

Remittances and the Brain Drain Revisited: The Microdata Show That More Educated Migrants Remit More

Albert Bollard, David McKenzie, Melanie Morten, and Hillel Rapoport

Two of the most salient trends in migration and development over the last two decades are the large rise in remittances and in the flow of skilled migrants. However, recent literature based on cross-country regressions has claimed that more educated migrants remit less, leading to concerns that further increases in skilled migration will impede remittance growth. Microdata from surveys of immigrants in 11 major destination countries are used to revisit the relationship between education and remitting behavior. The data show a mixed pattern between education and the likelihood of remitting, and a strong positive relationship between education and amount remitted (intensive margin), conditional on remitting at all (extensive margin). Combining these intensive and extensive margins yields an overall positive effect of education on the amount remitted for the pooled sample, with heterogeneous results across destinations. The microdata allow investigation of why the more educated remit more, showing that the higher income earned by migrants, rather than family characteristics, explains much of the higher remittances. remittances, migration, brain drain, education JEL codes: O15, F22, J61

Two of the most salient trends in migration and development over the last two decades are the large rise in remittances and in the flow of skilled migrants. Officially recorded remittances to developing countries have more than tripled over the last decade, rising from \$85 billion in 2000 to \$305 billion in 2008

Albert Bollard (abollard@stanford.edu) is a PhD student at Stanford University. David McKenzie (dmckenzie@worldbank.org; corresponding author) is a senior economist in the Finance and Private Sector Research Unit of the Development Research Group at the World Bank. Melanie Morten (morten@yale.edu) is a PhD student at Yale University. Hillel Rapoport (hillel@mail.biu.ac.il) is professor of economics at Bar Ilan University and at EQUIPPE, University of Lille and is currently a visiting research fellow at the Center for International Development at Harvard University. The authors are grateful for funding for this project from the Agence Française de Développement (AFD). They thank all the individuals and organizations that graciously shared their surveys of immigrants, and they are grateful to Michael Clemens, participants at the 2nd Migration and Development Conference held at the World Bank in September 2009, three anonymous referees, and the journal editor for helpful comments. All opinions are those of the authors and do not necessarily represent those of AFD or the World Bank. A supplemental appendix to this article is available at <http://wber.oxfordjournals.org>.

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(World Bank 2008, 2009). The number of highly educated migrants from developing countries residing in Organisation for Economic Co-operation and Development (OECD) countries doubled over 1990–2000 (Docquier and Marfouk 2005) and likely has grown since then as developed countries have increasingly pursued skill-selective immigration policies.¹

However, despite this positive association at the global level between rising remittances and rising high-skill migration, there are concerns—stemming from the belief that more educated individuals may remit less—that increasingly skill-selective immigration policies may slow or even end the rise in remittances. This belief is taken as fact by many; for example, an OECD (2007, p. 11) report says that “low skilled migrants tend to send more money home.” The main empirical evidence to support this assertion across a range of countries comes from two recent studies (Faini 2007; Niimi, Özden, and Schiff forthcoming) whose cross-country macroeconomic analyses find that the highly skilled (defined as those with tertiary education) remit less.

Yet there are many reasons to question the results of these cross-country estimations. Both studies relate the amount of remittances received at a country level to the share of migrants with tertiary education, at best telling us whether countries that send a larger share of highly skilled migrants receive less or more in remittances than countries that send fewer skilled migrants. The studies do not answer the factual question of whether more educated migrants remit more or less. There are a host of differences across countries that could cause a spurious relationship to appear between remittances and skill level across countries. For example, if poverty is a constraint to both migration and education, richer developing countries might be able to send more migrants (yielding more remittances) and those migrants might also have more schooling. Faini (2007) treats the share of migrants who are skilled as exogenous. Niimi, Özden, and Schiff (forthcoming) try to instrument for the education mix of migrants, but their instruments seem unlikely to satisfy the exclusion restrictions. For example, public spending on education is likely a function of a country’s overall institutional and economic development, which should independently affect the incentive to remit; migrants might send money to overcome poor public spending or for investment when complementary infrastructure and institutions are in place.

This article revisits the relationship between remittances and education level using microdata that permit computing the association between a migrant’s education level and remitting behavior. The authors assembled the most comprehensive micro-level database on remitting behavior currently available, comprising data on 33,000 immigrants from developing countries from 14 surveys

1. In contrast, the number of low-skill migrants (primary education or less) increased only 15 percent over the period. Immigration to OECD countries (as defined by the number of foreign born) was estimated at 90 million in 2000, about half of total world migration. Of the 90 million immigrants, 60 million were ages 25 or older and were split equally across education categories (primary, secondary, and tertiary; Docquier and Marfouk 2005).

in 11 OECD destination countries. The analysis begins by establishing the factual relationship between the propensity to remit and education. No attempt is made to estimate the causal impact of education on remittances.² From a policy perspective, the concern is whether migration policies that shift the education composition of migrants affect remittances, not whether education policies that change how much education individuals have affects remittances. Microdata enables asking whether more educated individuals are more or less likely to remit (the extensive margin) and whether they send more or less remittances if they do remit (the intensive margin). A mixed association is found between education and remittances at the extensive margin, and a strong positive relationship at the intensive margin. Combining both the extensive and intensive margins reveals that, at least in this large sample, more educated migrants do remit significantly more—migrants with a university degree remit \$300 more yearly than migrants without a university degree, where the mean annual remittance over the entire sample is \$730.

The article is organized as follows. Section I summarizes several theories of remitting behavior and the predictions they give for the relationship between education and remittances. Section II then describes the dataset of immigrant surveys with remittances. Section III provides results, and section IV draws some implications.

I. THEORETICAL BACKGROUND

Theoretically, there are several reasons to believe that there will be differences in the remitting patterns of highly skilled and less-skilled emigrants. However, a priori, it is not clear which direction will dominate and thus whether the highly skilled will remit more or less on average. On the one hand, several factors tend to lead highly skilled migrants to be more likely to remit and to send a larger amount of remittances. First, highly skilled individuals are likely to earn more as migrants, potentially increasing the amount they can remit. Second, their education may have been funded by family members in the home country, with remittances serving as repayment. Third, skilled migrants are less likely to be illegal migrants and more likely to have bank accounts, lowering the financial transaction costs of remitting. On the other hand, several other factors might lead highly skilled migrants to be less likely to remit and to remit less. First, highly skilled migrants may be more likely to migrate with their entire household, so they would not have to send remittances in order to share their earnings with their household. Second, they might come from richer households, which have less need for remittances to alleviate liquidity constraints. Third, they might have less intention of returning to their home country, reducing the role of remittances as a way of maintaining prestige and ties to the home community.

2. Convincing instruments are lacking to identify this impact.

Before turning to the empirical analysis, it is useful to clarify the theoretical relationship between education and remittances and the implied testable predictions about education. This will allow identifying the role of several variables that, once interacted with education and various possible motivations to remit, have the potential to explain differences in remitting behavior by education level. The discussion is limited to three possible motives for remittances: altruism, exchange, and investment. These were selected for general empirical relevance and as the motives through which education is most likely to affect remittances.³

Altruism

Altruistic preferences are generally captured by weighting one's own (the migrant's) and others' (relatives) consumption in an individual utility function, with weights reflecting the individual's degree of altruism, which can itself depend on the closeness among the relatives considered (both family and geographic proximity). For given weights and initial distribution of income, altruistic individuals maximize their utility by transferring (remitting) income so as to reach the desired distribution between themselves and the beneficiaries of their altruism. Altruistic transfers take place if pretransfer income differences are sufficiently large or altruism is strong enough and increases with the donor's income (the extensive margin) and decreases with the recipients' income (the intensive margin)

What does this basic theoretical framework imply for the comparative remitting behavior of highly educated and less well educated migrants? First, educated migrants tend to earn more, which all else equal should induce more remittances (at both margins). Second, the conventional wisdom is that educated migrants tend to have more family members with them because of a higher propensity to move with their immediate family, which all else equal should lower remittances.⁴ Methodologically, this suggests that the location and composition of the family (which fraction of the family accompanies the migrant and which fraction stays in the country of origin) is jointly determined with remittances. This makes it difficult to estimate the causal impact of family composition on remittances. Instead, the analysis simply looks at whether differences in remitting patterns by education level disappear when they are conditioned on family composition. Empirically, the analysis will show that while less educated migrants have more relatives in the home country, they also have larger households and more relatives with them in the destination country.

3. See Rapoport and Docquier (2006) for a comprehensive survey of the economic literature on migrants' remittances.

4. In this basic framework, education has no impact beyond its effect on the migrants' income and family size, composition, and location, and altruistic preferences are independent of education.

Exchange and Investment Motives

There are many situations of Pareto-improving exchanges in which remittances “buy” various types of services, such as taking care of the migrant’s assets (land and cattle, for example) or relatives (children, elderly parents) at home. Such motivations are generally a sign of temporary migration and signal a migrant’s intention to return. In such exchanges, there is a participation constraint determined by each partner’s external options, with the exact division of the pie (or surplus) to be shared depending on each partner’s bargaining power.

How does education interact with such exchange motives? Two directions emerge from the short discussion above: one through the effect of education on intentions to return, and another through education’s effect on threat points and bargaining powers.

The conventional wisdom is that migrants with higher education have less intention (and propensity) to return than do migrants with lower education (see [Faini 2007](#)), because they are better integrated or can obtain permanent resident status more easily. If that is the case, more educated migrants should transfer less for an exchange motive, reflecting their lower propensity to return.⁵ What about bargaining powers? Exchange models allow for different possible contractual arrangements reflecting the parties’ outside options and bargaining powers (see, for example, [Cox 1987](#); [Cox, Eser, and Jimenez 1998](#)). This has two complementary implications for education as a determinant of remittances in an exchange model. First, to the extent that education is associated with higher income, this relationship is likely to increase a migrant’s willingness to pay, leading to higher remittances; and second, to the extent that educated migrants come from more affluent families, this relationship is likely to increase the receiving household’s bargaining power, also leading to higher remittances. On the whole, an exchange motive therefore predicts that education will have an ambiguous effect on remittances, with the sign of the effect depending on whether return intentions or bargaining issues matter more to remittance behavior.

The investment motive can be seen as a particular exchange of services in a context of imperfect credit markets. In such a context, remittances can be seen as part of an implicit migration contract between migrant and family, allowing the family access to higher income (investment motive) or less volatile income (insurance motive; [Stark 1991](#)). Since the insurance motive does not in theory give rise to clear differences in transfer behavior between highly educated and less educated migrants, the focus here is on the investment motive. The amount of investment financed by the family may include the physical costs (such as transportation) and informational costs of migration, as well as education expenditures, and repayment of this implicit loan through remittances is obviously expected to depend on the magnitude of the loan. Thus, the

5. Again, as shown later in the article, this conventional wisdom is not supported by the data; exchange motives are equally relevant for highly educated and less educated migrants as far as return intentions are concerned.

investment motive clearly predicts that, all else equal, more educated migrants should remit more to compensate the family for the additional education expenditures incurred.

Summary of Predictions

Both the altruistic and the exchange motives for remittances yield unclear theoretical predictions as to whether more educated migrants remit more or less than do less education migrants. Once migrants' incomes are controlled for, their education level should not play a role under the altruistic hypothesis (assuming preferences are exogenous to education) except for its effect on the spatial distribution of the family. As already noted, the conventional wisdom here is that the highly educated tend to move with their immediate family, which would lower remittances. Similarly, education is expected to lower remittances under the exchange hypothesis if educated migrants have lower propensities to return; bargaining mechanisms work in the other direction and should translate into higher remittances, with the sign of the total expected effect being theoretically uncertain. Finally, education is likely to have a clear positive impact on remittances under the investment hypothesis.

Given these expected mechanisms and the fact that the descriptive statistics for the sample do not support the conjecture that more educated migrants have a substantially higher propensity to move with their family or a substantially lower propensity to return, the other forces at work should be expected to dominate, so that migrants with more education would remit more, which is indeed what the analysis shows.

II. DATA

The micro-level database on remitting behavior created for this study is the most comprehensive available, comprising data on 33,000 immigrants from developing countries derived from 14 surveys in 11 OECD destination countries that were the destination for 79 percent of global migrants to OECD countries in 2000 (Docquier and Marfouk 2005). The focus on destination country data sources enables looking directly at the relationship between education and remittance sending behavior by analyzing the migrants' decision to remit. It also permits capturing the remittance behavior of individuals who emigrate with their entire household; using household surveys from the remittance receiving countries would typically miss such individuals. Since more educated individuals are believed to be more likely to emigrate with their entire household than less educated individuals (Faini 2007), using surveys from migrant sending countries would not be appropriate for examining the relationship between remittances and education.

Most of the empirical literature on immigrants uses data from censuses or labor force surveys, but neither contains information on remittances. That

requires special purpose surveys of immigrants. The authors pulled together all publicly available datasets they were aware of⁶ and six additional surveys that are not publicly available but that other researchers generously shared. Table 1 provides an overview of the database of migrants, summarizing the datasets, sample population, and survey methodology. Full details of the source of each dataset are in the supplemental appendix, available online at <http://wber.oxfordjournals.org/>. The database covers a wide range of populations. It includes both nationally representative surveys, such as the New Immigrant Survey (NIS) in the United States (drawn from green card recipients) and the Spanish National Survey of Immigrants (ENI), which draws on a neighborhood sampling frame, as well as surveys focusing on specific migrant communities within the recipient country, such as the Black/Minority Ethnic Survey (BME) in the United Kingdom and the Belgium International Remittance Senders Household Survey (IRSHS) of immigrants from the Democratic Republic of Congo, Nigeria, and Senegal. In all cases, the database includes only migrants who were born in developing countries.⁷

For each country dataset, comparable covariates were constructed to measure household income, remittance behavior, family composition, and demographic characteristics. Remittances are typically measured at the household rather than individual level. The level of analysis is therefore the household, and variables are defined at this level whenever possible—for example, by taking the highest level of schooling achieved by any adult migrant in the household. All financial values are reported in 2003 U.S. dollars. In addition, any reported annual remittances that are more than twice annual household income are dropped. While remittance data in surveys can be subject to measurement error, the use of survey fixed effects will capture any common survey-level effects, and there is no strong reason to believe such measurement error would be correlated with education status. Mean and median reported remittances also seem to be of the right order of magnitude when compared with other surveys and migrant incomes.

The sample weights provided with the data are always used. Data are pooled by poststratifying by country of birth and by education, so that the combined weighted observations match the distribution of developing country migrants to all OECD countries in 2000 (Docquier and Marfouk 2005). The supplemental appendix provides further details.

Table 2 presents summary statistics for each country survey and the pooled samples of all destination countries. Overall, 37 percent of migrants in the database have completed a university degree, ranging from 4 percent in the Spanish Netherlands Interdisciplinary Demographic Institute (NIDI) survey to

6. Exceptions include longitudinal surveys of immigrants from Canada and New Zealand, which can only be accessed through datalabs in these countries, and so are not included here.

7. High income countries are defined based on the World Bank Country Classification Code, April 2009.

TABLE 1. Migrant Datasets

Dataset	Name	Year	Number of observations ^a	Population	Methodology
Australia LSIA	Longitudinal Survey of Immigrants to Australia	1997	2,537	Primary applicant migrant arrivals September 1993–August 1995	Sample of official records of those living in cities
Belgium IRSHS	International Remittance Senders Household Survey	2005	377	Immigrants from DR Congo, Nigeria, and Senegal	Referrals through Embassies.
France 2MO	Survey of Households' Transfer of Funds to their Countries of Origin	2007	713	Remitters to Algeria, Morocco, Tunisia, Turkey and the countries of Sub-Saharan Africa	Interviews of remitters at post offices in high-migrant regions
France DREES	Profile and Tracking of Migrants Survey	2006	4,278	New and regularized migrants with 1+ year residence permits	Sample of official records
Germany SOEP	German Socio-Economic Panel Study	2000	854	Resident population of the Federal Republic of Germany in 1984.	Sample of official records
Italy NIDI	Netherlands Interdisciplinary Demographic Institute	1997	1,072	Egyptians and Ghanaians who immigrated within past 10 years	Interviews at migrant meeting places
Japan IDB	Survey of Brazilians and Peruvians in Japan	2005	846	Latin American immigrant adults living in Japan	Interviews in 15 cities
Netherlands CSR	Consumentenbond Survey of Remittances	2005	648	Major immigrant populations: Moroccans, Turks, Surinamese, Antilleans, Somalis, and Ghanaians	Face-to-face interviews
Norway LKI	Living Conditions of Immigrants Survey	1996	2,466	Immigrants from 10 countries: Bosnia and Herzegovina, Chile, Iraq, Iran, Pakistan, Serbia, Somalia, Sri Lanka, Turkey, and Vietnam	Representative survey of immigrant population from these countries
Spain ENI	National Survey of Immigrants	2006	9,234	Foreign-born who (intend to) live in Spain for 1+ years	Sample of official neighborhood rosters

(Continued)

TABLE 1. Continued

Dataset	Name	Year	Number of observations ^a	Population	Methodology
Spain NIDI	Netherlands Interdisciplinary Demographic Institute	1997	1,020	Moroccans and Senegalese who immigrated within past 10 years	Geographical sampling, & references from sampled
UK BME	International Migration Survey	2006	993	Migrant minorities who have returned in past 12 months	Sampling of geographical blocks
U.S. NIS	Black/Minority Ethnic Remittance Survey	2003	7,046	Migrants receiving green cards	Sample of official records
	New Immigrant Survey	2006	1084	May–November 1993	Sampled phone numbers in high-Latino areas
	Pew National Survey of Latinos	2006	1,084	Nationally representative sample of Latino respondents ages 18 and older	Sampled phone numbers in high-Latino areas
U.S. Pew	Pew National Survey of Latinos	2006	1,084	Nationally representative sample of Latino respondents ages 18 and older	Sampled phone numbers in high-Latino areas

Note: Number of observations used to calculate the first result in each column of table 2.

TABLE 2. Survey Means, by Education

Variable and education level	Australia LSIA	Belgium IRSHS	France 2MO DREES	France 2MO DREES	Germany SOEP	Italy NIDI	Japan IDB	Netherlands CSR	Norway LBI	Spain ENI	Spain NIDI	UK BME	U.S. NIS	U.S. Pew	Pooled Extensive	Pooled Intensive	Pooled Total
Number of observations	2,656	451	717	4,280	900	1,153	1,065	836	2,466	10,282	1,113	1,152	7,352	1,304	33,022	28,981	26,276
Fraction with university education	0.32	0.59	0.07	0.18	0.20	0.21	0.14	0.11	0.12	0.23	0.04	0.20	0.34	0.06	0.36	0.37	0.37
Total remittances (\$ per year)																	
No university	286	1,681	1,380		368	2,724	2,662	993	988	988	3,099	2,691	375	1,530	699	793	650
University	379	2,475*	1,652		511	2,227	2,920	1,405*	743**	743**	2,835	2,629	1,145**	671**	868	897	874
Fraction who remit																	
No university	0.41	0.91		0.23	0.18	0.60	0.80		0.34	0.49	0.78		0.15	0.54	0.31	0.32	0.32
University	0.37	0.86		0.23	0.20	0.45**	0.90**		0.29	0.37**	0.48**		0.17	0.43	0.27**	0.27**	0.27**
Log remittances																	
No university	5.78	6.92	6.62		6.97	7.89	7.76	6.49	7.15	7.15	7.99	6.77	7.01	7.34	6.96	6.82	6.91
University	6.23**	7.29**	6.92		7.01	8.11	7.70	6.81**	7.22	7.22	8.49*	6.92	7.40**	6.97	7.02	6.97*	7.00
Household income (\$ per year)																	
No university	14,457	16,918	23,173	18,612	19,526	10,903	34,014		32,467	14,066	9,074	44,631	33,297	22,417	22,624	23,583	21,964
University	13,556	25,534**	31,301*	28,674**	21,984	13,302*	43,624**		41,995**	19,914**	10,168	50,565	61,084	34,729**	38,948**	38,669**	39,087**
Log income																	
No university	9.5	9.5	9.8	9.6	9.8	9.3	10.2		10.1	9.4	9.0	10.3	9.2	9.7	9.6	9.5	9.5
University	9.8**	9.8**	10.0	9.9**	9.8	9.4	10.4		10.3**	9.7**	9.2	10.4	10.0**	10.2**	9.9**	9.9**	9.9**
Working																	
No university	0.48	0.70	0.87	0.80	0.63	0.82	0.93		0.48	0.68	0.81	0.82	0.66	0.66	0.65	0.66	0.64
University	0.67**	0.74	0.86	0.86**	0.67	0.87	0.93		0.70**	0.73**	0.66	0.90**	0.78**	0.77*	0.75**	0.74**	0.73**
Household size																	
No university	3.81	1.88		2.51	2.90	1.80			1.53	3.82	1.84	3.33	4.10		3.44	3.73	3.76
University	3.44**	2.55**		1.90**	2.58	2.16**			1.76**	3.19**	1.95	3.04*	3.49**		3.17**	3.35**	3.36**
Married																	
No university	0.73		0.72	0.65	0.67	0.61			0.56	0.47	0.64		0.66	0.54	0.63	0.63	0.63
University	0.80**		0.51**	0.71*	0.59	0.60			0.48*	0.56**	0.51		0.86**	0.56	0.73**	0.74**	0.74**
Spouse outside country																	
No university	0.03					0.25			0.05	0.06	0.42		0.05		0.05	0.05	0.06
University	0.01*					0.19			0.01**	0.05	0.10**		0.03**		0.03**	0.03**	0.03**
Number of children																	
No university	1.29		1.16	1.78	1.78	1.06			2.50	2.06	1.58		2.25	2.37	1.99	2.05	2.03
University	1.22		0.89**	1.27**	1.00	1.00			2.15**	1.85**	0.62**		1.35**	1.81**	1.37**	1.37**	1.37**
Children outside country																	
No university	0.21		0.10	0.25	0.71	0.71	0.20		0.16	0.38	1.10		0.73	0.49	0.45	0.48	0.50
University	0.07**		0.06	0.17**	0.49*	0.49*	0.15		0.09	0.26**	0.21**		0.31**	0.37	0.24**	0.25**	0.25**
Number of parents																	
No university	1.97				1.13	0.95			1.35	1.42	1.27		2.18		1.81	1.84	1.83

(Continued)

TABLE 2. Continued

Variable and education level	Australia LSIA	Belgium IRSHS	France 2MO	France DREES	Germany SOEP	Italy NIDI	Japan IDB	Netherlands CSR	Norway LEI	Spain ENI	Spain NIDI	UK BME	U.S. NIS	U.S. Pew	Pooled Extensive	Pooled Intensive	Pooled Total
University	2.32**				1.03	0.70**			1.32	1.35**	1.37		2.74**		2.18**	2.21**	2.23**
Parents outside country																	
No university	1.48		0.81		0.42	0.94			1.03	1.01	1.23		0.88		0.98	0.98	1.00
University	2.00**		0.88		0.54	0.67**			1.17*	1.04	1.33		1.26**		1.30**	1.31**	1.31**
Years spent abroad																	
No university	3.70	9.32	17.90	4.00	19.20	6.69	8.35	18.46		10.06	7.27	14.89	7.35	16.43	9.20	11.17	10.29
University	3.91**	12.28**	12.70**	4.21	13.51**	7.02	9.18	19.36		12.41**	6.74	14.66	7.05	18.34	8.06**	8.73**	8.40**
Legal immigrant																	
No university	1.00			1.00		0.84				0.51	0.66		1.00		0.87	0.84	0.85
University	1.00			1.00		0.85				0.39**	0.82*		1.00		0.85**	0.84	0.84
Will return home																	
No university	0.02		0.45	0.06	0.23	0.39			0.01	0.08	0.35	0.63	0.09	0.19	0.09	0.16	0.11
University	0.04		0.65**	0.10*	0.17	0.53**			0.02	0.08	0.51	0.70	0.13**	0.14	0.09	0.12**	0.09*

*Significant at the 5 percent level ** significant at the 1 percent level

Note: Significant results indicate that the mean of the variable is statistically different between university-educated and non-university educated households. See table 1 for full survey names.

Source: Authors' analysis based on data described in the text.

59 percent in the Belgium IRSHS. The table also summarizes the covariates by the maximum educational attainment of all adult migrants in the household. Altogether, including both the extensive and intensive margins, more highly educated migrants send home an average of \$874 annually, compared with \$650 for less educated migrants. There are two opposing effects of education: negative on the extensive margin, and positive on the intensive margin. At the extensive margin, migrants with a university degree are less likely to remit anything than migrants without a degree: 32 percent of low-skilled migrants send some money home, compared with 27 percent of university-educated migrants. However, conditional on remitting (the intensive margin), highly educated migrants send about 9 percent more than do less educated migrants.

Characteristics that can affect remittance behavior differ between less and more educated migrants. First, more skilled migrants are both more likely to live in a household with working adults and to have a higher household income than are low skilled migrants. But contrary to conventional wisdom, household composition does not differ much for migrants by education level: on average, only 6 percent of low skilled migrants have a spouse outside the country, compared with 3 percent of high skilled migrants. Low skilled migrants are significantly less likely to be married (63 percent) than are high skilled migrants (74 percent). Low skilled migrants have more children (an average of 2.03 compared with 1.37 for high skilled migrants), as well as more children living outside the destination country (0.50) than do high skilled migrants (0.25). However, low skilled migrants also have more family inside the destination country than do high skilled migrants: the average household size for low skilled migrants is 3.76 people, statistically different from the mean household size of 3.36 people for high skilled migrants.⁸

Another piece of conventional wisdom, that more educated people are less likely to return home, is also not supported by the microdata. Indeed, more educated migrants have spent less time abroad (mean of 8.4 years) than have less educated migrants (10.3 years). Reported plans to return home are similar between the two groups: 9 percent of high skilled migrants report planning to return home, compared with 11 percent of low skilled migrants. While one should be cautious with treating both measures as truly reflecting return probabilities; at the very least, they do not indicate a strong tendency for the low skilled to be more likely to return.

The simple comparison of means in table 2 shows differences in remittance behavior by education status. However, these comparisons show only that more educated developing country emigrants remit more than less educated developing country emigrants. This risks confounding differences in remittance

8. In some cases this might reflect households in which poorer, less skilled migrants live with other immigrants who are not family members. The database can identify the presence of a spouse, child, or parent in the home country household but cannot identify who migrants live with abroad or the extent to which they share resources within the household abroad.

behavior among migrants from different countries with differences in remittance behavior by education level: the next section aims to separate these two differences.

III. RESULTS: THE RELATIONSHIP BETWEEN EDUCATION AND REMITTANCES

Results are reported for regressions of three remittance measures on education: total remittances (both extensive and intensive margins), an indicator for having remitted in the previous year (extensive margin), and log total remittances conditional on remitting (intensive margin; table 3). All regressions include country of birth fixed effects and dataset fixed effects.

The key result is that more educated migrants remit more. In the pooled sample, migrants with a university degree remit \$298 more per year than non-university educated migrants (row last, last column), with a mean annual remittance for all migrants of \$734. This overall effect is composed of a negative (statistically insignificant) effect at the extensive margin and a highly significant positive effect at the intensive margin. The results are consistent when the second measure of education, years of schooling, is considered.

Results for individual countries are mixed at the extensive margin, with education significantly positively associated with the likelihood of remitting in two surveys (the U.S. NIS and the Survey of Brazilians and Peruvians in Japan), significantly negatively associated with this likelihood in three surveys (the U.S. Pew survey and both Spanish surveys), and no significant relationship in the other six surveys, with three positive and three negative point estimates. One general observation is that a more negative relationship appears in surveys that focus on sampling migrants through community-sampling methods, such as the NIDI surveys, which take their sample from places where migrants cluster, and the Pew Hispanic surveys, which randomly dial phone numbers in areas with dense Hispanic populations. One might expect that educated migrants who live in such areas (and who take the time to respond to phone or on-the-street surveys) would be less successful than educated migrants who live in more integrated neighborhoods and thus who would not be picked up in these surveys.

In contrast, at the intensive margin, 10 of 12 individual surveys show a positive relationship between remittances and education, 5 of them statistically significant, and 2 show a negative and insignificant relationship. Thus it is not surprising that when the data are pooled there is a strong positive association at the intensive margin and that it outweighs the small negative and insignificant relationship at the extensive margin in the total effect.

This point is made graphically on a log scale in figure 1, which plots the nonparametric relationship between total remittances and years of schooling, after linearly controlling for dataset fixed effects using a partial linear model (Robinson 1988), together with a 95 percent confidence interval. The vertical lines demarcate the quartiles of years of schooling. Average remittances steadily

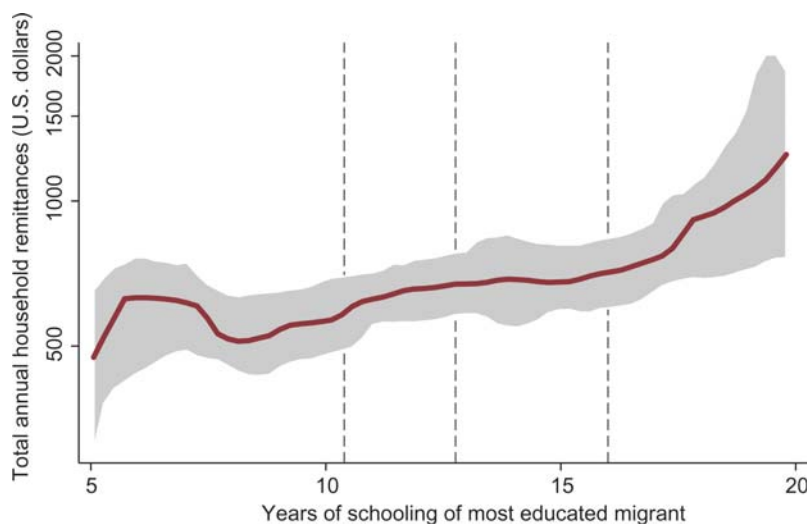
TABLE 3: Coefficients from Regressions of Remittance Measures on Education

Variable	Australia LSIA	Belgium IRSHS	France 2MO	France DREES	Germany SOEP	Italy NIDI	Japan IDB	Netherlands CSR	Norway LBI	Spain ENI	Spain NIDI	UK BME	U.S. NIS	U.S. Pew	Pooled Extensive	Pooled Intensive	Pooled Total
Education measured by university degree																	
Total remittances (\$ per year)	58.4	922.8**			291.0	-526.6	237.5			-92.6	-168.8		769.5**	-554.0*			298.0*
Number of observations	2,537	377			854	1,072	846			9,234	1,020		7,046	1,084			24,033
Extensive: Remits indicator	-0.019	-0.055		0.014	0.042	-0.065	0.091**		0.012	-0.049**	-0.232**		0.038**	-0.140*			-0.010
Number of observations	2,654	451		4,278	854	1,153	1,030		2,466	10,282	1,112		7,113	1,296			25,907
Intensive: Log remittances	0.341*	0.433**	0.363		0.492	0.073	-0.057	0.333**		0.093	0.430*	0.168	0.397*	-0.199			0.226**
Number of observations	958	317	713		184	545	690	648		3,966	761	993	1,118	514		11,392	9,038
Education measured in years																	
Total remittances (\$ per year)	19.08*	86.50			26.39	-7.56	-3.03			2.40	-13.65		86.53	64.89			57.81
Number of observations	2,531	377			854	1,072	846			9,164	1,020		7,033	1,084			23,944
Extensive: Remits indicator	0.0080	-0.0042		0.0018	0.0145	0.0010	0.0024**		0.0008	-0.0023	-0.0072**		0.0034**	0.0010			0.0014
Number of observations	2,648	451		5,529	854	1,153	1,030		2,450	10,201	1,112		7,100	1,296			25,807
Intensive: Log remittances	0.0441*	0.0341	0.0224*		-0.0085	-0.0032	-0.0040	0.0247*		0.0199**	0.0091	0.0548*	0.0329*	0.0369			0.0256**
Number of observations	956	317	713		184	545	690	648		3,942	761	993	1,116	514		11,364	9,010
Means																	
Total remittances (\$ per year)	316	2,159	1,399		396	2,621	2,692	1,040		932	3,089	2,679	633	1,479	764	2,466	734
Fraction who remit	0.40	0.85		0.23	0.19	0.53	0.77		0.34	0.41	0.75		0.15	0.46	0.30	1.00	0.27
Fraction with university	0.32	0.60	0.07	0.18	0.20	0.21	0.12	0.11	0.12	0.23	0.04	0.20	0.33	0.06	0.36	0.31	0.38
Years of education	13.4	14.2	7.7	12.0	11.5	14.1	13.3	10.7	12.2	11.4	7.5	13.4	13.4	9.4	12.9	12.3	13.0

* Significant at the 5 percent level ** significant at the 1 percent level Note: See table 1 for full survey names.

Source: Authors' analysis based on data described in the text.

Figure 1. Total Remittances by Years of Schooling



Note: Figure depicts a semiparametric regression line from a partial linear model with dataset dummy variable evaluated at means; 95 percent pointwise confidence intervals shown from 500 bootstrap repetitions. Vertical lines separate quartiles.

Source: Authors' analysis based on data described in the text.

increase from around \$500 in the lowest education quartile to close to \$1,000 for those with university degrees. Moreover, the positive association increases most strongly for migrants with postgraduate education, which shows that not only do migrants with some university education remit more than those without, but also that migrants with postgraduate degrees remit more than those with only a couple of years of university.

Robustness

Although this database on remittances is the most comprehensive available, there are clear limitations, which make it important to see how sensitive the results are to alternative ways of using these surveys.

First note that the results pertain only to migration in a sample of OECD countries. The surveys cover a large share of OECD destinations, but they omit other important destinations for developing country migrants such as the Gulf countries and South Africa. This is a limitation shared by the macro studies (Faini 2007; Niimi and others 2008), which also have data only for migrants in OECD countries. Nevertheless, the same forces acting on migrants in the OECD countries are likely to apply in these other destinations: more educated migrants will earn higher incomes and therefore remit more. Although data are rare, there is some evidence to support this in a study of Pakistani migrants in the Gulf countries, which found that conditional on age and duration of

stay, more educated Pakistani migrants remitted more (Abbasi and Hashmi 2000).

Moreover, it is still the case that there are a large number of low skilled migrants in the OECD. A large majority of migrants in the pooled sample (63 percent) do not have a university education. A reasonable concern is whether surveys like the U.S. NIS, which capture only legal immigrants, are missing most of the low-skilled migrants. Comparing the skill distribution of immigrants included in the NIS with that of immigrants included in the U.S. Census (which is generally believed to do a good job surveying both legal and illegal migrants), does show a higher skill level in the NIS (12.26 mean years of education) than in the Census (10.84 years). However, once Mexican immigrants are excluded (the group with the largest number of illegal immigrants), the skill distributions of the NIS (12.96 mean years of education) and the Census (12.21) are much closer, and 16 percent of immigrants in both the NIS and the Census have 8 years of education or less. The first two columns of table 4 then show that the results for the association between remittances and education continue to hold in the NIS (and, if anything, are more strongly positive) when Mexican immigrants are excluded (table 4, columns 1 and 2). Columns 3 and 4 show that this is also true for the pooled sample of all surveys, which suggests that failure to capture illegal migrants in the survey is not driving the main result.

A second potential concern is whether it is valid to pool so many different surveys with different sampling methods and differing degrees of representativeness. Note that survey fixed effects are included in the regression analysis, so that only within-survey variation is used to identify the effect of education; the pooled estimate is thus a consistent estimate for the average association among the surveys. Nonetheless, as an alternative, the regressions are run only for the five surveys based on representative sampling from a list of migrants: (Longitudinal Survey of Immigrants to Australia (LSIA), the French Profile and Tracking of Migrants Survey (DREES), the German Socioeconomic Panel Study (SOEP), and the Spanish ENI and the NIS). The results show point estimates and levels of statistical significance that are very close to those for the full pooled sample (see table 4, column 5). This demonstrates that the results are not being driven by the specialized surveys of particular migrant groups, such as the Japanese and Belgian surveys.

Finally, one might query whether the results are being driven by students. That could influence the results based on university education if there were many students studying for undergraduate degrees who do not send remittances and do not yet have a college degree. There are several reasons to believe that this is not the main factor driving results. First, the LSIA and NIS surveys do not include students, which eliminates from the sample students in the countries that are among the most popular destinations for international study. Second, many international students come for postgraduate education, so they would be classified as having a college education and remitting little, which

TABLE 4. Robustness Checks

Variable	U.S. New Immigrant Survey(NIS) sample		Pooled sample				
	Full sample	Excluding Mexicans	Full sample	Excluding NIS Mexicans	Nationally representative samples	Only migrants ages 2.5 +	Only working migrants
Education measured by university degree							
Total remittances (\$ per year)	769.5**	839.7**	298.0*	306.8*	318.5*	267.7	308.7
Number of observations	7,046	5,922	24,033	22,909	19,643	21,343	16,693
Extensive: Remits indicator	0.038**	0.046**	-0.010	0.000	-0.011	-0.023*	0.048**
Number of observations	7,113	5,984	25,907	24,778	20,875	23,043	18,147
Intensive: Log remittances	0.397*	0.458**	0.226**	0.236**	0.220**	0.192**	0.230**
Number of observations	1,118	982	9,038	8,902	6,220	8,303	7,360
Education measured in years							
Total remittances (\$ per year)	86.53	108.09	57.81	68.17	62.52	58.78	78.49
Number of observations	7,033	5,909	23,944	22,820	19,554	21,263	16,639
Extensive: Remits indicator	0.0034**	0.0021	0.0014	0.0016	0.0017	0.0007	0.0031*
Number of observations	7,100	5,971	25,807	24,678	20,775	22,954	18,083
Intensive: Log remittances	0.0329*	0.0391*	0.0229**	0.0260**	0.0307**	0.0235**	0.0242**
Number of observations	1,116	980	9,010	8,874	6,192	8,279	7,335
Means							
Total remittances (\$ per year)	633	719	734	813	614	772	935
Fraction who remit	0.15	0.16	0.27	0.29	0.24	0.28	0.33
Fraction with university	0.33	0.40	0.38	0.38	0.38	0.38	0.38
Years of education	13.4	14.0	13.0	13.1	13.1	13.0	13.4

*Significant at the 5 percent level ** significant at the 1 percent level.

Note: Nationally representative surveys are Australia LSIA, France DREES, Germany SOEP, Spain ENI and U.S. NIS. See table 1 for full survey names.

Source: Authors' analysis based on data described in the text.

would offset any effect of undergraduates.⁹ As a final check, the analysis is restricted to individuals who are working (table 4, last column). Since more educated individuals are more likely to be working, this eliminates one channel through which the more educated can earn more and thereby remit more. Nevertheless, even with this restriction, there is a significant positive coefficient at both the extensive and intensive margins, and the point estimate for total remittances is similar in magnitude, although it is not statistically significant.

Taken together, these results indicate that the basic finding of a positive relationship between total remittances and education appears reasonably robust to alternative ways of combining the surveys.

Channels

This section uses these microdata to explore some of the channels through which education might influence remittances. Proxies are added to the model to control for differences in household income and work status, in household demographics and the presence of family abroad, in time spent abroad, in legal status, and in intentions to return home.

Table 5 shows the results of adding this full set of variables to the pooled model, using years of education as the measure of educational attainment. These channels operate as theory would predict. Households with more income and with adults who work more are more likely to remit: households where a migrant member is working send \$345 more annually, with an extra \$38 remitted annually for each 10 percent increase in income. As expected, family composition variables are also strongly significant both overall and for the extensive and intensive margins: a spouse outside the country is associated with a colossal additional \$1,120 remitted each year, approximately one and a half times the mean annual remittance for all migrants. Each child living outside the destination country is associated with an additional \$340 remitted annually and each parent for an additional \$180. Residing in the destination country legally is associated with an additional \$400 annually, providing no evidence that legal migrants lose their desire to remain in contact with their home country. Migrants who plan to move back home also remit significantly more, but this effect is primarily through the extensive margin rather than the intensive margin.

Which channels account for the association between education and remittance behavior? Tables 6, 7, and 8 report how the coefficient on education in an ordinary least squares regression changes as controls are added for total remittances, the extensive margin, and the intensive margin. Each panel of each table first shows the baseline education coefficient from regressing remittances only on education and country of birth and dataset fixed effects (from table 3). Each succeeding row then shows changes in this coefficient when controls are

9. In the United States, 47 percent of international students are studying for postgraduate degrees, compared with 12 percent for associate degrees and 32 percent for bachelor degrees (<http://opendoors.iienetwork.org/?p=1.50827>).

TABLE 5. Remittances on Years of Education for Pooled Sample with All Controls

Variable	Total remittances	Extensive Remits	Intensive Log remittances
Years of education	37.81 (29.64)	-0.002* (0.001)	0.017** (0.005)
Log income	384.59** (105.37)	0.023** (0.003)	0.364** (0.034)
Working	345.06** (90.80)	0.113** (0.010)	0.514** (0.065)
Household size	-8.14 (17.67)	-0.002 (0.002)	0.015 (0.016)
Married	-89.77 (68.78)	0.004 (0.010)	-0.097 (0.061)
Spouse outside country	1,120.95** (236.04)	0.145** (0.020)	0.568** (0.097)
Number of children	-121.56** (36.44)	-0.006 (0.003)	-0.099** (0.027)
Children outside country	337.78** (75.14)	0.048** (0.006)	0.228** (0.039)
Number of parents	-47.07 (53.56)	-0.020** (0.005)	-0.125** (0.045)
Parents outside country	182.58** (38.02)	0.063** (0.006)	0.243** (0.045)
Years spent abroad / 100	2,539.77 (2,533.08)	0.251** (0.095)	1.744** (0.656)
Years spent abroad squared / 100	-31.43 (27.14)	-0.010** (0.002)	-0.033* (0.015)
Legal immigrant	398.79** (121.36)	0.096** (0.018)	0.167** (0.061)
Will return home	692.30** (201.83)	0.095** (0.021)	0.085 (0.072)
Number of observations	23,944	32,535	11,364

*Significant at the 5 percent level ** significant at the 1 percent level.

Note: Includes dummy variables for missing covariates and fixed effects for country of birth and survey. Trimmed remittances greater than twice income. Pooled samples poststratified by country and education.

Source: Authors' analysis based on data described in the text.

added for income and work status, family composition, and all controls from table 5 (income and family controls, as well as legal status, time spent abroad, and intent to return home).

Remittance behavior is accounted for primarily by income and not by differences in family composition. The baseline result for total remittances from table 3, controlling only for country of birth and dataset fixed effects, is that migrants with a university degree remit \$300 more than migrants without one. Controlling for the full set of covariates (the all row) reduces the coefficient on university degree by two-thirds, and it becomes statistically insignificant. The third row adds just the family composition variables to the baseline

TABLE 6. Education Coefficient as Controls Are Added: Total Annual Remittances (U.S. dollars)

Variable	Australia LSIA	Belgium IRSHS	Germany SOEP	Italy NIDI	Japan IDB	Spain ENI	Spain NIDI	U.S. NIS	U.S. Pew	Pooled total
University education										
Baseline	58.4 (61.1)	922.8** (351.4)	291.0 (275.6)	-526.6 (411.6)	237.5 (374.1)	-92.6 (62.8)	-168.8 (749.4)	769.5** (254.4)	-554.0* (227.2)	298.0* (137.6)
Income	-10.1 (62.4)	557.0* (281.4)	238.5 (262.2)	-623.9 (407.2)	166.5 (359.8)	-189.3** (63.5)	24.7 (729.0)	396.6* (174.4)	-741.5** (263.8)	102.3 (92.8)
Family ^a	29.8 (61.4)	534.7 (310.5)	237.8 (243.5)	-306.7 (394.7)	317.5 (380.3)	-112.8 (57.6)	-6.9 (725.9)	623.6** (204.7)	-698.6** (241.9)	228.2* (103.1)
All	-16.5 (62.1)	475.8 (272.7)	144.6 (179.8)	-539.6 (383.3)	328.7 (365.3)	-181.7** (58.6)	266.2 (698.6)	402.2** (154.3)	-835.7** (269.9)	99.9 (71.6)
Number of observations	2,537	377	854	1,072	846	9,234	1,020	7,046	1,084	24,033
Years of education										
Baseline	19.08* (9.01)	86.50 (45.11)	26.39 (29.37)	-7.56 (34.05)	-3.03 (7.92)	2.40 (7.36)	-13.65 (19.95)	86.53 (46.50)	64.89 (44.97)	57.81 (37.08)
Income	7.99 (8.69)	47.80 (38.28)	3.51 (27.33)	-32.44 (33.39)	-2.59 (11.50)	-13.39 (7.41)	-26.95 (19.68)	44.98 (40.00)	49.18 (45.09)	32.12 (31.98)
Family ^a	17.03 (8.98)	29.28 (38.45)	25.56 (27.79)	47.31 (34.93)	-1.86 (8.62)	3.93 (6.84)	10.32 (19.98)	80.78 (44.75)	47.95 (46.37)	53.43 (34.24)
All	8.86 (8.91)	33.77 (36.94)	9.66 (22.82)	22.64 (32.79)	1.99 (10.63)	-7.57 (6.84)	4.50 (19.32)	54.81 (37.32)	27.01 (46.38)	37.81 (29.64)
Number of observations	2,531	377	854	1,072	846	9,164	1,020	7,033	1,084	23,944

*Significant at the 5 percent level ** significant at the 1 percent level.

Note: Baseline row includes only country of birth and dataset fixed effects. Income row adds working dummy and log income to baseline. Family row adds seven family member controls to baseline. All row is full specification from table 3. Trimmed remittances greater than twice income. Pooled samples poststratified by country and education. See table 1 for full survey names.

a. Includes household size, dummy variable if married, dummy variable if spouse is outside the country, number of children, number of children outside the country, number of parents, and number of parents outside the country

Source: Authors' analysis based on data described in the text.

TABLE 7. Education Coefficient as Controls are Added: Remits Indicator

Variable											Pooled		
	Australia LSIA	Belgium IRSHS	France DREES	Germany SOEP	Italy NIDI	Japan IDB	Norway LBI	Spain ENI	Spain NIDI	U.S. NIS	U.S. Pew	Extensive	Total
University education													
Baseline	-0.019 (0.032)	-0.055 (0.029)	0.014 (0.027)	0.042 (0.048)	-0.065 (0.043)	0.091** (0.034)	0.012 (0.030)	-0.049** (0.015)	-0.232** (0.081)	0.038** (0.011)	-0.140* (0.060)	-0.018 (0.010)	-0.010 (0.010)
Income	-0.052 (0.032)	-0.112** (0.029)	-0.027 (0.027)	0.023 (0.047)	-0.074 (0.042)	0.082* (0.035)	-0.020 (0.030)	-0.062** (0.015)	-0.185* (0.078)	-0.000 (0.011)	-0.165** (0.058)	-0.043** (0.010)	-0.033** (0.011)
Family ^a	-0.062 (0.032)	-0.069* (0.032)	0.015 (0.027)	0.039 (0.048)	-0.046 (0.041)	0.088* (0.035)	-0.004 (0.030)	-0.067** (0.013)	-0.234** (0.081)	0.022 (0.012)	-0.148* (0.060)	-0.031** (0.010)	-0.026* (0.011)
All	-0.080* (0.031)	-0.113** (0.030)	-0.027 (0.027)	0.028 (0.048)	-0.065 (0.038)	0.083* (0.035)	-0.031 (0.030)	-0.073** (0.014)	-0.177* (0.075)	0.006 (0.012)	-0.161** (0.059)	-0.043** (0.010)	-0.033** (0.011)
Number of observations	2,654	451	4,278	854	1,153	1,030	2,466	10,282	1,112	7,113	1,296	32,651	25,907
Years of education													
Baseline	0.0080 (0.0043)	-0.0042 (0.0040)	0.0018 (0.0025)	0.0145 (0.0084)	0.0010 (0.0040)	0.0024** (0.0005)	0.0008 (0.0025)	-0.0023 (0.0018)	-0.0072** (0.0021)	0.0034** (0.0012)	0.0010 (0.0060)	0.0006 (0.0009)	0.0014 (0.0010)
Income	0.0014 (0.0042)	-0.0117** (0.0040)	-0.0016 (0.0025)	0.0071 (0.0084)	-0.0027 (0.0037)	0.0035** (0.0011)	-0.0027 (0.0026)	-0.0049** (0.0018)	-0.0074** (0.0021)	-0.0015 (0.0012)	-0.0035 (0.0057)	-0.0027** (0.0010)	-0.0018 (0.0010)
Family ^a	0.0018 (0.0044)	-0.0060 (0.0042)	0.0050* (0.0025)	0.0152 (0.0087)	0.0062 (0.0041)	0.0019** (0.0006)	-0.0006 (0.0026)	-0.0040* (0.0017)	-0.0054* (0.0021)	0.0029** (0.0012)	0.0006 (0.0060)	0.0000 (0.0009)	0.0006 (0.0010)
All	-0.0025 (0.0041)	-0.0115** (0.0041)	0.0012 (0.0024)	0.0130 (0.0087)	0.0031 (0.0037)	0.0034** (0.0010)	-0.0037 (0.0026)	-0.0061** (0.0017)	-0.0046* (0.0020)	0.0002 (0.0012)	-0.0059 (0.0055)	-0.0019* (0.0010)	-0.0011 (0.0010)
Number of observations	2,648	451	5,529	854	1,153	1,030	2,450	10,201	1,112	7,100	1,296	32,535	25,807

*Significant at the 5 percent level ** significant at the 1 percent level.

Note: Baseline row includes only country of birth and dataset fixed effects. Income row adds working dummy and log income to baseline. Family row adds seven family member controls to baseline. All row is full specification from table 3. Trimmed remittances greater than twice income. Pooled samples poststratified by country and education.

a. Includes household size, dummy variable if married, dummy variable if spouse is outside the country, number of children, number of children outside the country, number of parents, and number of parents outside the country

Source: Authors' analysis based on data described in the text.

specification. The main hypothesis for why less skilled migrants remit more is that they are more likely to have family members outside the country. Therefore, controlling only for this variable would be expected to increase the coefficient on education, but the opposite occurs: the coefficient on education drops from \$300 to \$230 and remains statistically significant. This casts doubt on the idea that low skilled migrants remit more because of their family composition. One explanation is the earlier observation that low skilled migrants are not only likely to have more family abroad, but they are also likely to live in larger households in the host country. The second row of the table adds just the income variables (a dummy variable for working and log income) to the baseline specification. The coefficient on university degree falls by more than half and is no longer statistically significant. This suggests that the income effect is a key channel through which education affects remittances—more educated people send more money because they have higher incomes.

Although education becomes insignificant after controlling for income in the pooled sample, this result masks the heterogeneity in the individual surveys. For example, the education coefficient remains statistically significant even after controlling for all available covariates for three datasets: the Spanish ENI survey, the U.S. Pew dataset, and the U.S. NIS survey. There are several reasons why the education coefficient might remain significant in some datasets and not in others that cannot be examined with the dataset. One key variable that cannot be controlled for is the socioeconomic status of the family in the home country. More educated individuals might come from better-off families and therefore not need to send back as much money. This could explain the negative coefficient in the ENI and the Pew datasets.¹⁰ Or more educated individuals might have fewer ties to their home country. Time spent away from the home country and desire to return home are used to control for this, but they may not fully capture the strength of the ties. Also lacking are data on whether migrants are using remittance to repay family loans—for example, for education. One additional key issue is that the use of cross-section data does not yield any information about economic shocks that affect the migrant or the migrant's family.

Table 7 examines the extensive margin. In the baseline specification, more educated migrants are less likely to remit anything, but this result is not statistically significant. The negative effect of education on the decision to remit anything is strengthened by the inclusion of different sets of covariates. The coefficient on education (measured by university degree) is negative and significant once any covariates are included. The alternative measure of education, years of schooling, is not statistically significant. Table 8 examines the intensive margin result, which again appears to be driven by the income effect. Adding

10. An alternative explanation may be that the high-earning highly educated migrants are less likely to respond to surveys. Survey methods that draw a sample from areas known to have a high concentration of migrants (such as the Pew survey) or from locations where migrants tend to congregate (such as the NIDI surveys) are especially likely to miss highly educated high-income individuals, who may be living in areas where there are fewer of their countrymen.

TABLE 8. Education Coefficient as Controls Are Added: Log Remittances

Variable	Australia LSIA	Belgium IRSHS	France ZMO	Germany SOEP	Italy NIDI	Japan IDB	Netherlands CSR	Spain ENI	Spain NIDI	UK BME	U.S. NIS	U.S. Pew	Pooled Intensive	Pooled Total
University education														
Baseline	0.341* (0.145)	0.433** (0.131)	0.363 (0.211)	0.492 (0.450)	0.073 (0.171)	-0.057 (0.146)	0.333** (0.116)	0.093 (0.066)	0.430* (0.202)	0.168 (0.133)	0.397* (0.169)	-0.199 (0.216)	0.249** (0.060)	0.226** (0.071)
Income	0.237 (0.138)	0.243* (0.116)	0.306 (0.203)	0.408 (0.445)	0.021 (0.165)	-0.086 (0.140)	0.333** (0.116)	0.040 (0.064)	0.367 (0.200)	0.097 (0.123)	0.023 (0.168)	-0.278 (0.210)	0.143* (0.058)	0.114 (0.067)
Family ^a	0.288* (0.139)	0.258* (0.128)	0.390 (0.207)	0.423 (0.368)	0.105 (0.178)	-0.033 (0.150)	0.333** (0.116)	0.092 (0.061)	0.495** (0.187)	0.206 (0.132)	0.364* (0.166)	-0.253 (0.218)	0.246** (0.057)	0.220** (0.066)
All	0.179 (0.134)	0.225 (0.118)	0.318 (0.210)	0.293 (0.309)	-0.015 (0.176)	0.003 (0.138)	0.323** (0.117)	0.054 (0.059)	0.409* (0.193)	0.127 (0.123)	0.071 (0.165)	-0.347 (0.206)	0.157** (0.055)	0.118 (0.063)
Number of observations	958	317	713	184	545	690	648	3,966	761	993	1,118	514	11,392	9,038
Years of education														
Baseline	0.0441* (0.0194)	0.0341 (0.0174)	0.0224* (0.0112)	-0.0085 (0.0783)	-0.0032 (0.0163)	-0.0040 (0.0038)	0.0247* (0.0100)	0.0199** (0.0076)	0.0091 (0.0063)	0.0548* (0.0237)	0.0329* (0.0146)	0.0369 (0.0221)	0.0256** (0.0061)	0.0229** (0.0071)
Income	0.0266 (0.0199)	0.0103 (0.0164)	0.0105 (0.0115)	-0.0387 (0.0770)	-0.0077 (0.0164)	-0.0041 (0.0048)	0.0247* (0.0100)	0.0114 (0.0075)	0.0021 (0.0062)	0.0313 (0.0220)	-0.0008 (0.0126)	0.0294 (0.0216)	0.0135* (0.0053)	0.0112 (0.0062)
Family ^a	0.0383* (0.0187)	0.0101 (0.0167)	0.0344** (0.0111)	0.0053 (0.0649)	0.0098 (0.0168)	-0.0042 (0.0037)	0.0247* (0.0100)	0.0247** (0.0072)	0.0146* (0.0066)	0.0612** (0.0235)	0.0392** (0.0144)	0.0194 (0.0231)	0.0272** (0.0060)	0.0243** (0.0070)
All	0.0227 (0.0193)	0.0060 (0.0165)	0.0268* (0.0124)	-0.0183 (0.0511)	0.0009 (0.0159)	-0.0020 (0.0050)	0.0274** (0.0100)	0.0179* (0.0070)	0.0086 (0.0064)	0.0319 (0.0224)	0.0172 (0.0123)	0.0128 (0.0213)	0.0169** (0.0052)	0.0139* (0.0060)
Number of observations	956	317	713	184	545	690	648	3,942	761	993	1,116	514	11,364	9,010

* Significant at the 5 percent level ** significant at the 1 percent level.

Note: Baseline row includes only country of birth and dataset fixed effects. Income row adds working dummy and log income to baseline. Family row adds seven family member controls to baseline. All row is full specification from table 3. Trimmed remittances greater than twice income. Pooled samples poststratified by country and education.

a. Includes household size, dummy variable if married, dummy variable if spouse is outside the country, number of children, number of children outside the country, number of parents, and number of parents outside the country

Source: Authors' analysis based on data described in the text.

only family variables to the baseline specification reduces the coefficient on university education by approximately 3 percent, but it remains highly significant. However, if only income variables are added to the baseline specification, the coefficient becomes statistically insignificant, with approximately the same point value as the full specification with the full set of covariates.

IV. CONCLUSIONS

The key advantage of this analysis over that in other papers in this literature (Faini 2007; Niimi and others 2008) is the ability to link the remittance decision of migrants with their education level and therefore directly answer the question of whether more educated migrants remit more. Cross-country macroeconomic analyses that relate the amount of remittances received at a country level to the share of migrants with tertiary education can at best tell us whether countries that send a larger share of highly skilled migrants receive less or more remittances than countries that send fewer skilled migrants, without accounting for the other differences between countries that could underlie such a relationship.

This new database on migrants allows direct examination of the relationship between education and remittance decisions. Results for the extensive margin (the decision to remit at all) and the intensive margin (the decision on how much to remit) combined show that, at least in this combined sample, more educated migrants remit significantly more: migrants with a university degree remit \$300 more yearly than migrants without one. Nonetheless, there is some heterogeneity across destination countries, with negative point estimates in a few of the surveys used—mainly in surveys that sample migrants only in areas where migrants cluster, thereby missing more educated, higher earning migrants who may live outside of the immigrant clusters.

The data also allow analysis of several competing theoretical channels that help to explain this result. Differences in household composition between high and low skilled migrants do not explain the observed remittance behavior. One explanation may be that although low skilled migrants are more likely to have a spouse and children in the home country, they have larger families on average than do high skilled migrants and tend to live in larger households in the host country. In contrast, there is considerable support for an income effect as the dominant channel through which education operates. More educated migrants earn more money and therefore remit more than low skilled migrants.

The article also highlights the clear limitations of existing microdata on remittances. While some basic information on migrants can be obtained from census microdata and government immigration records, there are no comparably reliable sources for remittances. The new database relies on specialized one-off surveys of migrants. Given the importance of remittances for many developing countries, it would be beneficial for migrant-receiving countries to include questions on remittances in their regular labor force or household budget surveys.

This would be a first step to being able to analyze how remittance patterns change as countries pursue more skill-selective immigration policies.

Policy debates on migration often raise concerns about the potential negative effects of the “brain drain” on developing countries. However, the main finding that remittances increase with education illustrates one beneficial dimension of high skilled migration for developing countries. High skilled migrants work in better jobs and earn more money than low skilled migrants and in turn send more money back home in remittance flows. This suggests that the fear that remittances will fall as the migrant skill level rises is not supported by existing empirical evidence.

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