THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Essays on the Economics of Migration

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Declaration

I certify that the thesis I have presented for examination for the MPhil/PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extent of any work carried out jointly by me and any other person is clearly identified in it).

I declare that my thesis consists of approximately 40,000 words.

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Abstract

This thesis contributes to our understanding of the economics of international migration. It consists of three chapters exploring some of the consequences and implications of human migration.

Chapter 1, ***'No Country for Young Men'***, studies the effects of international migration on the schooling and labour outcomes of left-behind children. While a large literature on the topic already exists and focuses on Latin America and China, little is known about how migration affects left-behind individuals in other parts of the world; and Central Asia in particular. The study concentrates on Tajikistan, the country with the highest level of remittance inflows relative to the size of the economy. Using panel data tracking the same children over time, I find important and gender-differenced schooling and labour supply responses. In a nutshell, young males are found to benefit from the migration of one of their household members, while young women are not.

The second chapter, ***'Invasive Neighbours'***, provides new evidence on the effect of immigration on electoral outcomes in developing countries. The Dominican Republic is used as case study as it provides a highly interesting context to analyse this issue. The vast majority of its immigrants come from neighbouring Haiti, and together the two countries share the island of Hispaniola. I find robust evidence that higher immigrant concentration is associated with greater support for the right-wing political coalition that has traditionally been more opposed to immigration. At the same time, the popularity of the centre-left coalition is found to decline in localities experiencing larger inflows of foreigners. Political competition, citizenship and identity considerations seem to be shaping voting behaviour and individual attitudes towards immigrants in the Dominican Republic.

The third and last chapter, ***'The Elusive Quest for Social Diversity?'***, analyses the effect of social housing supply on ethnic and social diversity in France's largest metropolitan areas. High income countries generally rely on the provision of affordable housing through various schemes to both facilitate access to decent accommodation and encourage social diversity at the local level. The analysis takes advantage of a national policy reform to shed light on the issue. I find strong evidence of a positive relationship between social housing and ethnic diversity in local labour markets with large immigrant networks and strong labour demand. Social housing provision also affects the distribution of households'

income at the local level. This chapter contributes to the small but growing literature on the impact of social housing developments on the neighbourhoods in which they are built.

Table of Contents

Introduction

This thesis contributes to our understanding of the economics of international migration. It focuses mainly on labour (or economic) migration as opposed to refugee migration. Asylum seekers and refugees have been forced to leave their countries in order to escape war, persecution, or natural disaster. Instead labour migration can be defined as the choice of an individual or household to move abroad to improve its living standards. Labour migration is in principle mutually agreed upon by migrants and host countries. Economic migrants therefore tend to choose and have prior information on their destination country (Dustmann et al. 2017).

This thesis is comprised of three chapters exploring some of the consequences and implications of labour migration. The first chapter concentrates on the impact of migration on the education and labour outcomes of left behind children in poor countries. The second chapter puts the emphasis on the electoral consequences of immigration in emerging democracies. The last chapter deals with the influence of housing policies on the location decisions of immigrants in industrialised countries.

Migration economists distinguish between the origin and destination countries of migrants. The economic literature on migration has always been interested in the effects of migration at the destination. In recent years, migration scholars have also begun to show great concern for the implications of emigration in source countries (Clemens 2011). The debates on the brain drain and the opportunities remittances offer for financing development have been written about extensively for instance. This thesis looks at migration in these two settings. The first chapter of this thesis is concerned with the effects of migration in a source country, namely Tajikistan. The second and third chapter examine the host countries of the Dominican Republic and France.

Migration is a socio-economic phenomenon of a fundamentally spatial nature. It also tends to be urban in the sense that more migrants settle in cities than in rural areas. There are an estimated 232 million international migrants and 740 million internal migrants worldwide (UN DESA 2013). About half of international migrants reside in ten highly urbanized, high-income countries. These include Australia, Canada and the United States, several countries in Europe (France, Germany, Spain and the United Kingdom), and the Russian Federation, Saudi Arabia and the United Arab Emirates. Migrants also tend to concentrate in the cities of these countries. Further, almost all the growth in the world's population

over the next few decades is expected to occur in the urban areas of low-and middle-income countries, particularly in Africa and Asia (UN DESA 2014). This urban characteristic of global migration flows can be witnessed in the three cases studies of this thesis. More than 90% of Tajikistani migrants go to Russia to look for work, and about half settle in the Russian capital Moscow. In the Dominican Republic, immigration was traditionally associated with agricultural plantation labour. Since the 1990s however, immigrants have started to favour urban areas where there are numerous job opportunities in construction and services. France is another good example of this phenomenon. More than a third of its immigrants reside in the Greater Paris region.

Migration has been a constant feature of human history, but twenty-first century migration is quite different from that of previous generations. Global migration flows have been stimulated by lower costs of transportation, communication innovations, and the rise of global media. Migrants have now the opportunity to maintain or develop cultural and socio-economic ties with their countries of origin. It is now much easier for today's migrants and their descendants to return to their home countries. It is also easier for them to import goods and services. They can also send remittances and goods purchased abroad back home (IOM 2017). Migrants can influence political preferences and social behaviours at the origin as well. Levitt (1998) was the first to coin the term *social remittances* to describe the flow of ideas, social and political capital from receiving to sending communities. Immigrants also have an impact on the locations in which they settle. Labour economists have spent three decades debating and measuring the effect of immigration on labour markets, innovation and productivity for instance. In consequence, migration has multi-faceted consequences in host and source countries. This is reflected in this thesis. The first chapter concentrates on the education and labour outcomes of left behind children. Attitudes, politics, and elections are the focus of the second chapter. The last chapter deals with public policies and how it affects the residential choices of immigrants.

This thesis makes several contributions to the literature on the economics of migration. I discuss in each chapter these contributions in great detail. I nonetheless take the time to focus on a few significant ones here. Firstly, I consider original settings to analyse the consequences of migration. Central Asia and the Caribbean are two underexplored regions of the world in the academic literature. Their economic, political, and social institutions are quite specific, however. The seminal migration studies focusing on the experience of well researched case studies such as Denmark, the US, Mexico, or China have limited external

validity for Tajikistan and the Dominican Republic as a result. The third chapter of this thesis concentrates on the validity of the *Welfare Magnet Hypothesis* in France. This hypothesis states that welfare generosity acts a 'magnet' for migrants. Few studies have tested it outside the US. Secondly, by attaching a great deal of importance to econometric endogeneity issues, this thesis also contributes to the migration literature from a methodological standpoint.

Chapter 1 studies the impact of migration on the schooling and labour outcomes of left-behind children in rural Tajikistan. In low income countries, migration is often used as a strategy to cope with poverty and diversify economic risk. Despite its common adoption, the consequences of this strategy for left-behind children are unclear from a theoretical standpoint. Remittances may improve family financial situations, ease the payment of schooling related expenses, and lower the opportunity cost of sending children to school. Parental absence might be detrimental for children, however. The lost labour due to migration might require replacement and child effort for example. Additionally, remaining family members might have less time resources available to invest in the education of youngsters.

Tajikistan provides a highly interesting and relevant case study to focus on. Migration has become a widespread phenomenon among rural households following the collapse of the Soviet Union. It is believed that as many as one in four Tajikistani households have engaged in international migration to improve its living standards since the country's independence in 1991. Largely in consequence of these emigration flows, Tajikistan has also recorded the world highest level of remittance inflows as a fraction of gross domestic product since the middle of the last decade.

Individual self-selection into migration is a serious challenge to measure the effect of living in a migrant household. The empirical analysis in this chapter relies on a detailed survey tracking households' economic and social experiences during half a decade. The panel dimension of the sample allows eliminating a considerable amount of unobserved individual and household heterogeneity. To remove time varying confounding influences, I design an instrumental variable strategy relying on the economic conditions prevailing in Russia where nine out of ten migrants settle and spatial variation in the cost of migration.

Overall, the analysis yields mixed conclusions regarding the impact of migration on children in rural Tajikistan. My findings indicate that male children living in migrant

households have a lower probability of lagging behind at school and engaging in child labour. They also work fewer hours per week. Interestingly, I find that migration has a different effect on left behind girls. Teenage females appear to be negatively affected by the migration of a family member in the sense that the amount of chores they have responsibility over increases. The positive impact documented for male children and the gender heterogeneity appear to be driven by financial channels, local socioeconomic institutions and gender norms.

This chapter provides scarce empirical evidence for a region that has been neglected in the literature on the economics of migration. It also has important public policy implications for countries like Tajikistan implementing measures of various kinds to encourage emigration.

Chapter 2 explores the electoral consequences of immigration in developing countries. Economists and political scientists have only recently begun to provide hard evidence on this topic. While empirical studies focusing on Europe and the US have been written in the last few years, little is known on how immigration affects attitudes and election results in developing countries. Such countries do not share the institutional and welfare system features of industrialized countries, and the voting behaviour of natives might differ. This chapter contributes to this literature by looking at the effect of Haitian immigration in the Dominican Republic (DR). In recent years migrant inflows from Haiti have skyrocketed, while at the same time political and ethnic tensions have grown sharply.

This study exploits a broad range of data sources to construct a novel municipality-level panel dataset used to examine the impact of immigration on both presidential and parliamentary elections. The empirical investigation is based on a first difference model cancelling out all unobserved time invariant municipality characteristics. To account for the endogenous location decisions of migrants, I adopt an instrumental variable strategy capturing the influence demographic push factors have in determining the settlement pattern of Haitian migrants in the DR. I also exploit the devastating 2010 Haitian earthquake as an alternative source of exogenous variation.

I find robust evidence of a positive relationship between a higher concentration of Haitian immigrants and the vote shares of the right-wing political coalition in both presidential and congressional elections. The small Dominican far-right party campaigning largely on an anti-migration platform also gains votes in more exposed municipalities. On the other

hand, the centre-left political coalition experiences a reduction in electoral support in the municipalities more exposed to Haitian migration. Empirical evidence based on both election data and individual opinion surveys suggests that concerns over citizenship, political competition and cultural identity might be the main drivers of Dominican natives' political response to the immigration of Haitians.

This chapter is the first quantitative study of the consequences of immigration on electoral outcomes in an emerging democracy. It exploits a rich and entirely novel dataset combining decennial census data, election results, and opinion survey answers. It also makes great effort in providing evidence on the channels driving the associations found between immigration and political party performance.

Chapter 3 contributes to the literature looking at the location decisions of immigrants by providing new evidence on the W*elfare Magnet Hypothesis*. This hypothesis claims that spatial variation in the generosity of welfare systems might distort migration flows resulting in an unproductive allocation of migrants across labour markets. Numerous high income countries count on the provision of affordable housing to facilitate access to decent accommodation and promote social diversity. Despite their wide adoption, there is limited evidence on whether affordable housing programs affect population composition, urban segregation, and ethnic and social diversity. This chapter looks precisely at these issues in France, a country with a long tradition of hosting immigrants and an ambitious social housing policy.

The direction of the causality between affordable housing provision, immigrant population presence, and neighbourhood diversity is difficult to measure. From a methodological viewpoint, the analysis is complicated by the complex decisions determining the allocation of low income housing across space. I take advantage of a national housing policy reform to circumvent this fundamental issue. I also go beyond 'traditional' magnet hypothesis studies and look at the demographic, economic, and social characteristics of immigrants.

I divide the empirical analysis in two parts. First, I concentrate on the Greater Paris region where about one sixth of the French population and one third of immigrants live. I find that social housing supply attracts immigrant populations and promote ethnic diversity in this region. Additional evidence indicates that the bulk of the increase in foreigners is accounted by female and economically inactive immigrants. I also observe that municipalities providing more affordable housing are poorer and exhibit lower household

median incomes. In the second part of the empirical analysis, I extend the investigation to the next three largest French metropolitan areas: Lyon, Marseille, and Toulouse. I do not detect any effect on the measures used to proxy for ethnic and social diversity for these urban areas. Pooling the four metropolitan area samples I study whether the effect of social housing supply is heterogeneous. My findings suggest that the effect of social housing on attracting immigrants is larger in municipalities located in local labour markets with a higher concentration of foreigners and more buoyant economic conditions.

The analysis in this paper is highly relevant and has important implications for public policy. Higher ethnic diversity prompted by a larger social housing supply can have wide ranging socio-economic effects. A large literature has shown that urban segregation has detrimental effects on the educational, employment and life prospects of minorities. There is also a large and ongoing debate on the impact of immigration on the labour market outcomes of natives and immigrants alike.

These three chapters provide new insights on the economics of international migration. Despite the heterogeneity of the research questions and cases studied, they show how human migration can have significant economic, political and social impacts in both origin and destination countries of different income levels.

Chapter 1

No Country for Young Men. International Migration and Left-behind Children in Tajikistan[1].

1.1 Introduction

In low income countries, migration is often used as a strategy to cope with poverty. Limited economic prospects as well as capital and insurance market failures often encourage households to send a member abroad to search for better opportunities and diversify economic risk. Once established overseas migrants often remit part of their income to household members left behind, while the separation of families that results can have important consequences on the household members remaining in sending areas (Stark and Bloom 1985; Amuedo-Dorantes and Pozo 2006; Banerjee and Duflo 2011; Gibson et al. 2011; Yang 2011; Antman 2013; Clemens and Ogden 2014).

This paper aims at identifying the causal impact of migration on the schooling and labour outcomes of left-behind children in rural Tajikistan. This country provides an interesting setting to study this topic since emigration flows have grown markedly over the last two decades following independence in 1991 and the end of the 1992-1997 civil war. Tajikistan being the poorest country in Central Asia with still 27.7% of its population living with less than US$ 2 a day in 2009, many households turn to labour migration to improve their living conditions. One in four Tajikistani households is thought to have engaged at some point in migration to better its quality of life during the last decade (World Bank 2009,

[1] My supervisors Steve Gibbons and Olmo Silva have provided tremendous guidance for this project. I have also benefited from productive conversations with Vernon Henderson, Martin Heger, Alexander Jaax, Jouni Kuha, and Nathalie Picarelli.

2011). As a consequence, the country has had the highest level of remittance inflows as a share of gross domestic product (GDP) in the world[2] since the middle of the 2000s.

To address the research question, the analysis relies on a three-wave panel survey with data collected in 2007, 2009 and 2011 by the Tajikistani National Committee for Statistics, the World Bank, and the Institute for East- and Southeast European Studies based in Germany. These surveys contain information on the education, labour market outcomes, and other socio-demographic characteristics of the respondents. Estimating the effect of having a household member living abroad on the left-behind is challenging because individuals and households self-select into migration. The panel dimension of the sample allows eliminating a considerable amount of unobserved heterogeneity through a two-way panel fixed effects specification. Nonetheless, given the observational nature of the data and non-random selection into migration, I also use an instrumental variable strategy to account for potential sources of time-varying endogeneity affecting both migration decisions and individual outcomes. Since the vast majority of Tajikistani emigrants (more than 90 %) move to the Russian Federation (IMF 2005; IOM 2009; Danzer and Ivaschenko 2010), I develop an instrument based on the economic conditions prevailing in Russia and spatial variation in migration costs. Business cycles overseas are exogenous to the schooling and labour outcomes of Tajikistani children, but it is reasonable to expect that they affect household emigration decisions[3]. My findings indicate that migration has a differential effect on left behind boys and girls. Overall, boys seem to benefit from migration. All else equal male children living in migrant households have a lower probability of lagging behind at school or engaging in child labour on the household farm. They also work fewer hours per week. Instead, education spending on left-behind girls falls. In addition, the probability of teenage females becoming idle rises. They also appear to increase their participation in household chores. The differential impact of migration on male and female children appears to be driven by financial channels and gender norms. My results suggest migrant households are more likely to receive remittances and be satisfied with their financial situation. In addition, they seem to rely to a greater extent on young females to perform domestic tasks such as cooking and cleaning.

[2] Since 2007, Tajikistan has ranked first in terms of remittance inflows as a share of GDP (World Development Indicators, 2016).

[3] There is empirical evidence justifying the latter argument. For instance, McKenzie et al. (2014) estimate the impact of economic shocks in Filipino migrant destination countries on migrant flows to those destinations over the period 1992–2009. They find that variations in destination countries real GDP have a large impact on Filipino migrant inflows.

From a theoretical point of view, the consequences of migration on the educational outcomes of the left-behind are a priori uncertain. On the one hand, the financial costs of migration combined with the potential need to replace the migrant's labour and the associated forgone income might lead to an increase in the labour market participation of the remaining children. Left-behind children might even be forced to drop out of school if the forgone income is too substantial. Moreover, if the migrant participated in household activities (for instance farming, running the family business or undertaking household chores), left-behind children may spend more time performing household domestic tasks (Jadotte 2009; Lokshin and Glinskaya 2009; Binzel and Assaad 2011; Chang et al. 2011; Mu and van de Walle 2011). Parental absence may also result in less time and effort allocated to children's education by adults. On the other hand, remittance receipt following the emigration of a household member should loosen budget constraints and facilitate sending children to school. It ought to translate as well in a reduction in the number of hours worked for minors already economically active. In this case, one would expect to observe a negative relationship between migration, dropping out of school and child labour (Kroeger and Anderson 2014, Cortes 2015). The receipt and amount of remittances thus play a very important role in determining the effect of migration on children. The prospect of future migration for children growing up in migrant households might also affect incentives to invest in human capital depending on the relative returns to education at home and abroad (McKenzie and Rapoport 2011; Batista et al. 2012; Antman 2013).

Further, cultural norms and institutions may influence how members within a household are affected. In a country such as Tajikistan with marked gender differences with respect to the household division of tasks, it can be expected that female human capital investments will be relatively inelastic to the migration of a household member compared to that of young males. Tajikistan is a patrilocal society and women leave their parental households when they get married to settle in those of their husbands (Grogan 2007). As a result, parents do not benefit much from their daughters' returns to education and have little incentives to invest in their schooling. Credit markets are also believed to be imperfect in Tajikistan. Faced with credit constraints, parents might be forced to invest only in the education of one or few children; especially when the returns to schooling are believed to be non-linear (very low first and rising fast after a certain amount of schooling). Given the limited labour opportunities available to women in Tajikistan, one would expect migrant households to choose to invest in their sons' human capital.

This paper is related to the literature on migration and its effects on left-behind children's schooling and labour. The existing empirical evidence has arguably failed to reach a consensus on what are the consequences of migration on these outcomes. Findings appear to be somewhat dependent on the empirical methodology adopted and at the same time context-specific[4]. Several studies find evidence of the possibility that migration and remittances relax budget constraints and translate in a reduction in child labour and better schooling outcomes. For instance, Cox Edwards and Ureta (2003) examine the effect of remittances in El Salvador using cross-sectional data. Assuming selection on observables, their results indicate that remittances have a positive effect on school attendance. In Mexico, Alcaraz et al. (2012) focus on the short term effects of remittances on both school attendance and child labour. They take advantage of the 2008–2009 global economic crisis as an exogenous event to observe how remittance beneficiaries react to negative remittance shocks. Using a difference in differences strategy and instrumenting remittance receipt with the distance from residence municipality to the U.S. border, they find that negative remittance shocks cause both an increase in child labour and dropping out of school. Gibson and McKenzie (2014) evaluate the development impact of New Zealand's Recognised Seasonal Employer (RSE) program in Tonga and Vanuatu. They find evidence that in migrant households school attendance rates for 16 to 18 years old increased in Tonga but not Vanuatu. On the contrary, McKenzie and Rapoport (2011) uncover a negative impact of migration on educational attainment in rural Mexico. Their results show a significant negative effect of migration on schooling attendance and attainment. Further, several studies report that the effects of migration differ based on age and gender of the child. Acosta (2011) finds that in remittance households in El Salvador, girls increase school attendance and reduce labour activities. Boys do not appear to modify their schooling decisions, however. Chang et al. (2011) examine the impact of migration on the time allocation patterns of left-behind children in rural China. Their analysis focuses on time use of children aged 7 to 14 years of age in farm work and domestic work. They show that the migration of household members increases time spent on farm work and domestic work, with the increase in work time being greater for girls than boys.

There is limited evidence on the impact of migration on the children left-behind in Tajikistan. Using cross-sectional survey data and assuming selection on observables, Bennett et al. (2013) find a significant positive association between parental migration and children's school enrolment. Dietz et al. (2015) exploit a panel dataset to address the same

[4] For a thorough review of the literature, see Antman (2013).

research question. Controlling for time and individual fixed effects, they find a negative relationship between the migration of a household member and school attendance of left-behind children. I build upon these studies by considering the trade-off between labour and educational outcomes. I also improve on the empirical methodology and assess the potential channels driving my findings.

The identification strategy adopted in this paper improves on the empirical methodology employed in the literature contributions discussed above. To be precise, by combining a fixed effects approach with an instrumental variable (IV) strategy I provide solid causal evidence on the relationship studied here. Indeed, the panel nature of the dataset allows me to remove the influence of unobserved time fixed confounders and yearly macroeconomic shocks. In addition, the instrumental variable strategy further addresses the endogeneity of self-selection into migration by mitigating the confounding effect of time-varying household and individual variables. In doing so, I contribute to the limited empirical literature with strong empirical strategies that has looked at this question.

The present work further contributes to the literature on migration and left-behind children in two important ways. First, my findings focus on both education and labour outcomes. In addition, they shed light on the channels driving the results. They also highlight the existence of gender heterogeneity in the impact of migration. Second, I provide empirical evidence for a region that is arguably neglected in the literature on the economics of migration. Tajikistan and Central Asia have been understudied despite the importance of the Russian – Central Asia corridor in global labour migration flows. In recent years, Armenia, Kyrgyzstan, Moldova, and Tajikistan – four countries of the former Soviet bloc – have figured among the top 15 world receivers of remittances as a percentage of GDP. Most of the related empirical literature has instead tended to focus on Mexico and other Latin American and Caribbean countries where cultural norms and economic institutions differ markedly (de Haas 2009; Antman, 2013).

The rest of this chapter is structured as follows. The next section provides some background on international migration in Tajikistan. I then discuss data sources and present descriptive statistics in the third section. The identification strategy is discussed in the fourth section. Estimation results are presented next. The last section concludes.

1.2 International migration in Tajikistan

1.2.1 Context

A former Soviet Republic, Tajikistan is the smallest landlocked country in Central Asia with a population of 8.2 million inhabitants as of 2013. It is highly mountainous with the two ranges of the Alay and Pamir Mountains passing through the western and eastern part of the country's territory, respectively. The country is the poorest in the region and more than two thirds of its population lives in rural areas where most of the poor are concentrated (World Bank 2009; Shemyakina 2011). The agricultural sector employs more than 50% of the labour force, and most of the rural population depends on agriculture-generated income (Akramov and Shreedhar 2012; Gang et al. 2016).

Tajikistan is a highly interesting case-study for the analysis of the link between emigration, human capital accumulation, and the labour market outcomes of left-behind children. The country's reliance on international migration as a coping strategy is a relatively new phenomenon. It started in the late 1990s as a direct consequence of the social and economic chaos caused by the post-independence civil war that ended in 1997 and the Russian financial crisis of 1998. With the independence of the country in 1991 followed by civil war and global financial turmoil, the payments system collapsed, the industrial and export base drastically contracted, public sector employment shrank, and daily household consumption began to rely on humanitarian aid. It is estimated that between 1990 and 1997, the country's real gross domestic product (GDP) fell by 65% (Abdulloev et al. 2014; Gang et al. 2016). In this context, labour migration eventually became an unavoidable strategy to generate much needed income for a large number of households (IMF 2005; Kireyev 2006; Piracha et al. 2013). Over the course of the last decade, the number of labour migrants moving abroad in search of better opportunities kept increasing, and so did international remittances (see Figure 1). Since the middle of the last decade, Tajikistan has ranked first in terms of remittances received as a share of GDP. Between 2005 and 2015, remittances sent from abroad amounted on average to 40 % of GDP; by far the highest level in the world (see Figure 2). Due to these massive emigration flows, Tajikistan's workforce contracted by 10% to 20% in the last decade (Kireyev 2006). The country has historically had one of the highest population growth rates of the former Soviet republics and despite positive economic growth rates, job opportunities have remained scarce. These economic stagnation and demographic pressures help explain the

persistence of the Tajikistani out-migration throughout the last fifteen years (Jones et al. 2007).

Russia is by far the main destination of emigrants. According to the World Bank (2009), approximately 96% of Tajikistani migrants locate in the Russian Federation, with roughly 50% of these migrants settling in Moscow. There are various reasons for the predominance of Russia as destination country. First, Russia possesses a sizable Tajik ethnic community that established itself in the country progressively through the twentieth century. In addition, the economy of the Russian Federation is characterized by the presence of dynamic or booming industries such as oil and gas, metallurgy, chemical industries and heavy machinery building requiring unskilled labour. Besides, Tajikistan workers do not need a visa to enter the country. Further, geopolitical tensions with Uzbekistan, protracted civil unrest in Afghanistan, and infamous cases of mistreatments of Tajikistani migrants in Kazakhstan divert emigrants away from neighbour countries towards Russia (Jones et al. 2007; Buckley and Hofmann 2012). The vast majority of emigrants are young men in their late twenties and mid-thirties. In terms of educational outcomes, migrants have usually completed secondary school. Prior to migrating most of these individuals were unemployed. Most migration spells are temporary in nature and typically last between six months and five years. Most migrants end up working in the construction sector or performing unskilled tasks in the services sector. Given the precarious nature of these jobs, migrants are quite vulnerable to Russian economic conditions. Still, emigrants make on average six times more than the average earnings in Tajikistan. In addition, almost all tend to remit cash back to their relatives left behind (World Bank 2009; Danzer and Ivaschenko 2010; Buckley and Hofmann 2012; Gang et al. 2016).

It is widely believed that labour migration and remittance inflows have successfully helped smooth the economic and social impact of the transition away from a planned economy and the subsequent civil unrest (IMF 2005; Kireyev 2006; Clément 2011; Justino and Shemyakina 2012). The World Bank (2011) estimates that between 2003 and 2007 the national poverty headcount fell from 68% to 37%, meaning that more than a million people were lifted out of poverty over the period. Remittance receipts are believed to have played a major role in the observed poverty reduction by allowing poor households to enjoy higher levels of consumption and by stimulating domestic demand for goods and services. All things considered, these large emigration and remittance flows are still relatively novel for the country, and their consequences are not yet fully understood

(Justino and Shemyakina 2012; Abdulloev et al. 2014). The rest of the paper is dedicated to filling in some of the existing knowledge gap.

1.2.2 Migrant profile

In this sub-section I provide some information on the profile of migrants and migrant households in Tajikistan using the 2007 Living Standards Measurement Surveys[5]. I begin with a discussion of the average characteristics of migrant households in rural areas. Table 1.1 shows means for selected variables in migrant and non-migrant households as well as the t-statistic of tests of mean equality across the two groups. As expected, almost all (90%) migrant households receive remittances. These households also exhibit a slightly lower number of members and are more likely to be female headed. Migration appears to be a strategy relied upon by ethnic Tajik households mainly. Not much difference in terms of the educational profile of household heads can be seen between the two household types. The data available on per capita consumption indicates that migrant households are better off. This suggests remittances help left-behind family members achieving higher levels of consumption. Much of that consumption difference is accounted by higher food expenses suggesting that remittances help meet basic needs.

Descriptive statistics on the profile of current migrants can be found in Table 1.2. The vast majority of emigrants are young men (93.4%) in their twenties and mid-thirties coming from rural Tajikistan. Around 82% of these migrants are sons and daughters of the head of the household to which they belong. Another 11% are head's spouses. In terms of educational outcomes, three fourths of migrants have completed secondary school. The remaining fourth is made of roughly equivalent numbers of primary and tertiary educated individuals. It can be seen that more than 95% of them settle in the Russian Federation. Prior to migrating most of these individuals were unemployed. Finally, the evidence presented in the bottom right panel of the table suggests that most migration spells are temporary in nature. Only 12.5% of migrants have been away from their households for six years or more.

[5] The dataset is presented in greater detail in Section 3.

1.3 Data

The analysis is based on a three-wave panel dataset comprised of the 2007 and 2009 Tajikistan Living Standards Measurement Surveys (TLSS07 and TLSS09) and the Tajikistan Household Panel Survey 2011 (THPS 2011). The TLSS07 and TLSS09 surveys were carried out by the Tajikistani National Committee for Statistics ("Goskomstat") with the assistance of the World Bank. The THPS 2011 was designed and implemented by the Institute for the East and Southeast European Studies as a follow-up to the two previous TLSS (Danzer et al., 2013). The primary purpose of these surveys is to gather data reflecting the actual living conditions of the population in Tajikistan. Samples were collected through multi-stage stratified random sampling and designed to be representative of Tajikistan as a whole, and of its rural and urban areas. In 2007, 4,860 households were interviewed after having been randomly selected from 270 communities (urban neighbourhoods and rural villages) chosen all across the country's territory. A total of eighteen households were questioned per community. In 2009, the National Committee for Statistics and the World Bank decided to revisit 1,503 of those households to collect updated information on their living conditions. Instead of tracking each of those households across space, the survey collection team went back to 167 out of the 270 communities sampled in 2007. While the second wave interviewed approximately only a third of the households visited in 2007, its coverage was still representative at the national, urban and rural area levels. The third wave re-visited households interviewed in the two previous surveys. Put together, the three surveys allow constructing an unbalanced panel dataset of 621 respondents aged between 14 and 18 years old tracked across time. The three waves include detailed data on the demographic characteristics, educational and employment outcomes of respondents. Of particular interest, the surveys collected information on the number of migrants per household, their destination, and remittances sent back.

Table 1.3 presents summary statistics for the variables later used in the empirical analysis. In the sample, 17.7% of the individuals live in a household with a member living abroad at the time of the survey. A slightly higher number lives in a household receiving international remittances (18.1%). This indicates that friends and relatives that are not part of the household also transfer funds back. Half of the surveyed persons are female. The average respondent is 16 years old and report living with 2.4 households members aged 14 years or old less. Around 13% of the individuals live in a female-headed household.

The outcomes I focus on are related to human capital accumulation and labour market outcomes. I concentrate on three measures of educational performance. The first binary variable measures whether an individual has dropped out of school. The second variable records whether an individual is lagging behind in school, i.e. being enrolled in a grade the individual should have already completed given her age. I also consider the total amount spent by the household on each child. I then consider the following three labour outcomes: working, idleness (not working and not being at school), and weekly number of hours worked. The first two variables are binary, while the last one can be treated as continuous. The share of individuals not enrolled in any education institution (referred to as dropouts) stands at 22.4%, while 11.8% are lagging behind in school (i.e., enrolled in a grade they ought to have completed at least one year earlier given their birth cohort). Approximately 11% report working, while 16% are idle, i.e., neither in school nor working. The average number of weekly hours worked amounts to 4.3 hours. For those working, the distribution between labour performed on the household farm, family private business and external non-household work is relatively balanced (Table 1.3).

1.4 Identification strategy

The main empirical challenge is to define the correct counterfactual given the observational nature of the data. I adopt a reduced form approach and the main empirical specification is the following:

$$y_{i,j,d,r,t} = \beta_0 + \beta_1 . m_{i,t} + X_{i,t} . \beta_2 + \beta_3 . n_{d,t} + \theta_i + \upsilon_{r,t} + \varepsilon_{i,j,d,r,t} \qquad (1.1)$$

where *i* is for individual, *j* for community/village, *d* for district, and *t* for year. $m_{i,t}$ is a dummy variable indicating living in a migrant household. $X_{i,t}$ are child and household covariates including age, age squared, number of household members aged 14 years old or less, number of household members aged 65 years old or more, and a female-headed household dummy. $n_{d,t}$ is the natural logarithm of the annual average district nightlight intensity[6] to proxy for local economic performance. θ_i and $\upsilon_{r,t}$ represent individual and region times year fixed effects, respectively, while $\varepsilon_{i,j,d,t}$ is the error term. I restrict the

[6] Tajikistan is divided in five administrative regions: Sogd, Khatlon, Region of Republican Subordination (RRP), Gorno-Badakhshan (GBAO), and the capital city Dushanbe. Tajikistan is further divided in 58 districts. Nightlight data comes from the US National Oceanic and Atmospheric Administration (NOAA). See Henderson et al. (2012) for a discussion of the use of nightlights to proxy GDP growth.

sample to children aged 14 to 18 years old living in rural areas for data reasons. The questionnaires ask about labour market participation to all individuals aged 14 years old and above. Children are supposed to complete high school by the time they are 18. Coefficients are estimated by least squares regressions. Standard errors are clustered at the community level to address concerns of serial correlation and within community correlation.

The panel dimension of the data allows estimating individual and year fixed-effects regressions, which free the estimation results from the confounding influence of time-fixed unobservable factors likely to affect both selection into migration and socio-economic outcomes as well as common country-wide time shocks. Further, district nightlight density controls for local macroeconomic shocks such as plant closure or localized natural disasters (floods or droughts for instance) that may impact migration decisions (see Figure A-1 in Appendix). Including region times year fixed effects allows addressing further potential econometric identification concerns stemming from local economic shocks and spatial spillovers.

Despite the inclusion of the set of explanatory variables and fixed effects discussed above, estimating the fixed-effects model set up in Equation (1.1) may not capture the causal effect of migration on individual outcomes. Imperfectly observable time-varying characteristics (such as an adverse household health shock) may influence labour market outcomes as well as international migration decisions. Reverse causation could also bias the results. For instance, sending a household member abroad might help finance the education of children left behind thanks to the remittances sent. However, sending someone overseas might also be a household strategy to finance the education of children in the first place. In an ideal setting, migration decisions would be randomly allocated across households, and in consequence there would be no selection and omitted variables problems. However, given the observational nature of the data at hand, an identification strategy addressing the absence of treatment randomization must be adopted (Adams 2011; Gibson et al. 2011). The Instrumental Variable (IV) approach is particularly well suited in this context and the one selected here (McKenzie and Sasin 2007; Angrist and Pischke 2009). Past emigration rates have often been used as instruments for migration in cross-sectional setting (see for example Acosta 2007; Woodruff and Zenteno 2007; Mckenzie and Rapoport 2011). However, in this context, such variables might not fully satisfy the exogeneity condition a valid instrument requires. Through constant and time-varying channels unobserved by the econometrician, it is plausible that these variables might also

affect current educational and labour market outcomes. The instrument I choose aims at addressing these fragilities and relies on both economic conditions abroad and spatial variation in the cost of migrating. As mentioned above, more than 90% of Tajikistani migrants choose the Russian Federation as destination. Close to half of those migrants go to Moscow and the rest scatter themselves across the other main Russian cities throughout the vast Russian territory.

I use as IV for household selection into migration the inverse distance between each rural village and the railroad network interacted with the unemployment rate in the Russian Federation in the year prior to interview. I use distance to the railroad network that existed at the end of the Soviet era in 1991. Doing so reduces endogeneity concerns related to the location of railways. Formally, this instrument $z_{j,t}$ is defined as follows:

$$z_{j,t} = \frac{unemployment_{t-1}}{railroad\_distance_j} \qquad (1.2)$$

where $unemployment_{t-1}$ is the Russian nationwide unemployment rate in year *t-1*. Unemployment data comes from the World Development Indicators database, which contains annual unemployment rate information for the Russian Federation. The variable $railroad\_distance_j$ measures the closest distance from each rural community to the Soviet-era railroad network (Figure 3). Tajikistani railroads are connected to the Russian Federation rail network[7]. Several trains depart each week from the capital city Dushanbe and Khujand with final destination Moscow. It is the cheapest way to reach Russia and the journey takes three days with a cost of 150 US Dollars approximately. As Tajikistan is member of the Commonwealth of Independent States (CIS), its migrants need not a visa to enter Russia. Railroad geographic information system data comes from the Digital Chart of the World (DCW)[8].

The intuition behind this IV is the following. Local economic conditions in Russia are exogenous to Tajikistani households and individuals' socio-economic outcomes. Nonetheless, they affect the expected returns of migrating and therefore household migration decisions. In other words, the lower the unemployment rate in Russia, the better the emigration prospects for a given Tajikistani household. Distance to the railroad network is a proxy for the financial cost of migrating. The greater the distance from the

[7] A map of the Central Asian railroad network can be seen in Appendix Figure A.2.
[8] The Digital Chart of the World (DCW) is a comprehensive digital map of Earth. It is a large geographical information system (GIS) global database that is freely available, although it has not been updated since 1992 - https://worldmap.harvard.edu/data/geonode:Digital_Chart_of_the_World.

railroad network, the more expensive the journey to Russia should be. The study period is particularly well suited for the use of this IV. Russia suffered a negative macroeconomic exogenous shock in the late 2000s as the global financial crisis hit its real economy. Its aggregate economic growth decelerated in 2008 and even turned negative in 2009 as a result of the international financial turmoil. The country emerged out of the recession in 2010 and registered a positive and higher growth rate in 2011 (see Figure A-3).

The instrument exploits both cross-sectional and time variation. Cross-sectional variation stems from the distance between villages and the railroads network. Time variation comes from the volatility of Russian macroeconomic conditions. The interaction of the two sources of variation is as good as random once year and individual fixed-effects are controlled for. The panel dataset being comprised of stayers, village fixed-effects are absorbed by the individual fixed-effects. The identification assumption is thus that conditional on covariates, cross-sectional unit and time fixed-effects, the instrument affects human capital investments and labour outcomes only through their influence on migration decisions.

A large proportion of Tajikistani migrants work in construction. To assess the sensitivity of the results I also build an instrument using the growth rate of the construction sector's value added as in Equation (1.3).

$$w_{j,t} = \frac{construction\_growth_{t-1}}{railroad\_distance_j} \qquad (1.3)$$

where $construction\_growth_{t-1}$ is the growth rate in year *t-1* of the construction sector value added in Russia. Annual construction real gross value added data comes from the OECD regional statistics database. The intuition for using this instrument is the same. The more dynamic the construction sector, the more likely Tajikistani migrants are to found work on construction sites.

1.5 Results

1.5.1 Children labour and schooling outcomes

First stage results using Russia's unemployment rate and distance to railroads as instrumental variable are reported in Table 1.4. The first column lumps together boys and girls of 14 to 18-years old. The second and third columns look separately at girls and boys,

respectively. For the either the whole sample, or boys or girls taken separately, the instrument has a strong and statistically significant effect on the probability of living in a migrant household. The coefficients are of the right sign and imply that worse economic conditions in Russia are associated with a lower probability of having a household member living abroad. The point estimate of column 1 indicates that a one standard deviation increase in the instrumental variable leads to a 38.4 percentage point (pp) lower probability of having a migrant abroad.

Table 1.5 tests the validity of this instrumental variable. One concern with this instrument is the possibility that the state of Russia's economy has a direct effect on the schooling investments of teenagers in Tajikistan. I test for this channel by measuring the effect of the instrument on a binary variable indicating positives intention to migrate abroad in the future. This variable is only available in the 2007 and 2009 first two waves. The instrumental variable is found to have no significant effect on intentions to migrate for all teenage individuals and boys taken separately (columns 1 and 2). No girl in the 14-18 years old age range ever declares any positive intentions to migrate making it impossible to run regressions for this sub-group only. The last three columns test whether the power of the instrument is robust to the exclusion of the third wave of data. The point estimates and standard errors show that it is (see columns 3 to 5).

Tables 1.6 and 1.7 present the fixed effects (FE) and 2SLS estimation results of Equation (1.1) for boys and girls separately. Pooled results can be found in Appendix Table A.1. Table 1.6 considers human capital outcome variables and is divided in three panels. In the first four columns of Panel A, the dropout dummy is considered as dependent variable. The first two columns present FE and 2SLS estimates for girls, while the last two columns focus on boys and report FE and 2SLS estimates as well. The FE results show no statistically significant migration effect on being enrolled in school for both boys and girls. 2SLS results show again no significant effect for both gender types. Lagging in school is the dependent variable considered in Panel B. Both FE and 2SLS estimates show no significant migration impact for girls on this outcome. On the other hand, 2SLS estimates in column 4 point to a negative and borderline statistically significant effect at the 10% level for young males. The magnitude of the coefficient suggests that living in a migrant household reduces by 21 pp the probability of lagging behind in school for boys. The last Panel concentrates on education spending per child. While having a family member abroad

is associated with less education expenses for girls, the effect is positive for boys. The 2SLS coefficients are not significant, however.

Table 1.7 is structured in a similar fashion. It focuses on labour market outcomes and reports migration effects on three dependent variables: working (Panel A), idleness (Panel B), and number of hours worked per week (Panel C). I discuss first the influence of migration on teenage males left-behind. 2SLS results in Panel A column 4 indicate that living in a migrant household has a negative and strongly significant effect on the probability of working. All else equal, boys from migrant households are found to be 77 pp less likely to be performing any type of work. This is a large effect, which is robust to estimating village fixed-effects instead of individual fixed-effects. It is also robust to dropping the villages with few observations from the sample. This reduction in the probability to work is not related to a higher propensity to be idle. The FE and 2SLS coefficients of Panel B show no effect of living in a migrant household on idleness. Lastly, the last panel of the table concentrates on the number of hours worked per week. After addressing endogeneity concerns, teenage males in migrant households are found to work on average 8.1 fewer hours per week. The effect is statistically significant at the 5% level (column 4). In the regression results for boys, FE point estimates tend to be lower in absolute values than 2SLS estimates suggesting that unobservables are biasing downwards the FE results. Reverse causation is a possible reason for this pattern. While migration strategies might allow parents to send their male children to school, the households selecting into migration are often poorer and more likely to rely on child labour in the first place. The FE and 2SLS estimates of Table 1.8 suggest that the labour outcomes of teenage females in migrant households are not significantly affected on either the intensive or extensive margins. Taking into account the endogeneity of selection into migration the coefficients in all three panels are all statistically insignificant. The effect on idleness is positive and borderline significant at the 10% level, however.

In Table 1.8, I investigate the types of work children do and look at three binary dependent variables. The first one measures whether children work on the household farm. The second variable records instead whether children work for the non-farm household business. The last variable focuses on work performed outside of the household for an external economic agent. The results of Panel A show that in migrant households the probability of boys engaging on farm work decreases by a large and statistically significant amount. The results in the other two panels indicate that the probability left-behind boys

perform other types of work is not significantly affected. The reduction in male child labour documented in the previous table thus appear to concern farm labour. In other words, migration allows taking teenage males out of the farm. The results in columns 1 and 2 indicate that left-behind females are less likely to work for the household business. Teenage female time might be reallocated to other household activities such as domestic chores or looking after younger brothers and sisters. I discuss outcomes for girls in more detail in the next paragraph.

While the set of results for girls seems to be consistent on the whole, one might worry that with a first stage F-statistic of 9.05 the instrumental variable is not powerful enough to discard weak IV issues. In other words, the absence of any migration effect found for girls could be due to both biased coefficients and inflated standard errors caused by the instrumental variable's lack of strength. To address these concerns, in Appendix Table A-2, I report first stage results using the second instrument defined above relying on construction output growth in Russia. The first two columns report first stage least squares results and indicate that this alternative IV also meets the relevance condition. The coefficients are also of the right sign. The F-statistic on the instrument for the girl sample is now 10.28. It is lower for boys and stands at 7.78, however. In columns 3 and 4, I test whether this other instrument has any influence on migration intentions. I find no evidence of it in the whole sample and boy sample only.

Since this second instrument is only more powerful for the girl sample, I present in Table 1.9 2SLS results based on this IV for the teenage female sample only[9]. The table is divided in three panels respectively focusing on schooling, labour outcomes, and labour types. The first three columns of Panel A focus on the schooling dependent variables discussed earlier. Migration is still found to have a positive but not significant effect on dropping out and lagging behind. On the other hand, the results of column 3 suggest that migrant households reduce education expenditures for girls. The effect is statistically significant at the 1% level. The magnitude of the effect is approximately equivalent to the mean of the dependent variable suggesting that left-behind girls are taken out of school. Labour outcomes are analysed in the second panel of the table. Left-behind female children are found to be less likely to engage in any labour activity. The effect is statistically significant at the 10% level. In addition, a strong and positive effect is now found for idleness. Living in a migrant household increases by 54 pp the likelihood of being idle for teenage females.

[9] The previous findings documented for boys are robust to this other IV.

The number of hours worked per week is still unaffected (column 3). The estimates in Panel C are consistent with the previous results based on the first instrument in Table 1.6. Left-behind girls appear less likely to work for the household business all else equal. The other types of work are not affected. All things considered this set of results based on the alternative instrument is consistent with the findings previously presented.

The analysis so far suggests that girls do not gain much from the migration of a household member. Less is spent on their education and the probability they become idle increases. This suggests they take on increased domestic responsibilities in migrant households. Descriptive evidence supporting this finding can be found in the 2007 survey. Respondents participating in that survey wave were asked about responsibility over family chores. These include shopping, fetching water, cooking, washing and cleaning, keeping and accounting money, and negotiating water. Appendix Table A.3 shows that teenage females in rural households are more likely than teenage males to be responsible over domestic chores. For each of these six chores, I present the distribution over responsibility in all households, migrant and non-migrant households. The evidence in Panels A and B indicate that girls are more likely to cook, wash and clean, and fetch water than boys. Further, the gender disparity in chore duty is higher in migrant households.

I also investigate whether female teenagers are more likely to be married in migrant households. Migration strategies could affect the incentives household heads have to marry their daughters. On the one hand, the financial costs of migrating to Russia could delay wedding decisions given the high costs of both events. On the other hand, the remittances from abroad might address shortage of savings and ease paying for marriage ceremonies. With most households being credit constrained and young men having spent too little time in the labour market to save sufficient resources, one popular source of marriage finance stems from international migration (Danzer 2013). Results in Appendix Table A.4 show that migration has no significant effect on the marital status of girls. I also fail to find any impact for boys. I return to this channel in the next sub-section where I discuss household level outcomes.

Overall, these results suggest that migration mainly benefits left behind boys. Male children are less likely to lag behind in school or work on the household farm. They also report fewer hours of work in a given week. However, living in a migrant household does not seem to bring the same benefits to teenage females with respect to human capital investments and labour outcomes. This gender heterogeneity may be explained by the

cultural norms prevailing in Tajikistan where gender roles are rather conservatively defined. Another explanation could be related to Tajikistan's patrilocal society nature where girls leave their parent households when they get married. As a result, parents do not benefit much from their girls' returns to education and have little incentives to invest in their schooling. These findings are also consistent with actual or perceived non-linear returns to schooling (very low first and rising fast after a certain amount of schooling) and credit constraints forcing parents to invest only in one or few children (Banerjee and Duflo 2011). Given the discrimination women face on the labour market, it is not surprising that migrant households choose to invest in their sons' human capital.

1.5.2 Additional results

To test the sensitivity of my findings and shed light on the mechanisms at work behind the above described results, I run household-level regressions in this section. The 2009 and 2011 waves asked household heads a battery of questions regarding coping strategies and whether they (or anyone in the household) had to change or adapt any of the things they normally do over the last 12 months. Of the data generated from these questions, three binary variables are interesting for the purposes of my investigation. The first variable records whether the household transferred children from private to public school. The second asks whether the household transferred children to a cheaper public or private school. The third asks if someone withdrew or postponed admission to school, college or kindergarten. I use these three variables as dependent variables on which I study the effect of having an international migrant in the household.

To assess the extent to which the remittances channel matters, I also look at the effect of migration on remittances receipt and financial satisfaction. The 2009 and 2011 surveys ask household heads about their level of satisfaction regarding their financial situation. The answers provided can take five distinct values and range from fully satisfied to not at all satisfied. I create a binary variable equal to one for answers equal to not at all satisfied and unsatisfied, and zero otherwise.

The empirical specification is the following:

$$q_{h,j,d,t} = \gamma_0 + \gamma_1 . m_{h,t} + C_{h,t} . \gamma_2 + \gamma_3 . n_{d,t} + \pi_h + \tau_t + \eta_{h,j,d,t} \qquad (1.4)$$

where *h* is for household, *j* for community, *d* for district, and *t* for year. $m_{h,t}$ is a dummy variable indicating migrant households. $C_{h,t}$ is a vector of household covariates including

the number of household members aged 14 years old or less, number of household members aged 65 years old or more, and a female-headed household dummy. $n_{d,t}$ is the annual average district nightlight intensity (in log). The symbols π_h and τ_t represent household and year fixed effects, respectively, and $\eta_{h,j,d,t}$ is the error term. Descriptive statistics of the dependent and control variables are provided in Table A.3 in Appendix. I use the same instrument as described in Equation (1.2) to address the endogeneity of migration self-selection. First-stage results (not shown) indicate a negative and statistically significant influence of the IV on the migration decision. With an F-statistic of 4.03 the power of the IV is limited, however. In the results table I present reduced form results along with 2SLS results given the possible bias that may originate from the weak first stage.

Regression results for the three education variables discussed above are presented in Table 1.10. For each of these three variables I present FE, reduced form (RF), and 2SLS estimates. The first three columns focus on the probability of transferring children from private to public school. Both FE and 2SLS point estimates of the effect of migration are statistically insignificant. Similar conclusions can be drawn for the probability of transferring children to a cheaper school (columns 4 to 6). In the last three columns, no effect is found on the likelihood to withdraw or postpone admission to an education institution. On the whole these results, while statistically insignificant, do not contradict the individual-level findings reported earlier. I don't find evidence of a systematic negative effect of migration on household human capital investments.

Table 1.11 concentrates on remittances and family financial situation. Its structure is identical as that of Table 1.10. Both FE and 2SLS point estimates report a positive and strongly significant impact of living in a migrant household on the probability of receiving remittances. Evidence of likely reverse causation between financial situation and migration can be seen from the last three columns. FE estimates report a positive but insignificant association between migration and being unsatisfied with one's financial situation. In contrast, 2SLS findings suggest that heads of migrant households are significantly less likely to report being unsatisfied all else equal. The difference between the point estimates of columns 4 and 6 could be partly explained by less wealthy households selecting into migration - as is believed to be the case (World Bank 2011). Overall, these results indirectly support the idea that financial constraints limit human capital investments in rural Tajikistan.

Finally, I look at the number of teenage girls present in the household. Weddings are quite expensive in Tajikistan. The family of the bride is typically responsible for providing a dowry. As a result, poor households often rely on friends and relatives to afford the celebrations. Migration is also a strategy commonly used by poor households to finance wedding related expenses (Danzer 2013). In particular, support from abroad via remittances might facilitate meeting the financial costs of arranging a daughter's marriage. To investigate this outcome, I run household level regressions where the dependent variable is the number of females aged 14 to 18-years old in the household. Results are presented in Appendix Table A.6. Its structure is similar as the previous two household level tables. Both the RF and 2SLS estimates suggest migration has a significant impact on household size. Migrant households appear to have 0.3 less teenage female members. This finding is consistent with remittances helping to finance expensive wedding customs.

1.6 Conclusion

The investigation conducted here has attempted to identify the effect of migration on the schooling and labour outcomes of left-behind children in rural Tajikistan using panel data. Post-conflict Tajikistan provides an interesting case for the study of this topic since a large share of its population rely on emigration towards Russia as a poverty-coping strategy.

Overall, the analysis yields mixed conclusions regarding the impact of migration on children in rural Tajikistan. After addressing the endogeneity of selection into migration with a fixed effects and instrumental variable strategy, my empirical results indicate that the migration of a family member has a beneficial influence on boys but not girls. Evidence is found that teenage males left behind are less likely to lag behind in school or engage in child labour. No significant effect is found for girls. The effect reported for boys is likely to be mediated by remittances and household wealth. Migrant households are found to be significantly more likely to receive remittances and report being satisfied with their current financial situation. These findings are consistent with credit constraints, non-linear returns to schooling, and traditional gender norms. They are also consistent with limited returns to schooling for girls from the perspective of parents living in a patrilocal society.

As part of its development strategy, the Tajikistani government has been actively encouraging migration and remittances in recent years. Public policy measures that have been taken include simplification of border-crossing procedures for labour migrants,

suppression of taxes on remittances inflows, and simplification of banking regulations on remittance receipts. Since the findings described in this paper suggest that the benefits of migration are not equally shared among children living in migrant households, the national migration policy should consider including a stronger gender component.

The differences between the results described here and those of earlier studies covering Latin American and other Asian countries can be explained in part by institutional setting disparities. In a broader perspective, this work stresses the importance of examining less studied albeit relevant migration corridors where the economic, institutional and cultural influences at play differ from the dominant regions of research interest.

1.7 Main Tables & Figures

Tables

Table 1.1: Migrant household characteristics – rural areas

	Non-migrant HHs	Migrant HHs		
	Mean	Mean	t-statistic	p-value
Number of migrants	0.000	1.325	-111.029	0.000
Receives remittances	0.038	0.896	-85.194	0.000
Household size	6.807	6.583	1.744	0.081
Number of HH members aged < 15	2.382	2.155	2.819	0.005
Number of HH members aged 65+	0.354	0.320	1.206	0.228
Dependency ratio	0.390	0.352	3.704	0.000
Female headed household	0.125	0.265	-8.572	0.000
HH Head ethnic group: Tajik	0.755	0.809	-2.735	0.006
HH Head ethnic group: Uzbek	0.227	0.184	2.262	0.024
HH Head ethnic group: Kyrgyz	0.016	0.005	1.941	0.052
HH head: no education	0.046	0.034	1.314	0.189
HH head: primary education	0.205	0.242	-1.949	0.051
HH head: secondary education	0.611	0.597	0.596	0.551
HH head: tertiary education	0.138	0.127	0.688	0.492
Nominal consumption*	161.054	173.060	-2.331	0.020
Of which:				
Food	107.135	112.740	-2.144	0.032
Non-food	31.714	31.804	-0.049	0.961
Education	7.687	5.870	1.184	0.236
Housing	9.400	8.983	0.461	0.645
Extreme poor HH	0.133	0.129	0.264	0.792
Poor HH	0.358	0.320	1.741	0.082
Non-poor HH	0.509	0.551	-1.843	0.065
HH owns land	0.860	0.898	-2.408	0.016
Observations	2,584	566		

Notes: 2007 LSMS data. Rural area sample. * Monthly nominal consumption per capita in local currency units.

Table 1.2: Current migrant characteristics

(in % unless indicated otherwise)

Basic demographics		Destination country	
Male migrant	93.48	Russian federation	95.32
Age (years)	28.31	Central Asia	0.92
Rural area	76.37	Other	3.77
Relationship to head		**Occupation before migrating**	
Son or daughter	81.77	Working	26.58
Spouse	10.59	Unemployed	66.4
Mother/father or brother/sister	3.67	Student	5.6
Other (niece/nephew, cousin, ...)	3.97	Other (housewives, military, …)	1.43
Education completed		**Time since migrant left household**	
Primary	12.93	1 year	12.22
Secondary general	64.36	2-3 years	61.91
Secondary technical/special	11.81	4-5 years	13.03
Tertiary	10.69	6 years or more	12.53

Source: TLSS 2007. Information on family members living abroad currently is provided by the household head. 982 observations.

Table 1.3: Descriptive statistics

Variable	Observations	Mean	Standard Deviation
Dropout	1,326	0.224	0.417
Lagging	1,326	0.118	0.322
Education spending (nominal local currency units)	1,326	208.546	606.496
Working	1,326	0.112	0.316
Idle	1,326	0.161	0.367
Weekly hours worked	1,326	4.283	13.096
Household farm work	1,322	0.041	0.198
Household non-farm business work	1,322	0.027	0.163
Work for non-household member	1,322	0.042	0.200
Migrant household	1,326	0.177	0.382
Remittances	1,326	0.181	0.385
Female	1,326	0.503	0.500
Age	1,326	16.019	1.343
Age squared	1,326	258.407	42.987
Married	1,326	0.005	0.007
Number of household members aged 14 or less	1,326	2.369	1.673
Number of household members aged 65 or more	1,326	0.220	0.512
Female headed household	1,326	0.128	0.334
Annual average district nightlights (in log)	1,326	0.026	1.424
Sogd region	1,326	0.199	0.399
Khatlon region	1,326	0.367	0.482
RRP region	1,326	0.317	0.466
GBAO region	1,326	0.117	0.321

Notes: Data from TLSS07, TLSS09 and TLSS11. Individuals aged 14-18 years old.

Table 1.4: First stage results

	(1)	(2)	(3)
	Dependent variable: Migrant household		
	All 14-18	Girls 14-18	Boys 14-18
Unemployment over distance	-0.389***	-0.364***	-0.447***
	(0.0983)	(0.121)	(0.0859)
Age	0.203	0.437**	-0.144
	(0.144)	(0.199)	(0.244)
Age squared	-0.00785*	-0.0158**	0.00335
	(0.00467)	(0.00625)	(0.00748)
HH members aged < 15	-0.000141	0.00863	-0.00198
	(0.0162)	(0.0216)	(0.0232)
HH members aged 65+	-0.0859	-0.00582	-0.177**
	(0.0620)	(0.0770)	(0.0885)
Female headed household	0.489***	0.469***	0.557***
	(0.0690)	(0.0962)	(0.0852)
Mean dependent variable	0.177	0.181	0.173
Number of clusters	104	96	98
Annual district nightlights	Y	Y	Y
Individual FE	Y	Y	Y
Region*Year FE	Y	Y	Y
Observations	1,326	667	659
R-squared	0.189	0.225	0.206

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS07, TLSS09 and THPS11. Individuals aged 14- to 18-years old. Living in a migrant household is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network. The instrumental variable is standardized to ease table interpretation.

Table 1.5: Migration intentions

	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Intends to migrate		Migrant household		
Sample:	All 14-18	Boys 14-18	All 14-18	Girls 14-18	Boys 14-18
Unemployment over distance	-0.0139	-0.0150	-0.444***	-0.376***	-0.743***
	(0.0131)	(0.0431)	(0.0833)	(0.115)	(0.0629)
Age	-0.0882	-0.180	0.0191	0.0935	-0.229
	(0.0745)	(0.154)	(0.186)	(0.267)	(0.254)
Age squared	0.00245	0.00517	-0.00324	-0.00817	0.00709
	(0.00239)	(0.00507)	(0.00581)	(0.00775)	(0.00815)
HH members aged < 15	0.00846	0.0131	-0.0299	0.00295	-0.0471
	(0.00869)	(0.0151)	(0.0264)	(0.0297)	(0.0364)
HH members aged 65+	0.00345	-0.0273	0.0310	0.148	-0.110
	(0.00667)	(0.0253)	(0.0854)	(0.117)	(0.0991)
Female headed household	0.0289	0.0921	0.119	0.0667	0.196*
	(0.0300)	(0.0676)	(0.0876)	(0.133)	(0.101)
Mean of dependent variable	0.006	0.014	0.147	0.152	0.141
Number of clusters	104	98	104	96	98
Annual district nightlights	Y	Y	Y	Y	Y
Individual FE	Y	Y	Y	Y	Y
Region*Year FE	Y	Y	Y	Y	Y
Observations	1,003	497	1,003	506	497
R-squared	0.044	0.092	0.065	0.156	0.087

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS07, TLSS09 and THPS11. Individuals aged 14- to 18-years old. Living in a migrant household is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network. The instrumental variable is standardized to ease table interpretation.

Table 1.6: Schooling outcomes

	(1)	(2)	(3)	(4)
Sample:	Girls 14-18		Boys 14-18	
Estimator	OLS-FE	2SLS-FE	OLS-FE	2SLS-FE
	Panel A. Dependent variable: Dropout			
Migrant	-0.0266	0.0798	0.0456	0.0347
	(0.0560)	(0.174)	(0.0588)	(0.0843)
	Panel B. Dependent variable: Lagging			
Migrant	-0.0289	0.0587	-0.0974	-0.212
	(0.0475)	(0.179)	(0.0635)	(0.137)
	Panel C. Dependent variable: Education spending			
Migrant	25.43	-28.81	16.62	264.2
	(33.46)	(256.4)	(68.58)	(427.3)
Kleibergen-Paap F statistic		9.05		27.13
Covariates	Y	Y	Y	Y
Individual FE	Y	Y	Y	Y
Region*Year FE	Y	Y	Y	Y
Observations	667	667	659	659

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS07, TLSS09 and THPS11. Individuals aged 14- to 18-years old. Living in a migrant household is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network.

Table 1.7: Labour outcomes

	(1)	(2)	(3)	(4)
Sample:	Girls 14-18		Boys 14-18	
Estimator:	OLS-FE	2SLS-FE	OLS-FE	2SLS-FE
	Panel A. Dependent variable: Working			
Migrant	-0.0352	-0.0896	-0.0595	-0.772***
	(0.0465)	(0.285)	(0.0525)	(0.161)
	Panel B. Dependent variable: Idleness			
Migrant	-0.0347	0.248	0.0786	-0.0000281
	(0.0632)	(0.164)	(0.0513)	(0.101)
	Panel C. Dependent variable: Weekly hours worked			
Migrant	-0.575	9.177	-4.170	-8.144**
	(1.976)	(11.52)	(2.697)	(4.162)
Kleibergen-Paap F statistic		9.05		27.13
Covariates	Y	Y	Y	Y
Individual FE	Y	Y	Y	Y
Region*Year FE	Y	Y	Y	Y
Observations	667	667	659	659

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS07, TLSS09 and THPS11. Individuals aged 14- to 18-years old. Living in a migrant household is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network.

Table 1.8: Labour types

	(1)	(2)	(3)	(4)
Sample:	Girls 14-18		Boys 14-18	
Estimator:	OLS-FE	2SLS-FE	OLS-FE	2SLS-FE
	Panel A. Dependent variable: Household farm work			
Migrant	0.00357	0.0159	0.0571	-0.717***
	(0.0309)	(0.0676)	(0.0391)	(0.140)
	Panel B. Dependent variable: Household non-farm business work			
Migrant	-0.0396	-0.314***	-0.0222	-0.0420
	(0.0265)	(0.0742)	(0.0138)	(0.0519)
	Panel C. Dependent variable: Work for non-household member			
Migrant	0.00387	0.213	-0.101**	-0.0128
	(0.0373)	(0.301)	(0.0458)	(0.0569)
Kleibergen-Paap F statistic		9.10		27.06
Covariates	Y	Y	Y	Y
Individual FE	Y	Y	Y	Y
Region*Year FE	Y	Y	Y	Y
Observations	665	665	657	657

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS07, TLSS09 and THPS11. Individuals aged 14- to 18-years old. Living in a migrant household is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network.

Table 1.9: Teenage female results

	(1)	(2)	(3)
		Panel A. Schooling outcomes	
Dependent variable:	Dropout	Lagging	Education spending
Migrant	0.0597	0.0291	-292.0***
	(0.209)	(0.129)	(99.71)
Kleibergen-Paap F statistic	10.28	10.28	10.28
Observations	667	667	667
		Panel B. Labour outcomes	
Dependent variable:	Working	Idleness	Weekly hours worked
Migrant	-0.369*	0.540**	6.425
	(0.204)	(0.238)	(9.800)
Kleibergen-Paap F statistic	10.28	10.28	10.28
Observations	667	667	667
		Panel C. Labour types	
Dependent variable:	HH farm work	HH business work	Outside HH work
Migrant	0.0235	-0.618***	0.232
	(0.0638)	(0.127)	(0.258)
Kleibergen-Paap F statistic	10.33	10.33	10.33
Observations	663	663	663
Covariates	Y	Y	Y
Individual FE	Y	Y	Y
Region*Year FE	Y	Y	Y

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS07, TLSS09 and THPS11. Individuals aged 14- to 18-years old. Living in a migrant household is instrumented with Russian construction growth divided by community distance to end Soviet-era railroad network.

Table 1.10: Household education decisions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	Transfer from private to public school			Transfer to cheaper school			Withdrew a member's admission to school		
Estimator:	OLS-FE	FE-RF	2SLS-FE	OLS-FE	FE-RF	2SLS-FE	OLS-FE	FE-RF	2SLS-FE
Migrant	-0.0238		0.315	-0.0250		0.496	0.00856		0.324
	(0.0366)		(0.357)	(0.0380)		(0.582)	(0.0290)		(0.348)
Unemployment over distance		-0.0659			-0.104			-0.0677	
		(0.0459)			(0.0733)			(0.0419)	
HH members aged<15	-0.0107	-0.0109	-0.0151	-0.0117	-0.0119	-0.0185	-0.0128	-0.0126	-0.0169
	(0.0106)	(0.0105)	(0.0126)	(0.0120)	(0.0120)	(0.0154)	(0.0104)	(0.0104)	(0.0115)
HH members aged 65+	0.0241	0.0264	0.0459	0.0861**	0.0890**	0.120**	0.0784**	0.0786***	0.0986**
	(0.0324)	(0.0325)	(0.0441)	(0.0368)	(0.0367)	(0.0606)	(0.0300)	(0.0301)	(0.0446)
Female headed household	-0.00166	-0.0105	-0.161	-0.0471	-0.0551	-0.292	-0.0188	-0.0123	-0.167
	(0.0489)	(0.0503)	(0.178)	(0.0487)	(0.0509)	(0.285)	(0.0451)	(0.0416)	(0.174)
Annual district nightlights	Y	Y	Y	Y	Y	Y	Y	Y	Y
Household FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Kleibergen-Paap F-statistic	.	.	4.03	.	.	4.03	.	.	4.03
Observations	1,718	1,718	1,718	1,718	1,718	1,718	1,718	1,718	1,718
R-squared	0.031	0.030	.	0.064	0.065	.	0.039	0.039	.

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS09 and THPS11. Migrant household status is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network. The instrumental variable is standardized to ease table interpretation.

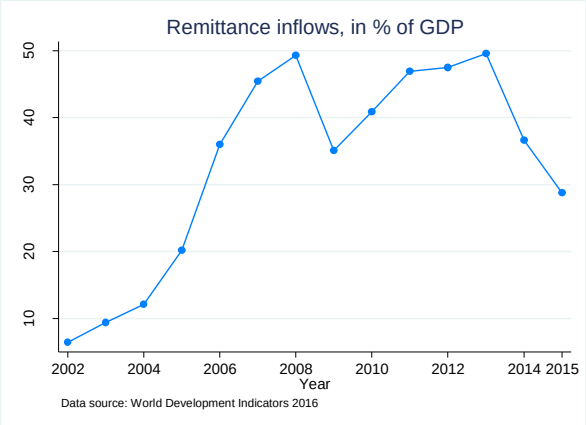
Table 1.11: Household finances

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Remittances			Unsatisfied with financial situation		
	OLS-FE	FE-RF	2SLS-FE	OLS-FE	FE-RF	2SLS-FE
Migrant	0.843***		0.902***	0.0505		-0.983*
	(0.0283)		(0.0482)	(0.0396)		(0.578)
Unemployment over distance		-0.189*			0.206***	
		(0.0958)			(0.0316)	
HH members aged<15	-0.00158	0.00969	-0.00235	-0.00888	-0.00852	0.00460
	(0.00684)	(0.0127)	(0.00656)	(0.0143)	(0.0142)	(0.0178)
HH members aged 65+	-0.0365	-0.0883*	-0.0327	0.0220	0.0162	-0.0444
	(0.0301)	(0.0479)	(0.0316)	(0.0545)	(0.0536)	(0.0760)
Female headed household	0.0261	0.428***	-0.00162	0.0565	0.0729	0.541*
	(0.0308)	(0.0629)	(0.0260)	(0.0590)	(0.0630)	(0.281)
Annual district nightlights	Y	Y	Y	Y	Y	Y
Household FE	Y	Y	Y	Y	Y	Y
Time FE	Y	Y	Y	Y	Y	Y
Kleibergen-Paap F-statistic	.	.	4.03	.	.	4.03
Observations	1,718	1,718	1,718	1,718	1,718	1,718
R-squared	0.726	0.120	.	0.421	0.422	.

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS09 and THPS11. Migrant household status is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network. The instrumental variable is standardized to ease table interpretation.

Figures

Figure 1.1: Remittance inflows in Tajikistan



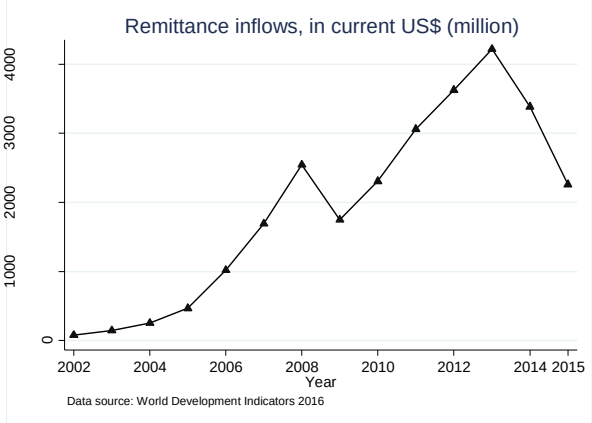


Figure 1.2: World's top 15 receivers of international remittances (2005-2015 average)

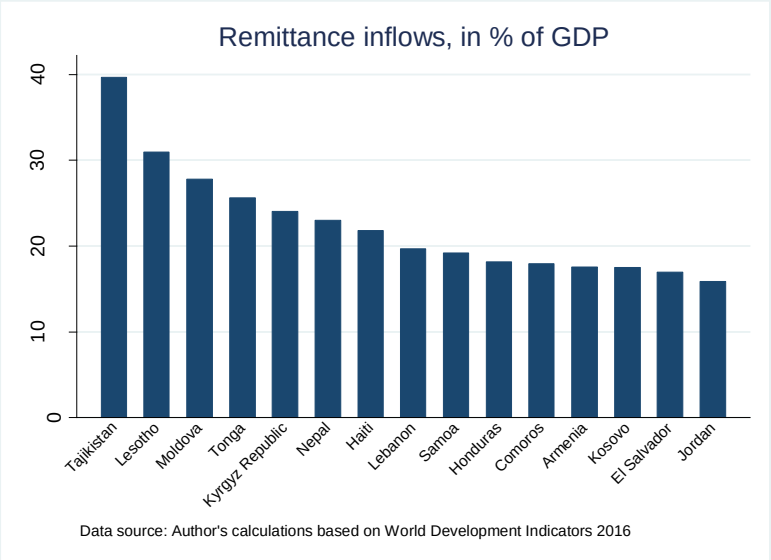
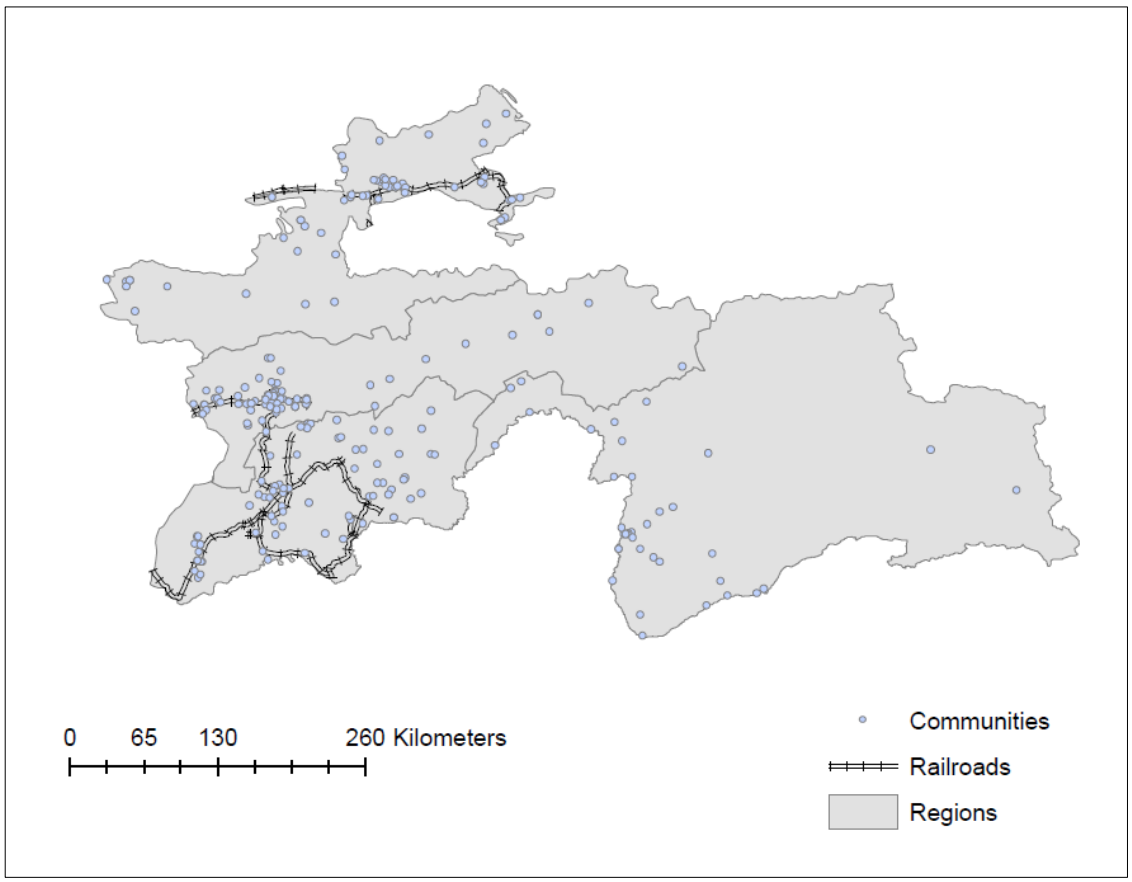


Figure 1.3: Tajikistan sample communities and railroads



Appendix A

No Country for Young Men.

Appendix Tables

Table A.1: Pooled results

	(1)	(2)	(3)	(4)	(5)	(6)
Estimator:	OLS-FE	2SLS-FE	OLS-FE	2SLS-FE	OLS-FE	2SLS-FE
			Panel A. Schooling outcomes			
	Dropout		Lagging		Education spending	
Migrant	0.00453	0.0747	-0.0660	-0.0653	23.85	-42.66
	(0.0386)	(0.112)	(0.0401)	(0.0926)	(39.14)	(217.2)
K-P F stat	.	15.68	.	15.68	.	15.68
Observations	1,326	1,326	1,326	1,326	1,326	1,326
R-squared	0.410	.	0.152	.	0.019	.
			Panel B. Labour outcomes			
	Working		Idleness		Weekly hours worked	
Migrant	-0.0429	-0.386***	0.0189	0.184*	-2.136	1.493
	(0.0354)	(0.121)	(0.0396)	(0.107)	(1.661)	(5.940)
K-P F stat	.	15.68	.	15.68	.	15.68
Observations	1,326	1,326	1,326	1,326	1,326	1,326
R-squared	0.103	.	0.238	.	0.068	.
			Panel C. Labour types			
	HH farm work		HH business work		Outside HH work	
Migrant	0.0304	-0.322***	-0.0329**	-0.216***	-0.0422	0.148
	(0.0247)	(0.0859)	(0.0139)	(0.0438)	(0.0306)	(0.162)
K-P F stat	.	15.70	.	15.70	.	15.70
Observations	1,322	1,319	1,322	1,319	1,322	1,319
R-squared	0.052	.	0.053	.	0.046	.
Covariates	Y	Y	Y	Y	Y	Y
Individual FE	Y	Y	Y	Y	Y	Y
Region*Year FE	Y	Y	Y	Y	Y	Y

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS07, TLSS09 and THPS11. Individuals aged 14- to 18-years old. Living in a migrant household is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network.

Table A.2: First stage results

	(1)	(2)	(3)	(4)
Dependent variable:	Migrant household		Intends to migrate	
Sample size:	Full 3-wave sample		2007 & 2009 samples	
	Girls 14-18	Boys 14-18	All 14-18	Boys 14-18
Construction growth / distance	0.133***	0.128***	0.0138	0.0148
	(0.0415)	(0.0458)	(0.0129)	(0.0426)
Age	0.453**	-0.144	-0.0882	-0.180
	(0.197)	(0.244)	(0.0745)	(0.154)
Age squared	-0.0162**	0.00334	0.00245	0.00517
	(0.00618)	(0.00748)	(0.00239)	(0.00507)
HH members aged < 15	0.00444	-0.00166	0.00846	0.0131
	(0.0227)	(0.0233)	(0.00869)	(0.0151)
HH members aged 65+	-0.0105	-0.176**	0.00345	-0.0273
	(0.0759)	(0.0884)	(0.00667)	(0.0253)
Female headed household	0.469***	0.553***	0.0289	0.0921
	(0.0961)	(0.0860)	(0.0300)	(0.0676)
Annual district nightlights	Y	Y	Y	Y
Individual FE	Y	Y	Y	Y
Region*Year FE	Y	Y	Y	Y
Observations	667	659	1,003	497
R-squared	0.224	0.199	0.044	0.092

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS07, TLSS09 and THPS11. Individuals aged 14- to 18-years old. Living in a migrant household is instrumented with Russian construction sector growth divided by community distance to end Soviet-era railroad network. The instrumental variable is standardized to ease table interpretation.

Table A.3: Responsibility over family chores (in %) – rural households

	Panel A					
	Shopping			Fetching water		
	All HHs	Non-migrant HHs	Migrant HHs	All HHs	Non-migrant HHs	Migrant HHs
Adult males	77.4	79.3	68.7	7.6	8.2	4.6
Adult females	21.0	19.0	30.0	71.9	71.3	74.6
Males under 16 y. old	1.1	1.2	0.9	7.9	8.2	6.7
Females under 16 y. old	0.4	0.5	0.4	9.7	9.4	11.3
Not applicable	0.1	0.1	0.0	2.9	3.0	2.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
	Panel B					
	Cooking			Washing and cleaning		
	All HHs	Non-migrant HHs	Migrant HHs	All HHs	Non-migrant HHs	Migrant HHs
Adult males	3.1	3.2	2.8	4.1	4.5	2.7
Adult females	90.8	90.8	90.6	84.7	84.6	85.3
Males under 16 y. old	1.5	1.6	0.9	1.8	2.0	0.7
Females under 16 y. old	4.5	4.3	5.7	9.3	8.9	11.1
Not applicable	0.1	0.1	0.0	0.1	0.1	0.2
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0
	Panel C					
	Keeping and accounting money			Negotiating to get water		
	All HHs	Non-migrant HHs	Migrant HHs	All HHs	Non-migrant HHs	Migrant HHs
Adult males	71.0	72.1	65.9	77.3	77.7	75.6
Adult females	28.1	27.0	33.2	19.5	18.9	22.3
Males under 16 y. old	0.3	0.2	0.5	0.5	0.5	0.5
Females under 16 y. old	0.5	0.5	0.4	0.5	0.6	0.2
Not applicable	0.2	0.2	0.0	2.2	2.3	1.4
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0
Number of observations	3,150	2,584	566	3,150	2,584	566

Notes: Household data from TLSS 2007.

Table A.4: Marital status

	(1)	(2)	(3)	(4)
	Dependent variable: Being married			
Sample:	Girls 14-18		Boys 14-18	
Estimator:	OLS-FE	2SLS-FE	OLS-FE	2SLS-FE
Migrant	0.00108	-0.00286	-0.00253	0.00385
	(0.00189)	(0.00336)	(0.00304)	(0.0119)
Kleibergen-Paap F statistic		9.06		27.12
Covariates	Y	Y	Y	Y
Individual FE	Y	Y	Y	Y
Region*Year FE	Y	Y	Y	Y
Observations	666	666	658	658
R-squared	0.039	.	0.045	.

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS07, TLSS09 and THPS11. Individuals aged 14- to 18-years old. Living in a migrant household is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network. The instrumental variable is standardized to ease table interpretation.

Table A-5: Descriptive statistics – households

Variable	Observations	Mean	Standard deviation
Transfer from private to public school	1,718	0.131	0.337
Transfer to cheaper school	1,718	0.148	0.356
Withdrew a member's admission to school	1,718	0.096	0.295
Unsatisfied with financial situation	1,718	0.345	0.475
Migrant	1,718	0.227	0.419
Remittances	1,718	0.229	0.420
Number of household members aged 14 or less	1,718	2.375	1.797
Number of household members aged 65 or more	1,718	0.337	0.605
Female headed household	1,718	0.174	0.379
Annual average district nightlights (in log)	1,718	-0.127	1.355
Number of girls aged 14-18 years	1,718	0.874	1.491
Sogd region	1,718	0.264	0.441
Khatlon region	1,718	0.327	0.469
RRP region	1,718	0.276	0.447
GBAO region	1,718	0.133	0.339

Notes: Data from TLSS09 and THPS11.

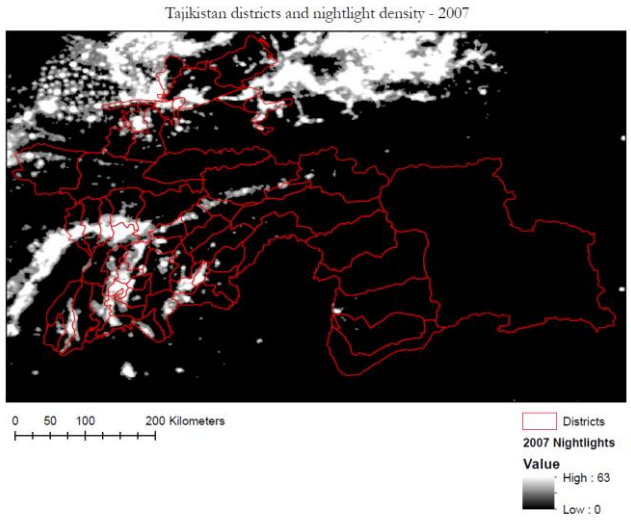
Table A.6: Number of teenage females in the household

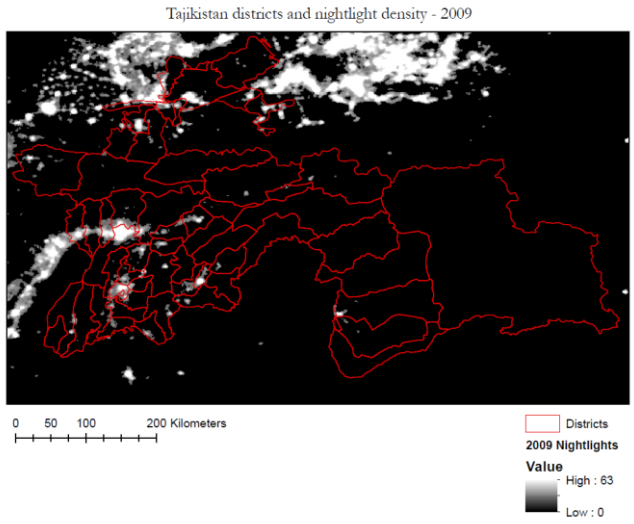
	(1)	(2)	(3)
Dependent variable:	Number of girls aged 14-18 years old in the household		
	OLS-FE	RF-FE	2SLS-FE
Migrant	0.0623		-0.298**
	(0.0588)		(0.141)
Unemployment over distance		0.0623*	
		(0.0370)	
Annual district nightlights	Y	Y	Y
Household FE	Y	Y	Y
Time FE	Y	Y	Y
Kleibergen-Paap F-statistic			4.03
Observations	1,718	1,718	1,718
R-squared	0.046	0.044	.

Notes: Robust-clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from TLSS09 and THPS11. Migrant household status is instrumented with Russian unemployment rate divided by community distance to end Soviet-era railroad network. The instrumental variable is standardized to ease table interpretation.

Appendix Figures

Figure A-1: Nightlight density





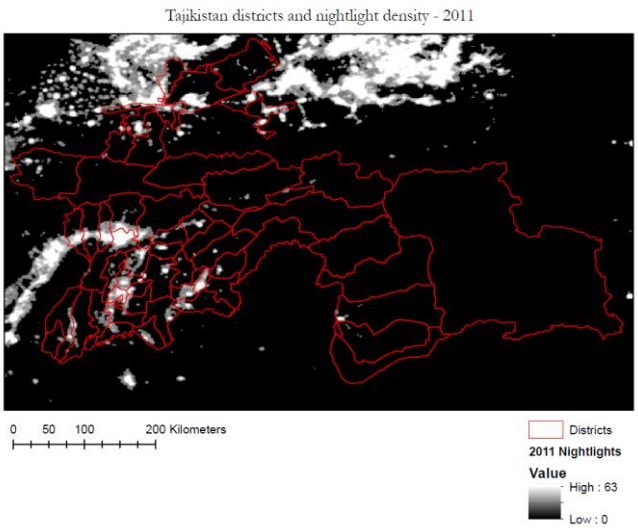


Figure A-2: Soviet railroad network in Central Asia

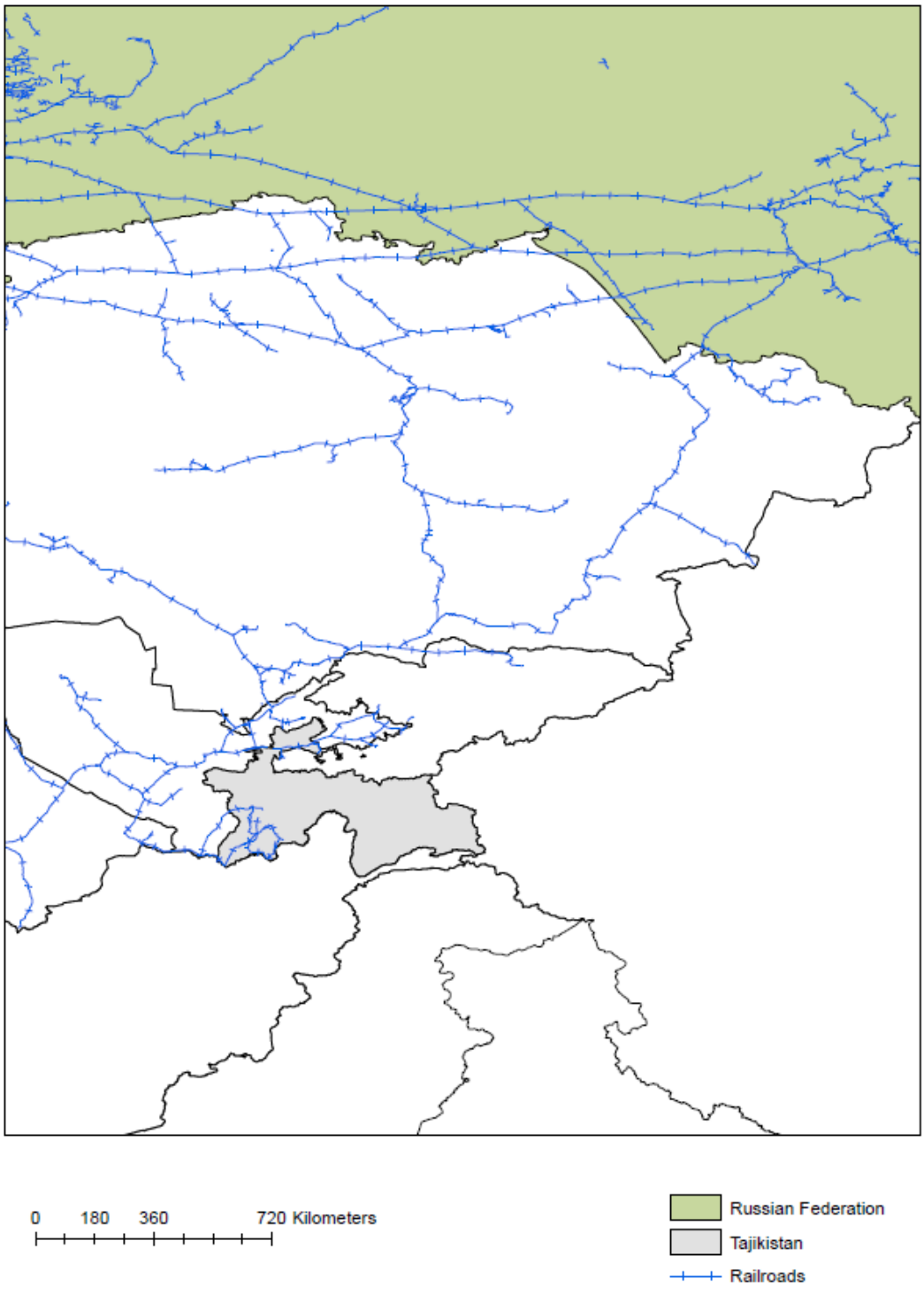
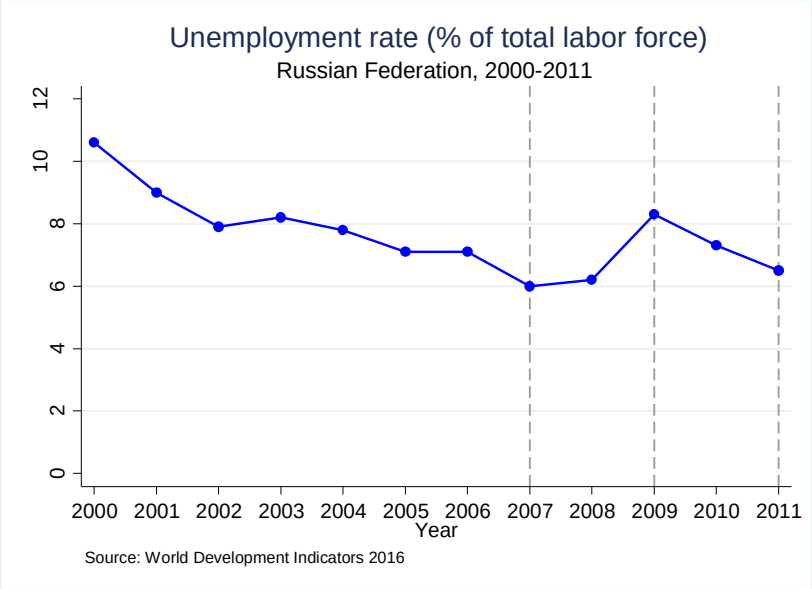
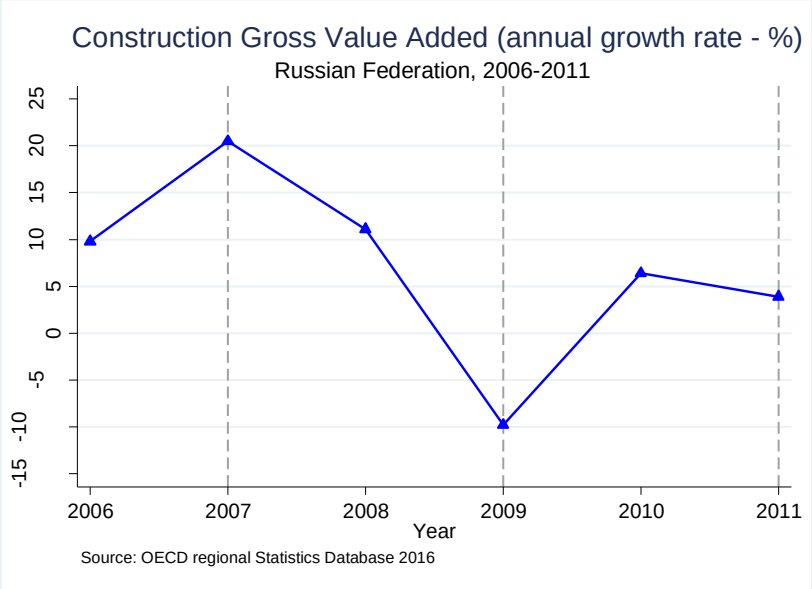


Figure A-3: Unemployment rate and construction sector growth in the Russia Federation





Chapter 2

Invasive Neighbours.
Haitian Immigration and Electoral Outcomes in the Dominican Republic[10].

2.1 Introduction

Anti-foreigner sentiment has been on the rise in several European countries in recent years. For instance, one of the major factors behind the Brexit vote of May 2016 has been attributed to voters' perception of immigration. In 2014, East Germany saw the emergence of the *Pegida* (Patriotic Europeans against the Islamisation of the West) political movement campaigning in favour of a stricter enforcement of Germany's existing laws on asylum and deportation. Contrary to conventional wisdom, immigration and the hostile reactions natives may have towards foreigners are not social issues specific to industrialized countries. In numerous developing countries such as India and South Africa, immigration from poorer neighbours has been triggering hostile and at times violent responses from native populations. In younger democracies, violence can sometimes be more pronounced, and the rule of law is often less established leading to human rights violations against migrants. Yet, little is known on how immigration affects attitudes and election results in developing countries. Understanding it is all the more important as political outcomes can lead to public policy reforms with long term welfare consequences. This paper fills this gap by looking at the effect of immigration in the Dominican Republic (DR). A middle-income country located in the Caribbean, the DR provides a very interesting natural experiment setting to study the relationship between immigration and the political preferences of

[10] This chapter has greatly benefitted from the supervision of Steve Gibbons and Olmo Silva. It has also gained from fruitful conversations with Vernon Henderson, Alexander Jaax, Ara Jo, Francisco Lazzaro, Lukas Linsi, Covadonga Meseguer, and Nathalie Picarelli. I also wish to thank participants at LSE research seminars, the 2nd Workshop on the Economics of Migration at the Goethe University in Frankfurt, the 9th World Bank – AFD International Conference on Migration and Development, the 2016 CESifo Junior Economist Workshop on Migration Research, the 28th European Association of Labour Economists Conference, and the Barcelona Institute of Economics invited seminar for useful and constructive comments.

natives. Over the last decades immigration from its neighbour Haiti, with which it shares the island of Hispaniola, has soared. Census data from the Office for National Statistics reveal that between 2002 and 2010 the official number of Haitians living in the DR increased five-fold, increasing the population by nearly 3%. In total, immigrants from Haiti represented as much as 81% of the total foreign population at the end of 2010. This increase was not evenly distributed across the Dominican territory and resulted in significant variation across space. This demographic trend has been accompanied by inter-ethnic tensions, unlawful and arbitrary deportations, and even a Constitutional amendment implicitly aimed at depriving Dominicans of Haitian descent of their Dominican nationality.

This paper addresses the question of whether Haitian immigration has influenced electoral outcomes in the DR. To do so, it draws upon a broad range of data sources, including a novel municipality-level panel dataset that combines for the first time information from various Dominican public databases. The analysis relies on the local outcomes of the 2004 and 2012 presidential elections, and the 2002 and 2010 congressional elections. Census data from 2002 and 2010 provides information on immigrant populations and local municipality characteristics. The choice of the study period is dictated by data availability. Using municipal-level data is advantageous since municipalities are rather small administrative units, implying that individuals are directly exposed to immigrant inflows. The empirical investigation is based on a first difference model that allows to difference out all unobserved time invariant municipality confounders. The focus on two countries sharing one island provides interesting opportunities to identify arguably exogenous sources of variation in Haitian migration. To account for the endogenous location decisions of migrants, I adopt an instrumental variable (IV) strategy capturing the influence demographic push factors have in determining the settlement pattern of Haitian migrants in the DR. The first instrument is based on a municipality's distance to Haiti's main administrative units interacted with population growth in Haiti. The second instrument exploits the large exogenous shock of the 2010 Haitian earthquake.

I find robust evidence of a positive relationship between a higher concentration of Haitian immigrants and the vote shares of the right-wing political coalition traditionally opposed to immigration. Moreover, I find that the historically more immigration-friendly coalition located at the centre of the political spectrum experiences a reduction in electoral support in municipalities with larger population shares of Haitians. This holds for presidential and

congressional elections. Even though these estimates must be interpreted as reduced form relationships between immigrant concentration and electoral outcomes, my estimates still have a causal interpretation. To shed light on the channels through which immigration affects electoral outcomes, I analyse opinion answers from Vanderbilt's University *AmericasBarometer* 2010 survey. The empirical evidence based on individual opinions suggests that concerns over citizenship, political competition, and cultural identity might be the main drivers of the political response of Dominican natives to the immigration of Haitians.

This paper brings together the economics of international migration and the political economy of migration. A large number of studies have looked at the consequences of immigration on the labour market outcomes of natives (see e.g., Card 2001; Friedberg 2001; Borjas 2003; Dustmann et al. 2005). In recent years several papers have investigated the link between immigration and crime (see e.g., Bianchi et al. 2012; Bell et al. 2013). Significantly less research has attempted to understand the political consequences of immigrant inflows and a consensus has yet to be found on how immigration affects the popularity of different political parties. The papers most relevant to my work are those of Halla et al. (2012) looking at Austrian elections, Barone et al. (2016) focusing on Italian national elections, and Mayda et al. (2016) studying US votes. These three studies either use a shift-share instrumental variable similar to Card (2001) or the inverse distance to origin countries to predict the location decisions of immigrant inflows. The focus on migration from Haiti only to the Dominican Republic prevents me from adopting these instruments. Instead, my analysis relies on two original instruments. The first exploits population growth and demographic pressure in Haiti, and the second relies on the distance to the January 2010 Haitian earthquake epicentre. My empirical findings are robust to the use of these alternative instruments. I also assess the sensitivity of my results to alternative validation checks and control for bilateral trade proxies, exclude outlier municipalities, and test for native flight.

This paper contributes to the literature on immigration and political outcomes in the following ways. It is to the best of my knowledge the first quantitative study of the consequences of immigration on electoral outcomes in a developing country. It is also the first study looking at an emerging democracy. In both settings political behaviour generally differs from European democracies. For instance, voters tend to have less experience with party politics and democracy. Combined with weaker rule of law, natives might more

readily voice their discontent at foreigners using violence rather than the ballot box. In new democracies, new electorates are also unlikely to have long-term party attachments guiding their behaviour (Dalton and Klingemann 2011). Electoral choice in the DR involves important sociocultural cleavages, such as ethnicity. Moreover, the literature on attitudes towards immigration has arguably put too much focus on the experiences of European countries (Ceobanu and Escandell 2010). Second, this paper exploits a rich and entirely novel dataset combining decennial census data, election results, and opinion survey answers. Third, instead of relying on traditional identification strategies this paper proposes a new instrumental variable based on distance and population growth abroad to account for the endogeneity of the location decisions of migrants. Fourth, it provides evidence using individual opinion survey data on the channels that might be driving the association found between immigration and political party performance.

The remainder of the paper proceeds as follows. Section 2 provides some theoretical background and reviews the relevant literature on the subject. In the third section, I provide some contextual information on the Dominican-Haitian setting. The fourth section describes the data used and the identification strategy, while section 5 discusses the main empirical results. Section 6 discusses channels and empirical evidence from individual opinion survey data. The last section concludes.

2.2 Theoretical background and literature review

Immigration can impact voting outcomes through two distinct channels. First, when immigrants become naturalized and participate in the elections of host countries, they directly influence political outcomes. Immigrants can also have an indirect effect by affecting the utility of native voters and their preferences towards immigration policy, and in consequence the identity of the political party natives decide to cast a vote for (Mayda et al. 2016). Only the indirect channel is relevant in the Dominican case as Haitian immigrants are *de jure* banned from obtaining the Dominican citizenship and voting rights.

Individual preferences over immigration policy are certainly determined by several considerations. Scholars have identified various economic and non-economic channels through which higher immigration can negatively affect natives' beliefs and attitudes towards foreigners. These channels have in common that they emphasize the potential threat that immigration might represent for the economic, political, and cultural interests of

natives. Labour market competition is arguably the most obvious of these channels. Native workers with similar skills and professional experience as immigrant workers might oppose immigration on the ground that foreigners stimulate competition in the labour market, which in some cases may translate into reduced wages or higher unemployment. On the other hand, native workers with different qualifications than migrants may favour immigration to the extent that they complement each other in the labour market and production (Scheve and Slaughter 2001; Mayda 2006; Ortega and Polavieja 2012). Welfare state (or fiscal burden) considerations are the other main economic factor that might adversely affect the attitudes of natives. Fear of immigration-induced higher tax rates and/or reduced amount of public benefits might push natives to become reticent to open-door immigration policies (Hanson et al. 2004; O'Rourke and Sinnott 2006; Facchini and Mayda 2009). Card et al. (2012) stress that immigration can provoke concerns over the compositional amenities natives enjoy - such as neighbourhoods, schools, or workplaces. In other words, natives might oppose immigration if they see it as a threat to the characteristics they appreciate of their local environment. According to the group-conflict theory, immigration can also result in greater hostility from natives if the latter perceive their culture and identity to be threatened. Central in this theory is the distance between hosts and destination countries with respect to norms, values, culture, and ethnicity (Dustmann and Preston 2001; Schneider 2008). Natives might also be worried that in the longer run naturalized immigrants alter the political balance between parties. In what follows I refer to these alternative channels as 'resource-threat' theories.

In contrast, the Contact Theory or Contact Hypothesis argues that proximity and interpersonal contact can help reduce prejudice between groups (Haubert and Fussel 2006; Carrell et al. 2015). In the original formulation of the contact hypothesis, the capacity of intergroup interactions to foster more amicable feelings is contingent on a number of factors, including the kinds of persons who are involved, participants' relative social status, as well as the frequency, duration, objective, and intimacy of the interaction (Williams 1947 p.69; Allport 1954, p.262-3; Katz 1991). In sum, theoretical predictions of what is the effect of greater exposure to immigration on natives' attitudes are a priori unclear. Understanding how anti-foreigner sentiment evolves following an influx of migrants in a particular country or locality remains an empirical question, the answer of which is ultimately context-specific.

The empirical literature on the effect of immigration on electoral outcomes is thin. Yet, the evidence available so far suggests that in Europe support for more conservative political

parties is strengthened by a higher concentration of immigrants. Otto and Steinhardt (2014) study the relationship between local immigrant concentration and the success of pro- and anti-immigration parties in the German city of Hamburg. Their analysis focuses on local city districts over a period during which the city experienced substantial inflows of immigrants and asylum seekers. Their fixed-effects results indicate a positive and substantial impact of growing shares of foreigners on the political success of extreme right-wing parties. In addition, they find a negative association between rising concentrations of immigrants and electoral support for the Green party, which was the only major party promoting liberal immigration and asylum policies during the time of study. Halla et al. (2012) find similar results when studying support for the far-right and anti-immigration Freedom Party of Austria (FPÖ). Pooling the outcomes of six national elections at the municipality level and relying on a time invariant instrument, the authors find that residential proximity with immigrants has a positive effect on the electoral performance of the FPÖ. Further, their empirical evidence suggests that it is the presence of low- and medium-skilled immigrants that is driving this result. Highly-skilled immigrants have no effect on FPÖ votes. Steinmayr (2016) also studies Austria but focuses instead on the effect of exposure to refugees on the 2015 state election results. His findings are contradictory to those of Halla et al. (2012). Using pre-existing local supply of group accommodations as instrumental variable for the spatial distribution of refugees, his results suggest that hosting refugees dampens local support for far-right, nationalist, anti-immigration parties in small rural communities. The discrepancy in the findings of these two studies could be explained by the fact that refugees are different from economic migrants. Barone et al. (2016) analyse the impact of immigration on the political preferences of natives in Italy. Using municipality panel data on national elections and migrant past settlement patterns as instrumental variable, they find that in municipalities that experienced relatively larger arrivals of immigrants, the electorate has been more willing to vote for the centre-right coalition with political platforms less favourable to the immigrants. They also find that the gain in votes for the centre-right coalition was accompanied with a loss of votes for the centre-left parties. These findings appear to be explained by multiple channels, including concerns over cultural diversity, native-immigrants competition in the labour market and access to public services. Finally, Mayda et al. (2016) empirically analyse the impact of immigration to the U.S. on the share of votes to the Republican and Democrat parties in recent years. Using variation across states and years as well as a novel instrumental variable combining distance and migrant's historical

location patterns, they find that on average immigration to the U.S. has a significant and negative impact on the Republican vote share. This average effect is driven by elections in the House of Representatives and works through two main channels. While the impact of immigration on Republican votes is negative when the share of naturalized immigrants in the voting population increases, the impact can be positive when the share of non-citizen immigrants reaches a certain threshold above which migration becomes a salient policy issue in voters' minds.

While there are only few studies that have looked at the relationship between immigration and electoral outcomes empirically, the literature on individual attitudes towards immigrants and immigration policy has benefitted from a vast amount of contributions from economists, political scientists, and sociologists. Hainmueller and Hopkins (2014) provide a thorough review of the subject, and overall find little evidence that individuals form their attitudes based on their personal economic situations. The labour market competition and fiscal burden hypotheses seem to have failed in most empirical cases. Education on the contrary appears as perhaps the most powerful predictor of policy preferences. The authors remark that schooling achievement however captures more than skills and includes for instance tolerance, political correctness, and taste for cultural diversity. On the other hand, concerns about the nation-wide cultural and economic effects of immigration appear to be strongly correlated with people views on immigration. Other factors that have regularly been found to matter comprise racial prejudice, ethnocentrism, political discourse, and the nature of media coverage of immigration issues. Ceobanu and Escandell (2010) also review the literature on public attitudes towards immigrants and immigration. They report that the effect of minority size is ambiguous as some studies have found that it has either a positive or negative influence on individual opinions.

2.3 The Dominican-Haitian case

2.3.1 A brief history of Dominican attitudes towards Haitian migrants

Haiti and the DR are located on the island of Hispaniola in the West Indies. They share a rich, complex, and at times violent history. The eastern part of the island, now the DR, was colonized and ruled by Spain for more than two hundred years. Haiti on the western part of the island, used to be a lucrative French plantation colony. France set up highly extractive institutions in Haiti and imported slave labour on a large scale from Africa

during the 18th century. With large territories to administer on the American continent, the Spanish crown did not invest as much in the island as France. Haitian slaves revolted in 1791 and fought for freedom and independence for 13 years. Haiti became the first republic of freed slaves in 1804. In 1822 the Haitian army invaded the DR, which had obtained its independence from Spain a year earlier. The DR became independent again in 1844 after 22 years of Haitian occupation. Unlike most countries in the region, the Dominican Independence Day celebrates independence from Haiti and not Spain or the United Kingdom. Some cultural differences between the two nations persist to this day. For instance, Dominicans are Hispanics whereas Haitians speak French and creole (Jaramillo and Sancak 2009; Acemoglu et al. 2012).

The attitudes of Dominicans toward Haitians have their roots in the distant past, and Haitian immigrants have suffered from stigmatization in the Dominican Republic for most of the last 150 years. This historical stigmatization has been documented by scholars and termed 'anti-Haitianism' (Howard 2001). Obtaining independence relatively early, Haiti invaded (or tried to invade) the DR five times in the course of the 19th century. These armed conflicts gave rise to a lasting suspicion of Haiti's intentions among Dominicans. Modern aspects of anti-Haitianism are largely the product of 20th century politics however; chiefly the anti-Haiti propaganda of Trujillo's right-wing dictatorship (1930-1961). During that period and subsequently under the rule of Joaquín Balaguer (1960-1962; 1966-1978; 1986-1996), the Dominican identity was built in good part by differentiating itself from the Haitian one. For decades, the DR has celebrated its European and indigenous heritage while downplaying its African roots. In contrast, Dominican elites have portrayed Haitians as being inferior, black, voodoo practitioners, and culturally African (Sagás 2000; Paulino 2002). Given the 330 km long and porous border between the two countries, Dominican leaders often talk of a silent invasion from Haiti and assert that Haitian immigration threatens the "three-pillars" of the Dominican society: Spanish ancestry, Hispanic culture, and Catholicism. As a result, a culture of entrenched prejudice against Haitians exists in the Dominican Republic (Martin et al. 2002; Howard 2007; Morgan et al. 2011). While anti-Haitianism used to be promoted by the State under Trujillo's and to some extent Balaguer's presidencies, nowadays anti-Haitianism is diffused throughout the Dominican society mainly by non-state actors such as school textbooks, news media, and ultranationalist literature (Sagás 2000; Paulino 2002).

2.3.2 Immigration in the Dominican Republic

Despite the aforementioned widespread resentment, the Dominican economy is highly dependent on cheap Haitian labour. From the beginning of the 20th century until the 1980s, most of the legal migration from Haiti to the DR was limited to seasonal labour contracts to work in the sugar cane cutting industry. Illegal migration must also have occurred during that period but limited information is available. Post 1980, with the decline of the sugar industry, the diversification of the Dominican economy, and the fall of the Duvalier dictatorship in Haiti (which was receiving bribes in exchange for the supply of short-term labour migrants), Haitians began to cross the border to work in other sectors – mostly agriculture, construction, tourism and services (Martin et al. 2002; Wooding and Moseley-Williams 2004).

The Dominican Republic has enjoyed a solid period of economic expansion over the last twenty years. It ranked among the fastest growing economies in Latin America and the Caribbean in the 1990s (World Bank 2006). Between 1998 and 2013, real GDP per capita grew at an average annual rate of 3.4%. In addition, Dominican democratic institutions have remained stable and fairly open over the last 20 years, features which have become entrenched in the country's political culture after a rather politically volatile 20th century. Conversely, Haiti has stagnated in terms of income per capita growth and suffered from repeated period of political instability (See Figures 1 and 2). The reasons for this drastic long-term divergence of fortunes between the two neighbouring nations are still debated. Reasons usually put forward include environmental factors, the institutional histories of the two countries, the profile and legacy of the two mid-20th century dictators ruling over each side of the island, political instability and the contrasted implementation of stabilisation and structural market-friendly policies (see e.g., Jaramillo and Sancak 2009; Diamond 2010; Acemoglu et al. 2012).

In practice, the economic divergence between the two countries has encouraged a large number of Haitians to cross the border in the hope of finding better economic opportunities and living conditions (World Bank 2006). Dominican census figures show that between 2002 and 2010, the number of individuals born in Haiti increased five-fold to represent 3.3% of the total population and 80.7% of the foreign population by the end of the decade (see Table 2.1 and Figure 3). Far behind Haiti in terms of immigrant numbers, the other main origin countries contributing to the foreign population living on the Dominican soil are the US, Spain, Puerto-Rico, and Venezuela (see Table B.1 in Appendix).

Haitian immigrants in the DR tend to settle close to the border, in the northern part of the country where sugar, banana and rice are cultivated, in the main urban centres - Santo Domingo the capital city and economic centre of the country in the South, and Santiago in the West -, and in the Eastern tip of the island where sugar cane grows on large-scale plantations and the tourism industry has been booming in recent years (see Figures 4 and 5). Roughly 60% of Haitian migrants settle in urban areas nowadays. This contrasts with the mostly plantation-labour related migration of the first half the 20th century. The Haitian immigrant population is also fairly young and mostly comprised of men (see Table B.2 in Appendix). About a fourth of Haitian migrants do not know how to read or write, with a higher proportion of illiteracy in rural areas where work is generally more physically intensive and less demanding in terms of literacy skills. In addition, only a third of the migrant population is believed to speak Spanish well. Prior to going abroad, most Haitian migrants were idle and living in urban areas. Those who had a job were mainly employed in the agriculture, trade, and construction sectors (ONE 2012 National Survey of Immigrants).

Data from the Dominican Office for National Statistics (2012) suggests that there is a positive relationship between the population size of the Haitian administrative regions (*départements*) and the number of migrants leaving these regions for the DR. On the other hand, there is a negative association between the distance of Haitian regions to the border and the number of migrants leaving these Haitian regions. This is clearly shown in Figures 6 and 7. Proximity to the border is evidently strongly correlated with migration costs.

Once in the DR, Haitian men are more likely to be working than Haitian women. Marked gender differences can also be observed with respect to occupational categories and economic sectors. Most Haitian men work as wage-employee, while close to half of the working women engage in self-employment. Men tend to work in physically demanding sectors (agriculture and construction) whereas women tend to work in the services sector. The working conditions of migrants are often quite precarious with a high prevalence of temporary work and verbal contracts (ONE 2012 National Survey of Immigrants). Discrimination in the workplace is also quite frequent, and the hardest tasks are usually left for Haitians (World Bank 2006). Abuses and various forms of discrimination have been denounced by non-governmental organisations and human rights groups. For instance, Haitian migrants lacking residency permits are regularly deported by Dominican authorities without any notice. In addition, while Dominican citizenship is subject to the *jus soli*

principle, in practice children of Haitian migrants born on Dominican soil are often refused their rights to citizenship and as a result are denied access to public services such as schools (Howard 2001; Amnesty International 2015; Human Rights Watch 2015).

2.3.3 Dominican politics

The Dominican Republic has a presidential system of government with independent executive and legislative branches. The president and the vice president are directly elected in each presidential election. The candidate with at least 50.01% of valid votes is declared winner of the election and is elected for four years. If none of the candidates receives a majority of the votes in the first round, a second round of voting is held (Nohlen 2005; IFES 2015; PDBA 2015). One of the advantages of working with presidential elections in the DR is that political platforms focus on nation-wide issues, such as immigration policy. I also analyse the effect of Haitian immigration on congressional election results. In the DR congressional elections are held in even numbered years not divisible by four, with even-numbered years divisible by four being reserved for presidential elections. I rely here on the 2002 and 2010 elections. In congressional elections, voters directly elect both Senators and Deputies. The Dominican Constitution vests all legislative power in the Congress, and the Chamber of Deputies and Senate are equal partners in the legislative process, i.e., legislation cannot be enacted without the approval of both chambers (Nohlen 2005). The Senate comprises 32 seats, and its members are elected in single-seat constituencies by simple majority vote to serve 4-year terms (one Senator per province). Deputies are directly elected in multi-seat constituencies by proportional representation vote and serve 4-year terms. In the 2002 election 150 seats were to be assigned in the Chamber of Deputies. In 2010, there were 183 seats to be allocated.

The Dominican political system has been dominated by two main parties since the end of the 1990s and under the period of study. The PLD (*Partido de la Liberación Dominicano*) and PRD (*Partido Revolucionario Dominicano*) have converged towards the centre of the political spectrum since the 1980s. While the two parties are not drastically different in terms of policy platforms, the PLD appeals to a more right-wing oriented electorate than the PRD (Hartlyn and Espinal 2009; Morgan et al. 2011; Meilán 2014). A few examples from recent history help corroborate this point. For instance, Hipólito Mejía, the last PRD member to seat in the presidential office, focused on modernizing and improving access to public services in poor rural areas during his term 2000-2004 term. His administration also established the first social-security type retirement system of the country. His successor,

Leonel Fernández from the PLD, focused instead on large infrastructure investments and macroeconomic stability during his 2004-2012 rule. He was publicly perceived as less attentive to social issues and socioeconomic inequality (Meacham 2013). Evidence on the ideology differences of the two parties can be found in the 2010 *AmericasBarometer*[11] opinion survey data. On average, a simple t-test of equality of means reveal that PRD sympathizers place themselves statistically significantly closer towards the left than PLD sympathizers on a 1-10 Left-Right political ideology scale (Appendix Table B.3). The *AmericasBarometer* survey also provides evidence suggesting that PLD sympathisers hold more conservative views. For instance, they are more likely to attach importance to religion in their life. They are also less likely to have relatives living abroad, possibly making them less sensitive to the difficulties migrants face.

Since none of these parties are usually predicted in opinion polls to win more than 50% of votes in the first round, the PLD and PRD are used to form coalitions with smaller parties to avoid a runoff election (Hartlyn and Espinal 2009). In 2004 and 2012, the PLD formed a coalition with six and thirteen other parties, respectively. The PRD was allied with five parties in both elections. Both elections under study were won by the PLD coalition. With 57.1% of the votes obtained in the first round, the PLD took over power in 2004 from the PRD after campaigning on the incumbent dismal economic record (Sagás 2005). In 2012, the PLD coalition won by a narrow margin in the first round of the election (51.2%) for the third consecutive time (Meilán 2014). In each election, the two coalition groups collected more than 90% of the votes (Figure 8). The PLD coalition did well in the North and the South of the country in the 2010 elections (Figure 9). Appendix Table B.4 shows the composition of each coalition in the 2004 and 2012 presidential elections.

None of these two parties adopts an explicit pro-Haitian stand. Yet, the PRD has historically been seen as less racially prejudiced; in large part because it was led by José Francisco Peña Gómez, a descendant of Haitian immigrants, for almost two decades. In addition, PRD Antonio Guzmán who led the DR between 1978 and 1982 tried explicitly to improve diplomatic relations with Haiti at a time when they were particularly tense. During the 2000-2004 presidency when the PRD was in power for the last time in recent history, the government announced measures to ease the access of unauthorized Haitian children

[11] The AmericasBarometer is a series of surveys of democratic public opinion and behaviour that covers the Americas (North, Central, South and the Caribbean). It is managed by the Latin American Public Opinion Project (LAPOP), which is hosted by Vanderbilt University. Source: The AmericasBarometer by the Latin American Public Opinion Project (LAPOP), www.LapopSurveys.org.

to primary and secondary schools (Martin et al. 2002; Sagás 2000; Wooding and Moseley-Williams 2004).

On the other hand, all the controversial citizenship laws and constitutional amendments targeting Haitian migrants were undertaken under recent PLD rule. The August 2004 General Migration Law introduced a different registration system for the children born in the Dominican Republic to foreign women who do not have regular migration status. The new law de facto stipulated that children of foreign mothers who had irregular migration status at the time of giving birth could no longer be Dominicans. In 2010 the DR revised its constitution to grant citizenship automatically only to those children born on Dominican soil with parents holding formal legal status. In 2013, the Dominican Constitutional Court issued a ruling retroactively denationalizing Dominicans of Haitian descent whose parents lacked formal residency permits, extending all the way back to 1929. In good part due to the pressure exerted by the international community, a subsequent law was passed in 2014 to provide a way to re-claim citizenship for those affected by the 2013 ruling, but only conditional on being able to prove that parents were in the Dominican Republic legally at the time of birth; a conditionality that is hard to meet in practice (Amnesty International 2015). Further, in both presidential elections under study the ultra-nationalist and most vocal anti-immigration *Fuerza Nacional Progresista* (FNP) party joined the PLD coalition. The FNP essentially campaigns on a far-right anti-Haitian migration platform. It backed the constitutional amendment stripping Haitian Dominicans of their citizenship rights. The FNP has proposed to build a wall along the border with Haiti. It also advocates putting in place preferential treatment recruitment practices for Dominicans[12]. As a result, if 'resource-threat' theories were to apply in the Dominican case, municipalities with a larger population share of Haitian immigrants would be expected to show greater support for the migrant-hostile PLD coalition, and less support for the PRD. The Contact Hypothesis predicts the opposite.

Lastly, it is important to note that Haitian immigrants cannot vote in presidential elections. In addition, naturalization is not an issue here as successive governments and Dominican institutions have literally made it almost impossible for Haitian immigrants to obtain Dominican citizenship. A non-negligible share of Dominican natives lacks identity papers and the right to vote as well due to the bureaucratic rigidities of the national registration

[12] Vinicio Castillo, FNP president, in the *Listin Diario* (2014): http://www.listindiario.com/puntos-de-vista/2014/06/09/325153/la-invasion-esta-anunciada.

system. The DR actually is one of the Latin American countries with the highest share of undocumented natives (Wooding and Moseley-Williams 2004; Hartlyn and Espinal 2009).

2.4 Empirical Strategy

2.4.1 Data sources

The data used in this part of the analysis comes from two distinct sources. Electoral outcomes for the congressional and presidential elections were obtained from the Dominican Central Electoral Board. The 2002 and 2010 national census provides municipality-level socio-economic indicators, including Haitian population presence. Census survey teams carried out field work in October 2002 and December 2010, and therefore almost a year after the earthquake for the last census. Appendix Table B.5 reports descriptive statistics for some municipality-aggregate variables. On average, over the two time periods considered, Haitians (defined as individuals born in Haiti) represents 3.1% of the population of Dominican municipalities, but the distribution is far from homogenous. In 2002, a few municipalities still have no Haitian migrants. In 2010, a fourth of the population of the municipality of *La Descubierta* are Haitians. Looking at the unemployment rate, it can be seen that economic conditions are also quite uneven across the Dominican territory.

Figures 10 and 11 plot the change in the stock of Haitian migrants (in percentage of the 2002 municipality population) against party vote share variation in presidential elections. There appears to be a marked positive association between Haitian immigration and right-wing PLD coalition vote shares. On the other hand, PRD presidential election results display a weak negative association with Haitian immigration. A few municipalities stand out as outliers due to the large increase in migrant population recorded over the study period. I drop these municipalities from the analysis later on to assess the sensitivity of the results to their exclusion.

2.4.2 Empirical methodology

To measure the effect of exposure to Haitian immigration on electoral outcomes, I estimate long first-difference (FD) equations of the following form:

$$\Delta Y^{j}_{m,r} = \beta_1 . \frac{\Delta H_m}{P_{m,t-1}} + \Delta X'_{p-m} . \beta_2 + \varphi_r + \Delta \varepsilon_{m,r} \qquad (2.1)$$

where $\Delta Y_{m,r}^{j}$ refers to the change in vote share received by political party coalition *j* in municipality *m* in region *r* between two elections. The key variable of interest is the change in the stock of Haitian immigrants $\frac{\Delta H_m}{P_{m,t-1}}$ and is expressed in percentage of the 2002 municipality population as is common in the literature. I include a vector of province-level covariates net of municipality characteristics X_{p-m} to avoid post-treatment bias. It includes the dependency ratio defined as the number of individuals aged 0-15 years old and over 65 years old (in percentage of the total population) to account for a potential demographic association between age composition and voting outcomes. The shares of adults with secondary and tertiary education are also included to control for the local level of human capital available. The unemployment rate is also considered as economic conditions are quite likely to influence political preferences. I include information on agriculture and manufacturing employment to control for the structure of the local economy. I also control for municipality total population. φ_r are region fixed effects and allow to flexibly control for unobserved regional shocks[13] common to municipalities. β_k are the parameters to be estimated and $\varepsilon_{m,r}$ is the error term. Standard errors are clustered at the municipality level.

2.4.3 Identification strategy

Figure 4 above made clear that Haitian migrants do not select their destination municipalities at random. Estimating the causal effect of exposure to immigration on election results therefore cannot be done with ordinary least squares (OLS). More generally, three endogeneity issues prevail: i) reverse causation; ii) omitted variable bias; and iii) measurement error. Reverse causation might arise if Haitians decide to settle in localities relatively more immigration-friendly. At the same time, the most hostile natives may leave host municipalities in response to migrant inflows (Mocetti and Porello 2010; Sá 2014). Also, time-varying omitted variables such as local economic shocks could determine at the same time the location of immigrants and the political preferences of the Dominican population (Zavodny 1999; Åslund 2005). Finally, there are valid reasons to believe that some measurement error plagues the data as a large number of Haitian migrants cross the border illegally. Official statistics are also thought to underreport the true size of the Haitian population living in the DR (World Bank 2006).

[13] The DR is divided into ten regions and 30 provinces in my sample. See Figure A.1 in Appendix for a map of the ten regions.

To address these endogeneity concerns and given the nature of the data and research question, I instrument time variation in the migrant stock with push factors variables. It has long been established in the migration literature that so-called push factors (demographic, socio-economic and political conditions at home) affect individuals' decisions to emigrate (Massey et al. 1993; Özden et al. 2011). They are also less likely to be correlated with unobserved destination characteristics.

The first instrument proposed for the presence of Haitians in each municipality is based on the Haitian migration patterns discussed in the previous section. It relies on population growth in Haiti and distance measures, two variables which were shown to be associated with the size of migrant stocks. The instrumental variable is constructed as follows. First, I calculate for each Dominican municipality the distance between its centroid and each centroid of the ten Haitian *départements*. Second, I measure the population size of each Haitian administrative unit using 2003 census data and 2009 population estimates produced by the Haitian Institute for Statistics[14]. Third, for every Dominican municipality I divide population size in each Haitian department by its distance to the municipality's centroid. Finally, I sum the ratio described above across the ten Haitian *départements* to obtain an instrumental variable, which can be understood as a population distance-weighted average (see Figure 12). Formally this instrument $Z_{m,t}$ can be written as:

$$Z_{m,t} = \sum_{d=1}^{10} \frac{Population_{d,t}}{Distance_{m,d}} \quad (2.2)$$

where $Population_{m,t}$ represents Haitian department *d*'s census population figures for 2003 (t=1) and population estimates for 2009 (t=2). The last Haitian population census was conducted in 2003 and in 2009 the Haitian Institute for Statistics calculated population estimates for the various regions of the country. The percentage point (pp) variation of the stock of Haitian migrants in each municipality is thus instrumented with the distance-weighted change in population in Haiti; with ΔZ_m defined in Equation (2.3).

$$\Delta Z_m = \sum_{d=1}^{10} \frac{\Delta(Population)_d}{Distance_{m,d}} \quad (2.3)$$

An instrumental variable must meet three conditions to be valid. The relevance condition states that the instrument must be strongly correlated with the endogenous variable. I present in the next sub-section first-stage least squares results showing that the instrument

[14] Institut Haïtien de la Statistique et d'Informatique (IHSI).

is highly correlated with Haitian immigration to discard weak instrument problems. The second condition requires that the instrument must be as good as randomly allocated. Both components of the instrument used here, i.e., distance to Haitian departments and population growth abroad, can be assumed to be exogenously determined from the perspective of a given Dominican municipality. Finally, the exclusion restriction, states that the instrument must be exogenous and uncorrelated with any other unobserved determinants of the dependent variable, here electoral outcomes (Imbens and Wooldridge 2007; Angrist and Pischke 2008, p.116). Population growth in Haiti could affect electoral outcomes in the Dominican Republic through two other channels than immigration. Firstly, as population grows in Haiti, market size increases and that increase could lead Dominicans to migrate to Haiti to seize new economic opportunities. As a result, the native population left-behind taking part in elections would be a sub-sample (probably less Haitians-friendly) of the original Dominican population. However, that argument is unlikely to hold in practice for cultural, historical and economic reasons explained earlier. In particular, the poor state of the Haitian economy is a strong deterrent for any Dominican to cross the border. Indirect evidence supporting this claim can be found in the 2012 election data. In this election, Dominicans residing overseas were allowed for the first time to cast their ballots in 19 voting centres located in countries where the Dominican diaspora is deemed sizable enough. While polling stations were opened in the US, Panama, Canada, Spain, Venezuela and even Italy, none was opened in Haiti. This confirms that the Dominican population present in Haiti is negligible. Moreover, in 2010 the total stock of immigrants in Haiti represented less than 0.3% of the Haitian population[15]. I also directly test for (and refutes) internal migration or 'native flight' responses in a later section. Secondly, population growth in Haiti could create bilateral trade opportunities with the Dominican Republic. While Haiti exports virtually nothing to its neighbour according to official trade statistics (see Table B.6), Haiti is a non-negligible markets for Dominican exports. Through trade-generated employment, Dominicans' political opinions could be affected. The idea of a relationship between trade, tolerance and peace is far from novel and can be traced to Montesquieu (1748)[16]. There is no data on trade with Haiti at the province or municipality levels. To account for the potential confounding channel brought by trade, in the regressions that are discussed next, in addition to controlling for the local

[15] World Development Indicators, 2016.

[16] "Peace is the natural effect of trade. Two nations who traffic with each other become reciprocally dependent; for if one has an interest in buying, the other has an interest in selling: and thus their union is founded on their mutual necessities." Montesquieu, Charles Louis de Secondat. "De l'esprit des lois (1748)." Chapter II, Book XX.

unemployment rate as well as manufacturing and agriculture employment I also run regressions including a proxy variable for bilateral trade defined at the provincial level. The identification assumption is thus that conditional on the included control variables distance-weighted population increase in Haiti has no effect on electoral outcomes other than through the share of Haitians present in a municipality's population.

The second instrument exploits the 2010 earthquake as source of exogenous variation to instrument for the inter-census change in local Haitian immigration. Gröger and Zylberberg (2016) and Henderson et al. (2017) have documented a strong link between environmental disasters and migration in developing countries. On January 12, 2010 a powerful earthquake of magnitude 7.0 on the Richter scale struck Haiti near the capital city Port-au-Prince. The quake claimed the lives of 250,000 individuals and displaced more than 1.5 million inhabitants (Kolbe et al. 2010). The capital city where more than half of the country's GDP was produced suffered substantial devastation and economic activities took a massive blow. The DR was not directly affected by the seism. Haitians crossed the border with the DR in large numbers as a result. I instrument the change in Haitian migrant population stock with the inverse of the distance between a municipality's centroid and the earthquake epicentre (see Figure 13). While distance to the epicentre as a variable is undeniably as good as randomly allocated, the exclusion restriction could potentially be violated due to some unobservable variables correlated with both proximity to the earthquake and political preferences. To address such concerns and test the robustness of my results, I run regressions controlling for municipality distance to the border in what follows.

2.5 Results

2.5.1 Presidential and Congressional Elections

This section discusses the results of the effect of the share of Haitian migrants in the local population on electoral outcomes in the DR. I start by looking at the first stages. Table 2.2 reports first-stage least squares estimates of Equation (2.1) using weighted population growth as IV in the first two columns and distance to the 2010 quake epicentre in the last two columns. For each instrumental variable, I present first stage results without and with region fixed effects. Distance-weighted population is positively and strongly associated with Haitian migration. This positive relationship suggests that greater population growth in

Haiti is associated with higher migration, which is consistent with the descriptive evidence discussed earlier. The second instrument is also positively and statistically significantly associated with Haitian immigration. The sign of the coefficient indicates that municipalities closer to the epicentre have experienced a larger inter-census increase in the stock of Haitian migrants. Adding region fixed effects lowers the power of the two instruments but does not invalidate the identification strategy.

Two-stages least squares estimates of the impact of Haitian population concentration on vote shares in presidential elections are presented in Table 2.3. The first three columns consider the vote shares of the right-wing PLD coalition as dependent variable. Centre PRD coalition votes feature as explained variables in columns 4 to 6. The last three columns consider support for the far-right FNP party instead. For each of these three outcome variables, I start by presenting first-difference estimates in the first column. I then present two-stage least squares results based on the population growth instrument and the inverse distance to the epicentre instrument. First-difference (FD) estimates reported in column 1 show that Haitian immigration is positively associated with PLD right-wing coalition's vote shares. Comparing estimates of the first column to the second and third, it appears that measurement error and reverse causation are biasing first-difference results downwards. The 2SLS point estimates of column 2 and 3 are positive and statistically significant at the 5% level. According to the results, a one percentage point increase in the stock of Haitians living among the municipality population leads to a 1.3 pp increase in the vote share of the right-wing PLD coalition. Instead, Haitian immigration is found to have a negative effect on support for the PRD-led coalition. The coefficient of column 6 suggests that a 1 pp increase in the share of Haitian migrants leads to a reduction of 0.2 pp of the centre PRD coalition vote share. The effect is not statistically significant at conventional levels however.

The last three columns show that Haitian immigration has a small but positive and significant impact on the popularity of the far-right FNP party. Immigration thus seems to create some amount of dissatisfaction among voters who turn to parties with an anti-Haitian agenda. On the whole, these results are consistent with 'resource-threat' theories. The local performance of the right-wing political coalition (including the FNP) tends to benefit from a larger concentration of Haitian immigrants. Two-stage least squares results generally suggest that first-difference estimates are downward biased. Measurement error is a likely source driving this bias. As discussed earlier, it is generally believed that Haitian

migration statistics are underreported. Assuming bilateral trade reduces prejudice towards Haitians, it could also drive the downward bias found in FD regressions. I discuss (and address) bilateral trade related sources of bias in greater detail in the robustness check section.

Congressional elections are the focus of Table 2.4. The table is structured in a similar fashion as the previous one. The impact of exposure to Haitian immigrants on the vote share of the PLD coalition is also positive and statistically significant in 2SLS regressions. The magnitude of the effect is larger with a 2.1 pp increase in the vote share for every 1 pp increase in Haitian immigration. FD estimates are downward biased again, suggesting that measurement error confounds the estimates of column 1. Columns 4 to 6 concentrate on PLD coalition support. The effect of exposure to migrants is still negative but becomes now significant at the 5% level. This finding is robust to the use of the two instruments. There is now more robust evidence that the performance of the centre coalition led by the PRD suffers in municipalities with more migrants. The FNP did not run in the 2002 race for congress. I cannot use time variation in its local performance here in consequence. Overall, these results support the finding that greater exposure to Haitian immigration translates into an increase in the popularity of the right-wing coalition parties. The centre-left coalition is penalised instead.

Another way through which voters can express their discontent is through abstention. Alternatively, some previously inactive voters could decide to cast their ballots when unpleased with the country's immigration policy (Dustmann et al. 2016). To explore if any such voter behaviour can be seen in the DR, I perform the same regression analysis as earlier with presidential election turnout as outcome variable in what follows. I focus on presidential elections as data on turnout in the congress elections is not available at the municipality level. The results are shown in Table 2.5. Overall I find no evidence that immigration creates some amount of dissatisfaction among voters. Results in the three columns show that Haitian immigration has a small and negative but insignificant impact on turnout.

2.5.2 Robustness tests

In this sub-section, I discuss several sensitivity tests. I begin by trimming off the tails of the migrant stock distribution. I exclude the top 5% municipalities that have experienced the largest increase in the stock of Haitian migrants over the period. Regression results are

shown in Appendix Table B.7. The table is comprised of two panels. Panel A focuses on presidential election outcomes, while Panel B concentrates on congressional elections. The right-wing PLD coalition vote share is the dependent variable in the first three columns of each panel. Votes for the centre-left PRD coalition are analysed in the last three columns. For every dependent variable I show FD results as well as 2SLS estimates based on the two alternative instrumental variables. The population growth instrument now performs better in the first stage as pointed out by the Kleibergen-Paap F-statistics shown at the bottom of the table. Overall the 2SLS results discussed previously are highly robust. Point estimates are somewhat larger than those discussed above. The positive effect of Haitian immigration on support for the PLD coalition is always positive and significant at the 5% level for both types of elections (columns 2 and 3). On the other hand inflows of Haitian migrants hurt the performance of the PRD coalition. The 2SLS estimates are negative but only significant for the congressional race.

As discussed above, bilateral trade is a potential confounder. However, if one makes the realistic assumptions that trade and population growth are positively correlated, or that trade and border distance are positively associated, and that trade creates more friendly attitudes among trade partners, the nature of the bias works against finding a positive relationship between immigration and support for the right-wing party. In that sense, my 2SLS estimates can be considered lower bounds of the true effect of immigration. To provide further support for my results, I use a proxy variable to control for bilateral trade. Regressions presented in Appendix Table B.8 control for the inter-census change in the number of operating special economic zone (SEZ) firms. This variable is defined at the province level[17] and is obtained from the Office for National Statistics. Special economic zones play a very important role in the Dominican economy. In 2008 free zone exports accounted for close to 70% of the country's total merchandise exports (World Bank 2011). In 2011 they were employing more than 125,000 individuals and Haiti was their eleventh more important export market[18] (CNFZE 2012). There is some amount of annual variation in the ranking of Haiti as trade partner, and in the previous decade Haiti often figured among the top ten export destinations of the DR. Regression results are barely affected by the inclusion of the number of operating SEZ firms despite the reduction in the power of the instruments. Haitian immigration is still found to generate an increase in the votes for the right-wing coalition (columns 2 and 3) and a reduction in support for the centre PLD

[17] There are 30 provinces in the dataset.
[18] As measured by the total number of firms exporting products to Haiti.

coalition group (columns 5 and 6) in both presidential and congressional elections. The estimated 2SLS coefficients estimates are quite close to those of Tables 3 and 4.

Having two instrumental variables opens the possibility to estimate overidentified 2SLS regression coefficients. Appendix Table B.9 provides such estimates. The table contains two panels covering each a different election. The first two columns consider the PLD coalition performance. The last two columns concentrate on the PRD coalition. I estimate overidentified regressions with 2SLS and the Limited Information Maximum Likelihood (LIML) estimator. The two instruments taken together have weaker explanatory power than when taken individually. The coefficients are highly stable and close to those presented in Tables 2 and 3. Using the Limited Information Maximum Likelihood (LIML) estimator instead of 2SLS does not alter the results and conclusions previously drawn (see columns 2 and 4). Sargan tests of overidentified restrictions fail to reject the null hypothesis that the instruments are uncorrelated with the error term.

The two instruments used in the analysis are constructed using distance measures. Despite first differencing the data and the inclusion of region fixed effects it cannot be ruled out that the instruments capture the confounding influence of unobserved variables whose time variation is correlated with distance to the Haitian border. To address such concerns, I control for border distance (in km) in Appendix Table B.10. The results are not affected by this sensitivity check. Point estimates remain significant and of the same sign. The same conclusions can be thus drawn from the estimated coefficients with respect to the influence of Haitian immigration on electoral outcomes. My findings are not affected either if instead of controlling for municipality population I weight the regressions by the initial municipality population recorded in the 2002 census (Appendix Table B.11).

I apply all these robustness checks to the vote share of the far-right FNP party in Table 2.6. In the first two columns of the table, I control for the number of SEZ firms in activity. The results of both columns indicate that a 1 pp increase in the share of Haitian migrants leads to a 0.11 pp increase in vote share of the FNP. Controlling for distance to the border instead does not affect much the previous results. The point estimates are now larger and equal to approximately 0.13 pp (columns 3 and 4). In the next two columns I report population weighted regressions. The results are essentially unchanged. I take advantage of having two instruments and report overidentified regressions in the last two columns. I still find a positive and statistically significant effect of immigration on support for the far right party.

My results could be contaminated by native flight, i.e., the internal migration response of Dominican natives. The voters most negatively affected by or opposed to immigration are the most likely to leave. Assuming it is the case over the study period, my results would likely underestimate the true effect of Haitian immigration on election outcomes in consequence. To test for any native mobility response across municipalities, I follow Peri and Sparber (2011) and Lewis and Peri (2014) and estimate Equation (2.4) below:

$$\frac{\Delta N_{m,r}}{P_{m,r,t-1}} = \gamma_1 . \frac{\Delta H_m}{P_{m,t-1}} + \Delta X'_{p-m} . \gamma_2 + \varphi_r + \Delta \nu_{m,r} \qquad (2.4)$$

where ΔN_m is the change in native population in municipality m, $P_{m,t-1}$ is the initial population size of the municipality, and ΔH_m is the change in the stock of Haitian migrants as defined previously. I abstract from the skill-experience cell dimension typically used in the literature on immigration and labour market outcomes because I am interested in the whole population and not only the labour force. First-difference and 2SLS results are presented in Table 2.7. On the whole the results provide no evidence of any significant internal mobility response of natives. The 2SLS estimates are negative and non-significant. In other words, the results suggest no significant displacement effect. This is to be expected in the Dominican context. Internal migration mainly occurs from rural areas, and migrating abroad is a costly and long-term strategy that is unlikely to be related to Haitian immigration. Consequently, these findings do not cast doubt on the validity of the analysis conducted so far.

In sum, I find solid evidence of a positive relationship between Haitian immigration and support for right-wing and far-right political parties. At the same time higher immigration leads to a reduction in the support for centre-left parties. These findings hold for both presidential and congressional elections. They are also in line with those of Barone et al. (2016) and Dustmann et al. (2016) for the cases of Italy and Denmark. Contrary to these two previous studies, I do not find any effect on turnout at the polls in municipalities more exposed to migrants inflows.

2.6 Channels

The association between Haitian immigration and the political success of right-wing parties found above could be driven by several channels, including labour market competition,

welfare state concerns, compositional amenities, political competition, and perceived cultural threat. This section seeks to understand which of these channels are most relevant in the Dominican context.

2.6.1 Channels and elections

In this section I explore the transmission mechanisms going from immigration inflows to native voting behaviour. I rely on interaction terms to provide causal evidence of the relevant channels. I consider nine variables measured in the baseline period in levels to proxy for initial characteristics. Unless stated otherwise these characteristics are measured in 2002 at the province level. I instrument the interaction between Haitian immigration and a given channel by multiplying distance to the earthquake with that channel. Second, I look at the impact of immigration on natives' unemployment.

2.6.1.1 Baseline Municipal Characteristics

I start by discussing the results of the interactions with baseline provincial or municipal characteristics. The results are shown in Table 2.8 where the dependent variable is the vote share of the PLD coalition in presidential elections. I begin with municipality population in column 1. Supportive of previous results, the baseline coefficient is positive and statistically significant. The interaction however is negative and significant, suggesting that the impact of migration inflows is weaker or even negative in more populated areas. This is consistent with the findings of Dustmann et al. (2016) in Denmark.

The next two characteristics I focus on are the initial dependency ratio and the population share of individuals aged 65 years and above (both from the 2002 census). These measures aim at assessing the cultural and the public taxation and services channels. Children and the elderly tend to use public services relatively more than the average population. They are also eligible to receive various welfare benefits. Older people are also more likely to care about Dominican values and culture whereas parents with young children might be afraid that exposure to Haitian migrants affects the beliefs and values their offspring are brought up with. Despite the possible relevance of this channel, I find that the interactions are negative but insignificant suggesting these channels might not be the most pertinent in the Dominican context (columns 2 and 3).

Haitian migrants are predominantly low skilled workers and a large fraction work in agriculture. In order to evaluate the labour market competition channel, I focus on three

variables: employment in agriculture, the share of adults with a primary education, and the unemployment rate. The results in columns 4 to 6 show that the labour market channel does not matter much when measured with those variables. While the baseline coefficients are positive, the interactions are not. This is not too surprising given the division of labour generally in place in the DR. Dominicans tend to stay away from low skilled and physically difficult tasks such as construction or plantation work. As a result Haitians do not threaten much the labour prospects of natives.

I concentrate next on political factors. I consider the initial performance of the PLD coalition in the 2004 elections (i.e., at the beginning of the timeframe studied). I also look at political competition measured as the absolute difference between the vote share of the PLD and PRD coalitions in 2004. The higher the value of this variable we can assume the lower is the local competition between the two parties. Both these variables are constructed at the municipal level. Baseline coefficients in columns 7 and 8 are positive and significant. The initial PLD performance interaction is negative and significant suggesting that the impact of Haitian migration is higher in places where the PLD did not perform well in 2004. It is not obvious to provide an explanation for this result. One possibility is that voters might believe the PLD to be capable of addressing their migration related concerns more when they have no experience with the party. Also, it is possible that voters might trust the PLD party discourse on migration and turn to this party following their experience with the more liberal PRD. Interestingly, the political competition interaction is negative and statistically significant. This implies that in closely contested municipalities immigration seems to have a higher impact on PLD coalition support suggesting that natives might perceive Haitian migrants as threats to local (and national) political equilibria.

The last channel I explore is violence and crime. Foreigners might be perceived as more likely to engage in petty criminal activities. It is also common for anti-migration propaganda to exploit the fear of natives to rally support. I interact Haitian migration with homicide rates measured at the province level (per 10,000 inhabitants). I use 2007 data as it is the earliest for which homicide statistics are available. The baseline coefficient in column 9 is positive and statistically significant, but the interaction is not. Despite political rhetoric linking immigration and crime, there is no evidence that migration has a different impact in more violent provinces. Most Haitians come to the DR to work and find better living conditions, and it is unlikely that they engage in criminal activities in a disproportionate way.

2.6.1.2 Migration & Natives Unemployment

Finally, to make the most of my municipality panel dataset I evaluate next whether immigration has any effect on native unemployment rates. Evidence of a positive effect would suggest that the labour market competition channel is still relevant. To be consistent with the previous analysis, I follow the area approach in the literature on the labour market impact of immigration (see e.g., Dustmann et al. 2005, Lewis and Peri 2014). I estimate Equation (2.5) below using the two previously defined instrumental variables, and with L_m standing for the unemployment rate of Dominican natives in the municipality. The other variables are defined as earlier.

$$\Delta L_{m,r} = \lambda_1 . \frac{\Delta H_m}{P_{m,t-1}} + \Delta X'_{p-m} . \lambda_2 + \varphi_r + \Delta \varsigma_{m,r} \qquad (2.5)$$

The results are displayed in Table 2.9. The first column shows first difference estimates. Columns 2 and 3 contain 2SLS estimates from the main specification based on the two different instruments. The next two columns control for SEZ firms, while the last two columns include distance to the border in the list of covariates. The association between Haitian migration and unemployment in column 1 is negative and insignificant. This negative association is likely to be partly driven by reverse causation with Haitian immigrants settling in municipalities with buoyant labour markets. The 2SLS estimates based on the preferred specification in columns 2 and 3 change sign. They are positive but not significant. Results from alternative specifications in the next columns are similar in substance. Overall, there is no evidence of Haitian immigration harming the labour market prospects of Dominican natives. These results add evidence and further cast doubt on the validity of the labour market channel in explaining the electoral results of section 5.

Given the limited power of the identification strategy in this section so far, I rely on opinion survey data in the next sub-section to provide more evidence on the mechanisms driving the association between immigration and electoral outcomes.

2.6.2 Opinion survey data

The analysis conducted here is more of a descriptive nature and relies on the 2010 wave of the *AmericasBarometer* - Latin American Public Opinion Project (LAPOP) surveys collected by Vanderbilt University. The nationally representative survey interviews about 1,500 Dominicans about their opinions regarding a wide range of political and social issues. Information on the socio-economic characteristics of respondents is also collected. Of

particular interest, the 2010 wave contains a battery of questions regarding Haitian immigration and information on the municipality of residence of respondents. It also asks respondents which party they would vote for if congressional elections were held on the interview day.

2.6.2.1 Methodology

To the greatest extent possible, I follow the approach of Dahlberg et al. (2012) who analyse the effect of ethnic diversity on preferences for redistribution in Sweden. I estimate linear probability model equations of the following form by 2SLS:

$$A_{i,m,r} = \mu_0 + \mu_1 . \frac{H_m}{P_m} + C'_{i,m} . \mu_2 + \varphi_r + \eta_{i,m,r} \qquad (2.6)$$

where *i*, *m,* and *r* denote individuals, municipalities, and regions respectively. $A_{i,m,r}$ refers to individual attitudes towards migrants or party preferences. $C_{i,m}$ is a vector of individual and municipality covariates, φ_r are region fixed-effects, μ_k are the parameters to be estimated, and $\eta_{i,m,r}$ is the error term. I estimate heteroskedasticy-robust standard errors clustered at the municipality level.

As before, the results obtained from estimating Equation (2.6) with OLS are certain to suffer from endogeneity issues. In an attempt to address these issues, the share of Haitians in the municipality population $\frac{H_m}{P_m}$ is instrumented with the inverse distance from the municipality centroid to the border with Haiti. While the instruments in the previous section were instrumenting changes, here an instrument for the levels is needed. The identifying assumption is that distance to the border has no effect on individual attitudes and voting intentions other than through the share of Haitians in the local population after controlling for region fixed effects and covariates. This is a rather strong assumption. Proximity to Haiti could be correlated with trade. Assuming trade and attitudes towards foreigners are positively correlated, my results could be underestimated. The results I discuss next are robust to controlling for the number of SEZ firms in operation. Proximity might also have a direct effect on attitudes towards Haitians, and in the regions near the border especially. Given the theoretical ambiguity with respect to the role of exposure and proximity in 'group threat' theories and the Contact Hypothesis, it is hard to anticipate the direction of any possible bias. The inclusion of region fixed-effects reduces the likelihood of bias however. First-stage least squares results indicate that distance to the border does a

reasonable job at predicting Haitian immigrant concentration with F-statistics on the excluded instrument ranging from 7.10 to 9.62 depending on the sample size (Appendix Table B.13).

2.6.2.2 Data

I focus on seven highly relevant survey questions to try to identify the channels at play. The first question deals with the issue of citizenship and asks respondents: "Do you agree with the children of Haitian immigrants born in the DR being Dominican citizens?" Answers can range from 1 (strongly disagree) to 7 (strongly agree). I dichotomise this variable with values {1,2,3} being now equal to 1 and the remaining answer values {4,5,6,7} set to 0. The new dummy variable effectively measures opposition to granting citizenship to Haitian second generation immigrants. The second question focuses on access to public services and asks: "Do you agree with the Dominican government offering social services to undocumented migrants?" Responses can vary between 1 (strongly agree) and 5 (strongly disagree). Once again? I dichotomise this variable with values {4,5} set to 1 and the rest {1,2,3} to 0. I also create a binary variable from the answers to the question: "The government should implement strong policies to reduce income inequality between the rich and the poor. To what extent do you agree or disagree with this statement?". Answers again range from 1 (strongly disagree) to 7 (strongly agree) and I assign a value of 1 to the responses {1,2,3}, and 0 otherwise. Next, I consider a question looking at immigrants and job competition. The phrasing goes as follows: "In general, would you say that people from other countries coming to live here do jobs Dominicans don't want to do (1), or take jobs away from Dominicans (2)?" I rescale the answers of the question to obtain an indicator variable equal to 1 if respondents believe Haitian migrants take jobs away from Dominicans, and zero otherwise. In addition, I exploit the responses to the following question on work permits: "To what extent do you agree with the government granting work permits to undocumented Haitians living in the Dominican Republic - 1 (strongly disagree); 7 (strongly agree)?". I dichotomize again the answers given to create a variable capturing opposition to work permits provision. All the binary indicators created so far are scaled to measure anti-Haitian attitudes, i.e., a value of 1 means more antagonistic attitudes. I also include a question on insecurity phrased as follows: "Speaking of the neighbourhood where you live and thinking about the possibility of being the victim of an assault or robbery, do you feel very secure, somewhat secure, somewhat insecure or very insecure?" I create a dummy equal to 1 for respondents feeling somewhat insecure or very insecure.

Last but not least, I take advantage of the following question: "If the congressional elections were held today, who would you vote for: PLD, PRD, others?" Based on answers provided, I create two indicator variables equal to one if the respondent stated voting for the PLD or the PRD, and zero otherwise. Appendix Table B.13 presents descriptive statistics of these variables. In the sample, 46.3% of the respondents declare disagreeing with second generation immigrants being Dominicans. Another 33.4% disagree with undocumented migrants accessing social services, while 40.7% think immigrants take natives' jobs. More than half of the respondents say they would vote for the PLD and only a fourth support the PRD.

To explain attitudes and voting intentions, I control for a set of explanatory variables commonly used in the literature on attitudes towards immigration (see e.g., O'Rourke and Sinnott 2006; Facchini et al. 2013). I try to use parsimony in the selection of controls and I restrict the list to covariates that are arguably the most exogenous. These consist of demographic characteristics, religious belief[19], and ethnicity controls. Summary statistics of these variables can also be found in Appendix Table B.12. In the sample, more than 67% of individuals self-identify as Mestizo, and another 10% identify as Black. Whites and Mulattos both represent about 10% of the sample. Only 1% does not identify as part of one of these four groups and is likely to be comprised of ethnic Chinese, Syrians and Lebanese. The average interviewed individual is 41 years old, has completed close to nine years of education, and lives in a household with three children. Half of the respondents are women (51.0%), slightly more than a fourth live in rural areas, and 22.5% report being married. In terms of religious beliefs, more than 60% of the individuals are Roman Catholics. Evangelists and Protestants respectively constitute 18.1% and 5.5% of the respondents. This is line with national averages.

2.6.2.3 Findings

Results on voting intentions are reported in Table 2.10. The first two columns consider voting intentions for the PLD as explained variable. The last two columns focus on intentions to vote for the PRD. For each dependent variable I report OLS and 2SLS estimates. Haitian migrant concentration appears to have a strong, positive and statistically significant effect on the probability to vote for the migrant-hostile PLD. The coefficient point estimates indicate that a 1 pp increase in the share of Haitians in the municipality

[19] Exposure to migrants could affect religious beliefs. The results in this section are robust to the exclusion of religion related covariates.

population is linked with a 13.6 pp higher probability of supporting the right-wing PLD. On the contrary, higher migrant presence is associated with a lower probability of supporting the PRD. These results are consistent with the previous findings reported in section 5. The 2SLS estimates are larger than the OLS estimates in both cases. This finding can be explained by attenuation bias stemming from measurement error as well as reverse causation with migrants avoiding highly hostile municipalities.

Table 2.11 reports the estimated effect of Haitian immigration on attitudes. I begin with the labour market channel. Greater migrant concentration is found to have a positive and significant effect at the 10% level on the likelihood of believing that immigrants take jobs from natives. However, exposure to immigration does not affect views on work permits provision (columns 1 to 4). Again the evidence in favour of this channel is weak at best. Looking at the welfare state channel next, Haitian concentration does not appear to influence opinions on whether undocumented migrants should be allowed to access social benefits. It does not affect preferences towards redistribution either (see columns 5 to 8). This is perhaps not too surprising since Haitians have been excluded so far from the provision of most social services. As such, immigrants do not represent a threat to natives' access to welfare programs. Opinions on the citizenship rights of second generation Haitian immigrants are found to be strongly influenced by the local presence of Haitians. Greater migrant concentration is associated with a higher and statistically significant probability of disagreeing with granting citizenship on *jus soli* grounds to children with Haitian parents (column 9). This suggests natives might worry about the influence Haitians could have on political outcomes and cultural identity in the long run. Lastly, exposure to Haitians does not appear to affect feelings of insecurity. This is consistent with the earlier results.

In sum, these results tend to confirm the previous findings based on election results and interaction terms. Given the cross-sectional nature of the data analysed in this section and the various issues characterising opinion surveys (see e.g., Bertrand and Mullainathan 2001), the evidence presented in this section is not as solid as the election results described earlier. Some interesting patterns still emerge from the data and suggest that the welfare state channel might not be the primary concern driving attitudes towards Haitian migrants and electoral preferences. Labour market competition is found to have an ambiguous influence on individual attitudes but overall does not seem to be the primary concern of Dominicans either. Citizenship rights, political equilibria, and plausibly cultural identity

seem to be the most important channels shaping Dominican electoral behaviour and individual attitudes. This result is consistent with anecdotal evidence and findings reported by anthropologists, political scientists and sociologists studying the Dominican case (see e.g, Sagás 2000; Howard 2001; Morgan et al. 2011). Finally, the PLD and its coalition seems to be seen as the political party natives turn to in order to express their concerns over Haitian immigration and citizenship issues.

2.7 Conclusion

This paper analyses the impact of immigration on electoral outcomes in the DR. In recent years the DR has experienced large inflows of immigrants from neighbouring Haiti. Immigration is also a highly salient issue in the country and as such this setting offers a very exciting context to study this question. The analysis is based on a municipality panel dataset comprising presidential and congressional elections results as well as two census waves. I account for the endogeneity of Haitian immigrant location decisions with two different instrumental variables exploiting exogenous migration push factors.

I find robust evidence that immigration impacts voting behaviour and election results. In municipalities with larger stocks of Haitian migrants, natives are more inclined to vote for the right-wing coalition characterized by a more negative stance towards Haitians. The popularity of the main far right political party also increases in such municipalities. At the same time, greater population diversity has a significantly negative effect on the electoral success of the main rival coalition party with a centre-left political agenda. The analysis of mechanisms based on election data and opinion surveys suggests that the main channels through which immigration impacts voting are citizenship rights and political competition, as well as cultural identity.

These results suggest that the spatial distribution of Haitian migrants may have important consequences in terms of local political outcomes and the degree of hostility of natives towards foreigners. Given the importance of Haitian migrants for the proper functioning of the Dominican economy, results here underline the risk of inflammatory anti-migrant political rhetoric and policies. Further, the paper provides empirical evidence that immigration is not only a salient social issue specific to developed countries. It shows that in developing countries, voters tend to behave in a similar manner as in industrialised countries when exposed to migrant populations. In terms of external validity, it speaks to

other democratic developing countries experiencing immigration from countries with cultural and linguistic differences. Overall, I shed light on an important social consequence of immigration and open the door to further analysing it in developing country settings.

2.8 Main Tables & Figures

Tables

Table 2.1: Immigration in the Dominican Republic

	2002	2010
	Total country population	
Total Dominican population	8,562,541	9,445,281
Born in the DR	8,466,308	9,058,779
Foreign-born	96,233	386,502
	Haitian immigrant population in the DR	
Born in Haiti	61,863	311,969
Share of total country population	0.72%	3.30%
Share of immigrant population	64.28%	80.72%

Data source: ONE 2002 and 2010 national censuses

Table 2.2: First stage least squares results

	(1)	(2)	(3)	(4)
	Dependent variable: Haitian migrants stock (%)			
IV: distance weighted population growth	0.581***	0.748**		
	(0.144)	(0.289)		
IV: inverse distance to quake epicentre			1.190***	1.534***
			(0.295)	(0.534)
Dependency ratio (%)	-1.345***	-0.413	-1.586***	-0.273
	(0.406)	(0.440)	(0.372)	(0.485)
Secondary education (%)	-0.551**	0.0115	-0.578**	0.0522
	(0.255)	(0.390)	(0.243)	(0.368)
Tertiary education (%)	-1.834***	-1.420***	-2.052***	-1.518***
	(0.416)	(0.448)	(0.400)	(0.463)
Unemployment rate (%)	-0.163	-0.0726	0.0212	-0.0548
	(0.143)	(0.183)	(0.135)	(0.167)
Agriculture employment (%)	-0.352***	-0.195	-0.424***	-0.244*
	(0.107)	(0.125)	(0.117)	(0.135)
Manufacturing employment (%)	-0.338***	-0.477***	-0.375***	-0.472***
	(0.114)	(0.107)	(0.109)	(0.110)
Municipality population (000's)	0.0161***	0.0187***	0.0161***	0.0184***
	(0.00470)	(0.00455)	(0.00429)	(0.00434)
IV F-statistic	16.25	6.69	16.32	8.24
Region FE		Y		Y
Number of municipalities	134	134	134	134
R-squared	0.642	0.728	0.668	0.740

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table 2.3: Presidential Election Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	PLD coalition vote share			PRD coalition vote share			FNP vote share		
	FD	FD-2SLS		FD	FD-2SLS		FD	FD-2SLS	
Haitian immigrants	0.289	1.643**	1.347**	0.194	-0.331	-0.226	0.0213	0.111*	0.113*
	(0.217)	(0.646)	(0.553)	(0.132)	(0.405)	(0.371)	(0.0179)	(0.0636)	(0.0584)
Dependency ratio (%)	-1.638*	-0.316	-0.605	-0.240	-0.754	-0.650	-0.0690	0.0185	0.0200
	(0.982)	(1.143)	(1.087)	(0.708)	(0.713)	(0.697)	(0.0903)	(0.125)	(0.120)
Secondary education (%)	-1.411**	-1.681*	-1.622*	0.333	0.437	0.416	-0.0461	-0.0639	-0.0642
	(0.682)	(1.016)	(0.915)	(0.532)	(0.645)	(0.612)	(0.0737)	(0.0694)	(0.0699)
Tertiary education (%)	-0.538	1.327	0.920	1.693***	0.969	1.115*	0.0245	0.148	0.150
	(0.738)	(1.083)	(0.981)	(0.559)	(0.694)	(0.661)	(0.0887)	(0.134)	(0.128)
Unemployment rate (%)	0.276	0.385	0.361	-0.185	-0.228	-0.219	0.0102	0.0175	0.0176
	(0.226)	(0.382)	(0.341)	(0.200)	(0.232)	(0.221)	(0.0280)	(0.0335)	(0.0336)
Agriculture employment (%)	-0.250	-0.0608	-0.102	-0.128	-0.202	-0.187	-0.0222	-0.00964	-0.00942
	(0.253)	(0.326)	(0.299)	(0.216)	(0.211)	(0.205)	(0.0208)	(0.0228)	(0.0220)
Manufacture employment (%)	-0.243	0.498	0.336	-0.0530	-0.341	-0.283	0.0202	0.0692	0.0701
	(0.214)	(0.382)	(0.334)	(0.170)	(0.230)	(0.218)	(0.0269)	(0.0515)	(0.0487)
Municipality population (000's)	-0.0206	-0.0460**	-0.0405**	0.00813	0.0180	0.0160	-0.000181	-0.00186	-0.00189
	(0.0132)	(0.0197)	(0.0179)	(0.0147)	(0.0171)	(0.0165)	(0.00114)	(0.00169)	(0.00161)
IV: population growth		Y			Y			Y	
IV: distance to epicentre			Y			Y			Y
Kleibergen-Paap F-statistic		6.69	8.24		6.69	8.24		6.69	8.24
Region FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Number of municipalities		134	134		134	134		134	134
R-squared	0.474			0.846			0.160		

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table 2.4: Congressional election results

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	PLD coalition vote share			PRD coalition vote share		
	FD	FD-2SLS		FD	FD-2SLS	
Haitian immigrants	0.432	2.165**	2.085**	0.00765	-1.220**	-0.974**
	(0.392)	(0.857)	(0.839)	(0.142)	(0.578)	(0.474)
Dependency ratio (%)	-5.419**	-3.727	-3.805	0.572	-0.627	-0.386
	(2.215)	(2.575)	(2.560)	(0.950)	(1.125)	(1.066)
Secondary education (%)	-0.522	-0.867	-0.851	0.284	0.528	0.479
	(1.103)	(1.355)	(1.322)	(0.605)	(0.746)	(0.678)
Tertiary education (%)	-0.00665	2.381	2.270	0.354	-1.337	-0.998
	(1.572)	(1.996)	(1.977)	(0.791)	(1.044)	(0.941)
Unemployment rate (%)	-0.425	-0.285	-0.291	0.141	0.0415	0.0614
	(0.478)	(0.622)	(0.618)	(0.221)	(0.341)	(0.310)
Agriculture employment (%)	0.0841	0.326	0.315	-0.451**	-0.622**	-0.588**
	(0.439)	(0.543)	(0.537)	(0.224)	(0.295)	(0.271)
Manufacturing employment (%)	-1.080***	-0.131	-0.175	-0.273	-0.946**	-0.811**
	(0.355)	(0.614)	(0.598)	(0.206)	(0.386)	(0.325)
Municipality population (000's)	-0.0719**	-0.104***	-0.103***	0.0308***	0.0538***	0.0492***
	(0.0280)	(0.0306)	(0.0299)	(0.0116)	(0.0152)	(0.0136)
IV: population growth		Y			Y	
IV: distance to epicentre			Y			Y
Kleibergen-Paap F-statistic		6.69	8.24		6.69	8.24
Region FE	Y	Y	Y	Y	Y	Y
Number of observations	134	134	134	134	134	134
R-squared	0.910			0.480		

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table 2.5: Presidential election turnout

	(1)	(2)	(3)
	Dependent variable: Turnout		
	FD	FD-2SLS	
Haitian immigrants	-0.0434	-0.171	-0.195
	(0.0490)	(0.141)	(0.125)
Dependency ratio (%)	0.907	0.782	0.758
	(0.580)	(0.586)	(0.582)
Secondary education (%)	0.479	0.505	0.509
	(0.403)	(0.383)	(0.386)
Tertiary education (%)	-0.00412	-0.180	-0.213
	(0.307)	(0.345)	(0.334)
Unemployment rate (%)	-0.168**	-0.178***	-0.180***
	(0.0811)	(0.0688)	(0.0679)
Agriculture employment (%)	-0.0900	-0.108	-0.111
	(0.0734)	(0.0724)	(0.0731)
Manufacturing employment (%)	-0.102	-0.172**	-0.186**
	(0.0760)	(0.0730)	(0.0753)
Municipality population (000's)	0.000708	0.00310	0.00356
	(0.00357)	(0.00410)	(0.00390)
IV: population growth		Y	
IV: distance to epicentre			Y
Kleibergen-Paap F-statistic		6.69	8.24
Region FE	Y	Y	Y
Number of municipalities	134	134	134
R-squared	0.515		

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table 2.6: FNP vote - sensitivity checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sensitivity check:	Special Economic Zone firms		Distance to the border		Weighted regressions		Overidentified regressions	
	2SLS		2SLS		2SLS		2SLS	LIML
Haitian immigrants	0.112*	0.113*	0.128*	0.126**	0.135	0.144*	0.114**	0.114**
	(0.0652)	(0.0595)	(0.0692)	(0.0636)	(0.0881)	(0.0864)	(0.0569)	(0.0569)
IV: population growth	Y		Y		Y		Y	
IV: distance to epicentre		Y		Y		Y		Y
Kleibergen-Paap F-stat.	6.24	7.77	7.91	10.22	5.65	5.43	4.30	4.30
Region FE	Y	Y	Y	Y	Y	Y	Y	Y
Covariates	Y	Y	Y	Y	Y	Y	Y	Y
Nb of municipalities	134	134	134	134	134	134	134	134

Notes: Dependent variable is FP vote share in presidential elections. Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table 2.7: Native flight regressions

	(1)	(2)	(3)
	Dependent variable: Native population		
	FD	FD-2SLS	
Haitian immigrants	0.461	-1.271	-0.540
	(0.456)	(1.031)	(0.947)
IV: distance population growth		Y	
IV: distance to epicentre			Y
Kleibergen-Paap F-statistic		6.69	8.24
Region FE	Y	Y	Y
Covariates	Y	Y	Y
Number of municipalities	134	134	134
R-squared	0.445		

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table 2.8: Immigration and local characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dependent variable: PLD coalition vote share								
Haitian immigrants	1.311**	2.457	4.433	1.849***	4.140	2.488	8.109***	1.538***	1.320**
	(0.512)	(1.824)	(4.445)	(0.715)	(4.460)	(1.660)	(1.097)	(0.582)	(0.592)
Haitian imm. * municipality population	-0.00776***								
	(0.00250)								
Haitian imm. * elderly population		-0.167							
		(0.299)							
Haitian imm. * dependency ratio			-0.0671						
			(0.0984)						
Haitian imm. * agriculture employment				-0.0313					
				(0.0295)					
Haitian imm. * primary education					-0.0582				
					(0.0933)				
Haitian imm. * unemployment rate						-0.0588			
						(0.0815)			
Haitian imm. * initial PLD coalition vote							-0.178***		
							(0.0336)		
Haitian imm. * political competition								-0.112***	
								(0.0208)	
Haitian imm. * homicide rate									-0.0593
									(0.251)
Cragg-Donald F statistic	11.47	13.36	7.33	11.76	11.87	7.07	6.28	8.79	2.97
Kleibergen-Paap F statistic	4.01	5.31	7.46	4.14	4.21	5.31	5.64	4.11	2.55
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Number of municipalities	134	134	134	134	134	134	134	134	134

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table 2.9: Native unemployment rate

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Specification:	Main specification	Main specification		SEZ firms		Distance to the border	
	FD	FD-2SLS		FD-2SLS		FD-2SLS	
Haitian immigrants	-0.0236	0.280	0.104	0.299	0.116	0.104	-0.0432
	(0.0925)	(0.270)	(0.222)	(0.279)	(0.223)	(0.220)	(0.203)
IV: population growth		Y		Y		Y	
IV: distance to epicentre			Y		Y		Y
Kleibergen-Paap F-statistic		6.69	8.24	6.24	7.77	7.91	10.22
Region FE	Y	Y	Y	Y	Y	Y	Y
Covariates	Y	Y	Y	Y	Y	Y	Y
Number of municipalities	134	134	134	134	134	134	134

Notes: Dependent variable is native unemployment rate. Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table 2.10: Opinion survey - voting intentions

	(1)	(2)	(3)	(4)
Dependent variable:	PLD vote		PRD vote	
	OLS	2SLS	OLS	2SLS
Haitian immigrants	0.00652	0.136***	-0.0137*	-0.115***
	(0.00778)	(0.0410)	(0.00733)	(0.0336)
Covariates	Y	Y	Y	Y
Region FE	Y	Y	Y	Y
Kleibergen-Paap F statistic		7.10		7.10
Observations	1,154	1,154	1,154	1,154
R-squared	0.036		0.039	

Notes: OLS and 2SLS estimates. Robust standard errors clustered at the municipality level in parentheses. LAPOP 2010 individual opinion survey. Haitian immigrant population instrumented with inverse distance to border. Variables described in text. *** p<0.01, ** p<0.05, * p<0.1.

Table 2.11: Opinion survey - channels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Channels:	Labour market competition				Welfare state - tax burden				Citizenship and identity		Violence and insecurity	
Dependent variable:	Job competition		Work permits		Public services		Redistribution		Citizenship		Insecurity	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Haitian migrants	-0.00400	0.0387*	0.00962	-0.0466	0.00640	-0.000323	-0.00103	0.0121	0.00889	0.0560**	-0.0132	0.0109
	(0.00681)	(0.0213)	(0.00757)	(0.0306)	(0.00706)	(0.0190)	(0.00341)	(0.0108)	(0.00743)	(0.0237)	(0.00877)	(0.0225)
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
K-P F-stat.		9.62		7.49		9.07		9.61		7.44		8.70
Observations	1,317	1,317	1,395	1,395	1,396	1,396	1,375	1,375	1,399	1,399	1,418	1,418
R-squared	0.070		0.054		0.060		0.029		0.065		0.034	

Notes: OLS and 2SLS estimates. Robust standard errors clustered at the municipality level in parentheses. LAPOP 2010 individual opinion survey. Haitian immigrant population instrumented with inverse distance to border. Variables described in text. *** p<0.01, ** p<0.05, * p<0.1.

Figures

Figure 2.1: Growth divergence

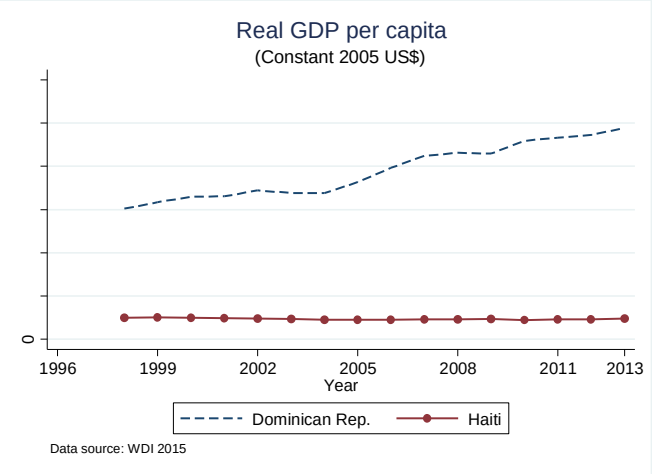


Figure 2.2: Political (in)stability

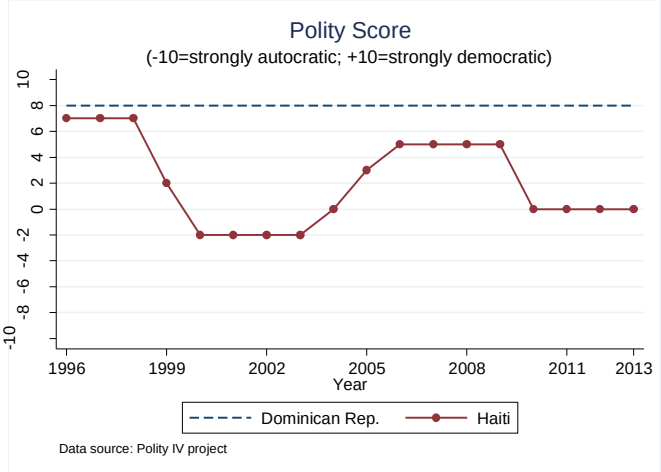


Figure 2.3: Haitian population growth

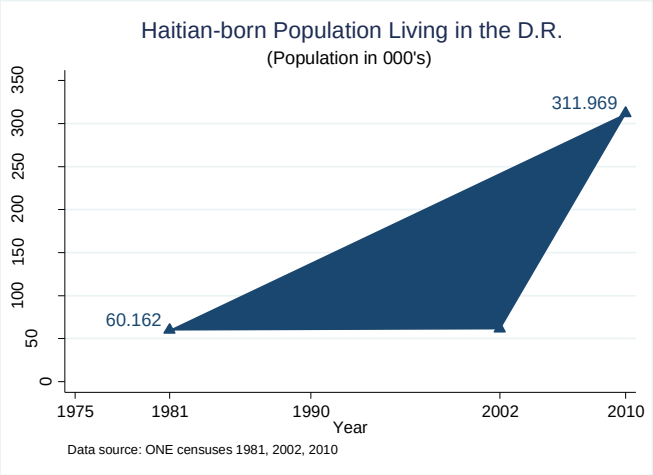


Figure 2.4: Haitian immigrant population per destination municipality (2010 Census)

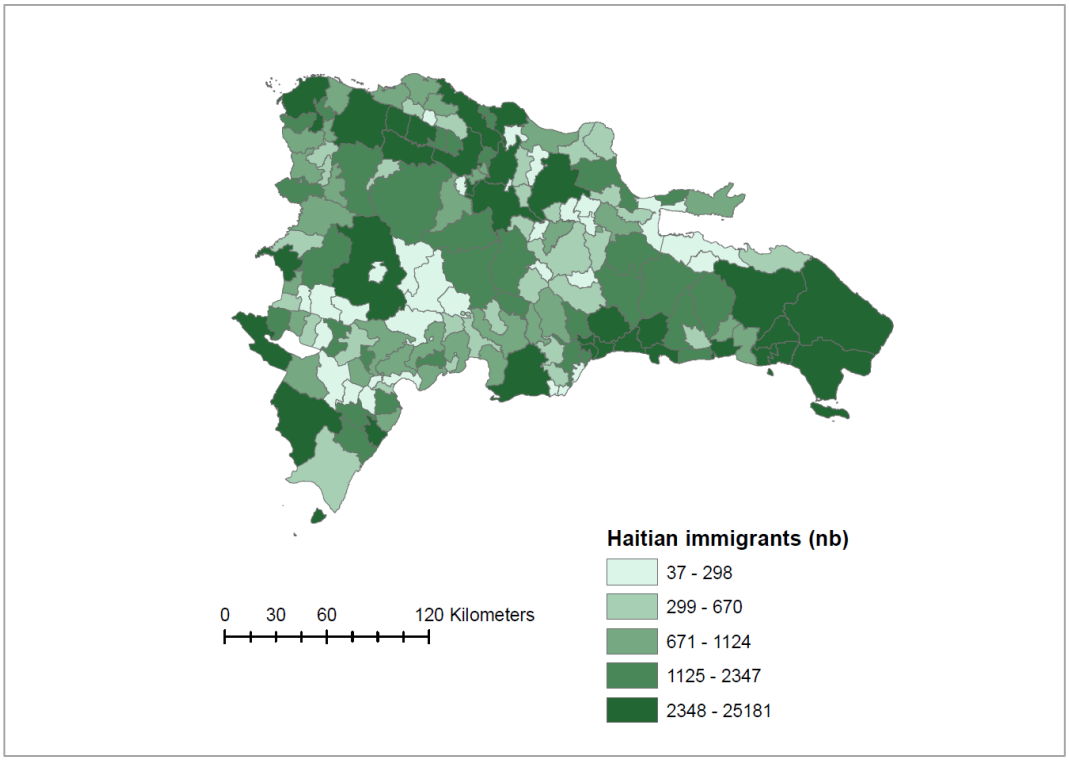


Figure 2.5: Haitian immigrant population per destination municipality (2010 Census)

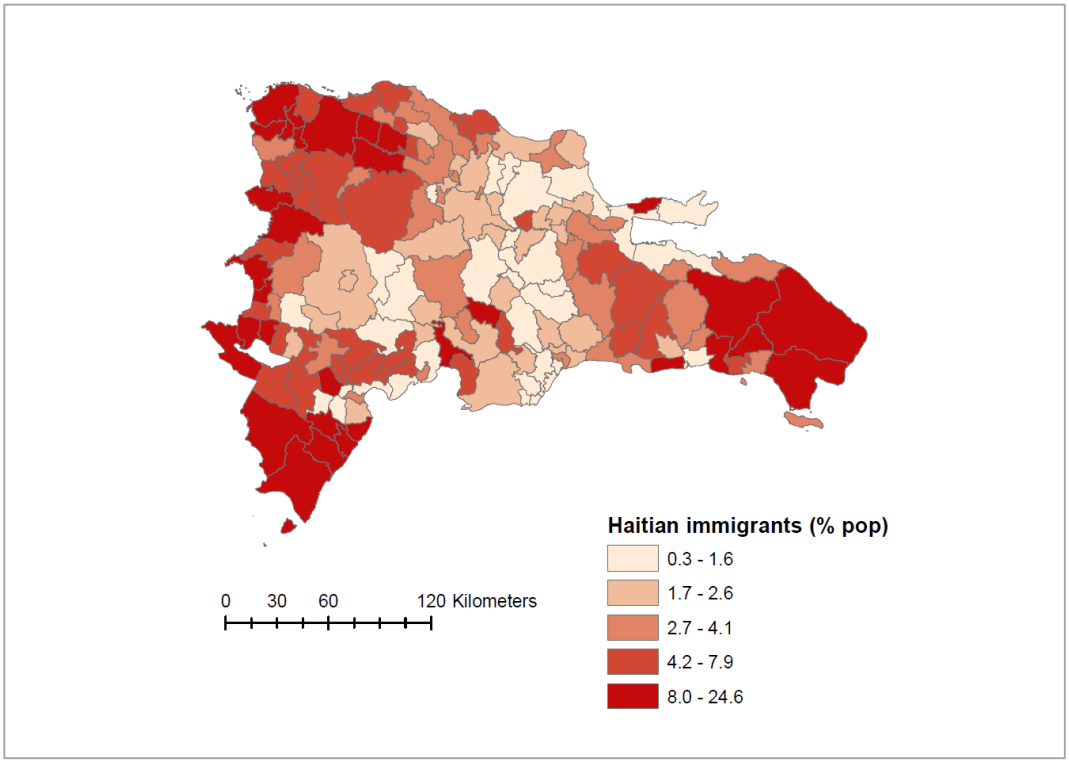


Figure 2.6: Haitian emigration (1/2)

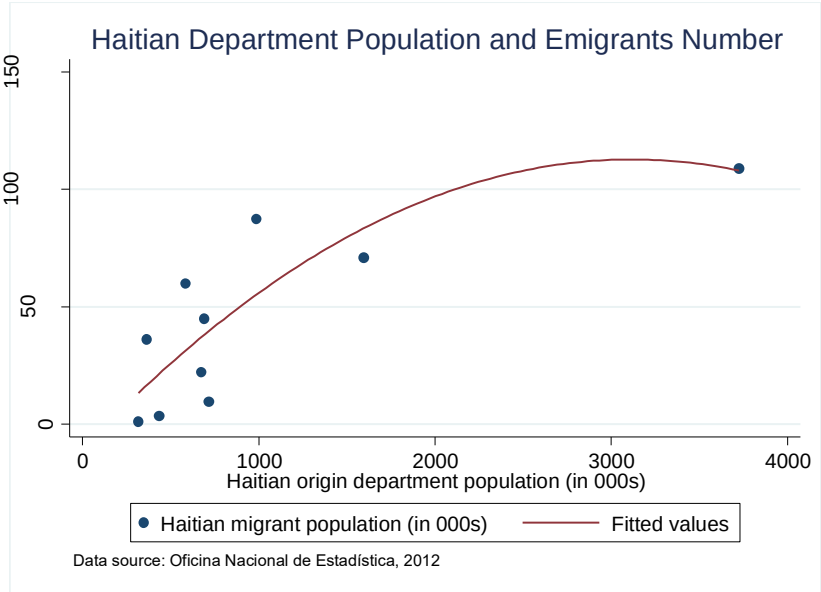


Figure 2.7: Haitian emigration (2/2)

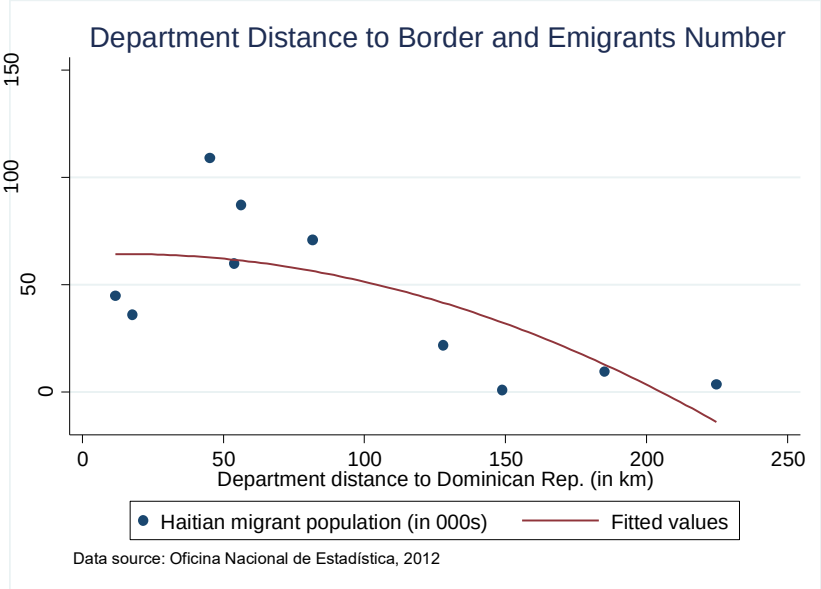


Figure 2.8: Presidential election outcomes

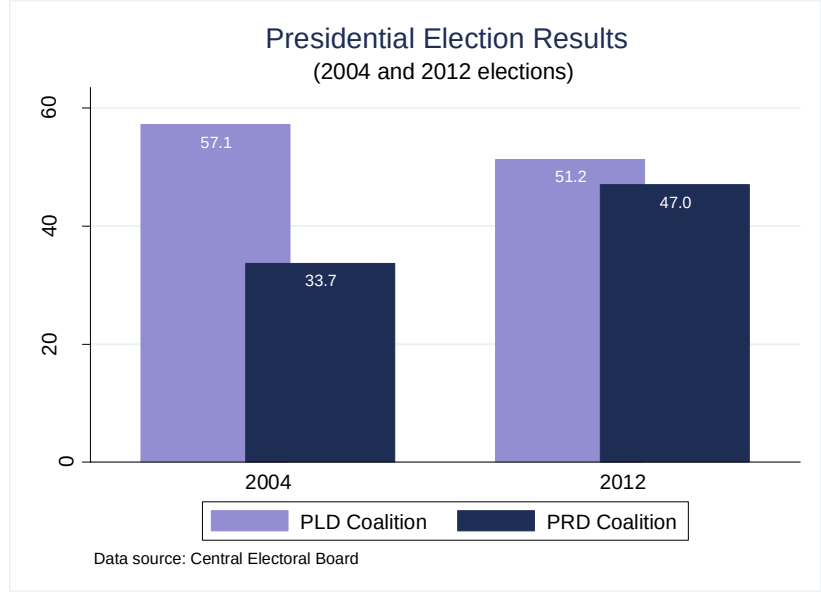


Figure 2.9. 2012 Presidential election outcomes

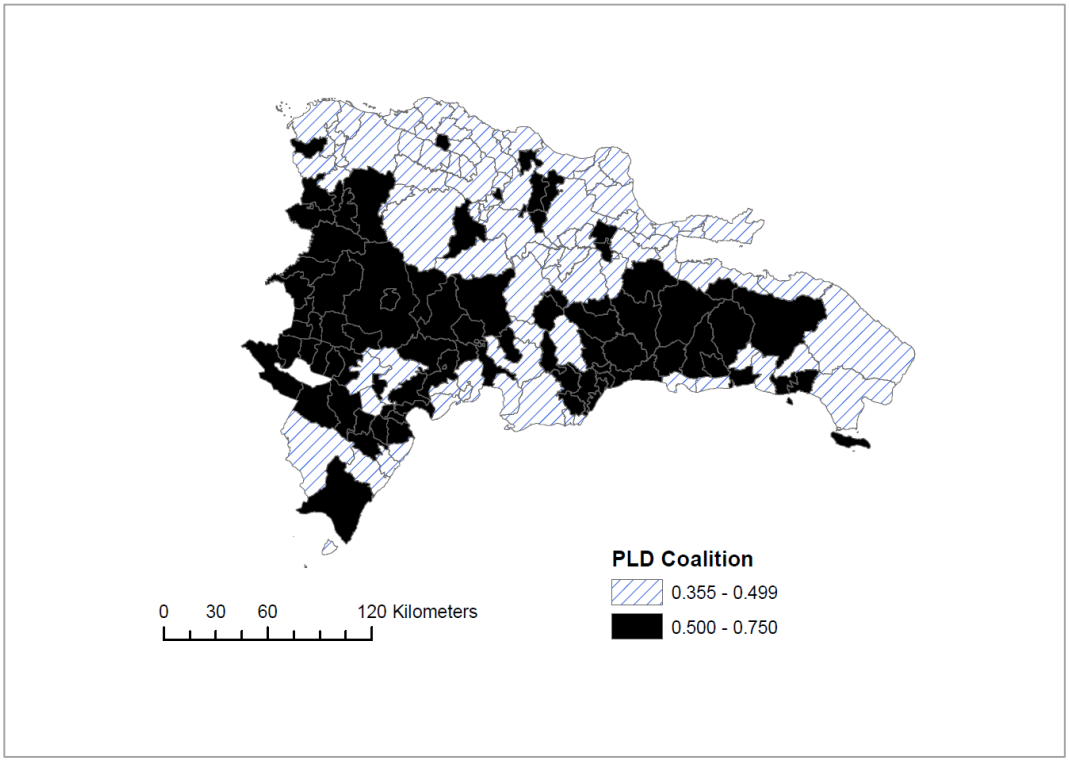


Figure 2.10: Right-wing vote shares and Haitian immigration

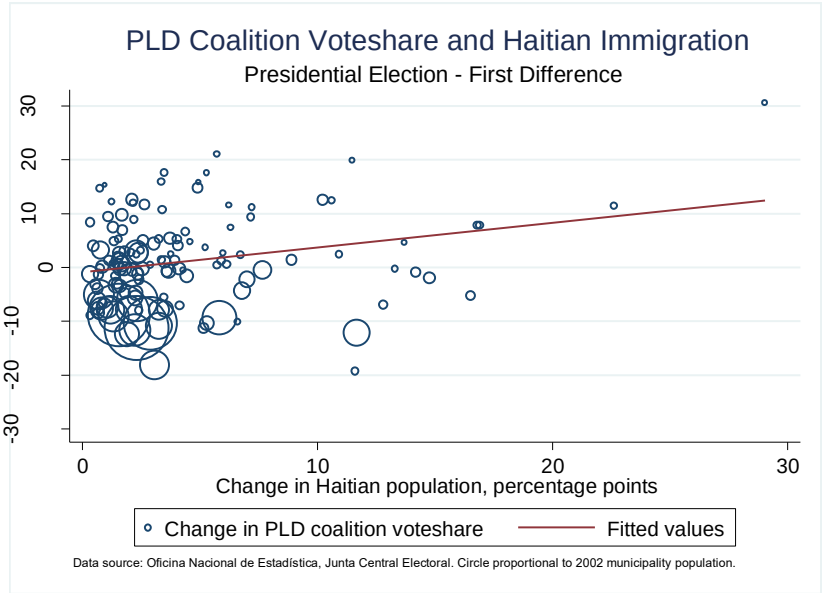


Figure 2.11: Centre coalition vote shares and Haitian immigration

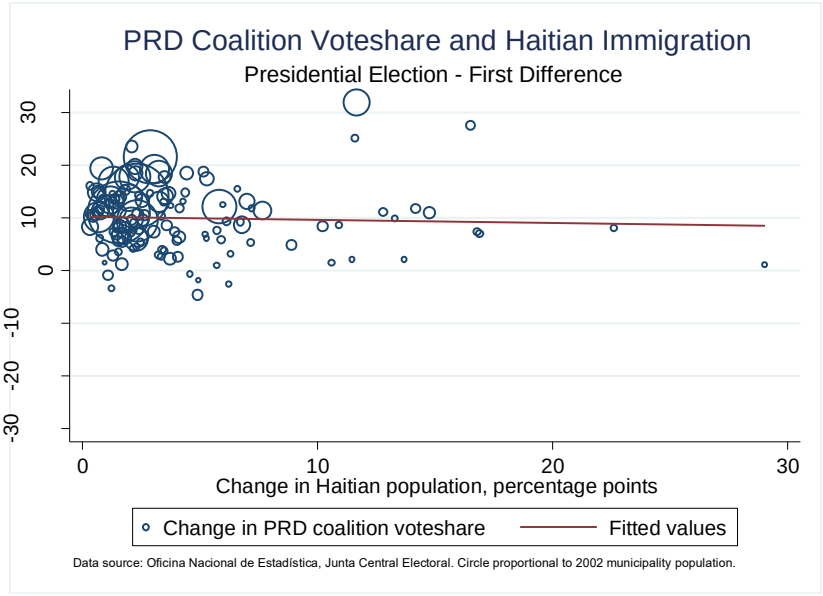


Figure 2.12: Haitian *départements* and Dominican municipalities

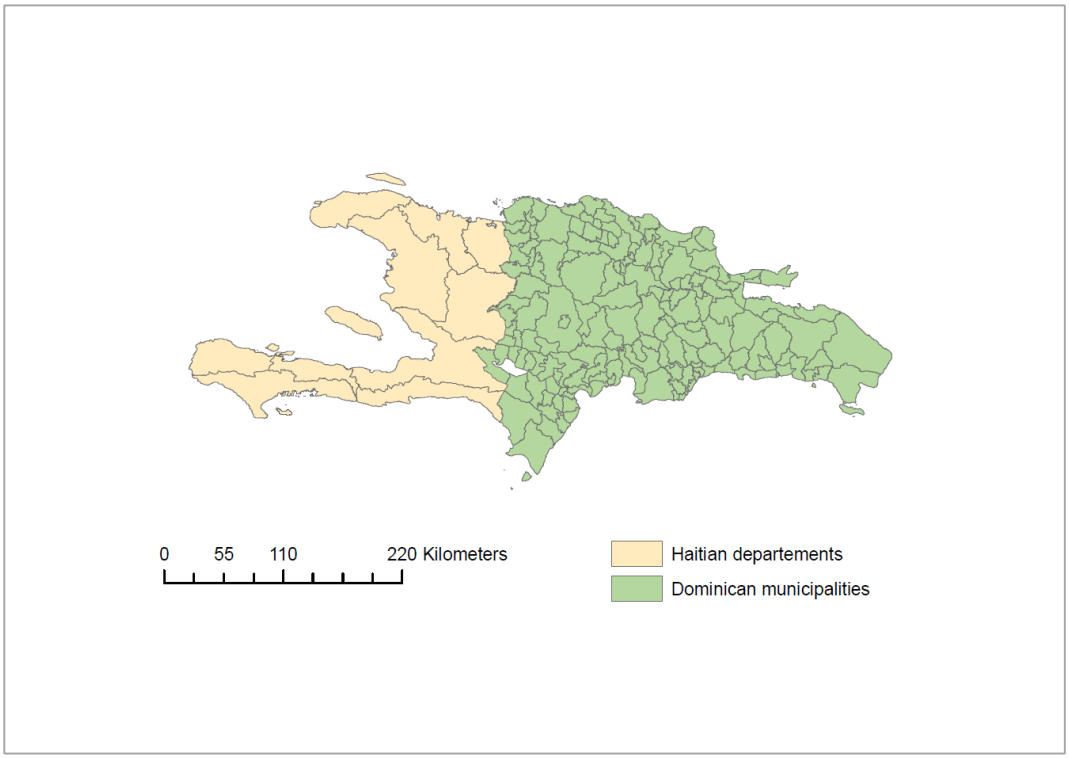
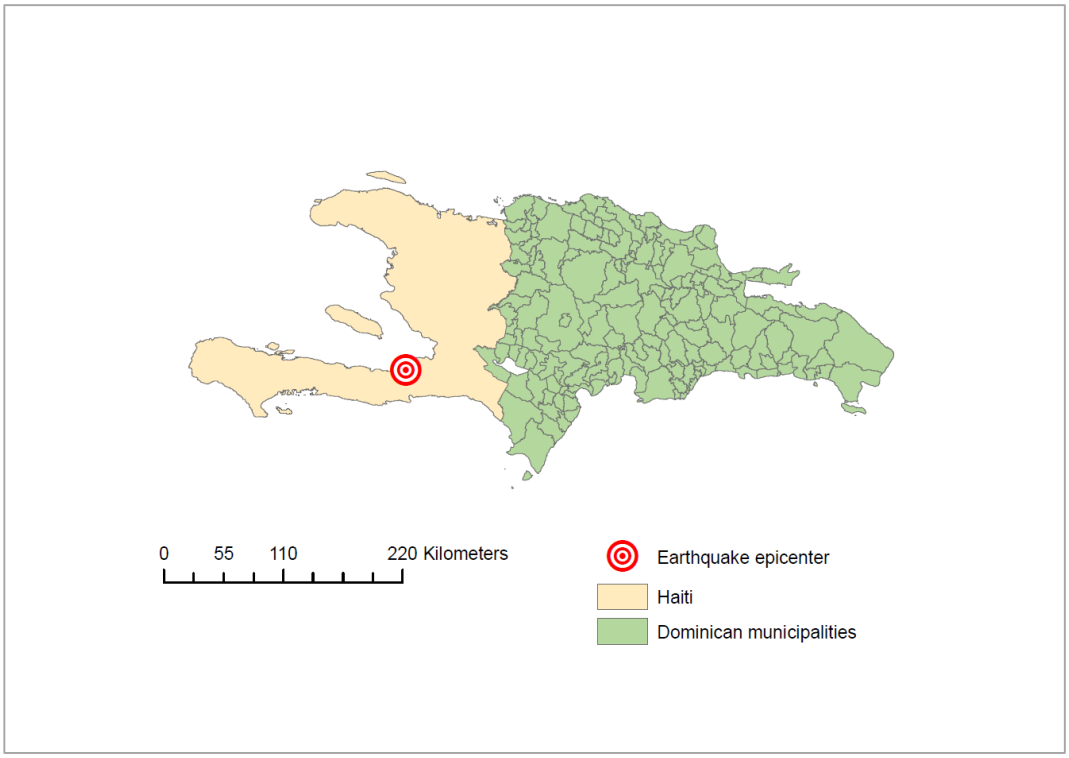


Figure 2.13: January 2010 earthquake instrumental variable



Appendix B

Invasive Neighbours.

Appendix Tables

Table B.1: Origin of immigrants – Top ten source countries

	Number of migrants
Haiti	311,969
US	24,457
Spain	6,691
Puerto-Rico	5,763
Venezuela	5,132
Cuba	3,639
Italy	3,595
Colombia	3,416
France	1,936
Germany	1,574

Data source: ONE 2010 Census.

Table B.2: Summary statistics – Dominican natives and Haitian immigrants

	Dominicans	Haitians
Demographics:		
Age	28.5	29.4
	(20.5)	(14.2)
Female (%)	50.3	37.6
Urban status (%)	74.7	59.6
Years of schooling (16-64 population)	8.8	4.2
	(4.9)	(4.6)
Secondary education completed (%, 16-64 population)	26.4	8.6
Tertiary education completed (%, 16-64 population)	9.4	1.1
Employed (%, 16-64 population)	48.4	59.3
Unemployed (%, 16-64 population)	9.1	8.3
Inactive (%, 16-64 population)	41.1	31.3
Occupational composition of employment (%):		
Legislators, senior officials and managers	2.1	0.3
Professionals	6.5	0.7
Technicians and associate professionals	6.4	0.9
Clerks	8.2	0.9
Service workers and shop and market sales	25.5	17.9
Skilled agricultural and fishery workers	6.3	18.5
Crafts and related trades workers	14.6	22.2
Plant and machine operators and assemblers	10.8	2.5
Elementary occupations	18.6	36.1
Armed forces	1.0	0.0
Industrial composition of employment (%):		
Agriculture, fishing, and forestry	8.4	35.1
Manufacturing	12.9	8.0
Construction	6.0	20.1
Wholesale and retail trade	24.3	18.4
Hotels and restaurants	4.8	3.3
Transportation and communications	6.4	1.5
Public administration and defence	5.1	0.3
Education	5.1	0.8
Private household services	8.7	7.7
Other	18.4	4.8

Data source: 2010 census.

Table B.3: Value differences between PLD and PRD sympathisers

	PRD sympathisers		PLD sympathisers		Mean differences	
	Mean	N	Mean	N	|t-test|	p-value
Political ideology 1-10 scale [1=far-left ; 10=far-right]	6.103	185	7.245	441	4.55	0.000
Religion importance in one's life 1-4 scale [1=not at all; 4=very]	2.635	222	2.732	530	1.89	0.059
Self-identify as 'having a black skin' [1=yes ; 0=no]	0.104	221	0.069	524	1.63	0.103
Family abroad [1=yes ; 0=no]	0.353	221	0.247	531	2.98	0.000

Notes: LAPOP 2010 survey data. See description in text.

Table B.4: PLD and PRD coalitions results (in %)

2004 Presidential Elections			
PRD Coalition	33.65	PLD Coalition	57.10
Partido Revolucionario Dominicano (PRD)	30.67	Partido de la Liberacion Dominicana (PLD)	49.01
Partido Quisqueyano Democrata Cristiano (PQDC)	0.76	Bloque Institucional Social Democrata (BIS)	2.72
Partido Renacentista Nacional (PRN)	0.31	Partido Alianza por la Democracia (APD)	2.34
Partido de Unidad Nacional (PUN)	1.24	Partido de los Trajadores Dominicanos (PTD)	0.68
Unidad Democratica (UD)	0.52	Partido Union Democrata Cristiana (UDC)	0.89
Partido Humanista Dominicano (PHD)	0.15	Partido Liberal de la Republica Dominicana (PLRD)	0.39
		Fuerza Nacional Progresista (FNP)	1.07

2012 Presidential Elections			
PRD Coalition	46.95	PLD Coalition	51.19
Partido Revolucionario Dominicano (PRD)	42.13	Partido de la Liberacion Dominicana (PLD)	37.73
Partido Movimiento Democratico Alternativo (MODA)	2.02	Partido Reformista Social Cristiano (PRSC)	5.87
Partido Revolucionario Social Democrata (PRSD)	1.36	Bloque Institucional Social Democrata (BIS)	1.59
Partido Humanista Dominicano (PHD)	0.76	Partido Union Democrata Cristiana (UDC)	0.78
Partido Democrata Institucional (PDI)	0.26	Partido Quisqueyano Democrata Cristiano (PQDC)	1.32
Partido Alianza Social Dominicana (ASD)	0.42	Fuerza Nacional Progresista (FNP)	0.73
		Partido de los Trajadores Dominicanos (PTD)	0.57
		Partido Popular Cristiano (PPC)	0.49
		Partido Democrata Popular (PDP)	0.21
		Partido Civico Renovador (PCR)	0.59
		Partido de Unidad Nacional (PUN)	0.27
		Partido Liberal de la Republica Dominicana (PLRD)	0.26
		Partido Accion Liberal (PAL)	0.46
		Partido Social Verde (PASOVE)	0.32

Source: Central Electoral Board (JCE)

Table B.5: Summary statistics

	Obs.	Mean	Std. Dev.	Min	Max
Presidential election outcomes					
PRD coalition vote share	268	43.70	7.41	23.30	63.47
PRD party vote share	268	39.47	6.62	21.25	57.19
PLD coalition vote share	268	49.88	6.55	30.60	72.15
PLD party vote share	268	38.59	7.47	17.69	62.00
Participation rate (turnout)	268	76.54	4.61	58.33	86.81
Covariates					
Haitian immigrants (in % of population)	268	3.10	4.02	0.00	24.63
Haitian immigrants (in % of 2002 population)	268	3.23	4.47	0.00	29.50
Dependency ratio	268	42.17	3.82	34.23	52.58
Secondary education	268	23.06	4.79	11.63	33.52
Tertiary education	268	8.26	3.83	2.50	29.64
Unemployment rate	268	12.00	4.83	4.70	32.30
Agriculture sector employment	268	18.41	13.17	0.41	64.93
Manufacturing sector employment	268	6.73	6.00	0.14	29.94
Municipality population (in 000s)	268	67.19	145.76	4.70	992.85

Data sources: Central Electoral Board and National Office for Statistics. Census data: 2002 and 2010. Presidential elections of 2004 and 2012.

Table B.6: Dominican international trade - 2007-2013 period

Partner / Trade flow	Total trade	Exports	Imports
World (US$ - 000s)	20,997,705	6,228,356	14,769,350
Haiti (US$ - 000s)	804,345	782,292	22,053
Haiti (in % of world trade flow)	3.8	12.6	0.1

Source: UN COMTRADE. Average for 2007-2013 period.

Table B.7: No outliers

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	PLD coalition vote share			PRD coalition vote share		
	Panel A. Presidential election results					
	FD	FD-2SLS		FD	FD-2SLS	
Haitian immigrants	0.214	2.675**	3.008**	0.114	-0.878	-1.105
	(0.280)	(1.078)	(1.276)	(0.260)	(0.746)	(0.923)
	Panel B. Congressional election results					
	FD	FD-2SLS		FD	FD-2SLS	
Haitian immigrants	0.382	3.063**	4.253**	-0.137	-1.919**	-2.247**
	(0.300)	(1.350)	(1.730)	(0.225)	(0.835)	(0.986)
IV: population growth		Y			Y	
IV: distance to epicentre			Y			Y
Kleibergen-Paap F-statistic		9.72	7.74		9.72	7.74
Region FE	Y	Y	Y	Y	Y	Y
Covariates	Y	Y	Y	Y	Y	Y
Number of municipalities	127	127	127	127	127	127

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table B.8: Special economic zones

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	PLD coalition vote share			PRD coalition vote share		
	Panel A. Presidential election results					
	FD	FD-2SLS		FD	FD-2SLS	
Haitian immigrants	0.270	1.614**	1.326**	0.213	-0.297	-0.201
	(0.233)	(0.630)	(0.536)	(0.141)	(0.392)	(0.358)
SEZ firms	-0.265*	-0.201	-0.215	0.267***	0.242**	0.247**
	(0.136)	(0.167)	(0.153)	(0.0978)	(0.101)	(0.0984)
	Panel B. Congressional election results					
	FD	FD-2SLS		FD	FD-2SLS	
Haitian immigrants	0.386	2.083***	2.027***	0.00788	-1.228**	-0.978**
	(0.437)	(0.801)	(0.781)	(0.141)	(0.595)	(0.484)
SEZ firms	-0.651***	-0.569**	-0.572***	0.00326	-0.0561	-0.0441
	(0.203)	(0.224)	(0.220)	(0.168)	(0.181)	(0.171)
IV: population growth		Y			Y	
IV: distance to epicentre			Y			Y
Kleibergen-Paap F-statistic		6.24	7.77		6.24	7.77
Region FE	Y	Y	Y	Y	Y	Y
Covariates	Y	Y	Y	Y	Y	Y
Number of municipalities	134	134	134	134	134	134

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table B.9: Overidentifed regressions

	(1)	(2)	(3)	(4)
Dependent variable:	PLD coalition vote share		PRD coalition vote share	
	2SLS	LIML	2SLS	LIML
	Panel A. Presidential election results			
Haitian immigrants	1.144**	1.320**	-0.153	-0.169
	(0.517)	(0.665)	(0.357)	(0.375)
Sargan-Hansen test p-value	[0.038]	[0.055]	[0.21]	[0.22]
	Panel B. Congressional election results			
Haitian immigrants	2.029**	2.036**	-0.804*	-0.903*
	(0.874)	(0.879)	(0.428)	(0.506)
Sargan-Hansen test p-value	[0.76]	[0.76]	[0.070]	[0.083]
IV: population growth	Y	Y	Y	Y
IV: distance to epicentre	Y	Y	Y	Y
Cragg-Donald F-statistic	12.93	12.93	12.93	12.93
Kleibergen-Paap F-statistic	4.30	4.30	4.30	4.30
Region FE	Y	Y	Y	Y
Covariates	Y	Y	Y	Y
Number of municipalities	134	134	134	134

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table B.10: Distance to the border

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	PLD coalition vote share			PRD coalition vote share		
	Panel A. Presidential election results					
	FD	FD-2SLS		FD	FD-2SLS	
Haitian immigrants	0.272	1.041**	0.859**	0.208*	0.152	0.161
	(0.199)	(0.411)	(0.384)	(0.121)	(0.250)	(0.229)
	Panel B. Congressional election results					
	FD	FD-2SLS		FD	FD-2SLS	
Haitian immigrants	0.435	2.371***	2.244**	0.0192	-0.844*	-0.666*
	(0.395)	(0.910)	(0.917)	(0.131)	(0.450)	(0.384)
IV: population growth		Y			Y	
IV: distance to epicentre			Y			Y
Kleibergen-Paap F-statistic		7.91	10.22		7.91	10.22
Region FE	Y	Y	Y	Y	Y	Y
Covariates	Y	Y	Y	Y	Y	Y
Number of municipalities	134	134	134	134	134	134

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table B.11: Weighted regressions

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	PLD coalition vote share			PRD coalition vote share		
			Panel A. Presidential election results			
	FD		FD-2SLS	FD		FD-2SLS
Haitian immigrants	0.228	3.167**	2.922**	0.312*	-1.418	-1.293
	(0.186)	(1.477)	(1.484)	(0.187)	(1.093)	(1.117)
			Panel B. Congressional election results			
	FD		FD-2SLS	FD		FD-2SLS
Haitian immigrants	-0.107	4.191*	4.329*	0.227	-3.476**	-3.251**
	(0.432)	(2.176)	(2.336)	(0.282)	(1.634)	(1.622)
IV: population growth		Y			Y	
IV: distance to epicentre			Y			Y
Kleibergen-Paap F-statistic		5.65	5.43		5.65	5.43
Region FE	Y	Y	Y	Y	Y	Y
Covariates	Y	Y	Y	Y	Y	Y
Number of municipalities	134	134	134	134	134	134

Notes: Cluster-robust standard errors in parentheses. First difference regressions. Data sources: Dominican Central Electoral Board, Dominican National Office for Statistics (ONE), Haitian Institute for Statistics (IHSI). See text for definition of covariates. *** p<0.01, ** p<0.05, * p<0.1.

Table B.12: Opinion survey - descriptive statistics

	Obs.	Mean	Std. Dev.	Min	Max
Outcome variables:					
Anti-Haitianism: job competition	1,380	0.407	0.491	0	1
Anti-Haitianism: work permits	1,461	0.517	0.499	0	1
Anti-Haitianism: access public services	1,466	0.334	0.472	0	1
Anti-Haitianism: redistribution	1,444	0.069	0.255	0	1
Anti-Haitianism: citizenship	1,463	0.463	0.499	0	1
PLD vote intention	1,207	0.503	0.500	0	1
PRD vote intention	1,207	0.254	0.435	0	1
Other party vote intention	1,207	0.244	0.429	0	1
Covariates:					
Haitians (in % of municipality population)	1,500	3.289	2.644	0.651	16.318
Unemployment rate	1,500	7.298	1.503	4.7	13.9
Gender (women=1; men=0)	1,500	0.510	0.500	0	1
Age	1,499	41.209	16.756	18	90
Age sq./1000	1,499	1.979	1.562	0.324	8.1
Education (years)	1,495	8.619	4.806	0	18
Married	1,487	0.225	0.417	0	1
HH size (number of children)	1,499	2.905	2.653	0	18
Rural area	1,500	0.269	0.444	0	1
Self-identify as: Indio/Mestizo	1,483	0.676	0.468	0	1
Self-identify as: White	1,483	0.096	0.294	0	1
Self-identify as: Mulatto	1,483	0.111	0.314	0	1
Self-identify as: Black	1,483	0.103	0.304	0	1
Self-identify as: Other	1,483	0.014	0.118	0	1
Catholic	1,460	0.603	0.489	0	1
Evangelist	1,460	0.181	0.385	0	1
Protestant	1,460	0.054	0.226	0	1
Religion other	1,460	0.016	0.127	0	1
Atheist	1,460	0.145	0.352	0	1

Data source: LAPOP 2010 individual opinion survey. Vanderbilt University.

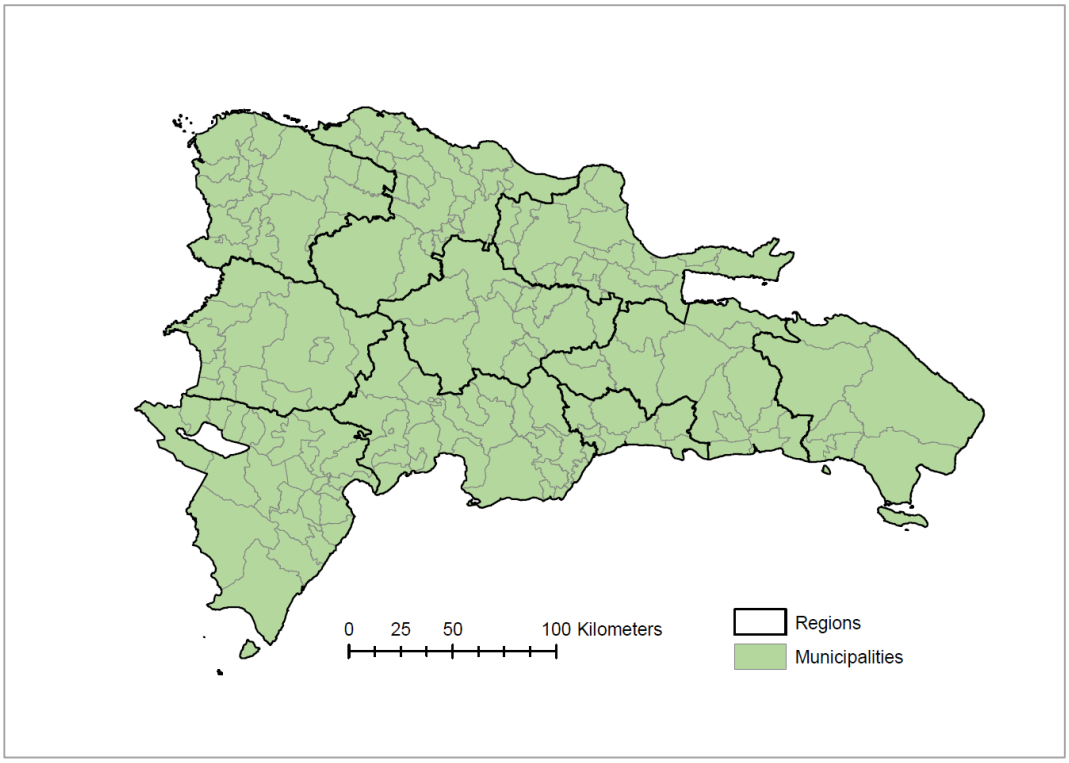
Table B.13: Opinion survey - first stage results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
First stage regression of:	PLD vote	PRD vote	Job competition	Work permits	Public services	Redistribution	Citizenship	Insecurity
	Dependent variable: Haitian immigrants (%)							
Inverse distance to border	15.60**	15.60**	14.41***	15.72***	14.75***	14.76***	15.85***	15.00***
	(5.854)	(5.854)	(4.645)	(5.743)	(4.897)	(4.764)	(5.813)	(5.088)
Covariates	Y	Y	Y	Y	Y	Y	Y	Y
Region FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,154	1,154	1,317	1,395	1,396	1,375	1,399	1,418
R-squared	0.555	0.555	0.516	0.517	0.515	0.502	0.519	0.511

Notes: OLS first stage estimates. Robust standard errors clustered at the municipality level in parentheses. LAPOP 2010 individual opinion survey. Haitian immigrant population instrumented with inverse distance to border. Variables described in text. *** p<0.01, ** p<0.05, * p<0.1.

Appendix Figures

Figure B.1: Dominican regions and municipalities



Chapter 3

The Elusive Quest for Social Diversity? Social Housing, Immigration, and Diversity in France[20].

3.1 Introduction

High income countries tend to rely on the provision of affordable housing through various schemes to both facilitate access to decent accommodation and encourage social diversity at the local level. While each country's housing system is unique and reflects its own history, legal framework, and economy, several European countries have developed sizable low-income housing programs. For instance, in England, France, the Netherlands, and the Scandinavian countries, the social rented housing sector represented close to or more than 20% of all housing at the end of the last decade (Scanlon and Whitehead 2011). Despite their wide adoption, there is limited evidence on whether affordable housing programs affect population composition, urban segregation, and ethnic and social diversity. Yet, these dimensions matter to understand how housing policies affect neighbourhood living conditions, and whether they facilitate social upward mobility (Chetty et al. 2016).

This paper addresses these questions by providing new evidence on the Welfare Magnet Hypothesis (WMH) for France. The WMH was first coined by Borjas (1999) and states that welfare generosity acts a pull factor for migration (Giulietti and Wahba 2013). In other words, generous welfare systems act as a 'magnet' for migrants (Razin and Wahba 2015). I look at the case of France where successive governments have invested a substantial amount of resources in the social housing sector. In 2014, the latest year for which data is

[20] This research project has benefitted from the support and guidance of Steve Gibbons and Olmo Silva, as well as insightful conversations with Ghazala Azmat, Laurent Gobillon, Jordi Jofre-Monseny, Hans Koster, Gabriel Loumeau, Ana Moreno-Monroy, Henry Overman, Nathalie Picarelli, Cheng-Keat Tang, Jos van Ommeren. Participants at LSE seminars, the 2017 Migration and Welfare International Conference at Rome La Sapienza University, and the 7th European Meeting of the Urban Economics Association also provided useful feedback and comments.

available, low income housing accounted for 14.7% of the all primary residences. The social tenant population totalled approximately 10 million that year (National Office for Statistics, *Insee*). I exploit a national policy reform to provide quasi-experimental evidence on the role of social housing availability in explaining immigrant location choices. I go beyond traditional studies of the WMH and look also at the demographic, economic, and social characteristics of immigrants.

The direction of the causality between social housing provision and neighbourhood ethnic diversity is hard to pin down. On the demand side, immigrants and socio-economically disadvantaged natives could exert pressure on their municipal authorities to provide social dwellings. Immigrants are on average less educated and wealthy than French natives (Fougère et al. 2011, Gobillon and Solignac 2016). They also tend to perform worse on the labour market (Gobillon et al. 2014). Several studies have also found that immigrants tend to be discriminated in both the labour and private housing markets in France (Adida et al. 2010, Bonnet et al. 2016). On the supply side, given their admissibility requirements new social housing units are expected to bring in and be occupied by populations with lower income. Due to the French context, one would expect immigrants to take a significant part of these inflows of new social dwellers. Yet, several factors complicate this interrelationship. The allocation process of social rental units is often influenced by local political economy considerations among the various local authorities and citizen associations. There is anecdotal and indirect empirical evidence of cases of discrimination against foreigners in social housing allocation committees (Tissot 2006, Bonnal et al. 2012, Schmutz 2015). Further, any observed relationship between immigrant population presence and social housing supply could be driven by unobserved local shocks. This research project aims to isolate the net supply side effect of social housing on local ethnic and social diversity.

Evaluating the impact of social housing developments at the local level is challenging. The allocation of affordable housing across space is determined by a host of observable and unobservable factors. I rely on a quasi-experimental setting to address these endogeneity issues. This setting is based on the Solidarity and Urban Renewal Law, known as the *Loi SRU*. After transferring decision-making power to municipalities over low income housing provision in the 1980s, the French government passed the SRU Law in 2000 to restructure the social housing sector. The SRU Law states that from 2002 onwards at least 20% of the primary housing stock in all medium and large urban municipalities should be social rental

units. That is municipalities with a population above 3,500 residents (1,500 residents in the Greater Paris region) and belonging to an urban unit of more than 50,000 inhabitants are under the obligation to meet the 20% social housing stock requirement. Municipalities failing to provide enough social dwellings are to draw up plans to increase their social stock and are subjected to pay fines for as long as they do not meet the threshold imposed by this Law. These eligibility rules provide opportunities to isolate quasi-exogenous variation in municipalities' social housing stocks. I combine three sources of variation, before and after the SRU policy implementation, population size thresholds, and geographic location (within or right outside the border of a dense eligible urban unit), to create a sample of observationally similar control and treated municipalities. I then rely on the nationwide policy reform to instrument local social housing supply. The method I adopt is essentially an instrumental variable strategy where a difference in differences set-up is used in the first stage. The empirical analysis relies on a municipality panel dataset constructed with the last four housing and population censuses (1990, 1999, 2007, and 2012).

The analysis is divided into two parts. First, I concentrate on the greater Paris (Ile de France) region where about one sixth of the French population lives. The policy reform is found to have had a positive and statistically significant effect on the size of social housing stocks in treated units. This result is robust to several sensitivity checks. Relying on this strong first stage, I find that social housing supply attracts immigrant populations and promote ethnic diversity measured as the share of foreigners in the population. In all the municipalities in my sample, the share of foreigners in the population is always well below 50%. I therefore assume that a higher share of foreigners correspond to greater ethnic diversity. Additional evidence indicates that the bulk of the increase in foreigners is accounted by female and economically inactive immigrants. I also observe that municipalities providing more affordable housing are poorer and exhibit lower household median incomes. On the other hand, I do not find any evidence of higher diversity in terms of socio-professional categories. These results survive a large number of robustness checks. I use alternative sample selection criteria to show that my results are not driven by arbitrary sample definitions. I also try different treatment and control group definitions based on geographic location to alleviate spatial spillover concerns. Additionally, I perform a placebo test using untreated municipalities on the outskirts of the territory where the SRU Law applies. I assume the first ring of bordering municipalities is treated in the last two time periods while the second ring of outskirt municipalities constitutes the control arm. I fail to find any effect on either social housing supply of foreign population presence.

In the second part of the empirical analysis, I extend the investigation to the next three largest French metropolitan areas, namely Lyon, Marseille, and Toulouse. I replicate the methodological approach discussed above for each of these samples separately and then pool all the samples, including Paris in some regressions. For all Lyon, Marseille, and Toulouse, I find evidence of a positive impact of the SRU reform on the size of the social sector. The order of magnitude of the impact is rather similar to the one found for Paris. However, no effect is detected on the measures used to proxy for ethnic and social diversity. I still find evidence of a negative association between social housing supply and median household income nonetheless. Pooling the four metropolitan areas confirms that the positive effect on ethnic diversity is specific to the Ile de France region. There is however strong evidence in favour of a significant effect on the income distribution. Pooling that data also allows testing for non-linearities in the effect of social housing. My findings suggest that the effect of social housing on attracting immigrants is larger in municipalities located in local labour markets with a higher concentration of foreigners and more buoyant economic conditions.

The analysis in this paper is highly relevant and has important implications for public policy. Higher immigrant and income segregation prompted by a larger social housing supply can have wide ranging socio-economic effects. A large literature has shown that urban segregation has detrimental effects on the educational, employment and life prospects of minorities. Cutler and Glaeser (1997) find that African Americans in more segregated areas have significantly worse outcomes than blacks in less segregated areas. Ananat (2011) shows that racial segregation in the US increases rates of black poverty and black-white income disparities. Chetty et al. (2016) find that children who move to lower-poverty neighbourhoods through the Moving to Opportunity (MTO) experiment in the US improve their chance to attend college and earn higher earnings.

Immigrant concentration has been found to matter for educational achievements. Gould et al (2009) show that the overall presence of immigrants in a grade had an adverse effect on the chances of natives of passing the high school matriculation exam in Israel in the 1990s. There is large and ongoing debate on the impact of immigration on the labour market outcomes of natives and immigrants alike (see e.g., Friedberg 2001, Edin et al 2003, Borjas 2003, Dustmann et al. 2005, Manacorda et al 2011, Foged and Peri 2016). Immigration inflows have also been found to lead to native outflows, lower house prices, and discriminatory zoning policies (Card and DiNardo 2000, Saiz and Wachter 2011, Sá 2014,

Shertzer at al. 2016). There is also evidence that greater ethnic concentration matters in France. Piketty (2004) finds a negative correlation between primary school test scores and the share of foreign students in the classroom. Algan et al. (2016) find that ethnic diversity leads to social anomie, and neglect and vandalism of building commons. Hémet and Malgouyres (2017) obtain evidence suggesting that ethnic diversity has also a negative effect on employment probability.

This paper relates to two strands of literature. First, it contributes to the literature on the determinants of immigrant residential location decisions, and the WMH in particular. Whilst most WMH studies have ignored the endogeneity of welfare systems (Giulietti and Wahba 2013), I provide quasi-experimental evidence on an additional publicly funded factor affecting the spatial distribution of immigrants. Borjas (1999), Kaushal (2005), and Alves Pena (2014) have debated the importance of state-level variation in welfare benefit generosity in explaining patterns of immigrant settlement in the US. In Europe, De Giorgi and Pellizzari (2009) have tested the magnet hypothesis across the countries of the pre-enlargement European Union. They find a significant but small effect of welfare state generosity on migration decisions. Razin and Wahba (2015) also find evidence in favour of the magnet hypothesis in Europe. Using a larger sample of OECD countries, Pederson et al. (2008) fail to find any migrant selection based on welfare regimes, however. This paper builds on the evidence of Verdugo (2015) who finds that French cities with higher social housing stocks attracted new immigrant men with children during the period 1960-1980 period. It goes beyond the previous WMH literature in the sense that it looks at a smaller geography. In addition, it provides more evidence on the socio-economic and demographic profile of the immigrants drawn to municipalities with larger social housing stocks. It also tests for non-linearities in the effect of social housing supply.

Secondly, I contribute to the small but growing literature on the impact of social housing developments and housing policies on the neighbourhoods in which they are built and implemented. Previous evidence primarily comes from the US and has looked mainly at house prices, labour outcomes, household sorting based on income, and crime (see e.g., Baum-Snow and Marion 2009; Rossi-Hansberg et al. 2010; Aliprantis and Hartley 2015; Chetty 2016). This paper is rather closely related to Diamond and McQuade (2016) who study the effect of the US Low Income Housing Tax Credit (LIHTC) program onto neighbouring residents. I contribute to that literature by focusing on a European country and looking at how social housing developments impact local ethnic and social diversity.

The rest of this paper is structured as follows. The next section describes the French social housing policy and the national reform used for identification. In the second section, I discuss my dataset and econometric strategy. The third section presents the main results and sensitivity checks. In the fourth section, I extend the analysis to the metropolitan units of Lyon, Marseille, and Toulouse. These urban units are respectively the second, third, and fourth largest metropolitan units of the country according to the last census (2012). The last section concludes.

3.2 Institutional framework

3.2.1 Social housing and immigration in France

The primary objective of the French social housing policy is to provide decent accommodations to working and middle class households. In recent years, this policy has also aimed at promoting local social diversity. Access and eligibility to social dwellings is based on household income ceilings, personal and family circumstances. In spite of these eligibility criteria, between 60% and 70% of French and legal immigrant households have been eligible to obtain a social housing unit over the last fifteen years (Goffette-Nagot and Sidibe 2016). Long waiting lists are one consequence of these generous criteria.

The French social rented sector counted 4.5 million units in 2009, accounting for 17% of the country's total housing stock (Stébé 2016). More than half of the social housing stock was built before 1976 as part of the post war effort to rebuild the country. The spatial distribution of social housing tends to reflect that of the French population. The vast majority of social units are located in large cities whereas very few are found in small towns or rural areas. Furthermore, the distribution of social housing within metropolitan areas is quite skewed. Major concentrations can be seen in the *banlieues* around major cities such as Paris and Lyon, while prosperous municipalities farther away from historical central districts hardly have any social tenant.

With regards to migration, France has a long tradition of immigration, and historians generally distinguish between three main waves of migrant influx: the Industrial revolution era, the inter-war period (1918-1940), and post-World War II. The size and composition of these three waves in terms of skills and origin countries are quite different. In the 19th century, the majority of immigrants were coming from neighbouring European countries.

Nowadays, the main groups of migrants include those born in Southern Europe (Spain, Italy, and Portugal), North Africa (Algeria, Morocco, and Tunisia), Turkey, South-East Asia (Cambodia, Laos, and Vietnam) and sub-Saharan Africa. Over the course of the second half of the 20th century, the share of immigrants increased and reached 8.9% of the total population in 2013. The foreign-born population tends to concentrate spatially in urban areas, near physical borders with neighbouring countries, and in locations with an existing sizable immigrants stock (see e.g., Safi 2009, Fougère et al. 2011, Shon and Verdugo 2014).

Immigrants tend to disproportionally occupy social housing units. For instance, immigrant households made up 9.6% of the total population but occupied 17.5% of the social rented sector in 2006 (Scanlon and Whitehead 2011). Figure 1 illustrates this point by showing a marked positive relationship between the population share of immigrants and the stock of social housing in all French municipalities, and in the urban areas of Paris, Lyon and Marseille.

3.2.2 The policy reform of 2000

As part of a national decentralisation process, the responsibility to provide social housing units was officially transferred to municipalities in 1982. The decentralisation of social housing provision is commonly believed to be partly responsible for the unequal distribution of social dwellings over France's territory (Stébé 2016). The *Solidarité et Renouvellement Urbains* Law (SRU – Solidarity and Urban Renewal) drafted by the Socialist government of Lionel Jospin was adopted in December 2000. The broad objective of this reform is to promote sustainable urban development and renewal as well as social diversity. Its Article 55 stipulates that in medium and large municipalities, the share of social housing units in the total stock of primary residences must be at least equal to 20%. This target must be reached by 2022. All municipalities of more than 3,500 inhabitants (1,500 residents in the Ile-de-France region where Paris is situated) that are part of an urban unit of more than 50,000 inhabitants containing at least one central city of more than 15,000 residents must comply. From January 2002 onwards, the municipalities failing to provide enough social housing have had to pay administrative fines and draw up plans to increase their stock of social units so as to reach the legal threshold. Once collected these fines are redistributed to municipalities with high proportions of social housing and public bodies in charge of promoting the provision of social dwellings (Vignolles 2014).

Figure 2 shows the municipalities of the Ile-de-France region that falls within the SRU policy territory, i.e., within an urban unit of more than 50,000 inhabitants with a central city of more than 15,000 people. The two urban units of Paris and Meaux in the Eastern part of the region qualify. Figure 3 displays in red the municipalities within these urban units that fell in 2002 under the obligation to construct more social housing units. These 'treated municipalities' seem to be relatively evenly distributed across the region.

The 2007 *Droit au Logement Opposable* Law (DALO - enforceable right to housing) extended the eligibility criteria of the SRU Law to large municipality associations (not part of any previously eligible urban unit). This amendment did not affect the geography of the SRU Law in Ile de France. In January 2013, the social housing threshold was raised to 25% and the eligibility criteria were enlarged further (Levasseur 2015). In 2015, more than 1,973 municipalities were concerned by the SRU policy nationally and 1,258 were not meeting their legal obligation in terms of social housing supply (Ministère de l'Ecologie, du Développement Durable et de l'Energie 2015).

3.3 Data and identification strategy

The empirical analysis relies on the last four housing and population censuses of 1990, 1999, 2007, and 2012. Using data provided by the National Office for Statistics (*Insee*), I construct a balanced municipality panel dataset containing information on the social, demographic, and economic characteristics of the population and housing sector. I also include in some parts of the analysis household income data from the *Insee* fiscal income database[21]. This dataset is available at the municipality level for the period 2001-2011 only. I match the 1999 census data with the 2001 income dataset. 2007 (2012) census data and 2007 (2011) income data are matched consecutively. I therefore lose the first time period when working with fiscal household income data.

The main difficulty of the empirical analysis is the definition of the right counterfactual. In an ideal experimental setting, social housing developments would be randomly allocated across municipalities. As in other European countries, social dwellings are endogenously provided by the French local authorities. Given the absence of randomization, quasi-experimental methods must be adopted to address the research objective of this paper. The

[21] Source Revenus fiscaux des ménages, *Insee*.

2000 SRU reform provides an interesting policy experiment to isolate quasi-exogenous variation in local housing sector characteristics. I rely on that reform and adopt an instrumental variable strategy design to identify the effect of the local supply of social housing on ethnic and social diversity. I cannot use a regression discontinuity design in the traditional sense because another policy, mayors' salary, also changes at the 3,500 inhabitants population cut-off.

Equation (3.1) below is the baseline specification linking municipality outcomes to social housing provision:

$$y_{m,z,d,t} = \beta_0 + \beta_1 . h_{m,t} + X_{z,t} . \beta_2 + \theta_m + \delta_t + \mu_d . t + \nu_{m,z,d,t} \quad (3.1)$$

where $y_{m,z,d,t}$ stands for population composition in municipality *m* located in travel-to-work area (TTWA[22]) *z* in district *d* at time *t*. Municipalities (*communes*) are the lowest level of territorial administrative division. There are more than 36,000 municipalities in France. Districts (*départements*) are the local authorities above the municipalities. Mainland metropolitan France counts 96 districts. TTWAs are statistical constructs of the *Insee* and define local labour markets. Each TTWA generally comprise several municipalities. TTWAs are always smaller than districts[23]. The main variable of interest is $h_{m,t}$ and measures the share of social housing units in the stock of primary residences. $X_{z,t}$ is a parsimonious vector of exogenous covariates defined at the TTWA level (net of municipality *m*). Control variables include the unemployment rate, industry employment share and public administration employment share. I avoid including time varying municipality characteristics to circumvent post-treatment bias. Social housing supply is likely to have an effect on the housing market; via house prices and construction for instance[24]. It is also likely to influence municipality socio-economic characteristics and political preferences through its effect on population composition. θ_m, δ_t, and $\nu_{m,z,d,t}$ are municipality fixed effects, year effects, and the error term respectively. The municipality fixed effects control for persistent differences across municipalities and year dummies control for time period specific shocks affecting every municipality in the same way. I also

[22] The travel-to-work areas used are the French *zones d'emploi* as defined in 1999 by the Statistical office Insee.
[23] The city of Paris is an exception. It is both a district, a municipality and one TTWA.
[24] See Chapelle (2017) for a detailed study on the impact of social housing on the construction sector in France.

include district[25] specific linear time trends ($\mu_d . t$) to control for unobserved district-level variables varying over time in an approximately linear fashion.

Despite the use of municipality and year fixed effects, several threats to identification remain. Omitted variables will bias coefficients if unobserved factors affect the housing sector and the population composition of a municipality at the same time. Reverse causality is another econometric concern. The local population affects the characteristics of the housing sector through their economic and political preferences. Since immigrants tend to suffer from discrimination in the housing and labour markets, they might pressure municipal authorities to provide a larger amount of social dwellings. If that reverse channel is operating, and assuming there is also a positive effect of the social housing supply on the share of foreigners, the estimate of β_1 will be upward biased. The third potential econometric concern is measurement error. It can plausibly be discarded here as the *Insee* releases exhaustive information on the housing sector for each census.

To obtain causal estimates, I exploit the top-down national social housing reform discussed in the previous section to address the endogeneity of social housing provision at the local level. This allows me to design an instrumental variable strategy. I take advantage of the geographic and population discontinuities established by the SRU policy to define control and treatment groups. I begin by restricting my sample to the municipalities located inside the SRU territory and the ones directly contiguous to it (see Figure 4). Following Gobillon and Vignolles (2016), I further limit my sample to the 189 municipalities with a population greater than 800 inhabitants and lower than 6,000 inhabitants in 1999. I also conduct my analysis using alternative samples based on different population thresholds to test the robustness of the findings. My sample thus exploits both the boundary and population discontinuities of the SRU policy. I rely on Equation (3.2) to measure the impact of the SRU policy reform on social housing supply using an approach akin to a difference-in-differences in the first stage.

$$h_{m,t} = \gamma_0 + \gamma_1 . D_{m,t} + X_{z,t} . \gamma_2 + \theta_m + \delta_t + \mu_d . t + \varepsilon_{m,t} \qquad (3.2)$$

$D_{m,t}$ is a binary variable indicating whether a municipality is 'treated' by the policy reform and must increase its supply of social dwellings. The other variables are defined as above. The coefficient γ_1 captures the difference-in-differences estimate of the reform impact.

[25] French *départements* (NUTS 3 EU classification of administrative units) are referred to as districts.

Regression results obtained from Equation (3.2) are the first stage used to predict the stock of social housing in two-stages least squares (2SLS) estimations of Equation (3.1).

The research design thus exploits the before/after and discontinuous policy variations to isolate the causal impact of social housing supply. I estimate these two equations with least squares and standard errors clustered at the municipality level to address issues stemming from serial correlation. The majority of the findings presented next are 2SLS estimates, but unbiased reduced form estimates are also available in Appendix. In all the municipalities in my sample, the share of foreigners in the population is always well below 50%. I therefore assume that a higher share of foreigners correspond to greater ethnic diversity.

3.4 Ile de France

3.4.1 Main findings

Appendix Table C.1 displays summary statistics for outcome and explanatory variables used in the analysis in the 1999 pre-treatment period for the main sample of 189 municipalities. Balancing tests run on several variables using 1999 census data are shown in Table 3.1. The first and second columns display covariate averages for the control and treatment arms in the pre-treatment period. The third and fourth columns show the t-statistics and associated p-values of tests of equality of means across the two groups. The only two variables for which there is a statistically significant difference are population and industrial employment share. The latter is controlled for in all regressions. The difference in terms of population size is not surprising given that policy eligibility is defined according to the municipality number of residents. Appendix Figure A.1 shows that the parallel trend identifying assumption seems to hold for the municipalities treated in 2000. Further empirical tests underpinning the validity of the identification strategy are discussed in what follows.

I begin with a discussion of the effect of the SRU policy reform on municipality social housing stocks. Table 3.2 presents first stage estimates for various samples defined according to municipality population in 1999 and geographic location. For instance, the sample of the first two columns is based on a balanced sample of municipalities with 500 to 9,000 residents in 1999. Columns 7 and 8 present regression estimates based on municipalities with 800 to 6,000 inhabitants in 1999. For every sample, I estimate Equation

(3.1) without a district time trend in the first column and with such a linear trend in the second column. Across the five samples the policy effect estimate is positive and significant at conventional levels of statistical significance. The inclusion of district linear trends does not affect the patterns of results. Furthermore, the point estimates are relatively stable across the different specifications and samples. For example, the results of column 8 based on a sample of municipalities with population between 800 and 6,000 residents indicate that in treated municipalities the social housing stock increased by 1.3 percentage point (pp) over the study period. This is equivalent to 38 additional social rental units. Appendix Table C.2 presents the results of a Granger causality test with anticipatory and post-treatment effects following the methodology discussed by Autor (2006) and Angrist and Pischke (2009, p.237-8). The absence of any significant lead anticipatory effects gives credit to the identification strategy. Overall these findings suggest the SRU policy implementation has augmented the provision of social rental units as intended. The magnitude of the impact is rather limited but in line with other studies analysing the SRU reform consequences (see e.g., Gobillon and Vignolles 2016).

The next tables measure the effect of the social housing stock on various population composition and social outcomes. They are structured in a similar fashion as Table 3.2. The first table focuses on the share of foreigners in the total population (Table 3.3). Social housing is instrumented with the policy reform binary indicator as discussed in the previous section[26]. The results show quite convincingly that in treated municipalities the relative presence of foreigners has increased over the study period in response to greater social housing provision. The point estimates are positive and statistically significant in all samples. The reported coefficient based on the preferred sample in column 4 indicates that a 1 pp increase in the social housing stock translates in a 0.6 pp increase in the share of foreigners. This corresponds to 19 new foreign migrants. These results corroborate the findings of Verdugo (2015).

Having established a positive link between social housing and foreigner presence, Table 3.4 concentrates on several migrant characteristics, including gender and economic activity status. It is divided in six panels, each focusing on a specific outcome variable. The regression results presented in this table are again displayed for alternative samples based on population size. In Panels A and B, I focus on female and male migrants. The point

[26] The 2SLS results presented are based on specifications excluding district linear trends. Including district trends leads to problems in the estimation of the covariance matrix. The point estimates are barely affected however. Levels of statistical significance do not change either.

estimates consistently suggest the positive impact of social housing provision on ethnic diversity is channelled through a greater presence of female immigrants. This is consistent with descriptive studies and reports on the characteristics of social tenants (see e.g., Jacquot 2007, Fougère et al. 2011). In particular, single parent households are given priority in social dwelling waiting list (Dujardin and Goffette-Nagot 2009). According to the results of column 4 in Panel B, the foreign women population increases by 0.4 pp for every 1 pp of additional social housing supply. Again, since access to social housing units is given in priority to single parent households, these results are not particularly unexpected.

The next four panels concentrate on the share of foreign unemployed, inactive, active, and student individuals among the adult population aged 15 years old or more[27]. The social housing sector does not seem to have much of an effect on the relative presence of unemployed migrants (Panel C). While the coefficient estimates are positive, they are not statistically significant. The positive impact of the social housing stock on the share of inactive migrants is a lot more robust. In all but the last column of Panel D, the measured effect is positive and significant at conventional levels. I do not detect any effect on the share of active foreigners, however (Panel E). I focus next on foreign students. Greater social housing supply seems to increase the share of foreign students in the population. This is consistent with the earlier results on inactive foreigners since students are classified are economically inactive. The size of the impact is small and ranges between 0.10 pp and 0.16 pp (Panel F).

Having looked at the socio-demographic characteristics of immigrants, I now focus on their professional occupation. Socio-professional category diversity is one element of local social heterogeneity. The French statistical office distinguishes between six main professional categories: i) farmers; ii) craftsmen, traders and entrepreneurs; iii) executives and higher intellectual professions; iv) intermediate professions; v) employees; and vi) workers. To measure local socio-professional diversity[28], I construct Herfindahl indices measuring professional diversity using information for both foreigners and the total population for each municipality in each census year. I calculate the squares of each profession share and sums across the six categories. The index can vary between 0 and 100, with higher values indicating greater concentration. I thus have two indices: one for the foreign population, one for the total population. I then use these measures as outcomes

[27] The National Statistical Office (*Insee*) records economic activity status for individuals aged 15 years old and above.
[28] I refer to 'job diversity' at times in the tables of results for the sake of concision.

variables in the first two panels of Table 3.5. Social housing supply is found to have a negative (more diversity) but insignificant effect on the Herfindahl index for the foreign population. On the other hand, the policy reform appears to have a positive effect on total job diversity (foreigners and nationals), but the impact is insignificant. The main message from the first half of this table is that social housing does not lead to greater professional heterogeneity in the Ile de France region. Appendix Table C.8 shows that the absence of significant effects on the Herfindahl indices does not hide heterogeneous effects on the individual professional category shares.

Municipality total unemployment rates and household median incomes are the focus of the last two panels of Table 3.5. Lower median household incomes seem to be associated with a higher availability of social dwellings. This negative measured impact is robust to the use of all five alternative samples. Column 4 estimates suggest that a 1 pp increase in the stock of social housing translates in a median income reduction of 520 euros. Baum-Snow and Marion (2009) also find that affordable housing developments depress local household median income. The results in Panel D unambiguously show no policy effect on aggregate unemployment rates. The coefficient is not significant and changes sign across samples. Overall, these findings imply that social housing availability draw immigrants and poorer households. This in turn might have important implications in terms of peer and neighbourhood effects on long term residents.

3.4.2 Robustness tests

I now turn to several robustness tests to assess the internal validity of my results. The first two tests deal with issues stemming from spatial spillovers. Assuming social housing is seen as a disamenity, residents living near SRU treated municipalities might leave and relocate elsewhere. If this population flight mostly concerns natives, one might worry that the previous results are underestimated. On the other hand, if native residents of treated municipalities flee to neighbouring municipalities (to avoid interactions with social dwellers but stay within the same local labour market), the previous findings could be overestimated. I begin by testing the sensitivity of my findings when restricting the control group to the outer ring neighbouring municipalities only. The sample is thus made of only the treated municipalities belonging to the urban units of Paris and Meaux and boundary municipalities (control group). That is, my sample comprises the red and grey municipalities in Figure 4. Doing so might restrict the potential for social housing spillovers to contaminate the analysis as I free the sample from some municipalities contiguous to

treated administrative units. I present 2SLS estimates using municipalities with a population in the 800-6,000 inhabitants range in 1999 in Table 3.6. Each column reports the coefficient estimates of separate regressions measuring the effect of social housing provision on alternative municipality outcomes. First stage least squares results (in Appendix Table C.11) show that the policy reform is found to have a positive and significant effect on social housing supply. In turn, a higher social housing stock is associated with a greater share of foreigners in the population. This positive association is driven by immigrant women as earlier (Panel A, columns 1-3). The point estimates are quite close to the ones discussed previously. For instance, the impact of the share of social dwellings on the percentage of foreigners is approximately equal to 0.5 pp as opposed to 0.6 pp earlier. I also find a positive and significant effect on inactive migrants. With respect to the income distribution, median household income decreases by approximately 630 euros for every additional pp increase of the social housing stock. These results are robust to alternative population-based samples. In sum, this robustness test supports the validity of the findings discussed earlier.

To address the possible spillover issue further, I construct a different sample containing the municipalities that are part of the second external ring, and all the municipalities within the policy territory (Appendix Figure C.2). This sample experiment provides another test aiming at alleviating spatial spillover concerns. However, the potential for heterogeneity in unobservable characteristics increases as some control units now lie farther away from the SRU Law eligibility boundary. I additionally restrict the sample to units with a population in the 800-6,000 range in 1999. The results are presented in Table 3.7, which is structured in a similar fashion as the previous one. The main conclusions discussed earlier are robust to this sample modification. The SRU policy coefficient estimate is positive and significant (see Appendix Table C.12). The strength of the first stage is weaker, however. In consequence, I lose statistical significance in the 2SLS results. Reduced form estimates are generally stronger as can be seen in Appendix Table C.12. The share of female[29] and foreign students is still positively associated with social housing supply, whereas median income is a negative function of social dwelling availability. Interestingly, the social housing sector is now found to enhance diversity among the socio-professional categories occupied by migrants. This finding is in line with the objective of the French social housing policy, which aims at attracting heterogeneous groups and fostering the mingling of populations.

[29] The coefficient is borderline significant at the 10% level.

Overall these two tests do not suggest that spatial spillovers are a serious concern for the validity of the main findings discussed earlier.

The next robustness test exploits the spatial discontinuity of the SRU policy eligibility criteria further. I restrict the analysis to municipalities adjacent to the Paris and Meaux urban units' boundaries. In other words, I limit the sample to units located just 'inside' and 'outside' the urban units of Paris and Meaux as shown in Appendix Figure A.3. Once this selection has been operated, the sample is further restricted to municipalities with a population size around the 1,500 residents threshold as before. This new sample definition reduces the risk that unbalanced unobservable characteristics might be driving the patterns identified so far. The approach is somewhat akin to a boundary discontinuity design. This test comes at a cost of a higher potential for spatial spillovers. First stage and reduced form results are displayed in Appendix Table C.13. I find additional evidence that the SRU policy has augmented the provision of social dwellings. The policy point estimate is positive and statistically significant at the 1 percent level. It is also of a magnitude similar to the ones found earlier. The 2SLS estimates are displayed in Table 3.8. Again, in every column a different dependent variable is considered. The results in column 1 show that the share of foreigners increases with social housing supply. Columns 2 and 3 of Panel A indicate that migrant women presence increases in areas with more low income housing. The coefficient estimates shown in Panel B are in accordance with the earlier findings as well. Social housing provision is positively and statistically significantly associated with foreign student presence. It also appears to reduce median household incomes. In sum, the results of this additional sensitivity check strengthen the credibility of the main findings.

Last, I take advantage of the SRU policy geographic criteria and design a placebo test. It compares the outcomes of the first and second contiguous municipalities outside the urban units of Meaux and Paris (Appendix Figure C.2) with a population relatively close to 1,500 residents. I design the placebo test as follows. I assume that all the municipalities belonging to the first contiguity external ring are treated in the last two time periods. The second ring constitutes the control group throughout the four time periods. I estimate Equations (3.2) and (3.3) using this sample and report results in Table 3.9. The dependent variable in Panel A is the social housing stock. As expected, in none of the five columns where alternative population based samples are used is the policy binary indicator statistically significant. Point estimates are imprecisely estimated and change signs across columns. Panel B concentrates on the share of foreigners and report reduced form estimates. Reassuringly,

no policy effect is detected here either. Overall, this placebo test strengthens the credibility of the identification strategy adopted.

3.5 Additional findings: Lyon, Marseille, and Toulouse

This section extends the analysis to the three largest French metropolitan units after Paris. It begins with the urban unit of Lyon. It then discusses Toulouse and Marseille before pooling the data from the four metropolitan areas studied and assessing heterogeneous policy effects.

3.5.1 Lyon

Lyon is the second largest metropolitan area in France. It is located in the Eastern part of the country. The population of its urban unit totalled 1.6 million residents in 2014. Its stock of social housing is relatively high and represents 19% of the primary residences of the urban unit. Foreigners represent close to 9% of the population, which is above the national average (Appendix Table C.14). Lyon is a major centre for banking, as well as for the chemical, pharmaceutical, and biotech industries.

The municipalities belonging to Lyon's urban unit are shown in Appendix Figure C.4 and highlighted in green. The units coloured in grey are municipalities directly adjacent to the urban unit boundary. This urban unit lies at the intersection of three districts as can be seen in the map[30]. Appendix Figure C.5 shows in red the municipalities which were treated in 2002, i.e., required to provide a greater number of social dwellings according to Article 55 of the SRU reform. I replicate the analysis previously conducted for this metropolitan area. I only consider municipalities that are part of the urban unit of Lyon and the ones contiguous to it. Since the population thresholds used for regions other than the Ile de France by the SRU policy is 3,500 residents, I use slightly different population cut-offs to define my sample. To be specific, in what follows I present results based on municipalities with population sizes lying in the [500; 9,000], [1,000; 8,000], and [1,500; 7,500] intervals in 1999. The rest of the empirical methodology is identical to the previous section.

First stage results are presented in Appendix Table C.15. For each of the three samples I present results obtained with and without a district linear time trend. The policy appears to

[30] These districts (*départements*) are: Ain, Isere, and Rhône.

have stimulated the construction of social housing units. In all samples, the effect of the SRU policy on social housing provision is positive and statistically significant. The magnitude of the policy impact seems a little inferior to the one in Ile de France. I focus on the foreign population and median income in Table 3.10. The availability of social housing does not seem to have any effect on the share of migrants. The estimated coefficients are positive but insignificant in all three samples. This finding is quite puzzling and will be discussed in greater detail later on. Diversity among professional categories is not affected either (Appendix Table C.17). The impact on household median income is negative as in Ile de France. The magnitude of the impact is lower and insignificant, however. Therefore, it seems that the SRU policy has encouraged the production of social rental units to some modest extent in the metropolitan area of Lyon. However, social housing does not appear to stimulate much ethnic or professional category diversity here. One reason for the absence of statistical significance in the 2SLS results could stem from the relatively low impact of the policy reform on the social housing sector. These findings must be interpreted with caution consequently.

3.5.2 Toulouse

The second metropolitan area I focus on is Toulouse. Situated in the Southwestern part of the country, its urban unit had close to one million inhabitants in 2014. It is the urban unit with the lowest share of foreigners and social housing units among the areas studied. Toulouse is known for being the centre of the European aerospace industry.

Appendix Figures C.6 and C.7 shows the urban unit of Toulouse and its neighbouring municipalities. I replicate the same analysis as above based on municipalities with a population relatively close to 3,500 inhabitants and lying within or at the periphery of the Toulouse urban unit. The impact of the SRU policy on social housing supply is shown in Appendix Table C.18. While the study area overlaps with two districts, once the sample is limited to units with a smaller population, only one district is left in the sample. For that reason, I cannot estimate a linear district trend in the first stage with these two samples. I find evidence that the policy has encouraged municipal authorities to provide more social dwellings. The policy coefficient is positive and significant at the 1 percent level in all samples. It is also somewhat larger than in Ile de France.

Table 3.11 concentrates on the effect of social housing on foreign population presence and median income. As in Lyon, social housing supply does not appear to affect the share of

foreigners in the population. The estimated coefficient is positive but always insignificant. I also find evidence of a negative impact on median income suggesting that population with lower incomes have settled in treated units. The household income reduced form estimates are significant but the 2SLS estimates are not. As in Lyon, the evidence presented here suggests that social housing provision has limited impacts on the municipalities in which they are built with respect to population composition.

3.5.3 Marseille

The last metropolitan area I study is Marseille. It is the third largest metropolitan area according to the 2012 census. 7% of its 1.6 million inhabitants are foreigners. Marseille is France's largest port for commerce, freight and cruise ships.

The implementation of the research design used so far is a little more complicated here. The urban unit of Marseille lies in close proximity to the urban units of Toulon and Avignon (Appendix Figures C.8 and C.9). To take this feature into account while preserving the empirical approach followed up to now, I concentrate on the three urban units. As earlier I identify the municipalities lying at the boundary of these urban units and select them to comprise the control arm. I further limit my sample to the municipalities with a population around the 3,500 inhabitants cut-off.

First stage results are shown in Appendix Table C.21. The point estimates suggest that in the broad metropolitan area of Marseille studied the SRU policy has also increased the availability of social dwellings. The policy coefficient is positive in all six columns. Statistical significance is lost in the smaller sample however (columns 5 and 6). Moreover, the size of the policy impact implies a lower effect of the policy on the housing sector. Instrumental variable estimates can be seen in Table 3.12. The estimated effect of social housing supply is in line with the previous findings. It has a positive but insignificant effect on the share of foreigners, while its effect on the median income is negative and insignificant. The conclusions derived here are to be taken with caution as the policy appears to have had a modest effect on the social housing sector. The 2SLS results are therefore based on relatively weak first stages.

3.5.4 Pooled regressions and interactions

Having conducted the analysis for each urban unit separately thus far, I now pool all the four datasets together and replicate the analysis. I then assess whether the impact of social

housing provision is conditional on the political orientation of municipalities, the size of the initial foreign population, and labour market tightness. The analysis is based on the municipalities belonging to and bordering the urban units studied. The set of cross-sectional units is further constrained to those with a population in the 800-6,000 residents range in Ile de France in 1999. In the three other study areas I select the municipalities with populations in the 1,000-8,000 inhabitants bandwidth.

Table 3.13 presents first stage results based on the estimation of Equation (3.2) defined above. In the first two columns, I present regressions results for the four study areas with and without a district linear time trend. The third column excludes the Ile de France sample. The Marseille sample is omitted in column 4. The last column focuses on Lyon and Toulouse only. In all five columns I find evidence of a positive and significant effect of the SRU policy on the stock of social dwellings. The coefficients are stable and approximately equal to 1 pp. It is clear from these estimates that the greater Paris region is not driving the results.

In the next table, I show 2SLS estimates of the impact of social housing supply on the share of foreigners, the income distribution, and professional occupation diversity. Table 3.14 is structured as earlier with three panels for each dependent variable considered. The results displayed in Panel A indicate a positive and significant impact of the policy on the relative presence of migrants when all the observations are used (column 1). Looking at the three other columns, it is clear the estimates in column 1 are due to the inclusion of the Ile de France sample. When the latter is omitted in columns 2 and 4, the coefficient turns insignificant and much smaller in size. Panel B supports the finding that municipalities with a larger share of social dwellings tend to have lower median incomes. The estimated social housing coefficient is negative across the four samples. The impact magnitude is plausible and ranges between 630 euros and 965 euros. Lastly, the estimates in Panel C confirm the absence of any effect on aggregate professional occupation diversity discussed earlier. Social housing supply has no significant effect in all of the four samples.

In the final Table 3.15, I report interaction terms with the objective of elucidating possible conditional effects. I concentrate on three potential mechanisms. First, I investigate whether the effect of social housing is higher in travel-to-work areas with a larger foreign population. Previous research has shown that immigrants tend to locate in areas where a sizable co-ethnic population presence (see e.g., Zavodny 1999, Bauer et al. 2005). Such areas provide migrants with access to larger social networks. I assess next the contribution

of the local unemployment rate[31]. Damm (2009) finds that refugees in Denmark tend to leave economically more deprived regions. Everything else equal social housing developments located in dynamic labour markets should be more attractive. I focus last on local political preferences. I interact social housing supply with a binary indicator measuring whether in the 1995 presidential elections the Socialist party candidate won more than 50% of the cast votes in the second round against the right-wing candidate and ultimately winner Jacques Chirac. This approach allows to me to broadly distinguish between right-wing and left-wing oriented municipalities. I avoid using post SRU reform political outcomes to limit endogeneity issues. By bringing in relatively disadvantaged households, new social housing developments might affect local political preferences. As is common in the literature, I use the interaction of the policy reform dummy with each of these three variables as instrument. I introduce separately the three interaction terms in the first three columns of Table 3.15, and include them all in the last one.

The baseline coefficient is positive and significant in all columns except the first. The estimates in columns 1 and 4 indicate that the effect of social housing supply is larger in TTWAs with more migrants. This suggests that social housing units offering a greater access to social networks are more attractive to migrants. This is consistent with evidence from Munshi (2003) and Edin et al. (2003) of a positive impact of ethnic networks on labour outcomes. On the other hand, the attractiveness of low income housing appears to be lower in sluggish labour markets. The interaction between social housing and the unemployment rate is negative and significant in column 4. I do not find any evidence of a nonlinear effect depending on the political orientation of municipalities. These findings must be interpreted with caution, however. The power of the first stage is not always strong enough to discard econometric issues related to weak instruments.

3.6 Conclusion

Social housing provision is one of the main policy tools used by the French government to promote access to decent accommodation and social diversity in medium and large cities. This paper assesses whether this public policy attracts immigrants and generates greater social mixing in France's largest metropolitan units. The empirical analysis relies on a quasi-experimental research design exploiting a nationwide policy reform. I find solid evidence of

[31] It is defined at the TTWA level as well.

a positive relationship between social housing and ethnic diversity in the municipalities of the Greater Paris region. Social housing is also found to lower median household income. This median income depression effect holds in the urban units of Lyon, Marseille and Toulouse. However, no effect is detected on ethnic diversity there. Further, in all four study areas I fail to find any effect on professional occupation diversity. Overall my results suggest that the French affordable housing policy is successful in attracting lower income households. It also promotes ethnic diversity in areas with tight labour markets and access to ethnic-based social networks.

The econometric strategy based on policy discontinuities imposes lower external validity. The empirical findings still offer valuable lessons to French lawmakers and other developed countries contemplating reforms of their social housing policies. The French experience suggests affordable housing policies can be successful in decreasing income segregation in housing markets. It also suggests that local economic conditions and ethnic diversity affect the extent to which social housing supply attracts immigrants.

Findings in this paper add to the small but growing literature on the impact of social housing developments on the neighbourhoods in which they are built as well as the literature on immigrant location decisions. A number of questions for further research are raised. The analysis has measured the net effect of social housing on ethnic composition and social diversity at the municipality level. Due to the research design and data constraints, little can be said on channels and micro impacts. In particular, it remains to be seen whether foreigners live in in the private or social sector in the Ile de France municipalities with a higher stock of social housing. At the very local level, affordable housing construction may bring about various costs and benefits to surrounding neighbourhood residents. These might vary depending on neighbouring characteristics, and ultimately affect the residential choices of the native population. More evidence is needed in this respect.

3.7 Main Tables & Figures

Tables

Table 3.1: Balancing tests on pre-treatment characteristics

	Control (n=111)	Treated (n=78)	t-stat	p-value
Population	2.146	3.538	-6.950	0.000
Social housing stock (%)	4.875	5.398	-0.485	0.628
TTWA unemployment rate	10.081	10.155	-0.219	0.827
TTWA industrial employment share	15.539	14.767	2.011	0.046
TTWA public administration employment share	32.728	32.581	0.629	0.530
Foreigners (% population)	5.379	5.117	0.416	0.678
Male foreigners (% population)	2.739	2.712	0.082	0.934
Female foreigners (% population)	2.640	2.405	0.652	0.515
Foreign children (% population less 15 y. old)	2.844	3.362	-0.558	0.578
Unemployed foreigners (% population 15+ old)	0.378	0.304	0.800	0.425
Inactive foreigners (% population 15+ old)	2.044	1.632	1.321	0.188
Job concentration - foreigners - Herfindahl index	45.564	48.606	-0.681	0.497
Job concentration - total - Herfindahl index	0.249	0.249	-0.159	0.874
Median income (Euros)	39948.712	40470.756	-0.508	0.612
Unemployment rate	7.306	7.255	0.212	0.832

Notes: 1999 pre-treatment municipality level data. Data source: 1999 French housing and population census. TTWA = France's 1990 *zones d'emploi*. Sample restricted to municipalities with population between 800 and 6,000 inhabitants.

Table 3.2: First stage results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Dependent variable: Social housing stock (%)									
Population sample:	[500 ; 9,000]		[600 ; 8,000]		[700 ; 7,000]		[800 ; 6,000]		[900 ; 5,000]	
SRU policy	1.064***	0.792**	1.127***	0.817**	1.082***	0.743*	1.477***	1.284***	1.529***	1.467***
	(0.353)	(0.362)	(0.363)	(0.388)	(0.395)	(0.424)	(0.383)	(0.380)	(0.393)	(0.391)
Unemployment rate	0.183	0.0941	-0.137	-0.155	-0.282	-0.342	-0.0397	0.0210	-0.373	-0.178
	(0.425)	(0.404)	(0.315)	(0.336)	(0.327)	(0.349)	(0.376)	(0.391)	(0.327)	(0.359)
Industry employment	-0.121**	-0.0886	-0.0991*	-0.0612	-0.102	-0.0710	-0.0966*	-0.0603	-0.0905*	-0.0479
	(0.0586)	(0.0556)	(0.0582)	(0.0546)	(0.0626)	(0.0591)	(0.0507)	(0.0540)	(0.0493)	(0.0534)
Public sector employment	-0.0544	-0.0588	-0.0207	-0.0196	-0.0139	-0.0150	0.0271	0.0296	0.0213	0.0255
	(0.0448)	(0.0462)	(0.0415)	(0.0416)	(0.0446)	(0.0444)	(0.0384)	(0.0410)	(0.0388)	(0.0408)
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District (NUTS-3) trend		Y		Y		Y		Y		Y
R-squared	0.341	0.359	0.345	0.359	0.325	0.340	0.364	0.378	0.361	0.376
Observations	1,072	1,072	984	984	872	872	756	756	632	632
Municipalities	268	268	246	246	218	218	189	189	158	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.3: Two-stages least squares results

	(1)	(2)	(3)	(4)	(5)
	Dependent variable: Foreigners (% population)				
Population sample:	[500 ; 9,000]	[600 ; 8,000]	[700 ; 7,000]	[800 ; 6,000]	[900 ; 5,000]
Social housing (%)	0.572*	0.651*	0.778*	0.577**	0.585*
	(0.333)	(0.347)	(0.421)	(0.282)	(0.313)
Unemployment rate	0.109	0.286	0.351	0.0126	0.0686
	(0.333)	(0.304)	(0.371)	(0.335)	(0.415)
Industry employment	0.0547	0.0787	0.111	0.110	0.0670
	(0.0768)	(0.0791)	(0.0910)	(0.0752)	(0.0767)
Public sector employment	-0.0118	-0.0120	-0.0307	-0.0725	-0.0814
	(0.0423)	(0.0453)	(0.0519)	(0.0454)	(0.0496)
K-P First stage F-stat	9.12	9.67	7.50	14.88	15.13
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Observations	1,072	984	872	756	632
Municipalities	268	246	218	189	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.4: Two-stages least squares results - other outcomes

	(1)	(2)	(3)	(4)	(5)
Population sample:	[500 ; 9,000]	[600 ; 8,000]	[700 ; 7,000]	[800 ; 6,000]	[900 ; 5,000]
	Panel A. Dependent variable: Male foreigners (% population)				
Social housing (%)	0.166	0.222	0.252	0.170	0.198
	(0.165)	(0.171)	(0.199)	(0.142)	(0.164)
	Panel B. Dependent variable: Female foreigners (% population)				
Social housing (%)	0.406**	0.429**	0.526**	0.407**	0.387**
	(0.194)	(0.197)	(0.246)	(0.163)	(0.173)
	Panel C. Dependent variable: Unemployed foreigners (% adult population)				
Social housing (%)	0.0831	0.0864	0.108	0.0435	0.0436
	(0.0545)	(0.0558)	(0.0687)	(0.0372)	(0.0402)
	Panel D. Dependent variable: Inactive foreigners (% adult population)				
Social housing (%)	0.322*	0.336*	0.422*	0.326**	0.227
	(0.173)	(0.175)	(0.216)	(0.148)	(0.150)
	Panel E. Dependent variable: Active foreigners (% adult population)				
Social housing (%)	0.108	0.207	0.241	0.144	0.238
	(0.210)	(0.216)	(0.248)	(0.178)	(0.198)
	Panel F. Dependent variable: Foreign students (% adult population)				
Social housing (%)	0.0886	0.119*	0.161*	0.0957*	0.0932
	(0.0655)	(0.0709)	(0.0897)	(0.0560)	(0.0598)
K-P First stage F-stat	9.12	9.67	7.50	14.88	15.13
Covariates	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Observations	1,072	984	872	756	632
Municipalities	268	246	218	189	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.5: Two-stages least squares results - other outcomes

	(1)	(2)	(3)	(4)	(5)
Population sample:	[500 ; 9,000]	[600 ; 8,000]	[700 ; 7,000]	[800 ; 6,000]	[900 ; 5,000]
			Panel A. Dependent variable: Job diversity - foreigners		
Social housing (%)	-0.0285	-0.0257	-0.0405	-0.0264	-0.0286
	(0.0305)	(0.0315)	(0.0377)	(0.0286)	(0.0306)
K-P First stage F-stat	[11.20]	[11.17]	[8.37]	[15.75]	[16.10]
Observations	1,019	940	834	729	613
			Panel B. Dependent variable: Job diversity - total		
Social housing (%)	0.0165	0.0127	0.0139	0.00748	0.0109
	(0.0104)	(0.00896)	(0.0104)	(0.00657)	(0.00756)
K-P First stage F-stat	[9.12]	[9.67]	[7.50]	[14.88]	[15.13]
Observations	1,072	984	872	756	632
			Panel C. Dependent variable: Median income		
Social housing (%)	-404.2*	-413.9*	-397.5	-519.9*	-433.3
	(219.2)	(223.5)	(254.9)	(304.2)	(322.7)
K-P First stage F-stat	[23.56]	[23.95]	[19.01]	[15.70]	[15.21]
Observations	804	738	654	567	474
			Panel D. Dependent variable: Unemployment rate		
Social housing (%)	-0.0369	-0.0481	0.0427	-0.0105	0.0367
	(0.155)	(0.155)	(0.162)	(0.126)	(0.133)
K-P First stage F-stat	[9.12]	[9.67]	[7.50]	[14.88]	[15.13]
Observations	1,072	984	872	756	632
Covariates	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Municipalities	268	246	218	189	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.6: Outer rings and treated municipalities

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:	Total Foreigners (% pop)	Male foreigners (% pop)	Female foreigners (% pop)	Unemployed foreigners (% adult pop)	Inactive foreigners (% adult pop)
Social housing (%)	0.478**	0.156	0.322***	0.0356	0.266**
	(0.199)	(0.107)	(0.109)	(0.0248)	(0.105)
K-P First stage F-stat	[36.31]	[36.31]	[36.31]	[36.31]	[36.31]
Observations	632	632	632	632	632
			Panel B		
Dependent variable:	Active foreigners (% adult pop)	Foreign students (% adult pop)	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Median income (euros)
Social housing (%)	0.109	0.0566	0.00267	0.00285	-631.2**
	(0.122)	(0.0365)	(0.0189)	(0.00441)	(292.4)
K-P First stage F-stat	[36.31]	[36.31]	[38.48]	[36.31]	[17.80]
Observations	632	632	609	632	474
Covariates	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Municipalities	158	158	158	158	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Sample based on municipalities with population in the [800 ; 6,000] range in 1999. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. Herfindahl indices are expressed in logs. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.7: Second outer ring municipalities

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:	Total Foreigners (% pop)	Male foreigners (% pop)	Female foreigners (% pop)	Unemployed foreigners (% adult pop)	Inactive foreigners (% adult pop)
Social housing (%)	0.350	0.0497	0.301	0.0427	0.228
	(0.319)	(0.157)	(0.187)	(0.0472)	(0.160)
K-P First stage F-stat	[10.89]	[10.89]	[10.89]	[10.89]	[10.89]
Observations	724	724	724	724	724
			Panel B		
Dependent variable:	Active foreigners (% adult pop)	Foreign students (% adult pop)	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Median income (euros)
Social housing (%)	0.0191	0.123*	-0.0835*	0.0117	-490.8
	(0.228)	(0.0719)	(0.0470)	(0.00908)	(302.1)
K-P First stage F-stat	[10.89]	[10.89]	[9.78]	[10.89]	[16.14]
Observations	724	724	695	724	543
Covariates	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Municipalities	181	181	181	181	181

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Sample based on municipalities with population in the [800 ; 6,000] range in 1999. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. Herfindahl indices are expressed in logs. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.8: Boundary rings

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:	Total Foreigners (% pop)	Male foreigners (% pop)	Female foreigners (% pop)	Unemployed foreigners (% adult pop)	Inactive foreigners (% adult pop)
Social housing (%)	0.905**	0.312*	0.593***	0.0743	0.407**
	(0.376)	(0.182)	(0.216)	(0.0474)	(0.189)
K-P First stage F-stat	[12.33]	[12.33]	[12.33]	[12.33]	[12.33]
Observations	592	592	592	592	592
			Panel B		
Dependent variable:	Active foreigners (% adult pop)	Foreign students (% adult pop)	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Median income (euros)
Social housing (%)	0.390*	0.111*	-0.0395	0.00331	-1,314**
	(0.220)	(0.0628)	(0.0356)	(0.00697)	(646.6)
K-P First stage F-stat	[12.33]	[12.33]	[13.56]	[12.33]	[6.69]
Observations	592	592	567	592	444
Covariates	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Municipalities	148	148	148	148	148

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Sample based on municipalities with population in the [800 ; 6,000] range in 1999. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. Herfindahl indices are expressed in logs. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.9: Placebo test

	(1)	(2)	(3)	(4)	(5)
Population sample:	[500 ; 9,000]	[600 ; 8,000]	[700 ; 7,000]	[800 ; 6,000]	[900 ; 5,000]
	Panel A				
	Dependent variable: Social housing stock (%)				
SRU policy	0.143	0.0108	-0.0141	-0.271	-0.228
	(0.333)	(0.332)	(0.354)	(0.384)	(0.442)
R-squared	[0.219]	[0.224]	[0.224]	[0.230]	[0.227]
	Panel B				
	Dependent variable: Foreigners (% population)				
SRU policy	0.148	-0.173	-0.276	-0.554	-0.435
	(0.416)	(0.431)	(0.469)	(0.495)	(0.575)
R-squared	[0.033]	[0.033]	[0.037]	[0.037]	[0.036]
Covariates	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
District (NUTS-3) trend	Y	Y	Y	Y	Y
Observations	852	792	700	608	524
Municipalities	213	198	175	152	131

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level and controlled for. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.10: Lyon - 2SLS results

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Foreigners (% population)			Median income		
Population sample:	[500 ; 9,000]	[1,000 ; 8,000]	[1,500 ; 7,500]	[500 ; 9,000]	[1,000 ; 8,000]	[1,500 ; 7,500]
Social housing	0.0225	0.111	0.160	-619.0	-344.1	-85.53
	(0.469)	(0.548)	(0.543)	(494.9)	(361.8)	(233.1)
Covariates	Y	Y	Y	Y	Y	Y
Muni. FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	528	436	336	396	327	252
Municipalities	132	109	84	132	109	84

Notes: Robust standard errors clustered at the municipality level in parentheses. Lyon area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.11: Toulouse - 2SLS results

	(1)	(2)	(3)	(1)	(2)	(3)
Dependent variable:	Foreigners (% population)			Median income		
Population sample:	[500 ; 9,000]	[1,000 ; 8,000]	[1,500 ; 7,500]	[500 ; 9,000]	[1,000 ; 8,000]	[1,500 ; 7,500]
Social housing	0.0807	0.0483	0.175	-7,895	-2,689	-1,567
	(0.141)	(0.172)	(0.220)	(15,053)	(3,199)	(2,509)
Covariates	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	392	280	208	294	210	156
Municipalities	98	70	52	98	70	52

Notes: Robust standard errors clustered at the municipality level in parentheses. Toulouse area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.12: Marseille - 2SLS results

	(1)	(2)	(3)	(1)	(2)	(3)
Dependent variable:	Foreigners (% population)			Median income		
Population sample:	[500 ; 9,000]	[1,000 ; 8,000]	[1,500 ; 7,500]	[500 ; 9,000]	[1,000; 8,000]	[1,500; 7,500]
Social housing	0.229	0.486	1.117	-398.9	-350.5	-167.7
	(0.499)	(0.626)	(1.217)	(478.7)	(518.5)	(659.2)
Covariates	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	416	380	320	312	285	240
Municipalities	104	95	80	104	95	80

Notes: Robust standard errors clustered at the municipality level in parentheses. Marseille area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.13: Pooled first stage results

	(1)	(2)	(3)	(4)	(5)
	Dependent variable: Social housing stock (%)				
Sample:	All four study areas		Excludes Ile de France	Excludes Marseille	Lyon and Toulouse only
SRU policy	1.090***	1.169***	1.047***	1.344***	1.387***
	(0.198)	(0.198)	(0.216)	(0.249)	(0.316)
Observations	[1,852]	[1,852]	[1,096]	[1,472]	[716]
R-squared	0.392	0.412	0.445	0.418	0.472
Covariates	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
District (NUTS-3) trend		Y	Y	Y	Y
Municipalities	463	463	274	368	179

Notes: Robust standard errors clustered at the municipality level in parentheses. Municipalities with population in 800-6,000 range in 1999 for the Ile-de-France region. Municipalities with population in 1,000-8,000 range in 1999 for the other study areas. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (ITWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.14: Pooled two-stages least squares results

	(1)	(2)	(3)	(4)
Sample:	All four study areas	Excludes Ile de France	Excludes Marseille	Lyon and Toulouse only
	Panel A. Dependent variable: Foreigners (% population)			
Social housing (%)	0.400**	0.00382	0.422**	0.0530
	(0.185)	(0.219)	(0.185)	(0.188)
K-P First stage F-stat	[30.38]	[15.88]	[30.64]	[17.72]
Observations	1,852	1,096	1,472	716
	Panel B. Dependent variable: Median income			
Social housing (%)	-632.9**	-821.1*	-702.8***	-964.0**
	(246.5)	(423.9)	(251.5)	(471.0)
K-P First stage F-stat	[26.34]	[8.09]	[27.36]	[7.85]
Observations	1,389	822	1,104	537
	Panel C. Dependent variable: Job diversity (total) - Herfindahl (log)			
Social housing (%)	0.00907	0.00487	0.00831	0.00508
	(0.00583)	(0.00905)	(0.00555)	(0.00891)
K-P First stage F-stat	[30.38]	[15.88]	[30.64]	[17.72]
Observations	1,852	1,096	1,472	716
Covariates	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Municipalities	463	274	368	179

Notes: Social housing stock instrumented with SRU policy binary variable. Robust standard errors clustered at the municipality level in parentheses. Municipalities with population in 800-6,000 range in 1999 for the Ile-de-France region. Municipalities with population in 1,000-8,000 range in 1999 for the other study areas. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.15: Two-stages least squares conditional effects

	(1)	(2)	(3)	(4)
	Dependent variable: foreigners (% population)			
Social housing	-0.172	0.851**	0.397**	0.707*
	(0.348)	(0.404)	(0.181)	(0.419)
Social housing * TTWA foreign population	0.0535			0.0633*
	(0.0337)			(0.0334)
Social housing * TTWA unemployment rate		-0.0426		-0.0932**
		(0.0301)		(0.0395)
Social housing * Socialist party municipality			-0.0481	-0.0183
			(0.116)	(0.132)
K-P First stage F-stat	10.30	13.67	17.36	4.85
Covariates	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Observations	1,852	1,852	1,852	1,852
Municipalities	463	463	463	463

Notes: Social housing stock instrumented with SRU policy binary variable. Robust standard errors clustered at the municipality level in parentheses. Municipalities with population in 800-6,000 range in 1999 for the Ile-de-France region. Municipalities with population in 1,000-8,000 range in 1999 for the other study areas. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. In columns 1 and 4 TTWA foreign population share (net of municipality value) is controlled for. *** p<0.01, ** p<0.05, * p<0.1.

Figures

Figure 1: Social housing and immigrant population in French municipalities

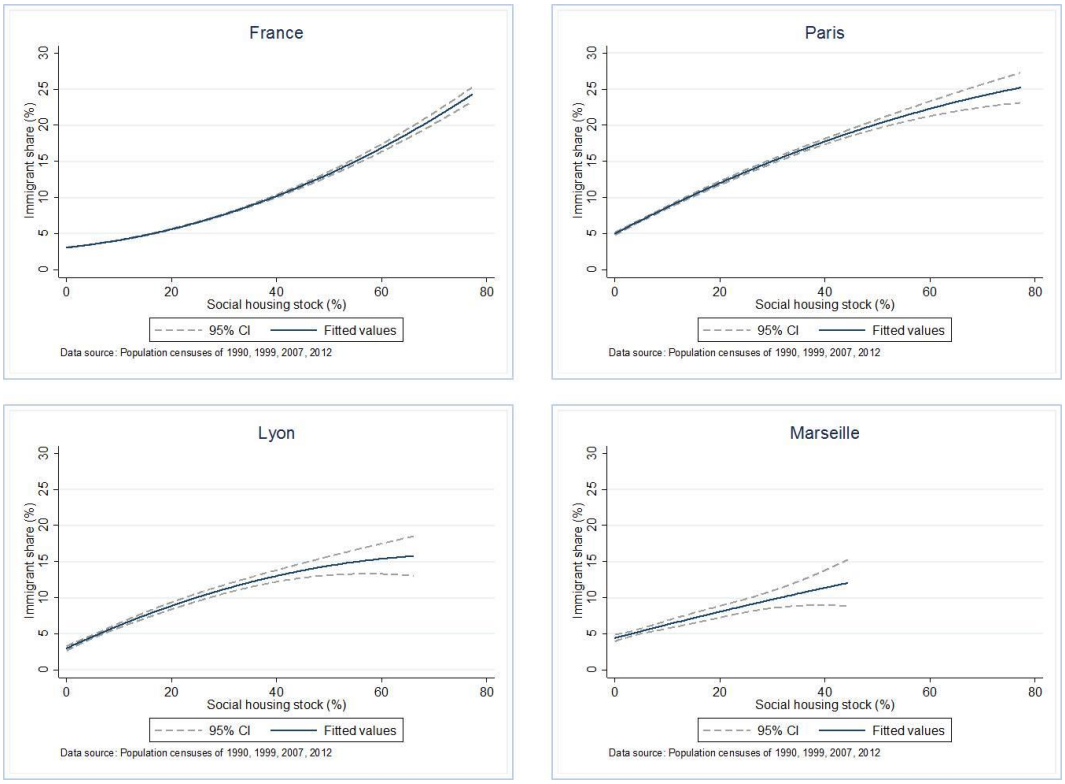


Figure 2: Urban units of the Ile de France region affected by the SRU policy reform.

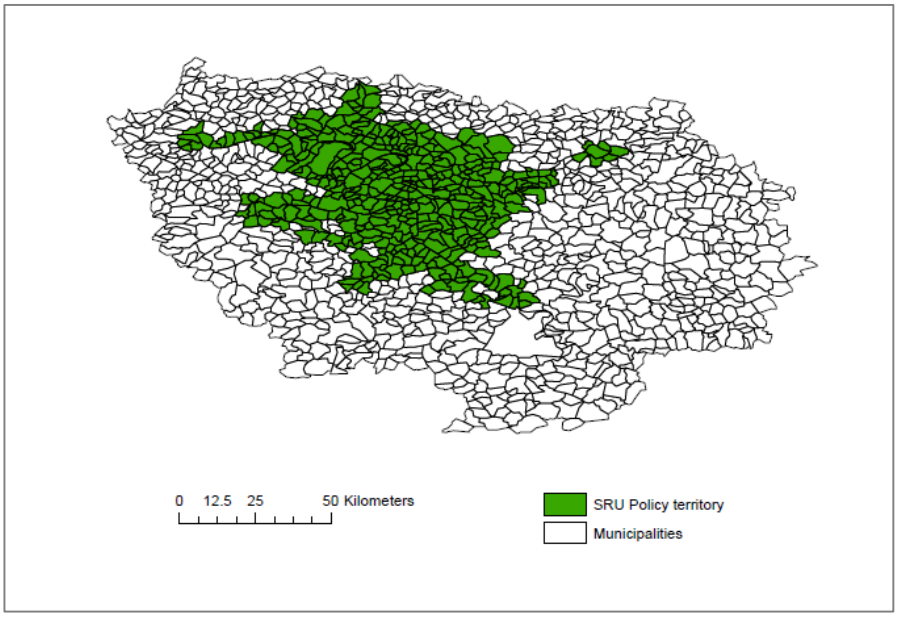


Figure 3: Municipalities treated in Ile de France in 2000.

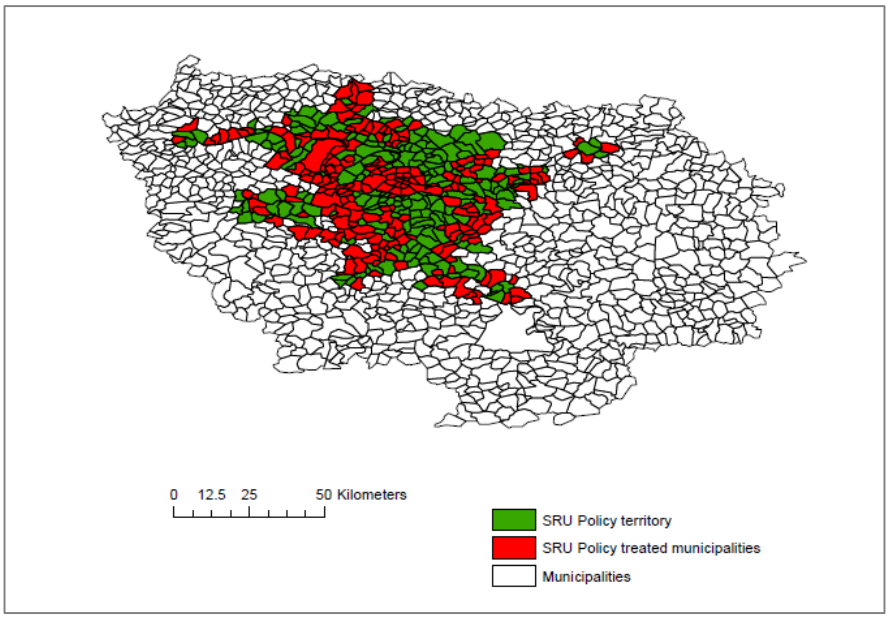
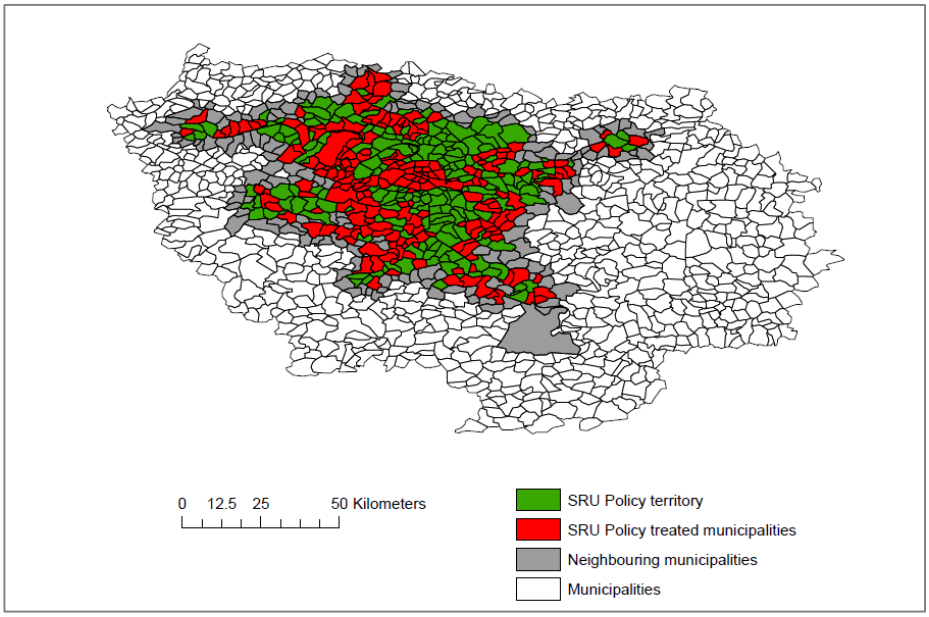


Figure 4: Neighbouring municipalities



Appendix C

The Elusive Quest for Social Diversity?

Appendix Tables

Table C.1: Summary statistics

	Obs.	Mean	Std. Dev.
Social housing stock (%)	189	5.09	7.28
Population	189	2720.05	1516.63
TTWA unemployment rate	189	10.11	2.29
TTWA industrial employment share	189	15.22	2.62
TTWA public administration employment share	189	32.67	1.58
Foreigners (% population)	189	5.27	4.27
Male foreigners (% population)	189	2.73	2.26
Female foreigners (% population)	189	2.54	2.44
Foreign children (% population less 15 y. old)	189	3.06	6.28
Unemployed foreigners (% population 15+ old)	189	0.35	0.63
Inactive foreigners (% population 15+ old)	189	1.87	2.12
Job concentration - foreigners - Herfindahl index	189	46.82	30.18
Job concentration - total - Herfindahl index	189	24.88	2.08
Median income (€)	189	40164.16	6940.53
Unemployment rate	189	7.29	1.64

Notes: Municipality level data. Data source: 1999 French housing and population census. TTWA = France's 1990 *zones d'emploi*. Sample restricted to municipalities with population between 800 and 6,000 inhabitants.

Table C.2: Granger causality test - anticipatory and post-treatment effects

	(1)	(2)	(3)	(4)	(5)
	Dependent variable: Social housing stock (%)				
SRU policy t+2	1.138	1.171	-0.0105	0.281	-2.007
	(2.353)	(2.372)	(2.653)	(2.667)	(1.696)
SRU policy t+1	0.729	0.970	-0.114	0.921	-1.628
	(2.441)	(2.465)	(2.769)	(2.746)	(1.909)
SRU policy t	1.538	1.727	0.566	1.639	-0.867
	(2.443)	(2.475)	(2.788)	(2.774)	(1.939)
SRU policy t-1	2.664	2.909	1.734	2.768	0.382
	(2.450)	(2.476)	(2.769)	(2.755)	(1.877)
Population size	[500 ; 9000]	[600 ; 8000]	[700 ; 7000]	[800 ; 6000]	[900 ; 5000]
Covariates	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
R-squared	0.345	0.349	0.329	0.372	0.371
Observations	1,072	984	872	756	632
Municipalities	268	246	218	189	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.3: Foreign population – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Dependent variable: Foreigners (% population)									
Population sample:	[500 ; 9,000]		[600 ; 8,000]		[700 ; 7,000]		[800 ; 6,000]		[900 ; 5,000]	
SRU policy	0.609**	0.627**	0.734**	0.710**	0.843**	0.843**	0.853**	0.857**	0.894**	0.910**
	(0.305)	(0.315)	(0.320)	(0.333)	(0.355)	(0.371)	(0.388)	(0.409)	(0.447)	(0.459)
Unemployment rate	0.213	0.271	0.197	0.228	0.131	0.166	-0.0104	0.0278	-0.150	-0.0646
	(0.219)	(0.220)	(0.233)	(0.230)	(0.256)	(0.249)	(0.300)	(0.292)	(0.389)	(0.369)
Industry employment	-0.0143	-0.00698	0.0142	0.0275	0.0318	0.0435	0.0547	0.0564	0.0140	0.0213
	(0.0593)	(0.0615)	(0.0590)	(0.0618)	(0.0621)	(0.0648)	(0.0655)	(0.0691)	(0.0538)	(0.0561)
Public sector employment	-0.0429	-0.0472	-0.0255	-0.0277	-0.0415	-0.0459	-0.0569	-0.0624	-0.0689	-0.0771
	(0.0352)	(0.0359)	(0.0358)	(0.0364)	(0.0389)	(0.0396)	(0.0412)	(0.0423)	(0.0455)	(0.0466)
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District (NUTS-3) trend		Y		Y		Y		Y		Y
R-squared	0.037	0.040	0.034	0.036	0.035	0.037	0.035	0.038	0.035	0.040
Observations	1,072	1,072	984	984	872	872	756	756	632	632
Municipalities	268	268	246	246	218	218	189	189	158	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.4: Male and female foreigners – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Male foreigners (% pop)	Female foreigners (% pop)	Male foreigners (% pop)	Female foreigners (% pop)	Male foreigners (% pop)	Female foreigners (% pop)	Male foreigners (% pop)	Female foreigners (% pop)	Male foreigners (% pop)	Female foreigners (% pop)
Population sample:	[500 ; 9,000]		[600 ; 8,000]		[700 ; 7,000]		[800 ; 6,000]		[900 ; 5,000]	
SRU policy	0.192	0.435**	0.243	0.467***	0.285	0.558***	0.263	0.594***	0.322	0.588**
	(0.171)	(0.168)	(0.179)	(0.179)	(0.199)	(0.200)	(0.216)	(0.224)	(0.251)	(0.241)
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District (NUTS-3) trend	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.048	0.030	0.045	0.027	0.044	0.030	0.044	0.032	0.047	0.034
Observations	1,072	1,072	984	984	872	872	756	756	632	632
Municipalities	268	268	246	246	218	218	189	189	158	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.5: Unemployed and inactive foreigners – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Unemployed foreigners (% adult pop)	Inactive foreigners (% adult pop)	Unemployed foreigners (% adult pop)	Inactive foreigners (% adult pop)	Unemployed foreigners (% adult pop)	Inactive foreigners (% adult pop)	Unemployed foreigners (% adult pop)	Inactive foreigners (% adult pop)	Unemployed foreigners (% adult pop)	Inactive foreigners (% adult pop)
Population sample:	[500 ; 9,000]		[600 ; 8,000]		[700 ; 7,000]		[800 ; 6,000]		[900 ; 5,000]	
SRU policy	0.0842*	0.341**	0.0907*	0.370**	0.112*	0.461**	0.0518	0.480**	0.0646	0.352
	(0.0509)	(0.156)	(0.0544)	(0.165)	(0.0601)	(0.182)	(0.0584)	(0.199)	(0.0643)	(0.216)
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District trend	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.040	0.023	0.038	0.021	0.039	0.024	0.045	0.027	0.043	0.025
Observations	1,072	1,072	984	984	872	872	756	756	632	632
Municipalities	268	268	246	246	218	218	189	189	158	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.6: Active and student foreigners – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Active foreigners (% adult pop)	Student foreigners (% adult pop)	Active foreigners (% adult pop)	Student foreigners (% adult pop)	Active foreigners (% adult pop)	Student foreigners (% adult pop)	Active foreigners (% adult pop)	Student foreigners (% adult pop)	Active foreigners (% adult pop)	Student foreigners (% adult pop)
Population sample:	[500 ; 9,000]		[600 ; 8,000]		[700 ; 7,000]		[800 ; 6,000]		[900 ; 5,000]	
SRU policy	0.189	0.114*	0.274	0.145**	0.309	0.197***	0.278	0.164**	0.411	0.158*
	(0.233)	(0.0601)	(0.244)	(0.0619)	(0.268)	(0.0664)	(0.288)	(0.0729)	(0.319)	(0.0813)
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District trend	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.016	0.128	0.015	0.124	0.018	0.133	0.022	0.118	0.030	0.112
Observations	1,072	1,072	984	984	872	872	756	756	632	632
Municipalities	268	268	246	246	218	218	189	189	158	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.7: Socio-professional categories – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Socio-professional diversity (Herfindahl) Foreigners	Total	Socio-professional diversity (Herfindahl) Foreigners	Total	Socio-professional diversity (Herfindahl) Foreigners	Total	Socio-professional diversity (Herfindahl) Foreigners	Total	Socio-professional diversity (Herfindahl) Foreigners	Total
Population sample:	[500 ; 9,000]		[600 ; 8,000]		[700 ; 7,000]		[800 ; 6,000]		[900 ; 5,000]	
SRU policy	-0.0317	0.0171**	-0.0304	0.0149*	-0.0414	0.0143	-0.0365	0.00921	-0.0327	0.0138
	(0.0359)	(0.00774)	(0.0378)	(0.00797)	(0.0412)	(0.00871)	(0.0447)	(0.00899)	(0.0496)	(0.0101)
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District (NUTS-3) trend	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.346	0.335	0.350	0.350	0.362	0.341	0.371	0.387	0.397	0.378
Observations	1,020	1,072	941	984	835	872	729	756	613	632
Municipalities	268	268	246	246	218	218	189	189	158	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Socio-professional categories are classified into six groups: i) farmers; ii) craftsmen, traders and entrepreneurs; iii) executives and higher intellectual professions; iv) intermediate professions; v) employees; vi) workers. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (ITWA) level. Herfindahl indices are expressed in logs. *** p<0.01, ** p<0.05, * p<0.1.

Table C.8: Socio-professional categories – adult foreign population

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Foreign agriculture share	Foreign trade and services share	Foreign executives share	Foreign intermediate share	Foreign employee share	Foreign worker share
Social housing (%)	0.0981	1.232	-0.502	1.570	0.481	-2.880
	(0.283)	(1.113)	(1.240)	(1.676)	(1.639)	(2.039)
Covariates	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	729	729	729	729	729	729
Municipalities	189	189	189	189	189	189

Notes: Kleibergen-Paap first stage F-stat is equal to 15.75. Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Sample based on municipalities with population in the [800 ; 6,000] range in 1999. Socio-professional categories are classified into six groups: i) farmers; ii) craftsmen, traders and entrepreneurs; iii) executives and higher intellectual professions; iv) intermediate professions; v) employees; vi) workers. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.9: Socio-professional categories – total adult population

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Agriculture share	Trade and services share	Executives share	Intermediate share	Employee share	Worker share
Social housing (%)	0.140	-0.140	-0.508	-0.189	0.544	0.153
	(0.0889)	(0.231)	(0.399)	(0.400)	(0.402)	(0.347)
Covariates	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	756	756	756	756	756	756
Municipalities	189	189	189	189	189	189

Notes: Kleibergen-Paap first stage F-stat is equal to 14.88. Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Sample based on municipalities with population in the [800 ; 6,000] range in 1999. Socio-professional categories are classified into six groups: i) farmers; ii) craftsmen, traders and entrepreneurs; iii) executives and higher intellectual professions; iv) intermediate professions; v) employees; vi) workers. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.10: Median income and unemployment rate – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Median income	Unemployed rate (%)	Median income	Unemployed rate (%)	Median income	Unemployed rate (%)	Median income	Unemployed rate (%)	Median income	Unemployed rate (%)
Population sample:	[500 ; 9,000]		[600 ; 8,000]		[700 ; 7,000]		[800 ; 6,000]		[900 ; 5,000]	
SRU policy	-653.6***	-0.0640	-639.2**	-0.0913	-649.6**	0.00211	-825.2***	-0.0593	-874.2**	0.0507
	(247.5)	(0.168)	(254.6)	(0.175)	(283.6)	(0.187)	(314.0)	(0.192)	(359.2)	(0.205)
Covariates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District trend	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.895	0.372	0.900	0.378	0.895	0.371	0.899	0.368	0.903	0.377
Observations	804	1,072	738	984	654	872	567	756	474	632
Municipalities	268	268	246	246	218	218	189	189	158	158

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.11: Outer ring and treated municipalities – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)
				Panel A		
Dependent variable:	Social housing (%)	Total Foreigners (%)	Male foreigners (%)	Female foreigners (%)	Unemployed foreigners (%)	Inactive foreigners (%)
SRU policy	1.932***	1.129**	0.392	0.737***	0.0760	0.586**
	(0.366)	(0.439)	(0.241)	(0.234)	(0.0608)	(0.229)
R-squared	[0.421]	[0.046]	[0.047]	[0.046]	[0.046]	[0.034]
Observations	632	632	632	632	632	632
				Panel B		
Dependent variable:	Active foreigners (%)	Foreign students (%)	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Unemployment rate (%)	Median income (euros)
SRU policy	0.370	0.151*	0.00912	0.00422	0.203	-1,074***
	(0.284)	(0.0802)	(0.0469)	(0.00977)	(0.206)	(331.8)
R-squared	[0.027]	[0.153]	[0.418]	[0.424]	[0.343]	[0.902]
Observations	632	632	609	632	632	474
Covariates	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
District trend	Y	Y	Y	Y	Y	Y

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Sample based on municipalities with population in the [800 ; 6,000] range in 1999. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level and controlled for. *** p<0.01, ** p<0.05, * p<0.1.

Table C.12: Second outer ring municipalities as control – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A			
Dependent variable:	Social housing stock (%)	Total Foreigners (%)	Male foreigners (%)	Female foreigners (%)	Unemployed foreigners (%)	Inactive foreigners (%)
SRU policy	1.078***	0.475	0.0801	0.395*	0.0451	0.282
	(0.380)	(0.407)	(0.209)	(0.227)	(0.0619)	(0.180)
R-squared	[0.396]	[0.021]	[0.027]	[0.026]	[0.048]	[0.030]
Observations	724	724	724	724	724	724
			Panel B			
Dependent variable:	Active foreigners (%)	Foreign students (%)	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Unemployment rate (%)	Median income (euros)
SRU policy	0.106	0.161**	-0.102**	0.0134	0.386	-752.2**
	(0.316)	(0.0729)	(0.0473)	(0.00961)	(0.235)	(328.4)
R-squared	[0.013]	[0.105]	[0.353]	[0.321]	[0.303]	[0.911]
Observations	724	724	695	724	724	543
Covariates	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
District trend	Y	Y	Y	Y	Y	Y

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Sample based on municipalities with population in the [800 ; 6,000] range in 1999. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level and controlled for. *** p<0.01, ** p<0.05, * p<0.1.

Table C.13: Boundary rings – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A			
Dependent variable:	Social housing (%)	Total Foreigners (%)	Male foreigners (%)	Female foreigners (%)	Unemployed foreigners (%)	Inactive foreigners (%)
SRU policy	1.517***	1.331***	0.458*	0.874***	0.117*	0.610**
	(0.432)	(0.476)	(0.255)	(0.253)	(0.0678)	(0.243)
R-squared	[0.352]	[0.045]	[0.044]	[0.045]	[0.031]	[0.028]
Observations	592	592	592	592	592	592
			Panel B			
Dependent variable:	Active foreigners (%)	Foreign students (%)	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Unemployed rate (%)	Median income (euros)
SRU policy	0.573*	0.181**	-0.0499	0.00383	0.206	-1,398***
	(0.318)	(0.0845)	(0.0555)	(0.0105)	(0.230)	(369.7)
R-squared	[0.023]	[0.122]	[0.351]	[0.359]	[0.341]	[0.896]
Observations	592	592	567	592	592	444
Covariates	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
District trend	Y	Y	Y	Y	Y	Y

Notes: Robust standard errors clustered at the municipality level in parentheses. Ile de France sample. Sample based on municipalities with population in the [800 ; 6,000] range in 1999. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level and controlled for. *** p<0.01, ** p<0.05, * p<0.1.

Table C.14: Urban unit characteristics

	France	Paris	Lyon	Marseille	Toulouse
Total population (thousands)	65,907	10,659	1,620	1,578	935
Foreign population (thousands)	4,200	1,526	141	110	69
Foreign population (%)	6.4	14.3	8.7	7.0	7.4
Social housing (%)	14.7	23.7	19.0	16.6	5.6
Unemployment rate (%)*	10.4	9.8	9.8	11.1	10.5

Notes: Insee 2014 data. Urban unit level data. * 15-64 years old population. 2014 data

Table C.15: Lyon - first stage

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Social housing stock (%)					
Population sample:	[500 ; 9,000]		[1,000 ; 8,000]		[1,500 ; 7,500]	
SRU policy	0.766**	0.781**	0.657*	0.732*	0.748*	0.846**
	(0.341)	(0.343)	(0.363)	(0.371)	(0.393)	(0.401)
Unemployment rate	-0.665	-0.679	-0.785	-0.842	-0.146	-0.0693
	(0.845)	(0.913)	(0.727)	(0.834)	(1.625)	(1.847)
Industry employment	0.850*	0.839*	1.062**	0.998**	0.831	0.785
	(0.479)	(0.479)	(0.446)	(0.443)	(1.113)	(1.092)
Public sector employment	0.0804	0.0777	0.0613	0.0429	-0.0804	-0.0980
	(0.115)	(0.115)	(0.144)	(0.145)	(0.107)	(0.128)
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
District (NUTS-3) trend		Y		Y		Y
R-squared	0.462	0.462	0.496	0.498	0.517	0.522
Observations	528	528	436	436	336	336
Municipalities	132	132	109	109	84	84

Notes: Robust standard errors clustered at the municipality level in parentheses. Lyon area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.16: Lyon - Immigrant population – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Foreigners (% population)					
Population sample:	[500 ; 9,000]		[1,000 ; 8,000]		[1,500 ; 7,500]	
SRU policy	0.0173	-0.0494	0.0728	-0.0453	0.120	-0.00418
	(0.364)	(0.355)	(0.362)	(0.346)	(0.402)	(0.382)
Unemployment rate	-0.812**	-0.955***	-1.021**	-1.201**	-1.175**	-1.446***
	(0.361)	(0.352)	(0.449)	(0.459)	(0.512)	(0.466)
Industry employment	0.0685	0.0774	0.227**	0.264**	0.343	0.396
	(0.127)	(0.141)	(0.0928)	(0.123)	(0.234)	(0.257)
Public sector employment	0.0890	0.0967	0.0414	0.0637	-0.00739	0.0116
	(0.114)	(0.116)	(0.129)	(0.134)	(0.127)	(0.123)
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Departement trend		Y		Y		Y
R-squared	0.076	0.081	0.137	0.154	0.149	0.182
Observations	528	528	436	436	336	336
Municipalities	132	132	109	109	84	84

Notes: Robust standard errors clustered at the municipality level in parentheses. Lyon area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.17: Lyon – Job diversity, unemployment and median income – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Population sample:	[500 ; 9,000]		[1,000 ; 8,000]		[1,500 ; 7,500]	
			Panel A			
Dependent variable:	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl)
SRU policy	0.0149	0.0225	0.0217	0.0291*	0.0574	0.0207
	(0.0621)	(0.0158)	(0.0659)	(0.0163)	(0.0691)	(0.0183)
Observations	[472]	[528]	[402]	[436]	[318]	[336]
R-squared	0.359	0.144	0.362	0.144	0.456	0.174
			Panel B			
Dependent variable:	Unemployment rate	Median income	Unemployment rate	Median income	Unemployment rate	Median income
SRU policy	0.102	-520.8	0.161	-371.0	0.0958	-168.4
	(0.270)	(362.2)	(0.275)	(362.4)	(0.295)	(382.7)
Observations	[528]	[396]	[436]	[327]	[336]	[252]
R-squared	0.279	0.934	0.329	0.942	0.325	0.948
Covariates	Y	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
District trend	Y	Y	Y	Y	Y	Y

Notes: Robust standard errors clustered at the municipality level in parentheses. Lyon area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.18: Toulouse - first stage

	(1)	(2)	(3)	(4)
	Dependent variable: Social housing stock (%)			
Population sample:	[500 ; 9,000]		[1,000 ; 8,000]	[1,500 ; 7,500]
SRU policy	2.128***	2.121***	1.945***	1.627***
	(0.493)	(0.495)	(0.541)	(0.583)
Unemployment rate	15.95	15.79	21.97	6.780
	(25.31)	(25.34)	(26.95)	(28.20)
Industry employment	33.05***	33.00***	28.17***	27.48***
	(9.181)	(9.189)	(9.321)	(9.766)
Public sector employment	16.52***	16.51***	15.88***	16.78***
	(2.690)	(2.688)	(3.331)	(2.499)
Municipality FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
District (NUTS-3) trend		Y		
R-squared	0.524	0.524	0.581	0.657
Observations	392	392	280	208
Number of districts	2	2	1	1
Municipalities	98	98	70	52

Notes: Robust standard errors clustered at the municipality level in parentheses. Toulouse area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.19: Toulouse – Immigrant population – reduced form estimates

	(1)	(2)	(3)	(4)
	Dependent variable: Foreigners (% population)			
Population sample:	[500 ; 9,000]		[1,000 ; 8,000]	[1,500 ; 7,500]
SRU policy	0.172	0.189	0.0939	0.285
	(0.297)	(0.299)	(0.338)	(0.340)
Unemployment rate	-10.12	-9.731	-10.16	-11.45
	(16.24)	(16.23)	(18.79)	(18.53)
Industry employment	2.218	2.334	-1.174	-6.915
	(6.795)	(6.823)	(6.668)	(5.961)
Public sector employment	-2.460	-2.430	-2.464	-1.564
	(2.142)	(2.145)	(2.235)	(1.875)
Municipality FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
District (NUTS-3) trend		Y		
R-squared	0.020	0.023	0.033	0.066
Observations	392	392	280	208
Number of districts	2	2	1	1
Municipalities	98	98	70	52

Notes: Robust standard errors clustered at the municipality level in parentheses. Toulouse area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.20: Toulouse - Job diversity, unemployment and median income – reduced form estimates

	(1)	(2)	(5)	(6)	(9)	(10)
Population sample:	[500 ; 9,000]		[1,000 ; 8,000]		[1,500 ; 7,500]	
			Panel A			
	Job diversity		Job diversity		Job diversity	
Dependent variable:	(foreigners) Herfindahl	(total) Herfindahl	(foreigners) Herfindahl	(total) Herfindahl	(foreigners) Herfindahl	(total) Herfindahl
SRU policy	-0.000727	-0.0433***	0.00872	-0.0226*	-0.0209	-0.0116
	(0.0733)	(0.0133)	(0.0782)	(0.0134)	(0.0816)	(0.0155)
Observations	[331]	[392]	[249]	[280]	[191]	[208]
R-squared	0.439	0.174	0.492	0.146	0.538	0.086
			Panel B			
Dependent variable:	Unemployed rate	Median income	Unemployed rate	Median income	Unemployed rate	Median income
SRU policy	0.370	-2,317***	0.0993	-1,315***	0.206	-637.5
	(0.255)	(420.4)	(0.259)	(426.2)	(0.274)	(447.1)
Observations	[392]	[294]	[280]	[210]	[208]	[156]
R-squared	0.543	0.861	0.592	0.876	0.644	0.883
Covariates	Y	Y	Y	Y	Y	Y
Muni. FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
District trend						

Notes: Robust standard errors clustered at the municipality level in parentheses. Toulouse area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.21: Marseille - first stage

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Social housing stock (%)					
Population sample:	[500 ; 9,000]		[1,000 ; 8,000]		[1,500 ; 7,500]	
SRU policy	0.592**	0.575**	0.496**	0.463*	0.340	0.285
	(0.237)	(0.252)	(0.243)	(0.263)	(0.276)	(0.293)
Unemployment rate	0.156*	0.107	0.121	0.0431	0.122	0.0449
	(0.0895)	(0.122)	(0.0925)	(0.125)	(0.0997)	(0.137)
Industry employment	0.0117	0.0253	-0.00893	0.000933	-0.0120	0.00191
	(0.0576)	(0.0586)	(0.0636)	(0.0623)	(0.0725)	(0.0723)
Public sector employment	-0.0468	-0.00164	-0.0684	-0.00514	-0.0684	0.000353
	(0.0478)	(0.0684)	(0.0499)	(0.0707)	(0.0585)	(0.0831)
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
District (NUTS-3) trend		Y		Y		Y
R-squared	0.394	0.399	0.396	0.407	0.405	0.417
Observations	416	416	380	380	320	320
Municipalities	104	104	95	95	80	80

Notes: Robust standard errors clustered at the municipality level in parentheses. Marseille area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.22: Marseille – immigrant population – reduced form estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Foreigners (% population)					
Population sample:	[500 ; 9,000]		[1,000 ; 8,000]		[1,500 ; 7,500]	
SRU policy	0.136	0.126	0.241	0.227	0.380	0.361
	(0.295)	(0.298)	(0.297)	(0.299)	(0.315)	(0.322)
Unemployment rate	-0.459***	-0.336**	-0.495***	-0.369**	-0.570***	-0.403**
	(0.131)	(0.166)	(0.139)	(0.177)	(0.151)	(0.192)
Industry employment	-0.112	-0.119	-0.0859	-0.0970	-0.0910	-0.108
	(0.0695)	(0.0726)	(0.0756)	(0.0772)	(0.0841)	(0.0837)
Public sector employment	-0.0825*	-0.0625	-0.0591	-0.0474	-0.0118	-0.00934
	(0.0470)	(0.0591)	(0.0503)	(0.0600)	(0.0516)	(0.0640)
Municipality FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Departement trend		Y		Y		Y
R-squared	0.223	0.235	0.252	0.265	0.284	0.295
Observations	416	416	380	380	320	320
Municipalities	104	104	95	95	80	80

Notes: Robust standard errors clustered at the municipality level in parentheses. Marseille area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Table C.23: Marseille - Job diversity, unemployment and median income – reduced form estimates

	(1)	(2)	(5)	(6)	(9)	(10)
Population sample:	[500 ; 9,000]		[1,000 ; 8,000]		[1,500 ; 7,500]	
			Panel A			
Dependent variable:	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl	Job diversity (foreigners) Herfindahl	Job diversity (total) Herfindahl
SRU policy	-0.149**	0.00345	-0.122*	0.00579	-0.133*	0.0116
	(0.0643)	(0.00911)	(0.0664)	(0.00972)	(0.0766)	(0.0101)
Observations	[394]	[416]	[363]	[380]	[308]	[320]
R-squared	0.379	0.129	0.404	0.121	0.409	0.118
			Panel B			
Dependent variable:	Unemployed rate	Median income	Unemployed rate	Median income	Unemployed rate	Median income
SRU policy	-0.372	-233.6	-0.192	-204.3	-0.146	-102.3
	(0.314)	(218.1)	(0.316)	(222.1)	(0.342)	(243.4)
Observations	[416]	[312]	[380]	[285]	[320]	[240]
R-squared	0.471	0.951	0.488	0.954	0.509	0.954
Covariates	Y	Y	Y	Y	Y	Y
Muni. FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
District trend	Y	Y	Y	Y	Y	Y

Notes: Robust standard errors clustered at the municipality level in parentheses. Marseille area sample. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

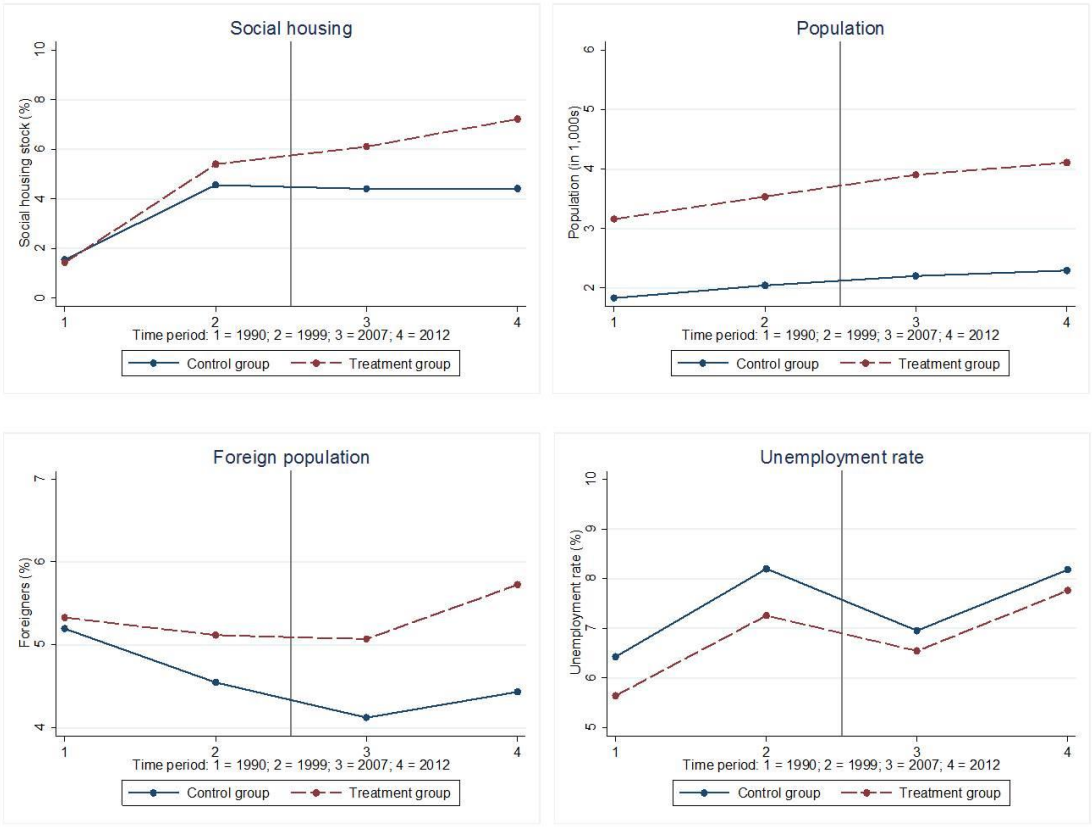
Table C.24: Pooled results – reduced form estimates

	(1)	(2)	(3)	(4)	(5)
Sample:	All four study areas		Excludes Ile de France	Excludes Marseille	Lyon and Toulouse only
			Panel A. Dependent variable: Social housing stock (%)		
SRU policy	1.090***	1.169***	1.047***	1.344***	1.387***
	(0.198)	(0.198)	(0.216)	(0.249)	(0.316)
Observations	[1,852]	[1,852]	[1,096]	[1,472]	[716]
R-squared	0.392	0.412	0.445	0.418	0.472
			Panel B. Dependent variable: Foreigners (% population)		
SRU policy	0.436**	0.386*	0.0673	0.443*	0.0130
	(0.194)	(0.200)	(0.186)	(0.247)	(0.239)
Observations	[1,852]	[1,852]	[1,096]	[1,472]	[716]
R-squared	0.050	0.081	0.158	0.052	0.113
			Panel C. Dependent variable: Median income		
SRU policy	-592.5***	-633.4***	-539.9***	-803.7***	-843.4***
	(196.2)	(169.2)	(186.3)	(212.5)	(277.9)
Observations	[1,389]	[1,389]	[822]	[1,104]	[537]
R-squared	0.897	0.914	0.927	0.907	0.917
			Panel D. Dependent variable: Socio-professional diversity - Herfindahl (log)		
SRU policy	0.00988*	0.00608	0.00347	0.00613	0.00327
	(0.00586)	(0.00571)	(0.00760)	(0.00692)	(0.0113)
Observations	[1,852]	[1,852]	[1,096]	[1,472]	[716]
R-squared	0.205	0.250	0.114	0.273	0.119
Covariates	Y	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
District trend		Y	Y	Y	Y
Municipalities	463	463	274	368	179

Notes: Robust standard errors clustered at the municipality level in parentheses. Municipalities with population in 800-6,000 range in 1999 for the Ile-de-France region. Municipalities with population in 1,000-8,000 range in 1999 for the other study areas. Data sources: 1990, 1999, 2007, and 2012 French population and housing censuses. Unemployment rate, industry employment and public administration employment shares are defined at the travel-to-work-area (TTWA) level. *** p<0.01, ** p<0.05, * p<0.1.

Appendix Figures

Figure C.1: Parallel trends



Notes: Ile-de-France municipalities with a population in the 800-6,000 range in 1999 and within the SRU territory or in the first outer contiguous municipality ring.

Figure C.2: First and second outer rings

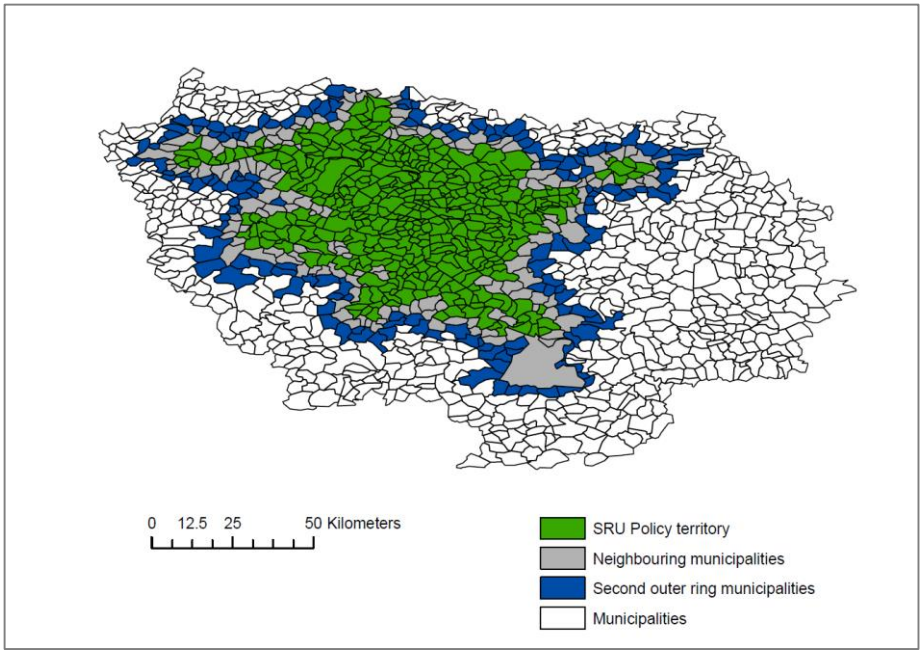


Figure C.3: Inner and outer ring municipalities

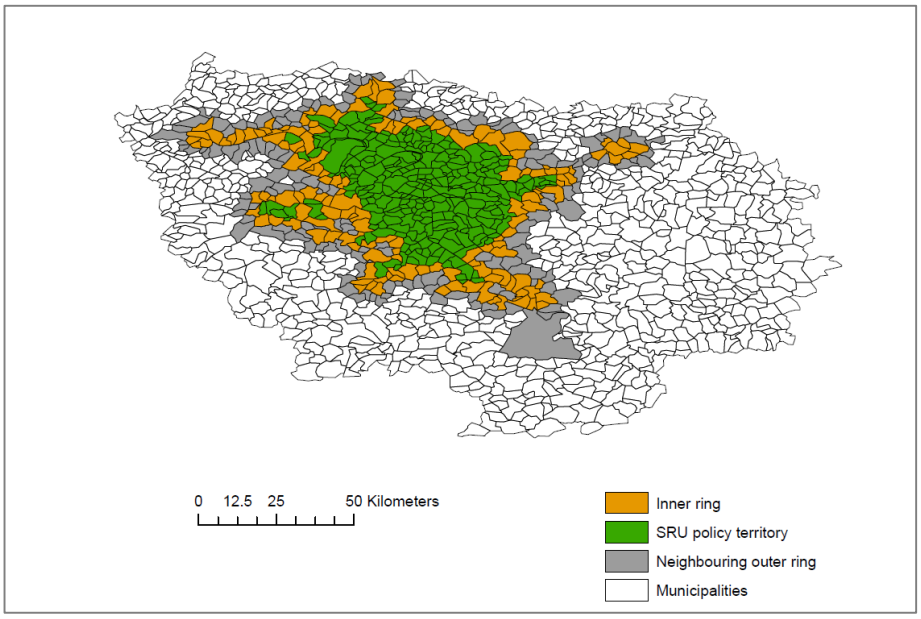


Figure C.4: Urban unit of Lyon.

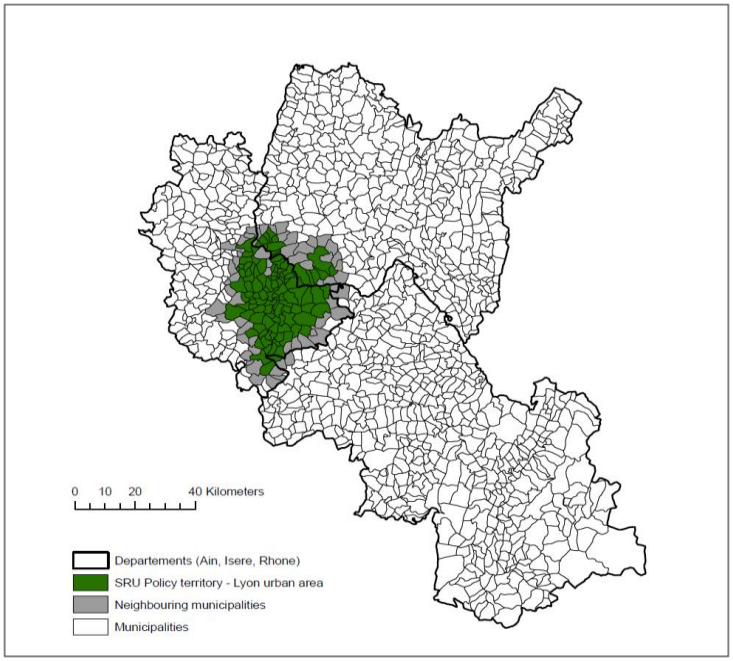


Figure C.5: Municipalities treated in Lyon's urban unit in 2002

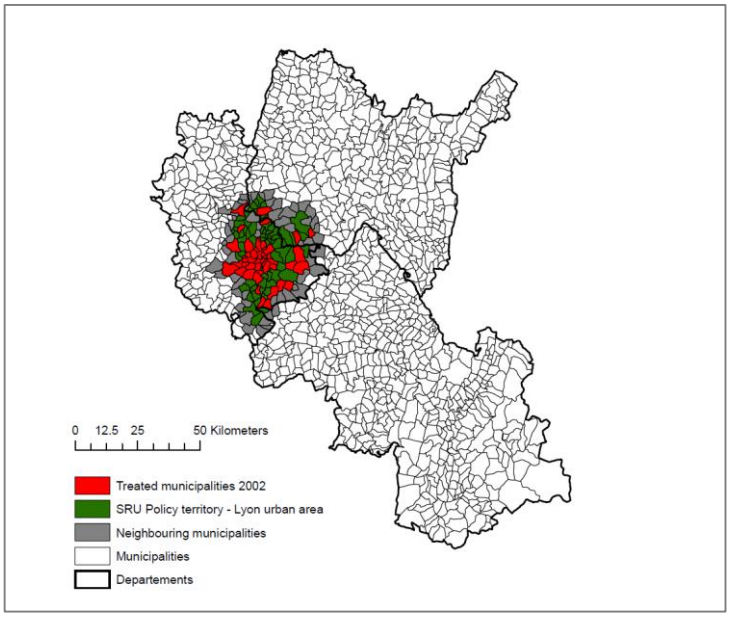


Figure C.6: Urban unit of Toulouse.

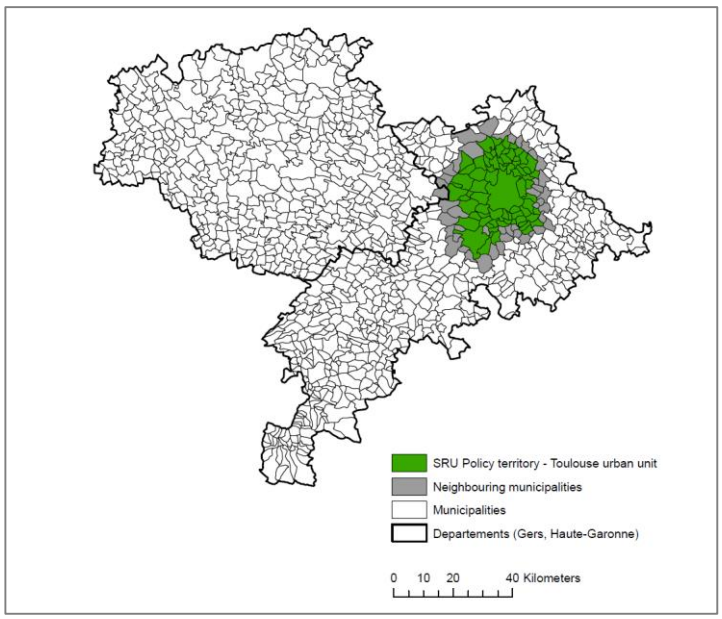


Figure C.7: Municipalities treated in Toulouse's urban unit in 2002

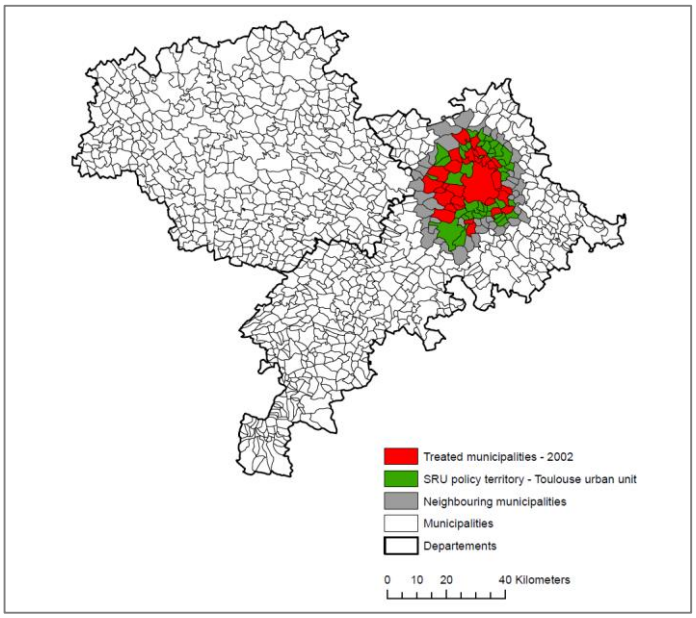


Figure C.8: Urban units of Avignon, Marseille, and Toulouse

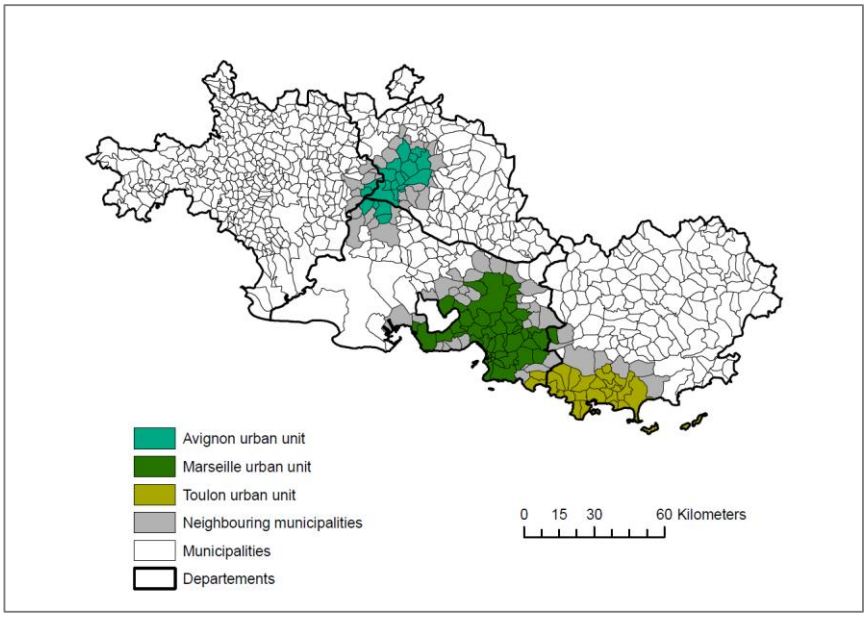
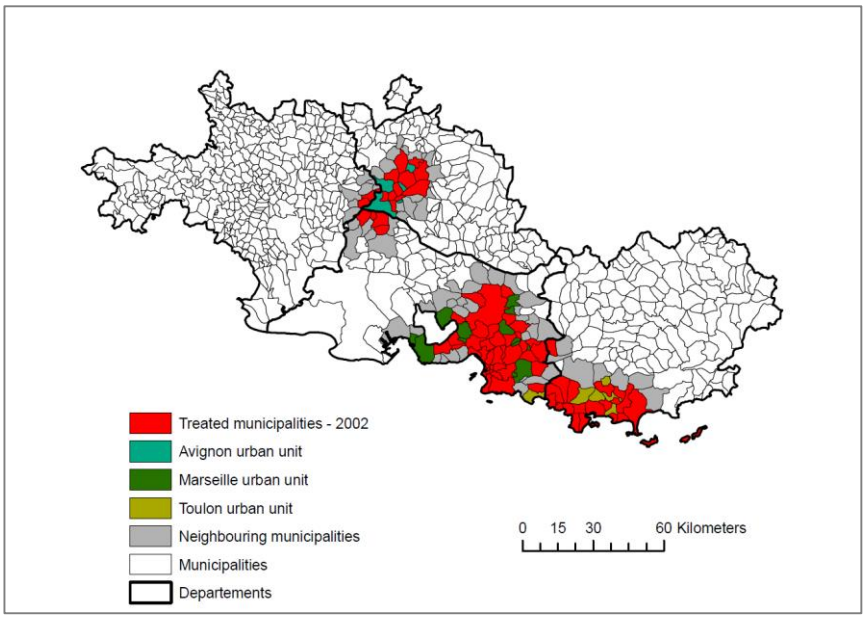


Figure C.9: Municipalities treated in Avignon, Toulon, and Marseille



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