Economics Bulletin

Volume 30, Issue 3

A quantitative indicator of the immigration policy's restrictiveness

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Abstract

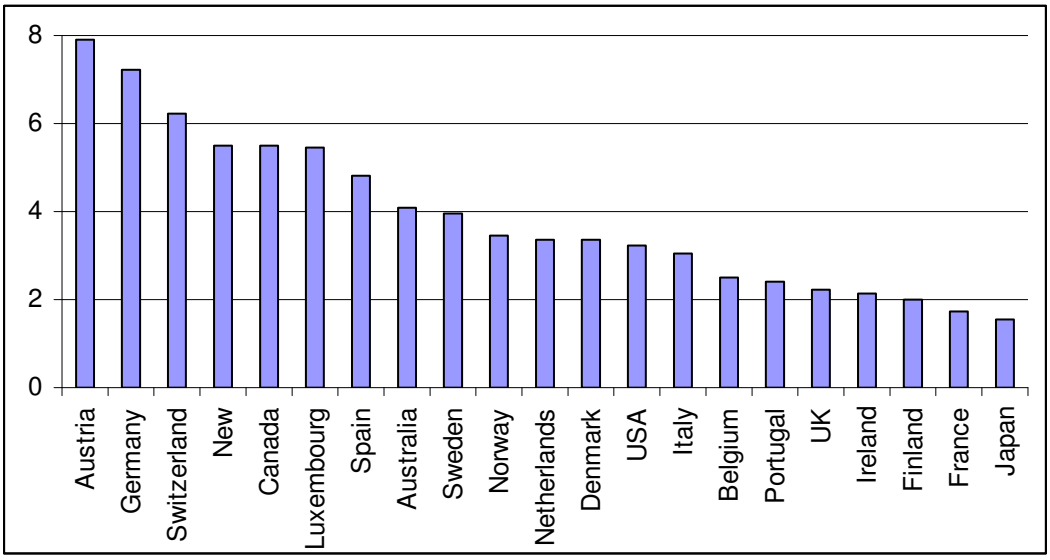
The openness of the immigration policy toward developing countries is strongly debated in industrialized countries. In this paper we build an indicator of the "revealed" migration policy openness by computing the difference between the observed migration flows and the structural migration flows that depend on non-political factors of migration (economical, geographical and cultural factors). Using OECD's annual data on migrations, the indicator is built for 21 industrialized countries over the period from 1990 to 2006, allowing us to compare the restrictiveness / openness of policies between countries and over time.

We are grateful to Patrick Guillaumont and Jean-Louis Combes for useful comments on earlier drafts. We gratefully acknowledge support by the FERDI (Fondation pour les Etudes et Recherches sur le Développement International). The usual disclaimers apply.
Citation: Matthieu Boussichas and Michael Goujon, (2010) "A quantitative indicator of the immigration policy's restrictiveness", *Economics Bulletin*, Vol. 30 no.3 pp. 1727-1736.
Submitted: Apr 12 2010. **Published:** July 11, 2010.

1- Introduction

Immigration from developing countries is a burning issue in industrialized countries, though it accounts for only a third of migration flows in the world (Parsons et al., 2007). Despite economic globalization, the development of transport networks, and the lasting huge difference in incomes between countries, annual immigration flows from developing countries represent less than one per cent of the population in industrialized countries. These figures might reflect the restrictiveness of immigration policies in industrialized countries. Moreover immigration flows from developing countries strongly differ between industrialized countries (see Figure 1): the annual averages range from 1.6 per 1000 people in Japan to 7.9 per 1000 people in Austria. However, it is difficult to compare the restrictiveness of migration policies between countries based solely on these figures, since migration flows depend on structural determinants that are independent from policies. For instance, the limited flows to Japan may also reflect the geographical distance between this country and the developing countries.

Figure 1: Immigration flows from developing countries
(1990-2006 annual average, per thousand people)



Notes: Austria and Italy from 1996 ; Ireland from 1991 ; New-Zealand from 1995, Portugal from 1992. Sources: authors' calculations from OECD and Eurostat data.

In this paper we build an indicator for industrialized countries of the "revealed" openness of migration policy by computing the difference between the observed migration inflows and the "structural" migration inflows that result from the non-political or structural determinants of migration. These "structural" migration inflows are the fitted values derived from a regression of observed inflows on economic, geographic and cultural determinants. The residuals of this regression, the migration inflows that remain unexplained by the regression, represent the impact of the migration policy and can then be used to build an indicator of this policy. Using OECD's annual data on migrations, the indicator is built for 21 industrialized countries between 1990 and 2006, allowing us to compare policies between countries over time.

2- Methodology

There are two methods for building a policy indicator. The first consists of analyzing the policy instruments and the second of analyzing the quantitative results of the policy. The first method is used by Mayda and Patel (2004), Mayda (2009), and Ortega and Peri (2009) to build indicators of the changes in the destination countries' migration policies based on a qualitative assessment of their laws. They then distinguish the timing of the « substantial » changes (loosening / tightening) in the migration policies by countries. However, this method suffers from a high degree of subjectivity, as questions about policy instruments and the assessment of the changes can be ambiguous. In addition, it is difficult to compare all of the characteristics of policies between countries and to derive a quantitative and synthetic indicator.

The second method can go in two different directions. First, as in Roodman (2009) in the Commitment to Development Index, the indicator can be based on the uncorrected observed migration flows. However, as migration flows depend on other factors than policy, this indicator is not appropriate to assess the impact of the policy alone. The second direction that we follow consists of correcting the observed flows for the impact of structural factors of migration.

2.1- The indicator of revealed policy

This method has recently been used to build an indicator of trade policy's openness (Combes and Saadi-Sedik 2006) or an indicator of the policy against deforestation (Combes Motel et al. 2009). We start with an econometrical regression of the observed migration inflows in countries i and year t (M_{it}) on the structural determinants of migration (X_{it}):

$$M_{it} = \beta X_{it} + P_{it} \quad (1)$$

We then consider that the residual of the regression (P_{it}), that can be derived from the estimation, represents the impact of migration policies:

$$P_{it} = M_{it} - \hat{\beta} X_{it} \quad (2)$$

For a given country, migration policy is then considered as relatively restrictive (open) if observed migration flows are lower (higher) than the predicted flows $\hat{\beta} X_{it}$, resulting in a negative (positive) value of P_{it}. Since the sum of the residuals is equal to zero, P_{it} is an indicator of the relative migration policy, allowing the comparison of the openness or restrictiveness between countries (and over time). According to this method, the "revealed policy" includes direct restrictions on migration inflows (quotas, visas, etc.) and the impact of integration policies, which modifies the attractiveness of the destination country besides structural determinants.

The migration policy restrictiveness measure being a residual, similar in spirit to the famous Solow's residual, different assumptions underlie the validity of the indicator. First, no explanatory variables must be omitted from the regression such that the residual accurately reflects the effect of immigration policy. Second, the included explanatory variables must be exogenous. Third, the functional form of the regression must be specified correctly. Fourth, there must be no measurement error. Given the restrictiveness of these assumptions, our results must be considered as preliminary and with caution. Our list of structural variables, which gathers the variables usually found in previous empirical studies, is not definitive and should be revised according to improving data availability. Arguably however, our structural variables might be considered as exogenous since immigration policies cannot influence them instantaneously. We partially acknowledge these shortcomings when only considering and discussing residuals that are statistically different from zero [1].

[1] We have greatly considered the comments of one of the referees of the Bulletin to improve this presentation.

2.2- Structural determinants of international migration

The selection of the determinants follows the works of Clark et al. (2004, 2007), Hatton and Williamson (2005 and 2006), Mayda (2009), Pedersen et al. (2008), and Ortega and Peri (2009). This selection covers the factors affecting the benefit and the cost of migration, and the (destination-countries') pull and (origin-countries') push factors. The benefit of migration is proxied by the difference of income per capita between origin and destination countries, allowing for a reverse U-shaped relation between the origin countries' income and migration flows: an increase in the origin countries' income raises the possibilities to migrate at low levels of income and reduce the benefits of migration above a threshold level (Faini 1996, and Hatton and Williamson 2005 and 2006). The unemployment rate in destination countries may also negatively affect the benefits of migration. The costs of migration depend mainly on the geographical distance between the origin and destination countries. Migrants may also privilege destination countries where an international language is spoken. Lastly, migration from developing countries may be facilitated by network effects (Massey et al. 1993, and Pedersen et al. 2008) like social networks, due to existing communities of migrants in the destination countries, and trade networks due to trade relations with the destination country.

Table 1 : Variables annual averages (1990-2006)

	Flows	Stocks	pc GDP	pc GDP origin	Trade	Distance	Unempl.	Language
	(per 1000)		$ PPP		% GDP	kms	%	
Austria	7.9	101	30546	3001	83	2785	4.0	0
Germany	7.2	94	28186	6340	59	3133	8.5	0
Switzerland	6.2	102	33456	6340	78	3059	3.4	1
Canada	5.5	107	30224	6784	71	5736	8.7	1
Luxembourg	5.5	57	57052	6340	234	3236	2.8	1
N-Zealand	5.5	84	21534	2920	59	9615	6.7	1
Spain	5.0	41	23299	4094	49	3313	16.5	1
Australia	4.1	92	29348	2699	39	8373	7.8	1
Sweden	4.0	70	27353	6340	76	3300	6.9	0
Norway	3.5	42	40912	6340	72	3522	4.5	0
Denmark	3.4	38	29954	6340	79	3229	6.4	0
Netherlands	3.4	68	30733	6340	119	3375	5.2	0
USA	3.2	104	36593	4126	24	6984	5.5	1
Italy	3.0	22	26164	4094	46	3139	10.4	0
Belgium	2.5	48	28466	6340	148	3350	8.0	1
Portugal	2.5	41	18129	4094	65	3637	5.6	0
UK	2.3	51	26787	6340	55	3571	6.9	1
Ireland	2.2	16	27546	6340	146	3920	9.2	1
Finland	2.0	15	25357	6340	67	3239	10.8	0
France	1.7	69	27620	4094	49	3564	10.5	1
Japan	1.6	11	28208	2699	21	4620	3.8	0
Mean	*3.6*	*47*	*29879*	*5159*	*78*	*4224*	*7.2*	

Notes : From 1992 for Japan, 1994 for Netherlands and Sweden, 1996 for Belgium, Finland, Italy, Luxembourg, Portugal, Switzerland and UK, 1997 for Ireland and New Zealand, 1998 for Spain and 1999 for Austria. For Canada, results are obtained for 1992, then from 1996 ; for France : 1991 and from 2000 ; for Norway : 1991 and from 1994 ; and for USA : 1991 and from 1995.
Sources : Author's calculations, World Bank, OECD, IMF, National statistical agencies

2.3- Data

We use aggregated data on migration inflows by destination countries, instead of bilateral flows, since the aim is to build directly a synthetic indicator of migration policy for destination countries. Table 1 reports the average of annual data for migration inflows and for structural determinants. Annual migrant inflows from developing countries are computed using data from OECD database from 1990 to 2006, completed by data from Eurostat, the World Bank and national sources. Immigrants are those who are foreign born. Therefore the figures are not biased by naturalization. This data excludes asylum seekers (this migration does not have the same determinants than the "common" migration) and illegal immigrants. Illegal immigrants' regularizations are however registered as legal migration inflows. Using legal migration data in our method is relevant, as the restrictiveness of migration policy must be measured through its impact on observed legal migration inflows (not on unobserved total migration inflows). The same data sources allow us to compute the annual stocks of migrants (per thousand inhabitants).

The destination countries' GDP per capita is measured on the basis of purchasing power parity (see appendix for data details and sources). Distance from the origin countries and the origin countries' GDP per capita are destination-country specific. The destination countries differ because they do not face the same "natural" sources of migration, that we consider to be the three closest developing regions (developing regions being *North Africa, Sub-Saharan Africa, South Asia, East Asia, Central America, Latin America, and East Europe/Middle East*). The average distance (in kilometers) is then computed between the destination country and its three closest developing regions. For each destination country, the average origin countries' GDP per capita is computed as the average of the three closest regions' GDP per capita. The dummy variable "Language" takes the value of 1 if English, French or Spanish is spoken in the destination country (0 otherwise). The destination countries' trade openness is the ratio of exports to and imports from developing countries to GDP.

3- Results

3.1- Regression estimates

The panel data regression takes the following general form:

$$M_{it} = c + \beta X_{it} + \alpha_i + \theta_t + \varepsilon_{it} \quad (3)$$

with α_i being the specific country effects (unobservable countries' characteristics that are time invariant), and θ_t the specific time effects (unobservable time characteristics that are common for countries). The regression is run following the "random effects" model (against the "fixed effects" model), since all important structural determinants have been included in X_{it}. Thus α_i and θ_t are components of the migration policy with ε_{it}. This choice is not rejected by the usual Hausman-test (associated probability: 0.19). As a robustness check, we present the regression under fixed effects. However, under fixed effects, specific country and time effects are then considered as part of structural determinants: residuals and the policy indicator should therefore be affected.

To avoid endogeneity bias, we introduce the lagged values of GDP per capita, trade openness, stock of immigrants and unemployment. Results shown in Table 2 are obtained from a Generalized Least Squared estimation. Results are broadly consistent with existing findings. Regarding the pull factors, the impact of the destination country's income is significant and positive as expected. For the pull factors, the impact of the origin countries' income shows a reverse U-shaped relationship that has been already highlighted by Faini (1996), Hatton and Williamson (2005), and Mayda (2009). Regarding the factors affecting the cost of migration, geographic distance has a negative impact on migration inflows, which is a standard finding. The international language is not significant however. This is consistent with the correlation

between language and migrant stock in the destination country and the significance of the variable of migrant stocks in the regression [2]. Migration inflows increase with the trade openness of destination countries as in Pedersen et al. (2008). Beyond previous studies that found a linear positive relation between the initial migrant stock and current migration inflows, we found a reverse U-shaped relation suggesting diminishing marginal benefits. Lastly, unemployment in the destination country has the expected negative impact on migration inflows (as in Mayda 2009, and Pedersen et al. 2008). Altogether, structural variables only explain 37% of the variance in the observed migration inflows between countries. The rest is then assumed to be explained by the difference in migration policies applied by destination countries.

The fixed effects estimation reported in the second column of Table 2 broadly gives similar results despite the exclusion of time invariant variables (distance and language). In the next section, the robustness of the policy indicator to random / fixed effects is discussed.

Table 2: Estimation results (dependent variable is migration inflows M_{it})

	GLS estimation		Fixed effects estimation	
	Coefficients	t-statistics	Coefficients	t-statistics
p.c. GDP destination	0.539	(1.22)	2.014 *	(1.87)
p.c. GDP origin	4.839	(1.40)	6.352 **	(2.16)
p.c. GDP origin squared	-0.309 **	(-2.12)	-0.457 *	(-1.81)
Distance	-0.331 **	(-2.23)		
Language destination	-0.047	(-0.35)		
Trade openess destination	0.067 *	(1.93)	0.453 *	(1.70)
Migrants Stock	0.938 **	(2.04)	-0.883	(-0.76)
Migrants Stock squared	-0.144 *	(-1.90)	-0.302 *	(-1.79)
Unemployment destination	-0.324 ***	(-3.08)	-0.401 *	(-1.84)
Constant	-14.59	(-0.83)	-0.086	(-1.11)
Ner Observations	245		224	
R^2	0.37		0.51	

Notes: * significant at the 10% level, ** at 5% and *** at 1%

3.2- The policy indicator

Table 3 reports the 1990-2006 average values of regression residuals for each destination country. Countries are then ranked in increasing degree of policy restrictiveness. The results show that the most open countries are Spain, Austria, Germany, New-Zealand, and Luxembourg, and the most restrictive are Japan, the United States, the Netherlands, the United Kingdom, and France. According to the policy indicator, Spain is even more open than suggested by the observed migration inflows. Italy appears to apply an open policy while observed inflows are relatively low. At the opposite, for countries at the bottom of the table, migration inflows are well below those that are predicted by their levels in structural variables, and they then appear to apply relatively closed policies toward the developing countries' migration. Figure 2 reports the annual values for each destination country.

[2] As suggested by one of the referees, the importance of the language in the destination country may be correlated with the existing social networks in the destination country. If there are already many migrants from the source country, then the importance of the language spoken in the destination country may not be an important factor in migration decision. These new migrants can still survive without speaking the destination-country language.

We also compute for each destination country the 1990-2006 average values of regression residuals generated by the fixed effects estimation reported in Table 2. These residuals are reported in Appendix – Table 5. Results are only marginally affected except for Luxembourg, which is relatively open under random effects and closed under fixed effects.

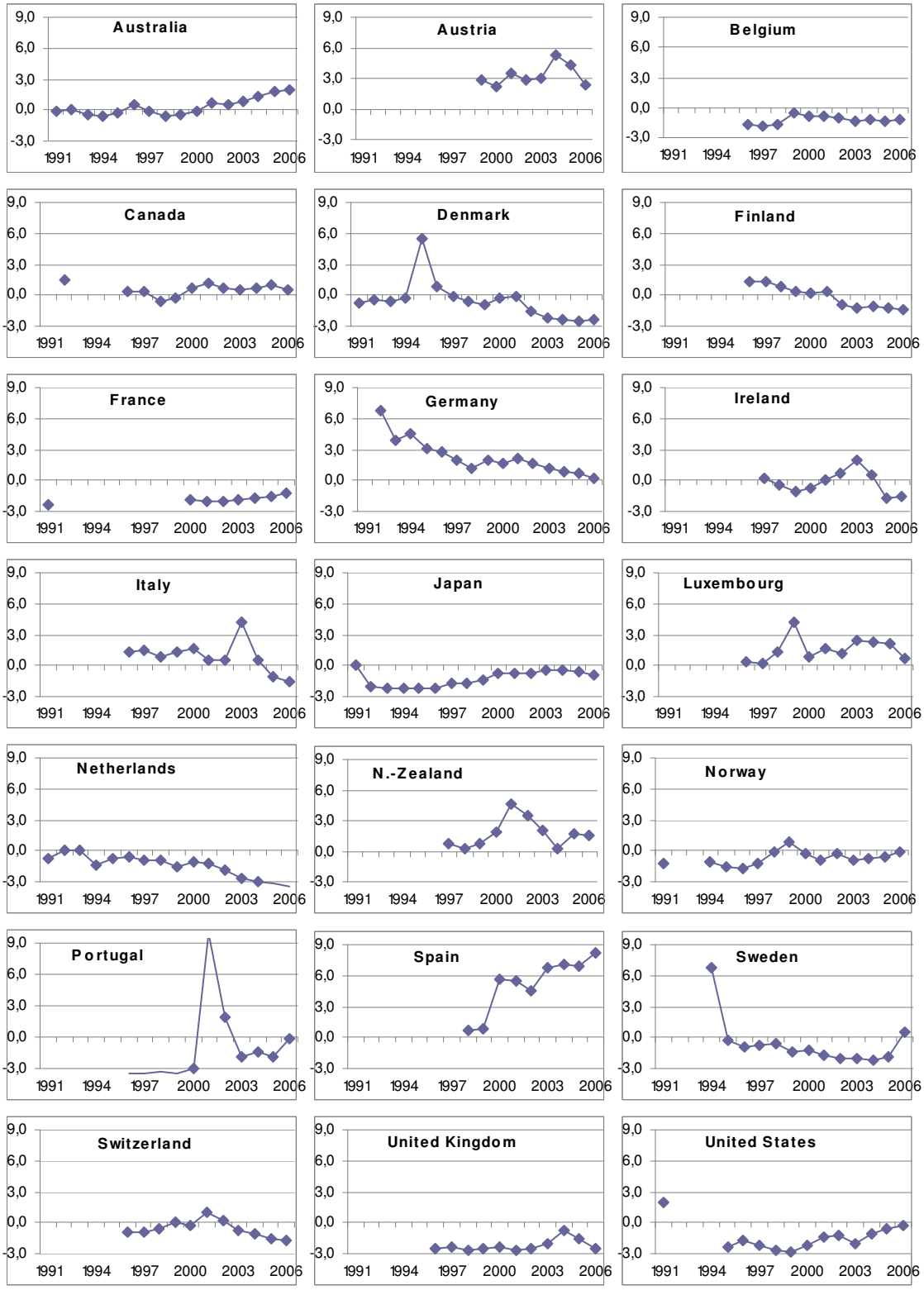
Table 3: Indicator of migration policy restrictiveness vs observed migration inflows (annual 1990-2006 averages)

	Policy indicator		Observed inflows		Rank
	value	rank	per 1000	rank	difference
Spain	5.1***	1	5.0	7	+6
Austria	3.3***	2	7.9	1	-1
Germany	2.3***	3	7.2	2	-1
N.-Zealand	1.7***	4	5.5	4	0
Luxembourg	1.6***	5	5.5	4	-1
Italy	0.9*	6	3.0	14	+8
Canada	0.5	7	5.5	4	-3
Australia	0.3	8	4.1	8	0
Finland	-0.2	9	2.0	19	+10
Ireland	-0.2	10	2.2	18	+8
Denmark	-0.5	11	3.4	11	0
Switzerland	-0.6	12	6.2	3	-9
Sweden	-0.6	13	4.0	9	-4
Norway	-0.7*	14	3.5	10	-4
Portugal	-0.9**	15	2.5	15	0
Belgium	-1.3**	16	2.5	15	-1
Japan	-1.3***	17	1.6	21	+4
USA	-1.4***	18	3.2	13	-5
Netherlands	-1.7***	19	3.4	11	-7
France	-1.8***	20	1.7	20	0
UK	-2.2***	21	2.3	17	-4

Notes : Residuals averages. From 1992 for Japan, from 1994 for Netherlands and Sweden, from 1996 for Belgium, Finland, Italia, Luxembourg, Portugal, Sweden and UK, from 1997 for Ireland and New-Zealand, from 1998 for Spain and 1999 for Austria. For 1992 and from 1996 for Canada, for 1991 and from 2000 for France, for 1991 and from 1994 for Norway, for 1991 and from 1995 for the USA.
*** significant at 1% level, ** at 5%, * at 10%.
Sources : Authors' calculations.

Our findings are broadly in line with other evidences. The relative openness of Austria, Spain, Germany and New Zealand and the restrictiveness of Netherlands, France and UK is well established in Roodman (2009) over the years 2000s. The openness of Germany is also documented in Ortega and Peri (2009). In some cases however, our results are quiet divergent. For example, contrarily to Roodman's Index, Italy is relatively open and the USA are relatively closed according to our policy indicator. These differences would be explained by the difference of methodology. Contrarily to Roodman's Index that is broadly based on observed inflows, we take into account the structural attractiveness to reveal the policy stance. Observed inflows are low in Italy (high in the USA), but the structural attractiveness of Italy is low (high for the USA), so that migration policy is in fact open in Italy (closed in the USA).

Figure 2 : Indicator of migration policy restrictiveness



Notes: A positive (negative) value means that the migration policy is relatively open (closed).
Sources: Authors' calculations.

4- Conclusion

Our indicator allows the comparison of migration policy restrictiveness between industrialized countries and over time. This quantitative, synthetic and relative indicator is an alternative to existing indicators of migration policy based on subjective assessments or on uncorrected observed migration flows. It allows a comparison of policies based on the overall impact of quantitative restrictions but also of integration policies (that affects the destination countries' attractiveness). This indicator shows that migration policy restrictiveness significantly differs between industrialized countries, and even between European Union countries. The most open countries appear to be Spain, Austria, Germany, New-Zealand, the most restrictive being Japan, the United States, the Netherlands, United Kingdom, and France.

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Appendix

Table 4: Definitions of the variables

Variables	Definitions	Sources of primary data
Migration inflows from developing countries	Ratio of migration inflows from developing countries to destination country population	OECD, The World Bank, Eurostat, National sources
Destination countries' income	Per capita GDP (PPP USD)	The World Bank
Origin countries' income	Average of Per capita GDP of the three closest developing regions.	The World Bank
Distance between destination and origin countries	Average of orthodromic distances between countries	CVN
Destination countries' trade openness	Ratio of import from and export to developing countries to destination country GDP	OECD, The World Bank
International language	Equal to 1 if an international language is spoken in the destination country (english, spanish or French), 0 otherwise.	
Stocks of migrants in destination countries	Ratio of the number of migrants from developing countries to destination countries population	OECD, The World Bank, Eurostat, National sources

Table 5: Indicator of migration policy restrictiveness
Random (GLS) vs fixed effects estimations

	Policy indicator		Policy indicator		Rank
	GLS		FIXED EFFECTS		difference
	value	rank	value	rank	GLS - FE
Spain	5.1***	1	6.8***	1	0
Austria	3.3***	2	4.5***	2	0
Germany	2.3***	3	3.9***	3	0
N.-Zealand	1.7***	4	2.7***	4	0
Luxembourg	1.6***	5	-2.6***	19	-14
Italy	0.9*	6	0.2	9	-3
Canada	0.5	7	2.2***	5	2
Australia	0.3	8	1.5**	6	2
Finland	-0.2	9	-1.2*	13	-4
Ireland	-0.2	10	-1.8**	18	-8
Denmark	-0.5	11	-1.2**	14	-3
Switzerland	-0.6	12	0.4	7	5
Sweden	-0.6	13	0.4	8	5
Norway	-0.7*	14	-3.1***	21	-7
Portugal	-0.9**	15	-0.1	10	5
Belgium	-1.3**	16	-0.9	12	4
Japan	-1.3***	17	-3.1***	20	-3
USA	-1.4***	18	-1.6**	16	2
Netherlands	-1.7***	19	-1.4**	15	4
France	-1.8***	20	-0.6	11	9
UK	-2.2***	21	-1.7**	17	4

Notes : Residuals averages. From 1992 for Japan, from 1994 for Netherlands and Sweden, from 1996 for Belgium, Finland, Italia, Luxembourg, Portugal, Sweden and UK, from 1997 for Ireland and New-Zealand, from 1998 for Spain and 1999 for Austria. For 1992 and from 1996 for Canada, for 1991 and from 2000 for France, for 1991 and from 1994 for Norway, for 1991 and from 1995 for the USA. *** significant at 1% level, ** at 5%, * at 10%.
Sources : Authors' calculations.