UNEMPLOYMENT IN EAST AND WEST EUROPE

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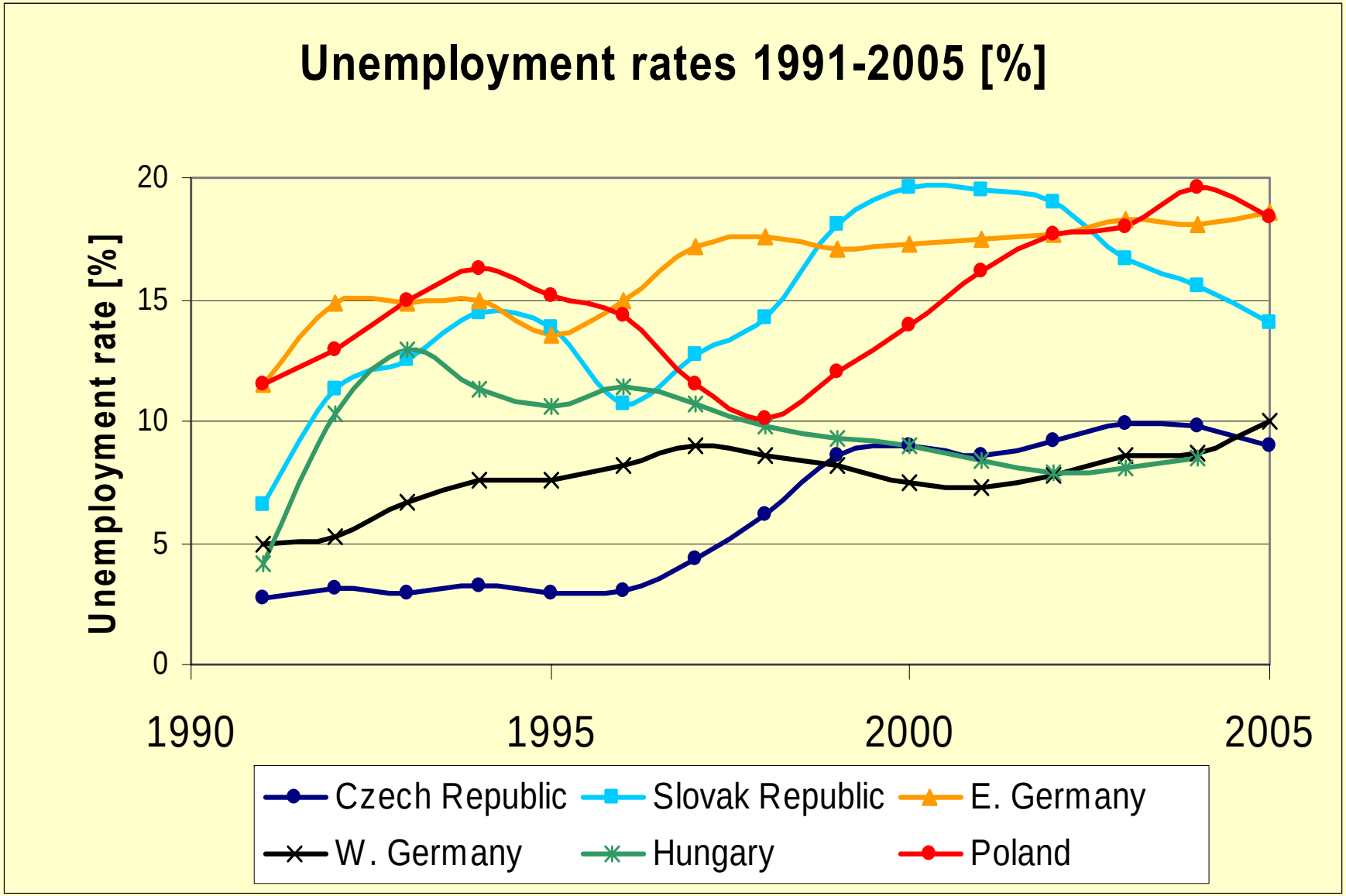

Unemployment rates 1991-2005 [%]
Unemployment rate [%]
20
15
10
5
0
1990
1995
2000
2005
Czech Republic
Slovak Republic
E. Germany
W. Germany
Hungary
Poland

Unemployment (*U*)

- Central-East -- *U* = still a problem after two decades
- West -- *U* = an issue in many countries for decades
- => Are similar or different factors at play?
- => What policies could be deployed?
- Central-East Europe: 3 hypotheses
  - Economic structure (mismatch)
  - Macroeconomic policies or major external shocks
  - Transition from plan to market in the presence of globalization
- Western Europe: 3 hypotheses
  - Structural (mismatch) shocks
  - Aggregate demand shocks
  - Hysteresis

Basic Ideas

- Q: Is unemployment in Central-East Europe a result of
  - economic structures (mismatch) => focus on L mkt institutions (as in Western Europe), labor mobility and skill formation
  - macroeconomic policies and external shocks => policies
  - ongoing transition => restructuring

- Use *national* and *district-level panel data* on
  - the unemployed *U*, vacancies *V*, inflow *S* into unemployment, and outflow *O* from unemployment
  - in CR, HU, PO, SR, and East and West parts of Germany

- Examine the three hypotheses in the context of *S* and efficiency of matching of the *U* and *V*

Two aspects of unemployment research

- Examine the relationship between economic activity and unemployment by focusing on either
  - inflows into unemployment (job destruction in firms)

  or

  - outflows (matching of the unemployed and vacancies)

Setting

- Outcomes in the U-V space -- intersection of the Beveridge (UV) curve and the vacancy supply (VS) curve
- UV curve characterizes labor market equilibrium – *U* exists (*U* and *V* do not match instantaneously) and *S* = *O*
- The UV curve is negatively sloped -- supply of more vacancies implies lower unemployment
- The VS curve maps combinations of *U* and *V* that reflect the employment and wage setting behavior of firms and workers
- Intersection of UV and VS curves gives equilibrium rate of U and V
- Can distinguish three types of shifts in the U-V space
  - aggregate demand shocks
  - structural (mismatch) shocks
  - hysteresis

Beveridge curve dynamics

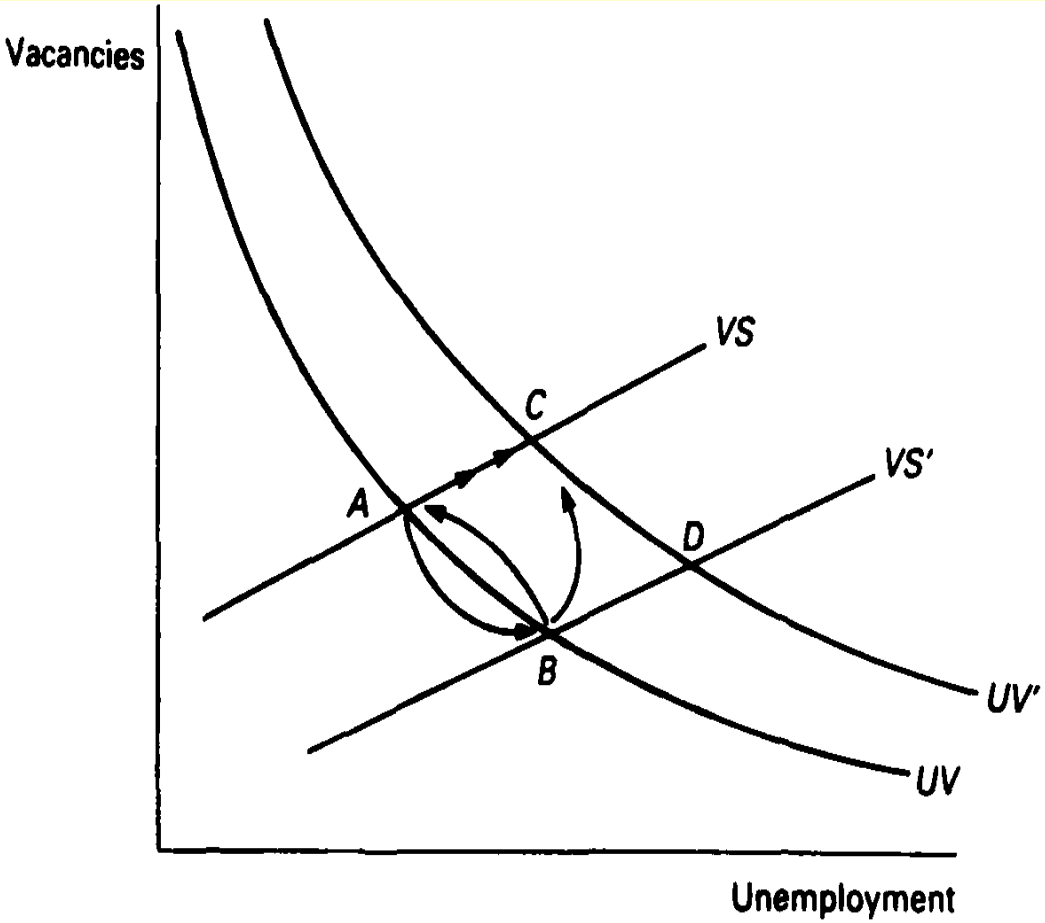
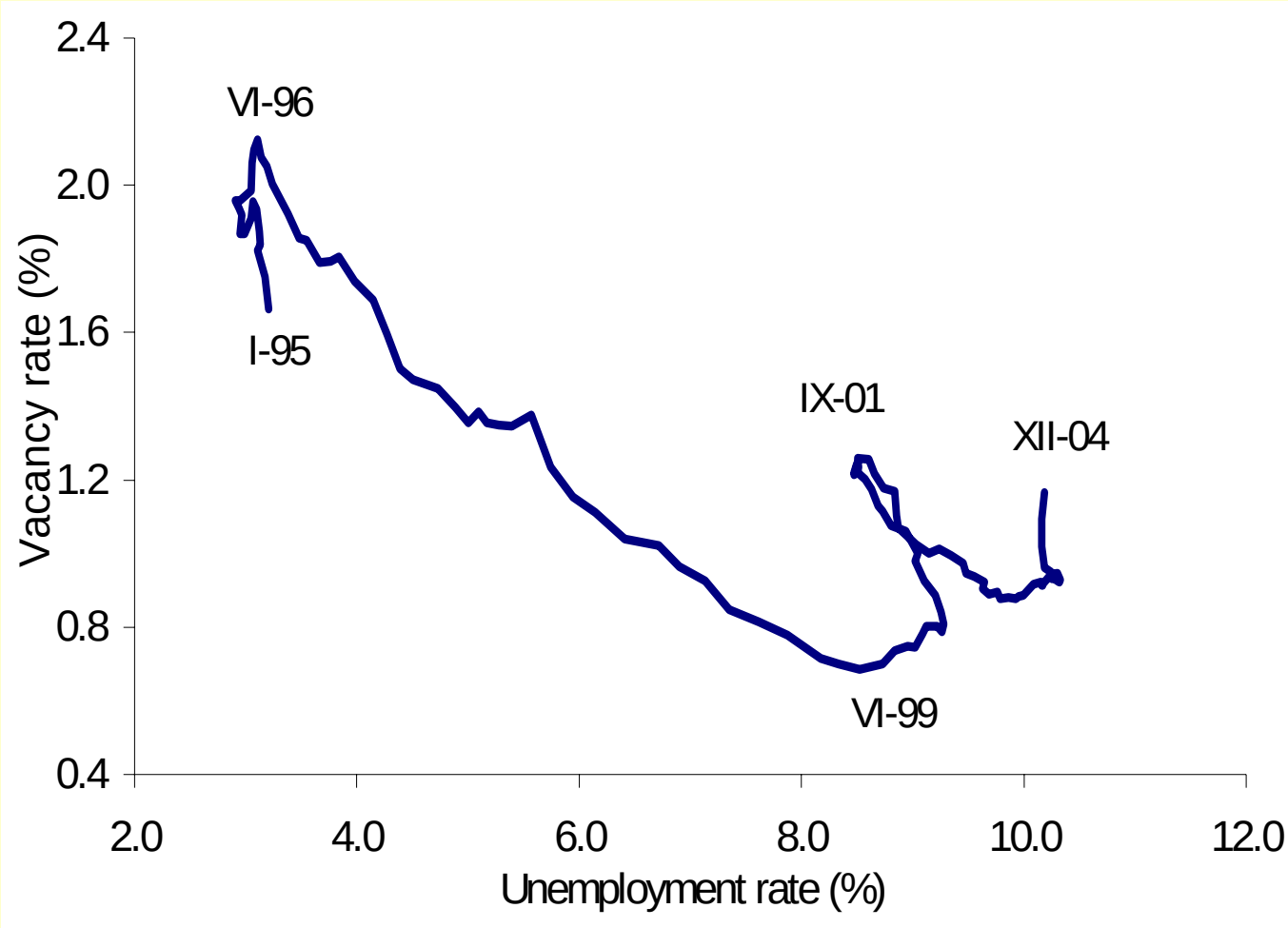
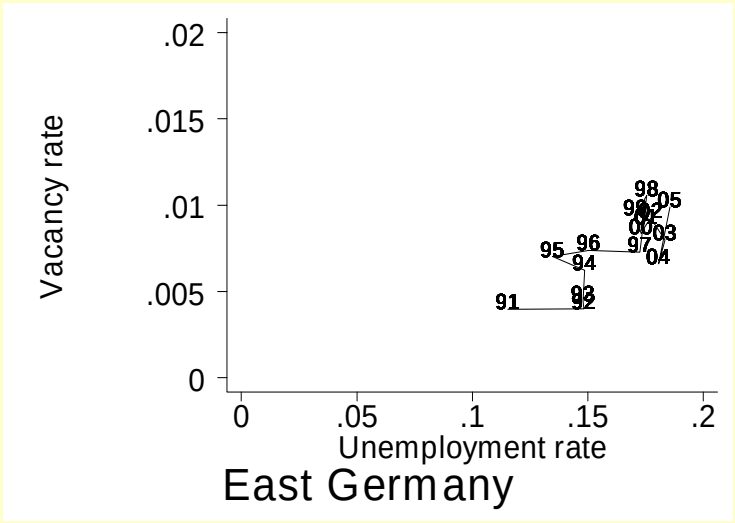


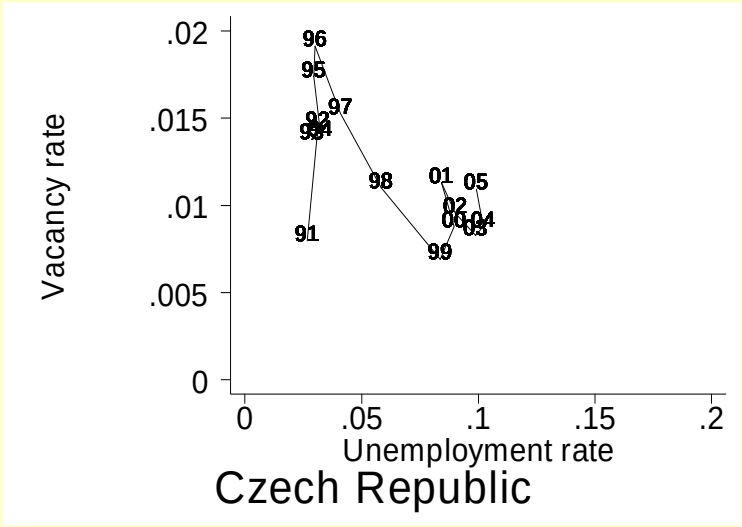
Figure 4. Three types of shocks in Beveridge space

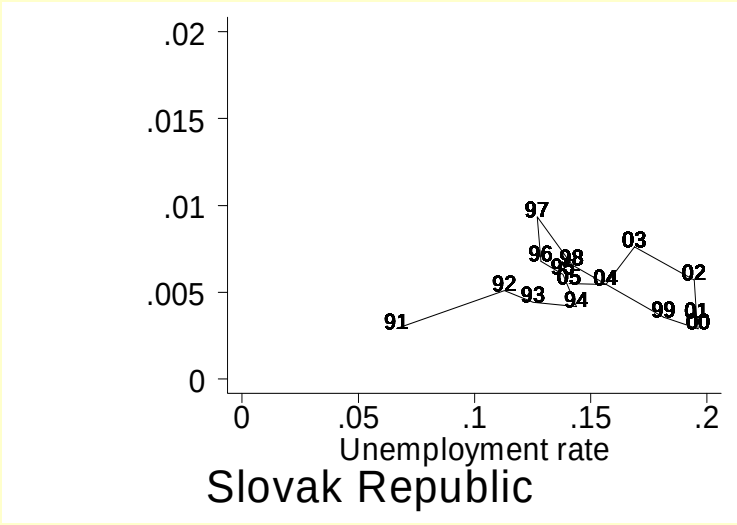
Beveridge curve (Czech Republic, seasonally adjusted data)

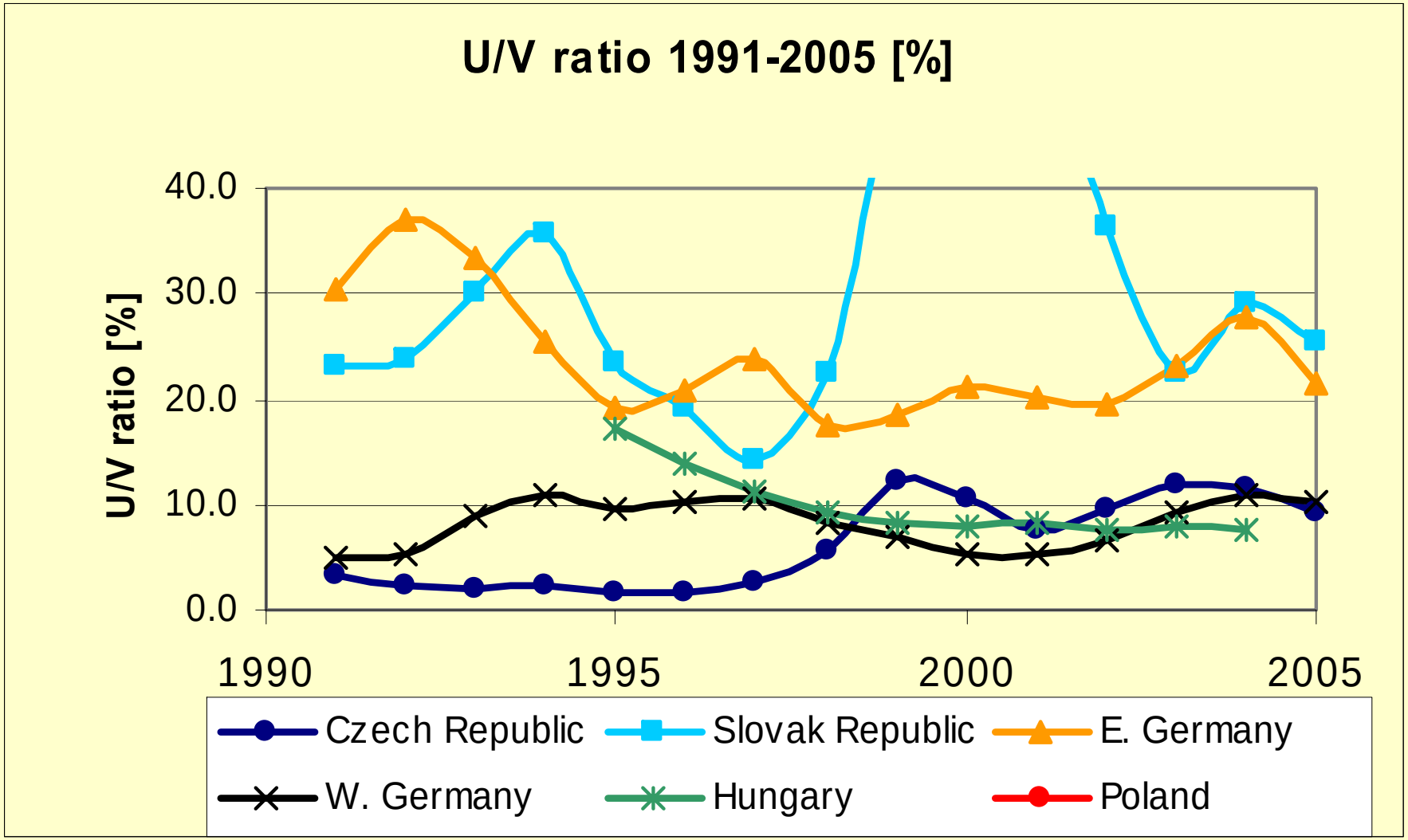


Beveridge curves (selected)



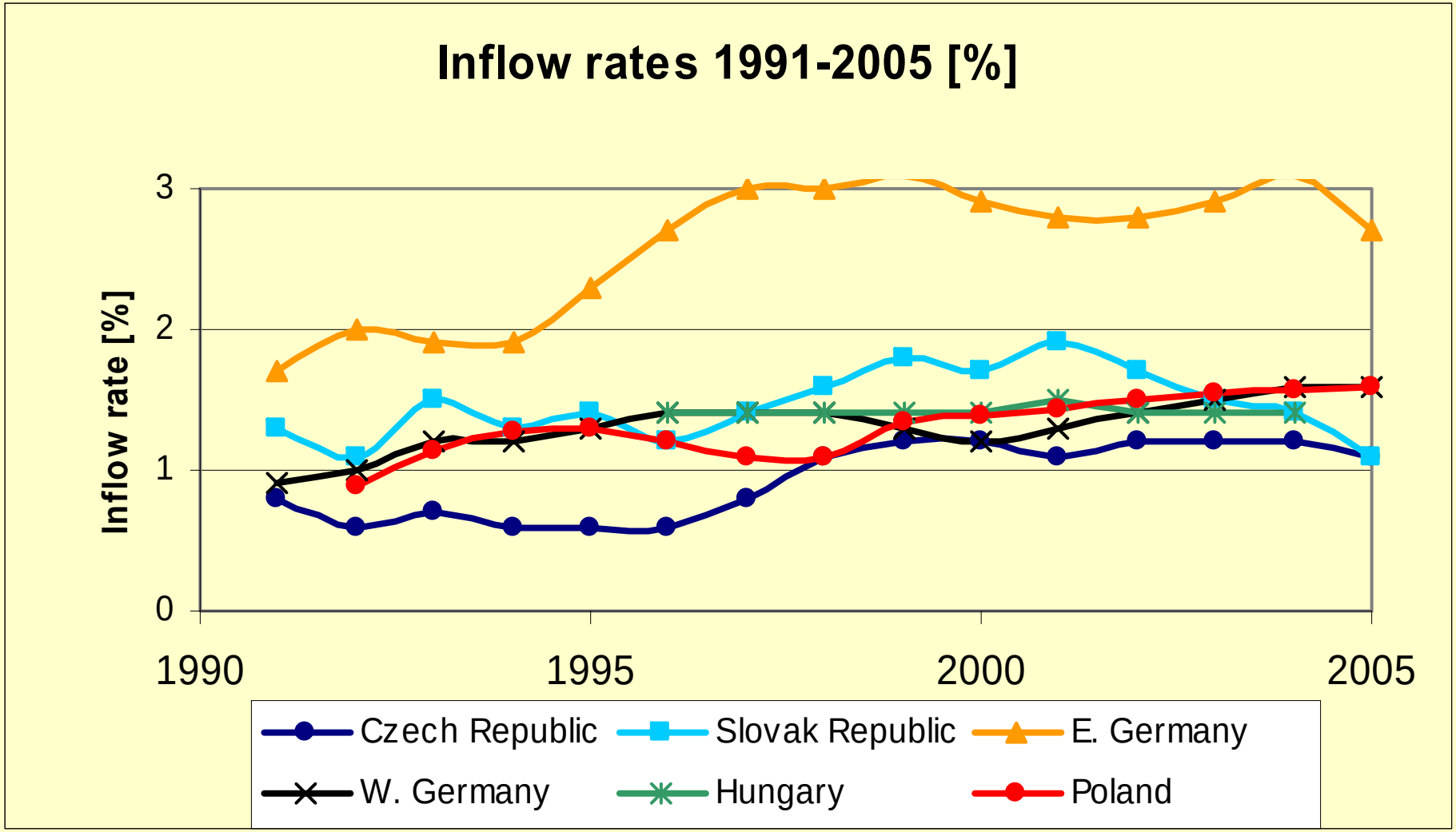





U/V ratio 1991-2005 [%]
U/V ratio [%]
40.0
30.0
20.0
10.0
0.0
1990
1995
2000
2005
Czech Republic
Slovak Republic
E. Germany
W. Germany
Hungary
Poland

Inflow side

- Models of transition assume that turnover (inflow) rate would rise as the state sector sheds workers who go through *U* into new jobs in the new private sector
- => prediction: *S* will be temporarily high and gradually decline and approach the level observed in similar market economies such as WG
- data from the five transition economies -- the *S* rate trajectories have been very different from theory


Inflow rates 1991-2005 [%]
Inflow rate [%]
3
2
1
0
1990
1995
2000
2005
Czech Republic
Slovak Republic
E. Germany
W. Germany
Hungary
Poland

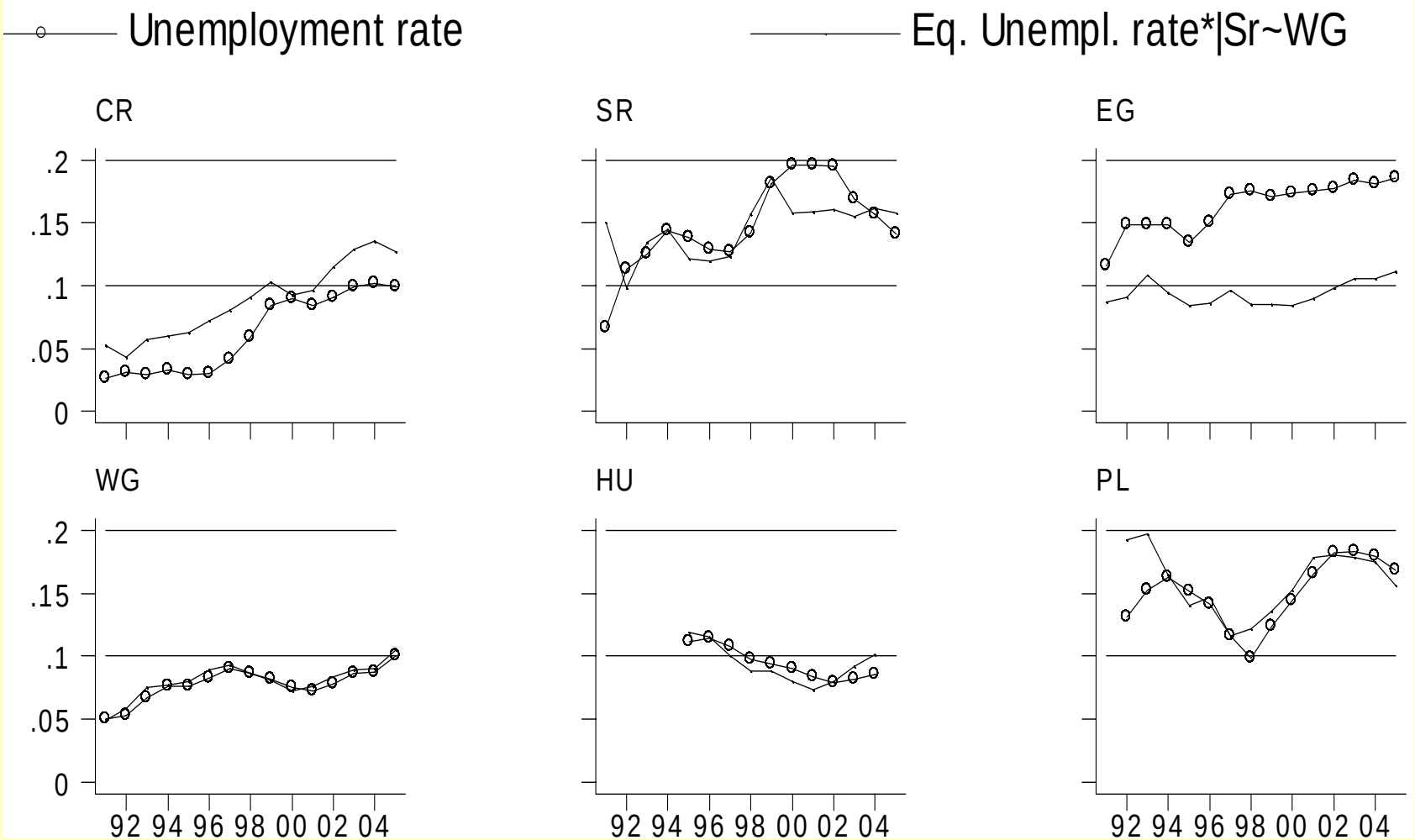
What explains this pattern?

- One hypothesis -- significant job-to-job mobility rather than job-to-unemployment flows
- Another hypothesis -- amount and speed of restructuring not as large as theorists expected, relative to restructuring in market economies
  - Market economies restructuring substantially in globalization
  - Some TEs (Hungary and Poland) were already in part restructured
  - Other TEs (Czechs and Slovaks) proceeded slowly in cutting off current and former state firms from subsidies
- East Germany is a special case (ALMPs)

Transition-related shocks?

- To what extent *U* in TEs been brought about by shocks related to their specific policies v. shocks that affect otherwise similar market economies?
- => Take the West German economy as a benchmark and calculate the *U* rate that each TE would have, had it had the same inflow rate as West Germany

Actual and hypothetical unemployment rates during 1992-2005



Outflows and efficiency of matching

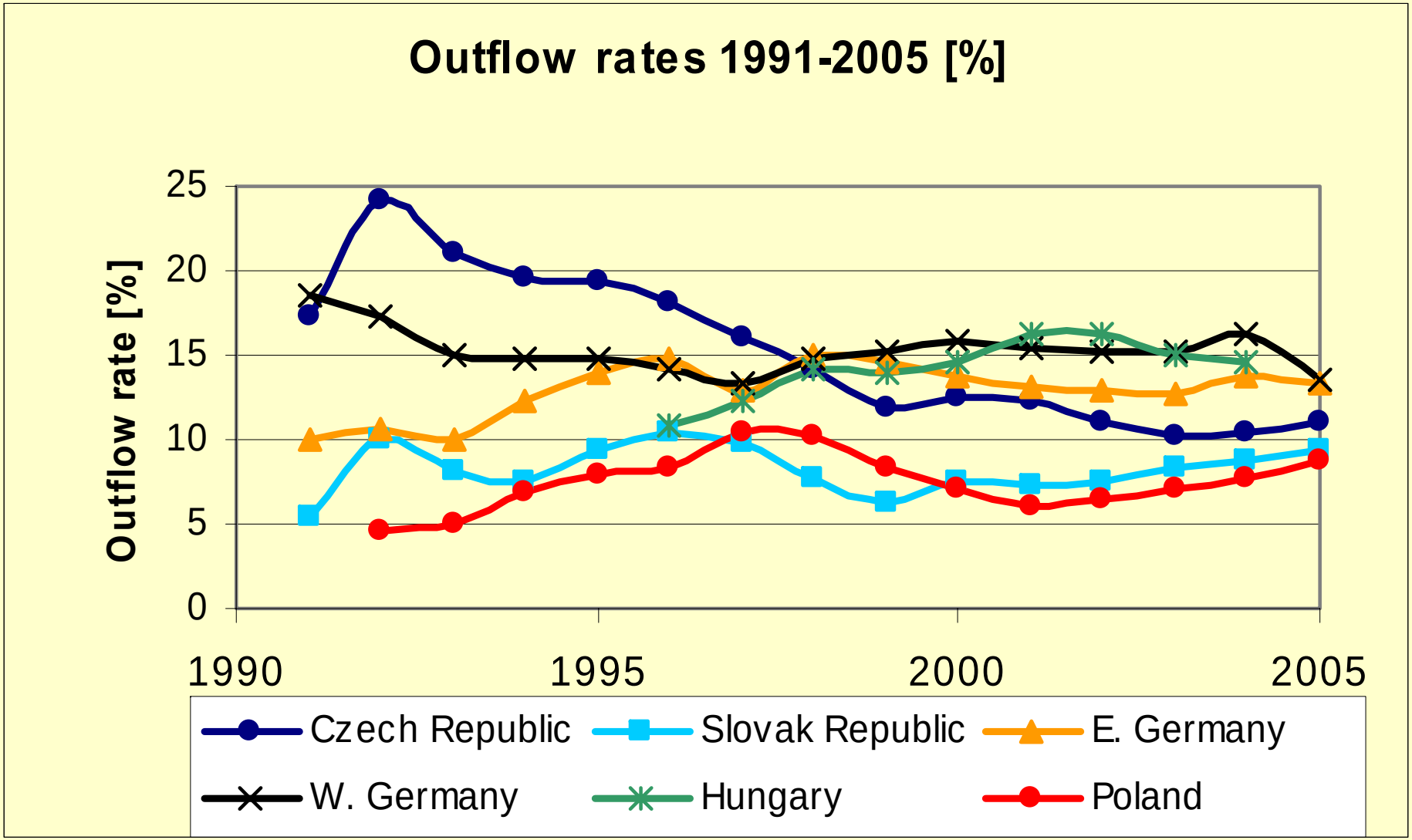
Conceptual framework of matching functions

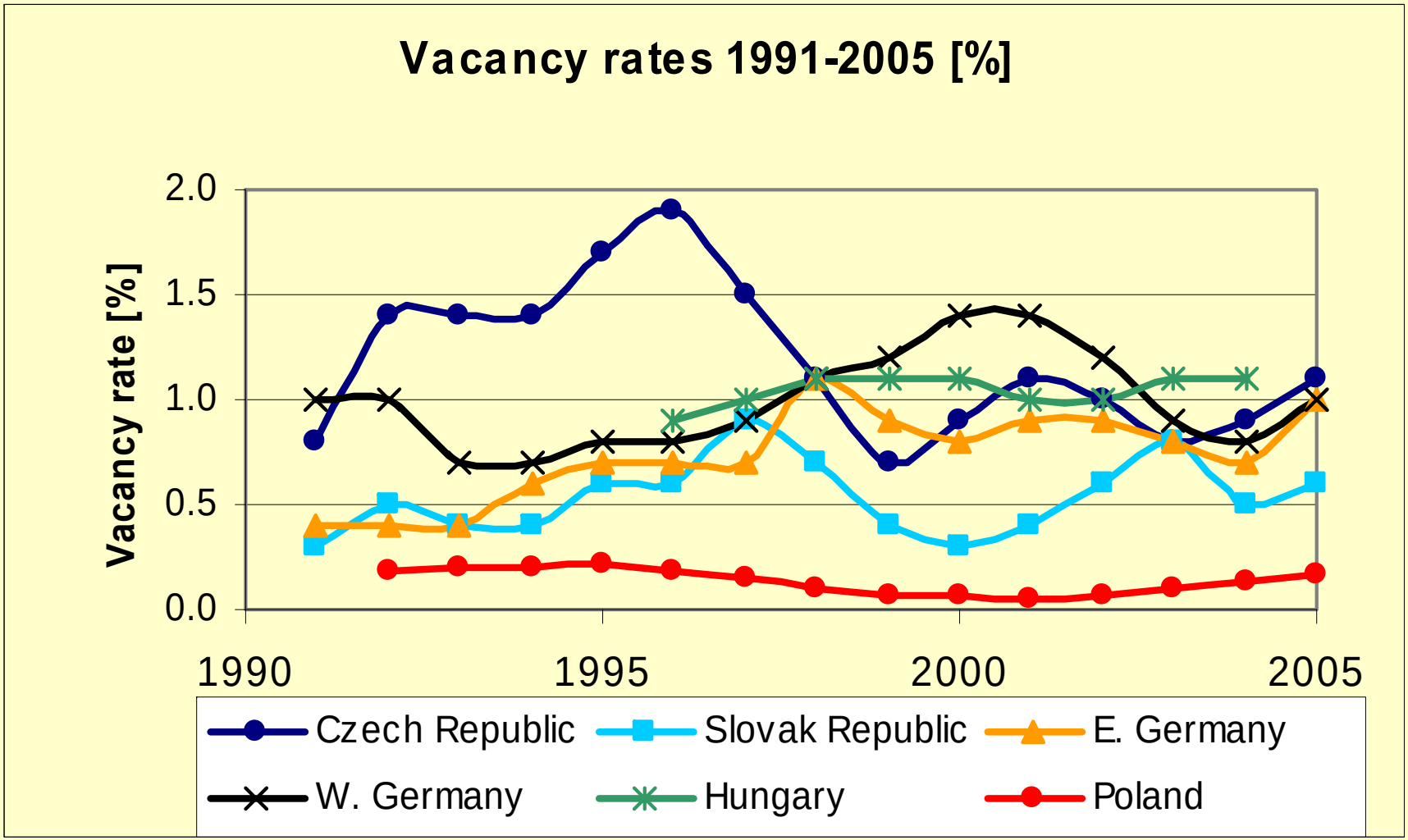
- $O = M(U,V)$ (1)

- Some expect function *M* to display constant returns to scale (CRS)
- Others expect IRS because of
  - externalities in the search process
  - heterogeneity in the unemployed and vacancies
  - lags between matching and hiring
- IRS may constitute a necessary condition for multiple equilibria => rationale for government intervention
- We find that IRS appear to be an important phenomenon
  - especially in the later (1997-2003) than the earlier (1993-96) period

Hypotheses about reasons for high U

- H1: restructuring still at work -- inflow *S* (from old jobs) high => *U* high due to high turnover
- H2: high *U* caused by low L demand (macro policies, exchange rate, shocks) => low *V* relative to *S*
- H3: inefficient *U*-*V* matching (L mkt institutions or geographical or skill mismatch) => *U* and *V* both high but not in the same districts or skill groups


Outflow rates 1991-2005 [%]
Outflow rate [%]
25
20
15
10
5
0
1990
1995
2000
2005
Czech Republic
Slovak Republic
E. Germany
W. Germany
Hungary
Poland


Vacancy rates 1991-2005 [%]
Vacancy rate [%]
2.0
1.5
1.0
0.5
0.0
1990
1995
2000
2005
Czech Republic
Slovak Republic
E. Germany
W. Germany
Hungary
Poland

Figures suggest

- West Germany consistent with H1-3; *U* risen with increasing inflows *S* (H1), *V* declined while inflow risen (H2), the *U* and *V* rates are relatively high (H3)
- CR starts with low *U* but increasingly conforms to H1 (higher *U* and *S)* and H2 (*V* low relative to *S* and *U)*
- East Germany conforms to H1 as well as H2
- Slovakia and Poland consistent with H1 and H2 throughout the 1990s and 2000s
- Because of low unemployment, Hungary does not fit clearly into any H -- has an element of all three Hs: inflow is relatively sizable (H1), the vacancy rate is low relative to inflow (H2), unemployment and vacancies are relatively high (H3)

Literature on matching in TEs

- Grown rapidly
- Produced contradictory results
- Studies use different methodologies and data
- Methodologically, they differ especially with respect to the
  - specification of the matching function and treatment of returns to scale
  - inclusion of other explanatory variables that might affect outflows
  - extent to which they use static or dynamic models
- In terms of data, the studies differ in whether they
  - use annual, quarterly or monthly panels of district-level or more aggregate (regional) data
  - cover short or long time periods
- None adjusts the data for the varying size of the (district or region)

Our approach

- Unlike other studies, we use a more up-to-date empirical methodology and superior data
  - control for the endogeneity of explanatory variables
  - account for the presence of a spurious scale effect introduced by the varying size across units of observation (districts)
  - use long panels of comparable monthly data from all districts in the countries that we analyze

Empirical Specification

- Cobb-Douglas function which may be written in a deterministic form as

$$\ln O_{i,t} = \beta \ln U_{i,t-1} + \gamma \ln V_{i,t-1} + \ln A \qquad (2)$$

- $U_{i,t-1}$ = number of unemployed in district i at the end of period *t-1*
- $V_{i,t-1}$ = number of vacancies in district i at the end of period *t-1*
- $O_{i,t}$ = outflow to jobs during period *t*
- *A* captures the efficiency of matching.

Empirical Specification

- Let lowercase letters stand for logarithms of variables
- a_i be district specific effects
- $\varepsilon_{i,t}$ be an idiosyncratic error term
- Can write (2) as

$$o_{i,t} = \beta u_{i,t-1} + \gamma v_{i,t-1} + a_i + \varepsilon_{i,t} \qquad (3)$$

Estimation problems

$$o_{i,t} = \beta u_{i,t-1} + \gamma v_{i,t-1} + a_i + \varepsilon_{i,t} \quad (3)$$

- OLS not appropriate if a_i are correlated with *u* and *v*
- Correlation likely to exist due to differences between districts
- Specific factor is district size (spurious scale effect)
- With panel data, one can use means deviation or first differencing to remove a_i
- But RHS *u* and *v are* predetermined through previous matching (endogenous) → inconsistent estimates → IV needed → first differencing preferred

- First difference transformation contaminates the transformed variables only with recent error terms $\{\varepsilon_t: t = \text{T-1, T-2}\}$
- To see this, rewrite (5) in a first difference form

$$\Delta o_t \equiv o_t - o_{t-1} = \beta(u_{t-1} - u_{t-2}) + \gamma(v_{t-1} - v_{t-2}) + \varepsilon_t - \varepsilon_{t-1} \quad (6)$$

Lagged outflows in (4) in turn given by a lagged version of (3)

$$U_{t-1} \equiv U_{t-2} + S_{t-1} - O_{t-1} \dashrightarrow o_{t-1} = \beta u_{t-2} + \gamma v_{t-2} + \varepsilon_{t-1}$$

$$U_{t-2} \equiv U_{t-3} + S_{t-2} - O_{t-2} \dashrightarrow o_{t-2} = \beta u_{t-3} + \gamma v_{t-3} + \varepsilon_{t-2}$$

- => further lags of *U or S* and *V* can be used as valid instruments

- District mean deviations transformation (fixed-effects): District mean computed from observations over time => means contain all values of error term $\{\varepsilon_t: t = 1, 2, 3, \ldots, T\}$ => contaminates variables with all error terms.

Newly unemployed

- Studies suggest propensity to match higher at time of entry into unemployment
  - Newly unemployed search through all existing vacancies
  - May have not experienced depreciation of skills
- Remaining unemployed match only with the newly posted vacancies
- To reflect this, include S as an additional explanatory variable

Total outflow v. outflow to jobs

- Data on outflow to jobs are available only for the Czech Republic, while data on total outflow are available for all the countries
- We carry out the estimation for the Czech Republic using both measures and find that the estimates based on total outflow and outflow to jobs are similar
- Assume the lack of data on outflow to jobs in other countries should not have a dramatic impact on our results (see also Petrongolo and Pissarides, 2000, for similar evidence from other countries)

Data

- Panel data on 76 Czech, 38(79) Slovak, 21 Hungarian, 34 East German, and 140 West German districts.
- Data cover Jan. 1991- 2005 and contain monthly observations for:
- $O_{i,t}$ = the number of individuals flowing from unemployment in district *i* during period *t*;
- $U_{i,t}$ = the number of unemployed in district *i* at the end of period *t*;
- $S_{i,t}$ = the normalized number of individuals flowing into unemployment (the newly unemployed) in district *i* during period *t*;
- $V_{i,t}$ = the number of vacancies in district *i* at the end of period *t*;

Matching function estimates for West Germany during 1997-2005

	Trend	Std.Err.	β	Std.Err.	γ	Std.Err.	δ	Std.Err.	RTS	p-value	adjR2
Panel A: Cross-sectional estimators											
OLS	0.012	0.001	0.68	0.00	0.15	0.00	-	-	0.83	0.00	0.85
OLS (Month Dummies)	0.011	0.001	0.69	0.00	0.13	0.00	-	-	0.82	0.00	0.90
OLS (Size Adjusted)	0.010	0.001	0.55	0.03	0.03	0.02	-	-	0.58	0.00	0.62
Panel B: Panel data estimators											
Random Effects	0.010	0.000	0.74	0.01	0.08	0.00	-	-	0.81	0.00	0.65
Fixed Effects	0.010	0.000	0.74	0.01	0.07	0.00	-	-	0.81	0.00	0.66
1st Differences	0.013	0.003	1.64	0.06	0.07	0.01	-	-	1.71	0.00	0.64
Panel C: Panel data estimators (preferred estimation methods)											
1st Differences + IV	0.014	0.002	1.31	0.04	0.14	0.03	-	-	1.45	0.00	0.63
1st Differences + IV	0.012	0.002	1.27	0.04	0.16	0.03	0.12	0.01	1.56	0.00	0.64
1st Differences + IV*	0.009	0.002	1.28	0.04	0.13	0.03	0.15	0.01	1.55	0.00	0.63

*Estimated coefficient on lagged outflow added: ϕ=.200 (.033)

Number of observations = 14734

Matching function estimates

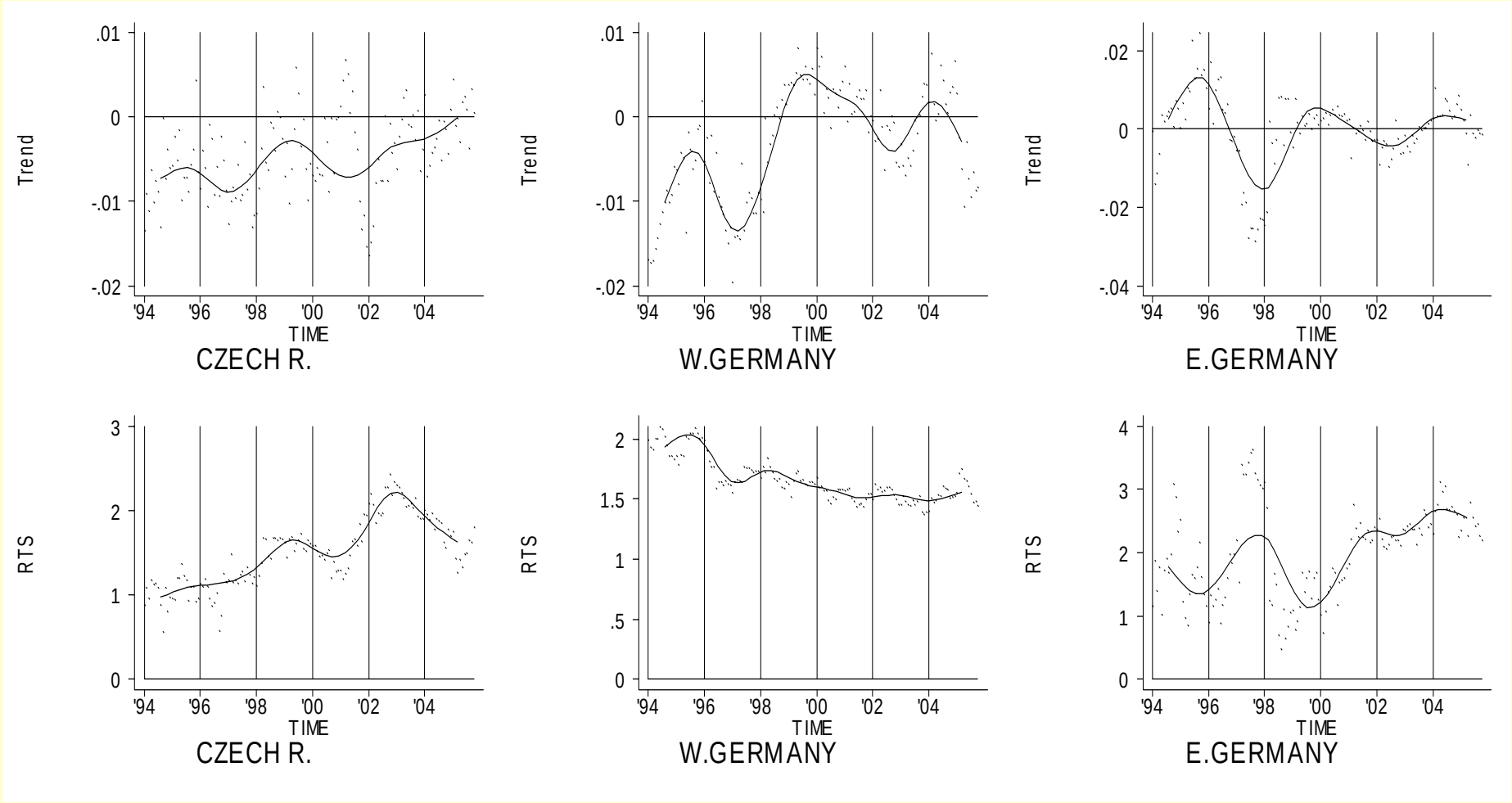
Panel A: 1994-1996

Country	Trend	Std. Err.	β	Std. Err.	γ	Std. Err.	δ	Std. Err.	adjR2	RTS	p-value	Nobs
CR	-0.112	0.027	0.75	0.16	0.23	0.11	0.26	0.03	0.65	1.24	0.31	2661
SR	0.045	0.058	0.95	0.58	0.17	0.16	0.17	0.05	0.31	1.29	0.60	1292
EG	0.045	0.026	0.91	0.45	-0.08	0.10	0.26	0.06	0.48	1.10	0.85	1211
WG	-0.103	0.005	1.27	0.07	0.22	0.04	0.20	0.02	0.67	1.69	0.00	5004
HU	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
PL	0.285	0.097	2.60	0.77	0.16	0.12	0.19	0.05	0.71	2.948	0.01	637

Panel B: 1997-2005

Country	Trend	Std. Err.	β	Std. Err.	γ	Std. Err.	δ	Std. Err.	adjR2	RTS	p-value	Nobs
CR	-0.039	0.008	1.16	0.07	0.51	0.06	0.19	0.02	0.74	1.86	0.00	7770
SR	0.004	0.010	1.51	0.14	0.24	0.05	0.07	0.01	0.49	1.82	0.00	6682
EG	-0.021	0.005	1.49	0.11	0.34	0.04	0.31	0.02	0.68	2.14	0.00	3602
WG	0.012	0.002	1.27	0.04	0.16	0.03	0.12	0.01	0.64	1.56	0.00	14734
HU	0.016	0.016	1.55	0.26	0.51	0.11	0.34	0.06	0.28	2.40	0.00	1920
PL	0.022	0.011	0.76	0.11	0.08	0.06	0.19	0.03	0.67	1.03	0.83	1072

Figure 2: Estimated trend in the intercept and returns to scale (24-month wide data moving window estimates)



Conclusions

- West GE - rising *U* and *S*, declining *V* and efficient matching (IRS and + trend) - consistent with H1 and H2
- CR similar – rising *U* and *S*, declining *V* and IRS (diminishing negative trend) - increasingly gives support to H1 and H2;
- East GE also H1 and H2 – high *U* and *S,* low *V,* strong IRS (training) but negative trend
- SR -- high *U* and *S,* low *V* and *O,* IRS and + trend => H1 and H2
- Hungary -- low *U*, highest IRS, moderate *S, O* and *V*
- *PO* – low V and O, CRS => H3

Overall Conclusions

- Regional disparities in *U, S* and *O are* persistent
- Restructuring proceeding

- Overall, two broad groups of countries
- First group = CR, Hungary, SR, and (possibly) East GE
  - resemble West GE – IRS in matching and unemployment appears driven by restructuring and low demand for labor
- The East GE case complex -- major ALMPs
- Poland – very low *V,* CRS in matching

Table 2: Persistence of Regional Differentials - Pearson's Rank Correlations

Base Year 1992							Base Year 1999						
Year	**CR**	**SR**	**EG**	**WG**	**HU**	**PL***	**Year**	**CR**	**SR**	**EG**	**WG**	**HU***	**PL**
						Unempl. Rate							
1996	0.81	0.82	0.54	0.94	n.a.	0.90	**2002**	0.95	0.95	0.87	0.96	0.95	0.86
1999	0.73	n.a.	0.32	0.94	n.a.	0.83	**2005**	0.91	0.92	0.71	0.89	0.92	0.83
						Inflow Rate							
1996	0.79	0.75	0.60	0.89	n.a.	0.90	**2002**	0.94	0.93	0.87	0.97	0.96	0.94
1999	0.70	n.a.	0.47	0.87	n.a.	0.87	**2005**	0.90	0.82	0.51	0.80	0.95	0.92
						Outflow Rate							
1996	0.50	0.57	0.43	0.84	n.a.	0.48	**2002**	0.86	0.88	0.68	0.87	0.86	0.45
1999	0.38	n.a.	0.46	0.84	n.a.	0.47	**2005**	0.83	0.86	0.54	0.78	0.66	0.72
						Vacancy Rate							
1996	0.33	0.25	-0.03	0.51	n.a.	0.55	**2002**	0.69	0.35	0.66	0.81	0.85	0.8
1999	0.29	n.a.	0.01	0.51	n.a.	0.46	**2005**	0.40	0.34	0.00	0.38	0.50	0.6
						U/V ratio							
1996	0.81	0.82	0.54	0.94	n.a.	0.90	**2002**	0.95	0.95	0.87	0.96	0.95	0.86
1999	0.73	n.a.	0.32	0.94	n.a.	0.83	**2005**	0.91	0.92	0.71	0.89	0.92	0.83