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Master's Programme in Economic Demography

From slums to sustainability?

Internal migration in a highly urbanised developing country: the case of Brazil

by

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Brazil is a country founded on migration, and since the Second World War most of that migration has been internal. However, urban overcrowding has changed the nature of migration in this, one of the most urbanized developing countries. Does internal migration in such a context still bring sizeable income gains, and are Brazilian workers right to be moving away from megaopolises like greater São Paulo? This thesis examines differences in income between migrants and non-migrants in both rural and urban settings, and finds a surprisingly large premium associated with being a migrant, which suggests that in some cases migration can in some cases be a mechanism by which economic inequalities are reduced.

Key words: internal migration, development, urbanisation, Latin America

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1 Introduction and research question

1.1 Introduction

1.1.1 Is internal migration different?

Migration is a highly significant part of economic development in the Global South. More than ninety percent of migrants within this part of the world move for economic reasons, although violent conflict, political persecution and trafficking are also important factors. Migration has important effects, both on the community that sends the migrants and the region to which they move. The welfare effects of migration on the migrants' region of origin are generally large and positive. They range from increased scope for remittances, making consumption less susceptible to environmental or economic shocks, as well as access to credit and knowledge. (Ratha et al., 2011)

Most migrants from the developing world do not move to rich countries. Instead, they move to cities in developing countries, because there are better employment opportunities there. Often, people are pushed out of their communities of origin by falling living standards or environmental degradation. These individuals arrive in cities in a state of desperation, leading to the development of slums in their new cities, which may enlarge the gap between rich and poor. Urbanisation in general is a challenge in the developing world, but the relationship between migration and the growth of cities is likely to be an important factor for policymakers across the world over the coming decades. (Ratha et al., 2011)

It is widely accepted by economists that migration is good for the economy, because it fills economic niches in sectors that are growing as well as those in decline, and because migrants generally have skills which fulfil an economic need in their destinations. It stands to reason that migrants would not move if they did not believe that they would make a gain by doing so. However, the gains from migration may not just be financial, and the pecuniary gains may take some time to come through. Studies of migration should therefore be careful not to assume that the reasons for migration are entirely economic, or that they all short-term. (Falck et al., 2015)

From an international perspective, it is believed that migration during the final decades of the nineteenth century and the early decades of the twentieth was an important vehicle for stimulating economic convergence in terms of factor prices. However, for a long time migration rates to most countries were simply too low to measure the effects on income. However, since the second phase of globalisation began in the 1980s, interest in this question has been rekindled. Many scholars have argued that migration played an important role in the early development of many economies and its effects have been highly persistent. (Putterman & Weil, 2010; Ortega & Peri, 2012)

Internal migration is a complicated phenomenon involving both demographic and economic aspects. It is generally accepted that the variables influencing the decision to migrate are similar to those influencing international migration: economic differentials, labour market advantages, environmental issues, with the additional factor of distance. Unlike with international migration, internal migration could easily involve moving only a short distance, putting it within relatively easy reach of people. (Van der Gaag & Wissen, 2003) However, does the fact that internal migration carries lower costs than international migration mean that the premium is also lower? Indeed, in the short-term, is it reasonable to expect any premium at all?

1.1.2 Migration in Brazil and Latin America

Migration has been a major factor in the history of Brazil for centuries, just as it has been across Latin America, in large part because Brazil was founded as a Portuguese colony. Over the last twenty-five years, however, the dynamics which had prevailed in the country for hundreds of years have begun to break down. Urbanisation in Brazil has reached saturation point, and, more importantly, emigration has become a more significant part of the country's economic development. This is broadly reflective of the observed tendency that as a country develops, the costs of international migration become more affordable, and this effect has been enhanced by the incorporation of Brazil into the wider global economy. (Brzozowski, 2012)

Latin America is an important region in which to study internal migration, because its isolated geographical location has historically given it relatively low levels of international migration, meaning that internal migration has more frequently been the main driver of demographic change. Considerable research has already been carried out to better understand this migration, which varies in many ways across countries, for example age. During the middle decades of the twentieth century, the high point of Latin American *desarrollismo*, the developmental state, internal migration across the region was characterised by massive movements from rural communities to a small sub-set of major cities. (Bernard et al., 2017)

The sizeable transatlantic migration stream to Latin America essentially dried up after the Second World War. (Cerrutti & Parrado, 2015) Capital cities in the region were a major destination for migrants during these decades, but since then there has been a wider migration to other large cities and to smaller ones. Bernard et al. (2017) discussed the demographic profiles of internal migrants across Latin America, and found that in Chile, Costa Rica, and Panama, migrants were likely to be older, and that these countries exhibited higher migration intensity. Others, particularly in the Andes, Central America, and the Caribbean, were likely to exhibit an earlier age peak and lower intensity, which somewhat blunted the redistributive effects of migration, though in those cases the effect of migration might have been weakened also by the increasingly tendency of Latin American workers to migrate to the United States in the second half of the twentieth century. (Cerrutti & Parrado, 2015)

Brazil, however, displayed traits similar to other Mercosur countries, like Argentina, Uruguay, Paraguay and Colombia. Internal migration here is characterised by intermediate intensity and low effectiveness, meaning that even though rates of internal migration are rather high, its impact on the overall income structure of the country is rather low. This is interesting because it points to a limited impact of migration on income for migrants in Brazil, which might be a

reflection of the fact that Brazilians were less able to migrate to North America than their Spanish-speaking counterparts in the region, even before the migration regime in the US became more restrictive. (Cerutti & Parrado, 2015; Bernard et al., 2017)

The net effect of these migration trends has been the large-scale urbanisation of most of Latin America, making it by now perhaps the most urbanised region in the world, challenged only by parts of Western Europe. In 1940, only 15 percent of Brazil's population lived in urban areas – by 1970 this had grown beyond 50 percent, and now it is above 80 percent. In spite of the rather disappointing economic development of the region over the second half of the twentieth century, urbanisation has had the effect of closing social gaps, reducing inequalities in life expectancy and literacy. (Wagner & Ward, 1980; Astorga et al. 2005)

This, as Astorga et al. (2005) note, is in contrast to the experience in Europe, where urbanisation had the effect in the short and medium terms of widening social inequality and lowering public health. It may well be that the fact that Latin America urbanised later than the more developed world has meant that its social and economic outcomes have been better. One reason for this is likely to be increased investment in potable water, the application of modern medical methods, and the availability of adequate healthcare, all of which would have been less effective in a less urbanised environment.

The positive and negative consequences of urbanisation in Latin America are important, because they have wider ramifications for the developing world. In 2008, a milestone was reached, as the percentage of the world's population living in urban areas exceeded fifty percent for the first time in human history. It is anticipated that by 2030 five billion people will be living in towns and cities throughout the world. (Chelala, 2010) That urbanisation, like the urbanisation in Brazil and its neighbours, is likely to be driven by internal migration from rural areas. It is important, then, that we gain an adequate understanding of the economic drivers of internal migration, as well as the pecuniary benefits it affords.

In a Brazilian context, it has generally been considered that internal migration has both push and pull factors, and this has particularly been the case for the main migration stream in modern Brazilian history, from the north-east of the country to the south-east. Migrants have been pushed out of the north-east because of poverty and lack of job opportunities, and they are drawn to the south-east, and to the city of São Paulo in particular, because of the concentration of industry there. The demand from the major economic centres in the south-east has served to accelerate the process, encouraging urbanisation but also creating demographic imbalances, as there have historically been more job opportunities for men than for women. (Amaral, 2013)

Internal migration in Brazil has placed considerable pressure on infrastructure networks in the country's cities. The outbreak of *favelas*, shanty towns occupied by internal migrants, began in the 1970s, and led internal migrants to adjust their preference towards smaller cities, with populations between 100,000 and 500,000, instead of the major urban centres. There are elements of selection to internal migration in Brazil, with more highly educated individuals being more likely to move from rural areas, and richer rural areas facing a more significant exodus. Nevertheless, it is important to consider the potential effect of large-scale internal migration on rates of poverty. (Ferré, 2011)

Brazil is a geographically large country, located a long distance from the developed world. It has relatively low incomes, which makes international migration prohibitively expensive for most people. Internal migration, however, is a significant factor in Brazil's demographics and the spatial composition of its labour force. Is it a poor alternative, though? Are Brazilians who migrate internally gaining real pecuniary benefits from it? And has Brazil's urbanisation reached a tipping point, where there are no longer gains to be made from moving into crowded cities, which may have poor sanitation and high levels of crime, among other problems?

1.1.3 Research question

This thesis seeks to examine the contours of internal migration in Brazil as it has existed in the early years of the twenty-first century. It tries to do this by looking at the economic outcomes of internal migrants, especially those who migrate from more distant regions. The theoretical framework of the thesis underlines the reasons why we should expect internal migrants to enjoy an income premium after migration, and this thesis seeks to show this premium with reference to real-world, empirical data.

In addition, this thesis seeks to establish how the migration premium interacts with educational attainment. We would, of course, expect educational attainment to have a positive relationship with income, but this thesis is intended to inspect whether or not increased levels of education result in a larger income premium from migration or not. We will also look at how the income premium interacts with race, a topic which plays a complex role in Brazilian society. In 2010, Brazil had a population which was 48 percent white, 43 percent mixed race, and 8 percent black, though these categories are complicated and controversial, as we will see.

We are also attempting to examine how migration outcomes differ across genders. As the Brazilian economy has developed, the importance of female labour market outcomes in influencing migration decisions has grown. There is a long-standing trend within Latin America of feminisation of migration: since 1990 the number of female migrants in the region has exceeded the number of male migrants. (Oliveira, 2016) This might be a consequence of reduced fertility, freeing women to migrate elsewhere in search of higher incomes and better living standards. Whether or not they have found these – or whether or not they have been better at finding them than men – will also be studied by this thesis.

Finally, the thesis aims to establish if the income premium is larger in smaller cities than it is in the established megacities, in order to see more clearly if there is an economic pull factor encouraging migrants to move there – a hypothesis which, if supported, would have important implications for the study of internal migration in other highly urbanised regions of the developing world.

1.2 Aim and scope

This thesis seeks to examine internal migration in Brazil in the early twenty-first century. Its aim is to determine whether or not migrants experience an earnings premium relative to those who were born in the town or city in which they reside. It also seeks to establish how the migration premium, if such a thing exists, interacts with important socioeconomic variables, like educational attainment, race, and gender. It also aims to examine how migrants fare over time, after they moved, and in so doing establish whether migration is related to an income shock, or an overall change in earnings trajectory.

The thesis seeks to answer these questions by looking at data for working-age individuals who have an income and have been living in Brazil for at least five years. It focuses specifically on a sample of census data from the 2010 survey. In order to shed more light on the impact of migration on earnings, the thesis will place particular focus on migrants who have moved internally within the past five years – in other words, from 2005 to 2010. It might be useful to examine economic outcomes over time for this group, because this period coincides with the financial crisis of the late 2000s, which might have had a stimulating effect on migration decisions.

1.3 Outline of the thesis

Chapter 2 deals with the theoretical framework of the thesis and previous research which has been carried out in this area. In particular, it focuses on theoretical ideas of why people migrate, and how internal migration differs from migration across borders. It can be presumed that migrants are in some way better off as a result of migration, and considerable research has been done in order to establish exactly how this works. Reasons for migration may entail pecuniary or non-pecuniary benefits, including social networks that may have been created by previous waves of migration. In looking at this topic, the chapter pays particular attention to the ample research which has been carried out into internal migration within the United States.

The chapter goes on to examine how internal migration has played out in Latin America, and Brazil in particular, and how it has differed. In particular, as has already been mentioned, rural-to-urban migration is considerably more advanced in Latin America than it is elsewhere, which opens up theoretical questions. Are cities in Brazil close to a saturation point, in comparison to their counterparts in North America and elsewhere? Would we expect rural-to-urban migration to fall the urban share of the population creeps ever higher, and would we expect the profile of migrants to change?

Chapter 3 deals with the data and statistical methods that will be used. This thesis uses a sample of census data which should provide us with a cross-section of the Brazilian population adequate for the purposes of making statistical inferences. The data has been managed in order to allow it to better answer our research questions. The models that will be used to analyse the

data are intended to be robust, and grounded in an idea of the effect of migration that is based on the theoretical framework outlined in Chapter 2.

Chapter 4 assesses the results of our empirical analysis and seeks to situate them in an appropriate context, by considering how they relate to our expectations and what we know about Brazil and other parts of the world. It will discuss the implications of our findings more generally, and their practical significance. In particular, it will consider whether or not race and gender have been adequately considered in the theoretical framework. Chapter 5 is the final part of the thesis, which seeks to draw conclusions from the findings of the empirical study, as well as considering areas that might merit further study in the future.

2 Theory and previous research

2.1 Context: Brazil and the developmental state

The history of the economic development of Latin America is tightly bound up with the ideas of the Monroe Doctrine, which was proclaimed in 1823 and declared that the United States regarded all parts of the Americas as representing its sphere of influence. As European power declined in South America over the course of the nineteenth century, the importance of the United States grew, as a supporter of economic growth and military protection. The geopolitical significance of Latin America grew substantially with the end of the Second World War, as yet another front in the ideological battle between capitalism and communism. It was during this period that economic growth in the region accelerated. (Almanadoz, 2016)

During the 1950s and early 1960s, Latin America's largest economies shared a relatively high level of economic expansion, which was accompanied by sustained urbanisation. The vast markets created by the US-backed Import Substitution Industrialisation created scope for massive growth, and Brazil and Mexico enjoyed annual rates of about six percent, very impressive even by the high standards of the post-war years. It seemed outwardly as though Latin America was experiencing its economic moment, breaking out of a post-colonial rut and taking its place among the developed regions of the world. (Markoff & Baretta, 1990)

However, this economic model was only sustainable in the short term. For as long as it endured, *desarrollismo* allowed the political debate in Brazil to be dominated by the day-to-day distribution of a rapidly growing economic pie. What became clear in the early 1960s was that import substitution could only do so much to promote economic development in Brazil. As industrialisation advanced, the numbers employed in manufacturing declined, and the need for expertise from abroad increased. This factor forced policymakers to take seriously the need to open up the Brazilian economy to competition and trade from the wider world, and was an important factor in the collapse of Brazilian democracy in 1964. (Almanadoz, 2016)

The prospect of economic contraction rather than growth destabilised the political situation in Brazil and aided the rise a military junta, which overthrew the government of President João Goulart, which had planned to implement a policy of socialising the profits of the large firms whose investment in the country had grown during the period after the Second World War, and this, combined with wider social unrest and the growing radicalism of other governments in the region resulted in a reaction. The military junta remained in power until 1985, when free and fair elections took place again. (Markoff & Baretta, 1990)

The period of the military dictatorship was characterised by very high economic growth, averaging more than seven per cent annually in the 1970s. Per capita GDP in Brazil, which had been one third lower than Chile's in 1960s, was higher by 1975. The regime had pursued

policies of gradual economic liberalisation, and had a view to relinquishing power, and allowing for political liberalisation also. This was impeded, however, by a sharp economic contraction in the 1980s, when inflation was even higher than it had been in the early 1960s. Nevertheless, the government was returned to civilian control. (Adrogué et al., 2006)

Brazil continued to struggle economically in the years after the end of the dictatorship – financial management of the country under the regime had generally been regarded as good, and the focus of democratic reformers was instead on expanding civil rights and ensuring the firm foundation of multiparty democratic institutions. Eventually inflation was tackled with currency reform in the mid-1990s. As the Brazilian economy has grown, the country has become more influential internationally, as a leading player in the Mercosul group of economies, and as one of the BRICS, alongside India, Russia, China and South Africa. (Fishlow, 2011)

Brazil's development in the decades after the Second World War was grounded in the ideas of development economics that existed at that time. It was assumed that in order to stimulate economic development, societies needed to invest, in order to bring about a “drive to maturity” that was not merely economic. The expectation was that such a stage would need to be sustained for at least two generations before the country could be said to lie among the developed nations of the world. It was in this context that urban planning ideas were imported from the United States, a continuation of a pattern which had existed since the Good Neighbour policy of Franklin D. Roosevelt, in the 1930s. (Rostow, 1960; Almanadoz, 2016)

The developmental state persisted in Brazil well into the second half of the twentieth century, as conscious efforts were made to strengthen the growth of the industrial sector, with an emphasis on heavy industry and consumer goods. Brazil benefitted from easy access to credit on international markets at this time, as well as widespread popular support for the developmental state. Indeed, the late 1950s, the period before the economic crisis that ushered in military rule, is often seen as the golden era of Brazilian developmentalism, under the leadership of Kubitschek, whose influence over urban development policy in the country was substantial, as we will see. (Ricz, 2014)

The developmental state was sustained by the military government, and a certain level of popular participation was maintained at all times. After 1964, this took the form of “bureaucratic rings”, as well as the opportunities which existed for outsiders to be appointed to run aspects of the bureaucracy within the developmental state. There was a recurring problem, however, of ensuring the adequate representation of non-elite voices in the state, during both democratic and non-democratic periods. This, combined with the failure of state-led developmental projects to ensure that they received value for the money they invested, left Brazil vulnerable when its economy finally opened. (Schneider, 2015)

After the war, local planning was centralised under the aegis of the *Departamento Administrativo do Serviço Público* (DASP), which sought to implement US-inspired ideas of zoning and framing metropolitan ideas within their hinterland, following the lesson that had been learned from the development of New York. There were also initiatives, spearheaded by Father Luis-Joseph Lebret, to facilitate the inclusion of rural migrants within the peripheries of growing cities. These interdisciplinary ideas of urban development contributed to a post-war

commitment to improved quality of life and the “spatialisation” of development. (Almanadoz, 2016)

Perhaps the apex of Brazilian urban development in the context of the developmental state was the construction of country’s new capital city at Brasilia. It had been intended since the early nineteenth century to construct a new capital somewhere on the Central Plateau, equidistant from Brazil’s major cities. Indeed, this plan had been set out in the country’s constitution. When Juscelino Kubitschek was elected Brazilian president in 1956, he promised to finally carry out the plan. In the outline given to aspiring city planners, it was decreed that the city should be built for a maximum population of 500,000. Lúcio Costa’s plan, generally known as the *Pilot Plan*, won out, and the centre of the city was complete by 1960. (Tavares, 2010)

Despite its reputation as a planned city, Brasilia lacked a comprehensive masterplan, meaning that its long-term development over the decades since 1960 has been haphazard, and influenced heavily by the illegal construction of slum-quality housing. Far from breaking the mould, Brasilia has found itself facing many of the same problems as other cities in Brazil: a teeming periphery, a shortage of affordable housing, and major traffic problems – because Brasilia, with a nod to the ideas of American urban planners like Robert Moses, was built for the automobile. Where Brasilia has been more successful, however, is in producing a high quality of life, comparable to that in major countries in Europe. (Deckker, 2016)

The need for urban development in the middle decades of the twentieth century often led to urban evictions and clearances, but from the 1960s onwards, as a consequence of the ideas of architect and anthropologist Carlos Nelson Ferreira dos Santos, it was decided to move poor urban dwellers, many of them migrants from the countryside, to *favelas*, districts of low-quality housing on the outskirts of cities. This was a safety valve for cities, but has contributed to the uncontrolled growth of cities, as well as increases in poverty. It has also been a factor in the slowing growth of Brazil’s megalopolises, as migrants opt to move to the more comfortable environment of smaller cities. (Serapião, 2016)

2.2 Theory: Modes of migration

Migration, where carried out for economic reasons, is usually done in an attempt to increase human capital and earnings capacity. Income generally increases over most of the life course, as workers gain experience and seniority within their field. It is generally accepted that educational attainment increases lifetime earnings, moving the income trajectory as a whole upward. (Becker, 1975) If migration is an investment, however, the factors influencing it and the mechanisms by which migrants benefit are not as clear. Not all migrants, for example, derive an immediate benefit from moving, and as we will see, not all of them are seeking to make pecuniary gains. In that sense, the decision to invest in migration is more complicated than the decision to invest in schooling or job training. (Baláž et al., 2014)

The theoretical framework for studies of migration has often been grounded in the economic differentials between the regions that migrants leave and those to which they move. In particular, the availability of adequately paid work which reflects the skill level of migrants is

considered the most important factor in driving migration decisions. There is a distinction, however, to be drawn between different theories of migration, some of which are focused on the individual-level factors that influence the decision to move, and some of which focus instead on the group dynamics, within a family or wider community, that might motivate an individual to go elsewhere in search of work. (Massey, et al., 1993; Todaro & Smith, 2006)

The first of the main theories of international migration which have been developed is the macro theory of neoclassical economics, which holds that international migration is driven by differences in the supply and demand for labour across geographic regions. Countries with high supply of and low demand for labour have low wages, while those with the inverse have higher, such that workers from the latter are incentivised to move to the former, in order to take advantage of the higher equilibrium wages that are to be found there. This flow is mirrored by that of capital, from countries in which it is abundant to those in which it is scarce. (Todaro, 1969; Massey et al., 1993)

The second major theory of migration is the micro neoclassical theory. This one focuses on individual-level decision-making, and concludes that individuals move because a cost-benefit calculation leads them to expect a net return which is positive from moving. This is usually a monetary return. Thus, international migration is a form of investment in human capital, which allows workers to go where they will be most productive, given the skills that they have – but before they can take advantage of this, they must pay the costs of migration, both pecuniary and psychic. These advantages and disadvantages are sometimes regarded as push and pull factors. (Sjaadstad, 1962; Lee, 1966; Massey et al., 1993; Bauer & Zimmermann, 1999)

This theory has its origin in the work of Larry Sjaadstad (1962), who sought to consider migration as an investment in human capital. To the extent, then, that migration is a decision with high up-front costs and a relatively uncertain outcome, it can then be described as an investment decision. Migrants observe the wage level in their own region, the costs of moving, and the gains they could make by moving, and decide for themselves whether the benefits outweigh the expenditure. For Sjaadstad, distance was a proxy for cost, though this might not always be the case, because of community or linguistic links between different countries or regions. (Sjaadstad, 1962, Bodvardsson & Van Den Berg, 2013)

The first major piece of literature dealing with macro theories of migration is Lewis' 1954 paper looking at how economic development takes place with a surplus of labour. He, however, does not consider migration in the context of urban and rural, but "subsistence" and "capitalist", arguing that individuals have incentives to leave subsistence economies, where the unlimited supply of labour ensures low wages and poor conditions, to the more advanced capitalist economies, where pecuniary gains may be made. This work failed to take account, however, of the possibility that migrants would leave prematurely, leading to urban unemployment. That issue was dealt with by subsequent literature. (Lewis, 1954; Godfrey, 1979)

Todaro (1969) made an important contribution to the early theoretical view of rural-to-urban migration in developing countries. He observed that at that time migration from rural areas to cities was continuing at a rapid pace throughout the developed world, and was even accelerating, in spite of the unproven ability of such cities to provide employment for the

individuals who already lived there. He noted that even the most sophisticated models of labour transfer and economic development did not take account of the effect of urban unemployment.

Todaro's new model took account of this conundrum and concluded that as rural-to-urban migration accelerates, it produces a rate of migrants which vastly exceeds the rate at which new job openings are being created in the urban economy. Therefore, as migration accelerates, the pool of unemployed within the city will also grow. Eventually, rising unemployment will slow the rate of growth of the urban labour force, and ultimately, an equilibrium balance between the two will be reached. Todaro concludes, therefore, that a substantial level of unemployment in a city will not necessarily deter would-be migrants from making the move. (Todaro, 1969)

Building on this, Harris and Todaro (1970) sought to place internal migration within a wider context of economic development. They argue that governments could increase overall welfare by combining wage subsidies for urban workers with policies that restrict migration, and incentivise workers to stay in rural areas. The authors suggest that such policies would boost demand in urban areas for goods made in rural exports, thereby making it easier for rural workers to stay in place. They suggest that such a mechanism could work in the absence of a wage subsidy, but it would be unlikely to.

It is generally accepted by economic historians that the decision to migrate is influenced strongly by two factors: the wage differential between the sending location and the receiving location, and the probability of finding a job in the receiving location. Individuals choose to migrate when they perceive a substantial income gain to be found in a new location, and when they rate their chances of finding work highly. In addition to these factors, the cost of travelling from one place to another is also important, as well as the availability of adequate social networks. Thus, the gain from migration must offset the costs of establishing a network and migrating in practice.

Theoretical studies of migration have tended historically to focus on international migration, and recent scholarship has particularly focused on the changing dynamics of migration in the United States, as Europe has become gradually less important as a source of migrants there, and Latin America and Asia have become significantly more important, especially after 1965. Massey et al. (1993) noted that by the 1990s even countries which had historically been suppliers of migrants, like Spain and Italy, were now destinations for workers from Africa, Asia, and the Middle East.

There are new theories which have been developed over the last few decades, which move beyond the neoclassical model of migration in order to look at it in a different way. One example of this is the theory of the "new economics of migration", first advanced by Stark and Bloom (1985). They suggested that the primary unit of measurement in migration decisions was in fact the family, and that income differentials were not justification for the decision to migrate. Instead, families had strong incentives to diversify risks by sending members to work in other labour markets. (Stark, 1985; Massey et al., 1993)

Other theories, like the dual labour market theory and the world systems theory, focused on how international migration fit into an integrated global economy, and further theories were developed to explain why communities of expats survive and thrive in their destination

countries. (Massey et al., 1993) This thesis, however, focuses on internal migration, so these theories are of less relevance. We will, instead, be putting the neoclassical theories of migration to the test, by seeking to establish if indeed there is a monetary premium associated with this kind of migration.

Stark (1991) sought to add more detail to the theoretical framework. He observed the existence of a confusion frontier, which influenced the decision to migrate. Rural to urban migration magnified subjective risks in the short run, but the risks associated with employment in cities declined over time, becoming low after a time. Therefore, it was argued that risk avoidance, rather than risk seeking, was the main factor driving migration decisions.

This was not the first attempt to put internal migration into a theoretical framework, however. Previous research in this area had focused on migration in nineteenth-century Britain, from rural areas to the industrial areas, predominantly in the north of England. It was clear from the research that was carried out that rural-to-urban migrants at this time were the cream of the rural working crop, and their decision to migrate was a highly fruitful one, resulting in people from all socioeconomic background experiencing an improvement in their socioeconomic status, as well as upward intergenerational occupation mobility over the longer term. This is also reflected in the data for internal migrants in London in the late 1920s, who enjoyed a modest but significant income edge over native-born Londoners. (Hatton & Bailey, 2002; Long, 2005)

It has been observed in a great deal of historical migration in this area that distance played a major role in likelihood to migrate. It was observed by Ravenstein (1885) that birthplace data from the 1881 British census suggested that the majority of migrants crossed only small distances when moving. It was concluded in other studies of urban migrants in nineteenth-century Britain that each industrial region had a “zone of attraction”, and with the exception of London and the contribution made by the Irish in the north of England, each industrial region broadly absorbed migrants from a radius of no more than fifty miles. (Boyer, 1997)

We have seen already that it is often argued that the decision to migrate, both internally and internationally, is motivated by differences in expected income rather than simple wage differentials – not least because internal migrants are not guaranteed to find work when they arrive at their new destination. This is important, because it complicates the oft-held assumption that migrants would simply move to the place with the highest wage levels. (Boyer, 1997)

An important factor in determining the likelihood of a migrant finding work upon their arrival is the presence of friends and relatives. The presence of trusted peers in a potential destination made it more attractive for a few reasons: it ensured the availability of reliable information about wage levels at the destination, and gave migrants access to a social and communal network that would make them more likely to find worthwhile job opportunities. In addition, the presence of friends and relatives offered a means of support, offering them food and shelter while they found work. Finally, the presence of friends and relatives made the process of migration less stressful more generally. (Boyer, 1997)

As previously noted, Harris and Todaro (1970) argued that rural-to-urban migration will therefore produce a gradual closing of the economic gap between rural and urban areas, as

decreased labour supply raises wages in the countryside and increased supply causes it to fall in the cities. This is not borne out by the historical data in Britain, which suggests that very high demand for labour in urban areas served to maintain the existing wage differentials, especially during the final decades of the nineteenth century. However, Boyer (1997) observes that had there been no internal migration during this period, the wage differentials would have been much larger.

A great deal of further research has been conducted into the Great Migration, of African Americans from rural areas of the southern United States to the rapidly industrialising cities of the north, during the early decades of the twentieth century, which was arguably the most important internal migration in the history of the United States. One issue that Collins and Wannamaker (2014) sought to answer was the profile of the migrants who went from south to north, using linked census data from the early decades of the century.

It is noteworthy in this instance that blacks in the southern states at the turn of the twentieth century were systematically discriminated against as a result of the Jim Crow laws, and therefore had more reason than most to want to move elsewhere – yet, for decades after the end of Reconstruction, they stayed. There is reason to believe that migrants were selected based on labour productivity, as they appear to have had higher educational attainment than southern blacks who remained. This is peculiar, however, because we might assume that the labour demands of the northern economy during the First World War would have leaned more heavily towards positions requiring lower skill. (Collins & Wannamaker, 2014)

Ultimately it was concluded that the sheer breadth of the Great Migration made the differences between migrants and non-migrants less significant in practice. The migration was instigated by very strong demand-side forces which motivated workers across the socioeconomic spectrum to move. However, it must also be considered that African American migrants had low levels of human and financial capital, which will have impeded migration over long distances, and that they faced the difficulty of competing with existing European immigrant labour networks established in northern cities. (Collins & Wannamaker, 2014; Collins & Wannamaker, 2015)

Boustan (2016) concurs with the view that migration rates for southern blacks were low because they lacked the social networks that would facilitate economic integration. Likewise, the proximity explanation is bolstered by the evidence that migrants simply followed the existing migration lines and train links to northern cities. Mid-skill blacks were less likely to move – those who left were less likely to come from agricultural households and more likely to have fathers who worked in occupations that were urban-oriented. Skills inherited in these households might well have given migrants from these backgrounds an advantage upon their arrival in the cities.

However, the idea of a confusion frontier or of short-term risk is not reflected in the data for southern African Americans. What Boustan finds is that the return to migration for blacks was forty percent higher than for whites. In addition, blacks who settled in the north earned at least double what their counterparts who remained in the south were earning in 1930 and 1940. Despite having been educated in low-quality southern schools and lacking a strong labour market network, blacks who moved north did remarkably well, and their earnings kept pace

with those of northern-born blacks from their arrival onwards. This, however, may have been the consequence simply of this stream of migrants being in the right place at the right time. (Boustan, 2016)

Zelinsky (1971) outlines the idea of the mobility transition. He notes what he perceives as a close association between the demographic transition and the laws of migration, which begins with a transition from a relatively stable condition of severely limited physical and social mobility towards much higher rates of movement as the modernisation process begins. These processes accelerate as time goes on, so that mobility becomes greater as an economy develops. However, Zelinsky questions the assumption that distance is the same as social mobility, by observing that a black family that moves into a white district in the same city is to some extent more migratory than one which moves a long way away.

The initial process of modernisation loosens the bonds that tie agricultural labourers to the countryside. Rapid growth of population, changes in landholding laws and a perceived lack of economic opportunity persuaded large numbers of individuals to opt either to farm their land in a more intensive way, or to leave altogether. Ultimately, however, this process cannot go on forever. The final stage of the mobility transition sees rural-to-urban migration slow down, because there are simply not enough rural would-be migrants left. Moreover, at this point migration is solely in the direction of cities, rather than towns. (Zelinsky, 1971)

This theory of mobility can be tied into theories of urbanisation. Geyer and Kontuly (1993) observe that at some point in the history of most countries, their primate cities reach a stage of maturity, where their growth begins to slow down and a process of deconcentration begins. This process is usually characterised by the growth of urban areas around the aging city. This has been observed in both developed and developing countries, and where this happens in the developing world, it is often associated with growth in intermediate-sized cities, especially ones located close to the larger city.

2.3 Previous research: internal migration in practice

Latin America has gone through a mobility transition of its own over the course of the twentieth century. With the decline of international migration from Europe after the Second World War, the primary pull factor for migration within the continent was the need for seasonal labour in the agricultural sector. As the influence of agriculture over the economy declined, and economic development accelerated in the decades after the war, intraregional migration became very important, as a result of unequal regional economic development. More recently, Latin America has faced outward migration to the developed world, especially the United States, but this has been less important in Brazil. (Cerrutti & Parrado, 2015)

Research on migration in Brazil has largely reflected Geyer and Kontuly's theory, which is not surprising, in view of the vast size and established nature of the country's two largest cities. Amaral (2013) observes that rural-to-urban migration has become less important in Brazil in recent decades, and that in the twenty-first century, the most important migration flow is that from cities to other cities. There are two other aspects of this pattern that must be observed:

intra-metropolitan development, in which the upper classes move into gated communities in order to segregate themselves from their poorer counterparts, and the end of the rural exodus, which has eased the strain on public services in cities, slowed down the growth of slums, and produced a marked rise in the socioeconomic status of new arrivals in the cities.

Golgher (2012) sought to consider how migration theories worked in practice in Brazil. He noted that very poor rural dwellers were the least likely to migrate, because they would not have the minimum amount of capital necessary to make it a viable option. Looking at the 2000 Census results, he found that rural-to-urban migration in Brazil tended to cover short distances, either within regions or to neighbouring regions, with the exception of migration from the north-east of Brazil, where a stronger tradition of migration to São Paulo and Rio de Janeiro had been established, and social networks were more likely to exist.

The study further sought to consider the demographic profile of Brazilians who were more likely to migrate. Golgher found that age had a strongly negative effect on likelihood to migrate, although it was considered that retirement and return migration might provide an incentive to migrate as workers approached the end of their working life. Women are more likely to move to urban areas, because the characteristics of the labour market are more favourable for them there. Men are more likely to move to rural areas, and are less likely to be deterred by long distances. However, it was noted that married people were also more likely to move long distances, perhaps because they perceived the social risks of doing so to be lower. Other research has found similar trends for internal migration in Mexico. (Baeninger & Cunha, 2007; Golgher, 2012)

Some studies have considered the potential role that climate could play in influencing internal migration in South America, and if this is relevant, it is likely to be a factor that becomes more important over time. Thiede et al. (2016) find that temperature shocks are more likely to drive migration that changes in rainfall, and that overall, climate variability is more likely to stimulate intraregional migration, rather than trapping populations in a single place. Although there is some heterogeneity across the eight countries looked at in this study, the relationship between climate variability and migration for Brazil is positive.

A great deal of research has been carried out to establish the impact of internal migration on income, and on the overall levels of income inequality within a country. Ozgen et al. (2010) conducted a meta-analysis across dozens of studies of internal migration, and found that the overall impact of internal migration on real income per capital was significant and positive, but small. They concluded that a one percentage point increase in internal migration would raise incomes by 0.1 percentage points, considerably smaller than the gain that could be attributed to a one percentage point rise in labour productivity. They cautioned also that the demographic profile of migrants and their reasons for migration would create considerable heterogeneity, and that it was not certain that these outcomes could be applied to international migrants.

Shumway and Otterstrom (2015) used US tax return data to get an idea of the effect of inter-regional migration on overall income inequality. Although the US is a developed country, its size and diversity make internal migration a popular choice, with about one in eight Americans changing residence each year. What they found in the data was a non-pattern pattern, in which the effect of income was unclear. They hypothesised that such outcomes were to be expected

in a developed country, where the effect of technological change on living standards was unclear. However, they observed that by and large, internal migration was driving divergence, as areas undergoing economic booms attracted those with the resources to move.

Matters are further complicated by Korpi and Clark's (2017) study of the outcomes for internal migrants in Sweden. They find that human capital explanations for migration are generally more applicable to migrants who already have high levels of education, but that quite large proportions of migrants do not see their income or socioeconomic status increase upon migration at all – indeed, anything from 25 to 40 percent of migrants experience a negative return from migration, which suggests that human capital alone cannot explain a sizeable proportion of migration decisions, and that a great focus should be placed on the distribution of migration decisions, rather than averages.

Hierro and Maza (2009) looked at the potential role that foreign migrants could play in complicating the relationship between internal migration and income inequality in Spain. They found that the process of interprovincial income convergence was weak, but significant and robust, and that internal migration of foreign-born individuals played a significant but modest role in promoting convergence. However, they did not expect it to be an important factor in the future.

When it comes to the developing world, Hua and Yin (2017) studied the impact of internal migration on rural income inequality in China. They found that while internal migration played an important role in raising household income level and changing income distribution in rural areas, because of the prevalence of pecuniary remittances, it was not clear that migration was causing a widening of the income gap, because there was no consensus as to the economic characteristics of migrants versus non-migrants, and the factors that may have influenced their decision to move.

For Brazil, Hering and Paillacar (2015) considered how access to foreign markets might influence the decision to migrate. They found a clear pattern of movement from areas with poor access to international markets towards ones with better access. They found some heterogeneity across sectors and educational levels, which could reinforce specialisation and go some way towards explaining differences in migration patterns between different groups of workers. This is an important finding because it underlines that internal migration is not necessarily a decision with purely domestic causes or effects.

Amaral et al. (2015) looked at the effect of internal migration on male earnings in Brazil between 1970 and 2000, using data from the 1970, 1980, 1991 and 2000 Brazilian censuses. They found that having migrated from another region had a positive impact on income across almost all age and education groups in 1970, and a stronger impact in 1991. By 2000, some negative effects were emerging for younger groups with middle-ranking education levels, but broadly positive effects were seen. They also sought to estimate the exogenous effects of migration, in order to examine the impact of population flows on earnings. What they found was consistent with previous research in this area: that migration streams negatively impact earnings – a ten percent increase in migration rates would reduce earnings of competing workers by up to three percent in 2000. (Borjas, 2003; Amaral et al., 2015)

However, these studies run the risk of overlooking the potential impact of gender on migration decisions. This is important, because it stands to reason that individuals who have different motivations for their decision to move are likely to face different outcomes. Looking at data for the United States, Geist and McManus (2012) found that quality of life was a major factor in the decision to migrate which was often missed by human capital models. In addition, while they found upward mobility for single men and women, as well as married men, following migration, much of their gains were the result of positive selection into migration. Among married women and single parents, post-migration earnings were more likely to be stagnant or declining. Within the household, the likelihood is that women who were secondary earners before moving are more likely to scale back their participation in the labour force afterwards, whereas dual-earner households are more likely to continue as before.

Ruysen and Salomone (2018) sought to consider the role that gender discrimination played in the decision of women in developing countries to migrate to other countries. They found that gender discrimination could act both as an incentive and a constraint to migration, increasing the intent of women to move elsewhere, but not influential as migration preparation goes on. However, they also noted that women in regions with particularly large pay gaps were less likely to see their intent to move translated into action in practice, due to the presence of discrimination, as well as their own lack of financial resources.

These findings are borne out to some extent in data relating to internal migration of women in Brazil. Oliveira (2016) finds that an additional child is linked to a 6-20 percent reduction in migration rates. It is considered that this is either a consequence of childbearing and the raising of young children making migration less profitable, as women curtail their participation in the labour market; or an increase in the psychic costs of migration, as women decide against moving their children away from their existing schools and peer groups to a new location. Studies in other developing countries have also considered the possibility that women are attracted to cities by their brighter lights, and the perceived personal safety that they bring. (von Fintel & Moses, 2017)

It seems likely that for the majority of migrants, there is a short-term financial gain to be obtained from internal migration. However, the exact size of that gain is not clear, nor is it obvious that it affects all socioeconomic levels equally. Evidence of the effect of internal migration on income inequality is unclear, suggesting that perhaps it is not an important factor. If that were true, our thesis would reveal broadly identical gains for all educational groups. Conversely, if internal migration were reducing social inequality, we would expect the gains from those with lower levels of education to be larger.

Moreover, while women often migrate for economic reasons, they are probably less likely to do so than men. This might result in them accepting a smaller income premium (or no premium at all) as a price worth paying for migration. However, some of this effect might be offset by the better employment profile for women in cities, and generally better employment conditions for women in urban areas. It is important that any study of this topic takes into account the possibility that women who migrate may drop out of the labour force upon doing so.

There is strong evidence from the United States that migration can improve the socioeconomic status of individuals from racial minorities, though it is not altogether clear whether such

migration closes the overall racial income gap or not. Nevertheless, it is likely that our study will find that black and brown Brazilians are considerably better off as a result of internal migration.

2.4 Summary

Internal migration continues to be an important factor in the spatial composition of Brazil's labour force. However, the nature of that migration has changed in recent decades, so that migration from urban areas to other urban areas has become more significant than that from rural to urban regions. This may be a consequence of overcrowding in the largest cities, as individuals opt to move to smaller cities, which are growing rapidly.

Theories of internal migration have generally focused on migration from rural to urban areas, based on the premise that a surplus of labour in rural areas keeps wages low and provides strong incentives to move. How can this theory be applied to urban-urban areas, however? Are workers moving from cities to other cities facing an income premium when they move, or are they moving for other reasons? Indeed, can a country which is approaching 90% urbanisation make its population distribution more efficient in a way which creates meaningful gains for migrants?

Previous research suggests that it is possible that other factors are influencing migration decisions, especially relating to gendered migration. In addition, it appears that studies of migration have not done an adequate job of assessing the different premiums associated with migration for different socioeconomic groups. This thesis seeks to assess whether internal migration in a highly urbanised developing countries affords gains in the same way as in a less urbanised country, and if so, how those gains are distributed, in terms of socioeconomic status, gender and race.

3 Empirical study

Our quantitative empirical study takes the form of a linear regression using detailed, rich sample data from a Brazilian national census. It includes variables for education and place of residence, as well as migration status.

3.1 Data

To conduct the empirical study, this thesis relies upon data from the 2010 Brazilian Census. Brazil carries out censuses approximately every ten years, and the one in 2010 is the most recent. It was the twelfth national census, and it took place on 1 August 2010, though the field work of collecting the census returns took place over the three months that followed. Since 1970, the Brazilian Institute of Geography and Statistics (IBGE) has sought to measure the coverage of the census, to ensure that as much of the population is measured as possible, and to establish which parts of the population are undercounted, so that they may be accounted for in some other way. On this occasion they found that coverage was much improved on previous census years, thanks largely to the incorporation of new technologies. (da Silva et al., 2015)

An anonymised sample of the microdata from the census was produced for research purposes: this sample includes a 5% sample of the population of municipalities greater than half a million people; a 10% sample of those between 20,000 and 500,000; a 20% sample of those between 8,000 and 20,000; a 33% sample of those between 2,500 and 8,000; and a 50% sample of the rest. From this, IPUMS drew a random sample of every 2.13 dwellings, about forty-seven percent of the total. The total size of the sample before the data was managed was 9,693,058. For the purposes of our study, we have weighted the sample to take account of its stratified nature.

Firstly, the data was adjusted by removing children and older people from the sample. All observations with an age below 17 or above 60 were removed, in order to obtain a sample of the working-age population of Brazil, whose economic fortunes are likely to be influenced by the decision to migrate, and in view of the theoretical finding that older working people were unlikely to migrate for economic reasons.

We used a sample of all workers in this age range, including those living in rural areas, and those who had not migrated. The intention of our study is to compare workers who have migrated in the past few years to those who have not done so, in order to ascertain whether or not migrants have a higher income, and if so, by how much. There is a variable within our sample, *urban*, which divides our observations between those living in urban, and those living in rural areas.

The dependent variable of our study was income, or, more accurately, the log of total income, which is used in order to account for the non-linear nature of income growth in relation to age. The Brazilian census provides us with two measures of income: total income and earned income. Earned income might have been a more valuable variable to use for this study, but it included a very high number of missing observations, so it was decided to use total income instead. There has been some concern expressed at the possibility that higher incomes are underestimated in Brazilian censuses, partially because of coverage issues, but also because non-labour income is underestimated. However, these form only a small part of the sample, and are unlikely to be a major factor in migration. (Medeiros et al., 2018)

The use of logged income requires some degree of caution, also, because it is interpreted as the relative income difference in percentage terms. That means that the base level of income varies with different analyses. In a country like Brazil, with rather high levels of income inequality, especially between its urban and rural areas, that calls for some caution when interpreting our results.

Our most important independent variable is *migrate_5*, which says where an individual was living five years before the census was taken. It is particularly useful because it allows us to focus exclusively on those who have migrated in the recent past. Other, longer term variables for migration were present, but they failed to properly account for repeat migration, and the effect that it might have on income. It would also have been possible to compare state of birth with state of residence, but that would not have allowed us to examine short-range migration, and would have captured factors like childhood migration, which are unlikely to have a major effect on income.

Repeat migration could conceivably be a problem in this study as well: it is possible that an individual could have migrated more than once in the previous five years, and we do not know how that might impact their income. There is no practical, failsafe way of accounting for this, however. The *migrate_5* variable includes four categories, when dealing with place of residence five years ago:

- Same state, same administrative unit: a proxy for non-migrants
- Same state, different administrative unit: a proxy for short-range migrants
- Different state: a proxy for long-range migrants
- Abroad: these observations made up a very small percentage of the sample (0.28%) and were not included in the finished study

Interpreting these variables in this way, again, is not foolproof. Some Brazilian states are very large, so migration within a state may cover very long distances. We have retained observations who came from abroad more than five years ago, because we think their experiences are relevant to the overall study of internal migration. The number of such observations is also very small.

Our data includes a variable for education, *ed_attained*, which is available either in a basic form, or a more detailed form. We opted to use the more detailed variable, which is divided into eight categories:

- No primary schooling

- Some primary schooling
- Four years of primary schooling
- Six years of primary schooling
- Lower secondary school
- Secondary general track completed
- Some college
- University completed

The 2010 census was an important milestone in the history of Brazil, because it was the first in which black and brown Brazilians comprised the majority of the population – though, because this study is focused on working-age Brazilians, whites continue to outnumber African-Brazilians in our sample. It might then be useful to examine racial patterns of migration, and whether black and brown migrants in the country do as well as their white counterparts. This is a complicated issue in Brazil, where racial identity categories are somewhat more fluid than in North America. It is more common to speak of “race colour” than “race group”, because this term captures that fluidity better. However, it has been found in many studies that “race colour” often has socioeconomic status incorporated into it – better-educated individuals, for example, are more likely to be considered “white”, regardless of their skin colour. (Loveman et al., 2011; Monk, 2016)

The 2010 census does include data for industrial sector, which could potentially be used to examine the effect of migration across different parts of the economy. However, there is potential for collinearity with educational levels, so it was decided that this variable would not be used for our study.

Although the 2010 Census did include data relating to metropolitan area, state, and municipality, the data could be made more effective for the purposes of our study. We wanted to examine if smaller cities had higher returns to migration than larger ones. To do that, we created a variable, *met_region_group*, which could account for this. Our metropolitan areas were grouped as follows:

- São Paulo (population 21.3 million, the largest city in the Western Hemisphere)
- Rio de Janeiro (pop. 12.3 million)
- *Other large metropolitan areas*: Belo Horizonte, Brasília, Porto Alegre, Fortaleza, Salvador (pop. 4-5 million)
- *Medium-sized metropolitan areas*: Recife, Curitiba, Campinas, Manaus, Vale do Paraíba e Litoral Norte, Goiânia, Belém, Sorocaba (pop. 2-4 million)
- *Small metropolitan areas*: All other metropolitan areas (pop. <2 million)
- *Non-metropolitan*: Those not living in any metropolitan area

The full sample used in our study is 4,253,741 observations. There are descriptive statistics at the end of this chapter.

3.2 Methodological approach

This thesis, a quantitative study, uses a model based on established theories about the relationship between income, age and education, in order to allow us to see how migration status might have an effect. As such, it is based on a model associating age and educational attainment with the natural log of income, in order to account for the non-linear nature of income growth over the life course. In view of the relatively simple independent-variable data available, and the fact that our dependent variable is income, it is believed that a linear regression is the most appropriate approach. Because the log of income is the dependent variable, only observations with an income greater than zero are included, which means there are marginally more men than women in our sample.

This thesis seeks to run an ordinary least-squares (OLS) regression to establish the relationship between income and a number of socioeconomic and demographic factors, some of them concerning migration. To do this properly, we must first take account of the larger socioeconomic factors which influence income. It has been well-established that the earnings profile of individuals rises with age, before peaking somewhat after the mid-point of the individual's working life, and then declining a little before retirement. This is generally accounted for in models that deal with age and income by including a second variable, *age squared* (age^2), which takes account of the inverse-U shape of the income profile. This variable will be used in our study.

Age, however, explains very little of an individual's earnings. To get a complete picture, we must also take account of human capital accumulation, which is perhaps the most important factor. It is generally expected that an increase in human capital will increase lifetime earnings by moving the earnings profile upward, rather than steepening the inverse-U shape. The data we are using includes one variable for educational attainment, which is divided into four broad categories, and a more detailed one, which divides the categories into smaller subgroups. For this thesis, the more detailed variable will be used (*ed_attained*). We will be adjusting for education in all of our regressions. All of our analyses will be weighted to account for the stratified nature of the sample we are using, so that it is as representative as possible of the real-world population.

We will then interact our variables in order to establish relationships between migration outcomes and different demographic factors

Our base model (1-3), then, is:

$$\ln(\text{income}) = \beta_1 + \beta_2 \text{age} + \beta_3 \text{age}^2 + \beta_4 \text{ed_attained} + \beta_5 \text{migrate_5} + c$$

We will then interact the variable *migrate_5* with a number of variables:

- Education attained (4-6)
- Race (7-9)
- Urban status (10-12)
- Metropolitan area group (13-15)

Each of these regressions will be run three times: the first with our full sample, the second with only men, and the third with only women, in order to examine differences depending on gender.

Our model’s robustness was verified by running the regression using only observations with an age below 40, and this suggested that when it came to the substantive issue, the relationship between migration and income, the model was robust enough to allow us to make statistical inferences.

3.3 Descriptive statistics

Table 3.1 Sample breakdown by gender

Sex	Percentage
Male	49.61%
Female	50.38%
Total	100.00%

Table 3.2 Sample breakdown by age group

Age group	Percentage
17-19	8.89%
20-24	14.74%
25-29	14.26%
30-34	13.14%
35-39	11.75%
40-44	11.12%
45-49	10.17%
50-54	8.72%
55-59	7.22%
Total	100.00%

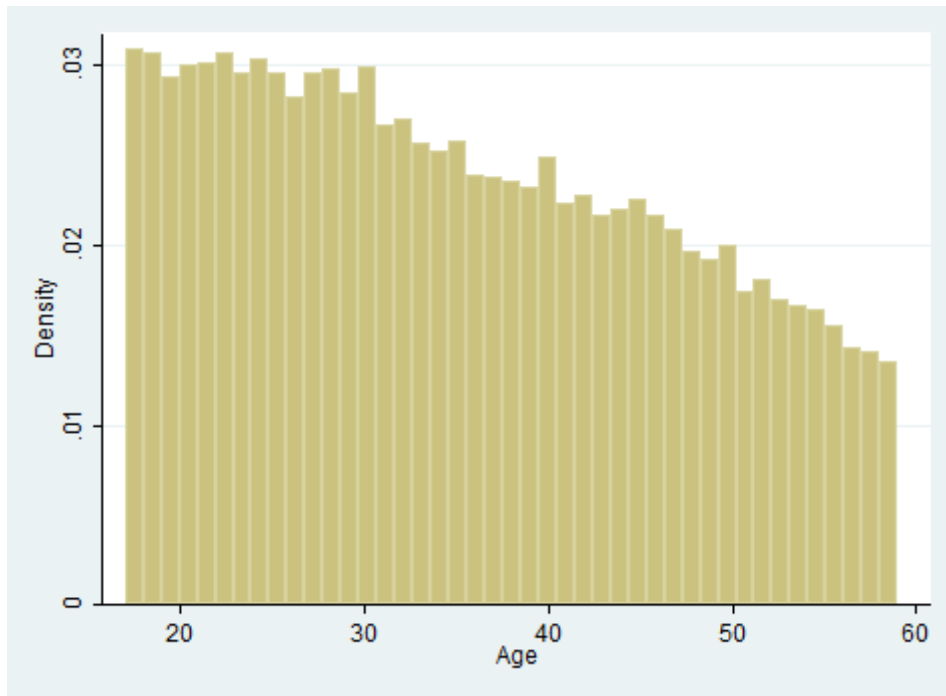


Figure 3.1 Sample distribution by age

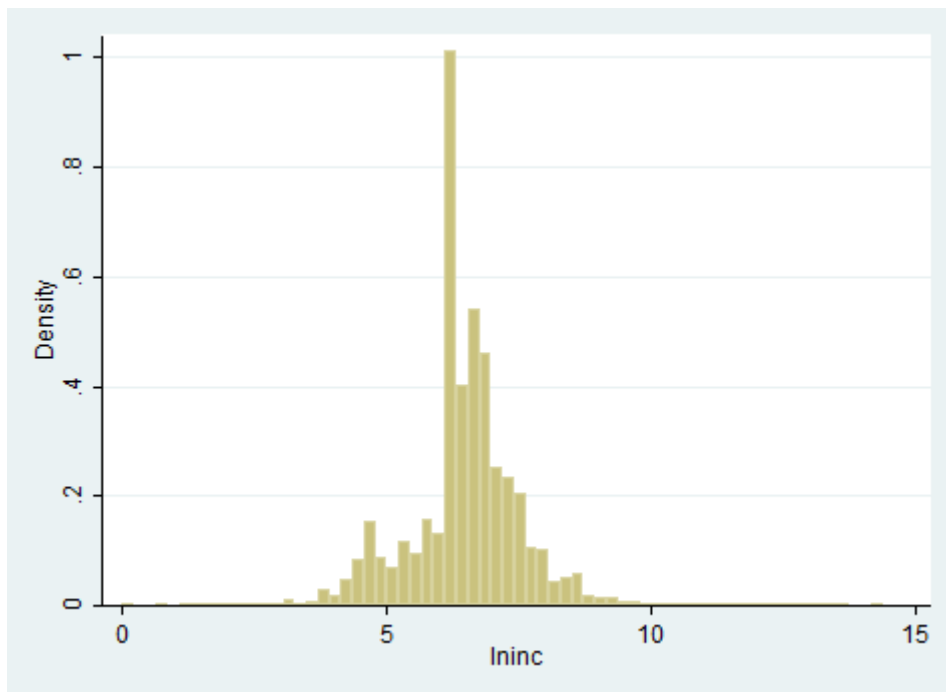


Figure 3.2 Sample distribution by log of income

Table 3.3 Sample breakdown by migration status

Migration status	Men	Women	Total
Non-migrants	90.98%	91.27%	91.13%
Short-distance migrants	6.02%	6.05%	6.03%
Long-distance migrants	3.00%	2.69%	2.84%
Total	100.00%	100.00%	100.00%

Table 3.4 Sample breakdown by educational attainment

Educational attainment	Men	Women	Total
No schooling	6.41%	4.99%	5.69%
Some primary completed	19.71%	17.36%	18.53%
Primary (4 yrs) completed	10.46%	9.38%	9.92%
Primary (6 yrs) completed	22.70%	20.29%	21.48%
Lower secondary general completed	8.89%	8.91%	8.90%
Secondary general completed	20.31%	22.87%	21.61%
Some college	5.11%	6.30%	5.71%
University complete	6.42%	9.89%	8.17%
Total	100.00%	100.00%	100.00%

Table 3.5 Sample breakdown by race

Race	Men	Women	Total
White	46.41%	48.20%	47.31%
Black	8.25%	7.11%	7.68%
Indigenous	0.45%	0.42%	0.44%
Asian	0.93%	1.14%	1.04%
Brown	43.93%	43.10%	43.52%
Unknown	0.02%	0.01%	0.02%
Total	100.00%	100.00%	100.00%

Table 3.6 Sample breakdown by place of current residence

Place of residence	Men	Women	Total
Urban	76.50%	79.71%	78.12%
Rural	23.50%	20.29%	21.88%
Total	100.00%	100.00%	100.00%

Table 3.7 Sample breakdown by metropolitan area group

Metropolitan area	Men	Women	Total
São Paulo	6.06%	6.44%	6.25%
Rio de Janeiro	3.38%	3.63%	3.50%
Other large metro	7.33%	7.73%	7.53%
Medium-sized metro	5.47%	6.00%	5.59%
Small metro	11.13%	11.51%	11.32%
Non-metro	66.63%	65.00%	65.81%
Total	100.00%	100.00%	100.00%

4 Empirical analysis and discussion

Before we look at the results, it is important to remember that there are caveats to be taken into account when examining the fortunes of short- and long-distance migrants. Firstly, there is the potential for a selection bias. Our data can only tell us if an individual has moved residence in the past five years – it cannot tell us how many times they have moved in that time. If an individual has moved more than once, they may experience a larger premium. It is not hard to imagine that workers with very low educational attainment might be more likely to migrate in search of work, or that they might be dependent on work of a seasonal character. This could be an explanation for the relatively high income gains of those with low education. The gains for those with high education are less difficult to explain, because the number of highly skilled jobs is relatively small, and it stands to reason that migration would therefore be associated with large gains at this level.

Table 4.1 Relative change in income associated with migration status, in percentage terms

	Non-migrants	Short-distance	Long-distance
Full sample	0	+8.25%	+26.30%
Men	0	+9.07%	+26.67%
Women	0	+4.15%	+15.53%

Our first table, based on Models 1-3 (in the Appendix) gives us the results of our basic model, which seeks to establish whether or not there is a premium associated with having migrated in the previous five years. It establishes quite clearly that there is, but that the premium appears to be different for men and women. We can see that for both men and women there appears to be an increase in income associated with short range migration, but for women it is four percent,

whereas it is nine percent for men. The difference between these figures is statistically significant. This is likely to be a reflection of what was discussed in Chapter 2: namely, that women were less likely to migrate for purely economic reasons. It is likely that part of the reason why the premium is lower for women is that they may drop out of the workforce upon migration, or because they may have migrated because they regarded the city as safer. (Geist & MacManus, 2012; von Fintel & Moses, 2017)

For longer-distance migration, there is an increase for men of slightly more than a quarter, but for women it is just over fifteen per cent. Again, the differences are statistically significant. This broadly reflects our theory, which suggests that because distance was often a considerable cost in migration, it stands to reason that migrants who travel longer distances are anticipating more substantial gains.

A possible explanation for the discrepancy between post-migration outcomes for men and women relates to the division of labour within households. As mentioned in Chapter 2, when a couple in which the man is the primary breadwinner migrate, they are likely to be doing so in order to pursue higher incomes for him. It is possible, then, that upon migration the woman's income may decline, or even fall to zero. However, the fact that the difference in outcomes persists, even when labour-force participation is taken into account, suggests that there are other factors explaining the difference as well.

These findings are also surprising, to some extent, because female labour force participation in Brazil is quite low, at about 50 per cent, which would suggest that the scope for female migrants to make income gains might be higher, because of lower levels of economic competition. It is possible that the migration of female workers reduces the wage levels of those who are already living in cities, though that is beyond the scope of this thesis. Nevertheless, the evidence suggests strongly that internal migration in Brazil increases the income gap between men and women, especially at lower levels of education.

Thus, our first finding is that migration *does* seem to bring with it an income premium, and that premium is larger for longer-distance moves, but the premium is generally smaller for women than for men, regardless of distance travelled.

Table 4.2 Relative change in income associated with migration status, in percentage terms, when interacted with educational attainment

Full sample

	Non-migrants	Short-distance	Long-distance
No schooling	0	+8.56%	+48.29%
Some primary	0	+11.84%	+42.04%
4 years primary	0	+6.78%	+29.38%
6 years primary	0	+3.70%	+20.23%
Lower secondary	0	+7.34%	+26.67%
Secondary general	0	+8.67%	+14.06%
Some college	0	+7.19%	+20.44%
University complete	0	+12.48%	+44.13%

Men

	Non-migrants	Short-distance	Long-distance
No schooling	0	+9.31%	+47.74%
Some primary	0	+12.32%	+37.83%
4 years primary	0	+7.05%	+26.98%
6 years primary	0	+5.82%	+20.15%
Lower secondary	0	+9.85%	+19.17%
Secondary general	0	+11.42%	+17.20%
Some college	0	+6.64%	+24.10%
University complete	0	+9.39%	+43.97%

Women

	Non-migrants	Short-distance	Long-distance
No schooling	0	+1.92%*	+27.45%
Some primary	0	+4.73%	+26.50%
4 years primary	0	+1.15%*	+14.84%
6 years primary	0	-1.25%*	+10.26%
Lower secondary	0	+3.81%*	+13.41%
Secondary general	0	+4.71%	+6.73%*
Some college	0	+5.19%	+12.12%*
University complete	0	+10.56%	+29.68%

* denotes that figure is not significantly different from the one immediately to its left

When we interact with education – models 4-6 in the Appendix – we find that the migration premium affects different socioeconomic groups in substantially different ways. Men experience a higher premium than women at all educational levels and distances migrated except two: short-distance migrants with some college, and short-distance migrants who have finished university. In the former case, the figure for men is higher but not significantly so, while in the latter case it is higher for women, but not significantly so.

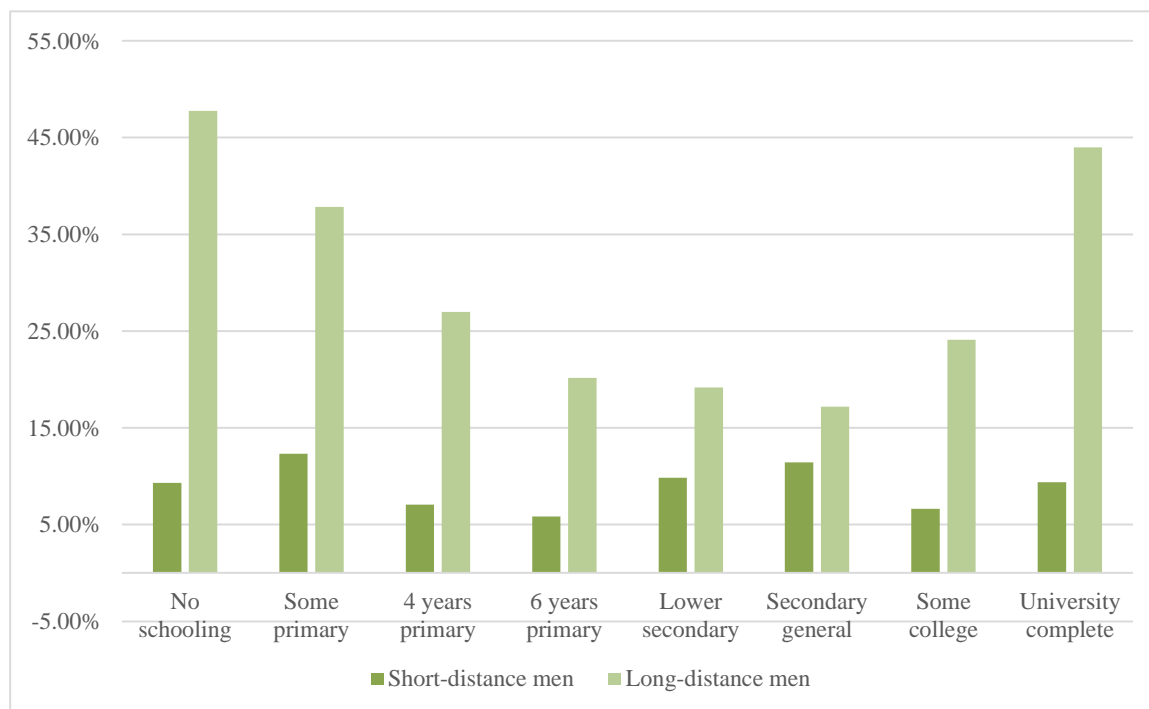


Figure 4.1 Relative change in income associated with migration status, in percentage terms, when interacted with educational attainment, for men in Brazil, 2010

The evidence for both men and women is that the gains from short-range migration are relatively small, and do not follow a clear pattern. In the case of women, university graduates fare the best among short-distance migrants. For most women in lower educational categories, the migration premium is not statistically significant at all, and might even be negative. Among men, there is no clear pattern at all. Those with some primary education do well, as do those who have completed secondary schooling, though the difference between these two groups is not significant. All eight groups experience a statistically significant premium, however.

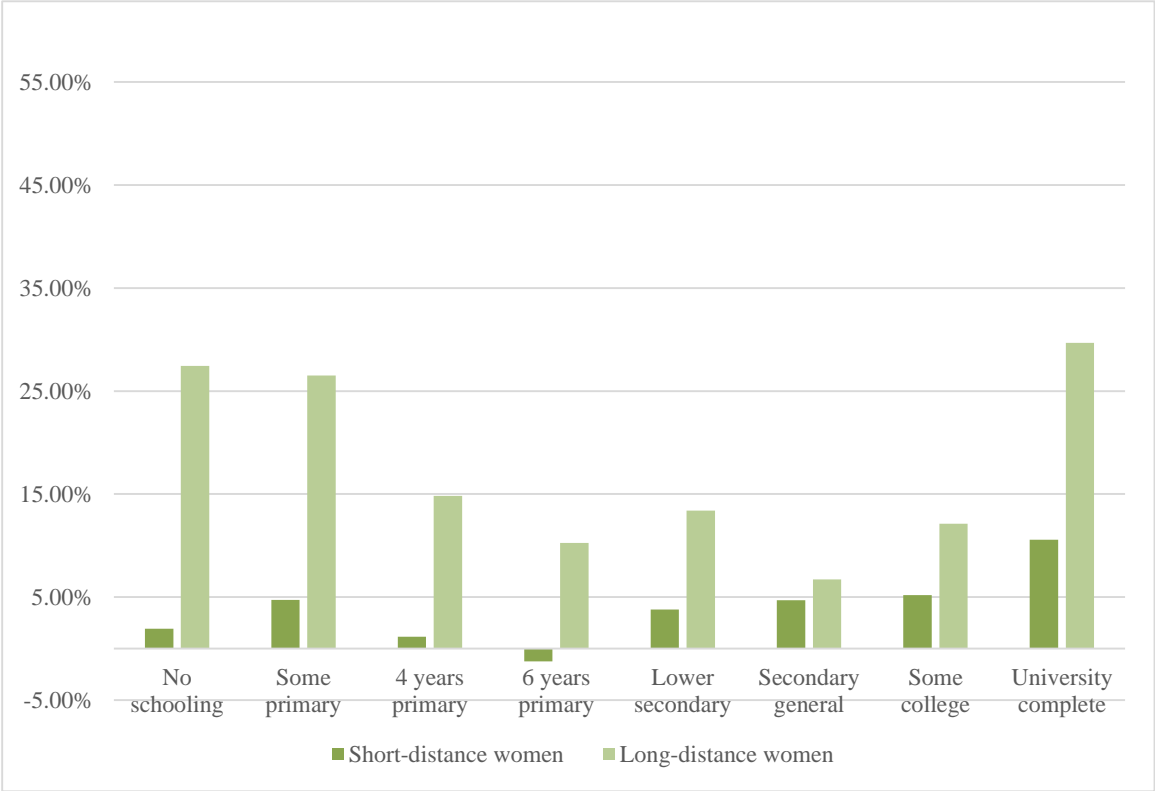


Figure 4.2 Relative change in income associated with migration status, in percentage terms, when interacted with educational attainment, for women in Brazil, 2010

Clearer patterns emerge when we look at long-distance migration. Here, it is clearer that the migration premium is mostly associated with those at the bottom and the top of the education distribution. For men who have not completed schooling, the premium is nearly fifty percent, which is higher than the 44 per cent gain associated with university graduates, though the difference is not statistically significant. It is important here to acknowledge that when we use a log-linear model, we obtain percentage increases in income. This means that the absolute increase in income for these two groups is not going to be the same – indeed, for university graduates it is probably substantially larger. These figures may be an artefact of the very low incomes experienced by those with no schooling before migration, rather than evidence of a premium which is large in absolute terms.

For women who migrate longer distances, the premium is smaller than for men at each level, and in each case it is statistically significant. Again, the lowest and highest levels of education experience the highest premiums, though the same caveats apply as before when looking at lower levels. Those with no schooling, with some primary schooling, and those who have

completed university have the highest premiums, though the three figures are not significantly different from one another.

A general pattern which emerges here, is that long-distance migrants with middling levels of education generally experience a lower premium in percentage terms. It may be the case, if we looked at absolute increases, that the increase for lower levels and medium levels of education are about the same, and only those with the highest level of education demonstrate a high absolute premium.

What we can conclude from this part of the empirical study is that socioeconomic status is important in determining the migration premium for long-distance migrants, though it is much less important for those who have only migrated shorter distances. In relative terms, those with higher and lower levels of education who migrate long distances have higher premiums, while those in the middle have smaller gains. At almost every level, the premium is larger for men than for women.

Table 4.3 Relative change in income associated with migration status, in percentage terms, when interacted with race

Full sample

	Non-migrants	Short-distance	Long-distance
White	0	+5.90%	+20.57%
Brown	0	+9.69%	+33.38%
Black	0	+9.28%	+32.91%
Asian	0	+7.13%	+15.22%*
Indigenous	0	+17.85%	+58.19%

Men

	Non-migrants	Short-distance	Long-distance
White	0	+6.10%	+22.16%
Brown	0	+11.87%	+33.11%
Black	0	+9.79%	+29.77%
Asian	0	+11.32%	+21.69%*
Indigenous	0	+19.07%	+47.32%*

Women

	Non-migrants	Short-distance	Long-distance
White	0	+3.46%	+11.60%
Brown	0	+3.48%	+20.18%
Black	0	+1.94%*	+19.10%
Asian	0	+0.28%*	+2.49%*
Indigenous	0	+10.81%*	+61.07%

* denotes that figure is not significantly different from the one immediately to its left

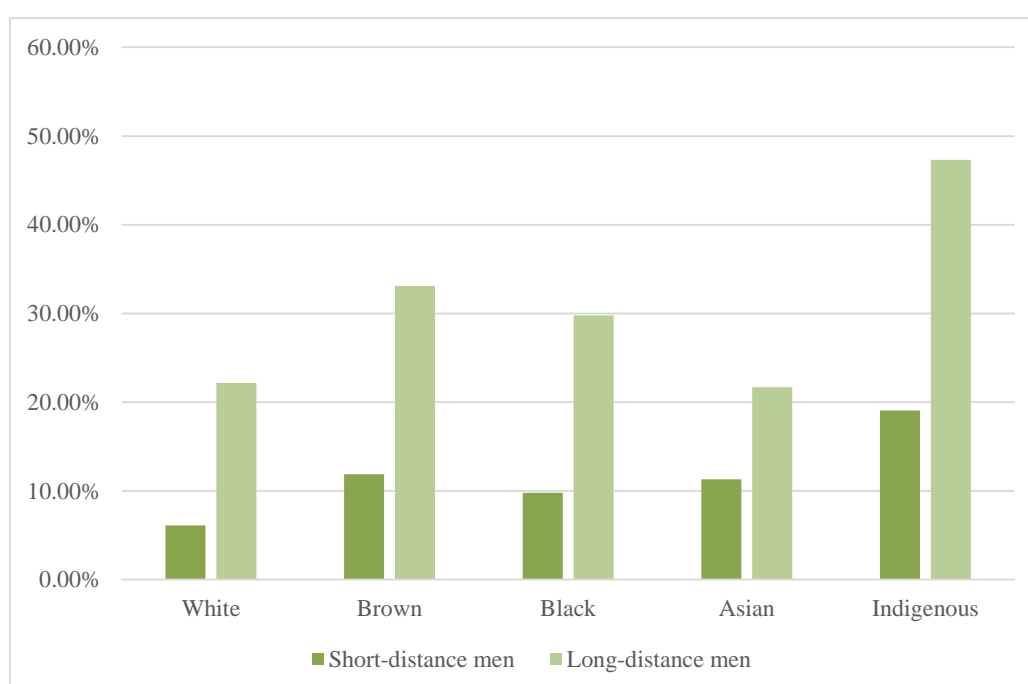


Figure 4.3 Relative change in income associated with migration status, in percentage terms, when interacted with race, for men in Brazil, 2010

Moving on to our interaction with race (models 7-9 in the Appendix) we find, again, that long-distance migration is associated with a higher premium than short-distance migration in most cases. This is true for men and women who are white, brown and black, but when it comes to Asian and indigenous Brazilians there are problems with the sample size. Although the premiums look large for indigenous observations, the confidence interval is very large. We cannot be certain at the five-percent level that there is a premium at all for indigenous women who migrate short distances, though we can for longer-distance migrants in that category. For

men, the premium is statistically significant at both levels, though the difference between short- and long-distance migration is not statistically significant. Although the premium appears to be very large for indigenous Brazilian men who migrate long distances, it is in fact not statistically significantly higher than the premium for brown Brazilians who do the same. It is significantly different for women, however. Among women, Asian long-distance migrants are associated with the smallest long-distance premium. For men, white Brazilians and Asians have the lowest long-distance premiums, and they are not significantly different from each other.

The most important finding here relates to the three largest racial groups: whites, blacks, and brown Brazilians. There is statistically significant evidence that for both men and women who migrate longer distances, the premium is higher for black and brown Brazilians, who generally experience lower incomes than their white counterparts. This suggests the possibility that internal migration in Brazil could be a mechanism by which racial income disparities are closed, similar to the way in which black migrants during the Great Migration were able to get their foot on the ladder of opportunity when they moved north. (Boustan, 2016)

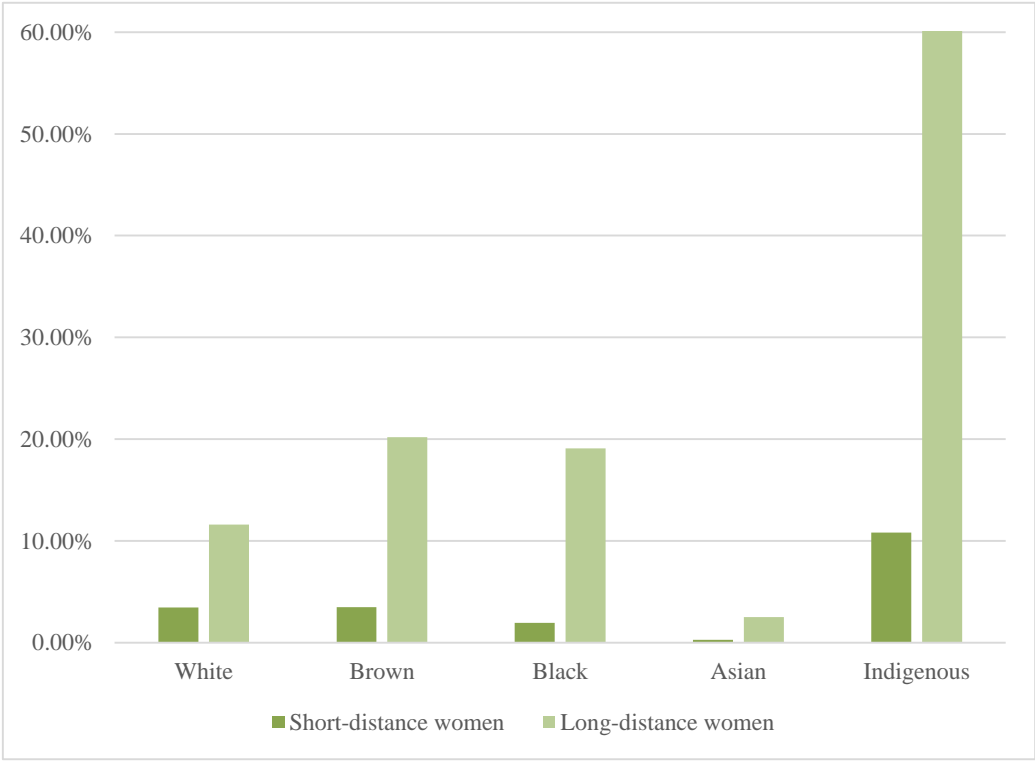


Figure 4.4 Relative change in income associated with migration status, in percentage terms, when interacted with race, for women in Brazil, 2010

Overall, our finding here is that premiums for black and brown Brazilians are higher than for white Brazilians, and this is true of both men and women. There is not enough data for us to make substantial inferences about Asian or indigenous Brazilians.

Table 4.4 Relative change in income associated with migration status, in percentage terms, when interacted with place of residence

Full sample

	Non-migrants	Short-distance	Long-distance
Urban	0	+7.31%	+22.39%
Rural	0	+20.72%	+38.79%

Men

	Non-migrants	Short-distance	Long-distance
Urban	0	+8.41%	+23.11%
Rural	0	+20.68%	+37.41%

Women

	Non-migrants	Short-distance	Long-distance
Urban	0	+3.58%	+12.26%
Rural	0	+11.49%	+21.17%

When we look at whether or not our migrants live in urban areas (models 10-12 in the Appendix) we get very striking results. For both men and women, at both migration distances, the premium is higher for migrants living in rural areas than it is for those who live in urban areas. However, again it is important to consider that we are dealing with relative incomes, and that comparisons between urban and rural should be made with caution. In fact, incomes generally are much higher for those living in urban areas, regardless of migration status, than they are for those living in rural areas. Nevertheless, there is evidence here that for those with low socioeconomic status, migration can bring very substantial gains in relative terms – though, of course, they are more substantial for men.

Overall, our finding is that in relative terms, migrants living in rural areas are association with higher premiums than those living in cities, but those gains do little to close the considerable income gap which exists between Brazil's urban majority and its rural minority. Nevertheless, it is clear that those who have low status and the resources to move can profit considerably from doing so.

Table 4.5 Relative change in income associated with migration status, in percentage terms, when interacted with metropolitan area group

Full sample

	Non-migrants	Short-distance	Long-distance
São Paolo	0	+8.83%	+8.06%*
Rio de Janeiro	0	+4.59%	+25.69%
Other large	0	+2.50%	+27.29%
Medium-sized	0	+4.09%	+23.84%
Small	0	+8.58%	+21.40%
Non-metro	0	+14.61%	+31.95%

Men

	Non-migrants	Short-distance	Long-distance
São Paolo	0	+9.06%	+10.46%*
Rio de Janeiro	0	+6.75%	+30.26%
Other large	0	+3.05%	+27.55%
Medium-sized	0	+4.75%	+24.44%
Small	0	+7.74%	+19.55%
Non-metro	0	+15.12%	+32.82%

Women

	Non-migrants	Short-distance	Long-distance
São Paulo	0	+5.51%	+3.50%*
Rio de Janeiro	0	+1.36%*	+16.31%
Other large	0	-0.21%*	+19.50%
Medium-sized	0	+1.65%*	+13.18%
Small	0	+8.03%	+15.82%
Non-metro	0	+9.05%	+14.90%

* denotes that figure is not significantly different from the one immediately to its left

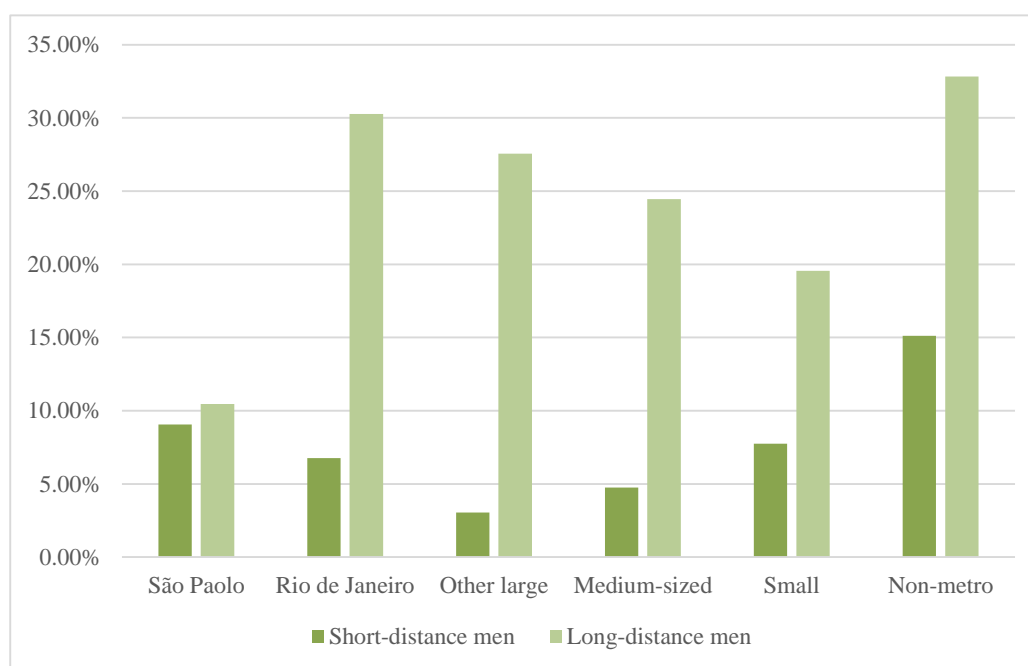


Figure 4.5 Relative change in income associated with migration status, in percentage terms, when interacted with metropolitan area group, for men in Brazil, 2010

The final part of our study sought to look at the relationship between migration status and income when interacted with metro region (models 13-15 in the Appendix) The purpose of this part of the study was to consider the possibility that the smaller cities in Brazil would demonstrate higher premiums than the larger ones. What we see here suggests that that is not necessarily the case. Premiums are noticeably lower in São Paolo for both men and women, though again this should be treated with caution because overall income levels here are somewhat higher than in the other metro regions.

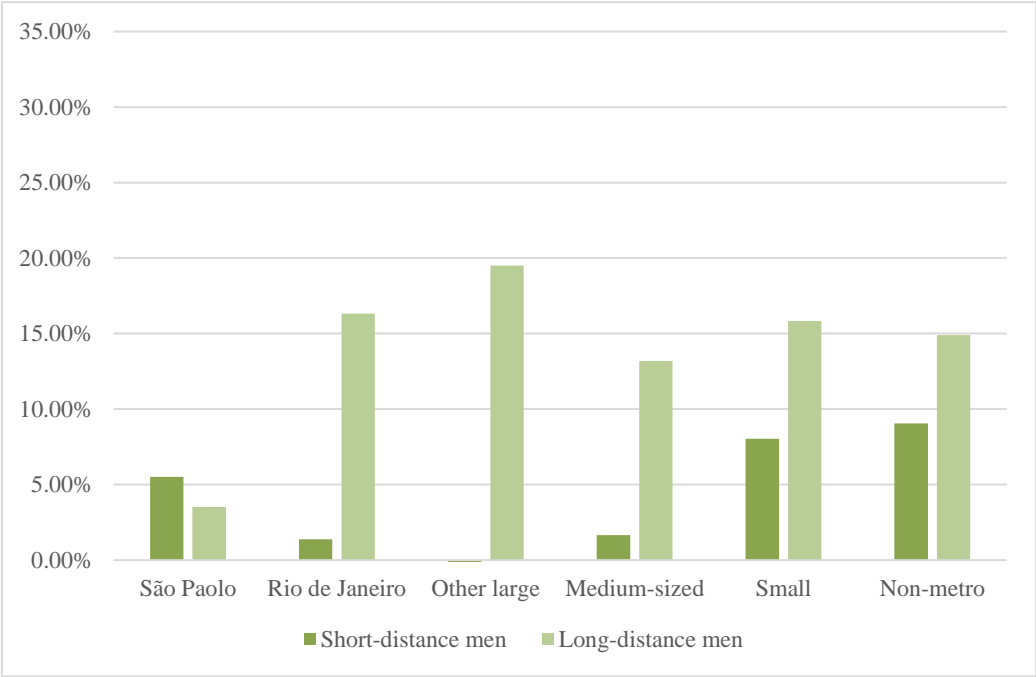


Figure 4.6 Relative change in income associated with migration status, in percentage terms, when interacted with metropolitan area group, for women in Brazil, 2010

The other four metropolitan categories have similar income levels, and allow for better comparison. Here, although there is evidence that male migrants to Rio fare better than those to smaller cities, the difference between Rio and the “other large cities” and “medium-size cities” categories are not significant. Again, premiums are higher for those not living in metropolitan areas, but overall income levels in these areas are considerably lower than in the cities.

The raw data (see Appendix) suggests that overall income levels for long-distance migrants are similar across all of the metropolitan categories (though lower for the smaller cities), but incomes for non-migrants in São Paolo are significantly higher than elsewhere. This might indicate that the premium is lower in São Paolo, but it might also suggest that long-distance migrants are a category unto themselves, whose income levels are not necessarily correlated with the incomes of non-migrants in their regions. Were this to be the case, we would expect an increase in long-distance migration to lead to a long-term reduction in the income gap between São Paolo and elsewhere.

For women, it is harder to establish a firm pattern. Strangely, long-distance female migrants in São Paolo do not have a statistically significant premium relative to short-distance migrants and

those who have not migrated at all. For Rio, and the other large and medium-sized cities, the premium for short-distance migration is not significant, but for smaller metropolitan areas it is significant.

Our finding here, then, is that there are gains to be made from moving to metropolitan areas, and these gains, if sustained over time, have the potential to close the income gap between São Paulo, which is by far the largest city in Brazil, and Rio de Janeiro and the smaller cities. There is reason to believe that the smaller cities are closing the gap, as our previous research had suggested they were.

It is not clear from the data exactly where our migrants are coming from, or going to. We cannot be sure if they are moving to large cities or medium-sized ones, and that makes it difficult to draw inferences about where the process of urbanisation in Brazil currently lies. We know that Brazil is a highly urbanised country, with more than eighty percent of its population living in cities. It is likely that most of the migrants in this study are moving from urban areas to other areas. What we can infer, however, is that it appears there are still gains to be made from internal migration in Brazil.

For longer-distance migrants, we must also take into account the possibility of another selection issue: that migrants who travel long distances have greater resources and earning power to begin with, and are therefore better able to take advantage of the opportunities presented by migration. We cannot know what wealth the individuals migrating might have amassed before leaving which might aid their relocation, or how they obtained that wealth. It is entirely possible that this is a factor for long-range migrants, though the disparity in gains from long-distance migration according to education suggest that other factors are also at work.

Overall, our results suggest that as rural-to-urban migration has become less common in Brazil, rural-to-rural migration has instead become a mechanism for social advancement. Urban-to-urban migration also persists, and has had the effect of closing income differentials between the major cities in Brazil. In addition, there is evidence that migration brings stronger gains for individuals from racial minority groups than white Brazilians. However, it is clear almost across the board that migration exacerbates income differences between men and women, rather than reducing them.

5 Conclusion

The purpose of this thesis was to establish whether or not there were still financial gains to be made from internal migration in Brazil, a developing country which is already highly urbanised. The answer, broadly, would appear to be yes. Migrants, on average, experience an increase in their income upon migration to a new, urban location, and this premium is observed for both men and women, and across different educational levels. Generally, longer-distance migration – defined in our study as migration to a different federal state – is associated with a higher income premium, but it is also associated with greater disparities for different groups.

We must, however, account for the possibility that these gains are a consequence of selection – of individuals who migrate having some unseen attribute which makes them more likely to earn more. We must also remember that not all migration is motivated by pecuniary benefits, and this is likely to be more true for women than for men. It must also be borne in mind when looking at relative income increases that a high increase could be reflective as much of a low starting point as any meaningful gains. Nevertheless, the evidence in our study suggests that generally migration reducing socioeconomic gaps, except for two important, persistent ones: the gap between male and female earnings, and the gap between urban and rural earnings.

For long-distance migrants, the income premium varies considerably depending on educational level, but in general, it is highest for those with very low levels of education, and also those with very high levels. For the highest-educated, this is likely to be a reflection of specialisation, and the relatively low number of jobs within highly skilled fields. Migration, therefore, is likely to provide for substantially better matching of workers with jobs. At lower levels, it might be a consequence of seasonal or otherwise precarious work, which provides short-term gains to individuals who lack the skills for more secure work.

It appears that women, generally, experience a smaller income premium than men, even when their participation in the labour force is accounted for. This cannot be explained by reductions in working hours, because part-time work is uncommon in Brazil. It might suggest that other factors besides financial gain influence the decision of women to migrate. This might relate to our overview of past research, which suggested that women migrated to places in which they would face lower levels of general discrimination, and to cities in particular because they were regarded as safer than the countryside.

One very noteworthy finding of our study is the capacity of internal migration to reduce racial disparities in income, even if only slightly. There is clear evidence that the premium for long-distance migrants who are black or brown is higher than for white Brazilians, even when education is accounted for. These findings are interesting because they would suggest that unlike gender, race is an area in which migration can reduce overall inequality. This may be a sign that social discrimination against racial minorities is less common than it is against women, and therefore racial minorities are no less likely to migrate for economic reasons than their

white counterparts. The increased premium may be an artefact of the higher level of poverty among these groups.

There are a number of practical implications to the findings of this study. Firstly, it is clear that migration continues to serve a useful economic purpose for Brazilians, even as the urban population approaches ninety percent of the country as a whole. It is clear that the benefits of migration, in freeing vulnerable individuals from regions where they face poverty and discrimination, and in better matching individuals with jobs that take account of their skills, are still pertinent in the second decade of the twenty-first century.

The study also seems to vindicate the observation made in previous research that the economic gap between São Paulo and smaller cities in Brazil was closing, and suggests that to some extent this is being driven by migration, possibly outward migration from the megalopolis. This would suggest that although overcrowding and poverty remain major problems in Brazilian cities, there is still room for urbanisation to create efficiencies and increase incomes, even as Brazil seems on the surface to reach a saturation point.

Another factor that ought to be taken seriously is that it is clear that migration, in some important ways, does not reduce income inequality. The overall number of migrants in our sample for Brazil is quite small: only about ten percent of the overall population. If the gains to migration are then distributed in a skewed way, we might conclude that migration is making a small but probably negative contribution to overall inequality. It would be interesting to consider why it is that the gains for individuals with medium levels of education are smaller when they migrate long distances, and why this has not encouraged fewer of them to do so. Indeed, it is interesting and not easy to explain that our migrant sub-samples have very similar educational attainment as the population as a whole. As Brazil becomes a majority-minority society, however, the ability of racial minority groups to increase their economic status through migration could become increasingly important.

It is also clear that there is no clear dividing line between economic and non-economic migration. Even the married women we mentioned earlier, who migrate and drop out of the workforce, are doing so in order to facilitate higher overall family earnings. Income gains alone do not fully capture the reasons why individuals migrate, though we might reasonably conclude that financial reasons are the most important. How they interact with other factors, like overt or covert discrimination, or regional poverty, would be an interesting topic for further study.

Finally, it appears that there are considerable obstacles to internal migration, in a country as large and dispersed as Brazil. The fact that there are major gains to be made from migration, especially for individuals with low skills, leads to the conclusion that it is difficult or impossible for most Brazilians of low socioeconomic status to move. Those who can may be in some unclear way unrepresentative of the population as a whole, but in this study we have not found what the difference might be.

How further study in this area will develop depends on the quality of future data. It would be useful in future if data were available showing whether or not individuals had lived in urban or rural areas before, so that rural-to-urban migration can be separated from inter-urban migration.

It would also be interesting to examine the major established flow of migrants, from the north-east to the south-east, to examine if they have fared better or worse than other internal migrants.

It would be useful also to better incorporate the economic and social position of women in Brazil into our analysis, in order to take into account the other reasons why women might migrate within the country. Regrettably, it is difficult for a macro study of migration patterns to take into account the micro theories. It would be useful if a study could be carried out examining the role that family economics and household dynamics make in the decision to migrate, and whether or not they affect men and women differently.

Another issue which might benefit from further study is the question of how workers from different industries are affected by internal migration. Our literature review looked at one paper which examined the role that globalisation and access to global markets played in internal migration. However, we lacked the data for this study to seriously engage with this, though it would have been illuminating to examine the role that globalisation of markets plays in encouraging individuals from certain sectors to move.

One final note referring to the changing patterns of international migration as they pertain to Brazil. Over the last thirty years, Brazil has become a country of emigration, rather than immigration. Or, to put it more accurately, it has changed from a country where virtually all migration was internal, to one where a considerable amount is international. One thing this study has been unable to look at is the difference between those who migrate abroad and those who stay. This study found it stubbornly difficult to see major demographic patterns in the profile of those who migrated, compared to the wider population. It would be interesting to see if international migrants were equally hard to pin down.

Urbanisation is proving to be the key to first-world status for much of the developing world, but ever-expanding cities of ten of millions of people bring their own problems, as the experiences of urban Brazil in the late twentieth century show. Changing migration patterns in the twenty-first century suggest that the spatial distribution of Brazil's labour force may be in the process of righting itself. This is not in itself a solution to Brazil's economic problems, but it holds the promise of being one less problem, at the very least.

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Appendix

Regression output

	Model 1	Model 2	Model 3
Constant	4.5617	4.3134	4.7190
Age	0.0506	0.0759	0.0263
Age²	-0.0003	-0.0007	-0.0001
Educational attainment			
<i>Some primary completed</i>	0.1167	0.1937	0.0356
<i>Primary 4 years completed</i>	0.2911	0.3672	0.1950
<i>Primary 6 years completed</i>	0.5425	0.6069	0.4558
<i>Lower secondary general completed</i>	0.6438	0.7066	0.5907
<i>Secondary general completed</i>	0.8995	0.9295	0.9137
<i>Some college completed</i>	1.2624	1.2739	1.3277
<i>University completed</i>	1.8335	1.8943	1.9078
Migration status			
<i>Short-distance migrants</i>	0.0793	0.0868	0.0407
<i>Long-distance migrants</i>	0.2335	0.2364	0.1443
Sample size	4253741	2262104	1991637
R²	0.303	0.345	0.345

* denotes non-significance at the 5% level

Model 1 uses full sample

Model 2 uses sample of men only

Model 3 uses sample of women only

	Model 4	Model 5	Model 6
Constant	4.5614	4.3120	4.7211
Age	0.0504	0.0757	0.0260
Age²	-0.0004	-0.0007	-0.0001
Interaction of migration status and educational attainment			
<i>No schooling</i>			
- Short-distance migrants	0.0822	0.0890	0.0192
- Long-distance migrants	0.3940	0.3903	0.2426
<i>Some primary completed</i>			
- Non-migrants	0.1163	0.1944	0.0347
- Short-distance migrants	0.2283	0.3106	0.0809
- Long-distance migrants	0.4673	0.5152	0.2697
<i>Primary 4 years completed</i>			
- Non-migrants	0.2951	0.3725	0.1973
- Short-distance migrants	0.3607	0.4408	0.2089
- Long-distance migrants	0.5527	0.6114	0.3357
<i>Primary 6 years completed</i>			
- Non-migrants	0.5504	0.6149	0.4610
- Short-distance migrants	0.5867	0.6715	0.4484
- Long-distance migrants	0.7347	0.7985	0.5587
<i>Lower secondary general completed</i>			
- Non-migrants	0.6487	0.7127	0.5923
- Short-distance migrants	0.7195	0.8067	0.6297
- Long-distance migrants	0.8252	0.8881	0.7181
<i>Secondary general completed</i>			
- Non-migrants	0.9060	0.9352	0.9165
- Short-distance migrants	0.9927	1.0433	0.9625
- Long-distance migrants	1.0375	1.0939	0.9816
<i>Some college completed</i>			
- Non-migrants	1.2688	1.2808	1.3290
- Short-distance migrants	1.3382	1.3450	1.396
- Long-distance migrants	1.4547	1.4967	1.4433

University completed

- <i>Non-migrants</i>	1.8302	1.8927	1.9018
- <i>Short-distance migrants</i>	1.9479	1.9824	2.0022
- <i>Long-distance migrants</i>	2.1958	2.2571	2.1617

<i>Sample size</i>	<i>4253741</i>	<i>2262104</i>	<i>1991637</i>
<i>R²</i>	<i>0.303</i>	<i>0.345</i>	<i>0.345</i>

* denotes non-significance at the 5% level

Model 4 uses full sample

Model 5 uses sample of men only

Model 6 uses sample of women only

	Model 7	Model 8	Model 9
Constant	4.7469	4.4798	4.9109
Age	0.0517	0.0766	0.0280
Age²	-0.0004	-0.0007	-0.0001
Educational attainment			
<i>Some primary completed</i>	0.0998	0.1775	0.0193
<i>Primary 4 years completed</i>	0.2566	0.3368	0.1579
<i>Primary 6 years completed</i>	0.4995	0.5683	0.4111
<i>Lower secondary general completed</i>	0.5969	0.6656	0.5432
<i>Secondary general completed</i>	0.8391	0.8764	0.8486
<i>Some college completed</i>	1.1674	1.1886	1.2269
<i>University completed</i>	1.7196	1.7921	1.7852
Interaction of migration status and race			
<i>White</i>			
- <i>Short-distance migrants</i>	0.0573	0.0593	0.0340
- <i>Long-distance migrants</i>	0.1871	0.2002	0.1097
<i>Brown</i>			
- <i>Non-migrants</i>	-0.2752	-0.2349	-0.2998
- <i>Short-distance migrants</i>	-0.1826	-0.1227	-0.2656
- <i>Long-distance migrants</i>	0.1287	0.0512	-0.1159
<i>Black</i>			
- <i>Non-migrants</i>	-0.2218	-0.2183	-0.2360
- <i>Short-distance migrants</i>	-0.1331	-0.1249	-0.2168
- <i>Long-distance migrants</i>	0.0625	0.0424	-0.0612
<i>Asian</i>			
- <i>Non-migrants</i>	-0.1161	-0.0698	-0.1063
- <i>Short-distance migrants</i>	-0.0472	0.0374*	-0.1035
- <i>Long-distance migrants</i>	0.0256*	0.1265	-0.0817*
<i>Indigenous</i>			

- <i>Non-migrants</i>	-0.4459	-0.3796	-0.4445
- <i>Short-distance migrants</i>	-0.2817	-0.2050	-0.3419
- <i>Long-distance migrants</i>	0.1271*	0.0078	0.0322*
<i>Unknown</i>			
- <i>Non-migrants</i>	0.1665	-0.0339	0.4365
- <i>Short-distance migrants</i>	-0.6400	-0.4522	-0.8702
- <i>Long-distance migrants</i>	none	none	none
<i>Sample size</i>	<i>4253741</i>	<i>2262104</i>	<i>1991637</i>
<i>R²</i>	<i>0.318</i>	<i>0.359</i>	<i>0.363</i>

* denotes non-significance at the 5% level

Model 7 uses full sample

Model 8 uses sample of men only

Model 9 uses sample of women only

	Model 10	Model 11	Model 12
Constant	4.2749	4.0652	4.3924
Age	0.0491	0.0741	0.0253
Age²	-0.0004	-0.0007	-0.0001
Educational attainment			
<i>Some primary completed</i>	0.0936	0.1701	0.0145
<i>Primary 4 years completed</i>	0.2414	0.3200	0.1444
<i>Primary 6 years completed</i>	0.4474	0.5209	0.3523
<i>Lower secondary general completed</i>	0.5238	0.5995	0.4611
<i>Secondary general completed</i>	0.7704	0.8131	0.7727
<i>Some college completed</i>	1.1179	1.1411	1.1724
<i>University completed</i>	1.6914	1.7648	1.7535
Interaction of migration status and urban status			
<i>Rural</i>			
- <i>Short-distance migrants</i>	0.1883	0.1880	0.1087
- <i>Long-distance migrants</i>	0.3278	0.3178	0.1920
<i>Urban</i>			
- <i>Non-migrants</i>	0.4851	0.4349	0.5320
- <i>Short-distance migrants</i>	0.5557	0.5166	0.5672
- <i>Long-distance migrants</i>	0.6872	0.6428	0.6477
Sample size	<i>4253741</i>	<i>2262104</i>	<i>1991637</i>
R²	<i>0.324</i>	<i>0.366</i>	<i>0.369</i>

* denotes non-significance at the 5% level

Model 10 uses full sample

Model 11 uses sample of men only

Model 12 uses sample of women only

	Model 13	Model 14	Model 15
Constant	4.5122	4.2773	4.6521
Age	0.0490	0.0744	0.0248
Age²	-0.0004	-0.0007	-0.00004
Educational attainment			
<i>Some primary completed</i>	0.1067	0.1850	0.0250
<i>Primary 4 years completed</i>	0.2703	0.3513	0.1692
<i>Primary 6 years completed</i>	0.4958	0.5727	0.3955
<i>Lower secondary general completed</i>	0.5832	0.6619	0.5169
<i>Secondary general completed</i>	0.8321	0.8773	0.8323
<i>Some college completed</i>	1.1743	1.2022	1.2261
<i>University completed</i>	1.7410	1.8163	1.8024
Interaction of migration status and urban status			
<i>Non-metropolitan</i>			
- <i>Short-distance migrants</i>	0.1364	0.1408	0.0866
- <i>Long-distance migrants</i>	0.2773	0.2838	0.1389
<i>São Paulo</i>			
- <i>Non-migrants</i>	0.4439	0.3503	0.5308
- <i>Short-distance migrants</i>	0.5285	0.4371	0.5845
- <i>Long-distance migrants</i>	0.5215	0.4498	0.5652
<i>Rio de Janeiro</i>			
- <i>Non-migrants</i>	0.2891	0.1987	0.3704
- <i>Short-distance migrants</i>	0.3340	0.2641	0.3839
- <i>Long-distance migrants</i>	0.5179	0.4639	0.5215
<i>Other large cities</i>			
- <i>Non-migrants</i>	0.2498	0.1917	0.3114
- <i>Short-distance migrants</i>	0.2745	0.2217	0.3093
- <i>Long-distance migrants</i>	0.4910	0.4350	0.4895
<i>Medium-sized cities</i>			

- <i>Non-migrants</i>	0.2534	0.2005	0.297
- <i>Short-distance migrants</i>	0.2935	0.2468	0.3141
- <i>Long-distance migrants</i>	0.4672	0.4191	0.4215
<i>Smaller cities</i>			
- <i>Non-migrants</i>	0.1841	0.1502	0.2187
- <i>Short-distance migrants</i>	0.2664	0.2248	0.2960
- <i>Long-distance migrants</i>	0.3780	0.3288	0.3656
<i>Sample size</i>	<i>4253741</i>	<i>2262104</i>	<i>1991637</i>
<i>R²</i>	<i>0.324</i>	<i>0.360</i>	<i>0.375</i>

* denotes non-significance at the 5% level

Model 13 uses full sample

Model 14 uses sample of men only

Model 15 uses sample of women only