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Global competition for attracting talents and the world economy*

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We examine the effects of a worldwide liberalization of high-skilled migration on the spatial distribution of income. Using Gallup survey data, we first identify the origin and preferred destination of all college-educated potential migrants in the world. The analysis of this database reveals that Europe has been less effective than the US in mobilizing its potential high-skilled labor force, but is also globally less attractive. Hence, a fierce competition for attracting talents would have a limited impact on the income gap between the EU15 and the US, and would be more beneficial for Canada and Australia. European countries such as Austria, Belgium, Germany, Greece, Luxembourg and the Netherlands are less attractive and would see their income gap with the US increasing. We also show that liberalizing high-skilled migration would decrease income per worker in the developing world by 4.0 percent to 6.7 percent, although we account for a positive effect of skill-biased migration prospects on education decisions.

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LA FERDI EST UNE FONDATION RECONNUE D'UTILITÉ PUBLIQUE. ELLE MET EN ŒUVRE AVEC L'IDDRI L'INITIATIVE POUR LE DÉVELOPPEMENT ET LA GOUVERNANCE MONDIALE (IDGM). ELLE COORDONNE LE LABEX IDGM+ QUI L'ASSOCIE AU CERDI ET À L'IDDRI. CETTE PUBLICATION A BÉNÉFICIÉ D'UNE AIDE DE L'ÉTAT FRANÇAIS GÉRÉE PAR L'ANR AU TITRE DU PROGRAMME « INVESTISSEMENTS D'AVENIR » PORTANT LA RÉFÉRENCE « ANR-10-LABX-14-01 »

It has been abundantly documented that human capital is a key determinant of the "wealth of nations" and that the global competition to attract talents has intensified over recent decades (see Boeri et al., 2012). This is due to economic reasons such as skill-biased technical changes, growing specialization of developed countries in skill-intensive activities, shortage of supply of knowledge and entrepreneurial skills, which have translated into greater returns for skill and greater income inequality. It is also due to political reasons: the highly educated do not compete with nationals in their access to the welfare state and other public services, integrate faster in the labor market, and assimilate better in society. The competition to attract foreign talent is likely to get tougher in the coming decades. For example, Europe has launched a selective blue card and the United States has increased the number of H1B visas; in addition, a growing number of countries (UK, Germany, Switzerland, Netherlands, etc.) have already adopted isolated policy measures specifically aimed at attracting skilled workers. So far, the US has been leading the race, attracting PhD candidates and college graduates not only from emerging countries, but also from the 15 member states of the European Union (EU15) and other industrialized countries. This note investigates the worldwide implications of a fiercer competition for attracting talent. To address this issue, we need to understand the reasons for the US leadership. Are other regions, like the EU15, less attractive, or are differences in immigration policies responsible for the success of the US in attracting the brightest?

High-skilled migration and the spatial distribution of human capital

In Table 1, we compare the effective, desired and potential levels of net immigration (entries minus exits) of adult college graduates in 18 selected countries (EU15 member states, United States, Canada and Australia). These countries represented about 50 percent of the world aggregate income in 2000. Numbers are expressed as percentage of the native-born, college-educated population aged 25 and over.

In 2000, there were around 111.6 million adult migrants in the world, including 26 million college graduates (see Artuç et al., forthcoming). Actual migration increased the number of college graduates in the United States (+11.6 percent), Canada (+25.8 percent) and Australia (+51.9 percent). On the contrary, the EU15 exhibited a net deficit equal to 1 percent of the EU15-born, high-skilled labor force. In relative terms, the greatest losses were observed in Ireland, Portugal and Greece. On the contrary, net inflows were observed in Luxembourg, Sweden and the Netherlands. So far, the EU15 has attracted less high-skilled immigrants and has been unable to retain its college-educated workers.

Table 1. Net immigration aged 25+ in 18 selected countries (year 2000)

	Actual net immigration		Desired net immigration		Potential net immigration	
Country	**Size**	**Perc. Natives**	**Size**	**Perc. Natives**	**Size**	**Perc. Natives**
Austria	-40,528	-3.1%	128,646	+9.8%	88,117	+6.7%
Belgium	50,720	+2.6%	48,112	+2.5%	98,831	+5.1%
Denmark	-31,649	-3.8%	111,272	+13.3%	79,623	+9.5%
Finland	-54,206	-5.5%	218,774	+22.0%	164,568	+16.6%
France	232,408	+2.5%	1,157,422	+12.2%	1,389,830	+14.7%
Germany	-32,884	-0.2%	856,931	+5.6%	824,047	+5.3%
Greece	-113,817	-8.9%	120,153	+9.4%	6,336	+0.5%
Ireland	-120,321	-20.8%	80,386	+13.9%	-39,935	-6.9%
Italy	-289,039	-3.6%	529,638	+6.6%	240,599	+3.0%
Luxembourg	13,746	+19.8%	-2,531	-3.7%	11,215	+16.2%
Netherlands	114,907	+4.9%	180,212	+7.8%	295,119	+12.7%
Portugal	-132,344	-12.7%	50,891	+4.9%	-81,453	-7.8%
Spain	101,970	+2.4%	1,118,610	+26.1%	1,220,581	+28.5%
Sweden	108,164	+6.8%	484,657	+30.3%	592,821	+37.0%
United Kingdom	-378,139	-4.5%	807,729	+9.7%	429,590	+5.1%
Total EU15	-571,011	-1.0%	5,890,901	+10.2%	5,319,890	+9.3%
Australia	1,440,055	+51.9%	3,415,750	+123.1%	4,855,805	+175.0%
Canada	2,182,516	+25.8%	4,870,447	+57.5%	7,052,963	+83.3%
United States	9,784,006	+11.6%	5,227,830	+6.2%	15,011,836	+17.8%
Total 18	12,264,555	+5.8%	25,295,828	+12.0%	37,560,383	+17.8%

Source: Own calculations based on Artuç at al. (forthcoming) and Gallup (2012).

As for desired migration, we aggregate four (2007-2010) Gallup World Poll surveys. This unique and largely understudied survey allows us to identify the proportion and the characteristics of people who had not yet migrated but expressed a desire to leave their own country in the last decade. According to the Gallup World Poll survey, around 274.5 million additional adult workers would like to leave their country permanently if they had the opportunity, including 68.1 million college graduates. About 80 percent of them want to emigrate to an OECD, high-income country. These numbers, taken at face value, give an upper-limit for the demographic shock that a complete liberalization of high-skilled migration would induce. Letting these would-be migrants emigrate would reduce human capital inequality between the EU15 and the US: it would increase the number of college graduates by 10.2 percent in Europe, and by 6.2 percent in the US. The most attractive EU15 countries are Scandinavian countries, Spain, Ireland and France. On the contrary, countries such as Germany, Italy, Belgium and Portugal are less attractive.

Potential migration sums up effective and desired migration. The last two columns of Table 1 show that the EU15 is overall less attractive than the United States. Letting all potential high-skilled migrants move would increase the number of college graduates in the labor force by 17.8 percent in the US and by 9.3 percent in the EU15. So far, the EU15 has poorly benefited from this potential labor force while the US has mobilized a larger portion of it. European immigration policies have been inefficient in targeting would-be talented migrants.

The power of quantitative theory

To predict the effects on the world economy of an intensification of the competition for attracting talent, we need a model that accounts for the behavioral and general equilibrium responses to this shock. First, the recent literature has shown that emigration prospects and investments in education are closely linked; many case studies and empirical articles have shown that changes in migration prospects stimulate people to educate in middle-income and poor countries, where education is perceived as increasing the probability of getting a visa. Gradually, the newly educated individuals left behind and the new migrants who move from poor countries (where the access to and quality of the education system is low) to rich countries (where the access to and quality of the education system is high) change their fertility and their investment in the basic education of their children. In addition, movements of human capital can have big effects on cross-country disparities in total factor productivity (TFP), wages, and income inequality. Our model formalizes the interactions between migration and education decisions and extends the existing research based on static models (see Docquier et al., 2014).

Quantitative theory (i.e. properly parametrized, micro-based, general equilibrium models) is an ideal tool to capture the above-mentioned mechanisms and to predict the effects of a skill-selective liberalization of migration on human capital formation, geographic concentration of college-educated workers, and the world distribution of income. Here we use such a model with the following features:

– Individuals are heterogeneous in their ability to acquire tertiary education and in their migration taste, i.e. the preference for alternative locations. They maximize their well-being, deciding where to live, whether to invest in their own (higher) education, how much to consume, and how much to invest in the quantity and quality (i.e. basic education) of their children.
– The timing of decision is such that they decide whether to acquire higher education or not before discovering their migration taste. They acquire higher education if the expected benefits from college education exceed the training cost. Hence, global changes in migration policies (such as a skill-selective decrease in visa costs) affect the expected benefits from higher education and stimulate human capital formation.
– After education, each individual discovers his migration type and decides whether to remain in his country of birth or migrate to another destination. Destination choices are governed by differences in income and public policies. In particular, cross-country disparities in income, and the public provision and quality of basic education are important.
– Finally, education and migration decisions affect the size and the structure of the labor force in all countries, with strong implications for TFP and wages.

Our model is designed to match the current characteristics of the world economy. In particular, country-specific, technological parameters are chosen to perfectly fit the world distribution of income, i.e. cross-country disparities in GDP per capita, and within-country income differences between college graduates and the less educated. Preference parameters are in line with the empirical literature. Total migration costs are calculated as residuals of the "migration technology" so as to match the observed size and structure of each migration corridor. Legal/visa migration costs are inferred from the comparison between effective and potential migration data. Finally, the time-path of exogenous variables is chosen to fit the population projections of the United Nations for the 21st century (high-fertility variant).

In summary, our parametrized model (i) perfectly fits contemporaneous data on migration, education and income, (ii) matches official demographic projections, and (iii) matches the empirically estimated levels of the elasticity of migration to income and the average elasticity of college education investment to high-skilled emigration prospects. Inevitably, such a stylized model omits several important features of the real world (trade, unemployment, redistribution, etc.). However it accounts for the key interactions between human capital accumulation, migration and growth. We believe such a quantitative theory framework is an appropriate tool to predict the medium- and long-run impacts of migration policy reforms.

Competititon for attracting talent and economic leadership

We have simulated the effect of a complete removal of legal/visa migration costs for college graduates (not for the less educated). This is equivalent to implementing a point-based system, granting a permanent visa to each applicant with at least one year of college education. We considered a global shock, i.e. applied worldwide in all countries and assume the shock occurs in 2025 and is permanent (in the model, one period represents 25 years). We do not claim that such a complete and uncoordinated liberalization reform is a realistic or politically feasible scenario. Our objective is to shed light on the likely effects of an intensification of the global competition for talent on the world economy.

Table 2 gives the short-run and long-run effects (after 50 years) on income per worker for the same 18 selected countries as in Table 1. We distinguish between two scenarios, the benchmark one assumes exogenous TFP levels, and the second assumes that TFP levels increase with human capital (with a 0.32 elasticity of TFP to the proportion of college graduates in the labor force).

Table 2. Effect of a skill-selective liberalization on income per worker

	Short-run	Long-run	Short-run	Long-run
Country	**Benchmark**	**Benchmark**	**Endogenous TFP**	**Endogenous TFP**
Austria	+3.7	+4.7	+7.5	+9.4
Belgium	+2.2	+4.4	+3.6	+7.7
Denmark	+6.4	+9.9	+13.3	+18.7
Finland	+12.5	+17.4	+20.4	+25.9
France	+6.1	+9.1	+11.3	+16.6
Germany	+3.1	+4.3	+6.2	+8.5
Greece	+3.0	+5.1	+7.2	+10.7
Ireland	+7.3	+12.7	+13.6	+21.2
Italy	+3.0	+6.6	+5.8	+12.0
Luxembourg	-0.3	+2.5	-1.3	+3.7
Netherlands	+3.0	+3.3	+6.4	+6.3
Portugal	+3.0	+10.6	+5.4	+18.9
Spain	+8.3	+13.5	+19.1	+27.4
Sweden	+13.3	+14.2	+25.2	+24.7
United Kingdom	+8.1	+15.1	+18.3	+29.2
Average EU15	+5.3	+8.8	+11.0	+16.6
Australia	+33.3	+15.8	+57.2	+22.9
Canada	+31.1	+16.0	+42.8	+20.2
United States	+5.7	+5.9	+7.6	+7.5
Average 18	+7.5	+7.8	+12.1	+12.3

Globally, we find that a complete liberalization of high-skilled migration would benefit the EU15 (+8.8 percent) more than the United States (+5.9 percent) in the long-run when TFP is exogenous. Several additional results emerge. Firstly, the gains among Europeans are unequally distributed. They would be smaller than the US gains in some countries (Austria, Belgium, Germany, Greece, Luxembourg and the Netherlands), and greater in others (Scandinavian countries, UK, Ireland Portugal and Spain). Secondly, with endogenous TFP, the difference between the EU15 and the US becomes even larger in the long-run (+16.6 percent in the EU15 vs +7.5 percent in the US). Thirdly, a complete liberalization of mobility would not reverse the economic leadership. The average income per worker in the US ex-

ceeds the average European level by about 60 percent, even with endogenous TFP, only a limited portion of this gap would be removed.

Effect on developing countries and global inequality

A global liberalization of high-skilled migration would increase the average emigration rate of college graduates by 15 percent in developing countries (from 11.6 percent to 26.6 percent). The largest change would be observed in the poorest regions such as sub-Saharan Africa (+23.2 percentage points) and Middle-East & Northern Africa (+18.9 percentage points); it would be smaller in middle-income or emerging regions such as China and India (+11.0 percentage points) and the Commonwealth of Independent States (+12.4 percentage points). Table 5.3 reports the effects of the shock on income per worker in the developing world, and income per natural (average income of all native-born adults from a given region, wherever they reside). We distinguish between three scenarios, one with exogenous TFP and endogenous education choices ("Benchmark"), one with exogenous TFP and constant education ("Constant education"), and one with endogenous TFP and education ("Endogenous TFP").

In the first scenario, the least pessimistic one for developing countries, income per worker in developing countries decreases by 4.0 percent. The largest effects are obtained in Middle-East & Northern Africa, and in Latin America and the Caribbean. This scenario takes into account the fact that skill-biased emigration prospects increase the expected returns to schooling and stimulate ex-ante investments in human capital. We disregard this effect in the second scenario and obtain similar (although more pessimistic) results. Hence, endogenizing education reduces the loss for developing countries, but the brain drain shock is too large to generate net "brain gain" effects. Not surprisingly, the adverse effect on income per worker is magnified under endogenous TFP.

Table 3. Long-run effect of a liberalization on developing countries

	Income per worker			Income per natural		
	Benchmark	Constant education	Endogenous TFP	Benchmark	Constant education	Endogenous TFP
Developing countries	-4.0%	-4.9%	-6.7%	5.3%	3.4%	5.2%
China and India	-1.6%	-2.2%	-2.5%	5.3%	4.1%	5.8%
Middle East and Northern Africa	-7.5%	-8.9%	-13.1%	6.9%	4.2%	7.5%
Rest of Asia	-3.5%	-4.4%	-5.4%	3.9%	2.4%	4.2%
Latin America and Caribbean	-5.0%	-6.1%	-7.5%	2.6%	1.1%	1.8%
Sub-Saharan Africa	-1.7%	-3.8%	-4.0%	12.0%	7.1%	13.0%
Commonwealth of Indep. States	-3.1%	-3.6%	-4.6%	7.6%	6.6%	7.7%

A different picture is obtained when focusing on income per natural. The income gain experienced by the new migrants exceeds the income loss for those left behind. Income per natural increases by 3.4 percent to 5.3 percent in the developing world. The rise is big in sub-Saharan Africa. Hence, the inequality and poverty implications of a complete liberalization of high-skilled migration are a priori uncertain. A Pareto-improving situation can be obtained if new college-educated migrants remit a large share of the income gain to the less educated left behind (i.e. emigrants share part of their in-

crease in income with non-migrants). Such an outcome is unlikely to be observed because on average, actual migrants only remit 3 percent to 4 percent of their income, and this propensity to remit may become even smaller as the ratio of emigrant-to-stayer increases. Disregarding remittances, poverty would increase in the developing world and the world Theil index would increase by 3.5 percent.

References

- **Artuç, E.**, **Docquier F.**, **Özden Ç.**, **Parsons C.** (2014). A global assessment of human capital mobility: the role of non-OECD destinations. *World Development*, forthcoming.
- **Boeri, T.**, **Brücker H.**, **Docquier F.**, **Rapoport H.** (2012): *Brain drain and brain gain: the global competition to attract high-skilled migrants*. Oxford University Press: Oxford UK.
- **Delogu, M.**, **Docquier F.**, **Machado J.** (2013): The dynamic implications of liberalizing global migration, *IRES Discussion Paper* n. 2013-029: Université Catholique de Louvain.
- **Docquier, F.**, **Machado J.**, **Sekkat K.** (2014): Efficiency gains from liberalizing labor mobility, *Scandinavian Journal of Economics*, forthcoming.
- **Esipova, N.**, **Ray J.**, **Srinivasan R.** (2011). *The World's Potential Migrants. Who They Are, Where They Want to Go, and Why It Matters*. Gallup, Inc: Washington DC.

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