

Reforms that keep you home: Migration in Transition Economies

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The fall of Iron Curtain at the beginning of the 1990s created a natural laboratory for studying effects of institutional reforms.

In this paper we show that introduction of efficient institutions in post-communist countries decreased outmigration flows.

Economic transition after the fall of Iron Curtain

- Post-communist countries had similar institutional environment set to provide ground for centrally-planned economies.
- After 1990 governments implemented reforms which aimed to introduce market-oriented institutions and economic policies.
- Quality and speed of implemented reforms were heterogeneous across countries.

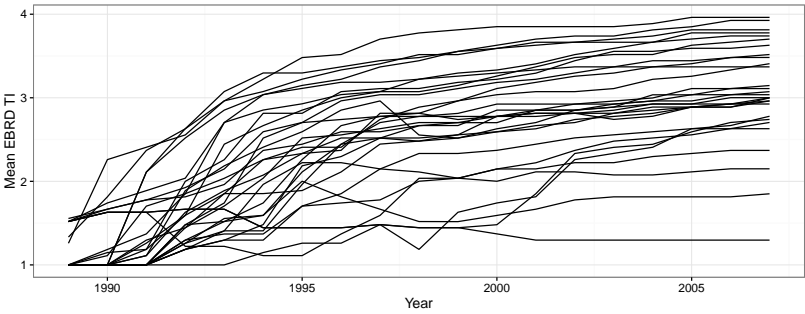
Transition progress

Progress of reforms is measured by EBRD Transition indicators in following areas:

- Large scale privatization
- Small scale privatization
- Enterprise restructuring
- Price liberalization
- Trade & Forex system
- Competition Policy
- Banking reform & interest rate liberalization
- Securities markets & non-bank financial institutions
- Overall infrastructure reform

The reform progress is evaluated on the scale from 1 (state typical for centrally-planned economy) to 4.33 (state typical for advanced market economy).

Heterogeneity in the course of reforms across 29 post-communist countries



Data: EBRD (2007)

Effect of reforms on economic growth

- EBRD indicators were used to show that economic reforms stimulate the economic growth (e.g. Fidrmuc 2003; Falcetti et al. 2006; Radulescu and Barlow 2002; Fidrmuc and Tichit 2013).
- Immediate effect of reforms on economic growth was insignificant or even negative (De Melo et al. 2001)
- Market-oriented reforms boosted economic growth in middle run (Falcetti et al. 2006)

Structural model of migration

Neoclassical tradition in migration research treats (potential) migrant α as an agent, who maximizes expected utility U from moving from country of origin i to destination $j \in \mathbf{J}$:

$$U_{\alpha ij} = \sum_{t=1}^T \left(\frac{w_{\alpha jt} u_{\alpha jt}}{(1 + \delta)^t} \right) - c_{\alpha ij} + \varepsilon_{\alpha j} \quad (1)$$

where w is wage, u probability of being employed, c moving costs, and ε individual stochastic component. Values at time t are discounted by factor δ .

Agent α will become a migrant if:

$$\exists T, j : j \in \mathbf{J}, U_{\alpha ij} > 0 \quad (2)$$

The probability that an agent in country i will move to destination j from all alternatives is:

$$Pr\left(\frac{j_\alpha}{i_\alpha}\right) = Pr[U_{\alpha ij} = \max(U_{\alpha i1}, \dots, U_{\alpha iJ})] \quad (3)$$

Which yields:

See more

$$\ln\left(\frac{M_{ij}}{M_{ii}}\right) = \ln(\omega_j) - \ln(\omega_i) - c_{ij} \quad (4)$$

where M_{ij} is gross migration flow from i to j , M_{ii} is number of stayers in i , and ω is total expected income in a country (discounted sum of a stream of expected incomes)

Migration depends on future income, employment prospects, and costs of migration.

Underlying mechanism

Theory assumed:

- Market-oriented reforms increase future incomes.
- Higher future income decreases the utility from migration.

Expected:

- We expect a negative correlation between reforms progress and emigration rates.

Migration from post-communist countries

Migration in the 1980s

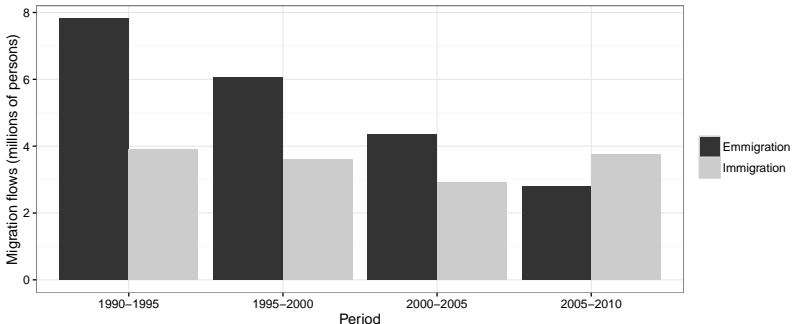
Basic facts (UN, 2002):

- International mobility of people in the communist countries was tightly controlled by the government
- 253 thousand of migrants a year headed to advanced economies in 1980–1987 (70 % of them left to West Germany)
- Migration within communist countries of Eastern bloc was negligible and controlled by state as well

Migration after 1990

Migration from post-communist countries

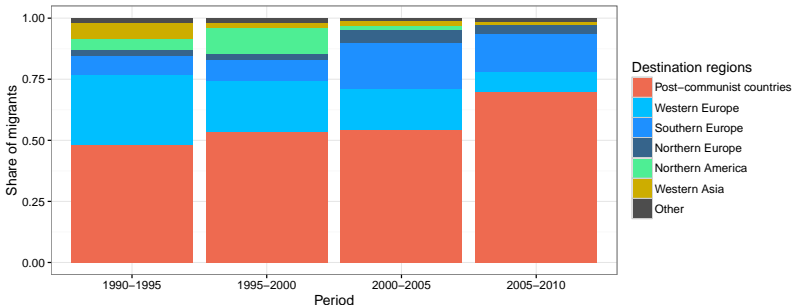
Migration in the 1990s



Source: Abel (2015)

Countries included: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

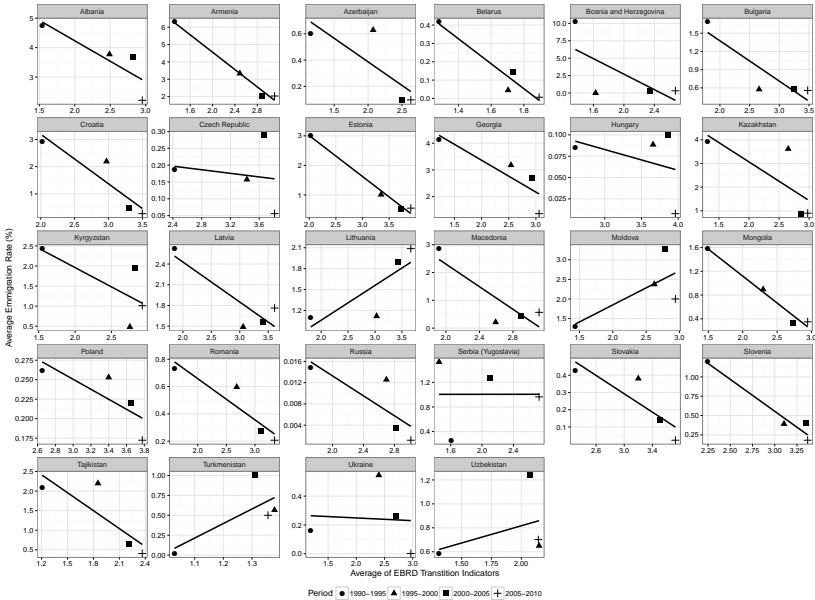
Migration after 1990



Data: Abel (2015)

Data shows that the majority of migrants move within the post-communist countries. In order to get an unbiased picture we use data on migration flows estimated by Abel (2015) which provides matrix of global bilateral flows during the period of 1990–2010. The cost is the aggregation of data in 5 years periods.

Migration after 1990



Empirical model

Empirical model specification is derived from Adsera & Pytlikova (2015):

$$\begin{aligned}
 \frac{M_{ijt}}{P_{it}} &= \beta + \beta_1 \ln(GDP_{jt}) + \beta_2 \ln(GDP_{it}) + \beta_3 \ln(U_{jt}) \\
 &+ \beta_4 \ln(U_{it}) + \beta_5 EBRD_{it} \\
 &+ \beta_6 \ln\left(\frac{S_{ijt}}{P_{it}}\right) + \beta_7 \ln(dist_{ij}) + \beta_8 border_{ij} + \beta_9 lang_{ij} \\
 &+ \beta_{10} war_{it} + \beta_{11} country_{ij} + \beta_{12} PR_{it} + \beta_{13} CL_{it} + \beta_{14} \ln\left(\frac{P_{jt}}{P_{it}}\right) \\
 &+ \delta_t + \delta_i + \delta_j + \varepsilon_{ijt}
 \end{aligned}$$

Bilateral migration flows from origin i to destination j at period t are described by the absolute size of the flow M_{ijt} divided by the number of stayers approximated by population in the country of origin P_{it} .

Empirical model

Empirical model specification is derived from Adsera & Pytlikova (2015):

$$\begin{aligned} \frac{M_{ijt}}{P_{it}} = & \beta + \beta_1 \ln(GDP_{jt}) + \beta_2 \ln(GDP_{it}) + \beta_3 \ln(U_{jt}) \\ & + \ln \beta_4 \ln(U_{it}) + \beta_5 EBRD_{it} \\ & + \beta_6 \ln \left(\frac{S_{ijt}}{P_{it}} \right) + \beta_7 \ln(dist_{ij}) + \beta_8 border_{ij} + \beta_9 lang_{ij} \\ & + \beta_{10} war_{it} + \beta_{11} country_{ij} + \beta_{12} PR_{it} + \beta_{13} CL_{it} + \beta_{14} \ln \left(\frac{P_{jt}}{P_{it}} \right) \\ & + \delta_t + \delta_i + \delta_j + \varepsilon_{ijt} \end{aligned}$$

Expected income (ω) is described by GDP per capita (GDP) and unemployment rate (U) in both the country of origin and destination. Future incomes in country of origin are instrumented by the current progress of reforms measured by EBRD indices ($EBRD$).

Empirical model

Empirical model specification is derived from Adsera & Pytlikova (2015):

$$\begin{aligned} \frac{M_{ijt}}{P_{it}} = & \beta + \beta_1 \ln(GDP_{jt}) + \beta_2 \ln(GDP_{it}) + \beta_3 \ln(U_{jt}) \\ & + \beta_4 \ln(U_{it}) + \beta_5 EBRD_{it} \\ & + \beta_6 \ln\left(\frac{S_{ijt}}{P_{it}}\right) + \beta_7 \ln(dist_{ij}) + \beta_8 border_{ij} + \beta_9 lang_{ij} \\ & + \beta_{10} war_{it} + \beta_{11} country_{ij} + \beta_{12} PR_{it} + \beta_{13} CL_{it} + \beta_{14} \ln\left(\frac{P_{jt}}{P_{it}}\right) \\ & + \delta_t + \delta_i + \delta_j + \varepsilon_{ijt} \end{aligned}$$

The Costs of migration are associated with the distance of countries. We control for geographical and distance (*dist* and *border*) and the presence of a language spoken in both countries (*lang*). The costs of migration can be decreased with the help of diaspora (S_{ijt}/P_{it}).

Empirical model

Empirical model specification is derived from Adsera & Pytlikova (2015):

$$\begin{aligned}
 \frac{M_{ijt}}{P_{it}} = & \beta + \beta_1 \ln(GDP_{jt}) + \beta_2 \ln(GDP_{it}) + \beta_3 \ln(U_{jt}) \\
 & + \beta_4 \ln(U_{it}) + \beta_5 EBRD_{it} \\
 & + \beta_6 \ln\left(\frac{S_{ijt}}{P_{it}}\right) + \beta_7 \ln(dist_{ij}) + \beta_8 border_{ij} + \beta_9 lang_{ij} \\
 & + \beta_{10} war_{it} + \beta_{11} country_{ij} + \beta_{12} PR_{it} + \beta_{13} CL_{it} + \beta_{14} \ln\left(\frac{P_{jt}}{P_{it}}\right) \\
 & + \delta_t + \delta_i + \delta_j + \varepsilon_{ijt}
 \end{aligned}$$

Other factors include indicator of war (share of battle-related deaths on total population) and dummy variable *country* for country-pairs which used to be part of one state in 1980s. Process of political liberalization is captured by variables describing civil liberties (*CL*) and political rights (*PR*). Specific factors

Summary statistics

Statistic	Mean	St. Dev.	Min	Median	Max
Migration flows	0.0002	0.002	0.000	0.000	0.101
GDP per capita (dest., log)	2.029	1.284	-1.410	2.104	4.837
GDP per capita (orig., log)	2.084	0.768	0.089	2.170	3.370
Unemployment (dest., log)	1.938	0.715	-0.968	1.985	3.589
Unemployment (orig., log)	2.371	0.454	1.292	2.378	3.547
Large scale priv.	2.563	0.982	1.000	2.800	4.000
Small scale priv.	3.314	0.974	1.000	3.670	4.330
Enterprise restr.	2.055	0.741	1.000	2.000	3.670
Banking reform	2.301	0.899	1.000	2.330	4.000
Price liber.	3.657	0.761	1.266	4.000	4.330
Trade & Forex	3.292	1.140	1.000	3.800	4.330
Competition Policy	1.978	0.664	1.000	2.000	3.602
Non-bank fin. instit.	1.956	0.757	1.000	2.000	4.000
Infrastructure ref.	1.961	0.765	1.000	1.934	3.670
EBRD average	2.564	0.782	1.030	2.675	3.962

Econometric issues

65.3% flows in the sample are equal to zero, OLS would lead to inconsistent results (Silva and Tenreyro, 2006).

We use pseudo-poisson maximum likelihood estimator (PPML) with white/sandwich standard errors. Silva and Tenreyro (2011) show that PPML provides unbiased estimates even for higher shares of zero in the sample.

Silva and Tenreyro (2006) suggest using levels instead of logs in the dependent variable.

Results

Overall effect

$$\begin{aligned} \frac{M_{ijt}}{P_{it}} = & \beta + \underset{(0.331)}{0.781^{**}} \ln(GDP_{jt}) - \underset{(0.273)}{1.147^{***}} \ln(GDP_{it}) \\ & - \underset{(0.242)}{1.438^{***}} \ln(U_{jt}) - \underset{(0.286)}{0.193} \ln(U_{it}) \\ & - \underset{(0.286)}{0.780^{***}} EBRD_{it} + \dots + \hat{\varepsilon}_{ijt} \end{aligned}$$

$n = 17577$, PPML estimates, robust SE in parentheses, * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Overall negative and significant effect of reforms (average of EBRD indicators) confirms theoretical expectations.

Standardized coefficients: $\ln(GDP_{it})$: -424.295 , $EBRD_{it}$: -293.964
(69% of GDP per capita)

Main specification

Results

Individual indicators (I)

	(1)	(2)	(3)	(4)	(5)
GDP per capita (dest.)	0.822**	0.812**	0.828**	0.785**	0.853***
1000 USD, log	(0.330)	(0.332)	(0.329)	(0.327)	(0.318)
GDP per capita (orig.)	-1.200***	-1.153***	-1.221***	-0.987***	-0.932***
1000 USD, log	(0.271)	(0.272)	(0.273)	(0.281)	(0.300)
Unemployment (dest.)	-1.432***	-1.432***	-1.455***	-1.415***	-1.445***
%, log	(0.245)	(0.246)	(0.250)	(0.245)	(0.235)
Unemployment (orig.)	-0.323	-0.227	-0.336	-0.094	-0.493*
%, log	(0.282)	(0.283)	(0.282)	(0.278)	(0.279)
Large scale priv.		-0.208			
		(0.136)			
Small scale priv.			-0.141		
			(0.136)		
Enterprise restr.				-1.087***	
				(0.257)	
Banking reform					-1.292***
					(0.221)
Observations	17,577	17,577	17,577	17,577	17,577

Note:

PPML estimates, robust SE in parentheses, *p<0.1; **p<0.05; ***p<0.01

Main specification

Results

Individual indicators (II)

	(6)	(7)	(8)	(9)	(10)
GDP per capita (dest.)	0.854**	0.826**	0.808**	0.850***	0.830**
1000 USD, log	(0.335)	(0.330)	(0.333)	(0.314)	(0.322)
GDP per capita (orig.)	-1.197***	-1.265***	-1.177***	-0.869***	-1.084***
1000 USD, log	(0.272)	(0.272)	(0.275)	(0.297)	(0.297)
Unemployment (dest.)	-1.437***	-1.442***	-1.416***	-1.439***	-1.419***
%, log	(0.242)	(0.247)	(0.244)	(0.240)	(0.242)
Unemployment (orig.)	-0.326	-0.279	-0.215	-0.153	-0.415
%, log	(0.279)	(0.287)	(0.277)	(0.268)	(0.302)
Price liber.	0.071				
	(0.141)				
Trade & Forex		-0.104			
		(0.107)			
Competition Policy			-0.223		
			(0.177)		
Non-bank fin. instit.				-0.643***	
				(0.200)	
Infrastructure ref.					-0.509*
					(0.288)
Observations	17,577	17,577	17,577	17,577	17,577

Note:

PPML estimates, robust SE in parentheses, * p<0.1; ** p<0.05; *** p<0.01

Results

Reforms identified to keep people at home

Governance and enterprise restructuring – covers the introduction and enforcement of bankruptcy legislation, tightness of credit and subsidy policy, and introduction of effective corporate governance

Banking reform and interest rate liberalization – covers introduction of standard banking laws and regulation as well as liberalization of interest rates and credit allocation.

Securities markets and non-bank financial institutions – evaluates progress in formation of security exchanges, establishment of non-banking financial institutions (investment funds, etc.) as well as regulation framework and market liquidity.

Main specification

Results

Standardized coefficients

	Large-scale privatization	Small-scale privatization	Enterprise restr.	Banking reform	Price liberalization
GDP per capita (dest.)	502.421**	512.091**	485.782**	527.664***	528.291**
GDP per capita (orig.)	-426.448***	-451.697***	-365.188***	-344.771***	-442.739***
Unemployment (dest.)	-493.200***	-501.049***	-487.196***	-497.842***	-494.916***
Unemployment (orig.)	-49.632	-73.522	-20.667	-107.906*	-71.466
EBRD ind.	-98.639	-66.158	-388.147***	-560.210***	26.064

	Trade & Forex	Competition policy	Non-bank fin. institutions	Infrastructure reform	EBRD average
GDP per capita (dest.)	510.965**	499.966**	526.012***	513.313**	483.009**
GDP per capita (orig.)	-468.017***	-435.618***	-321.535***	-401.034***	-424.295***
Unemployment (dest.)	-496.731***	-487.647***	-495.438***	-488.557***	-495.125***
Unemployment (orig.)	-61.095	-47.175	-33.597	-90.812	-42.265
EBRD ind.	-56.978	-71.318	-234.454***	-187.524*	-293.964***

Robustness checks

Attractiveness of alternative destinations

Bertoli and Fernandez-Huertas Moraga (2013) suggest to control for multilateral resistance in gravity models estimation by using Common Correlated Effects (CCE) estimator (Pesaran, 2006) or the inclusion of origin-by-time fixed effects.

We follow Mayda (2010) who includes a multilateral pull (MP) to the model. Variable MP_{ijt} measures the average additional wage gain per kilometer from moving to an alternative destination or

$$MP_{ijt} = \frac{1}{n_A} \sum_A \log \left(\frac{GDP_{at}}{dist_{ia}} \right) \quad (5)$$

where A is a set of n_A destinations alternative to j . The estimated effects of MP are insignificant and does not affect the main results (results are not presented here).

Robustness checks

Attractiveness of alternative destinations

Beine and Parsons (2015) include destination-period (δ_{jt}) fixed effects which allows them to partially control for multilateral term (Beine et al., 2015).

Inclusion of δ_{jt} to modified empirical model adds statistical significance to more EBRD indicators.

Results Tab. 1

Results Tab. 2

Robustness checks

Flows to Eastern bloc

Efficient institutions should also attract more migrants...

$$\frac{M_{ijt}}{P_{it}} = \beta + 1.531^{***} \ln(GDP_{jt}) - 1.996^{***} \ln(GDP_{it}) - 0.467 \ln(U_{jt}) - 0.358 \ln(U_{it}) + 0.812^{**} EBRD_{jt} + \dots + \hat{\varepsilon}_{ijt}$$

(0.409)
(0.330)
(0.381)
(0.285)
(0.382)

$n = 17577$, PPML estimates, robust SE in parentheses, * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Results Tab. 1

Results Tab. 2

Conclusion

- We use standard model of migration to confirm that positive income expectations decrease migration flows.
- An evidence from market-oriented institutions reforms in post-communist countries of Eastern Europe.
- There is a significant effect especially in the case of reforms which promote private business (property rights and access to finance/credit).

Thank you for your attention!

Questions? Comments?

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Equation (1) can be simplified as follows:

$$U_{\alpha ij} = \ln(\omega_{\alpha j}) - c_{\alpha ij} + \varepsilon_{\alpha ij} \quad (6)$$

Under the assumption that ε is i.i.d. extreme-value distributed than (following Beine and Parsons (2015) and results of McFadden (1974)) probability (3) can be written as:

$$Pr\left(\frac{j_{\alpha}}{i_{\alpha}}\right) = \frac{M_{ij}}{M_i} = \frac{\exp[\ln(\omega_{\alpha j}) - c_{\alpha ij}]}{\sum_{k \in J} \exp[\ln(\omega_{\alpha k}) - c_{\alpha ik}]} \quad (7)$$

Adapting (7) for bilateral migration flow between i and j and taking logs will yield:

$$\frac{M_{ij}}{M_{ii}} = \frac{\exp[\ln(\omega_{\alpha j}) - c_{\alpha ij}]}{\exp[\ln(\omega_{\alpha i})]} \quad (8)$$

$$\ln\left(\frac{M_{ij}}{M_{ii}}\right) = \ln(\omega_j) - \ln(\omega_i) - c_{ij} \quad (9)$$

Go back

Specific sources of migration in Eastern bloc

- Return of ethnic minorities (especially ethnic Germans).
- Break-ups of Czechoslovakia, Yugoslavia, and Soviet Union.
- Armed conflicts that followed break-ups of Soviet Union and Yugoslavia affected 7 successor countries in the period of 1990-2010 (UCDP, 2015).

Go back

Robustness checks

Destination-period (δ_{jt}) fixed effects (I)

	(2)	(3)	(4)	(5)	(6)
GDP per capita (orig.)	-1.051***	-1.132***	-1.056***	-0.911***	-1.131***
1000 USD, log	(0.247)	(0.258)	(0.251)	(0.268)	(0.255)
Unemployment (orig.)	-0.079	-0.308	-0.031	-0.333	-0.298
%, log	(0.254)	(0.262)	(0.258)	(0.248)	(0.272)
Large scale priv.	-0.417***				
	(0.099)				
Small scale priv.		-0.290**			
		(0.117)			
Enterprise restr.			-0.984***		
			(0.188)		
Banking reform				-1.085***	
				(0.174)	
Price liber.					-0.242*
					(0.129)
Observations	17,577	17,577	17,577	17,577	17,577

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Back

Results Tab. 2

Robustness checks

Destination-period (δ_{jt}) fixed effects (II)

	(7)	(8)	(9)	(10)	(11)
GDP per capita (orig.)	-1.214***	-0.989***	-0.702***	-0.810***	-1.095***
1000 USD, log	(0.261)	(0.263)	(0.269)	(0.280)	(0.252)
Unemployment (orig.)	-0.203	-0.139	-0.091	-0.393	-0.074
%, log	(0.274)	(0.274)	(0.267)	(0.270)	(0.259)
Trade & Forex	-0.252***				
	(0.090)				
Competition Policy		-0.517**			
		(0.202)			
Non-bank fin. instit.			-0.756***		
			(0.208)		
Infrastructure ref.				-0.611***	
				(0.220)	
EBRD average					-0.804***
					(0.186)
Observations	17,577	17,577	17,577	17,577	17,577

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Back

Results Tab. 1

Robustness checks

Flows to Eastern bloc (I)

	(1)	(2)	(3)	(4)	(5)
GDP per capita (dest.)	1.491***	1.462***	1.717***	1.474***	1.460***
1000 USD, log	(0.431)	(0.420)	(0.411)	(0.450)	(0.416)
GDP per capita (orig.)	-2.078***	-2.055***	-1.856***	-2.089***	-2.077***
1000 USD, log	(0.358)	(0.352)	(0.320)	(0.370)	(0.334)
Unemployment (dest.)	-0.262	-0.345	-0.416	-0.196	-0.328
%, log	(0.411)	(0.384)	(0.417)	(0.393)	(0.393)
Unemployment (orig.)	-0.375	-0.363	-0.386	-0.385	-0.369
%, log	(0.298)	(0.289)	(0.256)	(0.296)	(0.296)
Large scale priv.		0.202			
		(0.250)			
Small scale priv.			0.686***		
			(0.181)		
Enterprise restr.				-0.344	
				(0.350)	
Banking reform					0.641**
					(0.279)
Observations	17,577	17,577	17,577	17,577	17,577

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Robustness checks

Flows to Eastern bloc (II)

	(6)	(7)	(8)	(9)	(10)
GDP per capita (dest.)	1.780***	1.539***	1.503***	1.401***	1.135**
1000 USD, log	(0.448)	(0.405)	(0.427)	(0.435)	(0.441)
GDP per capita (orig.)	-1.970***	-2.040***	-2.075***	-2.058***	-2.000***
1000 USD, log	(0.337)	(0.337)	(0.358)	(0.346)	(0.342)
Unemployment (dest.)	-0.379	-0.491	-0.260	-0.430	-0.249
%, log	(0.393)	(0.385)	(0.407)	(0.375)	(0.393)
Unemployment (orig.)	-0.378	-0.361	-0.380	-0.375	-0.372
%, log	(0.295)	(0.291)	(0.297)	(0.297)	(0.296)
Price liber.	0.371**				
	(0.162)				
Trade & Forex		0.347**			
		(0.170)			
Competition Policy			-0.083		
			(0.313)		
Non-bank fin. instit.				0.441	
				(0.297)	
Infrastructure ref.					1.102**
					(0.443)
Observations	17,577	17,577	17,577	17,577	17,577

Note:

* p<0.1; ** p<0.05; *** p<0.01