

## Survey Methodology

For the World Bank's ECA migration report, returned migrants were surveyed in six countries: Bosnia and Herzegovina, Bulgaria, Georgia, Kyrgyz Republic, Romania, and Tajikistan. The survey instrument was a comprehensive, 77-item questionnaire that addressed a full range of the returned migrants' experiences before, during, and after migration. Questions covered the financial, social, family, and personal aspects of migrants' experiences both during and after migration. The full questionnaire and survey results will be available on the ECA Web site, [www.worldbank.org/ECA](http://www.worldbank.org/ECA).

The survey was designed to provide an impressionistic, rather than representative, picture of returned migrants' experiences. For the purposes of this survey, a "returning migrant" was defined as anyone who has been abroad for more than three months with the purpose of employment, and has hound him/herself in their home country during the survey. The survey also provides some information on the number of migrants who have returned permanently as opposed to those who have expressed desire to migrate again.

Though the same survey instrument was utilized in each of the six countries, local teams relied on slightly different methodologies to select the sample of returned migrants to interview. In most cases, this involved some form of "network" or "snowball" method in which

returned migrants were identified through references from other returned migrants or affiliated formal and informal institutions. The preference for this methodology stemmed from the fact that no systematic view, including prior studies on migrant flows and experience or the possibility to use household surveys, were found to support a more comprehensive methodology. In some cases national censuses have allowed for some blueprint on this selection.

Though in most case, efforts were taken to ensure that a national sample is taken and various regions of the six countries were sampled, the extent to which the survey is representative of the universe of returned migrants in these countries cannot be measured. The survey generated relatively large sample sizes—about 1,200 returned migrants in each country—yet the results must be interpreted with caution.

## Migration Statistics

APPENDIX TABLE 1.2.1

### Population Change in the ECA States, 1989–2004

(beginning-of-year; thousands)

	Total population (1)		Absolute change			Percent change		
	1989	2004	Total	Natural increase	Migration	Total	Natural increase	Migration
Russian Federation	147,400	144,534	-2,866	-8,635	5,769	-1.9	-5.9	3.9
Ukraine	51,707	47,442	-4,265	-3,482	-782	-8.2	-6.7	-1.5
Belarus	10,152	9,849	-303	-332	29	-3	-3.3	0.3
Moldova	4,338	4,247	-91	147	-238	-2.1	3.4	-5.5
Latvia	2,667	2,319	-347	-149	-199	-13	-5.6	-7.4
Lithuania	3,675	3,446	-229	6	-235	-6.2	0.2	-6.4
Estonia	1,566	1,351	-215	-62	-153	-13.7	-4	-9.8
Armenia	3,449	3,212	-236	399	-635	-6.9	11.6	-18.4
Azerbaijan	7,021	8,266	1,245	1,476	-232	17.7	21	-3.3
Georgia	5,401	4,544	-857	242	-1,099	-15.9	4.5	-20.4
Kazakhstan	16,465	14,951	-1,513	1,892	-3,406	-9.2	11.5	-20.7
Kyrgyz Republic	4,254	5,037	783	1,174	-390	18.4	27.6	-9.2
Tajikistan	5,109	6,640	1,531	2,302	-771	30	45.1	-15.1
Turkmenistan	3,518	5,158	1,640	1,269	371	46.6	36.1	10.6
Uzbekistan	19,882	25,707	5,825	7,125	-1,300	29.3	35.8	-6.5
Poland	37,885	38,191	306	973	-667	0.8	2.6	-1.8
Czech Republic	10,360	10,211	-149	-168	19	-1.4	-1.6	0.2
Slovak Republic	5,264	5,380	116	168	-53	2.2	3.2	-1

(Table continues on the following page.)

## APPENDIX TABLE 1.2.1 (continued)

**Population Change in the ECA States, 1989–2004**

(beginning-of-year; thousands)

	Total population (1)		Absolute change			Percent change		
	1989	2004	Total	Natural increase	Migration	Total	Natural increase	Migration
Hungary	10,589	10,117	-472	-498	26	-4.5	-4.7	0.2
Albania	3,182	3,103	-80	681	-760	-2.5	21.4	-23.9
Bulgaria	8,987	7,801	-1,185	-497	-688	-13.2	-5.5	-7.7
Romania	23,112	21,713	-1,399	-154	-1,245	-6.1	-0.7	-5.4
Slovenia	1,996	1,996	0	5	-5	0	0.2	-0.2
Croatia	4,495	4,442	-54	-35	-18	-1.2	-0.8	-0.4
FYR Macedonia	1,881	2,030	149	225	-76	7.9	12	-4
Bosnia and Herzegovina	4,435	3,785	-651	..	..	-14.7	..	..
Serbia and Montenegro	10,445	10,662	217	398	-182	2.1	3.8	-1.7

Sources: UNICEF TransMONEE Database and national statistical offices.

Note: .. = negligible.

## APPENDIX TABLE 1.2.2

## Population by Place of Birth in the FSU, 1989

Place of permanent residence	Persons born in							
	Russian Federation	Ukraine	Belarus	Uzbekistan	Kazakhstan	Georgia	Azerbaijan	Lithuania
Russian Federation	135,549,786	4,595,811	1,408,619	529,814	1,825,035	423,040	478,594	116,115
Ukraine	5,211,922	44,332,132	419,031	137,095	343,730	79,571	84,629	26,258
Belarus	786,672	268,015	8,883,290	14,828	61,894	14,141	11,153	17,403
Uzbekistan	915,978	199,096	27,169	18,108,456	202,204	35,511	26,989	2,577
Kazakhstan	2,450,213	510,702	136,939	139,495	12,714,676	44,485	40,361	10,088
Georgia	191,274	65,974	9,654	4,074	14,685	5,038,710	16,573	954
Azerbaijan	161,999	31,650	7,840	6,910	14,921	24,831	6,604,318	549
Lithuania	173,938	47,453	88,093	4,608	14,391	2,235	2,407	3,299,039
Moldava	248,674	266,585	15,640	5,979	21,091	7,882	3,703	1,041
Latvia	384,423	93,528	116,621	5,241	14,240	3,225	4,827	37,197
Kyrgyz Republic	348,471	53,652	10,056	69,560	125,534	6,597	3,548	784
Tajikistan	234,030	43,446	7,977	86,619	27,788	2,350	4,337	498
Armenia	53,766	13,294	2,297	2,116	4,257	60,756	125,123	322
Turkmenistan	175,788	33,182	9,630	36,860	16,309	2,736	19,916	947
Estonia	300,430	46,322	25,299	2,771	8,072	2,328	2,343	3,386
Place of permanent residence	Persons born in							Persons born abroad and persons not indicating birthplace
	Moldava	Latvia	Kyrgyz Republic	Tajikistan	Armenia	Turkmenistan	Estonia	
Russian Federation	228,795	99,932	260,914	153,806	151,484	140,551	65,485	994,088
Ukraine	186,983	20,965	38,745	36,207	36,498	32,406	10,994	454,868
Belarus	7,502	10,496	4,792	5,305	2,912	5,098	3,246	55,059
Uzbekistan	6,426	3,038	79,663	84,089	12,280	52,226	1,551	52,824
Kazakhstan	27,499	5,274	93,616	21,958	10,756	42,141	2,428	213,830
Georgia	2,243	902	1,486	1,529	37,742	1,466	644	12,931
Azerbaijan	1,830	606	987	1,008	137,027	7,819	243	18,640
Lithuania	1,935	12,247	1,105	1,626	895	3,668	1,663	19,499
Moldova	3,739,090	1,024	1,846	1,379	1,318	1,962	606	17,540
Latvia	4,212	1,974,518	2,115	4,097	1,399	1,811	5,401	13,712
Kyrgyz Republic	2,052	817	3,585,832	11,215	1,701	4,059	353	33,524
Tajikistan	1,830	890	14,926	4,649,781	2,302	5,825	565	9,439
Armenia	668	220	645	1,534	2,570,422	1,977	148	467,231
Turkmenistan	2,608	964	3,755	3,358	4,436	3,204,771	376	7,081
Estonia	1,635	6,467	1,187	904	758	1,056	1,154,585	8,119

Sources: EastView Publications and CIS Statistical Committee, USSR Census Results 1989 CD-ROM.

## APPENDIX TABLE 1.1.3

**Population by Nationality, 1989–1991 and 1999–2002**

(beginning-of-year; thousands)

	Population by nationality				Change from 1989–1991 to 1999–2002	
	(percent)		(thousands)		(thousands)	(percent)
	1989–1991	1999–2002	1989–1991	1999–2002		
<b>CEEC and CIS states</b>						
Russian Federation	100.0	100.0	147,400	145,164	–2,236	–1.5
Russians	81.3	79.8	119,866	115,869	–3,997	–3.3
Tatars	3.7	3.8	5,522	5,558	36	0.7
Ukrainians	3.0	2.0	4,363	2,943	–1,420	–32.5
Other	12.0	14.3	17,649	20,794	3,145	17.8
Ukraine	100.0	100.0	51,707	47,843	–3,864	–7.5
Ukrainians	72.4	78.5	37,419	37,542	123	0.3
Russians	22.0	17.4	11,356	8,334	–3,022	–26.6
Other	5.7	4.1	2,932	1,967	–965	–32.9
Belarus	100.0	100.0	10,200	10,045	–155	–1.5
Belarusians	77.5	81.2	7,905	8,159	254	3.2
Russians	13.2	11.4	1,342	1,142	–200	–14.9
Other	9.3	7.4	953	744	–209	–21.9
Moldova	100.0	100.0	4,338	4,293	–45	–1.0
Moldovans	64.4	69.8	2,795	2,997	202	7.2
Ukrainians	13.8	12.9	600	552	–48	–8.0
Russians	13.0	11.3	562	484	–78	–13.9
Other	8.8	6.0	381	260	–121	–31.9
Latvia	100.0	100.0	2,667	2,377	–289	–10.8
Latvians	52.0	57.7	1,388	1,371	–17	–1.2
Russians	34.0	29.6	906	703	–202	–22.3
Other	14.0	12.8	373	303	–70	–18.7
Lithuania	100.0	100.0	3,675	3,484	–191	–5.2
Lithuanians	79.6	83.4	2,924	2,907	–17	–0.6
Russians	9.4	6.3	344	220	–125	–36.2
Poles	7.0	6.7	258	235	–23	–8.9
Other	4.0	3.5	148	122	–26	–17.7
Estonia	100.0	100.0	1,566	1,370	–196	–12.5
Estonians	61.5	67.9	963	930	–33	–3.4
Russians	30.3	25.6	475	351	–124	–26.0
Other	8.1	6.5	128	89	–39	–30.5
Armenia	100.0	100.0	3,449	3,213	–236	–6.8
Armenians	93.3	97.9	3,218	3,145	–73	–2.3
Russians	1.6	0.5	54	15	–39	–72.1
Azeris	2.6	..	89	..	..	..
Other	2.6	1.6	88	53	–35	–40.0
Azerbaijan	100.0	100.0	7,038	7,953	915	13.0
Azeris	82.5	90.6	5,805	7,206	1,401	24.1
Russians	5.6	1.8	392	142	–250	–63.8
Armenians	5.5	1.5	391	121	–270	–69.0
Other	6.4	6.1	450	484	34	7.5
Georgia	100.0	100.0	5,443	4,372	–1,071	–19.7
Georgians	69.6	83.7	3,787	3,661	–126	–3.3
Russians	6.3	1.6	341	68	–273	–80.1
Other	24.1	14.7	1,314	643	–671	–51.1

APPENDIX TABLE 1.1.3 (continued)

**Population by Nationality, 1989–1991 and 1999–2002**

(beginning-of-year; thousands)

	Population by nationality				Change from 1989–1991 to 1999–2002	
	(percent)		(thousands)		(thousands)	(percent)
	1989–1991	1999–2002	1989–1991	1999–2002		
Kazakhstan	100.0	100.0	16,185	14,953	–1,232	–7.6
Kazakhs	40.4	53.4	6,535	7,985	1,450	22.2
Russians	38.5	30.0	6,228	4,480	–1,748	–28.1
Germans	5.9	2.4	957	353	–604	–63.1
Ukrainians	5.5	3.7	896	547	–349	–38.9
Other	9.7	10.6	1,570	1,588	18	1.1
Kyrgyz Republic	100.0	100.0	4,290	4,823	533	12.4
Kyrgyz	52.0	64.9	2,230	3,128	898	40.3
Russians	21.4	12.5	917	603	–313	–34.2
Uzbeks	12.8	13.8	550	665	115	20.9
Other	13.8	8.8	594	427	–167	–28.1
<b>ECA states</b>						
Tajikistan	100.0	100.0	5,109	6,127	1,019	19.9
Tajiks	62.1	79.9	3,172	4,898	1,726	54.4
Uzbeks	23.5	15.3	1,198	937	–261	–21.8
Russians	7.6	1.1	388	68	–320	–82.5
Other	6.8	3.7	350	224	–125	–35.9
Turkmenistan	100.0	100.0	3,534	4,418	884	25.0
Turkmen	71.8	77.0	2,536	3,402	866	34.1
Russians	9.4	6.8	334	299	–35	–10.5
Uzbeks	9.0	9.2	317	407	90	28.3
Other	9.8	7.0	347	310	–37	–10.6
Uzbekistan	100.0	100.0	19,905	24,231	4,326	21.7
Uzbeks	71.0	77.8	14,142	18,861	4,719	33.4
Russians	8.3	5.0	1,653	1,202	–451	–27.3
Tadzhiks	4.7	5.0	934	1,204	271	29.0
Kazakhs	4.1	4.0	808	966	158	19.5
Other	11.9	8.2	2,367	1,997	–370	–15.6
Czech Republic	100.0	100.0	10,302	10,230	–72	–0.7
Czech	94.8	90.4	9,771	9,250	–521	–5.3
Slovak	3.1	1.9	315	193	–122	–38.6
Other	2.1	7.7	217	787	570	263.0
Slovak Republic	100.0	100.0	5,274	5,379	105	2.0
Slovak	85.6	85.8	4,519	4,615	96	2.1
Czech	1.1	0.8	59	45	–15	–24.8
Other	13.3	13.0	696	720	24	3.5
Hungary	100.0	100.0	5,390	5,348	–42	–0.8
Hungarian	97.8	92.7	5,269	4,958	–311	–5.9
German	0.3	0.6	18	32	15	83.5
Croatian	0.1	0.2	7	8	1	12.0
Slovakian	0.1	0.2	6	10	4	62.0
Other	1.7	6.3	89	339	249	278.6
Albania	100.0	–	3,182	–	–	–
Albanian	98.0	–	3,118	–	–	–
Greek	1.8	–	59	–	–	–
Macedonian	0.1	–	5	–	–	–
Other	0.1	–	1	–	–	–

(Table continues on the following page.)

## APPENDIX TABLE 1.1.3 (continued)

**Population by Nationality, 1989–1991 and 1999–2002**

(beginning-of-year; thousands)

	Population by nationality				Change from 1989–1991 to 1999–2002	
	(percent)		(thousands)		(thousands)	(percent)
	1989–1991	1999–2002	1989–1991	1999–2002		
Bulgaria	100.0	100.0	8,473	7,929	–544	–6.4
Bulgarian	85.8	83.9	7,272	6,655	–617	–8.5
Turkish	9.7	9.4	822	747	–75	–9.2
Roma	3.4	4.7	288	371	83	28.8
Other	1.1	2.0	91	156	65	71.6
Romania	100.0	100.0	22,810	21,681	–1,129	–4.9
Romanians	90.7	89.5	20,683	19,400	–1,284	–6.2
Hungarians	7.2	6.6	1,639	1,432	–207	–12.6
Roma	0.7	2.5	167	535	369	221.1
Ukrainians	0.3	0.3	64	61	–2	–3.9
Other	1.1	1.2	257	253	–4	–1.5
Slovenia	100.0	100.0	1,913	1,964	51	2.6
Slovenes	88.3	83.1	16	1,631	–58	–3.5
Croats	2.8	1.8	53	36	–17	–32.6
Serbs	2.5	2.0	47	39	–8	–17.8
Others	6.5	13.1	123	258	135	109.1
Croatia	100.0	100.0	4,784	4,437	–347	–7.2
Croats	78.1	89.6	3,736	3,977	241	6.4
Serbs	12.1	4.5	582	202	–380	–65.3
Hungarians	0.5	0.4	22	17	–6	–25.8
Others	9.3	5.4	444	242	–202	–45.5
FYR Macedonia	–	100.0	–	2,023	–	–
Macedonians	–	64.2	–	1,298	–	–
Albanians	–	25.2	–	509	–	–
Turks	–	3.9	–	78	–	–
Roma	–	2.7	–	54	–	–
Other	–	4.1	–	84	–	–
<b>CEE-CIS states</b>						
Serbia and Montenegro						
Serbia	100.0	100.0	9,779	7,498	–2,281	–23.3
Serbs	65.9	82.9	6,447	6,216	–231	–3.6
Hungarians	3.5	3.9	344	292	–52	–15
Albanians	17.1	0.8	1,674	60	–1,614	–96.4
Roma	1.4	1.4	140	105	–35	–25.1
Other	29.1	11.8	2,848	885	–1,963	–68.9
Montenegro	100.0	100.0	615	651	36	5.8
Montenegrins	61.9	61.9	380	403	22	5.8
Serbs	9.3	9.3	57	61	3	5.3
Albanians	6.6	6.6	40	43	3	6.2
Other	22.2	22.2	137	144	8	5.7

Sources: Data are from censuses conducted in the CEEC and CIS countries between 1989 and 1991 and again between 1999 and 2002. Nationalities shown for each country are those numerically significant. Actual number of number of nationalities shown for each country differ.

Note: .. = negligible; – = not available.

## APPENDIX TABLE 1.1.4

## Income Differentials Between ECA Countries and Western Europe, 2000–02

	Per capita GDP PPP (US\$)	Percent of that of Western Europe
<b>EU-8</b>		
Slovenia	17,587	61.8
Czech Republic	14,933	52.5
Hungary	12,863	45.2
Slovak Republic	12,133	42.6
Estonia	11,303	39.7
Poland	10,253	36.0
Lithuania	9,530	33.5
Latvia	8,420	29.6
<b>EU accession countries</b>		
Croatia	9,660	33.9
Bulgaria	6,700	23.5
Turkey	6,190	21.7
Romania	6,147	21.6
<b>Other Western Balkans</b>		
FYR Macedonia	6,477	22.8
Bosnia and Herzegovina	—	—
Serbia and Montenegro	—	—

Sources: World Bank, SIMA database, and staff estimates.

Note: — = not available. PPP = purchasing power parity.

## APPENDIX TABLE 1.1.5

## Income Differentials Between ECA Countries of the CIS and Western Europe and the Russian Federation, 2000–02

	Per capita GDP PPP (US\$)	Percent of that of Western Europe	Percent of that of Russian Federation
Russian Federation	7,730	27.2	n.a.
Kazakhstan	5,263	18.5	68.1
Belarus	5,160	18.1	66.8
Ukraine	4,517	15.9	58.4
Azerbaijan	2,887	10.1	37.3
Armenia	2,757	9.7	35.7
Georgia	2,077	7.3	26.9
Kyrgyz Republic	1,607	5.6	20.8
Uzbekistan	1,603	5.6	20.7
Moldova	1,380	4.8	17.9
Tajikistan	900	3.2	11.6

Sources: World Bank, SIMA database, and staff estimates.

Note: n.a. = not applicable.

## APPENDIX TABLE 1.1.6

**Net Migration by Country for the FSU States, 1989–2003**

(thousands)

Country	Russia 1989–2003	Ukraine 1990–2000	Belarus 1990–2001	Moldova 1990–1997	Latvia 1990–2003	Lithuania 1990–2000	Estonia 1989–98
<b>Total</b>	3,796.5	–232.4	110.0	–142.2	–146.5	–57.5	–84.6
Russian Federation	—	–229.3	96.2	–40.8	–80.0	–30.8	–55.8
Ukraine	374.9	—	28.5	–28.2	–19.3	–7.2	–10.5
Belarus	–16.1	–4.2	—	–2.4	–23.3	–12.9	–5.8
Moldova	98.6	17.8	4.1	—	–0.8	–0.1	–0.3
Latvia	118.5	7.8	25.3	0.8	—	1.9	0.0
Lithuania	54.0	3.2	16.2	0.2	–1.6	—	–0.3
Estonia	70.7	3.6	6.6	0.3	0.0	0.3	—
Armenia	224.2	17.6	4.8	0.6	0.1	0.3	0.1
Azerbaijan	398.5	26.7	8.1	0.7	–0.5	0.1	0.0
Georgia	403.1	23.3	7.3	0.9	0.1	0.3	0.4
Kazakhstan	1,703.2	38.7	35.8	1.2	–0.9	0.4	–0.3
Kyrgyz Republic	326.5	6.5	3.4	0.1	–0.1	0.0	0.0
Tajikistan	377.0	16.7	6.1	0.2	0.0	0.1	0.1
Turkmenistan	140.2	5.7	3.9	0.3	0.0	0.1	0.0
Uzbekistan	779.2	82.8	9.7	0.4	–0.2	0.0	0.0
<b>Total FSU</b>	5,052.5	16.9	255.9	–65.7	–126.6	–47.5	–72.5
Germany	–753.7	–25.4	–6.5	–10.7	–6.4	–1.1	–3.6
Israel	–299.1	–157.5	–75.6	–48.1	–4.7	–3.5	–2.0
United States	–132.0	–58.5	–30.5	–13.8	–4.2	–2.2	–1.6
Australia	–4.3	–1.9	–0.8	—	0.0	—	0.0
Canada	–11.5	–3.8	–0.9	—	–0.6	–0.2	–0.2
Poland	–2.3	0.5	–1.3	—	0.0	–0.7	0.1
Sweden	–2.0	–0.1	—	—	0.0	—	–0.3
Finland	–9.8	–0.1	—	—	–0.1	—	–4.4
Other	–41.1	–2.4	–30.3	–2.3	–0.2	0.0	0.2
<b>Total non-FSU</b>	–1,255.9	–249.5	–146.0	–75.0	–19.3	–9.9	–12.1

Source: National statistical offices of the FSU countries.

Note: Data in columns show net migration for each FSU state with countries listed in left column, for the time period indicated. “—” indicates data not available or not applicable. A zero indicates that net migration rounded to less than 100.

Country	Armenia 1990–2001	Azerbaijan 1990–2003	Georgia 1990–1992	Kazakhstan 1990–2000	Kyrgyz Rep. 1990–1996	Tajikistan 1990–1995	Turkmenistan 1990–1995	Uzbekistan 1990–1998
<b>Total</b>	–60.4	–284.6	—	–1,581.1	–392.1	–357.1	–52.4	–728.3
Russian Federation	–125.6	–252.9	–85.2	–957.6	–278.8	–258.3	–51.2	–542.8
Ukraine	3.5	–2.3	0.9	10.0	1.8	–3.7	2.9	–28.1
Belarus	–3.9	–6.7	–3.3	–21.1	–2.9	–4.7	–1.8	–7.0
Moldova	–0.6	–0.4	–0.4	–1.1	–0.1	–0.2	–0.2	–0.5
Latvia	—	0.1	—	0.0	—	—	—	—
Lithuania	—	0.0	—	–0.1	—	—	—	—
Estonia	—	–0.1	—	0.0	—	—	—	—
Armenia	—	–31.0	–6.0	1.3	0.1	–0.4	–0.5	–2.8
Azerbaijan	60.3	—	–13.7	0.3	–2.6	–0.3	0.1	–13.5
Georgia	10.0	19.7	—	3.0	0.2	0.0	0.3	0.5
Kazakhstan	–1.1	1.3	–1.7	—	–2.1	–11.4	–17.4	–42.5
Kyrgyz Republic	–0.1	1.5	–0.1	4.6	—	–5.7	0.2	17.9
Tajikistan	0.4	0.4	–0.1	13.0	8.9	0.0	7.0	30.6
Turkmenistan	0.9	–0.8	–0.1	24.9	0.0	–7.0	0.0	–7.8
Uzbekistan	1.9	16.4	–0.1	36.3	–22.3	–30.8	9.3	—
<b>Total FSU</b>	–33.0	–251.6	–109.6	–883.6	–297.1	–322.3	–51.1	–595.0
Germany	–0.1	–1.1	—	–808.5	–93.8	–19.6	–0.5	–15.2
Israel	–1.4	–25.2	—	–19.9	–5.9	–12.5	–0.7	–53.2
United States	–21.0	–6.3	—	–4.7	–2.7	–2.1	–0.1	–10.4
Australia	—	—	—	—	—	—	—	—
Canada	—	—	—	—	—	—	—	—
Poland	—	—	—	—	—	—	—	—
Sweden	—	—	—	—	—	—	—	—
Finland	—	—	—	—	—	—	—	—
Other	–4.9	–0.4	—	–35.5	–2.9	–0.7	–0.2	–3.2
<b>Total non-FSU</b>	–32.3	–33.0	—	–851.1	–105.1	–34.8	–1.3	–139.5



## APPENDIX 2.1

# Remittance Data

### APPENDIX TABLE 2.1.1

#### Remittance Contributions to the Balance of Payments in Selected ECA Countries, 1995 to 2004 (US\$ millions)

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
High migration	114	180	179	470	418	400	407	438	519	393
Bosnia and Herzegovina	—	—	—	2,048	1,888	1,595	1,521	1,526	1,745	1,824
Albania	427	551	300	504	407	598	699	734	889	—
Slovenia	272	279	241	228	226	205	200	214	255	267
Armenia	65	84	136	92	95	87	94	131	168	340
Kazakhstan	116	89	60	72	64	122	171	205	148	167
Belarus	29	351	295	315	193	139	149	140	222	244
Georgia	—	—	284	373	361	274	181	230	239	303
Moldova	1	87	114	124	112	179	243	323	486	—
Intermediate migration	69	98	95	94	96	112	150	206	274	281
Estonia	1	2	2	3	2	3	9	17	40	133
Ukraine	—	6	12	12	18	33	140	207	330	411
FYR Macedonia	—	68	78	63	77	81	73	106	171	—
Croatia	544	668	617	625	557	641	747	885	1,085	1,222
Latvia	—	41	46	49	49	72	113	138	173	229
Kyrgyz Republic	1	2	3	2	9	9	11	37	78	—
Azerbaijan	3	—	—	—	54	57	104	182	171	—
Tajikistan	—	—	—	—	—	—	—	79	146	252

(Table continues on the following page.)

## APPENDIX TABLE 2.1.1 (continued)

**Remittance Contributions to the Balance of Payments in Selected ECA Countries, 1995 to 2004**

(\$ millions)

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Low migration	630	678	701	823	667	760	637	568	705	627
Bulgaria	—	42	51	51	43	58	71	72	67	103
Lithuania	1	3	3	3	3	50	79	109	115	308
Russian Federation	2,503	2,771	2,268	1,925	1,292	1,275	1,403	1,359	1,453	2,668
Hungary	152	169	213	220	213	281	296	279	295	307
Turkmenistan	—	4	—	—	—	—	—	—	—	—
Poland	724	774	848	1,070	825	1,726	1,995	1,989	2,655	2,709
Serbia and Montenegro	—	—	—	—	—	—	—	—	1,397	—
Romania	9	18	16	49	96	96	116	143	124	—
Turkey	3,327	3,542	4,197	5,356	4,529	4,560	2,786	1,936	729	804
Czech Republic	191	112	85	350	318	297	257	335	500	—
Slovak Republic	26	21	29	24	20	18	—	24	425	—

Sources: IMF Balance of Payment Statistics; UN International Migration Database; Walmsley, Ahmed, and Parsons 2005.

Note: — = not available. Received remittances = received compensation of employee + received worker's remittances + received migrants' transfers.

High-migration countries have over 180 migrants per thousand population. Intermediate migration countries have between 120 and 180 migrants per thousand population. Low-migration countries have fewer than 120 migrants per thousand population.

## Estimations of the Impact of International Remittances on Macroeconomic Growth

This appendix presents background information for the econometric estimation of the impact of international remittances on macroeconomic growth presented in chapter 3 (box 3.1).<sup>1</sup> The intention is to extend the model developed by Chami, Fullenkamp, and Jahjah (2003), which posits that because remittance transfer takes place under asymmetric information and uncertainty, remittances are burdened with a moral hazard problem that limits their ability to contribute to positive business and human capital investment in developing economies, thus leading to negative economic growth. After briefly outlining their model, we show how, using the same general empirical methodology but making slight modifications and adding institution variables, the results could be significantly different from those obtained by Chami, Fullenkamp, and Jahjah.

Using panel data on workers' remittances, per capita GDP, gross capital formation (formerly categorized as gross domestic investment), and net private capital flows (all reported over the period 1970–98), Chami, Fullenkamp, and Jahjah first examine the relationship between worker remittances and per capita GDP growth using standard population-averaged cross-section estimation. The estimated equation is based on

$$\Delta y_i = \beta_0 + \beta_1 y_{0i} + \beta_2 wr_i + \beta_3 gcf_i + \beta_4 npcf_i + u_i$$

where  $y$  is the log of real GDP per capita,  $y_0$  is the initial value of  $y$ ,  $wr$  is the log of worker remittances to GDP ratio,  $gcf$  is the log of gross capital formation to GDP ratio, and  $npcf$  is the log of net private capital flows to GDP ratio. They also use an alternative specification using change in the log of workers' remittances to GDP ratio as an independent variable:

$$\Delta y_i = \beta_0 + \beta_1 y_{0i} + \beta_2 \Delta wr_i + \beta_3 gcf_i + \beta_4 npcf_i + u_i$$

This specification is problematic because a country would need to increase remittances year after year to promote growth, which would end up with a 100 percent share of remittances on GDP in the limit. Therefore, unlike Chami, Fullenkamp, and Jahjah, we look at the level, rather than growth, of remittances to GDP.

Furthermore, as mentioned above, we include institutional quality variables that seem important, based on previous experience. Also, abstracting for missing observations, our dataset adds five years of observations to the data considered by the Chami model and covers the period 1970–2003.

Last, and more important, Chami, Fullenkamp, and Jahjah fail to address the problems associated with running panel estimations. One possible problem arising from the panel specifications is that estimated coefficients may be biased if errors are autocorrelated due to misspecified dynamics. It is very likely that growth is autocorrelated due to business cycle effects. One solution would be to pool observations from peak to peak of the business cycle or take five- or six-year averages of the data. The first option is implausible because it would require previous knowledge of business cycle features for each economy. The second appears to be very arbitrary. Both options also lead to a large loss of information.

Another, more rigorous, alternative is to model these dynamics by introducing the lagged rate of growth of per capita income as an independent variable. This, however, leads to some estimation problems that have to be dealt with by using Dynamic Panel Data (DPD) estimators. In our estimations, we used the annual data and introduced one lag of the rate of growth of per capita GDP. The estimator used in most equations is the Anderson and Hsiao (1981) method. This method estimates the equation in first differences and instrumentalizes the lagged growth of GDPpc by using its lagged level in  $t - 2$ . This estimation method is superior to the popular Arellano and Bond (1991) generalized method of moments (GMM) estimator for the typical macroeconomic panel datasets as demonstrated by Judson and Owen (1999). Nevertheless, the results of using the GMM esti-

mator are also relevant because we do not have specific Monte Carlo evidence on the appropriateness of each estimator for our panel settings. In both cases we provide a two-step estimator.

Another potential problem that arises is the endogeneity of the remittances variables. This can arise because it is likely that countries experiencing less successful economic performance would receive larger remittances from their émigrés. To deal with this problem, we have estimated the equations instrumentalizing also the remittances variable with its first and second lagged level in the transformed (first difference) equation. This is different from Chami, Fullenkamp, and Jahjah because we believe their results are heavily biased in the absence of this instrumental variables estimator.

In all the estimations we have used the logarithm of the remittances to GDP ratio as the independent variable, as well as the control variables mentioned in the previous estimates. We provide the estimated coefficients and their standard errors, the  $p$ -value of a Wald test of joint model significance (high  $p$ -values indicate joint significance), the  $p$ -value of the Sargan test for instrument validity (high  $p$ -values indicate valid instruments) and  $p$ -values of autocorrelation tests of orders 1 and 2. Note that autocorrelation of order 1 is expected due to first differencing even if the original-level errors are not autocorrelated unless they follow a random walk. Finally, we provide the long-run dynamic solution for the coefficient on remittances and its standard error, which is to be interpreted as the impact of remittances on growth in equilibrium. We use several specifications depending on the control variables introduced in the regression. We provide, in specifications (1) to (6), the results from the Anderson-Hsiao (AH) estimator. Specifications (7) to (9) present the results from estimating the model using a two-step GMM estimator with robust standard errors.

The results of the analysis are indicated in appendix tables 2.2.1 through 2.2.5. The main result of our analysis is that, although no firm conclusions can be made regarding the effect of remittances on economic growth, models that account for endogeneity concerns indicate that remittances make a positive, albeit modest, contribution to growth.

The cross-section and panel analysis<sup>2</sup> conducted in accordance with the Chami, Fullenkamp, and Jahjah model, over two separate periods, 1970–2003 and 1991–2003, show inconclusive results, but certainly do not find a negative relationship between remittances and economic growth (appendix tables 2.2.1 through 2.2.4). The robustness of the coefficients on remittances depends on model specifications, but in the instances where results are significant, they show a positive effect of remittances on growth. The inclusion of institutional variables also yields inconclusive results, which could be due to the

severe endogeneity problems associated with both remittance estimations and the use of subjective institutional indexes. The cross-section analysis conducted as the average over the same two periods leads to a similar outcome. However, although the panel and cross-section estimations (appendix tables 2.2.1 and 2.2.2) produce uncertain results, they do not give any indication that remittances have a negative impact, as suggested by Chami, Fullenkamp, and Jahjah.

Moreover, certain panel and cross-section estimations conducted with data on workers' remittances only, as in Chami, Fullenkamp, and Jahjah, showed a highly robust positive correlation between increases in remittances and GDP growth if institutional quality is accounted for. The consensus in the empirical literature, however, is that data on workers' remittances alone do not fully reflect the amount of money remitted by migrants, and thus the results of these estimations are not reported here.<sup>3</sup>

The results of the dynamic panel estimations are shown in appendix table 2.2.5. We present first the estimate of a simple dynamic model with remittances as the only independent variable and then add different control variables at a time. Specification (9) only includes variables that appeared to be significant in at least one of the previous equations. The inclusion of the Transparency International index and the United Nations Human Development Index (UNHDI) reduce dramatically the number of observations and countries, although this is also the case for the rest of the institutional variables. The result is a shorter panel, especially in the time dimension, in which we end up with four to five consecutive time series per country (this is an unbalanced panel). In that context, the GMM estimator is more reliable than the AH estimator. The Wald test for the AH estimator when these variables are included shows clearly that the model is not significant and is grossly misspecified. For this reason, we recommend looking at the results provided in equations (1) to (3) and (7) to (9).

The main result is that remittances appear to have a positive and statistically significant impact on growth in five out of nine of these specifications. Only in one specification is the impact negative but not significant (when we do not instrumentalize or use control variables). The significant long-run coefficients range from 0.001 to 0.022. This denotes that the estimates cannot be considered very robust. What seems to be more robust, however, is the fact that, if anything, remittances appear to have a positive effect on growth. The other important result is that the impact of remittances appears to be more positive when (a) we control for the potential endogeneity bias in remittances and (b) we consider remittances in conjunction with institutional variables that, in general, also appear to be significant and show the expected sign.

## APPENDIX TABLE 2.2.1

**Remittances (as Percentage of GDP) and Economic Growth: Cross-Section Estimation Ordinary Least Squares (1970–2003)**

Dependent variable: log(GDP per capita growth)	(1)	(2)	(3)	(4)	(5) Quadratic
Log(GDP per capita 1970)	−0.003* (0.002)	−0.014*** (0.002)	−0.006*** (0.001)	−0.007*** (0.002)	−0.007*** (0.002)
Log(remittances/GDP)	0.001 (0.001)	−0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)
(Log(remittances/GDP)) <sup>2</sup>					0.000 (0.001)
Log(GCF/GDP)	0.041*** (0.008)	0.028*** (0.006)	0.037*** (0.005)	0.039*** (0.007)	0.039*** (0.007)
Log(NPCF/GDP)	0.000 (0.002)	−0.003** (0.002)	−0.002 (0.001)	−0.004 (0.002)	−0.003 (0.002)
TI Corruption Perception Index		0.004*** (0.001)			
UNHDI		0.083*** (0.017)			
Voice and accountability			−0.004 (0.003)		
Political stability			−0.001 (0.003)		
Government efficiency			0.005 (0.005)		
Regulatory quality			0.004 (0.004)		
Rule of law			0.016** (0.006)		
Corruption			−0.004 (0.006)		
ICRG Composite Political Risk Indicator				0.001*** (0.000)	0.001*** (0.000)
Constant	−0.090*** (0.021)	−0.044** (0.022)	−0.052*** (0.016)	−0.111*** (0.023)	−0.110*** (0.023)
Observations	77	69	75	62	62
R-squared	0.44	0.71	0.72	0.55	0.55

Note: GCF = gross capital formation; ICRG = International Country Risk Guide; NPCF = net private capital flows; TI = Transparency International; UNHDI = UN Human Development Index. Robust standard errors in parentheses; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

## APPENDIX TABLE 2.2.2

**Remittances (as Percentage of GDP) and Economic Growth: Cross-Section Estimation Ordinary Least Squares (1991–2003)**

Dependent variable: log(GDP per capita growth)	(1)	(2)	(3)	(4)	(5) Quadratic
Log(GDP per capita 1970)	−0.001 (0.002)	−0.004 (0.005)	−0.007*** (0.002)	−0.004 (0.003)	−0.004 (0.003)
Log(remittances/GDP)	0.000 (0.001)	−0.000 (0.002)	−0.000 (0.001)	0.001 (0.002)	0.001 (0.002)
(Log(remittances/GDP)) <sup>2</sup>					−0.000 (0.001)
Log(GCF/GDP)	0.027*** (0.009)	0.024** (0.010)	0.027*** (0.008)	0.022* (0.011)	0.022* (0.011)
Log(NPCF/GDP)	0.000 (0.002)	0.001 (0.003)	0.000 (0.002)	0.001 (0.003)	0.001 (0.003)
TI Corruption Perception Index		0.006*** (0.002)			
UNHDI		0.003 (0.031)			
Voice and accountability			−0.009** (0.004)		
Political stability			0.002 (0.004)		
Government efficiency			0.014 (0.009)		
Regulatory quality			0.012** (0.006)		
Rule of law			−0.001 (0.009)		
Corruption			0.005 (0.008)		
ICRG Composite Political Risk Indicator				0.001 (0.000)	0.001 (0.000)
Constant	−0.069*** (0.026)	−0.059* (0.030)	−0.021 (0.022)	−0.066** (0.030)	−0.065** (0.031)
Observations	119	104	114	90	90
R-squared	0.13	0.20	0.40	0.17	0.17

Note: GCF = gross capital formation; ICRG = International Country Risk Guide; NPCF = net private capital flows; TI = Transparency International; UNHDI = UN Human Development Index. Robust standard errors in parentheses; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

## APPENDIX TABLE 2.2.3

## Remittances (as Percentage of GDP) and Economic Growth: Panel Estimation (1970–2003)

Dependent variable: log(GDP per capita growth)	(1)	(2)	(3)	(4)	(5) Quadratic	(6) Quadratic
Growth GDP <sub>pc</sub> (t – 1)	0.180*** (0.020)	0.299*** (0.057)	-0.068* (0.038)	0.017 (0.028)	0.097*** (0.020)	0.018 (0.028)
Log(remittances/GDP)	0.001** (0.001)	-0.000 (0.001)	0.003 (0.003)	0.000 (0.002)	0.006*** (0.001)	0.003 (0.002)
(Log(remittances/GDP)) <sup>2</sup>					0.001* (0.000)	0.001** (0.001)
Log(GCF/GDP)	0.030*** (0.003)	0.029*** (0.007)	0.065*** (0.009)	0.045*** (0.006)	0.036*** (0.004)	0.045*** (0.006)
Log(NPCF/GDP)	0.001 (0.001)	0.004* (0.002)	-0.001 (0.002)	-0.000 (0.001)	0.001 (0.001)	-0.000 (0.001)
TI Corruption Perception Index		0.001 (0.002)				
UNHDI		-0.018 (0.018)				
Voice and accountability			0.005 (0.009)			
Political stability			0.005 (0.005)			
Government efficiency			-0.011 (0.007)			
Regulatory quality			0.003 (0.006)			
Rule of law			-0.017 (0.011)			
Corruption			-0.006 (0.008)			
ICRG Composite Political Risk Indicator				-0.000 (0.000)		-0.000 (0.000)
Constant	-0.080*** (0.010)	-0.074*** (0.023)	-0.184*** (0.026)	-0.117*** (0.019)	-0.097*** (0.014)	-0.120*** (0.019)
Observations	1,913	297	716	1,108	1,913	1,108
Number of ID	123	80	114	91	123	91
R-squared			0.11	0.06	0.08	0.07

Note: GCF = gross capital formation; ICRG = International Country Risk Guide; NPCF = net private capital flows; TI - Transparency International; UNHDI = UN Human Development Index. Robust standard errors in parentheses; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

## APPENDIX TABLE 2.2.4

## Remittances (as Percentage of GDP) and Economic Growth: Panel Estimation (1991–2003)

Dependent variable: log(GDP per capita growth)	(1)	(2)	(3)	(4)	(5) Quadratic	(6) Quadratic
Growth GDP <sub>pc</sub> (t – 1)	0.143*** (0.026)	0.299*** (0.057)	-0.068* (0.038)	-0.027 (0.034)	0.078*** (0.027)	-0.027 (0.034)
Log(remittances/GDP)	0.001 (0.001)	-0.000 (0.001)	0.003 (0.003)	-0.004 (0.002)	0.001 (0.002)	-0.003 (0.003)
(Log(remittances/GDP)) <sup>2</sup>					-0.001 (0.001)	0.000 (0.001)
Log(GCF/GDP)	0.038*** (0.005)	0.029*** (0.007)	0.065*** (0.009)	0.061*** (0.008)	0.056*** (0.007)	0.061*** (0.008)
Log(NPCF/GDP)	0.002 (0.001)	0.004* (0.002)	-0.001 (0.002)	-0.000 (0.002)	0.001 (0.001)	-0.000 (0.002)
TI Corruption Perception Index		0.001 (0.002)				
UNHDI		-0.018 (0.018)				
Voice and accountability			0.005 (0.009)			
Political stability			0.005 (0.005)			
Government efficiency			-0.011 (0.007)			
Regulatory quality			0.003 (0.006)			
Rule of law			-0.017 (0.011)			
Corruption			-0.006 (0.008)			
ICRG Composite Political Risk Indicator				0.000 (0.000)		0.000 (0.000)
Constant	-0.102*** (0.016)	-0.074*** (0.023)	-0.184*** (0.026)	-0.194*** (0.028)	-0.155*** (0.021)	-0.194*** (0.028)
Observations	1079	297	716	807	1079	807
Number of ID	122	80	114	91	122	91
R-squared			0.11	0.10	0.10	0.10

Note: GCF = gross capital formation; ICRG = International Country Risk Guide; NPCF = net private capital flows; TI = Transparency International; UNHDI = UN Human Development Index. Robust standard errors in parentheses; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

APPENDIX TABLE 2.2.5

**Worker Remittances and Growth: Dynamic Panel Estimation (1970–2003)**

Dependant variable: growth of GDP per capita									
Endogenous variable: log (remittances/GDP)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	AH	AH-IV	AH-IV	AH-IV	AH-IV	AH-IV	AH-IV	GMM	GMM
Growth GDPpc (t – 1)	0.202 <sup>^</sup> (0.014)	0.170 <sup>^</sup> (0.006)	0.132 <sup>^</sup> (0.005)	0.083 <sup>^</sup> (0.000)	0.035 (0.071)	0.037 <sup>^</sup> (0.013)	–0.081 (0.197)	0.039 (0.051)	0.05 <sup>^</sup> (0.006)
Log(remittances/GDP Growth)	–0.005 (0.010)	0.002* (0.001)	0.002 (0.001)	0.001** (0.000)	0.021** (0.090)	0.012 <sup>^</sup> (0.002)	0.012 (0.022)	0.010* (0.006)	0.002 (0.002)
Log(GCF/GDP)			0.082 <sup>^</sup> (0.004)	0.070 <sup>^</sup> (0.000)	0.086** (0.035)	0.047 <sup>^</sup> (0.008)	0.124* (0.075)	0.056 <sup>^</sup> (0.018)	0.063 <sup>^</sup> (0.002)
Log(NPCF/GDP)				–0.004 <sup>^</sup> (0.000)	–0.001 (0.007)	–0.002 (0.002)	–0.019 (0.022)	0.000 (0.001)	
TI Corruption Perception Index					–0.020* (0.011)		–0.039 (0.026)		
UNHDI					–0.455 (0.657)		0.042 (3.037)		
Bureaucracy quality						0.006 (0.006)	0.014 (0.051)	0.005 (0.005)	0.005** (0.002)
Corruption						–0.002 (0.004)	–0.007 (0.026)	–0.000 (0.005)	
Ethnic tensions						–0.016 <sup>^</sup> (0.006)	0.046 (0.045)	–0.004 (0.004)	
Law and order						0.040 <sup>^</sup> (0.004)	–0.071 (0.064)	0.007 (0.005)	
Democratic accountability						0.004 (0.005)	–0.001 (0.027)	–0.001 (0.003)	
Government stability						0.012 <sup>^</sup> (0.001)	0.012 (0.016)	0.004** (0.002)	0.002 <sup>^</sup> (0.000)
Socioeconomic conditions						0.018 <sup>^</sup> (0.002)	0.008 (0.019)	0.002 (0.003)	0.002 <sup>^</sup> (0.001)
Investment profile						0.005** (0.002)	0.011 (0.012)	–0.000 (0.002)	
Political risk						–0.007 <sup>^</sup> (0.001)	0.003 (0.007)	0.001 (0.001)	–0.001** (0.000)
Observations	2946	2946	2860	1790	217	1017	212	1017	1710
Number of ID	155	155	152	121	65	89	60	89	120
Wald	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.004	0.000
Sargan	0.083	0.251	0.4290	0.701	0.634	0.450	0.757	0.490	0.233
AR(1)	0.000	0.000	0.000	0.000	0.005	0.000	0.037	0.000	0.000
AR(2)	0.671	0.790	0.819	0.992	0.544	0.538	0.171	0.621	0.374
Long-run remittances coeff.	–0.006 (0.012)	0.003* (0.002)	0.002 (0.002)	0.001** (0.000)	0.022** (0.011)	0.013 <sup>^</sup> (0.002)	0.010 (0.022)	0.010* (0.006)	0.002 (0.002)

Note: GCF = gross capital formation; ICRG = International Country Risk Guide; NPCF = net private capital flows; TI = Transparency International; UNHDI = UN Human Development Index. Robust standard errors in parentheses; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Specifications (1) to (7) were obtained using the two-step AH estimator and the AH estimator with instruments for the remittances variable. Specifications (8) to (10) were obtained using the two-step GMM estimator of Arellano and Bond (1991) with robust standard errors.

## Data Definitions

**Workers' remittances and compensation of employees, received (US\$):** Current transfers by migrant workers and wages and salaries earned by nonresident workers. This new World Development Indicator (WDI) category comprising both workers' remittances and compensation of employees was introduced in mid-2005. Data are in current U.S. dollars. *Source:* Workers' remittances and compensation of employees, received (US\$): World Bank World Development Indicators.

**GDP per capita (constant 2000 US\$):** GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant U.S. dollars. *Source:* GDP per capita (constant 2000 US\$): World Bank national accounts data, and OECD National Accounts data files.

**GDP (current US\$):** GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single-year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used. *Source:* World Bank national accounts data, and OECD National Accounts data files.

**Gross capital formation (current US\$):** Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales,

and “work in progress.” According to the 1993 system of national accounts, net acquisitions of valuables are also considered capital formation. Data are in current U.S. dollars. *Source:* World Bank National Accounts Data, and OECD National Accounts data files.

**Private capital flows, net total (current US\$):** Net private capital flows consist of private debt and nondebt flows. Private debt flows include commercial bank lending, bonds, and other private credits; nondebt private flows are foreign direct investment and portfolio equity investment. Data are in current U.S. dollars. *Source:* World Bank, Global Development Finance.

**Transparency International (TI) Corruption Perception Index (CPI):** The TI Corruption Perceptions Index (CPI) ranks countries in terms of the degree to which corruption is perceived to exist among public officials and politicians. It is a composite index, drawing on corruption-related data in expert surveys carried out by a variety of reputable institutions. It reflects the views of business people and analysts from around the world, including experts who are locals in the countries evaluated. *Source:* <http://www.icgg.org/>.

**UN Human Development Index:** Data are linearly interpolated by the UN Human Development Report Office. Otherwise, data conform to those used in Human Development Report 2004. *Source:* Unofficial data received as correspondence.

**Governance indicators:** The Web page <http://info.worldbank.org/governance/kkz2002/tables.asp> presents the updated aggregate governance research indicators for almost 200 countries for 1996–2002, for six dimensions of governance:

- Voice and accountability
- Political stability and absence of violence
- Government effectiveness
- Regulatory quality
- Rule of law
- Control of corruption.

The data and methodology used to construct the indicators are described in “Governance Matters III: Governance Indicators for 1996–2002” (World Bank Policy Research Working Paper 3106).

**ICRG Political Risk Rating:** A means of assessing the political stability of a country on a comparable basis with other countries by assessing risk points for each of the component factors of government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucracy quality. Risk ratings range from a high of 100 (least risk) to a low of 0 (highest risk), though lowest de facto ratings generally range in the 30s and 40s. *Source:* Monthly data were collected from [www.countrydata.com](http://www.countrydata.com), and yearly averages calculated by the authors.

### Endnotes

1. See Catrinescu et al. (2006) for a more detailed discussion of the estimation of the impact of remittances on growth using these methods.
2. The choice of fixed-effects or random-effects models in each instance was determined by the results of the Hausman test.
3. These are available on request from the corresponding author.

## Estimating the Determinants of Migration in ECA

In this appendix, we construct an econometric model of the determinants of migration in Europe and Central Asia (ECA), and present the results of a statistical estimation of this model.

### The Theoretical Model

By releasing the assumption of full employment, the Harris and Todaro framework has been generalized to understand that migration for individual  $i$  in the period  $t$  from the individual's home country  $h$  to potential destination country  $d$  is best understood as

$$M_{hd} = \int \left[ \frac{I_d(t) - I_h(t)}{I_h(t)} \right] \quad (3.1.1)$$

where

$Ih(t)$  represents the discounted present value of the expected real income stream in country  $h$  over a potential migrant's planning horizon, and

$Id(t)$  is the discounted presented value of the expected real income stream in country  $d$  over a potential migrant's planning horizon.

Given some of the weaknesses of this basic model to explain and predict migration, we follow the work of Hatton (1995) and Fertig (2001) as a starting point toward designing an alternative specification. The model is based on the concepts of individual utility maximization and migration as a form of investment in human capital. The probability of migration depends on the difference between expected utility in destination and home countries, where utility is represented by a monotonic function of expected income, probability of employment, and cost of migration, which depends on the current stock of immigrants.

$$U_t = \ln(w_d)_t + \gamma \ln(e_d)_t - \ln(w_h)_t - \eta \ln(e_h)_t - z_t \quad (3.1.2)$$

where  $w_d$ ,  $w_h$ ,  $e_d$ ,  $e_h$  are income and probability of employment in the destination and origin countries, respectively, and  $z$  is the cost of migration.

The formation of expectations of future utility streams follows a geometric series of past values with the most recent utility streams given greater weight.

$$\begin{aligned} U_t^* &= \lambda U_t + \lambda^2 U_{t-1} + \lambda^3 U_{t-2} + \dots, \quad 0 < \lambda < 1 \\ \text{or} \\ U_t^* &= \lambda U_t + \lambda U_{t-1}^* \end{aligned} \quad (3.1.3)$$

The immigration rate ( $M_t$ ) is assumed to be a function of current and net present value levels of utility from immigration.

$$M_t = \beta(U_t^* + \alpha U_t), \quad \alpha > 1 \quad (3.1.4)$$

where  $\beta$  stands for the aggregation parameter, and  $\alpha$  for the extra weight given to the current utility.

Extending the basic migration model and following Zoubanov (2004) to account for a nonlinear relationship between the cost of migration and the current stock of immigrants, the squared current stock of immigrants ( $MST$ ) from a given origin country is also incorporated. To account for quality-of-life considerations, the same adaptive expectations structure is used as above. The European Bank for Reconstruction and Development (EBRD) transition index<sup>1</sup> is used to account for the quality of life in the origin country. As such, the final specification is as follows:

$$\begin{aligned} \Delta M_t &= \beta(\alpha + \lambda) \left[ \begin{array}{l} \Delta \ln(w_d / w_h)_t + \gamma \Delta \ln(e_d)_t - \eta \Delta \ln(e_h)_t - \varepsilon_1 \Delta MST_t \\ - \varepsilon_2 \Delta MST_t^2 + \Delta EBRD_t \end{array} \right] \\ &+ \beta(\alpha + \lambda - \lambda \alpha) \left[ \begin{array}{l} \varepsilon_0 + \ln(w_d / w_h)_{t-1} + \gamma \ln(e_d)_{t-1} - \eta \ln(e_h)_{t-1} \\ + \varepsilon_1 MST_{t-1} + \varepsilon_2 MST_{t-1}^2 + EBRD_{t-1} \end{array} \right] \\ &- (1 - \lambda) M_{t-1} \end{aligned} \quad (3.1.5)$$

## Empirical Specification and Estimation Results

This model is applied to Austria, Denmark, Germany, the Russian Federation, Sweden, and the United Kingdom as destination countries. The samples of countries for estimation and the time period covered are presented in appendix table 3.1.1.

The dependent variable is the change in gross migration rates (inflows from origin to destination country divided by the population stock of origin country). Real wages  $w_d$  and  $w_x$  are approximated by the per capita income data (in purchasing power parity) of destination and origin countries, respectively. Ignoring labor market participation, the employment rates  $e_d$  and  $e_h$  are proxied by 100 percent minus the unemployment rate in destination and origin countries, respectively. The model also incorporates distance between the capitals of destination and origin countries<sup>2</sup> as a dependent variable, as well as the EBRD transition index. Appendix table 3.1.2 provides the summary statistics of the variables in the dataset.

An iterated GLS estimator with assumed heteroscedasticity across the cross-sectional units and autocorrelation within each cross-sectional unit with a unit-specific coefficient is used. The choice of the estimator was justified by computing the LR-Test statistic for the hypothesis of homoscedasticity in the original model, which proved that heteroscedasticity is indeed present. Appendix table 3.1.3 summarizes the LR-Test results.

The estimations have mixed results in explaining and predicting migration across the region. Appendix table 3.1.4 summarizes those results and suggests that wage and employment differentials were statistically significant predictors of migration in the expected directions only about half the time. In a number of cases, these differentials

APPENDIX TABLE 3.1.1

### Countries Employed in Model Investigating the Determinants of Migration

Destination country	Origin countries	Time frame
Austria	15 origin countries (Albania, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine)	1996–2001
Denmark	16 origin countries (Albania, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine)	1992–2002
Germany	16 origin countries (Albania, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine)	1994–2003
Russia	12 origin countries (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Latvia, Lithuania, Moldova, Tajikistan, Ukraine, and Uzbekistan)	1990–2002
Sweden	16 origin countries (Albania, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine)	1992–2002
United Kingdom	4 origin countries (Bulgaria, Hungary, Poland, Romania)	1991–2001

## APPENDIX TABLE 3.1.2

## Descriptive Statistics

Country	Variable	Number of observations	Mean	Standard deviation
Russia	Migration rate	156	.0048186	.0039413
	Log of per capita income ratio	151	.7880049	.7069455
	Log of employment rate of destination country	144	4.514289	.0373602
	Log of employment rate of origin countries	120	4.538245	.0604201
	Stock of migrants	132	1,047,410	1,402,638
	EBRD transition index	156	2.147179	.7582831
	Distance	156	1,577.333	837.706
Germany	Migration rate	158	.0010321	.0007154
	Log of per capita income ratio	160	1.255495	.6040464
	Log of employment rate of destination country	160	4.51303	.0071116
	Log of employment rate of origin countries	144	4.49148	.0548698
	Stock of migrants	128	60,086.52	81,026.13
	EBRD transition index	160	2.96	.5460401
	Distance	160	960.3813	356.8575
United Kingdom	Migration rate	44	.0000156	7.99e-06
	Log of per capita income ratio	44	1.140287	.2874813
	Log of employment rate of destination country	44	4.525252	.0195157
	Log of employment rate of origin countries	44	4.484731	.0480524
	Stock of migrants	44	22,196.48	26,543.6
	EBRD transition index	44	2.871818	.6664912
	Distance	44	1,751.25	306.4516
Austria	Migration rate	90	.0001618	.0002537
	Log of per capita income ratio	90	1.270075	.4556397
	Log of employment rate of destination country	90	4.565212	.0027299
	Log of employment rate of origin countries	90	4.486468	.0501821
	Stock of migrants	90	12,394.56	17,443.51
	EBRD transition index	90	3.011222	.5368109
	Distance	90	750.3333	455.1169
Sweden	Migration rate	174	.0000268	.0000437
	Log of per capita income ratio	176	1.25652	.5791293
	Log of employment rate of destination country	176	4.524534	.0207685
	Log of employment rate of origin countries	174	4.49469	.0598797
	Stock of migrants	160	2,786.981	4,383.52
	EBRD transition index	176	2.781976	.630339
	Distance	176	1,215.688	473.6677
Denmark	Migration rate	173	.0000305	.0000553
	Log of per capita income ratio	176	1.362795	.5799466
	Log of employment rate of destination country	176	4.539178	.0220577
	Log of employment rate of origin countries	174	4.49469	.0598797
	Stock of migrants	165	701.1152	1,311.389
	EBRD transition index	176	2.781976	.630339
	Distance	176	1,126.25	355.4167

## APPENDIX TABLE 3.1.3

## LR-Test Results for Groupwise Heteroscedasticity

Country	LR-Test statistic	Country	LR-Test statistic
Russia, $\chi^2(11) = 19.7$	104.825	Austria, $\chi^2(14) = 23.7$	95.302
Germany, $\chi^2(15) = 25.0$	79.599	Sweden, $\chi^2(15) = 25.0$	448.140
United Kingdom, $\chi^2(3) = 7.8$	9.340	Denmark, $\chi^2(15) = 25.0$	389.607

seemed to produce the opposite of the expected effect. These uneven results might reflect the poor quality of migration data.

In general, the results for the Russian model are broadly in line with our hypothesis that the migration rate is positively correlated with expected income differentials and negatively correlated with the expectations of improving quality of life at home. The significant negative effect of the stock of migrants seems to reject the commonly referenced “network” effect in the models for Russia, Austria, and Denmark, suggesting instead the existence of factors such as increased competition in the labor market of the destination country, anti-immigration policy, racial intolerance, and other factors may make migrant stock a poor predictor of future migrant flows. As was expected, distance is negatively correlated with the migration rate in all models.

Once the specification developed by Fertig is dropped, the per capita income ratio and employment rate variables are removed, and only the EBRD index is left to account for the quality of life (appendix table 3.1.5).

## APPENDIX TABLE 3.1.4

## Signs of the Coefficients in the Models

Migration to	Changes				Lagged levels					
	PCI ratio	E in $d$	MST	EBRD	PCI ratio	E in $d$	MST	EBRD	M	D
Russia	+	–	–	+	+	0	–	–	–	–
Germany	0	+	+	0	0	+	–	+	–	–
United Kingdom	–	–	0	0	–	0	0	+	0	0
Austria	0	0	–	0	–	+	0	+	–	–
Sweden	0	+	0	0	0	+	+	–	–	–
Denmark	0	0	0	0	+	+	–	–	–	–

Note: PCI = per capita income; E = employment rate; MST = stock of immigrants; EBRD = EBRD Transition index; M = migration rate; D = distance between destination and origin country;  $d$  = Migrants' destination country. If a variable encourages statistically significant migration from  $h$  to  $d$ , it receives a “+” sign; if negative, a “–” sign; if insignificant, a 0 is assigned.

APPENDIX TABLE 3.1.5

Estimation Results: Dependent Variable  $\Delta M_t$ 

	Russia model		Germany model		UK model	
	Coeff	Z-score	Coeff	Z-score	Coeff	Z-score
<b>Changes</b>						
EBRD index	0.0019455	6.64	0.000062	0.88	-8.46E-06	-4.06
MST	-7.85E-08	-3.77	2.22E-09	0.71	-2.84E-08	-2.63
Squared MST	8.37E-15	4.57	2.49E-14	3.62	2.1E-13	2.12
<b>Lagged levels</b>						
EBRD index	-0.0009978	-5.38	0.0002729	5.27	0.0000017	1.61
Migration rate	-0.4538256	-4.71	-0.4367562	-11.19	-0.0354594	-0.26
MST	-2.64E-08	-10.37	-1.93E-09	-3.70	1.62E-09	1.74
Squared MST	2.74E-15	12.32	8.41E-15	4.62	-1.04E-14	-1.35
Distance	-0.0000191	-7.65	1.44E-08	0.14	9.45E-08	1.88
Wald chi2	466.76		322.15		75.57	
Log likelihood	653.3195		869.0873		473.441	

Estimation Results: Dependent variable  $\Delta M_t$ 

Explanatory variable	Russia model					
	Coeff	Z-score	Coeff	Z-score	Coeff	Z-score
<b>Country-specific effects<sup>a</sup></b>						
Armenia	0.0033819	3.64	-0.0053404	-1.95	-0.0162904	-3.45
Azerbaijan	0.0016483	3.32	-0.0035908	-2.72	-0.0120918	-3.78
Belarus <sup>b</sup>	0.0068437	5.00			-0.0194683	-3.76
Estonia	0.0088344	6.64	-0.0057415	-1.52	-0.0259414	-3.38
Georgia	0.0037153	5.38	-0.0029113	-1.71	-0.0148168	-3.44
Kazakhstan	0.0168113	5.26	0.024169	5.61	0.017718	6.32
Lithuania	0.0077908	5.37	-0.0067712	-1.82	-0.0279602	-3.69
Latvia	0.0084265	7.61	-0.005681	-1.61	-0.0261036	-3.48
Moldova	-0.0016337	-1.96	-0.0125317	-4.34	-0.0258678	-4.08
Tajikistan	-0.0032731	-2.56	-0.0052925	-2.65	-0.0032557	-2.63
Ukraine <sup>b</sup>	0.0194571	3.02	0.021917	3.55		
<b>Changes</b>						
PCI ratio	0.0056835	11.36	0.0050619	9.13	0.0063701	6.07
Employment destin.	-0.0128993	-8.93	-0.0134857	-8.84	-0.0079046	-1.98
Employment origin	-0.0090613	-12.61	-0.0091548	-12.02		
MST			-2.26E-08	-1.42	-3.66E-08	-2.75
Squared MST			1.31E-15	0.82	3.5E-15	2.95
EBRD index					0.0008346	2.50
<b>Lagged levels</b>						
PCI Ratio	0.0057828	9.28	0.0052635	8.21	0.0025046	3.28
Employment destin.	0.0130283	6.89	0.0112431	5.47	-0.0013986	-0.39
Employment origin	0.015399	17.06	0.0144664	13.56		
Migration rate	-0.6209453	-35.85	-0.5837639	-14.58	-0.4079454	-4.74
MST			-1.03E-08	-3.08	-1.09E-08	-4.27
Squared MST			7.49E-16	2.02	9.17E-16	3.89
EBRD index					-0.0009004	-2.89
<b>Inherent dynamics</b>						
MST	-3.04E-09	-2.13				
Distance			-0.0000042	-4.82	-0.0000115	-4.07
Constant	-0.1334887	-12.07	-0.1024069	-6.47	0.0480387	2.29
Wald chi2	16669.77		14268.97		274.79	
Log likelihood	526.3308		530.5909		643.7139	

a. To prevent multicollinearity, a country dummy for Uzbekistan is not included.

b. In the second and third specifications, respectively, Belarus and Ukraine country dummies were dropped because of colinearity.

	Austria model		Sweden model		Denmark model	
	Coeff	Z-score	Coeff	Z-score	Coeff	Z-score
	9.57E-06	4.37	6.04E-07	0.58	8.01E-07	0.90
	-2.21E-08	-4.33	3.52E-09	1.32	4.15E-09	1.05
	5.48E-13	4.80	-6.15E-13	-2.67	-8.53E-13	-0.91
	0.0000141	4.01	7.61E-07	1.60	1.38E-06	3.10
	-0.556848	-5.38	-0.7567089	-14.24	-0.1185468	-2.33
	5.52E-09	3.67	4.81E-09	3.56	-5.09E-10	-0.39
	6.14E-14	0.75	-4.54E-13	-3.45	4.42E-13	2.08
	-1.32E-07	-3.96	-1.31E-07	-7.10	1.40E-09	0.77
	98.61		357.77		33.44	
	780.9786		1600.348		1689.842	

## Endnotes

1. The EBRD transition index is a composite index calculated as an arithmetic average of the eight indexes published in the EBRD Transition Reports. These include an index of price liberalization, index of foreign exchange and trade liberalization, index of small-scale privatization, index of large-scale privatization, index of enterprise reform, index of competition policy, index of banking sector reform, and an index of reform of nonbanking financial institutions. The measurement scale ranges from 1 to 4.25 where 1 represents little or no change from a planned economy and 4.25 represents the standard of a developed market economy.
2. The City Distance Tool (<http://www.geobytes.com/CityDistanceTool.htm>) was used to calculate the distance between two cities.

## Computable General Equilibrium Model of Migration

The computable general equilibrium (CGE) model used is based on the Global Trade Analysis Project (GTAP), which is a comparative-static, multiregional CGE model. To mimic migration, the standard GTAP structure was modified so that the extended model allows for bilateral movement of labor. Unlike the standard GTAP model, the factor labor is now able to cross borders and take part in the production process of foreign firms in different regions similar to production commodities. This migration mechanism generates a country's labor in- and outflow endogenously driven by the different regions' labor demand and supply, and the interregional wage differentials. Accordingly with the interregional differences in labor demand and wage level representing the driving forces of migration, this approach to modeling follows the classical migration theory inspired by Adam Smith and the approach of Harris and Todaro (1970).

In addition to the extensions described above, the model was adjusted to consider illegal migration. Thus, in addition to (legal) domestic and foreign unskilled and skilled workers, employers can hire illegal foreign workers. Illegal workers are assumed to belong to the group of unskilled employees. A full description of the model and its calibration follows.

## Description of the Model

GTAP is a comparative-static, multiregional CGE model. It provides an elaborate representation of the economy including the linkages between farming, agribusiness, industrial, and service sectors of the economy. The use of the nonhomothetic constant difference of elasticity (CDE) functional form to handle private household preferences, the explicit treatment of international trade and transport margins, and a global banking sector that links global savings and consumption is innovative in GTAP. Trade is represented by bilateral trade matrixes based on the Armington (1969) assumption. Further features of the standard model are perfect competition in all markets as well as profit- and utility-maximizing behavior of producers and consumers. Usually policy interventions are represented by price wedges. They lead to different prices according to different market stages. Price differentiation adjusts through introduction or change of taxes and subsidies, respectively. Quantitative restrictions or quantitatively induced price adjustments do not exist in the standard version. The framework of the standard GTAP model is well documented in the GTAP book (Hertel 1997) and available on the Internet (<http://www.gtap.agecon.purdue.edu/>).

## Previous (Migration) Extensions of the Model

The standard version of the GTAP model allows for the bilateral exchange of industrial and agricultural products as well as for trade in services. Thus, these components are not only demanded by domestic firms, private households, and the government but also by foreign firms, foreign private households, and foreign governments. In contrast, the remaining input factors—capital, natural resources, land, and labor—are assumed to be regionally fixed. However, when it comes to the analysis of regional integration processes, this means that a border opening for production factors, labor for example, cannot be considered simultaneously with a trade-liberalizing event. Thus, interdependencies between both aspects and resulting economic impacts cannot be observed.

To mimic migration, the standard GTAP structure was modified so that the extended model allows for bilateral movement of labor. Unlike the standard GTAP model, the factor labor is now able to cross borders and take part in the production process of foreign firms in different regions similar to production commodities. This migration mechanism generates a country's labor in- and outflow endogenously

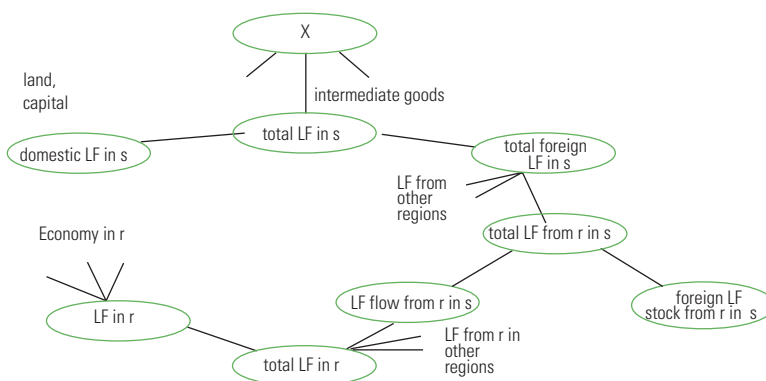
driven by the different regions' labor demand and supply, and the interregional wage differentials. Accordingly with the interregional differences in labor demand and wage level representing the driving forces of migration, this approach to modeling follows the classical migration theory inspired by Adam Smith and the approach of Harris and Todaro (1970).

For the implementation of this new feature, the "nested" production structure of the standard GTAP framework was expanded by an additional "nest" (appendix figure 3.2.1). This component is responsible for the split of a country's total labor force into foreign workers and domestic workers. Thus, in contrast to the standard model, firms now choose from a pool of workers composed of both nationals and foreigners.

Appendix figure 3.2.1 represents the basic mechanism regulating the distribution of workers across countries. At the bottom of the circle, a country's total labor force (total LF in  $r$ ) is divided into workers who decide to stay in their home country (LF in  $r$ ) and are employed in their home country's economy, and workers who decide to emigrate.

At that point, the workers' decision making is regulated by a CES (Constant Elasticity of Substitution) function. In accordance with the Harris-Todaro theory, the driving force of migration flows is the development of the different regions' wages. Thus, the corresponding parameters reflect the intensity of the workers' reactions to the developments of the wage level across regions. Furthermore, the CES function ensures a distinction between the different nationalities of migrant workers and the resultant different preferences regarding the choice of a host country (equation 3.2.1).

### APPENDIX FIGURE 3.2.1 Extended GTAP Production Structure



Source: World Bank.

Note: LF = labor force;  $r$  = countries;  $s$  = countries;  $X$  = final product.

$$X_{i,r} = (\alpha * Y_{i,r}^\eta + (1 - \alpha) * Z_{i,r}^\eta)^{1/\eta} \quad (3.2.1)$$

where

$X_{i,r}$	total labor force in $r$
$\alpha$	share of emigrating labor
$Y_{i,r}$	emigrating labor
$Z_{i,r}$	staying labor in $r$
$\eta$	elasticity of substitution

The reason for such preferences can be found in social factors such as geographical and cultural nearness, tradition, and the like. This theory is supplemented by another assumption implying a certain influence of the development of unemployment in different regions. It is assumed that migrants compare the unemployment situation in their home country and potential host country. Accordingly, if the development in the worker's home country is more favorable than in the destination location, the incentive to emigrate declines and vice versa. With unemployment reflecting a disequilibrium situation, a CGE model is not capable of representing unemployment in its standard set-up. Thus, the implementation of unemployment is conducted through application of Okun's law, which states that there exists an inverse relationship between the development of a country's GDP and the country's unemployment rate. This consideration of unemployment can only be regarded as an approximation because other related aspects, such as unemployment benefits, a social security system, and so forth, are not taken into account. With this theoretical background, the migrants who decided to move from  $r$  to  $s$  (LF from  $r$  in  $s$ ), together with the community of workers from  $r$  already living in  $s$  (foreign LF stock from  $r$  in  $s$ ), form the total pool of workers coming from  $r$  "available" in  $s$  (total LF from  $r$  in  $s$ ) while the remaining migrants scatter across the other destinations (LF from  $r$  in other regions). Of course, workers from regions other than  $r$  will have chosen  $s$  as their working destination. Thus, summing up all the immigrants stemming from countries all over the world leads to a pool of foreign labor (total foreign LF in  $s$ ).

Together with the domestic workers who decided to stay in  $s$  (domestic LF in  $s$ ), this represents the total labor force available to producers in  $s$  (total LF in  $s$ ). The remaining production decisions made are conducted in the "old-fashioned" CGE-GTAP manner. Together with land and capital, labor flows into the production process and builds the value-added nest. The last step to the final product (X) is the combination of value-added and other intermediate commodities.

In addition to this main mechanism, further extensions of the model framework incorporate remittances. Based on figures obtained from the International Monetary Fund, shares of migrants' income that are sent back to their home country or spent in the host country, respectively, are calculated. This enables the consideration of the interregional redistribution of remittances. Thus, outgoing money is subtracted from regional and private household income, while incoming money is added on top of the corresponding income.

### New Extensions to the Model

In addition to the extensions described above, the model was adjusted to consider illegal migration. Thus, in addition to (legal) domestic and foreign unskilled and skilled workers, employers can hire illegal foreign workers. Illegal workers are assumed to belong to the unskilled-employees group. Thus, according to the data in appendix table 3.2.1 the ratio between a country's legal and illegal migrant stock and inflow refers to the data for immigrating unskilled labor. In value terms, the percentage share of illegal workers is slightly less because it is assumed that illegal workers face lower wages than legal workers.

A payroll tax of 40 percent was implemented on legal skilled and unskilled employees working in a member state of the EU-15. This payroll tax applies to every production sector.

Furthermore, workers' migration behavior now also depends on the change in a country's or region's quality-of-life index. This index is represented as an exogenous variable and reflects characteristics of a country such as social equity, structural improvement, and the like. It is assumed that workers compare the development of the quality of life in their home country with that in potential destination countries. Similar to the situation concerning the development of unemployment, a quality-of-life improvement in the home country relative to potential host countries weakens the emigration motivation. The parameter determining the strength of the quality-of-life index on workers' migration behavior is adopted from Karemera et al. (2000). That study found a migration elasticity with respect to the development of a country's unemployment rate. Because no migration elasticity considers quality-of-life concerns, this parameter might be an adequate approximation since a country's unemployment situation might reflect a certain part of a region's quality of life.

## APPENDIX TABLE 3.2.1

**Irregular Migration**

(thousands)

Country	Total number of migrants	Estimated number of irregular migrants		Estimated year	Average % of total migrants
		Max	Min		
<b>North America and Canada</b>					
United States	34,988	10,300		2004	29.44
Canada	5,826	200	100	2003	3.43
<b>High-income Europe</b>					
Greece	534	320		2003	59.87
Portugal	233	100		2003	42.96
Italy	1,634	500		2003	30.59
United Kingdom	4,029	1,000		2003	24.82
Spain	1,259	280		2003	22.24
Belgium	879	150		2003	17.06
Germany	7,349	1,000		2003	13.61
Switzerland	1,801	180		2003	9.99
Netherlands	1,576	163	112	2003	8.72
France	6,277	400		2003	6.37
Ireland	310	10		2003	3.23
Finland	134	1		2003	0.75
Total	26,015	4,104			15.78
<b>ECA countries</b>					
Poland	2,088	600		2000	28.73
Ukraine	6,947	1,600		2000	23.03
Tajikistan	330	60		2002	18.16
Czech Republic	236	40		2003	16.98
Slovak Republic	51	8		1998	15.69
Turkey	1,503	200		2001	13.31
Russia	13,259	1,500	1,300	2000	11.31
Kazakhstan	3,028	300	220	2002	9.91
Belarus	1,284	150	50	2000	11.68
Kyrgyz Republic	572	30		1998	5.24
Uzbekistan	1,367	30		2000	2.19
Lithuania	339	2		1997	0.59

Source: Pew Hispanic Center, IOM, ILO, World Bank, Home Office in UK, ISTAT, Jimenez (2003), Centre on Migration, Policy and Society of the University of Oxford, EU business, Council of Europe, Ministry of Labor in Finland, Sadovskaya (2002), Migration Policy Group, Jandl (2003).

Notes: 1. Estimation methods are different for each country. 2. Total number of migrants is at the point in 2000 and is estimated by UN (2003).

**Model Design (Regional and Sectoral Aggregation)**

The aggregation strategy was dictated by two main requirements: on the one hand, the selection of countries must allow for capturing relevant labor flows and, on the other hand, to keep calculation effort to a reasonable scope, the aggregation must not exceed a certain size. Therefore, all countries representing home regions of most of the immigrants coming to Germany are treated as single individual countries. Obviously, Germany and Poland are among those single regions

as well as several other CEECs, Turkey, and the former Soviet Union. The remaining countries are put together as aggregated regions, either in the group representing the rest of the EU-15, or comprising the rest of the CEECs, respectively (see appendix table 3.2.2)

The 57 industries included in the GTAP database were aggregated to 11 sectors including 6 agricultural sectors. This aggregation was predominantly determined by a sector's relevance in terms of migrant workers' employment and by a sector's labor intensity. Because Germany's vegetables and fruits sector, in particular, and the construction sector account for major shares of seasonal foreign employees, both industries are represented as disaggregated sectors. To be able to observe differences regarding impacts on labor-intensive and less labor-intensive sectors, agricultural production is split up into primary production sectors and processing production sectors. With regard to calculation effort, the same restriction applies as in regional aggregation. Thus, agricultural production is represented in the form of the main agricultural production categories, plant and animal production (see appendix table 3.2.2).

## Limitations

In a quantitative analysis it is very difficult to depict any qualitative circumstances. With regard to the migration this becomes particularly

### APPENDIX TABLE 3.2.2

#### Regional and Sectoral Aggregation

Regions	Abbreviation	Sectors	Abbreviation
Germany	D	Plant products (primary)	plant
Rest of the EU-15 Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, United Kingdom, Spain, Sweden	EU15	Paddy rice, wheat, cereal grains, oilseeds, sugarcane, sugar beet, Plant products (processed) Vegetable oils and fats, processed rice, sugar, other food products	plantproc
Poland	PL	Vegetables and fruits	vandf
Czech Republic	CZE	Animal products (primary)	animal
Hungary	HUN	Cattle, sheep, goats, horses, raw milk	
Slovak Republic	SVK		
Rest of candidate countries Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovenia	CAND6	Animal products (processed) Meat: cattle, sheep, goats, horses, meat products, dairy products	aniproc
Croatia	HRV	Other animal products	oap
Former Soviet Union	FSU	Construction	constr
Turkey	TUR	Primary products	prim
Rest of the world	ROW	Manufactures Services	mnfcs svces

Source: own illustration.

apparent when it comes to the representation of migration restrictions. Those restrictions mostly exist as certain bureaucratic procedures, special requirements a potential immigrant has to fulfill, and the like. Due to a lack of quantitative estimations of such rules and formalities, migration restrictions are not considered. The same limitation applies to migration costs. Even though migration costs do represent a quantitative factor, they are not taken into account in the migration part of the model because corresponding data are not available.

Furthermore, data availability imposes major problems on modeling opportunities. Data collection on the share of foreign workers in a country's labor force, migration flows by home and host country, and so forth, turned out to be particularly difficult for the CEECs. Some simulation results may be distorted because of this lack of data. Another difficult task was the introduction of adequate parameters. Because labor migration elasticities with respect to international wage differentials could not be retrieved from the literature for the analysis at hand, these parameters are based on income migration elasticities. There are estimations of migration elasticities with respect to wage differentials on a sectoral or intraregional (for example, rural-urban) basis. But because these are neither specifically estimated for labor movements nor for international migration they did not seem appropriate for application to international labor movements. The same shortcoming applies to the quality-of-life index. As previously described, the parameter for this variable is only an approximation because parameters referring to the influence of a country's quality of life on people's migration behavior could not be obtained from the literature.

Further research is also necessary on technological progress and the resulting development of or advances in labor-saving production processes, particularly with regard to transition countries. Last, in the case of Germany especially, it is essential to focus more extensively on the characteristics of the very complex social security system and its interactions with migration behavior.

## Sensitivity Analyses

To verify the robustness of the results on exogenous parameters and shocks a sensitivity analysis was conducted.

There are two ways to carry out such sensitivity tests—Monte Carlo Analysis or Systematic Sensitivity Analysis. Both procedures treat exogenous variables as continuous random variables (Arndt 1996; Arndt and Pearson 2000). The two procedures differ when it

comes to the determination of the expected value. Using Systematic Sensitivity Analysis, a sample of solution values within the corresponding integral is selected; Monte Carlo Analysis determines the expected value through a sufficient number of simulations. However, because of the high number of simulations and repetitions necessary, the Monte Carlo method is not practicable. Thus, the Systematic Sensitivity Analysis is used more often. A particularly suitable procedure for the calculation of the integral is the Gaussian Quadrature. The Systematic Sensitivity Analysis available in GTAP is based on this approach and offers two different methods developed by Stroud (1957) and Liu (1997). With these methods, estimates of mean and deviation of endogenous variables are calculated by specifying a distribution for the corresponding exogenous parameters. Furthermore, based on this information and the assumptions concerning the distribution of the parameters, a confidence interval can be determined.

Usually the selection of the parameters to be subject to the sensitivity analysis is geared to the conducted experiments. Thus, for this sensitivity analysis, the parameters to be checked are the ones that significantly influence the development of migration flows and labor demand. The corresponding parameters were simultaneously varied by 50 percent in the course of the Systematic Sensitivity Analysis, assuming that each value is equally likely (uniform distribution). The procedure used here is the procedure developed by Stroud (1957).

The sensitivity analysis showed that for all the examined and reported variables (change in migration flows, welfare, GDP, and so forth), the standard deviations take quite low values. Accordingly, assuming that variables are normally distributed, the corresponding confidence intervals are small. Generally, standard deviations and confidence intervals are larger for those variables to which high shocks are applied. Nevertheless, in most of the cases, the algebraic sign of the results can be classified as reliable at a level of 95 percent. Very few results show only a 68 percent probability. These results are close to zero, so the difference between a positive and a negative value is marginal.

## Data and Calibration

The database used is GTAP database 5, comprising 76 regions and 57 sectors. The base year of the database is 1997. Although a 2001 GTAP database has been released, it was not available when the database for the extended model version was prepared, so the 1997 version was used. For detailed documentation of data collection, calibration, and so forth of GTAP database version 5, see Dimaranan and McDougall

(2002) ([https://www.gtap.agecon.purdue.edu/databases/archives/v5/v5\\_doco.asp](https://www.gtap.agecon.purdue.edu/databases/archives/v5/v5_doco.asp)). The data necessary for simulating migration were calibrated to this dataset and represent a benchmark global equilibrium situation; that is, the global data of the GTAP database were not modified. The majority of the migration-related data are also from 1997. However, because information on foreign workers by home and host country is difficult to obtain, data from a different year are sometimes used. The share of foreign workers in a country's different production sectors was allocated according to information from OECD (2001). The classification of migrant workers into skilled and unskilled is also based on this information. Because substitution elasticities cannot be endogenously obtained through a calibration process, the substitution elasticities required for the migration-related functions were obtained from secondary literature. However, the elasticities that could be retrieved from the literature represent migration elasticities with respect to the wage development in the country of origin. Elasticities of substitution with regard to migration incentives from wage development in both host and home country at an international level could not be obtained. Thus, the elasticity mentioned above was used as an approximation. The same applies to the elasticities of substitution with respect to the development of unemployment and the change of quality of life in home and host countries. To take account of these inaccuracies, the sensitivity analysis gives information about changes in the results caused by a variation of parameter values.

## The Impact of Migrants and the Receiving Society: Integration Policies

The term “integration” is widely used today to denote the process through which a migrant becomes an accepted part of a new society (Penninx 2005). Integration refers to all the processes, activities, and initiatives introduced by host societies that help migrants not only to complete their travel and settle in a host country, but also to find a place in the country, both in physical and in sociocultural terms. The integration process involves such diverse activities as finding housing, jobs, and income; gaining access to educational and health facilities; and adopting new languages and ways of life.

Integration policies are meant to facilitate migrants’ participation in host societies by, on the one hand, enabling migrants to live independently and be self-sufficient and, on the other, supporting their active participation in all aspects of the host society’s life, including the political process (European Commission 2003). Family reunification, citizenship and naturalization, and antidiscrimination legislation are key elements of traditional approaches to migrant integration, yet these are more specific to permanent immigrants, rather than to the circular or temporary migrants central to this study. Thus, the focus of this appendix is more directly on social inclusion policies. This section will briefly consider the integration processes that apply to temporary migrants, and how the presence of immigrants more broadly affects the receiving society—in this case, the European Union (EU).

## Conceptualizing EU Integration Policies

To understand the European integration process, one must first understand the diverse ways in which integration is conceptualized in EU countries. This section highlights two such debates: the falling out of favor of assimilation and migrant conformity, and the variety of entities into which migrants can integrate.

The concept of integration needs to be understood separately from “assimilation” and the implied conformity once expected from migrants. Contemporary democratic societies are complex social orders with diverse cultures, lifestyles, values, and institutional processes, which are constantly in flux. In many societies, however, political pressures to assimilate still persist. In view of the tendency to collapse integration and one-way assimilation, the concept of integration is often replaced with terms such as “inclusion” and “participation.” Community organizations, in particular, emphasize the concept of participation, which denotes democratic notions of access, agency, and change, though it does not directly refer to relationships between social groups.

Successful integration requires meaningful interaction between migrants and the receiving society, which means that integration must be conceived of as a two-way process. The host society must ensure that the migrant has the opportunity to participate in economic, social, cultural, and civil life. Conversely, migrants are expected to respect the fundamental norms and values of the host society and participate actively in the integration process, though they are not expected to relinquish their own identity (European Commission 2003).

The speed at which integration occurs varies in different sectors of society. For example, migrants can be integrated in the labor market but excluded from participation in civil society and political processes. Others can be included as citizens and participate in social and cultural interactions, but lack access to education and employment opportunities. Both cases could be considered integration failures, but would require different policy responses. Integration can also involve completely different modes of interaction with the receiving society. For example, typical indicators of integration include the level to which migrants establish social networks or find partners among the majority population. Many others, however, rely on family and kinship networks, or neighbors of the same racial or ethnic background, to create stability and develop roots in the receiving society. Both modes can be considered integration successes, and policies that stifle interaction in any form are likely to be counterproductive.

The experience of migration changes in complex ways depending on the individual's characteristics, including gender, age, racial, ethnic, or religious background. This implies that most policies must address a complex combination of issues. Some policies, however, should target specific factors that disadvantage particular groups. For example, while discrimination on grounds of nationality can lead to racial discrimination, a policy addressing issues of nationality-related discrimination will not affect black and minority ethnic citizens because they are already nationals of the receiving country. At the same time, while racial discrimination may be a major cause of exclusion for black citizens, Muslims in Europe are subject both to religious and racial discrimination.

Generally, the process of integration appears particularly challenging when migrants are perceived as physically, culturally, and religiously different from the host society. For Europe and Central Asia (ECA), this may become more relevant as migrants increasingly move from the southern Muslim belt to non-Islamic countries. At the same time, one positive legacy of the Soviet system is that migrants from ECA Islamic countries may be more attuned to the secular values of the main receiving countries than are migrants with similar religious affiliations from other part of the world.

## **EU Practices and Policies**

EU countries practice a variety of integration schemes. In France, regardless of their ethnic, racial, or religious composition, migrants are expected to be subject to a set of universal social rights and values that presumably bind the whole society together. Austria, Denmark, Germany, and Greece emphasize ethnic ancestry as a basis for membership in society, while countries such as the Netherlands and the United Kingdom traditionally subscribe to a multicultural model of membership and promote pragmatic management of relationships between different ethnic and religious groups (though this has been changing in recent years). The EU Commission has called on the political leadership of Europe to address inherent social divisions and to promote acceptance for diversity and difference in the enlarged union. In the commission's view, the implementation of integration policies that promote at once equality and diversity is the route to a desired social cohesion, based on recognition of the pluralist nature of European society.

Specific policies to counter the particular disadvantages faced by various groups will also operate differently in each EU member state.

While U.K. policy making on diversity and cohesion is characterized by a discourse on race relations, this resonates differently in Germanic countries, where there are few black citizens and immigration mainly originated in Southern Europe. In Scandinavia, most migrants came from Islamic countries, and public attitudes and integration measures there have centered on religious and cultural differences. A problem that many member states share, however, is a reluctance to monitor how different target groups are affected by processes of exclusion. They often monitor social indicators only in relation to nationality (plus gender and age), not race, ethnicity, or religion. This means that there is insufficient information about the social situation of many migrants and ethnic minorities, including their progress toward inclusion.

Many reasons underlie the social and political exclusion, economic deprivation, and disadvantages that migrant populations often face, particularly undocumented migrants. Hence, integration requires a range of different tools to address these disadvantages, including legislation, social inclusion policies, and policies to enhance participation in civil society and democratic decision making. Before turning specifically to social inclusion issues, the following briefly discusses the role of social networks in organizing migrant experience and providing the essential safety net and emotional stability to foreign workers.

### The Role of Social Networks

Given the current international mobility in ECA (see chapter 2), social networks play a key role in the flow of information, goods, money, services, and people. Migrants depend on both local and international networks for successful outcomes and personal safety (Vertovec 2003). The well-being of migrants abroad largely rests on the availability of work to generate sufficient income, on a clear and secure legal status, on access to social services and social and health protection, and on their participation in the host society. Integration policies, where available, provide a general structure to the migrant experience and life, yet the social networks that emerge among migrants are often what make it livable.

Temporary and undocumented migrants, who often fall outside formal institutions that assist and organize legal migration flows, rely on social networks to provide an essential social safety net for migrants (World Economic and Social Survey 2004). Research has shown that labor markets in the Russian Federation and Ukraine, for instance, have been closely linked with sending countries through

the interpersonal and organizational ties surrounding migrant networks.<sup>1</sup> The majority of migrants who decide to move to Kiev have relatives, family members, or Ukrainian acquaintances in the city (Kennan Institute 2004). Similarly, among Tajik migrants in Moscow, the presence of established networks of people dates back to partnership enterprises developed during the Soviet period in Tajikistan and Russia. In some cases, managers of Tajik plants that ceased production have used their contacts to help their laid-off workers find employment in partner enterprises in Russia. Tajiks continue to work at the fuel and energy complex in Tumen because in Soviet times they had already been employed there as shift workers (IOM 2003).

International standards that provide for the protection of temporary foreign workers' rights in the destination country, established by the International Labour Organization, are not widely ratified. Migrants thus rely on social networks to protect themselves.<sup>2</sup> For instance, research among migrants in Kiev, who came from various parts of the former Soviet Union, has shown that those foreign workers who lacked legal work permits, and who therefore were unable to find employment in the formal sector, came to rely exclusively on the assistance of charitable organizations and family members or other acquaintances from their homeland to make a living. African migrants in Kiev, because of their weaker social safety net, found themselves more often unemployed in comparison to Afghan or Vietnamese migrants, who lived in more closely knit communities and developed a successful system of mutual assistance (Kennan Institute 2004).

While at present migrant networks provide essential support to foreign workers from ECA, they also signal the absence of effective integration programs in host countries that would alleviate the burdens of the migrant experience. Ultimately, this reduces the value of migrants' contributions to host societies. Furthermore, migrant networks are not immune to internal conflicts. Among other problems, they may endanger women and children because, when faced with scarce resources and information, women and children become more vulnerable to abuse from other family members.

Other vulnerabilities pertain to the area of employment, because individuals forced to rely on social networks without alternatives may also be exploited. Such vulnerabilities may arise from the very start of the recruitment process, during travel to the host country, and during the process of finding employment. In ECA, cases proliferate in which recruitment agencies take advantage of migrant workers' limited information about working and living conditions in the host country, misinforming them, charging excessive fees that bear little

resemblance to the actual costs of recruitment, and even assisting in smuggling and trafficking (especially of women and children).

The concentration of migrant workers' networks is often linked with the emergence of ethnic migrant neighborhoods, which may lead to the creation of various forms of ghettos. To summarize, some of the common experiences for host communities arising from the presence of a large number of foreign workers include (a) the emergence of "immigrant sectors" in the host country's labor market, (b) the vulnerability of migrant workers to various forms of exploitation in recruitment and employment, (c) the tendency of temporary migration to become longer in duration and bigger in size than initially envisaged, (d) resistance on behalf of the local population to accept the newcomers, as well as (e) the emergence of undocumented foreign workers who, together with local employers, circumvent existing regulations.<sup>3</sup>

## Endnotes

1. By way of example, such patterns and processes of network-conditioned migration were extensively and comparatively examined in 19 Mexican communities. See Massey et al. (2004).
2. The problem of protecting temporary foreign workers is a serious one. On the one hand, the sending country does not have any legal jurisdiction outside its territory. The host country, on the other hand, is often reluctant to assume full responsibility unless migrant workers are permanent residents or become citizens. Finally, as reflected in the low ratification percentages of the three global legal instruments developed for the protection of migrant workers, efforts by international organizations to represent and effectively protect the rights and interests of migrant workers have so far had only very limited success.
3. For a detailed discussion of temporary foreign workers programs and their social and economic impact on host societies, see Ruth (2002).

## Transitional Arrangement for the Free Movement of Workers from the New Member States

The transitional arrangements for the free movement of workers from the new member states (except Cyprus and Malta) following enlargement of the European Union (EU) on May 1, 2004, allow the EU-15 to decide to postpone the opening of their labor markets for a maximum of seven years.<sup>1</sup> Transitional periods for the free movement of labor have already been granted in other enlargement rounds. What makes the present rules different is that the EU delegated the decision to adopt transitional arrangements to the individual member states. This appendix will briefly discuss the nature and impact of these transitional arrangements, and how they are expected to change in upcoming years.

Since the accession of the EU-8 countries to the EU in May 2004, only seven countries have fully opened their labor markets to the new member states: Ireland, Sweden, and the United Kingdom never had restrictions on workers from the EU-8. Finland, Greece, Portugal, and Spain lifted restrictions in May 2006. Italy ended the transitional arrangements in July 2006, while Belgium, France, and Luxembourg softened their restrictions on workers from the EU-8. Hungary, Poland, and Slovenia apply reciprocal restrictions to nationals from the EU-15 member states applying restrictions. All new member states have opened their labor markets to EU-8 workers.

In May 2006, the second phase of the transitional period started, which allowed member states to continue national measures for up to another three years. At the end of this period (2009), all member states will be invited to open their labor markets entirely. Only if countries can show serious disturbances in the labor market, or a threat of such disturbances, will they be allowed to resort to a safe-guard clause for a maximum of two years. From 2011, all member states will have to comply with European Commission rules regulating the free movement of labor.

Available evidence suggests that transitional arrangements after EU enlargement resulted in the diversion of migration flows from the new member states. Figures from the Irish Department of Family and Social Affairs<sup>2</sup> show that Ireland is the most popular destination for migrants from these countries. During the first year after enlargement, over 85,000 migrants from accession states were allocated social security numbers in Ireland, with Polish workers composing almost half the number of newcomers. A report by the U.K. Department of Work and Pensions estimates net flows of approximately 80,000 workers from the eight new member states to the United Kingdom (Portes and French 2005). This number suggests that migrant flows from these states are in excess of those predicted by econometric analyses. Denmark, which opened its labor market in a similar way to Ireland and the United Kingdom, issued 2,048 work permits to workers from the CEECs in 2004. In Sweden, the only country that grants full access to its labor market and welfare system to EU-8 workers, the number of migrants nearly doubled from 2,097 in 2003 to 3,966 in 2004; however, the total is much lower than predicted. Available evidence from Germany, the traditional destination country for migrants, suggests that the number of migrants from the CEECs declined during 2004 to 2005, while the number of residents from new member states dropped by 13.2 percent. The overall picture that emerges from the available data indicates a diversion of migration flows from countries that tightly close their borders (Austria and Germany) to countries with more liberal transitional regimes, particularly English-speaking countries (Ireland and the United Kingdom).

## Endnotes

1. According to the transitional arrangements (2+3+2 regulation) the EU-15 can apply national rules on access to their labor markets for the first two years after enlargement. After two years (2006), the European Commission will review the transitional arrangements. Member states that

wish to continue national measures need to notify the European Commission and will be allowed to apply national measures for up to another three years. At the end of this period (2009), all member states will be invited to open their labor markets entirely. Only if countries can show serious disturbances in the labor market or a threat of such disturbances, will they be allowed to resort to a safeguard clause for a maximum period of two years. From 2011, all member states will have to comply with the Community rules regulating the free movement of labor.

2. Data from the Irish Department of Family and Social Affairs, at <http://www.breakingnews.ie/printer.asp?j=117490020&p=yy749x6xx&n=117490629&x>. Retrieved August 18, 2005.



## Undocumented Immigration and Vulnerabilities

The majority of migrant workers find themselves on the low-skilled side of the occupational spectrum. Deception, discrimination, exploitation, and often abuse are employment-related situations commonly and increasingly encountered by poorly skilled and undocumented migrants. Lacking work permits, migrants may experience difficulty finding the employment they aspire to, and must settle instead for low-paying, hazardous, or demeaning jobs. This appendix will briefly describe how undocumented status can influence migrants in all aspects of their lives, including the most extreme example—human trafficking.

Migrants are more susceptible to unemployment and layoffs, unfair labor practices, lesser pay, and other forms of exclusion. A study of Organisation for Economic Co-operation and Development (OECD) countries shows that rates of employment were significantly lower among migrants than among citizens between 2000 and 2001. In Denmark and Switzerland, the migrant unemployment rate for men was over three times the corresponding nonmigrant rate, and unemployment rates for migrant women were over 20 percent in Finland, France, and Italy (OECD 2003). Furthermore, undocumented migrants lack access to public housing, schools, health care, and other social services. Simultaneously, they lose pension funds

and social security entitlements at home. This makes them vulnerable to various recruiters and recruitment agencies.

Undocumented status can render migrants vulnerable to other forms of abuse, especially because they lack legal recourse to challenge such abuses. They may be simultaneously invisible to the guardians of the law and subject to excessive forms of policing. Millions of people undergo mistreatment and are subject to xenophobia in part because their presence and labor in foreign countries without papers has been criminalized as “illegal” and subjected to various, often excessive, forms of policing. The undocumented are often denied fundamental human rights and many rudimentary social entitlements, which leaves them in an uncertain sociopolitical situation.

### **Deciding to Become and Stay Undocumented**

Given these disadvantages, why might migrants choose a path of undocumented migration? The legal requirements associated with migration and the enforcement of such provisions constrain and shape migrants’ choices. Reports on the process of obtaining work visas and permits in the Russian Federation demonstrate that it is a complicated and expensive endeavor, even where migration quotas or bilateral agreements between countries exist presumably to facilitate the process. Large-scale corruption accompanies this process at every level (Hill 2004). Even though the risks and costs associated with undocumented travel may be high, migrants opt for undocumented entry into host countries when the chances of obtaining legal migrant status are unlikely.

Furthermore, within the current migration regime it appears that some migrants prefer to keep their unauthorized status even if the option of legalizing is open. Those who remain at the fringes of the law gain certain flexibilities, including the option to change employers or negotiate workload and remuneration. This is an issue that deserves serious consideration in specific national contexts, because it contradicts a general truism about undocumented migration being more costly than legal migration. It appears that under the current international migration regime, it is sometimes more expensive to migrants to take part in legal contracts and interactions than to pay the social price of being undocumented migrants. The preference of some migrants for staying undocumented suggests the need to construct multilevel migration policies that include all stakeholders (including employers, migrants, native workers, and the sending country) in the discussion and, at least to some extent, also in the determination of policy parameters.

To foreign nationals from the Commonwealth of Independent States (CIS) countries and Central Asia, for instance, entry into Russia can occur without a visa. Yet, registration with the passport office of the local police station is required upon arrival. While failure to register constitutes an administrative offense and is punishable by a small fee, migrants tend to ignore this regulation. Legalization is viewed as time-consuming and bureaucratic: applications can be rejected and multiple visits to various institutions may be needed, entailing the payment of bribes to various officials. Even after registering, a quarter of migrants continue to be harassed by police who openly ask them for bribes. For Tajik migrants to obtain legal status in Russia, Kazakhstan, or the Kyrgyz Republic, they must either marry a local citizen, legal or fictitious, or alternatively “buy” a passport at a cost of \$1,000–2,000 (Olimova and Bosc 2003). The murkiness of today’s migration regime exacerbates these problems, because the lack of transparency allows civil servants to take the “rule of law” into their own hands and thus makes migrants vulnerable to their subjective decisions.

Another example confirms the above argument. In Greece, only 50 percent of undocumented migrants applied for residence and work permits in the first migrant regularization program of 1998. Similarly, our survey indicates that many migrants used the same documents in their most recent trip as they had during their first trip. This suggests that even those who had already lived and worked in Greece did not change their legal status or fell out of status after a particular time. It is possible that some migrants purposely did not change their status, particularly if the costs exceeded the benefits in doing so, and given the fact that legal migrants were not permitted to be accompanied by family members. Additionally, such migrants may have lacked necessary information to apply, or feared retribution for exposing their undocumented status.

While the above examples make an undocumented status appear slightly less inconvenient, they do not take away from the fact that illegality exposes migrants to numerous vulnerabilities. Even so, in these cases, it seems the social cost of becoming legal exceeds the economic inconvenience of illegality.

### **Migrant Vulnerability at Its Extreme: Human Trafficking**

The emergence of the human smuggling and trafficking industries are perhaps the most worrying consequences of the mismatches between labor supply and demand and the economic incentives to migrate vis-

à-vis the legal means for doing so.<sup>1</sup> With more than 175,000 persons trafficked annually, Europe and Central Asia (ECA) is the second largest source of trafficked persons in the world after Southeast Asia.<sup>2</sup> Victims of human trafficking largely come from the Balkans and the poorer countries of the CIS (in particular Albania, Bulgaria, Lithuania, Moldova, Romania, and Ukraine).

Trafficking is distinguishable from smuggling, although sometimes the two activities may merge or smugglers may collaborate with traffickers. The smuggling of migrants, while often undertaken in dangerous or degrading conditions, involves migrants who have consented to the course of action. Trafficking victims, conversely, have either never consented or, if they initially consented, their consent has been rendered meaningless by the coercive, deceptive, or abusive actions of the traffickers. Trafficking involves the ongoing exploitation of the victims to generate illicit profits for the traffickers. The majority of such victims in ECA are females who are trafficked to work in the sex industry. However, male victims and adolescents are also forced to labor in the building industry, agriculture, or small-scale production; are brought into households; or are set to beg in the streets. In some Balkan countries, such as Albania, Bosnia and Herzegovina, and Serbia and Montenegro, minors of Roma origin in particular were a large percentage, if not the majority, of victims assisted by the IOM in the region (Surtees 2005).

Most of the trafficking networks operating in Europe are believed to be Albanian, Russian, or Turkish (Clert and Gomart 2004). While criminal groups in these countries are known for their drug trafficking, the high profits obtained through human trafficking, as compared with the relatively low risk in running such operations, make this activity highly attractive.

Trafficking of humans typically starts at the place of origin. Traffickers target those who are interested in finding employment abroad but are unable to make the journey independently or perceive a high risk in doing so. Recruitment most often involves the promise of a high-paying job, marriage to a Western European, or kidnapping. Most such arrangements are made informally. Interestingly, 60 percent of victims of trafficking in Southeast Europe were contacted through someone they knew (Laczko and Gramegna 2003). Recruitment through job advertisements and job agencies is less common in countries where awareness-raising campaigns have already addressed the use of such techniques (as in Bulgaria). As a result, increasingly, new recruitment strategies are employed, including female recruiters who are often victims themselves or former victims, and recruitment by couples. Trafficking increasingly occurs within a façade of legality,

where victims are trafficked with legal documents and cross borders at legal border crossings (Surtees 2005).

The risks and costs involved in human trafficking mean that the typical victim is someone whose situation at home is relatively poor. Typically these conditions include poverty, unemployment or underemployment, a difficult or abusive family background, and experience with political instability, violence, or discrimination. As a consequence, a substantial portion of trafficked victims are young, female adults, with low education levels.

Trafficking magnifies the disadvantages suffered by undocumented migrants. By definition, they are exploited, so will not earn as much as legal or other undocumented migrants. Exposure to a variety of inhumane living and working conditions is common. These include, but are not limited to, mental violence, including blackmail, insult, manipulation, humiliation, and threats; physical violence, including beating and threats with physical violence; or sexual attack, including rape. Along with limited sphere of movement, trafficked persons find themselves highly isolated; they lack the vital social networks available to other undocumented workers and are often under constant surveillance by traffickers.

Apart from human rights violations, trafficked victims face serious health risks, such as exposure to sexually transmitted diseases including HIV/AIDS, and other communicable diseases such as tuberculosis and hepatitis; reproductive health problems such as sexual abuse and violence, unwanted and unsafe motherhood, and complications associated with teenage pregnancies; physical traumas from severe beatings; and psychological and mental health disorders, including substance abuse or misuse. Political concern for the public health implications of human trafficking in ECA was spelled out in the Budapest Declaration of 2003.<sup>3</sup> For those without access to health care, these cases will go untreated and sufferers will lack access to necessary information. In migration-receiving countries, the result is a heightened risk of infection among the native population. The link between human trafficking and the sex trade means that the prevalence of HIV/AIDS and other sexually transmitted diseases is a particular area of concern. Given that most migrants will, at least periodically, return to their home countries, these risks apply equally to source countries.

Those who have fallen victim to human trafficking find it much harder to return home and would be expected to have less surplus income to remit back home. More directly, the families of the victims may have to pay financially, socially, or psychologically for the consequences of their relatives' abuse. The family may have to meet the

costs of the necessary medical and psychological care for returned migrants, some of whom may be unable to work again. Families may also suffer trauma and guilt or face social stigma. If the migrant returns with a communicable disease, such as HIV or tuberculosis, family members risk infection. In cases of death, there will be a permanent loss of potential family income, as well as personal loss.

## Endnotes

1. According to the UN Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, Supplementing the Convention on Transnational Organized Crime, UN, Palermo 2000, the “trafficking in persons” is the exploitation of others for (a) prostitution or other forms of sexual exploitation, (b) forced labor or service, (c) slavery or practices similar to slavery, (d) servitude, or (e) the removal of organs.
2. <http://www.unfpa.org/news/news.cfm?ID=48>.
3. Trafficking in human beings and health implications. Seminar on Health and Migration, June 9–11, 2004. Session II B—Public Health and Trafficking: When Migration Goes Amok.

## Incentives for Criminality in Migration

Criminality, defined for the purposes of this report as any transaction that is illegal or a constituent of the informal economy, is present in almost all types of migration and in most stages of migration (that is, in the countries of origin, and in transit and destination countries). Criminality ranges in its level of severity from bribing the passport-issuing agency to obtain a travel passport, to entering into a marriage with a citizen of the destination country to receive citizenship. Incentives for these types of criminality arise partly from the lack of legal channels for migration. The most violent and grave forms of criminality are exercised by organized criminal groups that traffic and smuggle human beings and drugs. An incentive for this type of criminality is usually enormous profits derived from human and drug trafficking.

Migrant smuggling and human trafficking are often an integral part of the illegal economy that is connected with other forms of illegal business (Phongpaichit, Piriyarangsan, and Treerat 1998). It has been reported that human trafficking and drug trafficking routes are often the same. Estimates indicate that up to 175,000 persons are trafficked from Central and Eastern Europe and the Commonwealth of Independent States (CIS) annually (Organization for Security and Cooperation in Europe 1999).

This appendix reviews some of the incentives for criminality in migration.

## Economic Disparity

The wage gap between poorer countries in Europe and Central Asia (ECA) and typical migrant destination countries is enormous. For example, an average salary in the Kyrgyz Republic is \$48 per month.<sup>1</sup> Labor migrants working in low-wage jobs in the United States reported making \$1,500–2,000 per month. Men working in the construction industry earn at least twice as much.<sup>2</sup> Such a wage difference serves as a powerful incentive to seek jobs abroad. In the absence of legal channels for migration, people migrate illegally.

## Demand for Cheap Labor in Destination Countries

There is substantial demand for inexpensive labor in high-income and many middle-income economies. Unskilled migrants often work in jobs that the native population or legal migrants would not take at the wages being offered. In most cases, such jobs pay below the minimum wage and provide no overtime payment or benefits. The growing demand for cheap labor may result in illegal activities, such as employment of illegal immigrants or migrants with no proper work authorization, if there are not sufficient legal channels for matching the demand with the supply of unskilled labor.

However, some have found that while there is demand for cheap labor in the Western European countries, greater homogeneity, smaller territories, and a strict registration system make it more difficult for illegal immigrants to find jobs and live in Europe. Thus, a larger share of illegal migrants in Europe may be women trafficked for sexual exploitation (Shelley 2003).

## Political Instability or Ethnic Conflicts in Countries of Origin

In some cases, economic disparity is not the main push factor for migration; political instability or ethnic conflicts (or both) force individuals to flee their home countries. This category of migrants often turns to illegal migration to escape persecution or conflict. In such cases, migrant smuggling is an overlapping issue between migration and human rights. Koser (2001), for example, examines asylum seekers as another major source of human smuggling, often falling between that uncomfortable dichotomy of “freedom fighter” and “evil smuggler.” He argues that one should not put too fine a point on the distinction between human smuggling as a migration issue and human trafficking as a human rights issue. Asylum seekers straddle this distinction in that they are often escaping

human rights violations by seeking out smugglers but then also encounter additional human rights violations along the way.

## Restrictive Immigration Regime in Destination Countries

Stricter border control may not be an effective way to combat smuggling of undocumented immigrants. Opponents of restrictive immigration regimes argue that “as more restrictive policies increase the obstacles to crossing borders, migrants increasingly turn to smugglers rather than pay the growing costs of unaided attempts that prove unsuccessful” (Koser 2001, pp. 207–8). Moreover, tougher immigration control will only enrich smugglers and traffickers because fees, and consequently debts, to be paid by would-be immigrants rise dramatically. As Koslowski (2001, p. 208) puts it, “if potential migrants are willing to pay the additional costs while at the same time stiffer border controls prompt more migrants to enter into the market, border controls will most likely increase the profits of human smuggling and entice new entrants into the business.”

## Conclusion

Overall, it is likely that migration from poorer ECA countries into wealthier ones will continue as economies of sending countries deteriorate and the demand for low-wage labor in receiving countries remains high. Because channels for legal labor migration are limited, irregular migration is likely to prevail. The consequences of this migration are serious for the countries concerned, as well as for labor migrants themselves. The International Organization for Migration (2001, p. 11) reports, “99 percent of labor migration in the Eurasian Economic Union formed of Tajikistan, Kyrgyz Republic, Kazakhstan, the Russian Federation, and Belarus is irregular. Due to their irregular situation, most labor migrants do not benefit from the same protection rights other regular citizens enjoy and are thus more vulnerable to exploitation by underground employers” (IOM 2001, p. 11).

## Endnotes

1. National Statistics Committee of the Kyrgyz Republic, [<http://www.stat.kg/Eng/Annual/Labor.html#Top1>], accessed on August 15, 2005.
2. Interviews with Kyrgyz labor migrants in the United States, December 2005 to January 2006.



## **Migrants, Their Families, and Communities “Left Behind”**

The impact of migration is felt nowhere as keenly as in the family. Migration alters not only kin relationships and the size and composition of families, but also affects predominant gender roles and responsibilities, the care of the elderly and children, the education of children, reproductive patterns, and even patterns of social and political participation and civic engagement of citizens. The consideration of “family migration” has consistently been neglected in European scholarship and policy debates. This appendix briefly attempts to fill this gap by investigating how the absence of family members, as well as their return, is dealt with by the family and the larger community.

### **Migrants and Their Families**

For some families in Europe and Central Asia (ECA), sending a family member to work abroad is one of the few options available to avoid poverty or improve quality of life and social status. The fact that migration is often perceived as a family coping strategy is expressed in the frequency of survey answers; many migrants desire to “save money for the education of children” or “buy a house upon return.” In all of the researched cases, the decision to work abroad is overwhelmingly economic. Yet, at the same time, there is little mention of

any reasons for migration related to increasing the earning capacity of migrants (to learn new skills, to acquire a new profession) and thus improve their economic situations in the long run. This suggests that migration may not necessarily be part of a consciously defined long-term investment plan but rather a reaction to the pressures to satisfy everyday needs. In the absence of secure employment alternatives, strategic employment planning, and more tactical migration management in countries of origin, migrants prioritize improving their immediate economic situation.

The departure of any family member transforms the family structure and its economics, which may have far-reaching effects for the structure of society as a whole. Many of these implications—including the country's fertility rates and number of divorces—are gendered.

Women who are left behind have developed a number of strategies to cope with the absence of partners. In countries and areas where recent wars took many male lives, three or four generations of women may live together as a coping strategy. With the overall decline in household incomes in ECA and the growing number of women in poverty as a "push" factor on the one hand, and the demand for domestic labor abroad as a "pull" factor on the other, households often resort to financial strategies that stretch across national divides. The increase in recent decades in the demand for female labor in the home care services (domestic work, care of children) of Northern European and North American countries has put new pressure on women to look for employment.

Such efforts have also changed the structure of family care relationships. Caring at a distance involves relying on older children, grandparents, and relatives; however, such arrangements are contingent on the socioeconomic conditions and other reasons that underlie migration. The current immigration regime in Europe, in particular, makes it hard for many migrant families to have recourse to other family members to help with care, because restrictions exist on the number of family members allowed to join the migrant in the destination country.

The migration of women has boosted family incomes, but also contributes to reshaping gender relationships as women become more active as decision makers. Furthermore, there has been little study in ECA on the impact of the migration of women on children they leave behind. Children of emigrants tend to receive less supervision; they lag behind in their education and often do not receive regular medical care. For example, it has been suggested that migration has been a significant factor in declining school enrollment of children in Moldova and Bulgaria. Moldova has also seen an increase in the

number of street children in the larger urban areas. Children abandon their families for various reasons: feeling disconnected, lacking attention, and even because of hunger and abuse. Specialists in Moldova fear that among other negative repercussions, inadequate education (both at school and at home) will have long-term negative implications for human development in the country. Separation from parents can disturb the psychological and social development of children and in the long run can contribute to a deterioration of the stock of human capital in the society.

### Returning Home and Reintegration

Return migration has emerged recently in international debates as a central topic when development opportunities for countries of origin are discussed. Despite the impact of remittances on consumption and investment, return migration is seen as essential for human development and positive social change, the circulation of knowledge and ideas, and the benefits of skills return. There are various factors that affect the potential of migrant return to improve development. These include the number and concentration of returnees in a particular period, the duration of their absence from home countries, the social class of migrants, their motives for return, the degrees of difference between countries of destination and origin, the nature of acquired skills and experiences, the organization of return, and the political relationships between the countries of immigration and return. The developmental impact of return also depends heavily on a healthy business environment in the country of origin, characterized by a sound legal framework, an effective banking system, honest public administration, and a functioning physical and financial infrastructure.

From the individual’s perspective, the return experience may not be universally positive. Some migrants may find that their country or families are not as they remembered. For others, changes in the labor market in their absence, or the weakening of important social networks, reduce the quality of job opportunities. A migrant’s condition on return will reflect the income, experiences, and skills earned or gained while abroad. Migrants who have been away for a longer period are likely to return with more cash and experience, but may find it more difficult to adjust to their own, perhaps greatly changed, communities.

Some migrants return after they have accomplished the objectives they left to pursue; this has a positive impact on their attitude to return. Furthermore, the more returning migrants respond to posi-

tive socioeconomic developments that attract them home, the greater the chance for innovation. Other migrants return home after a relatively short stay abroad because they are disappointed with the actual conditions of life and work in the destination country. They may not be able to bear the psychic cost of separation from family and loved ones or familiar environments, or the difficulties interacting with people who speak a different language and have a different culture and ways of doing things. Finally, some migrants return home because of unforeseen and undesirable changes such as health problems or family crises at home. Those migrants who make a conscious decision to return and who have planned ahead emerge as most valuable to their home communities in terms of the invested interest and the human capital they are able to transfer to their country of origin.

Surveys with returned migrants conducted for this report point to a general improvement in household living standards in Bulgaria, Bosnia and Herzegovina, and Romania despite the difficulties encountered by family members when the migrant is away. This means that migrants have reported they are now better able to finance their household expenses, buy clothing, pay utility bills, purchase electrical appliances, buy a new car, and even travel abroad.

More crucial, however, is the extent to which the country of origin is prepared to offer reintegration strategies for returning migrants and to nurture their newly acquired skills and capital. Options include making social benefits portable (discussed in chapter 4) and designing programs that support returning migrants in making informed decisions about the use of their resources. Many ECA migrants have expressed their desire to start businesses of their own, yet almost all point to investment constraints and a lack of trust in formal institutions, such as banks, as discouraging factors. Training programs and access to microcredit facilities are also in high demand. Such programs should make special provisions to target women in particular—research shows that women make the most effective use of remittances.

## Brain Drain in the ECA Region

This appendix provides a brief overview of the quantity and type of “brain drain” resulting from the migration of skilled workers from Eastern Europe and the former Soviet Union since transition.

### **Past Efforts at Estimating the Importance of Brain Drain in ECA Countries**

In an attempt to estimate the importance of brain drain in developing countries (Carrington and Detragiache 1999), experts from the International Monetary Fund explained that their justification for excluding the former Soviet Union and Eastern European countries from their study was the lack of reliable data. Four years later, the availability of data has not significantly improved and the exact nature of brain drain is still not well understood. Studies undertaken during the last 10 years have come to somewhat contradictory conclusions. The absence of a generally accepted definition of “highly skilled migration” is also a problem, as is the lack of reliable information on migrants’ job qualifications, both in the countries of origin and the destination (with the sole exception of the United States [Straubhaar and Wolburg 1999]).

Moreover, estimates of the importance of highly qualified migration tend to depend on the approach adopted. Taking into account the point of view of the country of origin or of destination may affect any conclusions regarding the exact nature of the phenomenon. For example, Albanian migrants to the United States have generally been viewed in the United States as highly qualified (Kosta 2004), while they were seen as relatively poorly qualified in Greece or Italy. From an Albanian point of view, emigrants are perceived as belonging simultaneously to both unskilled and highly skilled groups (Galanxhi et al. 2004). Therefore, any conclusions regarding migration and possible brain drain will necessarily depend on the country of reference.

Generally speaking, highly skilled migration from the ECA countries flows toward the Western and Northern European countries, as well as toward Canada and the United States. Migratory flows from one ECA country to another are not characterized by a large proportion of highly skilled migrants, even though some students regularly do come to the Russian Federation. The nature of the phenomenon differs from one country of origin to another, in both the numbers and proportions of highly skilled emigrants. Both of these measures are comparatively low in the former Yugoslavia and Albania as compared with Bulgaria, Poland, and Romania.

Previous studies on brain drain have distinguished between student migration, migration of researchers and scientists, and migration of other highly skilled persons (such as managers, engineers, artists, athletes and clergy).

### **Student Migration**

About 100,000 foreign students from the ECA region were enrolled in tertiary education in industrial countries in 1998–99, according to UNESCO. Among them, 37,000 foreign students from ECA countries (including Poland, 7,800; Russia, 5,400; Croatia, 4,600; Serbia and Montenegro, 4,300) were studying in Germany and 21,100 (including Russia, 6,100; Bulgaria, 2,400; Romania, 2,100) in the United States. However, student statistics in the United States clearly show that the Russian community was not the largest group of student migrants, in fact, not even one of the five largest groups. Graduate students from China, the Republic of Korea, India, and Taiwan (China) constitute most of the migrant student population in the United States. In Europe, even though the enlargement of the European Union in 2004 effectively increased student mobility, the increase in student migration from the ECA was rather small.

## Migration of Active, Highly Skilled Populations

The proportion of highly qualified persons in each migration flow varies according to factors such as the type of migration (“political” emigrants are generally not particularly qualified), the selectivity of emigration (the socioeconomic structure of the aspiring emigrant population), the match between the level of the educational system and the labor market in the country of origin, and the average level of education in the country of origin. It is important to remember that enrollment in tertiary education is generally very high in ECA countries. The gross enrollment ratio (appendix table 4.5.1) shows considerable variation in the level of education according to country. Of course, those countries with a high level of education (such as Belarus, Bulgaria, Lithuania, Russia, Slovenia, or Ukraine) are more likely to have highly skilled people among emigrants than countries with fewer university graduates (such as Armenia, Azerbaijan, or Albania). However, the impact of brain drain (that is, the problems caused by the emigration of the highly skilled) may be more evident in countries with a relatively low proportion of highly skilled persons.

A country’s size also plays a role in highly skilled emigration and brain drain. A report from the World Bank (2006) recently stated that countries with more than 30 million inhabitants, such as Russia, were not massively affected by brain drain. According to this report, the proportion of emigrants in the former Soviet Union (FSU) should amount to something between 3 percent and 5 percent of the total number of persons having completed tertiary education. In recent years, the high proportion of tertiary-educated persons in Russia and other Commonwealth of Independent States (CIS) countries has largely compensated for the emigration of highly qualified persons. Smaller countries, such as Bulgaria, have been more likely to suffer from the negative impact of brain drain.

## Migration of Scientists

The frequent attempts to estimate migration undertaken by scientists have often been subject to debate. Russian sources suggest that the emigration of scientists is not a problem in CIS countries. The Ministry of Education and Research has considered the emigration of researchers from Russia as “normal.” It is harder for the Russian government to deal with the fact that young researchers prefer to work in the private sector, where wages are higher.<sup>1</sup>

Nonetheless, it is no surprise that the youngest and best researchers have been the most likely to leave the country. Academics often left

## APPENDIX TABLE 4.5.1

**Gross Enrollment Ratio, Tertiary Level, by Country, 1998–99 and 2002–03**

(regardless of age, as a percentage of the population of official school age for that level)

Country	Men		Women	
	1998–99	2002–03	1998–99	2002–03
Albania	10.9	11.7	17.2	20.9
Armenia	20.7	23.3	25.2	27.4
Azerbaijan	20.0	18.6	12.4	14.4
Belarus	41.6	51.7	55.4	72.1
Bulgaria	34.5	35.9	52.9	42.2
Croatia	29.6	36.1	34.2	42.8
Czech Republic	25.7	34.3	26.5	36.8
Estonia	42.3	50.1	60.0	83.4
Georgia	30.4	38.3	34.1	37.5
Kazakhstan	22.0	38.7	25.5	50.7
Kyrgyz Republic	29.8	38.5	30.9	45.9
Lithuania	36.1	56.2	55.0	87.5
Poland	38.5	49.6	53.1	70.6
Moldova	25.8	25.7	33.1	34.0
Romania	20.4	31.3	22.1	38.7
Russian Federation	—	59.1	—	79.3
Serbia and Montenegro	31.1	—	37.0	—
Slovak Republic	25.2	31.0	27.9	36.4
Slovenia	45.3	58.4	60.7	79.0
Tajikistan	20.3	24.4	7.1	8.3
FYR Macedonia	19.3	23.6	24.7	31.6
Ukraine	44.1	56.5	50.5	67.2
Uzbekistan	—	17.5	—	13.9

Source: UNESCO, <http://stats.uis.unesco.org/ReportFolders/reportfolders.aspx>.

Note: — = Not available.

the country during the 1990s to continue their work abroad. This has significantly diminished the quality of research, especially in the natural sciences such as mathematics, where such research flourished during the Cold War. UNESCO's *1998 World Science Report* (UNESCO 1998) estimated that the number of Russian scientists involved in research and development (R&D) fell from 900,000 to 500,000 from 1991 to 1995. Izvetzia (March 20, 2002) was more cautious, estimating the number of researchers who emigrated after the fall of the Iron Curtain at 200,000. Armenia saw a similar decrease in scientists involved in research (from 15,000 to 3,000) and in Ukraine, approximately 15,000 specialists with higher education degrees (not only scientists) have left the country each year.<sup>2</sup> Bulgaria was estimated to have lost annually 50,000 qualified scientists and skilled workers (Chobanova 2006) following the collapse of the Warsaw Pact; the main destinations were the United States, Canada, and Germany.

The cooperative programs in R&D between Western European countries and FSU member countries set up during the last 10 years

were an attempt to remedy the pattern of emigration. However, programs favoring research in Central and Western Europe were not able to stop the decline of the research infrastructure and capabilities of FSU countries. Even so, according to an international survey carried out in 10 Eastern European countries, they did have a positive impact, with the brain drain turning out to be less serious than previously feared (INCO 1997).

A Polish survey on scientists who emigrated clearly demonstrated that the opportunity to work with new technologies was not the main reason behind emigration between 1995 and 1999. Most emigrant researchers explained that a salary increase was the reason that best explained their decision (Koszalka and Sobieszczanski 2003). The recent move on the part of the Russian government to improve the wages of researchers was an attempt to solve the salary-related emigration problem.<sup>3</sup> However, wage differentials between Russia and industrial countries are still significant. If they remain high, researcher emigration will likely continue.

### Highly Skilled Emigrants in Six Countries of Origin

Surveys undertaken for this project provide an estimate of highly skilled emigration in six countries (appendix table 4.5.2). The proportion of persons having completed higher education (master of arts or other degree) among return migrants varied according to sex and country of origin. Because of the different return rates observed between highly skilled and low-skilled emigrants, those proportions imperfectly reflected the exact nature of the phenomenon.

However, these results clearly showed the high level of qualification among migrants in countries such as Georgia (53 percent of female

#### APPENDIX TABLE 4.5.2

##### Proportion of Return Migrants Having Completed Higher Education (Bachelor or Master's Degree)

(percent)

Country	Female	Male
Bosnia and Herzegovina	11.0	9.5
Bulgaria	31.5	25.0
Georgia	52.7	37.7
Kyrgyz Republic <sup>a</sup>	30.3	20.0
Romania	11.5	12.8
Tajikistan <sup>b</sup>	28.8	17.2

Source: World Bank staff.

a. University degree.

b. Master's degree or higher.

return migrants held a university degree). FSU countries and Bulgaria were also characterized by high levels of return migrants who had completed university, while Bosnia and Herzegovina and Romania showed a low proportion of highly skilled migrants. Perhaps cross-country differences could have been partially explained by the respective education systems and tertiary education enrollment statistics (see appendix table 4.5.1). Moreover, female return migrants were more frequently highly qualified than males. Such a result could have been partially explained by the fact that work opportunities abroad (particularly in Russia) were probably less numerous for lower-qualified women. It is also possible that emigration strategies differed according to the education levels of the partners: in a couple with a woman whose qualifications are higher than the man, the gain resulting from female emigration would tend to be higher than from male emigration.

### The Effects of the Brain Drain in Countries of Origin

According to a number of theoretical approaches summarized by, among others, Straubhaar and Wolburg (1999) and Abu-Rashed and Slotje (1991), the emigration of skilled labor, contrary to that of unqualified workers, clearly has a positive impact on the global income of destination countries. The effect on “donor” countries of highly skilled migration is not so clear.

It is generally agreed that the international mobility of highly qualified labor is positive. However, in the case of brain drain, which implies an irreplaceable loss to the stock of highly skilled populations in the country of origin, the overall impact is hard to estimate. One important implication of brain drain frequently mentioned in the case of Africa is that a part of the investment in education in the country of origin is not replaced once migrants leave. Consequently, a shortage of skills becomes evident, leading to the impossibility of ensuring economic growth. However, the aforementioned high level of enrollment in tertiary education and universities in most ECA countries may help offset this situation in the future.

Emigration on the part of highly skilled labor also leads to an aging of the more highly qualified population at home (it is the younger workers who emigrate), and to a rapid decrease in the development of sectors such as R&D. This has been observed in Russia following the departure of top researchers, who not only go abroad but also move to work in other sectors of the economy.

However, negative effects may occasionally be counterbalanced by a decrease in unemployment in the country of origin or by an increase in

remittances from highly skilled emigrant labor, which can partially or totally compensate for any losses from emigration. Straubhaar and Wolburg (1999), in fact, argue that brain drain can improve economic efficiency from an international perspective. Therefore, the main issue to be resolved is how to compensate for certain negative aspects of brain drain in the countries of origin without diminishing the overall positive effect.

#### *Easing Temporary Migration as an Answer to Brain Drain*

Brain drain probably cannot be avoided in ECA countries, but its negative impact on research and industrial development may be attenuated by implementing measures aimed at making it worthwhile for highly trained professionals to stay home or to come back. Many programs encouraging the return of highly skilled migrants have been implemented in African countries. In the ECA region, programs promoting R&D in the countries of origin will probably play an important role in the future.

#### *Maintaining the Quality of R&D*

Maintaining the quality of R&D in countries of origin is also an important factor when attempting to avoid brain drain. To reach this objective, it is important to replace emigrants with competent locals at the same rate as they depart. Specialization abroad is a good thing, and job opportunities for emigrants may exist in both scientific and economic domains. The simplification of investments and business in the country of origin is an important factor in using highly skilled labor emigration to the advantage of the country of origin.

#### *Networking Between Migrants and Nonmigrants*

Another aspect frequently mentioned is the need to encourage the creation of networks between emigrants and their countries of origin, for instance, by providing information to migrants. Such networks would allow the dissemination of professional and scientific knowledge and know-how through contacts between emigrants and researchers who have stayed in the home country. Networking between migrants and nonmigrants has already become more frequent with the rising development of communications services.

#### *The Role of Remittances*

Remittances have a positive impact on highly qualified migration. This is the case even when surveys show that highly educated persons send less money than those with lower qualifications (see chapter 3, "Migrants' Remittances"). A differential between remittances sent by highly skilled and other emigrants can be easily explained by factors

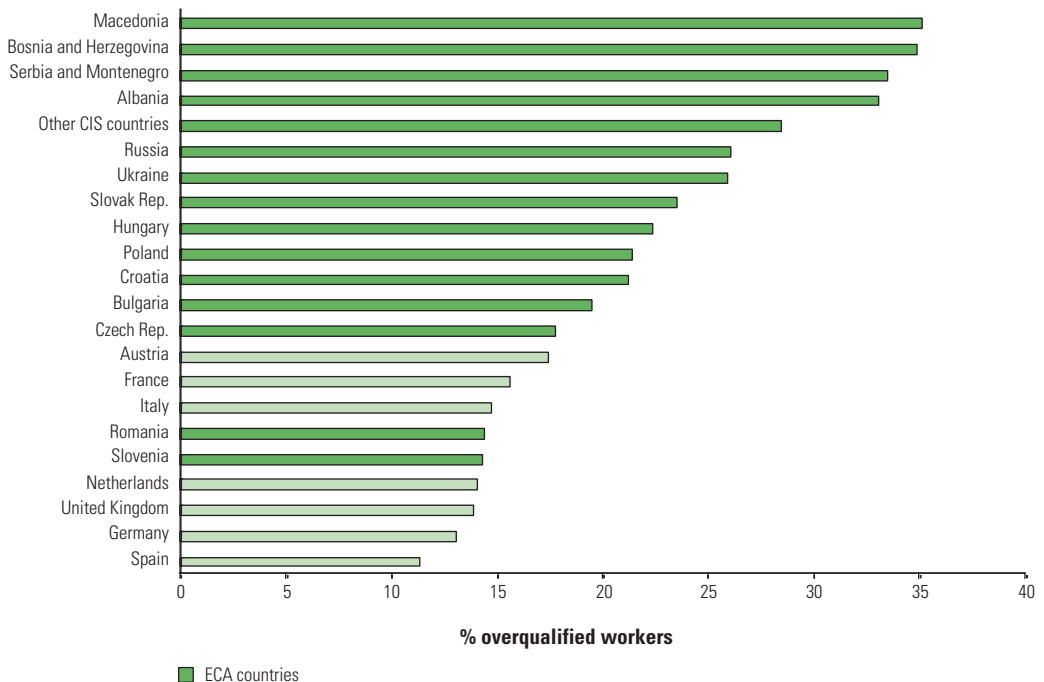
such as specific spending behaviors abroad, the kind of migration (individual or family), the financial necessities of the family at home, and the expectations concerning the duration of migration. Remitted money can have an immediate impact on economic development in countries of origin when it is used for investments. However, as mentioned in chapter 3 of this report, only one-fifth of remitted money corresponds to an investment in material capital, and 14 percent to investment in human capital (education of children). Among the investments in material capital, the portion of investment in business is small (about 6 percent of the total amount of remittances). Therefore, to improve the economic impact of highly skilled migration for the country of origin, it would also be useful to provide incentives to invest.

### **Conclusion: The Nature of Migration within ECA Countries and Between ECA Countries and the Industrial World—Brain Drain, Brain Gain, or Brain Waste?**

Surveys in CIS countries (Tajikistan and Kyrgyz Republic) have clearly demonstrated that, during their stay in Russia, highly skilled migrants frequently worked in sectors requiring a low qualifications (such as agriculture, transportation, or construction). Therefore, emigration may lead to “brain waste,” that is, a downward adjustment of migrants’ aspirations to reconcile with the divergent characteristics of the Russian labor market (appendix figure 4.5.1). Brain waste, a negative effect of migration flows, has also been observed, to a lesser extent, in Western Europe, in border countries (principally Austria [Fassmann, Kohlbacher, and Reeger 1995]), and among Russian migrants to Israel (Hansen 2006). Highly skilled migrants, especially women, working in domestic sectors or in nonqualified (and seasonal) work are frequently observed in Western Europe. Swiss data show that highly qualified migrants from ECA countries, and particularly from the former Yugoslavia and countries of the FSU, are much more affected by brain waste (that is, the fact that a job requires less qualification than their skills) than migrants from Western Europe (appendix figure 4.5.1). Obstacles encountered in the Western labor market (such as infrequent recognition of diplomas) may increase such brain waste.

Industrial societies are progressively moving toward a tertiary economy with a high level of added value. Therefore, the demand for highly qualified immigrants will probably increase. Furthermore, during recent decades, migratory flows have increasingly been composed of highly skilled migrants. Such highly skilled migration will probably also increase in the future.

## APPENDIX FIGURE 4.5.1

**Proportion of Migrants with Tertiary Education from ECA Countries and from the Main Western Communities Who Are Active in Work Requiring Low Skills**

Source: Swiss 2000 census.

Even so, labor market segmentation is still evident, leading to a demand for relatively unqualified immigrants, which can cause brain waste. Enlargement of the European Union in May 2004 and the consequent free movement of workers may turn out to be a factor influencing the ratio between brain waste and brain gain.

In short, highly skilled migration is a reality that cannot be avoided. The extent to which countries of origin are capable of using it to their own advantage depends on a variety of factors. The issue for the next decade will therefore be how highly skilled migration can become a positive factor in the development of countries of origin, rather than a negative phenomenon resulting in waste.

## Endnotes

1. See a report from the French Senate on Russian education ([www.senat.fr/rap/r04-274/r04-2746.html](http://www.senat.fr/rap/r04-274/r04-2746.html)).
2. State Committee of Statistics of Ukraine.
3. President Putin decided at the beginning of 2006 to increase wages (from the equivalent of US\$800 to up to the equivalent of US\$1,000).