	15
Employment	1	0.82	0.58	0.41	0.35	0.36	1	0.74	0.46	0.42	0.43	0.43
Employment Rate	0.30	0.26	0.17	0.06	0.01	0	0.14	0.06	0.01	-0.02	-0.01	0
Participation Rate	0.40	0.21	0.14	0.04	0.01	0	0.43	0.28	0.07	0.02	0.01	0
Migration	0.31	0.36	0.27	0.31	0.34	0.36	0.43	0.40	0.38	0.42	0.43	0.43

Comparing the Regional AM after Aggregate Shock

- Impulse Responses





- Decomposition

	Europe						US					
Years	1	2	3	4	5	15	1	2	3	4	5	15
Employment	1	1.32	1.55	1.62	1.61	0.88	1	1.27	1.42	1.4	1.33	0.85
Employment Rate	0.48	0.66	0.77	0.75	0.68	-0.03	0.43	0.48	0.42	0.33	0.26	0.04
Participation Rate	0.27	0.31	0.39	0.42	0.43	0.30	0.28	0.42	0.45	0.42	0.37	0.06
Migration	0.25	0.36	0.40	0.45	0.50	0.61	0.29	0.38	0.55	0.65	0.71	0.76

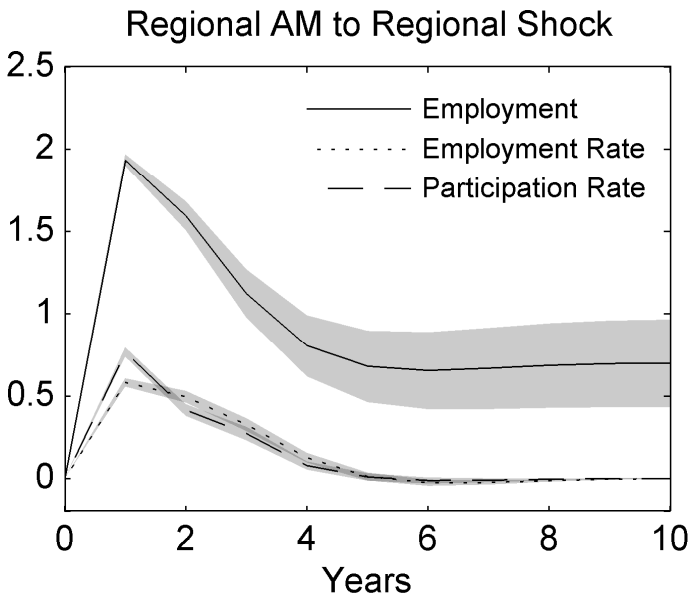
Changes over Time

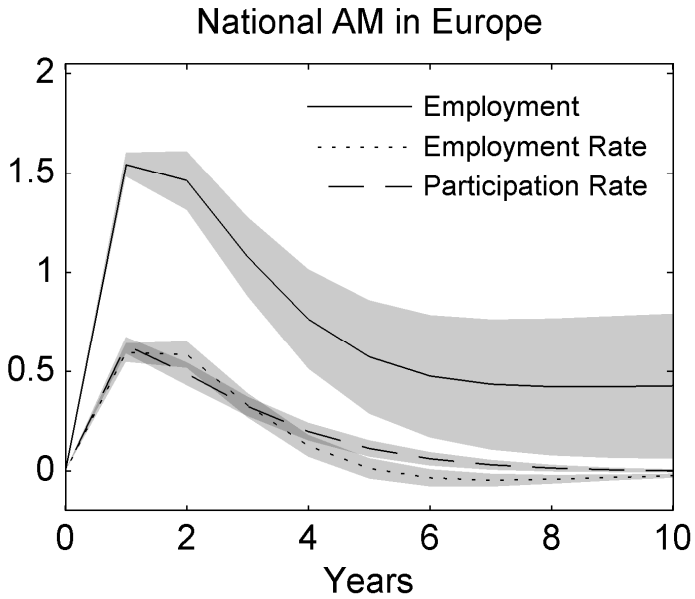
- Average contribution of migration in first three years

	Regional		Aggregate	
	EU	US	EU	US
1976-1993	44	51	43	45
1994-2011	30	46	20	22
Change	-14	-5	-23	-23

- Nearly symmetric decrease in US and Europe for both shocks
- Possible reasons:
  - Increasing share of women in labour force?
  - Increasing home ownership rates?
  - More part-time jobs?
  - Disentanglement of work and home?
  - More homogeneous regions/states?

Comparing the Regional and National AM in Europe

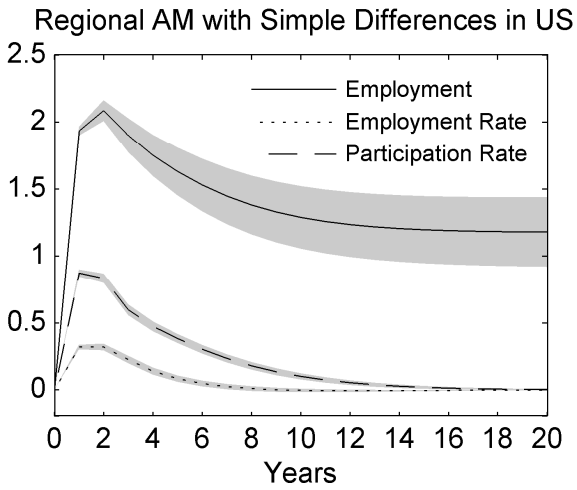




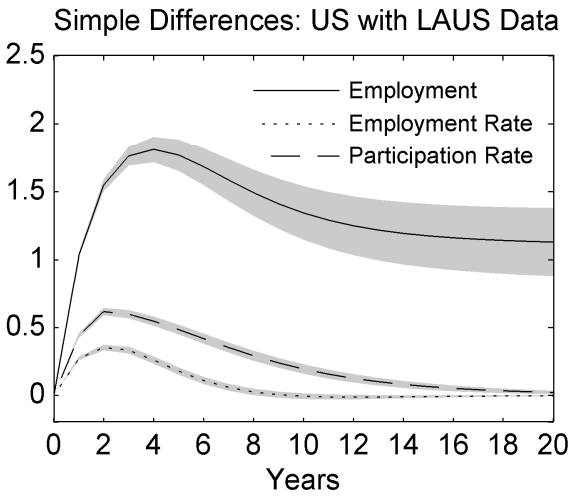
- Decomposition

	Regional						National					
Years	1	2	3	4	5	15	1	2	3	4	5	15
Employment	1	0.82	0.58	0.41	0.35	0.36	1.00	0.95	0.70	0.50	0.37	0.29
Employment Rate	0.30	0.26	0.17	0.06	0.01	0	0.39	0.38	0.21	0.08	0.01	0.00
Participation Rate	0.40	0.21	0.14	0.04	0.01	0	0.41	0.32	0.21	0.13	0.07	0.00
Migration	0.31	0.36	0.27	0.31	0.34	0.36	0.20	0.25	0.27	0.28	0.29	0.29

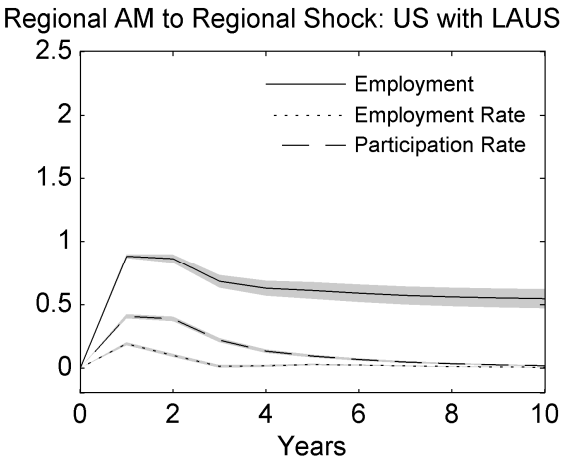
Robustness I



- Mixture of AM to heterogeneous responses to aggregate shocks and to regional specific shocks



- Similar to BK
- Humped shape response conflicts with identification



- Different from CPS
  - smaller shock
  - more migration
- Part-time jobs?

Robustness II

- Regional AM very similar in European countries
- β-differences very similar to simple differences
- Role of lag length
  - No effect for one lag
  - Permanent effect decreases with more lags
- Robust to changing the data frequency to monthly
- Robust to very different specifications of the factor analysis

Conclusion

- Compared to aggregate shocks after regional shocks
  - the adjustment is very fast (4-5 vs. $>$ 15 years)
  - migration picks up immediately
  - the overall contribution of migration is low (below 50%)
- Compared to the US in Europe
  - the employment rate contributes more and migration somewhat less
  - the adjustment takes somewhat longer but it is not very different
- Compared to the adjustment in the past today
  - the participation rate contributes more and migration less
- Compared to regional shocks national ones are
  - more persistent
  - less driven by migration

$\Rightarrow$ In Europe some room for improvement but migration will not become a much more important adjustment mechanism in the future

$\Rightarrow$ Adjustment through jobs is crucial!

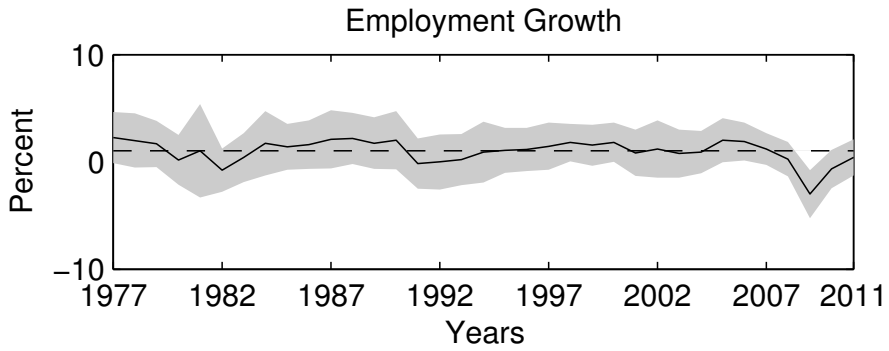
Contributions of Factors

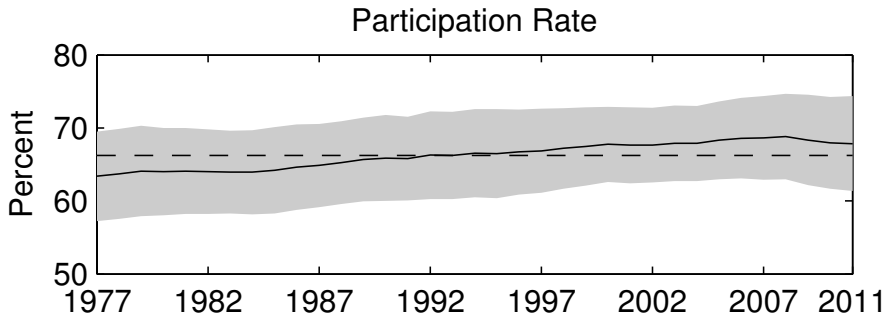
- Explained Variance in %

	G1	G2	G3	US	EU	LR	C	Global	Total
Employment Growth	15	16	20	4	4	10	5	51	74
Employment Rate	30	11	9	5	2	4	2	50	65
Participation Rate	34	27	11	2	3	1	4	72	83

- Filtered variation a little higher than in Decressin and Fatás (1995)
- Filtered variation slightly higher in Europe
- Loadings of European regions have wider distributions

Original Variables: Means and Standard Deviations



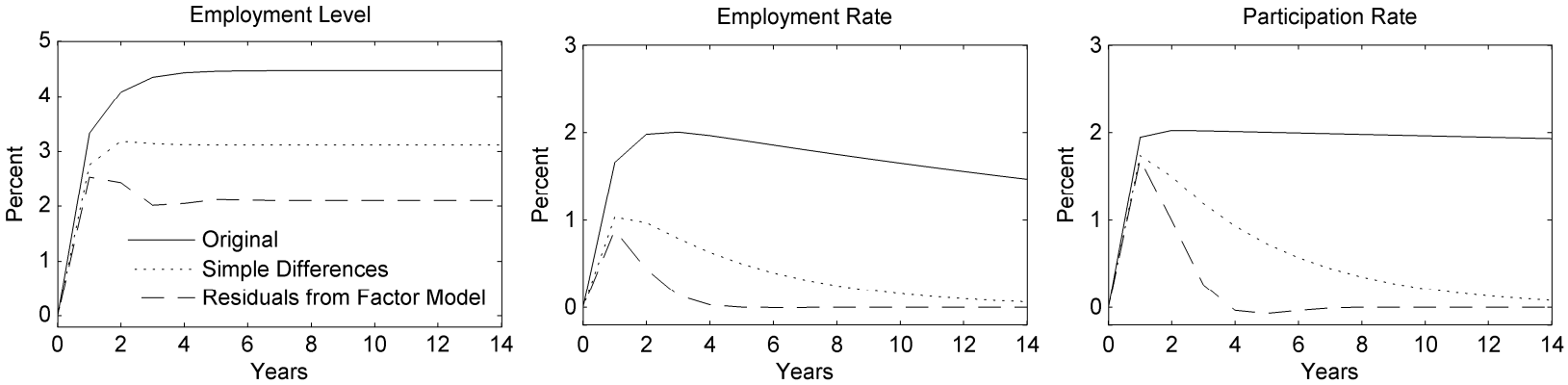


QML Approach of Doz, Giannone and Reichlin (2012)

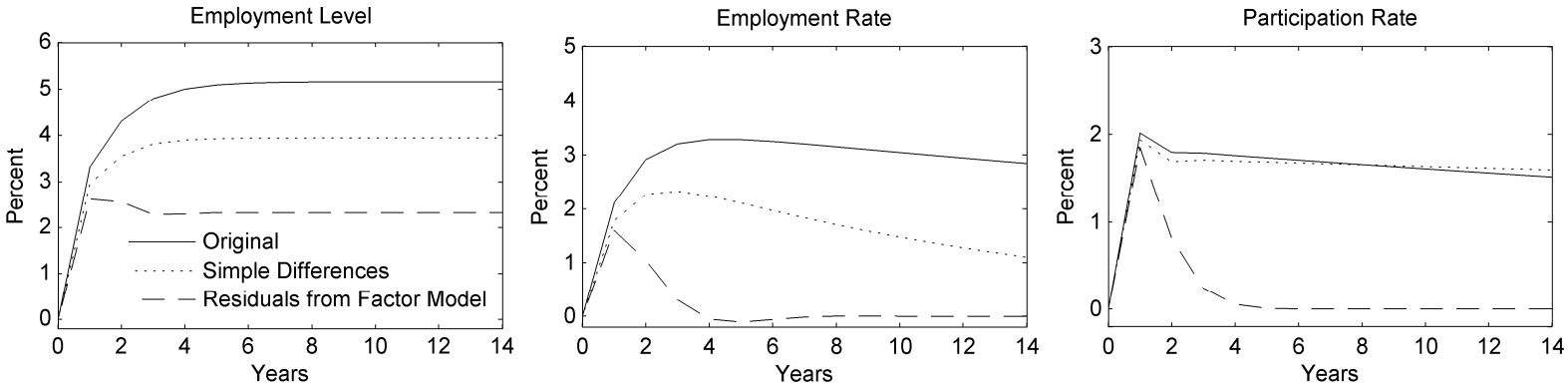
- Exact factor model as misspecified approximate factor model (true probabilistic model is approximated by more restricted model)
- Expected value of estimated common factors converge to the true factors as cross-section and period go to infinity
- Requires large panel
- Likelihood is maximized using the EM (expectation-maximization) algorithm that requires (at each iteration) only one run of the Kalman smoother (computational complexity depends on the number of factors, which is small)
- Principal Components initialize numerical algorithm

Autoregressive Processes

- AR(2) Processes: US



- AR(2) Processes: Europe



- Unit root in European employment rate and participation rate with simple and β-differences