Highly skilled migration in Brazil – from isolation to global integration?

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Abstract:

In this paper, we examine, using recent census and administrative data and a historical perspective, how much international circulation there is in Brazil, with emphasis on highly skilled persons, and discuss its consequences and implications. Brazil received large flows of international immigrants at the end of the 19th and early 20th century, but remained mostly isolated since then. More recently, for the first time, Brazilians started to go abroad for different reasons, while the country started again to attract immigrants from the United States, Europe and other Latin American countries. We examine the links between education, labor markets and international migration into and out of Brazil today, discuss the extent to which migrants with may be contributing to the country's economic and social development by sending of remittances and through their participation in the Brazilian and foreign businesses and labor markets. Then, we examine how the transnational circulation of people is operating today within the education sector. Finally, we conclude by discussing what role international migration – for education and work purposes -- is likely to be having in Brazilian economic and social development, and add some considerations about different policies that could be implemented to manage it better.

Introduction

While much of the world has been in crisis, the Brazilian economy has remained relatively stable. The 2000s were to be the years of the BRICS, in which Brazil, Russia, India, China and South Africa were supposed to take the lead of international growth (O'Neill 2001). In 2008/9, with the world recession, the Brazilian economy stagnated, and since then a combination of creeping inflation, growing trade deficit and low investments led to a more pessimistic view about the country's ability to complete its transition from a developing economy into a modern, developed society (Leahy 2013). One of the factors that can make a difference is the country's ability to improve the education of its population and develop a pool of high qualified scientists, engineers and professionals that could keep the country, and the economy, at the edge of international innovation and competitiveness (Barbosa Filho and Pessoa 2012). More broadly, there is a growing literature about the risks of developing countries falling in the so-called "middle income trap", defined by their inability to compete either with low wage economies in manufacturing exports or with advanced economies in high skill innovations (Asian Development Bank 2011, box 2, p. 9). To achieve high productivity, these countries must develop institutional, organizational and technical capabilities, which can be facilitated by opening the countries to the international flow of persons, resources, competencies and tacit knowledge (Hidalgo and Hausmann 2009).

Policymakers and social scientists in developing countries have often been concerned about "brain drain", that is, the condition in which a country loses its educated people, who go abroad in search for better opportunities. The assumption is that, by staying in the country, these people would contribute to the national economy, and provide other valuable services to the national population. Otherwise, this would imply a waste of the resources spent on educating people who are often relatively privileged compared to the rest of the population. In Brazil, especially, where public expenditures on higher education is very high relative to basic education (97.3% of the GNP per capita per student on higher education, compared with 20% on secondary education) (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira 2013) and where only a minority of the population goes to college, this is an important concern.

At the same time, policymakers and academics have recently replaced the idea of "brain drain" with "brain circulation", arguing that international flows of talent can also bring benefits to the sending countries beyond the usual cash remittances. The quintessential example is Indian software developers, who go to Silicon Valley for many years, acquire knowledge, skills and contacts there, and create a vibrant software industry in India (especially Bangalore), which grows while maintaining its transnational connections to the industry in California. High-skilled migrants' role (both those who return, and those who stay abroad) is to serve as bridges in these networks, thanks to their mobility, their

transnational social connections, and their understanding of two or more national contexts (Saxenian 2002).

Like high-skilled return migrants, high-skilled foreign immigrants can put their skills to good use in the receiving country, bringing resources to invest in creating businesses linking people and companies in the host country with people and companies in their countries of origin, and sharing knowledge through formal teaching or informal means.

This positive role of brain circulation is not the whole story. Although highly skilled immigrants often send remittances, their departure often implies a loss to the country of origin that invests in their education and cannot reap the benefits of their professional skills. Also, when skilled workers leave, they often do not work in the occupations for which they have been trained, because of social, language and professional barriers (Iredale 2001), having to work in low-paid and low skills activities. The case of Filipino high-skilled immigrant women who become domestic workers abroad illustrate this well (Parreñas 2000). In this situation, they do not have access to the networks and resources in the new country they could use to connect their country of origin to global circulation of capital, knowledge and ideas. A similar analysis can be done regarding high-skilled returnees or foreigners who move to developing countries. If conditions are not there, they cannot really use their skills, connections and resources for the benefit of the receiving country. Instead, they may remain under-employed or disconnected from the local economy (Friedberg 2000).

Debates about "brain drain" and "brain circulation" often focus on the role of already educated people in transnational labor markets, but do not examine the role that education institutions such as universities play in this process, taking their existence and characteristics as given. On the other hand, scholars of higher education have been interested in the global circulation and transmission of "knowledge" (and of people who are carriers of knowledge) within and between education institutions, but have often left unexamined the relationship between universities and the broader world of work and economic production. Scholars of international education have examined how the circulation of academics between universities in different countries have enabled the development of new fields of knowledge and the integration of individual universities into global networks of academic production. Some universities have also sought global certification of the degrees they offer to their students, which could allow their degrees to be accepted in international labor markets. Universities have also attempted to attract international students, with the hopes of charging tuition and increasing the quality of the student body through a larger pool of qualified applicants. Finally, universities and governments have often supported domestic students to study abroad, with the hopes that they can acquire knowledge and skills they can use when they return, either in the general labor market or, in the case of graduate students, as future professors and researchers. Whether these efforts are successful or not depends on both how these international exchanges operate, and how educated people are able to connect to global and local labor markets outside of the universities (García Guadilla, et al. 2002, Boeri, et al. 2012, Agrawal, et al. 2011, Filipović, et al. 2012, Barrow, et al. 2003). In short, the

international flows of persons, knowledge and resources can lead to positive and negative outcomes, depending on the country's job market for skilled personnel, the historical, economic and cultural proximity with other regions, as well as on the public policies related to international mobility of persons and educational and technological resources.

In this paper, we examine, using recent census and administrative data and a historical perspective, how much "circulation" of educated people there is in Brazil, and discuss the potential of this circulation of people for the country's economic and social development. After a brief overview of the historical links between international migration and the development of both education institutions and the economy, we examine the links between education, labor markets and international migration into and out of Brazil today. We do so, first, by looking at the extent to which migration into and out of Brazil consists of more vs. less educated people, and the extent to which migrants with different amounts of education may be contributing to the country's economic and social development by sending of remittances and through their participation in the Brazilian and foreign businesses and labor markets. Then, we examine how the transnational circulation of people is operating today within the education sector, by examining the internationalization of higher education institutions. Finally, we conclude by discussing what role international migration – for education and work purposes -- is likely to be having in Brazilian economic and social development, and add some considerations about different policies that could be implemented to manage it better.

Skills, immigration and economic development in Brazil: the historical context

Brazil has evolved from a slave-based economy up to the 19th century to become a large developing country since the late 20th century, aided by the inflow of immigrants from Europe, Japan and other origins, which brought to the country their economic resources, as well as their knowledge, skills, social connections and populated its first education institutions. However, this flow of intense international migration did not last much, and this period of openness to international flows was replaced by a pattern of relative isolation. At the same time, Brazil did not develop the needed skills in its own population, as education institutions were slow to develop, and are still today relatively limited.

Brazil was slow in developing its education institutions. For the early Portuguese settlers, Brazil was the "King's plantation" (Lang 1979) which did not need nor was allowed to establish education and scientific institutions. Much of the work was performed by African and Afro-Brazilian slaves and freemen who were not expected to be educated, but contributed nevertheless with agricultural, mining and craftsmanship skills (some of which were brought from Africa) as part of the expanding colonial enterprise (Klein 1969, Luna and Klein 2003, Edelson 2010, Martins Filho and Martins 1983, Carney 2009, Carney 2004). As the Portuguese court moved to Brazil in 1808, fleeing from the Napoleonic Wars, it brought also some of its professional education institutions in Law, Medicine and Engineering, but even after independence in 1822, nothing much changed (Schwartzman

1991). The economy remained heavily based on manual, agricultural work performed by slaves until late in the 19th Century. Most members of the small elite that run the Brazilian Empire in the 19th Century were educated in Coimbra, Portugal, with Belgium and France being also countries of choice. Although there were strong economic ties between Brazil and England, this did not translate into elites being educated in England, nor in English influence on national education institutions (Carvalho 1982, Manchester 1964).

With the end of slavery, starting late in 1800s, Brazil became a major destination of international migration from Europe, the Middle East and later Japan, perhaps the largest after the United States and Argentina (Fausto 1995, Fausto 1997, Fausto 1999). Most immigrants were poor and came to work in agriculture, but some brought money, family resources and high skills and connections to foreign businesses, looking for opportunities that did not exist in their countries of origin (Dean 1969). Data on socioeconomic characteristics of early immigrants are scarce or non-existing, but there are many historical and qualitative studies showing the importance of elite immigrants in shaping the modern sector of Brazilian society (such as the Matarazzo and Romi, Italians, and Klabin and Lafer, Jewish), in industry and trade, and scientists and engineers which created and managed the country's first research institutes (Gustav Brieger, Fritz Feigel, Bernard Gross, Gleb Wataghin and others) (Brandão 1996, Dean 1969, Dean 1974, Martins 1967, Schwartzman 1991). Since 1915 the Rockefeller Foundation got involved in the organization of the first public health institutions and the improvement of medical education, bringing in experts and sending a small flow of Brazilian specialists to study in the United States. (Gadelha 1998, Glick 1994, Cueto 1994). German, Italian and Japanese communities organized their own schools teaching in their original language in spite of government's restrictions, and later helped to create several community-based higher education institutions that are typical of the Brazilian southern states of Rio Grande do Sul, Santa Catarina and Paraná (Andreazza and Nadalin 2001, Kloss 1971, Lesser 1994). After World War II, however, this flow of high skilled persons dwindled. Brazil continued to send persons for graduate studies abroad, but they tended to be few, would usually return and be reabsorbed in the local institutions, and would often lose contact with their places of study (Glaser and Habers 1974, Glaser and Habers 1978). The Brazilian economy and society became notable for is relative isolation from the rest of the world, compared with other developing countries.

The first Brazilian universities were established only in the 1930s, and by 1950 about 34% of the population above age 10 was still illiterate (IBGE 1956). Things started to move more rapidly after Word War II, and by the end of the 1990s most of the children were in schools, although the quality of primary and secondary education remained low. Higher education also expanded in the last fifty years, but still remains small for the country's size, with a net enrolment rate of 16%. Since the 1970s, graduate education and research also expanded, with about 12 thousand PhDs graduating yearly from the country's main universities, and a growing number of scientific papers appearing in the international literature (Leta 2012, Balbachevsky 2004).

The 1970s marked the pinnacle of what became known as the "import substitution model" a project of economic development and industrialization characterized by intense investments in national industry and high tariffs against imports (Hirschman 1968, Fishlow 1972). At the end of the decade, however, the economy stalled, hit by the oil shocks and its after effects (Cardoso 1991). For the first time, Brazilians started to go abroad in search of better opportunities for work.

Current migration trends

In this section we look at the current international migration flows, both of high skilled and low skilled persons, in and out of Brazil. Since the 1980s, as the economy stalled, more Brazilians left the country to stay abroad, but they were few compared with other large developing economies, such as China and India, and also compared with other Latin American countries such as Argentina, Peru and those of Central America. Next, we look whether Brazilians emigrants tend to return to the country after a period of study and work abroad. We find that they mostly return, perhaps because of the improvements in the country's economic conditions since the mid 1990s. We then turn to foreigners living in Brazil, finding that the country has become a significant destination of poor immigrants from neighboring countries such as Paraguay and Bolivia, but also that modernization and internationalization of significant parts of the economy has led to an inflow of skilled persons to work in high technical and managerial posts.

Brazilians abroad

The Brazilian Ministry of Foreign Affairs estimated that, in 2011, there were 3.1 million Brazilians abroad, 1.4 million of which in the United States (Margolis 2013, p. 5). Most of the immigrants to the US work in low-skilled activities, including construction work, household services and as restaurant waiters, and many of them are illegal, making these estimations not very reliable. Thus, the 2010 American Community Survey in the US found only about 340 thousand persons who declared to be born in Brazil (United States Census Bureau 2011). Demographic estimations indicate that Brazil lost 1.8 million persons to international migration between 1980 and 1900, and another 550 thousand between 1990 and 2000 (Carvalho and Campos 2006). Japan was also an important destination of descendants of the Japanese immigrants to Brazil from the early 20th century. They often remained marginalized within Japanese society, worked in menial jobs, sent money to their relatives in Brazil or saved to buy land or start a small business on their return.

These data, compared with Brazil's population of about 200 million (190.7 million in the 2010 census), confirm the country's relative international isolation. There is some migration for better economic opportunities among people who are relatively better off than the average population, and some movement for studies abroad, but Brazilians are less likely to remain abroad than other immigrants from Asia or other South American countries.

The Brazilian Institute for Geography and Statistics (IBGE) asked in a sample of the 2010 population census if there was someone from the household living abroad, and 483

thousand families said yes, listing 546 thousand persons. Although the census missed the information about whole families that were no longer living in Brazil, this allowed for a fresh insight on who these emigrants were, where they went, and where they came from. An overview of the results is in Table 1.

Table 1 -Brazilian households with members living abroad, 2010

	Region					
	North	Northeast	Southeast	South	Center West	Total
Number of households	34026	75550	233965	80448	59763	483752
Percentage of households in the region	0.86%	0.51%	0.94%	0.91%	1.39%	0.85%
Average household income						
Absolute value (Reais/month)	1128.73	1567.91	2297.89	2117.74	1656.91	1992.51
Ratio relative to families without immigrants	1.79	2.78	2.02	1.98	1.5	2.12
Characteristics of immigrant family member						
% Female	60.0%	63.0%	51.0%	52.0%	55.0%	54.0%
Mean age of departure	27.92	28.51	28.83	28.34	28	28.54
Place of residence						
Asia (without Japan)	0%	1%	1%	2%	1%	1%
Africa	1%	3%	1%	1%	1%	2%
Eastern Europe	3%	4%	7%	10%	8%	7%
Central and South Amerca	26%	11%	5%	12%	8%	9%
France	8%	5%	3%	3%	4%	4%
Germany	2%	7%	3%	4%	1%	4%
Italy	3%	13%	6%	8%	3%	7%
Japan	6%	2%	9%	10%	4%	7%
Portugal	11%	14%	14%	11%	15%	13%
Spain	16%	11%	6%	9%	18%	10%
USA	14%	14%	31%	19%	21%	24%
No information	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%

Source: Brazilian Institute for Geography and Statistics, National Census, 2010, section 3 (author's tabulation)

Most of the emigrants came from families living in the Southeast and Southern regions of Brazil, and particularly from the States of São Paulo, Paraná, Minas Gerais, Rio de Janeiro and also Goiás in the Center-West. In the city of São Paulo, the country's largest, 107 thousand families reported having relatives abroad, about 0.8% of the local population. In contrast, in Governador Valadares, a much poorer town in the state of Minas Gerais, 6.7 thousand families reported having relatives abroad, 9% of the local households. In some small towns in the same region, about one fifth of the families had relatives abroad, a pattern not found anywhere else in the country. The only other town with many families with relatives abroad was on Brazil's border with Bolivia, pointing to another dimension of international migration in Brazil, among neighboring countries.

The case of the Governador Valadares region confirms the notion that migration takes place through personal networks that facilitate international mobility (Massey et al, 1999). For these families, foreign remittances became a major source of income. Margolis (2013) noted that, in 2004, about 1.3 million Brazilians benefited from remittances from abroad, which amounted to $5.6 billion dollars. Although not very significant for the country as a whole, this money made an important difference for the families and regions where these emigrants came from.

The mean income of families with relatives abroad is twice the income of the families living in the same municipality, showing that immigration may be an opportunity and an option for those who are relatively well off, but not for the poorest. This difference in

income is not likely to be due to remittances, but related to the general conditions of the families, which gives them better conditions for international mobility than those with less social and economic resources.

The US Community Survey allows us to see some characteristics of these immigrants from Brazil to the US. 49% had a college degree of four or more years; 15% worked as professionals and scientists, and 0.7% in management positions. About a third had naturalized as US citizens, a low percentage compared with immigrants from Central America or Colombia, of around 50%, showing that the Brazilians may be more prone to return. This sample confirms that Brazilian immigrants to the US tend to be highly skilled compared with the general population, although it probably underrepresents the illegal immigrants working in low skills and menial jobs (United States Census Bureau 2011).

The American Community Survey also gives us a sense of what educated Brazilians who stay in a major country of destination end up doing. Table 2 reports aggregate data for all the detailed occupations where more than 1% of Brazilians are represented. About half of those who got an education beyond college (such as a graduate degree) are in technical and managerial occupations. A college degree, however, often keeps Brazilians in domestic or service occupations, and a high school degree does not seem to give access to much beyond low-wage work.

Table 2 - Occupation of Brazilians in the United States with high school degree or more, by level of education, 2011 (column percentages)

	Grade 12	1 year of college	2 years of college	4 years of college	5+ years of college	TOTAL
Managers, executives	4.3	10.3	7.7	13.8	15.8	9.7
Professionals, scientists	4	6.9	18	17	39.7	14.9
Sales workers	5	5.1	3.7	5.3	5.8	5.3
Office workers, secretaries, bank tellers	2.4	6.2	9.6	7	1	4.1
Domestic workers*	18.7	9	10.1	6	1.5	10.6
Other low-wage services	30.6	31.8	29.7	16.7	7.2	23.1
Occupations with less than 1% of Brazilians	35	30.7	21.2	34.2	29	32.3

*Housekeepers, maids, butlers, stewards, and lodging quarters cleaners

Source:Tabulated from 2011 American Community Survey, available at Minnesota Population Center, IPUMS_USA, https://usa.ipums.org/usa/, acessed Augus 22, 2013

Two other main sources about highly skilled Brazilians in the US are the Open Doors Report, produced by the Institute of International Education, and the Survey of Earned Doctorates, done for the National Science Foundation. The Open Doors study identified 8,777 Brazilians studying in the US in 2011/12, a figure similar to nationals from Germany, United Kingdom and France, and far from those of China and India, with more than one hundred thousand each, or South Korea, with 73 thousand. From Latin America, the largest group is from Mexico, 14 thousand (Institute of International Education 2010-12). In relative terms, the number of Brazilians studying abroad corresponds to just 0.12% of the population enrolled in higher education in the country, several times smaller than for others listed above, with 0.30% or more, and very far from South Korea, with 2.15% (table

3).

Table 3 - Foreign students in the US, selected countries, 2011-2012

	(a) Foreign Students in the US (*)	(b) higher education enrollment (**)	Percentage (a/b)
Brasil	8,777	7,241,405	0.12%
Germany	9,458	2,939,463	0.32%
UK	8,947	2,495,779	0.36%
France	8,098	2,296,306	0.35%
China	194,029	32,585,961	0.60%
India	103,895	28,525,722	0.36%
South Korea	72,295	3,356,630	2.15%
Mexico	13,713	3,161,195	0.43%

Sources:
(*) Institute of International Education 2010-12.
(*) Unesco Instittue of Statistics Data Center, http://www.uis.unesco.org/DataCentre/Pages/BrowseEducation.aspx accessed Nov 30 2014

The Survey of Earned Doctorates found that 1,132 doctorates in science and engineering were issued to Brazilians with temporary visas in the 2005/2011 period, and that 50% of them declared their intention to remain in the US, a relatively low figure compared with 71.6% for the total of 100 thousand foreign doctorates (National Science Foundation 2011). Part of the explanation may be that most Brazilians that go abroad for doctoral studies do so with government fellowships that require them to return and their visas cannot be transformed into residence permits.

In short, out-migration seems to be an important strategy in some smaller, impoverished Brazilian communities, and also an option for better-educated persons from more developed regions, but the results of this for brain circulation seem to be mixed. Data on Brazilians in the USA suggest that Brazilians who go there to study may acquire important knowledge and skills that they can apply back in their home country, but because they return to Brazil right after they finish their education they may not have the time to acquire the professional experience and networks abroad they could bring back home. Many Brazilians in the USA who have a college degree or less often end up in low-wage occupations, either because their degrees are not recognized, or because they lack the right networks, language skills and other resources to obtain a job compatible with their education. Those who stay in the USA and have advanced degrees do seem to be getting experience in management and professional roles, which might be useful to help Brazil participate in a global economy, if they maintain ties to Brazil while occupying these positions, but they are few, in any case.

Immigration and Return

The 2010 Population census in Brazil had two questions relevant to our understanding of immigration to Brazil: the persons' place of birth and where the person was living five years before, in 2005. Of the 190 million persons in the country in 2010, 592 thousand were born abroad, 0.3% of the population. This compares with 1.2 million foreigners in 1900, or 7.5% for a population of 16 million, (Brasil Diretoria Geral de

Estatística 1908-1912 table 29). The foreigners were also older than average - 51 years, of which 42% where 60 year olds or more. Older immigrants tend to be from Europe, particularly Portugal, Japan and the Middle East (mostly Syria and Lebanon), while the new generation is mostly from Latin America and the United States (table 4).

Table 4 - Brazilians orn abroad, average age and year of settlement

Country of Birth	age	year of settlement	persons
America South, Center	37.9	1993	183,626
Portugal	65.9	1961	137,972
Japan	61.3	1962	49,059
Italy	64.0	1965	37,165
Asia	44.2	1990	32,715
Spain	63.0	1965	30,736
Western Europe	54.3	1977	26,990
USA	24.1	1999	23,513
Middle East	56.3	1972	19,484
Germany	55.5	1975	16,241
Africa	39.5	1993	15,311
France	44.5	1991	9,559
Eastern Europe	67.7	1960	4,810
Israel	48.6	1979	2,011
Canada	30.4	1998	1,587
Oceania	33.5	2000	968
no information	41.1	1985	824
Total	51.3	1977	592,570

Source: Tabulated from Brazil, Brazilian Institute for Geography and Statistics (IBGE), 2010 Population Census sample (microdata)

Of the total population, 268 thousand answered that they lived abroad in 2005. Of those, 65.5% were Brazilians returning to the country. Table 5 compares the foreign-born and the Brazilians who returned from abroad in the last five years and the remaining of the population.

Table 5 - Characteristics of the general population, return immigrants and the foreign born, according to the 2010 Brazilian census (in column percentages)			
	General population	**Foreign-born**	**Brazilian Returnees**
Employment relations, among the employed			
Formal employees (with "carteira assinada")	45.3	29.2	37.9
Military and civil service employees	5.4	3.2	4.4
Informal employee (without "carteira assinada")	20.2	15.7	17.5
Self-employed	21.4	38.3	30.1
Employer	1.9	10.5	6.8
Unpaid worker	5.7	3.1	3.4
Total	100	100	100
Number of persons	85,983,264	265,058	105,515
Occupation			
Managers, high level executives in the public and private sector	3.9	12.5	11.0
Professionals in sciences and arts	10.0	23.5	19.3
Middle level technicians	6.4	7.2	9.1
Workers in administrative activities	7.0	3.1	6.5
Workers in service activities	16.8	16.9	15.7
Workers in agricultural activities	8.6	3.2	4.9
Workers in industrial production and services	19.5	15.8	16.7
Workers in maintenance and repair services	20.2	7.2	6.8
No information	7.5	10.6	7.8
Total	100	100	100.0
Number of persons	85,983,267	265,058	105,514
Education level (adults 25 years or older)			
Less than basic education	57.8	38.2	28.1
basic education (8 years)	14.8	13.4	15.0
Secondary education (12 years)	19.9	24.4	34.1
Higher education	7.0	23.6	22.4
Not determined	0.5	0.4	0.4
Total	100.0	100.0	100.0
Number of Persons	109,957,886	491,665	136,963
Degree subject matter, among the college-educated			
Administration	21.5	18.9	18.7
Teacher training (education)	19.5	7.1	8.0
Law	10.0	5.2	5.8
Health	7.5	4.1	4.5
Humanities	6.3	8.1	7.1
Engineering	4.7	14.3	9.9
Medicine, dentistry	4.3	6.8	6.4
Others	26.4	35.6	39.8
Total	100	100	100
Number of persons	13,284,353	139,922	39,482
Source: Tabulated from Brazil, Brazilian Institute for Geography and Statistics (IBGE), 2010 Population Census sample (microdata)			

Compared with the general population, both those born abroad and the returnees are more likely to work as self-employed or as employers, as managers and professionals in arts and

sciences and to be significantly more educated, reflecting their higher socioeconomic standing. Although very similar, the foreign born are less likely than the returnees to work in the formal sector and be professionals of arts and sciences, particularly in engineering. Data not shown here indicates that returnees with college degrees are not as likely to be self-employed as those without, but are much more likely to be employers.

Further information on the economic activities of foreigners in Brazil can be obtained from the National Registry of the Employed and Unemployed (RAIS/CAGED), a database with about 50 million persons managed by the Ministry of Labor. Since about half of the work force in Brazil are in the so-called "informal market" (meaning that their firms are not registered or they work individually and do not pay taxes), the information from RAIS/CAGED is biased towards the richest sector of the economy and the better educated employees, which are more likely to hold jobs in the formal labor market. At the end of 2013, there were 103 thousand foreign born persons in this group, of which 9 thousand naturalized Brazilians. Forty percent of the foreign born work either in top management positions or as professionals in the sciences and arts, and another 24% in the industrial sector (table 6). A more detailed breakdown (not shown here) shows that the highest relative concentration of foreigners is in the administration of private companies, where they occupy 3.06% of the positions, and among researchers and scientists, 2.34%.

Table 6 - Brazilians and Foreigners in the Labor Market, by occupation, Dec. 2013

			percentages	
	Brazilians	Foreign born	% of total foreigners	% of foreigners in the group
Managers, high level excutives in the public and private sector	2,331,408	15,757	15.21%	0.68%
Professionals in sciences and arts	5,098,121	25,299	24.43%	0.50%
Middle level technicians	5,254,901	10,024	9.68%	0.19%
Workers in administrative activities	9,556,947	11,692	11.29%	0.12%
Workers in service activities	11,448,902	12,863	12.42%	0.11%
Workers in agricultural activities	1,519,588	967	0.93%	0.06%
workers in industrial activities	11,660,302	25,183	24.32%	0.22%
workers in maintenance services	1,187,016	1,629	1.57%	0.14%
Undefined	787,681	153	0.15%	0.02%
Total	48,844,866	103,567	100.00%	0.21%

Source: Brazil, Tabulated from Ministry of Labor, Annual Report of Social Inforomation, General Registry of Employed and Unemplyed [Relação Annual de Informações Socais -RAIS/ CAGED), http://bi.mte.gov.br/bgcaged/, accessed Nov 2014.

More than half of these foreigners have higher education, and their number has been growing in recent years, which may be related to the inflow of foreign direct investments in the Brazilian economy in the last decade.

The internationalization of science and higher education

In this section we look at what is happening with Brazilian higher education in terms of internationalization, in which we find an interesting paradox. On one hand, the higher education institutions are very inward looking, with all teaching taking place in Portuguese, with few international students and not many foreigners in the academic staff. At the same

time, many of the leading scientists and professors in graduate programs have been trained abroad, keeping international ties and publishing in international journals.

While the older generation of Brazilian scientists came from Europe or got their advanced degrees in Europe or the United States, today most persons with doctoral degrees graduate from Brazilian institutions. There is no available information on the places the doctors doing research or teaching in Brazil got their degrees, but a Survey of the Professoriate done in 2007, which was biased in favor of research intensive institutions, found that 17.3% of the doctors graduated abroad, mostly from the US, UK, France and Germany, countries with which Brazil has had long standing programs of academic cooperation (Balbachevsky and Schwartzman 2010) (table 7).

Table 7 - Brazillian professors: country of doctoral degrees, by type of institution

	Public research Institutes	Public research universities	public regional universities	privat elite institutions	private mass institutions	Total
Brazil	69.4%	79.5%	86.2%	83.3%	85.5%	82.7%
USA	8.2%	5.8%	2.6%	3.8%	0.0%	3.4%
UK	10.2%	5.8%	0.5%	3.0%	0.0%	2.9%
France	2.0%	2.1%	2.0%	3.8%	0.0%	1.9%
Germany	2.0%	1.6%	1.5%	0.0%	1.2%	1.2%
Others	4.1%	2.6%	3.6%	3.0%	6.6%	4.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
N	49	190	196	132	166	733

Source: Data tabulated from the survey on "The Changing Academic Profession" for Brazil, 2007

Data from CAPES, the agency in the Ministry of Education responsible for graduate education, Brazil graduated 105 thousand Ph.Ds. between 1998 and 2012. (Ministério de Ciência e Tecnologia e Inovação, table 3.5.2), The Higher Education Census of 2012, carried on by the Ministry of Education, found a similar figure - 115 thousand teaching posts[3] occupied by doctoral degree holders, almost of all of them – 98% - born in Brazil. In total, there were 5,734 posts occupied by foreigners or naturalized Brazilians, about 1.5% of the total. They come mostly from Spanish and Portuguese speaking countries (particularly from Argentina, Peru, Portugal, Chile and Cuba), benefiting from language proximity and also from the recent expansion of Brazil's public higher education sector (table 8)

[3] The same person can hold more than a teaching post, in different institutions.

Table 8 -Teaching posts with foreigtn and naturalized professors in Brazil	
Country of origin	
Spanish and Portguese Speaking countries	3,069
Italy	227
Germany	194
USA	155
France	148
Others	783
Total	4,576
Obained Brazilian Nationality	1,630
With Doctoral Degrees	3,967
Doing research	2,736
Working in Public Institutions	3,734
With full time working contracts	2,889

Source: Tabulated from Brazil, Ministry of Education, Census of Higher Education, 2012

There are relatively few international students in higher education in Brazil, less than 20 thousand (table 9). Since public universities cannot charge tuition and are under pressure to expand the number of Brazilian students they receive, they have no incentives to recruit and support foreign students. Most private institutions, on other hand, cater to low-income students and are therefore not attractive to foreign students either.

Table 9 - Brazilian and Foreign Students in Higher Education, 2010					
Undergraduate		**MA Programs**		**Doctoral Programs**	
Total enrolment	6,197,318	Total enrolment	177,471	Total enrolment	77,762
Total foreigners	15,949	Total foreigners	2,051	Total foreigners	1,757
of which:		of which:		of which:	
Portugal	1,350	Colombia	250	Colombia	192
Angola	1,314	Peru	197	Peru	183
Argentina	1,004	United States	165	France	133
United States	959	Argentina	155	Argentina	119
Cape Verde	840	France	138	Italy	106

Source: Tabulated from Brazil, Brazilian Institute for Geography and Statistics (IBGE), 2010 Population Census sample (microdata)

Brazilian universities also scores low in international rankings: only two or three Brazilian universities appear in the international rankings of higher education institutions, but not among the 100 best (although the University of São Paulo appears consistently as the leading institution in Latin America), and there is no explicit policy to try to change this situation (Schwartzman 2007).

Recently, the government decided to create a "University for Latin American Integration", UNILA, in the Iguaçu Falls region, where Brazil meets with Argentina and Paraguay, with the expectation that this would foster cooperation between Brazil and other countries in the region; and a "University for International Integration with the Portuguese speaking countries in Africa", UNILAP, in the interior of the State of Ceará, in the Brazilian Northeast. These are very small and poorly staffed institutions, with less than one thousand

students among the two in 2011, and are not likely to play any significant role. There are also a few fellowship programs for students from Latin America and Africa, provided by the Brazilian government.

These initiatives are meant to be part of a broader policy orientation of the Brazilian government to give preference to links with the "third world" in foreign relations. Creating university-based relationships with these countries may be important for sharing knowledge and experiences, as well as creating knowledge, social networks and technology that can address problems facing these countries. However, maintaining connections with the most dynamic and resourceful centers of scientific and technological innovation in the "first world" is crucial for creating capacity for maintaining connections with – and having the ability to benefit from -- the worlds' most powerful centers of science and technology.

There are no branches of foreign universities in Brazil, but the legislation allows for-profit higher education institutions to coexist with the public and philanthropic sectors. This created an opportunity for international corporations such as Laureate, University of Phoenix, DeVry Education and others to invest in the Brazilian education market, as well as for other national and international investment groups with no previous experience in education, to come. Some private conglomerates with open capital in the stock exchange, such as Kroton Education, that has more than a million students and is valued at about 6 US billion dollars (Levy 2006, Ricardo Geromel 2013). Today, 72% of the higher education students are in private institutions. The arrival of international organizations and investment groups in Brazilian higher education has been seen with suspicion by some Brazilians, that argue that education cannot be treated as business, and that international institutions could introduce contents that may be inappropriate or alien to the Brazilian culture. In practice, however, the international groups preferred to acquire preexisting institutions without altering their contents, which have to respond to the requirements of the Brazilian legislation and the Ministry of Education, while introducing new management and accounting approaches to make them more efficient and profitable. These large teaching institutions are indeed very different from the traditional universities, with their strong and autonomous academic departments, but they provide education opportunities to many Brazilians who could not gain access to the more selective and smaller public education sector.

In 2010, the Brazilian government announced the program "Science Without Borders" which was supposed to send 100 thousand Brazilians to study abroad in the next four years, in an effort to move rapidly in the internationalization of Brazil's science, technology and innovation sector. On closer inspection, however (Castro, et al. 2012), it became clear that most of the fellowships would be given to undergraduate and graduate students for one academic year abroad. There were also doctoral and post-doctoral fellowships, and resources to bring foreign scholars to Brazil, which meant an increase, but not a dramatic change relative to the previously existing fellowships and international exchange programs; and 25% of the fellowships were to be supported and handled by private companies for technical training abroad, also for short periods.

One of the difficulties the program faced was the lack of enough applicants with fluency in English or French to go to top universities in Europe or the United States, which was one of the purposes of the program. The latest figures published on the program's Internet site (Portal Ciência Sem Fronteiras 2013) are that there were 825 students receiving support for doctoral studies, 3.7 thousand for doctoral "sandwich" fellowships, 2.3 thousand for post-docs, and 15 thousand for undergraduate "sandwich" programs, adding up to 22.6 thousand. There is no information on fellowships either for technical training or for persons coming to Brazil with the program's support. The countries of preference are the United States, Spain, France, Canada, Portugal and Germany.

Discussion and Conclusion

Although immigration, emigration and return-migration have been increasing again in Brazil in recent years, and although highly skilled people are disproportionately represented relative to Brazilians who do not immigrate, this still represents a tiny fraction of the workers, professionals and managers in Brazilian companies. The lack of skilled workers will likely not be resolved in the near future through immigration, unless a radical change in the immigration policy happens. Nonetheless, it is worth learning more detail who these international migrants are and what they are doing.

We have looked at two reasons that lead people to go into and out of the country: to study and to work. These reasons are inter-connected, and related not just to individual decisions, but also to government policies and institutional arrangements in Brazil and abroad.

Regarding the connection between education and work experience abroad, there are two different stories that come out from our data from immigrants to the United States. First, college-educated Brazilian immigrants in the US often do not have the chance to get work experience compatible with their educational level. The work experience they get abroad, as well as their new social connections, do not necessarily bring them advantages back home (except for the money that they may have accumulated), nor lead them to make connections to global professional and entrepreneurial networks. Second, people who do have advanced degrees beyond a college education usually do not stay abroad, but when they do, they generally work in professional or managerial occupations, which make them potentially well-positioned to acquire resources, knowledge, capital and connections which can lead in turn to economic and technological development, if they re-establish or maintain their ties to Brazil at the same time.

Brazilians who return to Brazil are also privileged relative to the general population. They work in higher status occupations, those with college education have degrees in the more prestigious and better paying careers, and those with PhDs are more likely to get jobs in the more prestigious and research-intensive Brazilian universities. There are, therefore, strong incentives to go back, especially for those with a college degree, who seem to get a

better status position (though perhaps not better financially) within Brazil than, say, in the United States, Europe or Japan.

There are few foreign-born people in Brazil today, compared with a century ago. Probably due to a restrictive policy on the formal employment of foreigners, the rate of informal employment among immigrants is much higher than that of the general population. Those who get formal employment are relatively privileged, suggesting a class-stratified immigration policy, and perhaps a connection between highly skilled and elite migrants and the establishment of foreign companies in Brazil. In the academic realm, students and professors who come from abroad are usually from Portuguese or Spanish-speaking countries. Language and institutional factors thus seem to be a big limiting factor in the capability of Brazil to "gain brains" from abroad.

In the early 20th century, Brazil, together with the United States and Argentina, was a major destination of international migration, and foreign scientists and entrepreneurs helped the development of the country's education and research institutions and private companies. Brazil joined the allies during Second World War, coming under strong American influence for the reorganization of its economy and public institutions, and the opening of the economy to international investors was a key factor in the country's economic development and modernization thereafter.

However, Brazil did not remain a strong participant in the international flow of information and knowledge. Brazil's relative economic isolation from the rest of the world may have shielded the country from the economic crisis of the late 1990s, but in the long term, the economic and social development of the country may be paying a price if Brazil remains disconnected from the international flow of ideas, knowledge, connections and other resources.

Although the circulation of people into and out of the country has been increasing again recently, it is still extremely low relative to historical rates, and also compared to other countries in a similar level of development. Brazil could benefit from more international migration, particularly from more highly skilled immigrants, and by allowing greater participation of foreigners in the formal labor market. The Brazilian population is still young, but the fertility rate, of about 1.8 births per woman, is below replacement. Unemployment has been very low for many years, particularly for more educated persons, so, increasing immigration and allowing immigrants to work in the Brazilian formal economy would not significantly change the job prospects for educated Brazilians, while possibly enabling a greater links with global professional and business networks. Moreover, existing immigration laws are outdated, and still impregnated by racial and nationalistic prejudices supported by the authoritarian governments of the 1930s and 1980s (Cook-Martín and FitzGerald 2010, Seyferth 1997).

In spite of its limitations, the leading Brazilian higher education institutions and graduate schools are among the best in the region, and Brazil could easily become an

international hub for students coming from all over Latin America and Africa, if its main universities received the necessary incentives and support from government and could allow students and faculty to work in English or Spanish, not just Portuguese. Leading foreign and Brazilian scholars abroad could be attracted to work in the best Brazilian public institutions if they were allowed to offer internationally competitive salaries and reduced the bureaucratic barriers for bringing in new talent. The money being spent today in the "Science without Borders" program, estimated to cost about 500 million dollars in 2014, could be better used by making sure that students going abroad with public support should only do so if they were admitted to high quality institutions for advanced degrees, and to provide financial and technical resources to Brazilian institutions to bring them back and put their newly acquired competencies to the best possible use, or to establish and retain connections to those who choose to stay abroad after completing their studies.

References

Agrawal, Ajay, Devesh Kapur, John McHale, and Alexander Oettl. "Brain Drain or Brain Bank? The Impact of Skilled Emigration on Poor-Country Innovation." *Journal of Urban Economics* 69, no. 1 (2011): 43-55.

Andreazza, Maria Luiza, and Sergio Odilon Nadalin. "The Context of Colonization in Southern Brazil and the Immigrant Family." *Brazilian Journal of Population Studies. Campinas, São Paulo* 2 (2001): 121-44.

Asian Development Bank. *Asia 2050 - Realizing the Asian Century*. 2011.

Balbachevsky, Elizabeth. "Graduate Education: Emerging Challenges to a Successful Policy." In *The Challlenges of Education in Brazil*, edited by Colin Brock and Simon Schwartzman. Oxford Studies in Contemporary Education, 209-28. Oxford: Smposium Books, 2004.

Balbachevsky, Elizabeth, and Simon Schwartzman. "The Graduate Foundations of Research in Brazil." *Higher Education Forum (Research Institute for Higher Education, Hiroshima University)* 7, no. March (2010): 85-100.

Barbosa Filho, Fernando de Holanda, and Samuel Pessoa. "Educação e Desenvolvimento No Brasil." Chap. 7 In *Desenvolvimento Econômico: Uma Perspectiva Brasileira*, edited by Fernando Veloso, Pedro Cavalcanti Ferreira, Fabio Giambiagi and Samuel Pessoa, 211-35. Rio de Janeiro: Editora Campus / Elsevier, 2012.

Barrow, Clyde W, Sylvie Didou-Aupetit, and John Mallea. *Globalisation, Trade Liberalisation, and Higher Education in North America: The Emergence of a New Market under Nafta?* Vol. 4: Springer, 2003.

Boeri, Tito, Herbert Brücker, and Frédéric Docquier. *Brain Drain and Brain Gain: The Global Competition to Attract High-Skilled Migrants*. Oxford University Press, 2012.

Brandão, Ignácio de Loyola. *Oficina de Sonhos - Américo Emílio Romi, Aventuras de Um Pioneiro*. São Paulo: DB Artes Gráficas, 1996.

Brasil Diretoria Geral de Estatística. *Annuario Estatistico Do Brazil* Vol. 1, Rio de Janeiro1908-1912.

Cardoso, Eliana. *From Inertia to Megainflation: Brazil in the 1980s*. Working Paper 3585. National Bureau of Economic Research, 1991.

Carney, Judith A. "'With Grains in Her Hair': Rice in Colonial Brazil." *Slavery & Abolition* 25, no. 1 (2004): 1-27.

Carney, Judith Ann. *Black Rice: The African Origins of Rice Cultivation in the Americas*. Harvard University Press, 2009.

Carvalho, José Alberto Magno de, and Marden Barbosa de Campos. "A Variação Do Saldo Migratório Internacional Do Brasil." *Estudos Avançados* 20, no. 57 (2006): 55-58.

Carvalho, José Murilo de. "Political Elites and State Building: The Case of Nineteenth-Century Brazil." *Comparative Studies in Society and History* 24, no. 3 (Jul. 1982): 378-99.

Castro, Claudio De Moura, Hélio Barros, James Ito-Adler, and Simon Schwartzman. "Cem Mil Bolsistas No Exterior." *Interesse Nacional*, no. abril-junho (2012): 25-36.

Cook-Martín, David, and David FitzGerald. "Liberalism and the Limits of Inclusion: Race and Immigration Law in the Americas, 1850-2000." *Journal of Interdisciplinary History* 41, no. 1 (2010): 7-25.

Cueto, Marcos. *Missionaries of Science: The Rockefeller Foundation and Latin America*. Indiana Univ Pr, 1994.

Dean, Warren. *The Industrialization of São Paulo, 1880-1945*. Latin American Monographs. Austin, TX: Institute of Latin American Studies; University of Texas Press, 1969.

———. *Remittances of Italian Immigrants from Brazil, Argentina, Uruguay and USA., 1884-1914*. Occasional Papers (New York University. Ibero-American Language and Area Center). New York: New York University, Ibero-American Language and Area Center, 1974.

Edelson, S. Max. "Beyond "Black Rice": Reconstructing Material and Cultural Contexts for Early Plantation Agriculture." *The American Historical Review* 115, no. 1 (2010): 125-35.

Fausto, Boris. *Fazer a América a Imigração Em Massa para a América Latina*. São Paulo: Edusp. Memorial. Fundação Alexandre de Gusmão, 1999.

———. *Imigração e Política Em São Paulo*. Série Imigração. São Paulo, São Carlos, São Paulo: IDESP, Editora Sumaré. Editora da UFSCar, 1995.

———. *Negócios e Ócios Histórias da Imigração*. São Paulo: Companhia das Letras, 1997.

Filipović, Jovan, Srečko Devjak, and Goran Putnik. "Knowledge Based Economy: The Role of Expert Diaspora." *Panoeconomicus* 59, no. 2 (2012).

Fishlow, Albert. *Origins and Consequences of Import Substitution in Brazil*. International Economics and Development. Essays in Honor of Raul Prebisch. New York, 1972.

Friedberg, Rachel M. "You Can't Take It with You? Immigrant Assimilation and the Portability of Human Capital." *Journal of Labor Economics* 18, no. 2 (2000): 221-51.

Gadelha, Paulo. "Conforming Strategies of Public Health Campaigns to Disease Specificity and National Contexts: Rockefeller Foundation's Early Campaigns against Hookworm and Malaria in Brazil." *Parassitologia* 40, no. 1-2 (1998): 159-75.

García Guadilla, Carmen, Sylvie Didou, and Carlos Marquis. "New Providers, Transnational Education and Accreditation of Higher Education in Latin America." *Informe al IESALC-UNESCO* (2002).

Glaser, William A, and G. Christopher Habers. *The Brain Drain Emigration and Return Findings of a Unitar Multinational Comparative Survey of Professional Personnel of Developing Countries Who Study Abroad*. Unitar Research Report; No. 22 Unitar Research Reports. Oxford, New York: Pergamon Press, 1978.

Glaser, William A., and G. Christopher Habers. "The Migration and Return of Professionals." *International Migration Review* 8, no. 2 (1974): 227-44.

Glick, Thomas. "The Rockefeller Foundation and the Emergence of Genetics in Brazil, 1943-1960." *The Rockefeller Foundation and Latin America* (1994): 149-64.

Hidalgo, César A, and Ricardo Hausmann. "The Building Blocks of Economic Complexity." *Proceedings of the National Academy of Sciences* 106, no. 26 (2009): 10570-75.

Hirschman, Albert O. "The Political Economy of Import-Substituting Industrialization in Latin America." *The Quarterly Journal of Economics* 82, no. 1 (1968): 1-32.

IBGE. *Anuário Estatístico Do Brasil 1955*. Vol. 16, Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística, 1956.

Institute of International Education, "Open Doors Data - International Students: Leading Places of Origin", Institute of International Education http://www.iie.org/Research-and-Publications/Open-Doors/Data/International-Students/Leading-Places-of-Origin/2010-12 (accessed August 22 2013).

Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, "Indicadores Financeiros Educacionais", Brasil, Ministério da Educação http://portal.inep.gov.br/indicadores-financeiros-educacionais (accessed August 22 2013).

Iredale, Robyn. "The Migration of Professionals: Theories and Typologies." *International migration* 39, no. 5 (2001): 7-26.

Klein, Herbert S. "The Colored Freedmen in Brazilian Slave Society." *Journal of Social History* 3, no. 1 (1969): 30-52.

Kloss, Heinz. "Language Rights of Immigrant Groups." *International migration review* 5, no. 2 (1971): 250-68.

Lang, James. "Portuguese Brazil: The King's Plantation." New York: Academic Press, 1979.

Leahy, Joe. "Doubts Cloud Brazil Outlook after Disappointing First Quarter." *Financial Times*, 2013.

Lesser, Jeffrey. "Immigration and Shifting Concepts of National Identity in Brazil During the Vargas Era." *Luso-Brazilian Review* (1994): 23-44.

Leta, Jacqueline. "Brazilian Growth in the Mainstream Science: The Role of Human Resources and National Journals." *Journal of Scientometric Research* 1, no. 1 (2012): 44.

Levy, Daniel C. "The Unanticipated Explosion: Private Higher Education's Global Surge." *Comparative Education Review* 50, no. 2 (2006): 217-40.

Luna, Francisco Vidal, and Herbert S. Klein. *Slavery and the Economy of São Paulo,1750-1850*. Social Science History. Stanford, Calif.: Stanford University Press, 2003.

Manchester, Alan Krebs. *British Preeminence in Brazil Its Rise and Decline; a Study in European Expansion*. New York: Octagon Books, 1964.

Margolis, Maxine L. *Goodbye, Brazil - Emigrés from the Land of Soccer and Samba*. Madison: The University of Wisconsin Press, 2013.

Martins Filho, Amilcar Vianna, and Roberto B. Martins. "Slavery in a Nonexport Economy - Nineteenth Century Minas Gerais Revisited." *Hispanic American Historical Review* 63, no. 3 (1983): 537-68.

Martins, José de Souza. *EmpresáRio e EmpreSa Na Biografia Do Conde Matarazzo*. Monografias Do I C S ,. Rio de Janeiro,: Instituto de Ciências Sociais, 1967.

Massey, Douglas S, Joaquin Arango, Graeme Hugo, Ali Kouaouci and Adela Pellegrino. 1999. *Worlds in Motion: Understanding International Migration at the End of the Millennium*. Oxford University Press.

Ministério de Ciência Tecnologia e inovação, "Indicadores Nacionais de Ciência Tecnologia e Inovação," Portal do Ministério da Ciência, Tecnologia e Inovação http://www.mct.gov.br, acessed November 10, 2014.

National Science Foundation, "Science and Engineering Doctorates: 2011", National Science Foundation (accessed August 22 2013).

O'Neill, Jim. "Building Better Global Economic Brics." In *Global Economics Paper No: 66*: Goldman Sachs, 2001.

Parreñas, Rhacel Salazar. "Migrant Filipina Domestic Workers and the International Division of Reproductive Labor." *Gender & Society* 14, no. 4 (2000): 560-80.

Portal Ciência Sem Fronteiras, "Estatísticas e Indicadores", Portal Brasil http://www.cienciasemfronteiras.gov.br/web/csf/estatisticas-e-indicadores (accessed August 22 2013).

Ricardo Geromel, "Brazil's Multi-Billion Dollar Education Industry: Shaping Futures, Changing Lives, and Minting Billionaires" http://www.forbes.com/sites/ricardogeromel/2013/05/10/brazils-multi-billion-dollar-education-industry-shaping-futures-changing-lives-and-minting-billionaires/ (accessed March 7, 2014).

Saxenian, AnnaLee. "Brain Circulation. How High-Skill Immigration Makes Everyone Better Off." *Brookings Review* 20, no. 1 (2002): 28-31.

Schwartzman, Simon. "Brazil's Leading University: Between Intelligentsia, World Standards and Social Inclusion." In *World Class Worldwide: Transforming Research Universities in Asia and Latin America*, edited by Phillip G. Altbach and Jorge Balán, 143-72. Baltimore: The Johns Hopkins University, 2007.

———. *A Space for Science the Development of the Scientific Community in Brazil*. University Park: Pennsylvania State University Press, 1991. Formação da comunidade científica no Brasil, 1979.

Seyferth, Giralda. "A Assimilação Dos Imigrantes Como Questão Nacional." *Mana* 3, no. 1 (1997): 95-131.

United States Census Bureau. "The Foreign Born from Latin America and the Caribbean: 2010." In *American Community Survey Briefs*. Washington, DC, 2011.