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“THE IMPACT OF LOW-SKILLED IMMIGRATION
ON ITALIAN MANUFACTURING FIRMS”

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Table of Contents

INTRODUCTION	5
CHAPTER 1 – MIGRATION: A GENERAL OVERVIEW	9
1.1. Categories of human migration	10
1.1.1. Home-community migration	12
1.1.2. Colonization	13
1.1.3. Whole-community migration	13
1.1.4. Cross-community migration.....	14
1.2. Attempts to explain the migration phenomenon: an overview of the leading theories	16
1.2.1. The laws of migration of Ravenstein	19
1.2.2. Theories explaining the initiation of international migration flows.....	21
1.2.3. Theories explaining the persistence of international migration flows	30
1.2.4. Future challenges in building migration theory	36
CHAPTER 2 – IMMIGRATION DYNAMICS AND ITS EFFECTS ON HOST COUNTRIES: A LITERATURE REVIEW	41
2.1. The impact of immigration on domestic economies and native population	43
2.1.1. What is the influence of immigration on the economic prosperity of the host country?.....	44
2.1.2. What is the influence of immigration on the population growth in the host country?.....	47
2.1.3. What is the influence of immigration on the labor market opportunities in the host country?	48
2.2. The impact of immigration on entrepreneurship, innovation and domestic firms.	52
2.2.1. What is the influence of immigration on entrepreneurship and innovation in the host country?	53
2.2.2. What is the influence of immigration on firms’ structure and performance in the host country?	56
CHAPTER 3 – THE EFFECTS OF THE PRESENCE OF LOW-SKILLED IMMIGRANTS ON FIRM’S PERFORMANCE AND INNOVATION: AN EMPIRICAL ANALYSIS ON ITALIAN DATA	63
3.1. A brief contextualization: the Italian immigration peculiarities	65
3.2. Focus on profitability and efficiency of manufacturing firms	69
3.2.1. Data description and dataset construction	69
3.2.2. Estimation strategy: econometric model specifications	86
3.2.3. Assumptions violation: heteroskedasticity, serial correlation and endogeneity issues	90
3.2.4. Regression findings	96

3.3. Focus on Italian propensity to innovate	109
3.3.1. Data description and dataset construction	110
3.3.2. Estimation strategy: econometric model specifications.....	116
3.3.3. Assumptions violation: heteroskedasticity, serial correlation and endogeneity issues.....	117
3.3.4. Regression findings	118
CONCLUSIONS	127
REFERENCES	131

INTRODUCTION

The migration phenomenon can be said to be as old as humanity, but it has never received so much attention as in recent years. More than ever before, migration encompasses nearly all countries in the world and touches on a variety of economic, social and security aspects affecting people's daily lives. Now that we are living in the era of globalization, modern transportations has made it easier, faster and cheaper for people to move around an increasingly interconnected world in search for better jobs, education, and living conditions. As a matter of fact, the number of international migrants worldwide has continued to grow rapidly in recent years, reaching 258 million in 2017, up from 220 million in 2010 and 173 million in 2000 (U.N., 2017b). At the same time, conflicts, poverty, inequality and lack of sustainable livelihoods force many people to move and seek a better future for themselves and their families far from their homelands. In fact, in 2016, the total number of refugees and asylum seekers in the world was estimated at 25.9 million (U.N., 2017b).

In the last decades, given the exponential growth of immigrant population in developed countries, migration is increasingly seen as a crucial policy issue by many governments, politicians and the broader public all over the world. Perhaps, the importance of migration as a public policy issue and newsworthy topic has never been more pronounced; just think that, according to the European Commission, EU citizens perceive immigration as one of the most important issues facing the European Union, second only to terrorism.

Moreover, immigration has progressively arouse the interest of many scholars, who attempted to explain its determinants and to investigate its effects on a diversity of outcomes. Therefore, in the last three decades, we have witnessed to a huge proliferation of academic papers and empirical studies aimed at giving economic and social explanations for immigration dynamics that took place in major destination countries.

Most of this literature focuses on the United States, a country with a long history of immigration, whereas studies that aim attention at Europe are still less numerous, giving that European countries began to transform from emigration to immigration areas far more recently. Anyway, in the last years most Western-European countries, including Italy, have experimented huge inflows of foreigners coming from developing countries with a strong impact on many different national aspects – like aging, labor market, industrial specialization, innovative capacity, economic welfare, education, pension system, and so on.

The present paper is related to the large body of literature that tries to measure the effects of immigration on domestic dynamics. In particular, it focuses on the impact of low-skilled immigration on Italian manufacturing firms, with an emphasis on its implications for productivity, efficiency, and innovation. By conducting two different types of analyses, this work represents an attempt to enhance the quite limited existing literature on the subject. The main analysis is aimed at examining whether low-skilled immigration, measured as the local share of low-skilled immigrants out of the total population, exerted a causal influence on Italian manufacturing firms' profitability and efficiency in the period between 2008 and 2017. This main investigation is carried out on a big panel dataset that combines firm-level and local-level data. The second, additional analysis is intended to take the empirical research a little step further by exploring whether low-skilled immigration had also an impact on Italian innovation, measured as the number of patent applications presented by Italian residents between 2004 and 2016. This additional investigation is performed on a smaller panel dataset that incorporates local-level dimensions.

This study consists of three chapters. The first one is a sort of contextualizing chapter designed to theoretically define the migration phenomena. After a brief presentation of the different categories of migration, it is mainly devoted to an overview of the leading theories expressed by various scholars with the purpose of providing an explanation for the initiation and persistence of international migration. At the end, the chapter presents also some interesting insights about the challenges that migration theorists should deal with in the near future.

The second chapter offers a quite comprehensive literature review. It firstly focuses on the major academic papers that attempted to investigate the impact of immigration on domestic economies and native population, in particular on the economic prosperity, the population growth and mainly the labor market opportunities in the destination countries. Subsequently, the chapter illustrates the main empirical studies on the effects of immigration on domestic entrepreneurship, innovation, and firm performance. This last group of papers are of particular interest because the empirical analyses on which the present work is focused can be said to belong precisely to it.

The third and final chapter indeed illustrates in detail how the abovementioned statistical investigations have been set up and carried out. The core of the chapter is the search of a *causal* effect of low-skilled immigration on manufacturing firms' performance. In particular, EBITA margin and asset turnover ratio has been identified as indicators of operating profitability and efficiency, respectively. Afterwards an additional analysis has been conducted in order to assess whether low-skilled immigration also exerts an influence on Italian innovation capability. For both analyses, the chapter details i) how data have been collected and combined to construct

the datasets, ii) which indicators have been used to conduct the empirical investigations, iii) which methodologies have been adopted, and iv) the results obtained from the regressions estimates. Moreover, some robustness checks and heterogeneous effects analysis are also illustrated.

Finally, in the conclusions of the paper, empirical findings are resumed, interpreted, and compared to those obtained in the extant literature on the subject; moreover, the main limitations of the analyses together with some suggestions for further studies are also briefly illustrated.

CHAPTER 1

MIGRATION: A GENERAL OVERVIEW

The concept of migration has always been inherent in human nature. As a matter of fact, the migratory movement is a habit that accompanies human beings through their entire history as a species. Over the centuries, they have always moved around the world, driven by many different causes that may vary according to the specific historical period.

It is not difficult to believe that, without mobility, humanity would probably have faced nothing but extinction. And sure enough, population movements have allowed the spread of innovation and development from one region of the world to another, and have contributed therefore to the diffusion of technology and to the prosperity of mankind as a whole. In this perspective, it is clear that migration assumes a particular importance because of the way it continuously shapes – and re-shapes – societies, making them more and more diverse and complex over time. In fact, it is precisely because of its heterogeneity and complexity that the migratory phenomenon can be said to be one of the most discussed and studied by scholars of multiple disciplines – primarily economics, sociology, and geography.

This first, contextualizing chapter is aimed at giving a general historical and theoretical overview of the multi-dimensional and multifaceted phenomenon of human migration. It is structured in two paragraphs: the first one classifies migration movements in four main categories, based on the definition of human communities according to language boundaries; the second one provides an overview of the most important and significant theories formulated by the various scholars over the years in an attempt to study and explain the reasons why migration flows generate and persist over time.

1.1. Categories of human migration

Migration, whether of long or short distance or duration, is one of those characteristic human behaviors that have always occurred in human experience, from the appearance of the first hominid communities to the present. Over the centuries and millennia, there have been a series of periodic migratory waves, driven by different historical causes and characterized by peculiar features. But these “large-scale movements [...] consisted in practice of an accumulation of smaller movements that fit into larger pattern with time” (Manning, 2013, p. 2). In this perspective, migration can be seen not only as a collective phenomenon but also as an individual experience, linked to many deeper issues and choices, which intervene in the life of a single person or household. Therefore, it is clear that, having human migration a myriad of different facets and being it able to be analyzed at different levels, it emerges the need to define the phenomenon in the simplest possible way. Hereafter it will be presented a classification of human migration in four main categories, built on the definition of human communities on the basis of linguistic boundaries¹.

In any event, first of all, it might useful to specify why the concept of human *community* is so important for the definition of the migratory phenomenon. By its nature, migration generates connections, at least because every migration connects a point of origin to a point of destination. But more than links between two geographic areas, migrations consist of links between a community of origin and one of destination. From this point of view, it becomes fundamental to define what is meant by a human *community* and what are its *boundaries*.

Like most other animal species, human beings also organize their existence in defined communities. However, what characterizes and distinguishes human communities is *language*². Indeed, human beings organize their own communities on the basis of a shared language, and not just of geographic proximity. Only the members of the same community are able to communicate profoundly with each other, while communication with members of other human communities is possible, but it can occur in the best way only if one learns the other’s language. Therefore, a human *community* can be defined as the speakers of a given *language*, so the

¹ However, it is worth specifying that, given the complexity of the migratory phenomenon, this classification should not be understood as exhaustive. The intention here is simply that of trying to frame a problematic phenomenon, so diverse by its very nature, within more or less defined categories. In the existing literature about migration, there can be found many other classifications, more or less sophisticated and complex, based on different criteria – sociological, geographical, economic, and so on (for a different perspective see, for instance, King, 2012). But since none of them is able to cover in full all the possible manifestations of the migration phenomenon, each of them must be taken for what it is – a simple, unpretentious attempt to describe an extremely multifaceted human habit.

² Oral communication surely exists among other animal species, as birds, dolphins and monkeys, and it existed also among the first hominids who appeared on Earth. However, what is meant here by *language* is a fully inflected language, with its distinctive grammar and vocabulary. Such a language eventually appeared and developed with our own species, *Homo sapiens*, approximately 300,000 years ago.

*boundaries*³ of human communities are not based on geography or ethnicity but rather on speech.

Notwithstanding the usual thinking according to which communities are usually defined as ethnic groups or nations, the identification of communities based on linguistic boundaries adopted here turns out to be the most appropriate and useful for the purpose of framing migratory phenomena, at least for two main reasons. First of all, this definition allows a simple classification of social and cultural differences among communities. Indeed, members of the same community, tied together by language, also share a set of customs and traditions. People that move from one community to another, must learn not only a new language but also a connected set of customs if they strive for full assimilation. Second, language communities have long-term stability and steady patterns of transformation, while the ethnic identities and nations have been, and still are, considerably much more changeable over time.

At this point, given the previous definition of human language communities, it is possible to classify migration – within and among different communities – in four main categories: home-community migration, colonization, whole-community migration and cross-community migration. Table 1.1 briefly summarizes these four categories of migration, their main function and their typical demographic profile among humans. Three of these categories roughly corresponds to patterns of migration that can also be identified in other animal species, but the fourth one is peculiar of human beings, and has even been of key importance in determining the most part of human history and in fostering the development of mankind; though it represents only one of four categories, cross-community migration conditions every aspect of human migration because it has also an influence on all the other three categories. The following subparagraphs will deal with these four categories one by one and will briefly present their main distinctive features.

³ These boundaries among language communities are not necessary sharp – closely related languages and dialects may be easily understood by members of similar communities. In this sense, emblematic is the case of Italy in which dialects and linguistic inflections vary, in a more or less marked way, not only from region to region but often also from city to city. However, this does not completely prevent the understanding of the various dialects and inflections, especially if spoken in neighboring areas. But “beyond a certain level of difference, languages become mutually unintelligible, and can only be understood after a period of study and practice” (Manning, 2013, p. 3).

Table 1.1: The four categories of migration.

Home-community migration Function: broaden gene pool or allow the division of labor by moving within community Species following this pattern: all species Human demographic profile: mostly young male and female migrant
Colonization Function: extend geographic range of species Species following this pattern: all species Human demographic profile: mostly male migrant, primarily young adults
Whole-community migration Function: alternate among ecological settings Species following this pattern: some species Human demographic profile: overall demographic profile of the entire community
Cross-community migration Function: share community experience and spread technology Species following this pattern: <i>Homo sapiens</i> only Human demographic profile: mostly young migrant, primarily single male

Source: own elaboration, based on Manning (2013).

1.1.1. Home-community migration

Home-community migration implies the movement of individuals from one region to another within their home community. That is, people that decide to change place where to live but without leaving the community they belong to.

This type of migration mainly concerns offspring abandoning the family of origin in search of a life mate. So, “home-community migration is necessary for reproduction of the species, in order to maintain a sufficiently wide genetic pool” (Manning, 2013, p. 5). For humans in particular, these movements imply young men and women moving from one family to another in marriage.

Moreover, home-community migration can also be linked to a sort of division of labor. An example of that is what happened in Italy in the 1950’s and 1960’s, when the profound process of restructuring that involved the manufacturing industry led to the intensification of the phenomenon of the so-called *internal migration*. In those years, the strengthening of the mass-consumption industry required the large-scale employment of workers, even without qualified industrial experience; therefore, young males left their farming families *en masse* and moved from Southern Italy either to the industrial cities of the North-West or to other important cities – primarily Rome –, where they were employed as workers in factories or in construction. This caused on the one hand, a general reduction of agricultural workers, and on the other hand, a sudden *feminization* and ageing of the agricultural sector (Pugliese, 2015). Hence, in this context, home-community migration ended up enabling the division of the labor force between agriculture and industry.

All things considered, it can be said that almost all human beings experience home-community migration in their life, at least as soon as they decide to build a new family on their own or to move in search for a better working position within their country, even if they tend not to consider these localized movements as “migration”.

1.1.2. Colonization

Colonization consists in the departure of a narrow group of individuals from their own community with the purpose of establishing a new community elsewhere. Usually, the aim of colonization is that of replicating the home community in the new area by seizing unoccupied territory or either expelling previous occupants, even using force if necessary.

This type of migration can be considered one of the primary means by which a species expands its geographic range. Usually the colonists settle in an environment that is similar to that of the community of origin, in order to maintain as much as possible the lifestyle to which they are accustomed. Colonists are more often male than female, and are primarily young adults.

In human history, colonization occurred occasionally, but it turned out to be crucial in shaping the world as we know it today. Just think about how post-Columbian colonization in the Americas, Australasia and New Zealand is linked to the spread of tens of millions of people from Western European states all over the world. Former Western European colonists established their settled colonies in territories until then unexplored, forming larger or smaller groups, that were often dominant in their places of settlement. As it is well known, this European domination has lasted more or less over time, however influencing the customs and habits – including the language – of the colonized countries up to the present day. However, the most tragic consequence of colonization, especially the Anglo-Saxon one, was the extermination of a large part of the native population and the relegation of the few survivors in the so-called “indigenous reserves”; colonialism caused indigenous people to count nowadays around 370 million people – some 5 per cent of the world's total population (U.N., 2010).

1.1.3. Whole-community migration

Whole-community migration involves the relocation of all the members of a community. Some animal species migrate periodically, usually cyclically on an annual basis, and all the members of the community – except for some laggards – take part to the movement. These animal migrations occur between alternating environments, and this enables the community to accomplish its life cycle.

Humans rarely undertake this type of migration. However, some communities – the so-called “nomadic people” – do move habitually; these communities do not settle permanently in a fixed location, rather they regularly move to and from the same areas, usually because of their form of economy or for reasons of historical and cultural tradition. This pattern – referred to as “nomadism”⁴ – “may have been fairly common for early human communities in the days before settled life began” (Manning, 2013, pp. 5-6). And sure enough, many cultures have traditionally been nomadic, but nomadic behavior is increasingly rare in modern, industrialized countries. Indeed, nomads are estimated to be around 30-40 million people in the world – definitely less than 0.05 per cent of the total population.

Apart from economic or traditional reasons, it may also happen that a whole community is forced to migrate and abandon its homeland because of a natural or human disaster – such as, for example, in case of famine or expulsion by invaders.

1.1.4. Cross-community migration

Cross-community migration occurs when single individuals or groups leave their home community and move to join another community. This pattern of migration is almost exclusively followed by humans, while it is extremely rarely observed in other animal species; “language communication among humans provides the basic reason for this distinct pattern of migration” (Manning, 2013, p. 6).

All human communities universally experience both out-migration and in-migration. *Out-migration* concerns members of a community who emigrate towards other communities because of various reasons; on the contrary, *in-migration* regards individuals who come from other communities and find a local role to play in a new community, for either a long or short time.

Unlike other categories of migration, which present a main reason for their occurrence, cross-community migration may be triggered by multiple causes. The first reason for individuals to leave their home community is the need – or even the chance – to improve their

⁴ *Nomadism* is a form of mobility that is typical of three categories of communities: hunter-gatherers, pastoralists and “peripatetic nomads”.

The nomadism of *hunter-gatherers* is usually linked to directly providing for their primary needs in the context of an economy of mere subsistence, and it appears as a cyclical phenomenon within the territory.

The nomadism of *pastoralists* rest on the satisfaction of the needs of the livestock, and can be itinerant or seasonal. If pastoralists also practice some form of agriculture, their nomadism assumes the connotations of *transhumance*. “*Peripatetic nomads*” refer to various itinerant populations who move about in densely populated areas living not on natural resources but by offering services – based on their skills in crafting or trading – to the settled populations among whom they travel. Undoubtedly, they are the most common remaining nomadic people in industrialized countries.

Nomadism is also a lifestyle adapted to infertile regions – such as steppe, tundra, or ice and sand deserts –, where periodic mobility is the most efficient strategy for exploiting scarce resources.

own social or economic condition. A second reason for people to migrate is the hope to bring benefit to their family, or more generally to their home community; the migrants may be going to look for needed resources and learn new skills with the purpose of bringing back help to their households. A third, less common, reason for migration is the will to provide additional resources – or other type of benefits – to the receiving community; this motivation can be attributed to humanitarian volunteers and religious missionaries who reach destitute communities in poor countries. A fourth reason for migrating may be considered also the simple pleasure of voyaging, exploring new places, meeting new people, and discover different cultures around the world⁵.

The decision to migrate, however, is not always taken in total freedom or autonomy; it can also assume the connotation of voluntary or forced migration. Some individuals may be compelled to abandon or escape their home community by external causes – not dependent on their will. Just to mention a few examples, this is the case of the various ethnic, religious, political, and social persecutions that have taken place over the centuries and that still occur today in many parts of the world; or even of the “Atlantic slave trade” from Africa to the Americas and the Caribbean which started after the discovery of the New World⁶; or, more simply, one can think of all the wives and children forced to accept the decision to migrate taken by the breadwinners.

Clearly, as for other human migration categories, also cross-community migrants display a predominant demographic profile; they are usually young adults, and most of them are single males. Despite cross-community migration includes a variety of patterns which render it complex to be described, it can be framed in four generally recognized subcategories: settlers, sojourners, itinerant, and invaders. *Settlers* – sometimes referred to as “permanent migrants” – migrate to join an existing community that is different from their home one and of which they accept the prevailing rules and customs, with the intent of set up a new home at destination. *Sojourners* – also known as “temporary migrants” – move to a new community, with the intention of coming back to their original community after a period of time spent far

⁵ Although migration often generates hope and benefit to the migrants, it always brings also costs and dangers. The main risk linked to migration – especially for people emigrating from poor countries or escaping from conflicts and persecutions – is the mortality risk brought by the displacement; hunger, thirst, diseases, storm, injuries, disputes, and accidents in the course of travel, all raise the risk of dying for people that travel away from their home community, and the probability of these circumstances to occur increases the longer is the distance to cover to reach the destination community. The costs of migration include both monetary costs – the expenses incurred by migrants to move – and non-monetary costs. The latter concerns also the effort of learning a new language and new customs, and finding a new job in the new community. Moreover, the migrants “must go through the effort of social initiation, joining and finding an adequate place in a new community or household. This process [...] is an essential step in the successful completion of any act of migration” (Manning, 2013, p. 8). For a well detailed analysis of costs and returns of migration, see Sjaastad (1962).

⁶ Between 1492 and 1880 about 11 million black slaves were taken into captivity by slave traders and transported to the Americas, “under horrendous conditions and with very high mortality rates” (Ferrie and Hatton, 2013, p. 2).

from home, usually for a precise purpose. *Itinerants* – also called “onward migrants” – habitually move from community to community; unlike sojourners, they have no single home to which they plan to return. *Invaders* decide to relocate as a group in an existing community, with the objective of setting the rules and force natives to abide and adapt to them.

As mentioned before, cross-community migration of humans assumes a particular character because of the existence of language and its peculiarities among different communities. Unlike animal species, human beings who migrate to new communities usually need to learn new languages and customs, while often introducing new language and customs to their host communities. This type of migration covers therefore a fundamental role both in spreading innovation from community to community⁷ and in sharing diverging community experiences, thereby bringing new resources and generating new ideas into the receiving community, which in turn stimulate further innovation in a sort of virtuous circle.

In this respect, it can be said that migration not only brings benefits to individual migrants and their families or communities but also on a broader aggregated level; “the exchange of language, customs, and technology leads to innovations, as different ideas are brought into contact with each other” (Manning, 2013, p. 11). Nonetheless, there are also aggregated costs of migration; it always spreads diseases, sometimes causing massive contagion and bringing waves of death to all connected communities.

To conclude, it is worth emphasizing that the typologies of migration presented above do not manifest themselves as independent phenomena. On the contrary, these categories – primarily colonization, whole-community migration, and cross-community migration – combine with each other to provide one of the major forces for positive and negative historical change and the engine for the continuous transformation of human way of living.

1.2. Attempts to explain the migration phenomenon: an overview of the leading theories

Even though, as already said, “for thousands of years humans have moved around the globe in search for food, in flight from enemies, or in pursuit of riches, spreading their cultures, languages, diseases and genes” (Ferrie and Hatton, 2013, p. 2), it is only over the past decades, that migration has gained increasing cultural, social, and political significance.

⁷ Language is important in spreading innovations within human communities, thereby differentiating communities one from the other, and in turn cross-community migration is important in spreading these innovations from community to community.

It is well known that with the beginning of European expansion from the sixteenth century, and the Industrial Revolution from the nineteenth century – which set in motion a massive transfer of population from rural to urban areas within and across borders –, long-distance migration assumed a new character, drastically different from that of the most ancient migrations. But it was in the second half of the twentieth century, and in particular in the last quarter, that “rapid and sustained economic growth, the increasing internationalization of economic activity, decolonization, and emergent processes of economic development in the Third World, all brought about the intensification of migration, both internal and international”⁸ (Arango, 2000, p. 284). This change and exacerbation of migration flows has led some to state that we live in the “Age of Migration”⁹, a period in which international migration is becoming more and more “accelerated, globalised, feminised, diversified and [...] politicised” (King, 2012, p. 4).

In addition to what has been said so far, in recent years population movements are gaining even more importance because of the diminishing impact of natural change on population dynamics. Immigration is becoming fundamental especially in the developed countries¹⁰, which are facing almost zero – or even negative – natural population growth. But the effects of migration are not limited to demography; it also affects many other aspects of social life – including economy, labor relations, politics, and culture. Hence, the phenomenon of human migration is a matter of common interest for many social-science disciplines¹¹.

From the twentieth century onwards, many scholars have attempted to provide general explanations for migratory phenomena and to assign them a defined theoretical framework. The final result of such efforts has been a series of theoretical models, conceptual approaches, notions, analytical frameworks, and empirical generalizations that do not constitute a coherent and general *theory of migration*; rather than developing a cumulative sequence of contributions, the relative short history of theorizing about migration consists of various attempts, often rigid

⁸ In theory, “there is a clear distinction between *internal* and *international* migration”, but in recent times globalization processes exacerbated the complexity of migratory phenomena, increasingly blurring the diversity between the mechanisms that characterize internal and international migration (Bijak, 2006, p. 4). Nowadays, both types of population flows are becoming more and more substitutes. Just think of contemporary Europe, in which the process of European integration with respect to the free circulation of persons and labor force, and the consequent partial dissolution of institutional barriers, both allow prospective migrants to rationally select their destinations; they can freely choose whether to migrate internally or externally, making their decisions on the basis of a cost-benefit analysis, and therefore revealing their true migration preferences.

⁹ See Castles *et al.* (2014).

¹⁰ According to the United Nations Population Division, between 2000 and 2015, positive net migration contributed to 42 per cent of the population growth registered in North America and 31 per cent in Oceania (U.N., 2017b). These figures prove how immigration is essential for most of the world’s developed countries, the majority of which, as a consequence, “have become diverse, multiethnic societies, and those that have not [yet] reached this state are moving decisively in that direction” (Massey *et al.*, 1993, p. 431).

¹¹ Mainly economics, sociology, and human geography but also social psychology, anthropology, demography, history, political science, law, and – moving towards the humanities – literary, media and cultural studies.

and largely developed in isolation from one another, sometimes even segmented by disciplinary boundaries (Massey *et al.*, 1993; Arango, 2000). In any case, more recent efforts – combining deductive and inductive reasoning – have led to a variety of middle-range theorizations, which seem to fit more closely with the patterns of migration today.

Nonetheless, the migration phenomenon seems to be too multifaceted to be explained by a single theory¹². Some scholars think that “the increasing diversification of migration types and processes, and also their increasing spontaneity of occurrence in the globalized, ever-more interconnected world of today, makes it difficult if not well-nigh impossible to envision a single, overarching theory of migration” (King, 2012, p. 7); some others believe that “a full understanding of contemporary migratory process will not be achieved by relying on the tools of one discipline alone, or by focusing on a single level of analysis”, rather they think that the complexity of current patterns and trends in migration can only be explained through “a sophisticated theory that incorporates a variety of perspectives, levels, and assumptions” (Massey *et al.*, 1993, p. 432). But evidently such a comprehensive and multidimensional theory is still far from being formulated and developed.

In the light of the above, the following subparagraphs will present in broad terms the leading contemporary theories of international migration. The first one focuses on Ravenstein’s “laws of migration” as they can be said to be the first attempt to synthesize knowledge on spatial population movements in the form of a *coherent theory*; the second subparagraph examines models that describe how international movements *begin*, while the third one considers theories that account for why transnational flows *persist* across time and space. Clearly, it would not have been possible to illustrate hereinafter all the various theorizations on migration developed over the years, therefore only the most significant will be presented. Table 1.2 summarizes these selected theories, specifying their subject and level of analysis, and their perspective in terms of disciplines of science. Finally, the last subparagraph will exhibit a brief overview of the future challenges that scholars should tackle to make significant additional contributions to migration theorizing.

¹² In the past, studies of migration focused mainly on temporary labor migrants, settler-migrants, and refugees. But in the “Age of Migration” arose a variety of new types of population movements which are acquiring more and more importance in international mobility. These new patterns include, but are not limited to, globe-spanning migrations, local-scale cross-border shuttle migration, “residential tourism”, business visits and work contract migration, retirement migration, high-skilled migration and brain drain (King, 2012, p. 9).

Table 1.2: Selected migration theories.

Theory	Subject of analysis	Level of analysis	Perspective
Neoclassical theory (Lewis, 1954; Ranis and Fei, 1961; Harris and Todaro, 1970) (Sjaastad, 1962; Todaro, 1969, 1976)	Initiation of migration	Macro Micro	Economic
Value-expectancy theory (De Jong and Fawcett, 1981)		Micro	Socio-economic
Intervening opportunities theory (Stouffer, 1940,1960)		Macro	Sociological
Push and pull factors theory (Lee, 1966)		Macro	Socio-economic
New economics of labor migration theory (Stark and Bloom, 1985; Stark, 1991)		Micro Meso	Economic
Relative deprivation theory (Stark and Taylor, 1989)		Micro	Economic
Dual labor market theory (Piore, 1979)		Macro Meso	Economic
Dependency theory (1960s)		Macro	Socio-economic
World systems theory (Wallerstein, 1974)		Macro	Socio-economic
Mobility transition (Zelinsky, 1971)		Macro	Socio-geographical
Gravity theory (Stewart, 1941)		Macro	Geographical
Network theory (Taylor, 1986; Massey et al., 1993, Boyd and Nowak, 2012)		Perpetuation of migration	Meso
Institutional theory (Massey et al., 1993)	Meso		Socio-economic
Cumulative causation (Myrdal, 1957; Massey, 1990)	Macro		Socio-economic
Migration systems theory (Mabogunje, 1970; Kritz et al., 1992; Massey et al., 1993)	Macro Meso		Unifying
Transnational social spaces (Portes, 1999; Faist, 2000)	Macro		Sociological

Source: own elaboration, based on Bijak (2006) and Kurekova (2011).

1.2.1. The laws of migration of Ravenstein

Theory building in relation to the explanation of migration phenomena is basically a matter of the second half of the twentieth century – especially of the last third. “Most contributions prior to the 1960s are nowadays of only historical interest, except for a number of contributions to the vocabulary of migration and the epoch-making significance of few outstanding forerunners” (Arango, 2000, p. 283). These undoubtedly include the seven “*laws of migration*” of Ernest-George Ravenstein, who is considered the uncontested founding father of the modern thinking about migration. Rather than real laws, his are empirical generalizations

based on observations and calculations about internal migration in Great Britain. Ravenstein (1885-1889, as cited in Bijak, 2006, p. 6) pointed out that the intensity of the migratory process is influenced by several factors – including distance, population size of the origin and destination regions, absorption capacities of the latter, and sex of migrants. Although he found the rural-urban flows to be dominant, he also acknowledged the existence of the return migration phenomenon. Ravenstein’s laws – as reported by King (2012, pp. 12-13) – are summarized here below:

- 1) Migrants move mainly over short distances; those going longer distances head for the great centers of industry and commerce;
- 2) Most migration is from agricultural to industrial areas;
- 3) Large towns grow more by migration than by natural increase;
- 4) Migration increases along with the development of industry, commerce and transport;
- 5) Each migration stream produces a counterstream;
- 6) Females are more migratory than males, at least over shorter distances, while males are a majority in international migration;
- 7) The major causes of migration are economic.

These seven simple laws have represented a real pioneering approach for that period since they were able to capture many aspects of the migratory dynamics that are still valid nowadays, even anticipating – by nearly a hundred years – some issues that would have been concern of successive theories. Boyle *et al.* wrote that Ravenstein’s laws “provided the hypotheses upon which much future migration research and theorization was built” (1998, p. 59, as cited in King, 2012, p. 12). More specifically, law 1) foreshadowed the *gravity theory of migration* (see subparagraph 1.2.2.); laws 2) and 3) concerned rural-urban migration and urbanization, which are historically the main mechanisms that still determine population change in most countries all over the world; law 4) linked development to migration and prefigured the *hypothesis of mobility transition* (see subparagraph 1.2.2.); law 5) opened up the study of two-way migration dynamics, net migration, and return migration¹³; law 6) was even more pioneering and anticipated the matter of migration gendering; finally, law 7) can be thought as the most obvious since it stated a fundamental truism of most types of migration.

It is generally recognized that Ravenstein’s laws implicitly constituted the first, leading-edge endeavor to combine the individual rational-choice framework with macro phenomena, like rural-urban and developmental inequalities (King, 2012, p. 13).

¹³ “Return migration was only picked up for detailed study in the 1970s and 1980s and remains an under-researched component of migration” (King, 2012, p. 13).

1.2.2. Theories explaining the initiation of international migration flows

There exist a variety of models that attempt to explain why and how international migration originates, and albeit they seek to examine the same thing, they do so by concentrating on different levels of analysis and by resorting to different assumptions, concepts, and frames of reference. Some of them – the most significant and influential – will be briefly illustrated below.

Neoclassical economics: macro and micro theory

Probably the oldest and best-known *real* theory of migration was developed by Lewis in 1954 in his “Model of Economic Development with Unlimited Supplies of Labour”. Then his approach laid the foundations for the *neoclassical macroeconomic theory*, which is based on *factor mobility* and *wage differentials* between geographic areas. According to this theory – firstly developed by Ranis and Fei (1961, as cited in Massey *et al.*, 1993, p. 433 and Arango, 2000, p. 285) – and its following extensions¹⁴, both internal and international migration is caused by geographic differences in the supply of and demand for labor and other factors of production, above all capital, between two regions. Indeed, given wage differentials between two countries or regions¹⁵, – one characterized by a surplus of labor (unemployment) and the other by a surplus of capital – migration and capital movements occur between them. The flows of both production factors in opposite directions contribute to their even redistribution, and the related convergence of wage levels progressively brings back to the *economic equilibrium*, where the newly-stabilized wage differentials reflect only the costs of undertaking migration.

Therefore, in the neoclassical view, the origin of international migration can be traced in disparities in wage rates between countries – which in turn mirror income and welfare disparities – and in the subsequent spatial redistribution of factors of production; “migration is a disequilibrium phenomenon, which ceases as soon as the equilibrium is reached” (Bijak, 2006, p. 9).

One of the main advantages of the neoclassical economic theory of migration is the fact that it combines the macro perspective of structural determinants with the micro counterpart of individual decision-making mechanisms. Sjaastad (1962) firstly articulated the *neoclassical microeconomic theory* – that explains the reason why individuals respond to structural differences between countries or regions and engage in migration. It is founded on the concepts of *rational choice*, *utility maximization*, and expected net returns.

¹⁴ As cited in Massey *et al.* (1993, p. 433), see Harris and Todaro (1970) – who based their model on *expected* wages – and Todaro (1976).

¹⁵ Lewis estimated that a differential of about 30 per cent would be sufficient for the exceeding labor force to migrate (Arango, 2000, p. 284).

Following this model and its subsequent specifications¹⁶, migration constitutes a form of investment in human capital, and the individual decision to migrate results from a rational *cost-benefit analysis*. Hence, prospective migrants – who seek to improve their well-being by moving to new places – weight up the pros and cons of moving relative to staying and choose the destinations that allow them to maximize the *net present value* of their expected future income, considering direct and indirect, tangible and intangible, costs of moving. Migration is therefore an individual, spontaneous, and voluntary act which is based on the comparison between the present situation of the rational actor and the expected net gain of moving.

A subsequent generalization of the microeconomic theory is the *value-expectancy concept* of De Jong and Fawcett (1981, as cited in Bijak, 2006, pp. 11-12), which specifies the personally valued goals that might be met by moving. The assessment of the perceived linkage between migration behavior and the attainment of goals in alternative locations determines the individual motivation to migrate. This model may be adapted to many facets of human decisions in the migration context – not only limited to economic ones but including also social and psychological ones. The main problem behind this model is that many dimensions of migration decisions may prove to be hardly measurable.

Despite its simplicity and its reconciliation between macro and micro perspectives, the neoclassical approach to migration presents some intrinsic shortcomings, which remarkably emerged after the mid 1970's, when the dynamics of international migration changed dramatically. Therefore, the criticism to the neoclassical theory of migration is linked mainly to its problems in dealing with reality. Indeed, it does not justify some facts that commonly occur as part of migration phenomena; in particular, first of all, it fails to explain why so few people actually move, despite the huge differences in income, wages, and levels of welfare among countries should represent an incentive to migrate¹⁷; second, it is not able to justify differentials in migration rates among countries with similar structural economic conditions (Arango, 2000, p. 286); and third, it does not provide an explanation for quite some migratory phenomena, like for example return migration or population flows in the absence of economic disparities¹⁸ (Bijak, 2006, p. 9).

Anyway, most shortcomings of the neoclassical economic model of migration can be partly lead back to the neglect of the *role of the State* in patterning migration flows; political

¹⁶ As cited in Massey *et al.* (1993, p. 434), see Todaro (1969, 1976).

¹⁷ “In fact, economic disparities [among countries] are important, no doubt, but by no means sufficient for migration flows to take place” (Arango, 2000, p. 286).

¹⁸ Moreover, “there exists an alternative Keynesian view on migration-induced labour market adjustments towards the economic equilibrium, through the elimination of differences in unemployment, not in wages” (Bijak, 2006, p. 9). In this perspective, net migration rates of a particular region follow – although with a time lag – the business cycle, disclosing a pro-cyclical nature of migration.

barriers, like restrictive admission policies, severely curtail the circulation of labor force and deter the movement of would-be migrants¹⁹. Clearly, mobility or immobility are nowadays much more affected by political factors, rather than differential economic conditions, and the selectivity of migration can be defined mainly in term of legal entitlements or personal characteristics in the event of undocumented migrants (Arango, 2000, p. 286).

Intervening opportunities theory

The neoclassical theory of migration has been also criticized because it disregards non-economic factors, mechanically limiting the determinants of migration. The *intervening opportunity theory* of Stouffer, being part of the sociological theories of migration, considers also non-economic elements affecting population movements. According to it, the amount of migratory events over a given distance is directly proportional to the availability of *attracting opportunities* at destination and inversely proportional to the availability of such opportunities closer to the region of origin, i.e. to the emergence of *intervening opportunities* on the route to destination (Stouffer, 1940 and 1960, as cited in Bijak, 2006, p.6). These intervening opportunities may induce a migrant to settle in a place different from the destination initially scheduled.

Therefore, under this theory, migration is related to the mutual interaction between geographic distance and opportunities available for prospective migrant in each different location.

Push and pull factors theory

Another criticism to the neoclassical theory concerns the treatment of individuals and societies as if they were alike and the disregard of types of migration different from labor migration. The unified *push and pull factors approach* of Lee (1966, as cited in Bijak, 2006, p. 6 and King, 2012, p. 13) somewhat overcomes such criticism by combining the concept of opportunities with the elements characterizing the neoclassical approach. This theory describes migration as determined by the existence of attracting (*pull*) factors at destination, and repelling (*push*) factors at origin²⁰. For international migration, these factors can be further classified in

¹⁹ On the contrary, the inclusion of the role of the State in the theorizing process about migration is the essence of the *political economy approach*. It merges the economic function of labor demand with state – or even supra-state – political mechanisms, which may spur or restrict international population movements. Indeed, “the political economy approach sees the immigration policies of receiving states (or supra-national bodies such as the EU) [...] as directly shaping the volume, dynamics and geographical patterns of international migration flows” (King, 2012, p. 19).

²⁰ *Pull factors* include better income and job opportunities, better education and welfare systems, good environmental and living conditions, political freedom, land availability, etc., while *push factors* comprise unemployment, poverty, rapid population growth, political repression, religious intolerance, low social status, landlessness, poor marriage prospects, etc.

hard and *soft* ones: the former comprise dramatic events – such as environmental catastrophes, armed conflicts, or humanitarian crises – while the latter refers to less critical problems – like unemployment, poverty, or social exclusion. In addition, there exist also a set of “intervening obstacles” which may show up along the way and have to be overcome by the migrants – for instance, physical distance, cost of making the journey, cultural and language barriers, and political obstacles such as immigration restrictions.

Personal factors also play a role in this model; different people will have different perception of the push and pull factors, and therefore they will react dissimilarly to various combinations of pushes and pulls – according to their status, age, preferences, and personality. Hence it becomes clear that the characteristics of the migrating population are determined by the prevalence of some factors over others; the favorable pull factors at destination tend to attract migrants who are positively selected in terms of motivation or human capital. But this is not what happens when the unfavorable push factors at origin are crucial in initiating the migration flow.

Push and pull models influenced much of the migration thinking during the mid-twentieth century, until the 1960s and later on. They clearly echoed the neoclassical economic theory, being they also based on principles like utility maximization, rational choice, factor-price differentials between regions and countries, and labor mobility. Like the neoclassical economic framework, therefore, push and pull theories have been appreciated because of their logical simplicity but also criticized because of their determinism, functionalism, and disconnection from historical migration background and from the reality of migration.

New economics of labor migration theory

The deep changes undergone by international migration in the last quarter of the twentieth century²¹ had a crucial effect on the theorizing about migration. This led to the emergence of new theories that developed outside the neoclassical economic tradition. The *new economics of labor migration theory* – introduced by Stark and Bloom in 1985 and perfected by Stark in 1991 – is one of them, probably the most influential since the 1980s. According to Arango, “it can be seen either as an inside criticism of the micro version of neo-classical theory, or as a variant of it that refines and enriches it with a number of amendments and additions” (2000, pp. 287-288).

²¹ This period, for instance, is characterized by: i) migration flows becoming more global and heterogeneous in composition, ii) restrictive admission policies being adopted by most destination countries, iii) undocumented flows and clandestine traffics assuming an increasing relevance, iv) social integration of immigrants in the receiving societies becoming more problematic, v) transnational spaces and communities emerging more and more decisively.

The new economics of labor migration presents two main innovative features (King, 2012, pp. 22-23). First, it suggests that migration-related decisions are not individual decisions but joint decisions taken within the sphere of the *household*. Sometimes the scope of the decision-making process moves to the meso level of more extended families or even wider community groups (Massey *et al.*, 1998, p. 21, as cited in King, 2012, pp. 22-23). This first finding is in line with the fact that many migratory processes exhibit clear family patterns. Second, this model recognizes that the decision-making process is driven not only by wage and expected income maximization but also by *income diversification* and *risk management* strategies (Arango, 2000, p. 288 and Bijak, 2006, p. 12). In this perspective, wage differentials between origin and destination countries are no more the drivers of migration.

Combining these two perspectives, it emerges that households and families control the various risks to their economic well-being by diversifying their capital resources in different activities and spreading their labor resources over space and time, in order to minimize uncertainty about family income or to overcome capital constraints (King, 2012, p. 23). Therefore, migration can be defined as a family strategy to risk management.

The new economics of labor migration model stresses also the importance of *individual preferences* towards mobility, as well as of the difference – between countries of origin and destination – in the purchasing power of savings generated by migrants, which explains the phenomenon of *return migration*.

Another crucial element is the community context, which pertains to the *relative deprivation concept* (Stark and Taylor, 1989, as cited in Bijak, 2006, p. 12). According to this approach, migration is driven by income maximization not in absolute terms but rather relative to other potential migrants in the reference group. Thus, the more uneven is the distribution of income in a given community, the more strongly relative deprivation will be perceived, and the more inducements will there be for further migration to take place (Arango, 2000, p. 288).

It is interesting to notice that the neoclassical and new economic theories “lead to divergent conclusions about the origins and nature of international migration” (Massey *et al.*, 1993, p. 440). For instance, the two models present different return migration outcomes; in the neoclassical approach, return migration is seen as a *failure* because it occurs when migrants have miscalculated the balance of costs and benefits of moving, while in the new economic framework, return migration represents a *success* since people that come back to their home countries have achieved their target in migrating and accumulated the wanted savings.

Nevertheless, also the new economics of labor migration theory has been abundantly criticized. First of all, it is totally focused only on the causes of migration at the *sending side* and shows limited applicability; the migratory contexts it portrays seem to be rather specific

ones, defined by long migration patterns and characterized by poor, rural settings. Moreover, it presumes that intra-household relationships are harmonious and that decisions are unanimously and collectively taken; in reality, tensions and conflicts are common inside a family or household, and this can often lead to distorted decision making. Finally, the new economics of migration do not consider those situations in which the whole family or household migrates.

Dual labor market theory

A theory that instead focuses only on the *receiving side* of migration is the *dual labor market theory* of Piore. According to this model – which was firstly introduced in 1979 in an attempt to explain migration at the macro level – international migration is driven by *labor demand characteristics* at destination (Bijak, 2006, p. 10); the dominant force in determining workers' movements is the structural demand for certain types of cheap and flexible labor factors in advanced societies. This is based on the existence in industrialized countries of a dual labor market: a primary labor market of high-skill, well-paid, secured, and capital-intensive jobs for native workers, and a secondary labor market of low-skill, low-wage, dangerous, deteriorating, and labor-intensive jobs²², filled mainly by migrant workers (King, 2012, p. 16).

This theory is founded on the fact that wages do not only represent the price of labor but also a proxy measure of a worker's position. Indeed, Bijak wrote:

If there are labour shortages at the bottom of the [occupational] hierarchy, the entrepreneurs would prefer to hire immigrant workers without aspirations to a higher social status, than to raise wages in order to attract local labour force. The latter option would require proportional wage increases in the whole sector to preserve the whole job ladder, and would ultimately lead to a structural inflation (2006, p. 10).

In this perspective, immigrant labor is crucial for the economies of developed countries to be sustainable.

The dual labor market theory justifies why advanced and newly industrialized countries present *labor markets' segmentation*. Indeed, this segmentation occurs at two levels: at a more general level, the labor market is segmented between attractive jobs carried on by native workers and less attractive ones borne by immigrants; at a lower level, the secondary labor market, in turn, is divided in employment subsections according to gender, nationality, or race of the foreign workers.

²² While native workers refuse this type of jobs, foreign workers tend to accept them because they have no *bargaining power*, and because such wages and jobs are still preferable to the poverty and unemployment they should face at home. This falls under the so-called “status paradox of migration” – the *transnational status disparity* between a migrant worker's status in the home country and in the host country. This status paradox is mainly observed in the case in which migrants are neither perceived to be skilled in the country of destination nor unskilled in the country of origin.

Therefore, the dual labor market theory furnishes interesting explanations for many aspects of migratory phenomena. In particular, it illustrates: i) why in advanced economies there exist low-productivity and instable occupations; ii) why national workers avoid such jobs; iii) why a countermeasure to this reluctance cannot be found in standard markets mechanisms; and iv) why immigrant workers from poor countries are willing to accept such jobs (Arango, 2000, pp. 288-289). Another merit of this model is that it highlights that immigrant workers do not necessarily compete with native workers, affecting the latter's wages and employment opportunities.

Nevertheless, also this theory has its shortcomings. First of all, it hypothesizes that international migration is only demand-driven and ignores all the supply-side factors. Second, it appears difficult to operationalize to fit macro-level migration predictions, because it disregards all migrations flows that are not generated by recruitment practices²³. Finally, it is not able to justify why different advanced industrial economies with analogous economic structures may exhibit different immigration rates.

World system theory

Keeping the focus on macrosocial processes, the *world system theory* of Wallerstein – developed in 1974 on the wave of the *dependency approach*²⁴ – presents a more sophisticated analysis of the development of the global capitalist system from the sixteenth century onwards (King, 2012, p. 18). Wallerstein conceived the notion of a “modern world system” based on European hegemony, which comprises three coexisting realities. Indeed, countries cover different positions within the global market economy; the dominant capitalist countries represent the “core-states”, poor countries constitute the “periphery” – which totally depends on the core through asymmetric connections in terms of trade, capital penetration, and migration –, while intermediate countries with regard to their wealth and interdependent status form the

²³ Nowadays, most migrants move to advanced industrial countries on their own initiative, and in many case they even create their own demand for labor, rather than occupy pre-existing working positions.

²⁴ The *dependency theory* is the direct precursor of the world system theory. It took hold during the 1960s as a neo-Marxist approach which gave an explanation of migration diametrically opposed to the neoclassical one. While the neoclassical framework depicts migratory phenomena as self-correcting, leading to a new equilibrium in which migration no longer takes place, the dependency theory asserts that migration is self-perpetuating, replicating existing inequalities between regions. Therefore, this approach sees “social processes in terms of conflict rather than of equilibrium” (Arango, 2000, p. 285). Moreover, as opposed to the school of thought according to which migration is positively connected to development, dependency theory considers international migration linked to the global geographic division of labor and to the historical evolution of capitalism. According to the dependency approach, the world can be seen as a *binary system* in which the *core* of advanced, industrialized, and rich countries is opposed to the *periphery* of underdeveloped, agrarian, and poor ones. In this view, core and periphery are linked by uneven and asymmetrical relations; the enrichment and advancement of the former rest on the exploitation of the latter through colonization or other policies. Therefore, the dependency theory sees underdevelopment as a by-product of development and international immigration as a mechanism through which inequalities between countries are perpetuated and reinforced.

“semi-periphery”. These roles can be mutual beneficial and the role of a specific state can also change over time.

According to this model, the flow of capital and goods from the core to the periphery is offset by the flow of labor in the opposite direction. This process is driven by two main forces: on the one hand, the raising demand for low-skilled labor in the core countries, caused by the increasing loss of attractiveness of manufacturing jobs for local workers; on the other hand, the intensification of productivity in the peripheries, brought about by the commercialization of agricultural production fostered by capital inflows, and the resulting reduced demand for local labor. These two combining factors determine the movement of the surplus of agricultural workforce from the peripheries in search for job opportunities in the low-paid segments of the manufacturing sector in the core.

Therefore, the world system theory sees international migration as driven by the displacement generated by capital penetration in less developed countries – as a consequence of the domination exerted by core countries over peripheral areas –, and by the subsequent extension of the capitalist production method to further regions into a progressively unified world economy²⁵.

The main merit of the world system theory is that it recognizes that migratory flows are affected by the existence of many links – material, economic, historical, linguistic, cultural, and so on – between the origin and destination countries (Bijak, 2006, pp. 10-11), even if they present different stages of development. All these connections are the reason why, rather than a macroeconomic theory of migration, this model represents a cross-cutting historical generalization; it combines economic and sociological aspects to give a reasonable interpretation of history, in which all countries experience similar processes. As pointed out by Massey *et al.*, in the world system approach “international migration ultimately [...] follows from the dynamics of market creation and the structure of the global economy” (1993, p. 448), in particular from the asymmetrical relationships between the old colonialist countries and their former colonies. This is in line with the common-sense empirical observation that migration often occurs between countries that were connected in the past by colonial ties.

However, the main problem with this theory is that it can be only applicable at a global level and that “migrants are little more than passive pawns in the play of big powers and world processes presided over by the logic of capital accumulation” (Arango, 2000, p. 291). Moreover, it seems that it can hardly be reconciled with the increasing trend toward the diversification of migratory paths; in reality, migration flows do not always follow the channels

²⁵ “Therefore, migration also stems from inequality – in this case an unbalanced international order – but, contrary to equilibrium models, it reinforces the inequality instead of leading to its reduction” (Arango, 2000, p. 290).

of capital penetration, and spontaneous streams between either weakly connected or even unconnected countries frequently occur.

Mobility transition theory

The hypothesis of mobility transition of Zelinsky (1971) represents another attempt to theorize migration by historical generalizations on a large scale; it links changes in migratory behaviors to different moments in the process of social modernization. According to Zelinsky, this process provoked an increasing spatial mobility and a continuous diversification of migratory patterns. More precisely, this model is based on the fact that “there are definite patterned regularities in the growth of personal mobility through space-time during recent history, and these regularities comprise an essential component of the modernization process” (Zelinsky, 1971, pp. 221-222, as cited in King, 2012, p. 15).

These migration and mobility patterns manifested themselves differently through the five stages in which the historical experience of Europe can be split up (pre-modern traditional society, early transitional society, late transitional society, advanced society, and future super-advanced society). Indeed, before the eighteenth century, migration was very limited and related mainly to local movements; during the transition from a pre-modern to a modern society, in the eighteenth and nineteenth centuries, migratory flows were directed both towards national borders and to other countries; in conjunction with the advancement of the industrialization processes, rural-urban migration increased until it began to diminish only in the second half of the twentieth century; in the advanced societies, either inter- or intra-urban migration is predominant, together with short-term circulatory movements; as technology improves and societies become super-advanced, some forms of human circulation are progressively substituted by better communication and delivery systems.

Zelinsky’s model was quite visionary at his time since it combines various types of migration and mobility into a unique framework, and it even envisages the role of advanced communication technology in replacing some forms of mobility. However, in other aspects it was more limited and backward-looking; it totally ignores the phenomena of suburbanization and counter-urbanization, which are also typical of advanced societies, and it presents a limited applicability given that it embraces an obsolete approach to development, which can be related only to the historical experience of advanced economies.

Gravity theory

While Zelinsky’s theory was based on the concept of “demographic transition”, the *gravity theory* of Stewart was founded on that of “demographic gravitation”. This theory, firstly

introduced in 1941, represented an attempt to adapt equations of classical physics, in particular the Newton's *law of gravity*, to the demographic behavior of large numbers of human beings (Bijak, 2006, p. 13).

This theory conceives that migration between two regions is directly proportional to the product of the population sizes in the origin and destination regions – corresponding to the masses in the Newtonian model – and inversely proportional to the squared distance²⁶ between the two regions. Hence, large numbers of people residing in a geographical region actually act as an *attractive force* for other people from other regions to migrate there, while the distance between the two regions behaves as a *discouraging force*.

Interesting developments of this simple gravity theory observed that it can be adapted to the analysis of other aspects of the two regions by specifying the notions of mass and distance in different manners. For instance, instead of population sizes, economic dimensions like income or employment levels can be adopted as masses, while distance can be determined as a crow-fly measure or even considering the transport network structure, the costs of movement, or time. Moreover, different mass factors can be also investigated jointly, to cover more aspects that simultaneously influence migratory patterns.

Therefore, according to the gravity theory distance represents a (discounting) factor which reduces the spatial interactions between regions, including population flows.

1.2.3. Theories explaining the persistence of international migration flows

At this point, it is clear that human international migration may start for several reasons – the hope for individual income gain exploiting wage differentials, or other attracting opportunities trade-offs, between countries; the presence of more general push factors at origin and pull ones at destination; the attempt to manage and diversify risk to household income; the recruitment strategy to satisfy the request for low-wage workers in advanced societies; the international displacement generated by market penetration in less-developed countries; the stage of the modernization process in which societies find themselves; the spatial interactions between origin and destination countries; or some sort of combination thereof.

However, the situations that trigger international mobility may be quite different from those that sustain it across space and time. Although the aforementioned causes may continue to generate population movements, other forces that intervene in the course of migration come to operate as independent conditions that make additional movement more likely or easy. A

²⁶ In the subsequent versions of the gravity model, theorists preferred not to square the distance measure and to apply the logarithmic transformation to the right-end side of the equation describing the magnitude of migration (Bijak, 2006, p. 13).

series of theories have been formulated to explicitly deal with this latter kind of causes determining the persistence of international migration flows over space and time. Some of them will be presented hereinafter.

Network theory

Migration networks are sets of interpersonal relations “that connect migrants, former migrants, and nonmigrants in origin and destination areas through ties of kinship, friendship, and shared community origin” (Massey *et al.*, 1993, p. 448). They facilitate the circulation of information, grant financial relief, help new migrants to find accommodation and employment, and give them further assistance in many other aspects of everyday life. In this sense, networks reduce the costs – not only monetary costs but also psychological costs, time costs, search costs, and so on – and the risks associated with migratory movements and increase the expected net returns to migration. Therefore, they facilitate the flow of individuals from origin to destination countries, thereby increasing the likelihood of international movement.

According to Massey *et al.*, migration networks represent a form of *social capital* “that people can draw upon to gain access to foreign employment” (1993, p. 448); they are established on social connections that allow to achieve other benefits, such as employment or higher income. Notably, this “capital role that networks have usually played in migration flows is greatly enhanced nowadays in a world in which circulation is widely restricted” (Arango, 2000, p. 292).

Boyd and Nowak (2012, as cited in King, 2012, p. 22) classified migrant networks in three main categories: i) family and personal networks, ii) labor networks, and iii) illegal migrant networks²⁷. They also emphasize the gendered nature of networks and the fundamental role that women usually play in the subsistence and improvement of networks.

However, Taylor (1986, as cited in Bijak, 2006, p. 6) can be considered the first who identified the presence of interpersonal migrant networks in the receiving country as a fundamental factor explaining the self-perpetuation of migratory phenomena. Many migrants decide to move because others, with whom they are somehow connected, migrated before, and subsequently they usually join the network in turn. Indeed, migration networks continuously become denser and larger, as every movement widens the original network and increases the probability of its further expansion. Given their cumulative nature, migration networks act as a

²⁷ Networks do not necessary have a positive significance, they also present a darker side. Just think of the phenomenon of trafficking and smuggling, which unfortunately is quite widespread nowadays. This common practice – which can be said to be in between social networks and criminal business networks – consists in the forcibly or tricky transportation of migrants across borders, and in their subsequent exploitation by keeping them in a restrained and indebted state (Samers, 2010, pp. 87-93, as cited in King, 2012, p. 22).

multiplier factor and thereby explain the perpetuation of migratory flows irrespective of the reasons that generate the initial displacement.

According to Fussel (2012, as cited in King, 2012, p. 21), migration networks provide three important intuitions to the theorization of migration dynamics and foster their deeper understanding: first of all, the *network theory* marks a clear logical separation between the initial causes of migration and those that determine its diffusion and perpetuation over time and space; second, it contributes to the explanation of the phenomenon of *differential migration*; and third, it facilitates the prediction of future migration patterns. Moreover, Faist (1997, as cited in King, 2012, pp. 10 and 21) pointed out that another upside of networks is that they can be seen as the “crucial meso level” between the micro and macro perspectives of migration thinking, helping to connect individual decision-making to socio-structural determinants of migration, and therefore bridging a gap that represents one of the main drawback of previous theorizing efforts.

All this notwithstanding, networks are not necessary inclusive, they can also be exclusionary. Furthermore, they must reach, sooner or later, a *saturation point*, which triggers a progressive decline in their scope and effectiveness. So far, however, little inquiry has been carried out on networks’ stagnation and dissolution; “theorising about migration networks has not gone beyond the stage of a conceptual framework” (Arango, 2000, p. 292).

Institutional theory

The *institutional theory* outlined by Massey *et al.* (1993) formally recognizes the importance of private institutions and voluntary organizations in facilitating the migratory process. Nowadays, a considerable amount of people try to enter into highly-industrialized and capitalized countries, but these countries generally offer a limited number of immigrant visas – which is not sufficient to satisfy all the requests – and built up strict barriers to entry. This unbalanced situation fosters the appearance of an increasing number of lucrative enterprises and other institutions that support international movements or somehow exploit them to gain whatever profits, yielding an underground market in migration. In fact, in developed countries, alongside voluntary humanitarian associations that assert the rights of documented and undocumented migrants and try to better their living conditions, there are also for-profit organizations, unlikely licit, that provide to migrants in trouble a series of services in exchange for expensive fees²⁸.

²⁸ “Humanitarian groups help migrants by providing counseling, social services, shelter, legal advice about how to obtain legitimate papers, and even insulation from immigration law enforcement authorities”, while the services provided by lucrative entities include “surreptitious smuggling across borders; clandestine transport to internal destinations; labor contracting between employers and migrants; counterfeit documents and visas; arranged

As pointed out by Bijak (2006), this institutional theory can be seen as an extended version of the network theory, in which the set of subjects facilitating the migration flows are broadened to a wide range of institutions, entities and organizations – either for-profit or nonprofit, either legal or illegal. As observed for the process of networks generation, also the process of institutions development appears to be self-perpetuating; over time, international migratory flows become more and more institutionalized and independent from the causes that initially generated them. Moreover, this progressive institutionalization of international movements turns out to be increasingly difficult to regulate, therefore authorities progressively lose control over migration flows once they have begun (Massey *et al.*, 1993, p. 451).

Cumulative causation theory

The fundamental idea that migration is a self-sustaining and self-perpetuating phenomenon was firstly suggested by Myrdal in the late 1950s, under the label of *cumulative causation*. In more recent times, this concept was resumed and discussed further by Massey (1990, as cited in Bijak, 2006, p. 8), who highlighted how the evolutionary process of migration stimulates institutional and socio-economic change, both in the origin and in the destination countries, through various factors and feedback mechanisms. In this perspective, “causation is cumulative in that each act of migration alters the social context within which subsequent migration decisions are made, typically in ways that make additional movement more likely” (Massey *et al.*, 1993, p. 451).

The socio-economic factors and processes that may be subject to the influence of migration in this cumulative pattern include: i) the redistribution of income – both in absolute and relative terms – and the consequent relative deprivation, ii) the redistribution of land, iii) the organization of agricultural production, iv) the development of a culture of migration, v) the perverse regional distribution of human capital, and vi) the social meaning of work and the stigmatization of “immigrant jobs”. “Feedbacks through other variables are also possible, but have not been systematically treated” (Massey *et al.*, 1993, p. 451).

Therefore, according to the cumulative causation theory, immigration influences the socio-economic reality both in origin and destination countries by triggering a series of self-reinforcing processes, which in turn stimulate more migration to occur.

marriages between migrants and legal residents or citizens of destination country; and lodging, credit, and other assistance in countries of destination” (Massey *et al.*, 1993, p. 450).

Migration systems theory

Deriving from the pioneering work of Mabogunje, the *migration system theory* has been widely acclaimed as an effective and comprehensive model for the study of migratory phenomena, mainly because of its multidisciplinary, analytical focus on the various structures, links, and processes.

Seeing as how migration flows acquire a sort of stability and defined framework over time and space, stable international migration systems can be identified. *Migration systems* are comprised of a core receiving region – which may be a single country or a group of countries – and a set of specific sending countries, characterized by somewhat intense exchanges of goods, capital, and people. The relatively stable association of sending and receiving countries results not only from large migration flows; it is also bolstered by a continuous interplay of historical, economic, cultural, and political connections between the countries – both on the macro and micro levels – that give rise to a dynamic system. In this perspective, the presence of feedback effects makes population flows both a cause and an outcome of the other various interactions.

In the very first draft of the migration systems theory, Mabogunje (1970, as cited in King, 2012, p. 20) described a model made up of five elements: i) the environmental setting, ii) the migrant, iii) control subsystems, iv) adjustment mechanisms, and v) feedback loops²⁹. Massey and his co-authors then added a number of “interesting hypotheses and propositions” concerning the concept of migration systems. In particular, he highlighted that: i) although proximity facilitates exchange relationships, countries belonging to the same system do not need to be geographically close since flows rather reflect political and economic relationships; ii) systems may be multipolar, and this occurs when a set of dispersed core countries receive immigrants from a group of overlapping sending countries; iii) some countries – especially sending ones – may belong to more than one migration system; iv) stability does not imply a fixed structure, in fact systems evolve as social, economic, and political conditions change (Massey *et al.*, 1993, p. 454).

Even if Mabogunje firstly applied the migration systems model to rural-urban migration in West Africa, as subsequently noted by Kritz *et al.* (1992, as cited in King, 2012, p. 21), his theory may also fit to international migration features. This is because of the capability of the systems approach to combine the contributions of previous theoretical explanations with different levels of analysis, also incorporating the more relevant factors influencing the

²⁹ *Feedback loops* were conceived as mechanisms calibrating the system either to maintain and expand it (positive feedback), or to reduce and cease it (negative feedback).

migration process – including networks, intermediary institutions, and even usually neglected dimensions like the State³⁰ (Arango, 2000, p. 292).

Therefore, the migration systems theory is regarded by many as a potentially *scientific model* but flexible in its extent and outlook. Its attractiveness is due to the fact that it moves the migration perspective from a linear, unidirectional, push-pull movement to a circular, multi-causal, and interdependent framework, with the effects of change in one part of the system being traceable through the rest of the system (Faist, 1997, p. 193, as cited in King, 2012, p. 20). In this sense, systems are self-sustaining, self-regulating (e.g. after a shock to the system) and self-adjusting.

Nevertheless, despite the clear advantages of such a synthesizing and multi-perspective approach, the migration systems theory is at the moment too complex and mechanistic to find a practical application. Moreover, it has so far failed to go beyond the descriptive identification of various international, national, and regional systems, by the way concentrating on the most stable side of the system, i.e. the receiving countries.

Transnational social spaces

On the wave of both network theory and migration systems theory, international migration has been recently framed as a *transnational process*. The theory of *transnational social spaces* recognizes the existence of various cross-border links between individuals and groups that influence or are related to migration. As specified by Faist, “transnational social spaces consist of combinations of social and symbolic ties, their contents, positions in networks and organizations, and networks of organizations that can be found in multiple states” (2000, p. 199, as cited in Bijak, 2006, p. 7). Moreover, Portes clarified that:

[...] transnational activities [are] defined as those that take place on a recurrent basis across national borders and that require a regular and significant commitment of time by participants. Such activities may be conducted by relatively powerful actors, such as representatives of national governments and multinational corporations or may be initiated by more modest individuals, such as immigrants and their home country kin and relations. These activities are not limited to economic enterprises, but include political, cultural and religious initiatives as well (1999, p. 464).

This transnational social spaces approach lies on the notion of *social capital*, viewed as the “resources that help people or groups to achieve their goals in ties and the assets inherent in patterned social and symbolic ties that allow actors to cooperate in networks and organizations” (Faist, 2000, p. 102, as cited in Bijak, 2006, p. 7). Therefore, the social capital – represented by the series of norms of solidarity, reciprocity, and mutual obligations between individuals and

³⁰ According to Massey *et al.*, the migration systems framework is “not a separate theory” but rather “a generalization following from the foregoing theories” (1993, p. 454).

groups – constitutes a set of local assets. Once migration begins, this social capital speeds up the adaptation process to the host society and also facilitates the preservation and sustainment of linkages with the country of origin. However, the social capital may not always be easily movable across borders, and this explains why certain social groups present a substantial relative immobility. In this perspective, transnational social spaces can be seen as a sort of bridges that facilitate migration flows between source and destination countries.

The transnational social spaces theory has the advantage of presenting a sufficiently broad and interdisciplinary perspective to explain a wide series of migratory phenomena, like for instance chain migration, return migration, perpetuation of migration, and saturation of population flows once reached a certain level. Nevertheless, as pointed out also by Faist (2000, as cited in King, 2012, p. 25), there is the risk of overstating the significance of transnationalism by assuming that all international migration is related to transnational social spaces; in practice, this transnational approach can be applied only to a minority of migrants (Portes, 2003, p. 876). Moreover, despite its attractiveness, it is still far from a practical application and a concrete operationalization in migration forecasting.

1.2.4. Future challenges in building migration theory

After this brief overview of the most significant theories about migration developed so far, it should be clear that none of them is able to capture the full complexity of migratory phenomena, and probably no single theory will ever be. The main obstacle in migration studying and theorizing stands in its intrinsic diversity of types, forms, processes, triggering causes, actors involved, socio-economic and cultural contexts entailed, and so on. Therefore, it definitely seems quite far from reality the chance of succeeding in constructing a unique, comprehensive model capable of combining the two micro levels of decision making – both individual and household – with the macro dimension of the social and political context.

As King stressed more than once, migration displays a “double embeddedness”: on the one hand the individual dynamics of migration – which are linked to *human agency* and directly influence migrants’ lives –, and on the other hand the macro dimension of migration – which is part and parcel of the current world’s social changing process and is related to the State and other structures. Indeed, migration is the result of an individual choice, but no doubt it is also, and especially nowadays, induced and shaped by government, military, or corporate decisions. Therefore, it emerges the issue of developing a “multi-level, multi-criteria micro-model of migration” (Bijak, 2006, p. 13) that is able to connect these micro and macro levels analytically and to explain the mutual interdependence between human agency and social structure, rather than their antinomy. An attempt in this perspective is represented by the *structuration*

approach, firstly theorized by Giddens in 1984 and then resumed and expanded by a number of migration scholars (King, 2012, p. 28). This model defines the social context and structure in terms of a time-space scale; as explained by Morawska (2007, as cited in King, 2012, p. 28), long-term and macro processes and powers form the “upper-structural layers” defining the “dynamic limits” which restrict the range of individuals’ action, while more proximate social environment – in terms of both time and space – determines the ground upon which people base their decisions and define their goals. In turn, actions undertaken by individuals may, or may not, have an influence on these local structures in the short-term and, over time, conceivably on the larger-scale ones too.

This structuration model may be particularly suitable for studying population movements that occur between different settings, hence compelling migrants to face new structures and situations which they have to acknowledge and conform to, or maybe reshape to their own advantage. In this approach, migrants’ actions are neither the passive product of social structures nor simply the outcome of individual freedom of choice; rather they are the result of the evolving time- and space-specific contexts, and of the interplay between structural limitations and human agency. Nevertheless, despite its positive aspects, some critics argued that the structuration model has failed to provide any substantial improvement in migration theory, mainly given the problems in implementing the theoretical dualism intrinsic in structuration.

However, notwithstanding the attempt represented by the structuration model, migration theorization is still far from being comprehensive and exhaustive. Existing theories “tend to be partial and limited” given that “they are useful to explain a facet, or a dimension, or shed light on a particular feature, or are applicable to certain types of migration in certain contexts and not to others” (Arango, 2000, p. 294). Indeed, there are still many aspects of migratory phenomena that existing theories have not yet properly addressed or that have even completely neglected. Therefore, it can be traced a list of future challenges that scholars should, sooner or later, deal with if they aim to offer (additional) satisfactory and interesting contributions to the overall picture of migration theory.

To begin with, in the attempt of explaining why people move, theorists forgot to disclose why so few people move, i.e. why so many people do *not* move³¹. *Causes of immobility* are as

³¹ The latest figures from the United Nations Population Division point out that the number of international migrants worldwide – that is to say, people that are living in a country other than their country of birth – reached 258 million in 2017 (U.N., 2017a). These numbers may seem notable, and even huge considered that if all these migrants were put in a single country, it would be the fifth largest in the world – after China (1.4 billion), India (1.3 billion), United States (324 million) and Indonesia (264 million). However, the other side of the coin is that over a population of 7.55 billion in 2017, migrants represent only 3.4 per cent. This means that 96.6 per cent of the world’s population prefers not to move, despite the main economic models, founded on push and pull factors of wage and unemployment differentials, suggest they should go. Hence, in such a globalized world like today’s,

important as causes of mobility to be investigated and illustrated. Therefore, migration theories should focus not only on centrifugal forces but also on centripetal ones. Many critics argue for the introduction of the pair of *retain* and *repel* factors in addition to the classic one of *push* and *pull* factors. In fact, the presence of centripetal forces that compel people to stay in their place of origin has been generally disregarded by the various theories – even though there can be identified significant signs of their importance, especially in recent years. This involves redirecting the focus on family, cultural, and social structures of non-migration at micro, meso, and macro levels; scholars should concern more about family and kinship systems, as well as about cultural, social, and political dimensions – including, for instance, the costs of cultural adaptation and the limitations represented by restrictive immigration policies, both of which are extremely crucial issues nowadays.

This last argument is connected with the second challenge in migration theorizing; the acknowledgement of the importance of the *role played by politics and the States* in shaping migration types and flows – a role that is too often missing in the main theories. To better understand this necessity, one need only think that some even asserted that “migration is a creature of policy” (Davis, 1988, p. 259 as cited in Arango, 2000, p. 293)³². Sure enough, it is quite straightforward that theories based mainly on economic dimensions have some difficulties in conforming to an international migration setting, in which political concerns and decisions have such a prominent influence. Therefore, migration theories should aim for the explicit incorporation of political determinants that impact migratory processes and patterns, in particular countries’ admission policies and restrictions.

A third challenge is linked to the problem of *access to mobility*. This issue represents one of the main determinants of class segmentation, both on an international scale – between countries in which people can freely move and those where this cannot happen so easily – and within countries on the basis of people’s wealth, social status, and connections. Kaufmann *et al.* (2004, as cited in King, 2012, p. 26) even suggested the concept of “motility”, a notion of mobility as capital – which they define a “new form of inequality” – that describes the potential and actual capacity of individuals to be mobile both geographically and socially. Moreover, according to King, “access to mobility [...] will become a more fundamental differentiating factor within societies in the future” (2012, p. 26). Therefore, scholars should be more cognizant

while goods, capital, and knowledge can flow across countries’ borders almost without restrictions, people are less free to migrate than they were in the past; this is what some scholars called the “immobility paradox”. Evidently, there may exist plenty of factors that work to inhibit the mobility of particular groups and individuals. To go further into that, see, for instance, Malmberg (1997) and Chatterji (2017).

³² In addition, Arango affirms that “nothing shapes migratory flows and types more than admission policies” (2000, p.293).

of this increasing significance of social structures of mobility and not be led astray by the over-celebration of mobility for its own sake.

Fourth, most theories only illustrate labor migration, as if it was the dominant type of migration. Nevertheless, the contemporary international scene is characterized by the *increasing relevance of other forms of migration* – such as family reunion, refugee migration, student migration, brain drain, lifestyle migration –, and they can be no longer overlooked in migration theorizing. Hence, existing theories should be adapted – when possible –, or even new ones specifically tailored, to deal also with these other types of migration.

This last point is connected with the fifth challenge; the need for *comparative migration studies* in a period in which most theories are such restrictive and limited to particular migration types or historical periods.

A sixth challenge is the strengthening of the relevance of *gender* in migration theory, much of which has totally neglected it or, perhaps even worse, has presumed that only men migrate, while women do not. As firstly recognized by Ravenstein at the end of the nineteenth century, males and females have distinct migration attitudes and propensities. However, even if men and women usually migrate under different circumstances and for different reasons, migration phenomena are characterized by “gender relationality”, in the sense that “the mobility of men will be misunderstood if not seen in relation to the mobility of women” (Bjerén, 1997, p. 226, as cited in King 2012, p. 27), and vice versa. Therefore, migration theories cannot fail to consider how gender relations radically affect migration flows and the decision-making process underlying them. In addition to that, they should also study whether and to what extent migration itself changes gender relations³³.

Seventh, migration theories rarely take into account that migration is essentially a *growth and decline process*; population movement streams can be usually described by a bell-shaped curve, given that they rise, reach a peak, and then fall. Therefore, scholars should delve not only into the factors that determine the initiation or perpetuation of migration but also into the causes of its subsequent decline. Moreover, they should also be constantly mindful that the causes driving migration – and the contingent context enclosing it – can, and usually do, change over time, following the evolution of the migration flow³⁴.

Eighth and finally, so far theories concentrated mainly on the economic and sociological aspects of migration, and more rarely analyzed it under an *anthropological and cultural*

³³ For instance, under particular migratory environments, migration can even contribute to women empowerment.

³⁴ At this point, it should be clear that migration cannot be considered a one-off phenomenon that concludes with migrant’s settlement, but rather an evolving process that is subject to the influence of various changing circumstances which reveal themselves at different time-scales – for instance, over an individual’s life-span or even between different historical periods.

perspective. Actually, according to King, there can be identified “two very broad trends [...] in the recent writings about migration”. On the one hand, he recognizes a more traditional “attempt to reinscribe migration within the wider phenomena of social change”, which describes migration as both an effect and a cause of social transformation; in this perspective, migration studies are embedded in broader social science disciplines. On the other hand, in more recent times, the study and theorization of migration “has been heavily influenced by new perspectives arising from qualitative sociology, anthropology, human geography and cultural studies” (King, 2012, p. 24). Just to mention an interesting contribution in this sense, in one of the still few studies built with a cultural approach, the geographer Fielding (1992, as cited in King, 2012, p. 27) investigated the existence of two main “cultures of migration”: migration experienced as a “stairway to heaven” (connected to freedom, new opportunities, exploring places, etc.) and migration experienced as “being crippled inside” (connected to exile, slavery, exploitation, sacrifice, misery, loneliness, etc.). Even if it will not influence so much the traditional studies on the causes and types of migration flows, this *cultural turn* in theorizing migration will be useful to a better awareness of the migrant experience as a whole.

To conclude, theoretical contributions so far provided a good but not yet satisfactory understanding of the causes of migration and of the mechanisms that give rise to its self-perpetuation³⁵. Actually, they can be seen as a range of interlocking perspectives which – combined together in various ways – can help to have a broader but not exhaustive overview of the nature and complexity of migration reality. Indeed, as pointed out by Arango more than once, “migration is hard to define, difficult to measure, multifaceted and multiform, and resistant to theory-building” (2000, p. 295). Therefore, future efforts to theorize migration are surely needed, and – in the light of what said above – they should not only aim at a better insight into the reasons behind migration, but also focus on other, less examined dimensions of migratory phenomena, including social structures (e.g. family and kinship ties), the State and the political context in which migration occurs, the relationship between migration and development³⁶, various types of linkages between the macro and micro dimensions of migration (e.g. migration networks), the process of transnationalization, the experience of migration, and so on.

³⁵ Also because many of them almost exclusively concern the most widespread migration phenomenon of the last period – migration from poor countries to richer ones – and ignores many other emerging mechanisms.

³⁶ As a proof of the importance of the relation between international migration and development, this issue continues to rise steadily on the agenda of the international community to the point that the 2030 Agenda for Sustainable Development includes several migration-related targets (U.N., 2017b).

CHAPTER 2

IMMIGRATION DYNAMICS AND ITS EFFECTS ON HOST COUNTRIES: A LITERATURE REVIEW

At this point, it should be clear that international migration is, as some scholars have said, very straightforward and complex at the same time. On the one hand, it is a behavior so entrenched in human nature that there are a multitude of – rational and irrational – reasons to move, and some of them can even be given for granted. On the other hand, as Arango clarified, “providing general answers apt to account for an endless variety of situations is exceedingly difficult [and] general answers are bound to be reductionistic” (2000, p. 293).

The previous chapter attempted to briefly illustrate the main migration theories developed so far. However, all these efforts in theorizing have not evidently led to significant cumulative progress in the knowledge of the migratory phenomenon. On the contrary, the whole contribution of theories to insights into migration is very limited – much more than one could reasonably expect from theories defined as such. The main issue with migration is that the wealth of forms and processes that characterize it, as well as the dynamism of the ever-changing reality in which it manifests, inevitably clash with the limitations of theory building. When scholars try to explain a human behavior that, like migration, is so affected by a large number of interrelated variables, they necessarily experience great general difficulties due to these limitations. As a result, “rather than fulfilling the function of guiding empirical research and providing testable hypotheses that can be contrasted with facts, existing migration theories are mainly useful for providing explanations *ex-post*” (Arango, 2000, p. 294).

What is important to stress out is that migration is so complex and difficult to delineate, not only because it displays a multitude of causes and mechanisms, but also because its various consequences are not all so clear and well known. During the last three decades, along with the exponential growth of the immigrant population in developed countries, a huge proliferation of empirical case studies and academic papers on the consequences of immigration took place. These empirical works extensively analyze the effects of this or that migrant group on this or that country outcome: population growth and skill composition, internal migration, crime,

health and well-being³⁷, wages and employment opportunities, ethnic and income composition of the neighborhoods³⁸, school performance³⁹, innovation and entrepreneurship, firm productivity, trade creation and prices – just to mention a few.

Most of these studies estimating the impact of migration phenomena are based on U.S. data, while the empirical literature on European migration is by far more recent. This is due to two main factors. The first factor is historical; the Americas – and the United States in particular – have been the leading destination of huge immigrant flows for a very long time⁴⁰, while Europe began to turn from an emigration to an immigration area only after World War II, and more markedly at the end of the 70s⁴¹. The second factor is more “technical”; migration in the United States is strictly monitored and data on immigrants are largely available, while for the European Union there is still a lack of data on migration, which is notably *illegal* migration⁴².

In the light of the above, the aim of this second chapter is to present an overview of the main papers intended to study the possible effects of immigration on the national dynamics of the destination countries. For clarity of exposition, given the multitude of studies on the subject, it was decided to sort the most significant ones into two broad groups, identified according to the topic under consideration and the different outcomes resulting from the immigration effects.

³⁷ About this topic, see, for instance, Longhi (2014) for England, Giuntella and Mazzonna (2015) for Germany, and Ortmeyer and Quinn (2015) for the United States.

³⁸ For a cross-country analysis of the relationship between immigration in neighbor states and state redistributive expenditures, see, for instance, Hempstead (2001).

³⁹ About this topic, see, for instance, Neymotin (2009) for the United States and Brunello and Rocco (2013) for a broader cross-country analysis.

⁴⁰ Consider that only “in the century following 1820, an estimated 60 million Europeans set sail for labor-scarce New World destinations [and] about three fifths of these went to the United States” (Hatton and Williamson, 1992, p. 2). But to fully understand the historical role of the Americas as main immigrant destination, the mass (voluntary) migration of Europeans which occurred over the nineteenth and twentieth centuries has to be taken into account along with another intercontinental migration of comparable size, i.e. the preceding (coerced) migration of black slaves from Africa to the Americas and the Caribbean.

⁴¹ For more details on historical migration trends in Europe see, for instance, Fassmann and Münz (1992), Stalker (2002) or Bettin and Cela (2014). To go into the most recent development of the so-called “New Migration” in Europe see, instead, Koser and Lutz (1998).

⁴² For the European Union as a whole, the stock of illegal immigrants in 2008 has been estimated to be between 3 and 8 million – which would constitute between 6 and 15 per cent of the total foreign-born population (IOM, 2017).

2.1. The impact of immigration on domestic economies and native population

First of all, it is necessarily to clarify that the immigration phenomenon can be analyzed along three dimensions: not only the quantity and quality dimensions but also the diversity dimension, which is linked to population heterogeneity in the destination country⁴³. Vicious and virtuous circles may emerge between quantity, quality and diversity of immigration. On the one hand, more skilled and more diverse immigration is expected to be not only economically more profitable but also better accepted and even supported by public opinion. On the other hand, in a scenario with weak, unskilled and poorly diversified immigration each aspect negatively reinforces the other. Australia, Canada and the United States are countries that illustrate the virtuous regime quite well. Unfortunately, most European countries, including Italy, are currently stuck in a low-quantity, low-quality and low-diversity immigration trap.

In the last decades, the question of whether increased immigration flows – and the resulting cultural and ethnic diversity – affect the macroeconomic performance in the host country has become a very prolific research area in a number of disciplines, including economics, development studies, management, and political science.

As mentioned before, theory suggests that immigration and diversity have both positive and negative effects, and, for this reason, some referred to them as a “double-edged sword”. When migrants move from one country to another, they may contribute to generate complementarities in production and carry diverse skills, experiences, perspectives and ideas⁴⁴, which nurture technological innovation and stimulate economic growth. At the same time, increased heterogeneity may give rise to coordination and communication barriers, disagreements about public policies, animosity between different ethnic groups and conflict, which may undermine social cohesion and adversely affect economic development.

A large body of literature has analyzed whether the net effect of immigration on domestic economies and labor markets is predominantly beneficial or harmful. However, this net positive or negative effect may depend on many factors, including the level of development of the destination country and/or the skill composition and experience of the immigrant population.

⁴³ Nevertheless, immigration policies tend to focus on the quantity and quality dimensions of immigration, generally neglecting the diversity dimension. The only exception is the so-called “Green Card Lottery” in the United States, for which the official name is “Diversity Visa Lottery” and which distributes annually around 100.000 visas with the explicit objective of increasing the diversity of the American population.

⁴⁴ As Alesina *et al.* said, “people born in different countries are likely to have different productive skills because they have been exposed to different life experiences, different school and value systems, and thus have developed different perspectives that allow them to interpret and solve problems differently” (2016, p. 104).

2.1.1. What is the influence of immigration on the economic prosperity of the host country?

Ortega and Peri (2014) explore the relationship between openness to immigration and income per capita across 188 different countries⁴⁵. To do so, they construct a gravity-based model on the basis of proxies for bilateral geographical and cultural distance across countries. Since many factors can be responsible for cross-country disparities in income per capita, they explicitly account for other channels of influence – such as climate, natural resources, disease environment, colonization history, early development, and, more importantly, the quality of institutions. Using an instrumental-variable strategy to address endogeneity issues, Ortega and Peri get evidence of a robust, positive, and statistically significant effect of the share of immigrants in the population on long-run real GDP per capita of the host country. They also investigate the mechanisms behind this main finding and show that the effect of immigration on income operates primarily through an increase in total factor productivity (TFP). This result reflects a positive *diversity effect*, implying that the degree of diversity by country of origin within the immigrant population additionally enhances income per person.

In another study, Alesina *et al.* (2016) also focus on analyzing the impact of *birthplace diversity*⁴⁶ on income and productivity of 195 countries worldwide. Using data on immigration for the years 1990 and 2000, they construct a *diversity index* that reflects the probability that two individuals drawn at random in a given country would be born in the same country. The main robust finding of their analyses is that of a positive, statistically and economically significant effect of the birthplace diversity due to immigration on the GDP per capita and TFP per capita of the host country. Moreover, they uncover that this positive relationship is stronger when considering skilled immigrants in the richest and most productive countries of the sample. These positive effects of immigration on domestic income and productivity can be interpreted as due to the complementarities between individuals coming from diverse backgrounds in their

⁴⁵ The authors also conduct a cross-sectional analysis on the effects of openness to trade on income per capita, but they are unable to disclose a significant role in this perspective. This finding is likely to be particularly relevant for policies, since international migration remains highly regulated when compared to trade flows, implying large unrealized efficiency gains if their estimations are correct. In this respect, international migration has been defined the great absentee in the era of globalization; while the barriers to international trade and capital mobility have already been largely removed, cross-border worker flows are tightly restricted in most countries.

⁴⁶ Previous studies, focusing on ethnic, linguistic, and sometimes even genetic, fractionalization, show negative effects of diversity on economic growth in cross-country comparisons – with the possible exception of very rich countries. Diversity in terms of birthplace, however, is very different from ethno-linguistic diversity, given that cultural identity of individuals is mainly determined by their country of birth. Alesina and his co-authors show that *birthplace diversity* is largely uncorrelated with ethnic, linguistic or genetic diversity. Moreover, they expect that potential productive complementarities arise rather from diversity linked to the birthplace than from that of other type.

productive interactions⁴⁷. Diversity brought about by foreigners' inflows appears to increase the range of skills and ideas in the host country, thereby expanding the set of differentiated productive skills and enhancing the innovation activity.

Taking advantage of the same index of birthplace diversity introduced by Alesina *et al.* (2016), Docquier *et al.* (2018) obtain comparable results employing panel data on U.S. states over a large period, from 1960 to 2010. In particular, they produce separate results for the total immigrant population and for the two main skill groups, i.e. college-educated and less-educated immigrants. Their results suggest that *diversity* among high-skilled immigrants is positively and monotonically associated with the level of GDP per capita, while low-skilled diversity has insignificant – or weakly significant and much smaller – effects on macroeconomic performance⁴⁸.

On the same page are also Bove and Elia (2017) who investigate the extent to which *birthplace diversity* brought about by immigration affects economic growth, this time focusing on whether this relation depends on the level of development of a country. They aim attention at 135 countries – of which 27 are defined as “high-income economies” – and consider a global sample as well as two subsamples, made up of developed and developing economies, to investigate whether there are systematic differences between them. Using country-level data on bilateral migration stocks over the period 1960-2010 to compute time-varying measures of fractionalization and polarization⁴⁹, they conduct cross-country regressions and observe that both indices have a distinct positive impact on the growth rate of real GDP per capita over large time periods, and that this effect seems to be more consistent in developing countries.

⁴⁷ Alesina *et al.* (2016) show in their research that the productive effects of birthplace diversity appear to be largest for immigrants originating from richer countries and from countries at intermediate levels of cultural proximity. These results may entail the probable presence of trade-offs between communication and social costs of diversity and benefits in terms of production function effects that arise from skill complementarities.

⁴⁸ Moreover, the authors also conduct other interesting exploratory regressions using alternative dependent variables, including alternative outcomes of interest or intermediate variables influencing the level and/or growth rate of their main dependent variable, GDP per capita. They first test whether diversity influences the average employment rate in the receiving country and find that high-skilled diversity does not significantly affect employment rate at state level. Secondly, they investigate the effect of high-skilled diversity on the performance of the R&D sector and observe that high-skilled diversity increases the number of patents per capita. Thirdly, the authors assess whether birthplace diversity increases the level of labor market complementarities between immigrants and natives. Using natives' earnings as dependent variable, they find a positive and significant effect, which appears to be larger and more significant for low-skilled natives than for the high skilled. This result provides evidence that skill complementarities exist between workers trained in different countries.

⁴⁹ Most empirical economic studies on the effects of diversity use the *fractionalization index*, which measures the likelihood that two individuals randomly selected from the population belong to different ethnic groups. However, some scholars have argued that the *polarization index* is better suited to capture the concept of social tensions – related mainly to ethnolinguistic and religious diversity – and is therefore a more appropriate index of diversity. Bove and Elia (2017) prefer to include both indices in their analysis, so they construct also a polarization index, which captures how far the distribution of the immigrant groups is from a bipolar distribution where there are only two groups of equal size.

Another study on the subject that deserves to be mentioned is that of Edwards and Ortega (2016) who provide an interesting quantitative assessment of the economic contribution of *unauthorized* immigrant workers to the U.S. economy and of the potential gains from their legalization. Using data for the years 2011, 2012, and 2013, they conduct a calibration and simulation analysis at the industry and state level. Their results appear to show that illegal workers have a positive impact on the annual *private-sector* GDP⁵⁰. It must be specified that the aggregate estimates conceal large differences across industries, largely reflecting the shares of unauthorized workers in industry employment. Overall, their economic contribution appears to be substantial, even if these effects on production are smaller than the share of unauthorized workers in employment. The authors explain this evidence by the fact that illegal workers are less skilled and appear to be substantially less productive, on average, than natives and legal immigrants with the same observable skills⁵¹. Moreover, the authors find that legalization of unauthorized workers would further increase their contribution to the private-sector GDP. These gains would be due to the productivity increase arising from the expanded labor market opportunities for these workers.

As is evident, the academic studies mentioned so far focus mainly on the United States or present cross-country evidence; empirical research for European countries is much more recent and sparse. Nevertheless, Campo *et al.* (2018) analyze the impact of immigration on productivity in the United Kingdom. Their results suggest that immigration has a positive, substantial and significant impact (in both the statistical and economic senses) on productivity, measured as the gross value added (GVA) at geographical level⁵². They point out that this appears to be driven by higher-skilled workers, since the results prove to be consistently more positive for immigrants with higher skill levels, as measured either by their level of education or by occupation. Moreover, the authors tried, but have been unable, to go into further detail and to construct reliable estimates of impacts at a sectorial level, or to disaggregate between EU and non-EU migration.

Another interesting study for Europe is that of De Arcangelis *et al.* (2015), who investigate the effect of migrants' stock on the Italian production structure – intended in terms of sectorial recomposition – at the provincial level. Indeed, the change in factor endowments – implied by a higher presence of immigrant workers – may have different effects on the production structure in the host country. First, migration may induce firms to switch to

⁵⁰ Obviously, the authors assume that there are no undocumented workers in public administration or the military, so they omit the public sector (i.e. the Government sector in the NAICS) from consideration.

⁵¹ The authors report that documented foreign-born workers prove to be 25 per cent more productive than undocumented ones with the same levels of education and experience.

⁵² These results are not apparent in the initial OLS estimates, but they emerge when the authors use an instrumental variable approach to identify causality.

techniques that are more complementary to the characteristics of the new labor force, increasing or decreasing their capital-to-labor ratio; second, immigration may cause an effect in the production structure but at a highly disaggregated level, due to the fact that some sectors employ immigrant workers more than others. Since immigrants are assumed to be *relatively* more productive when performing simple and manual tasks, this implies a production-composition change in favor of manufacturing plus construction (i.e. the relative simple-task intensive aggregate sector) with respect to a subset of services (i.e. the relative complex-task intensive sector). Using data on foreign-born residence and work permits of the 103 Italian provinces in 1995-2006, De Arcangelis and his co-authors investigate these effects and find a small but statistically significant impact on the Italian production structure. Evidence suggests that an increase in the ratio of foreign-born residents to the province population significantly enhances manufacturers' and constructors' value added with respect to services' value added. This means that the production-composition changes induced by immigration are in favor of the simple-task relative intensive sector rather than of the relative complex-task intensive sector. Moreover, the authors notice that these effects are magnified when considering an increase in foreign-born populations drawn from countries more different to Italy in terms of GDP per capita and educational attainment. This confirms that *diversity* boosts the effects of immigration on the economy of the destination country.

2.1.2. What is the influence of immigration on the population growth in the host country?

Beyond the effects of immigration on a country's economic prosperity, another topic of interest is whether migratory flows have an impact on a country's population. In this respect, the so-called *displacement theory* of native migration adjustments foresees that offsetting changes will occur in the destination country after an immigrant inflow. As immigrants increase the labor supply in a local market, they should lower wages in that market relative to other markets. Obviously, this creates an incentive for natives to move from the affected market to higher wage markets, and, as a consequence, wages in the original market should rise again. Evidently, this displacement and wage re-adjustment process is intrinsically of limited duration; therefore, native population changes in an area following immigrant inflows should be observed within a relatively short period of time.

Nevertheless, Card (2001) ends up disproving this theory with his empirical analysis aimed at investigating the effects of immigrant inflows on occupation-specific labor market outcomes. Using 1990 census data for U.S. metropolitan areas, Card observes that intercity mobility rates of natives and earlier immigrants are insensitive to immigrant inflows, implying

that any native out-migration response is at most very modest. In fact, the impact of recent immigration on net native population growth proves to be positive, denoting no offsetting flows by natives after immigrants' arrival. Despite these findings, Card observes that shifts in the relative supply of different occupations due to immigration are anyway associated with systematic, even if small, changes in occupation-specific wages and employment rates. This means that immigrant inflows over the 1980s in the United States had a modest negative effect on wages and employment rates – according to Card, mainly on those of younger and less-skilled natives in high-immigration cities.

Wozniak and Murray (2012) bring Card's analysis on the displacement effect of immigration a step further, distinguishing between its impact on low-skilled and high-skilled native population. Their estimates show that immigration increases the low-skilled native population in the short run because of a decline in outflows of low-skilled natives from affected areas. This effect proves to be more marked in areas from which relocation is more expensive since low-skilled natives are, in a sense, "temporally trapped" by immigrant inflows. On the contrary, given that high-skilled natives are more geographically mobile than low-skilled ones, the short-run response among high-skilled population is definitely in line with the *displacement theory*. However, overall, also Wozniak and Murray find that the effect of immigrant inflows for the whole native population is insignificant.

2.1.3. What is the influence of immigration on the labor market opportunities in the host country?

In the economic field, the labor market impact in the destination countries – or more specifically the question whether immigration negatively affects wages and employment of native workers – has been one of the most extensively researched topics.

Theoretical models of a competitive labor market predict that an immigrant influx should lower the wage of competing factors. Despite the intuitive appeal of these theoretical models and despite the large number of careful studies in the literature, the existing evidence provides a mixed and confusing set of results. The measured impact of immigration on the wage of native workers fluctuates widely from study to study, but it seems to cluster around zero.

Speaking about this issue, it is worth specifying that the effects of immigration on the wages paid to native-born workers depend upon two critical factors: i) whether immigrants take jobs similar to those of natives or instead take different jobs due to inherent comparative advantages between native and foreign-born workers in performing particular tasks (i.e. *substitutability*); ii) whether native workers respond to immigration and adjust their occupation

choices in order to shield themselves from competition with immigrant labor (i.e. *task specialization*).

Clearly, if workers' skills are assumed to be differentiated solely by their level of educational attainment, and the production technology and productivity of each type of labor are given, then a large inflow of immigrants with limited schooling should alter the relative scarcity of education groups, increasing wages paid to highly educated natives and reducing wages paid to less-educated ones. However, immigrants have a comparative advantage in occupations requiring manual labor tasks, while less-educated native-born workers have an advantage in jobs demanding communication skills. Therefore, immigration may encourage workers to specialize; in fact, less-educated natives may respond to immigrant inflows by leaving physically-demanding occupations for language-intensive ones. These language-intensive tasks tend to earn comparatively higher returns, and those returns are further enhanced by the increased aggregate supply of complementary manual-intensive tasks. As a consequence, foreign-born workers may not create large adverse effects on wages paid to less-educated natives.

In the light of the above, it appears straightforward why many studies focus on the extent to which native and migrant workers with similar characteristics (e.g. education and experience) can substitute for each other in production. For instance, assuming that similarly educated workers with different levels of experience are *imperfect substitutes*, Borjas (2003) studies whether immigrants harm or improve the employment opportunities of native workers. His results suggest that immigration reduces the average wage and labor supply – intended as the fraction of time worked – of competing native workers. Even after accounting for the beneficial cross effects of low-skill (high-skill) immigration on the earnings of high-skilled (low-skilled) workers, Borjas's analysis reveals that immigration has substantially worsened the labor market opportunities faced by many U.S. native workers.

Anyway, Borjas deserves credit for introducing a new approach of thinking about and estimating the labor market impact of immigration⁵³. He pays closer attention to the characteristics that define a skill group – introducing for the first time the intuition that both schooling *and* experience are significant in this sense – and resorts to a production model that

⁵³ Most previous studies, indeed, exploit the geographic clustering of immigrants and use differences across local labor markets to estimate the impact of immigration. However, according to Borjas (2003), this framework has been troublesome since it presents three conceptual problems: i) because of the native out-migration phenomenon, the effects of new immigration may be quickly diffused across the national labor market; ii) the cross-sectional correlation between immigrant inflows and native wages may be upward-biased by local demand shocks that raise wages and attract in-migrants; iii) in the long run, an immigration-induced increase in the supply of labor to a particular city can be diffused across the economy by other strong currents that tend to equalize economic conditions across cities and regions.

emphasizes the role of *complementarities* in production, which allows for a clear discussion of both within and between skill group effects.

Peri and Sparber (2008) confirm the assumption of *imperfect substitutability* between less-educated immigrants and natives, proving that foreign-born workers specialize in occupations that require manual and physical labor skills, while U.S. natives pursue jobs more intensive in communication and language tasks. Therefore, given that immigration induces natives to reallocate their task supply – thereby reducing downward wage pressure –, task complementarities and increasing specialization might explain why economic analyses commonly find only modest wage and employment consequences of immigration, even for less-educated native-born workers⁵⁴.

Few years later, this time focusing their attention on science, technology, engineering, and mathematics (STEM) occupations, Peri *et al.* (2015) analyze the impact on native employment and average weekly wages of a variation in foreign-born workers across 219 U.S. cities. They find out that increases in immigrant STEM workers between 1990 and 2010 – made possible by the H-1B visa program – are associated with large, significant wage gains for native STEM and college-educated workers; gains for non-college-educated natives appear to be smaller but still significant. These findings imply that foreign STEM workers increase total factor productivity growth in U.S. cities, but this productivity effect is skill biased. Since they are closer substitutes for college-educated natives rather than for non-college-educated ones, they generate a much larger increase in the wage paid to college-educated native workers. While the effect found on natives' wages is sizable, the impact of the inflow of STEM workers on the employment of any native group turns out to be insignificant. As noticed by the authors, this weak employment response may suggest the potential existence of additional adjustment mechanisms for college-educated workers at the metropolitan area level.

Manacorda *et al.* (2012) and Ottaviano and Peri (2012) extended the theoretical set up presented by Borjas in 2003 to allow for *imperfect substitutability* in production between natives and immigrants with the same education and potential experience. In particular, Ottaviano and Peri investigate the effect of immigration on the wages of native U.S. workers of various skill levels and find a small but significant degree of imperfect substitutability between natives and immigrants *within* education and experience groups. Their estimates imply, in the long run, an overall small positive effect on average native wages and a substantial negative effect on wages of previous immigrants⁵⁵.

⁵⁴ See, for instance, Altonji and Card (1991) and Peri (2012).

⁵⁵ Imperfect substitutability entails that, on average, immigrants already in the United States tend to suffer much larger wage losses than natives consequently to inflows of new immigrants in the country.

In conclusion, once *imperfect substitutability* between natives and immigrants is allowed for, immigration to the United States had at most a modest negative long-run effect on the real wages of the least educated natives. These results at the national level are in line with the findings typically identified at the city level. As a matter of fact, the empirical analysis of cross-city – and cross-state – evidence in the United States has consistently found small, and often insignificant, effects of immigration on the wages of native workers. However, estimating the effects of immigration using national level data, some scholars have found a more significant negative effect of immigration on the wages of natives with no high school diploma. These scholars argued that wages across local labor markets are subject to the equalizing pressure that arises from the special arbitrage of mobile workers. As a result, the wage effects of immigration are better detected at the national level since one can exploit variation in wages and immigrants across groups of workers with different skills (as captured by education and experience) over time.

So far, there have been discussed only studies focused on the United States, since, for the reasons mentioned above, few researches have been carried out at European level. Among them, it is worth mentioning the analysis of Winter-Ebmer and Zweimüller (1996) on the impact of immigrants on the wages paid to young native blue-collar workers in Austria. Even if this group is the one that should compete most heavily with migrant workers, they find no negative wage effects at regional, industry, or firm level. That is, in regions, industries, or firms with a larger foreign share, natives appear to earn higher wages.

With regard to Italy, Barone and Mocetti (2011) concentrate on studying whether the inflow of female immigrants who specialize in household production has an impact on the labor supply of Italian women. They observe that when the number of immigrants who provide household services is higher, native women spend more time at work (*intensive margin*) without affecting their labor force participation (*extensive margin*). Moreover, they disclose that this impact works through substitution in household work rather than complementarities in the production sector⁵⁶.

Further to the above, it is worth adding that some scholars went even beyond the analysis of the consequences of immigration on the labor market opportunities, investigating whether and how the quality of institutions⁵⁷ in the destination country may alter the influence of immigrant flows on natives' wages and employment. Among them, Angrist and Kugler (2003) carry out an interesting cross-country analysis of immigration effects interacted with

⁵⁶ These results are concentrated on high-skilled women, whose time has a higher opportunity cost compared to low-skilled ones.

⁵⁷ For an interesting study that, instead, examines the direct impact of immigration on a nation's policies and institutions see Clark *et al.* (2015).

institutions. Focusing on Western Europe countries and constructing measures of labor and product market rigidity⁵⁸ (i.e. firing costs, high replacement rates, rigid wages and business entry costs), they obtain empirical result that are consistent with the hypothesis that reduced flexibility worsens immigration effects on native equilibrium employment⁵⁹.

In the subsequent years, Kemeny (2012) and Kemeny and Cooke (2017) test whether the impact of immigrant diversity on the average economic welfare of natives depends on the quality of institutions in U.S. countries. The results suggest that *generalized trust* and *inclusive institutions*⁶⁰ catalyze the positive correlation between diversity and average native wages. These findings confirm the economic significance of immigrant diversity, while suggesting the importance of local policies that succeed in fostering trust, community spirit, and other informal institutions, as well as promoting inclusive social and economic institutions.

To summarize what have been said so far, research on immigration's impact on local labor markets generally focuses on how native workers' opportunities are affected. However, the majority of empirical studies for the United States and Europe fail to find any significant effect of immigration on both wages and employment rates. There are basically two possible lines of explanation for these results. The first one – which has already been mentioned above – is *labor segmentation*; foreign-born workers specialize in occupations that require manual and physical labor skills, while natives pursue jobs more intensive in communication and language tasks. The second one is related to immigration-compensating changes at the sector- or firm-level productive or organizational structure; in fact, an exogenous immigration-induced increase in the availability of low-skilled workers could cause a shift toward more low-skill intensive productions. This kind of adjustments will be dealt with in more detail in the subsequent paragraph.

2.2. The impact of immigration on entrepreneurship, innovation and domestic firms

As pointed out in the previous paragraph, immigration seems to have a positive impact on the destination country's economic prosperity. However, there may be different mechanisms behind this aggregate beneficial effect. First of all, when arriving in a country, foreign-born

⁵⁸ The main rationale for institutions that reduce flexibility is to protect natives – and especially incumbent workers – from competition in the labor and product markets. However, the equilibrium consequences of protective regulations and institutions are unclear; although employment protection and entry barriers may reduce job losses in the short run, reduced flexibility may be counter-productive, possibly amplifying any negative employment consequences of immigration for natives. This ambiguous effect of market rigidity is the main reason behind this type of academic studies.

⁵⁹ Part of this interaction is due to scale effects; institutions that reduce employment levels, higher entry barriers, and reduced wage flexibility will tend to make the effect of a given number of immigrants worse.

⁶⁰ Inclusive institutions means that they lower the costs of interaction in a society consisting of different groups. Kemeny and Cooke (2017) build two distinctive indicators for inclusive institutions: a composite measure of social capital and a variable that captures locality-specific ordinances aimed at immigrants.

workers alter the skill mix of local labor supply and therefore may have an influence on the country's labor market, particularly on wages and employment. This channel has already been discussed above and can thus be set aside at this point, even more because the effect of immigrants on average native wages and employment rate is negligible – at least in the long run. This means that other mechanisms come into play; immigration, indeed, can exert its influence on the welfare of the host country through its aggregate impact on entrepreneurship and innovation or through its direct consequences on domestic firms, particularly on their production structure and performance.

Compared to the literature examined so far, the impact of immigration on innovation, entrepreneurship and domestic firms has received some attention only recently. Over the last decade, academic studies provided evidence in support of a “*diversity dividend*” in terms of creativity, innovation, and productivity. This literature argues that *cultural heterogeneity* within a labor force expands the collective variety of skills, knowledge, and ideas that are contained within it, becoming a determinant factor for a region's economic development and prosperity.

2.2.1. What is the influence of immigration on entrepreneurship and innovation in the host country?

In theory, immigrants may facilitate innovation and entrepreneurship by providing a responsive labor supply that is both willing and able to invest in new skills. Because immigrants face a lower opportunity cost of investing in new capabilities or methods and exhibit a higher risk propensity, they tend to be more flexible in their human capital investments than observationally equivalent natives are. Hence, areas with large numbers of immigrants – even if they are not self-employed – may prove to be areas in which entrepreneurship and innovation are generally easier to accomplish.

In this regard, Rodríguez-Pose and Hardy (2015) analyze the impact of cultural diversity on the entrepreneurial performance of U.K. regions. Their findings suggest that culturally diverse regions tend to be more entrepreneurial and, more specifically, that diversity amongst highly skilled workers – i.e. those employed in knowledge-intensive occupations – exerts the strongest influence upon start-up intensities⁶¹.

Regarding the United States, Duleep *et al.* (2012) carry out an empirical study aimed at analyzing the impact of immigration on the aggregate entrepreneurial activity. Results

⁶¹ The authors clarify that the type of cultural diversity taken into account is a decisive factor; they show that birthplace and ethnic diversity measures are clearly linked, but, in the case of knowledge-intensive entrepreneurship, birthplace diversity proves to be prevalent. Therefore, new migrants born outside the United Kingdom turn out to be of greater benefit to a region's knowledge stock and provide for more business opportunities to be identified and realized.

consistently suggest that college-educated immigrants lead to increased innovation and business development in a variety of dimensions – which include entrepreneurship, establishment creation, and job formation. Moreover, the authors observe that greater shares of college-educated natives also contribute to increased entrepreneurial activity. However, the per capita effect on entrepreneurial activity of immigrants far exceeds that of natives. Finally, the authors notice that higher shares of college-educated immigrants also lead to increased entrepreneurial activity of natives, and this finding suggests that benefits of immigrants are greater than just their direct innovative activity.

Therefore, Duleep and her colleagues point out an important issue; in addition to the direct contributions of immigrants to creativity and research, high-skilled immigration can boost innovation indirectly through positive knowledge spillovers on fellow researchers, the achievement of critical mass in specialized research areas, and the provision of complementary skills – such as management and entrepreneurship.

Anyway, despite few studies on the effect of immigration on general entrepreneurship, the vast majority of empirical research concentrates on the influence of foreign-born workers on patent applications. Gaining insight into the consequences of immigration on technological progress, which is a driver of productivity growth, allows to ultimately get a greater understanding of economic growth; if immigrants increase patents per capita, they may increase output per capita and make natives better off.

For instance, Hunt and Gauthier-Loiselle (2010) investigate the impact of skilled immigration on U.S. patents per capita. Their data show that immigrants account for 24 percent of patents – twice their share in the population – and that a college-graduate immigrant contributes at least twice as much to patenting as his or her native counterpart. However, the authors emphasize that this *immigrant patenting advantage* over natives in the United States is entirely accounted for the disproportionately greater share of immigrants holding degrees in science and engineering fields, implying immigrants are not innately more able than natives. Combining individual and aggregate data, Hunt and Gauthier-Loiselle find that college-graduate immigrants increase patents per capita substantially; this shows evidence of positive spillovers of immigrants. Moreover, the authors find that immigrants who are scientists and engineers, or who have post-college education, boost patents per capita more than simple immigrant college graduates do.

On the contrary, exploiting fluctuations in H-1B admissions in the United States, Kerr and Lincoln (2010) find no evidence of positive spillovers. They observe that increases in the size of the H-1B program substantially expand Indian and Chinese patenting activity in H-1B dependent cities relative to their peers. However, they identify limited effects for native science

and engineering patenting. This means that total science and engineering invention increases with higher H-1B admissions mainly through direct contributions of immigrants.

Blit *et al.* (2017) concentrate their analysis on 98 Canadian cities and obtain similar results for Canadian STEM-educated immigrants; those who, among them, are successful in obtaining jobs in STEM areas do appear to raise patenting rates in a significant way. However, with little more than one-third of STEM-educated immigrants finding employment in STEM jobs, the aggregate beneficial impact of Canadian skilled immigration on patent rates appears to be relatively modest in comparison to the United States. Given the modest magnitude of the estimated effects, it emerges that, for Canada, any spillover effects of immigrants on native patenting are likely minimal.

As can be noticed, the extant research on the effects of immigration on innovation is generally limited to the role played by highly educated immigrants – individuals with tertiary or post-tertiary education or in research occupations – and is predominantly focused on the United States. However, in most European countries only the minority of immigrants are high skilled. According to common sense, there should be a negative correlation between the migrant share and the innovation variable when the migrant population is dominated by unskilled workers, while this might not be the case when immigrants are culturally diverse and high skilled.

Despite this generally held belief, empirical evidence for Europe tells a different story. Jahn and Steinhardt (2016) investigate the impact of immigration on innovation in Germany. By exploiting a placement policy for immigrants, they do not find any evidence of a negative impact on innovations – as measured by patent applications –, although the majority of inflows was unskilled. Instead, their panel estimates suggest that the investigated inflows had no or even a positive impact on innovations.

Similar results are also obtained by Bratti and Conti (2017), who analyze the effect of overall and low-skilled immigration on both Italian provinces' patent applications and firms' self-reported innovation outcomes. Their study is quite interesting because it provides evidence not only for R&D-based but also for non-R&D-based innovation using a very small geographical scale of analysis. The estimates demonstrate that the share of immigrants in the province population has neither positive nor negative effect on Italian provinces' patent applications. These main findings do not change when the authors use firm-level data and self-reported measures on firm product, process, and organizational innovations⁶².

⁶² According to Bratti and Conti (2017), this lack of influence of increasing waves of low-skilled workers on firms' creation and adoption of innovation in Italy may be due to their similarity to the natives' skill structure, which prevented a dramatic rise in the relative abundance of low-skilled workers.

The findings achieved by Ozgen *et al.* (2014) are even more unexpected. Basing their analysis on two unique and harmonized linked employer-employee datasets for Germany and the Netherlands, they conduct a consistent cross-country study on the impact of cultural diversity among migrant employees on the product innovation of firms. Surprisingly, they observe that innovation in both countries is predominantly determined by other factors – such as establishment size and industry but also obstacles and organizational changes faced by firms. Cultural diversity of employees, instead, can make a positive but definitely modest and context dependent contribution to product innovation⁶³.

To sum up what said so far, there is abundant anecdotal belief that the contribution of immigrants to innovation and entrepreneurship is quite substantial, particularly in the United States. In addition, despite few studies that buck the trend, several empirical researches have established a clear connection between skilled immigration and patenting activity. What is still less clear and unexplored is whether this increase in patenting activity in broad terms has translated into innovation with direct effects on firms' outcomes, and this is precisely the issue addressed hereinafter.

2.2.2. What is the influence of immigration on firms' structure and performance in the host country?

The increasing international labor migration of the last decades inevitably had important effects on the workforce composition of firms in all migrant receiving countries. However, the consequences of these changes for firms' structure and performance have attracted growing attention only in recent years.

A first type of studies on the subject focus on the effect of immigrant flows on the offshoring decisions made by firms⁶⁴. Labor supply shocks due to immigration may basically affect a firm's choice to relocate its production activities in two ways. On the one hand, by reducing the relative cost of having some tasks performed domestically rather than being sourced abroad, immigrants may reduce the need for offshore production; according to this view – usually referred to as the “labor supply effect” or “import substitution effect” – immigration and offshoring will be *substitutes*. On the other hand, by reducing the costs of

⁶³ Moreover, the authors affirm that, with respect to the composition of employment, the presence of high-skilled staff appears to be most crucial for the innovativeness of firms; simply considering the presence of foreign workers among employees does not affect the likelihood of introducing a product innovation.

⁶⁴ The relocation of domestic jobs abroad is often motivated by the firm's desire to reduce its labor costs, to move production closer to foreign consumers, or to utilize a foreign workforce with a different skill set. The firm has to weigh these benefits against the inherent trials associated with offshoring, which include the difficulty of monitoring production activities abroad, the need to transport intermediate goods between countries, and the foreign connections and familiarity with foreign business environments required to offshore.

exporting thanks to the information and connections that they often have with their home country, immigrants favor bilateral exports and offshore production to the immigrants' country of origin; according to this view – usually referred to as the “bilateral network effect” or “export promotion effect” – immigration and offshoring will be *complements*.

Since both immigration and relocation of production offshore can be thought of as international movements of factors, there should be a possible general equilibrium link between the two. Skiba (2006) observes that, theoretically, this link crucially depends on the sector specificity of immigrant labor. What matters is whether immigrants' cross-sectoral employment pattern is different from that of native workers, and usually immigrant labor is less mobile across industries than the domestic labor is. In his empirical analysis, Skiba then documents a positive relation between immigration and firms outflows across U.S. states and presents evidence that this relation is likely to be driven, precisely, by the specificity of immigrant labor. First, a comparison of immigrant labor specificity across states reveals that states with the most specific – relative to total – immigrant labor experience the highest firm outflow rates. Second, a comparison of industries shows that industries where immigrants tend to work experience statistically significantly lower firm relocation rates.

Olney (2009) takes this issue a step further; he specifies that the relocation of production activities can be captured both at the *extensive margin* by the net birth rate of establishments in a city and at the *intensive margin* by their net expansion rate. His empirical results indicate that, in the United States, low-skilled immigration decreases and high-skilled immigration increases the relocation of production activities at both the extensive and intensive margins. An additional industry level analysis reveals that there is no relationship between immigration and the establishments' net birth and expansion rates in non-mobile industries⁶⁵, but there is a strong, significant relationship in the remaining mobile industries.

More recently, Olney and Pozzoli (2018) obtained similar results using data for Denmark; they observe that an exogenous influx of non-EU immigrants into a municipality reduces firm-level offshoring at both the extensive and intensive margins. The general reduction in offshoring could explain why immigration is found to have no negative impact on wages; it may cause an increase in local labor demand that ends up compensating the direct immigrant-induced increase in labor supply, without any consequence on wages and employment. Moreover, by analyzing the effect of immigration on international trade, the authors find no impact on both imports into and exports from a municipality. However, an interesting

⁶⁵ Clearly, not all industries can respond to immigration in a similar manner; certain industries that are reliant on natural resources or that need to be close to consumers have less ability to adjust the location of their production activities in response to immigration.

subsequent bilateral analysis shows that immigrants have connections in their country of origin that increase the likelihood that firms import from, export to and offshore to *that* particular foreign country. Therefore, the network effect that encourages offshoring to the immigrants' country of origin is also useful in facilitating trade with that country⁶⁶. Thus, Olney and Pozzoli, with this revealing study, demonstrate that both the effects mentioned before prove to be valid; overall, immigration and offshoring are complements at the *bilateral level* but substitutes at the *multilateral level*.

In this respect, it is worth specifying that the *information advantage* brought about by immigrants is not the unique factor that affects a firm's decision about whether and where to offshore. Countries' policies and institutional characteristics may also have an impact in this regard. For example, Moriconi *et al.* (2018) observe that countries endowed with institutions that enhance investor protection and reduce corruption register a higher probability of been chosen by firms, while those with institutions that increase regulation in the labor market decrease such probability.

As well as on offshoring and relocation decisions, immigration may have an impact on firms' expenditure in automation; theoretically, firms endogenously respond to the skill level of their workforce by changing their investment decisions. In principle, automation machinery may be thought as substitutes for low-skilled labor and complements for medium-skilled labor. Therefore, certain academic studies focused their attention on the so-called *technology-skilled complementarity*. For instance, Lewis (2011) investigates how U.S. firms respond to increases in the relative supply of low-skill labor by comparing technology adoption rates across metropolitan areas with different shocks to the relative supply of high school dropouts induced by low-skilled immigration. The author finds that plants added technology more slowly when immigration induced the ratio of high school dropouts to graduates to grow more quickly. These results are consistent with automation machinery being a relative substitute for low-skill labor.

However, investigating the impact of low-skilled immigration on the investment decisions by Italian manufacturing firms, Accetturo *et al.* (2009) come to different conclusions. Their econometric evidence indicates that, on average, an increase in the share of low-skilled immigrants, computed at provincial level, raises firms' investment rate in machineries. Therefore, it appears that a more intense inflow of unskilled immigrants in Italy increases the probability for firms to make large investments⁶⁷.

⁶⁶ In addition to Denmark, similar effects of immigration on international trade have also been observed for other European and non-European countries. See, for instance, Gould (1994) for the United States and Combes *et al.* (2005) for France.

⁶⁷ Investigating further, the authors observe that this evidence is larger for small firms and firms in more competitive and less technologically intensive industries, which are likely to produce less differentiated goods and

Conducting a firm-level analysis on French data, Mitaritonna *et al.* (2014) also observe that firms in districts receiving a remarkable influx of immigrants display faster growth of capital investments. Moreover, they find that immigration is associated with productivity gains and, consequently, with natives' wage increases. This effect is particularly strong for firms with initially zero, or very low, level of foreign employment – provided that they start hiring some immigrants.

Other quite recent papers have also investigated whether local availability of immigrants benefits productivity or increases the surplus of local firms. Immigrants may complement native workers, stimulate investments and technological adoption, allow specialization by skill in the firm, and lower costs per unit of output. These effects could be beneficial for the firm and increase its productivity and profits. However, on the other hand, cultural diversity may affect firm performance negatively due to worse communication, lower social ties and trust, and worse cooperation among workers.

In this regard, Teruel-Carrizosa and Segarra-Blasco (2008) analyze the effect of increasing immigration flows on firms' performance in Spain. Their findings reveal that the share of immigrants in a municipality has a positive impact on both labor productivity and wages of manufacturing firms. In particular, they point out that the increased employment supply brought to bear by immigrants displaces native workers to more skilled occupations and has a positive indirect impact on skill composition and productivity of firms – since it allows a better distribution of labor qualifications.

In contrast to the aforementioned study, again for Spain, Nicodemo (2013) discloses that immigration has instead a negative effect on labor productivity, as measured by gross value added (GVA) per employee. Moreover, she notices that the type of immigration – European 15 *versus* non-European – is not relevant in explaining this negative effect on productivity; in this respect, she points out that what really matters is the way in which firms employ the immigrant workers, and firms prove to be somewhat heterogeneous in the use of workers.

Another remarkable study on this topic is that of Paserman (2008), carried out using unique micro-level data for Israeli. He observes a negative correlation between the change in the high-skilled immigrant share and the change in firms' output per worker. In particular, a more in-depth analysis exhibits that immigration is strongly negatively correlated with productivity in low-tech industries, whereas in high-tech industries it seems to prevail a positive relationship – suggesting the presence of complementarities between high-skilled immigration and technology.

react to the availability of foreign workers by accumulating relatively more capital. Whereas, the positive effect of immigration partially vanishes as long as firm employment increases.

Other scholars focused their attention on the effects of the workforce heterogeneity – rather than of the immigrant share – on firm productivity and performance. In fact, diversity can affect productivity by, among other things, stimulating innovative thinking and introducing new ideas to solve problems. For example, René *et al.* (2012) find a positive effect of workforce heterogeneity by birthplace on workers' productivity in Austrian firms and conclude that teams of mixed backgrounds present complementarities in production that, in turn, lead to higher wages.

Also Trax *et al.* (2015), analyzing data for Germany, detect positive spillovers associated with the degree of cultural diversity in the workforce, which induce notable productivity gains. These benefits appear to be especially strong within larger manufacturing firms and weaker in service companies⁶⁸.

Partially in contrast with the previous studies, Parrotta *et al.* (2010) notice that, while labor diversity in terms of skill significantly boosts Danish firms' performance, ethnic diversity has either no or even negative effects on firm total factor productivity (TFP). According to these findings, it seems that the negative effects, if any, due to communication and integration costs linked to a more culturally heterogeneous workforce, outweigh the benefits deriving from creativity and knowledge spillovers. However, the authors observe that ethnic diversity can be valuable for firms operating in industries characterized by above-average trade openness, confirming the idea that workers coming from different countries provide product and market information useful for firms in order to compete in global markets.

At this point of our vast literature review, it should be clear that very little has been done so far to understand whether immigration has an impact on firm profitability and, if so, to which extent. Nevertheless, two interesting researches on U.S. data seem to find positive effects on firm profits. Using the increase in the number of H-1B visas as a proxy for increased immigration, Ghosh *et al.* (2014) detect a positive effect not only for labor productivity but also for firm profits. Two years later, Doran *et al.* (2016) analyze the impact of additional H-1B visas on different firm outcomes and, among others, notice an increase in median profits and a related decrease in median payroll costs per employee.

The very latest study worth mentioning in this regard is a very recent and appealing research conducted on Italian data. Brunello *et al.* (2019) investigate the effects of low-skilled immigration on the performance of Italian manufacturing firms. Their results exhibit a positive

⁶⁸ In addition to the firm level analysis, the authors conduct also a regional investigation and observe that a more diversified regional environment – i.e. with foreigners from many different cultural backgrounds and not with more foreigners *per se* – brings about substantial benefits for firms' productivity, both in manufacturing and in services. In conclusion, it turns out that regional diversity is at least as important for productivity as micro-level diversity.

but small average effect of immigration on profits, a negative impact on labor costs, and no influence on total factor productivity (TFP). Entering into more detail, the positive effects on profitability prove to be larger for small firms operating in low-tech sectors and for firms located in low-skilled production areas, while these firms report negative effects on TFP. Moreover, the authors observe that also firms with easier access to credit supply seem to experience a stronger positive impact on profits, consistently with the fact that firms with no restriction on capital adjustments can move to the efficient combination of inputs more quickly.

Obviously, this second chapter simply aimed at presenting just a little part of the myriad of existing studies on the effects of immigration on economies and firms. What is clear is that scholars found a substantial heterogeneity in outcomes depending on the various scenarios considered in their analysis. The impact of immigration on the different economies, in fact, substantially varies according to host countries' labor market characteristics, policies and institutions, while the effects on firm performance largely depend on firm size, age, level of technology and sector. Moreover, the consequences of immigration significantly change depending on the skill characteristic of the foreigner population – high-skilled *versus* low-skilled – and the time horizon under consideration – long run *versus* short run⁶⁹.

To conclude with an emblematic remark, as Borjas said, “the most important lesson is that the economic impact of immigration will vary by time and by place, and can be either beneficial or harmful” (1994, p. 1668).

⁶⁹ Longer-run analysis, in fact, may conceal important short-run dynamics in the adjustment process to incoming migration. A series of short-run responses (e.g. outmigration) often restores equilibrium over the longer period, and therefore the impact of immigration in the long run tends to be at least negligible.

CHAPTER 3

THE EFFECTS OF THE PRESENCE OF LOW-SKILLED IMMIGRANTS ON FIRM'S PERFORMANCE AND INNOVATION: AN EMPIRICAL ANALYSIS ON ITALIAN DATA

The academic literature exposed in the previous chapter shows that much has been done in investigating the effects of immigration on the economic dynamics of the host country, but many aspects have not yet received proper attention. Two main issues must be clarified in this respect. First of all, so many studies focus their analysis on the United States, or in any case on countries characterized by high-skilled immigration phenomena. However, highly-qualified and low-qualified immigrants may have completely different – or even opposite – consequences on domestic economies and firms. Second, although there exists a vast literature that analyzes the impact of immigration on macroeconomic aspects, still few researches investigate its effects on firm-level dimensions. Nevertheless, aggregated dynamics may disguise highly differentiated microeconomic mechanisms, which instead would be interesting to consider.

Therefore, since the extant research gives mainly a partial picture of the overall influence of immigration on domestic trends – and particularly on firm-level ones –, this third and last chapter is intended to give a little contribution in order to enrich this fragmented picture.

The main purpose of the empirical work presented hereinafter is to investigate whether low-skilled immigration has a causal effect on manufacturing firms' performance indicators. The focus of the analysis is the Italian context, characterized by quite high levels of immigration, mainly from developing or less developed countries. The chapter will be organized in three paragraphs. The first one represents a sort of contextualization since it offers a brief *excursus* on the characteristics of the Italian immigration phenomenon in the past decades. The two subsequent paragraphs are similarly structured if compared to each other since they both illustrate the dataset construction, the empirical methodologies and the results obtained from a number of regression estimations. In particular, the second paragraph presents the main econometric analyses, which are based on micro-level data and are aimed at looking for a causal effect of low-skilled immigrant share on selected indicators reflecting manufacturing firms' profitability and efficiency. The third and last paragraph, instead, is

devoted to the search for a causal link between the share of less-educated immigrants and patent applications at provincial level as a proxy for firms' innovation capability.

Before proceeding, it is worth specifying that in this chapter – as in most literature – the terms “low-skilled”, “less-educated”, and “low-qualified” are used as perfect synonyms. Likewise, the adjectives “high-skilled”, “highly educated”, and “highly qualified” can be intended as interchangeable.

3.1. A brief contextualization: the Italian immigration peculiarities

Compared to the United States, which boast an immigration history of almost two centuries, European states began to transform from emigration to immigration countries after 1945 – only 75 years ago. At the beginning, the inflows were mainly due to the return migration of European colonists and colonials officers who came back to their home country during decolonization; Great Britain, France, Belgium, and the Netherlands were the countries most affected by this phenomenon. Subsequently, by the end of the 1950s, Western European economies “began to meet part of their growing demand for labor by recruitment, often on the basis of bilateral agreements, in several Mediterranean countries: at first in Italy, Spain, Portugal, and Yugoslavia, and later in Morocco, Algeria, Tunisia, and Turkey” (Fassmann and Münz, 1992, p. 461). In addition to the aforementioned states, West Germany, Switzerland, Sweden, and Austria also experienced a sharp increase in their foreign resident population because of these labor migration flows.

But it was only in the mid-1970s and during the 1980s that most Southern European countries have finally become destination countries as well. This is particularly the case for Italy, and “to a lesser extent the same holds true for Spain, Portugal, and Greece” (Fassmann and Münz, 1992, p. 462). Actually, the economic boom of the 1950s-60s had already fostered the very first arrivals of foreigners in Italy; these inflows mainly involved people characterized by a high level of mobility who came from developing countries attracted by better living conditions. However, the Italian emigration rate⁷⁰ continued to exceed the immigration rate until the beginning of the 1970s, when net migration became positive for the very first time in 1973.

Table 3.1 illustrates the evolution of the foreign resident population in Italy, both in absolute terms and as a percentage share on total resident population. As can be seen, the number of foreign residents increased from about 47,000 in 1950 to 144,000 in 1970, and then started to rise until the mid-1990s, when it reached about 729,000 (1.28 per cent of the total population).

⁷⁰ Italian emigration can be considered one of the most massive in history. The emigration phenomenon started immediately after the Italian unification and lasted for over a century. “During the period 1861-1976 over 26 million people emigrated, half of them towards other European countries, the rest towards North and South America. Two fifths of all these emigrations originated from the regions of the South of Italy” (Del Boca and Venturini, 2003, p. 1).

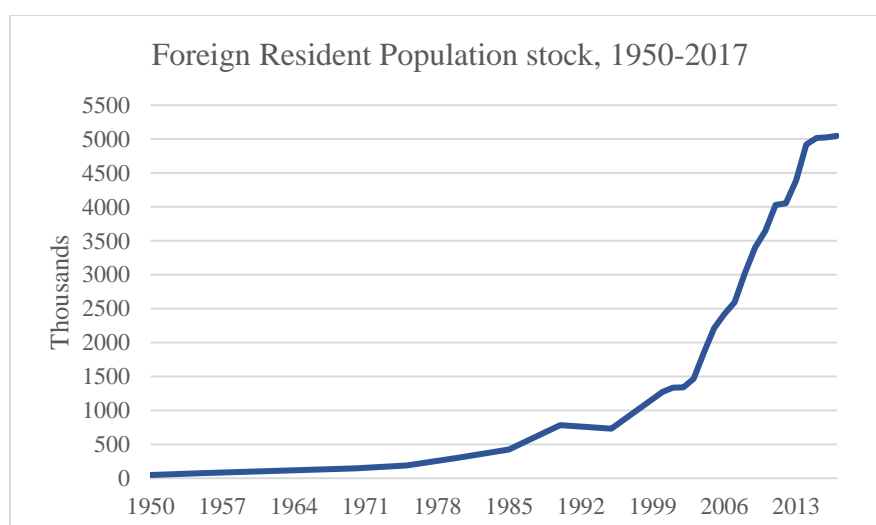
Table 3.1: Foreign Resident Population (FRP, in thousands) in Italy and its percentage share on the total population, 1950-2015.

Year	FRP (thous)	Share (%)
1950	47	0.10
1970	144	0.27
1975	186	0.34
1980	299	0.53
1985	423	0.75
1990	781	1.38
1995	729	1.28
2000	1,271	2.23
2005	2,210	3.82
2010	2,648	6.16
2015	5,014	8.25

Source: own elaboration, based on data reported on I.Stat warehouse, supplemented with information found in Fassmann and Münz (1992), Del Boca and Venturini (2003).

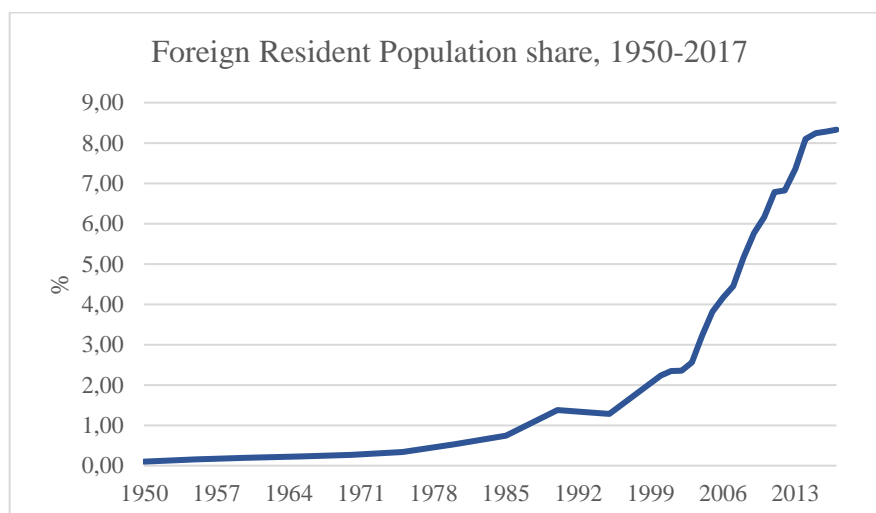
Figures 3.1 and 3.2 better highlight this trend in Italian immigration. Foreign population stock and share steadily increased until the beginning of the 2000s, when the immigrant phenomenon definitely took hold. In just over 15 years, non-native presence in Italy has almost quadrupled; indeed, the number of foreigners rose from 1,271,000 (2.23 per cent of the total population) in 2000 to about 5,047,000 (8.33 per cent of all Italian residents) in 2017.

Figure 3.1: Evolution of Foreign Resident Population stock in Italy from 1950 to 2017.



Source: own elaboration, based on an extended version of Table 3.1.

Figure 3.2: Evolution of Foreign Resident Population share in Italy from 1950 to 2017.



Source: own elaboration, based on an extended version of Table 3.1.

Generally, it should be noted that immigration to Italy has displayed quite peculiar characteristics. First of all, it has been a very rapid phenomenon, the scope of which grew quite exponentially. Second, due both to the absence of strong colonial links and to the lack of official recruitment channels, the foreign population turned out to be highly diversified in terms of countries of origin, more than in any other European state⁷¹. Moreover, the different communities show very heterogeneous migratory models, with reference to the distribution in the territory⁷², the composition by gender, the size of the families and often the work carried out by foreigners (ISTAT, 2018).

Another fundamental peculiarity of Italian immigration is that foreigners have proved to be an essential resource for the Italian economy. Just think that in 2016 immigrants accounted for 8.9 per cent of total Italian GDP and represented 9.4 per cent of total entrepreneurs⁷³ (Fondazione Leone Moressa, 2017). Moreover, in contrast to the rest of Europe, in Italy the employment rate of foreign population is higher than that of natives (59.5 per cent for foreigners compared with 57 per cent for nationals in 2016). However, the great majority of immigrants work in manual-intensive and low-qualified occupations (e.g. in construction, agriculture,

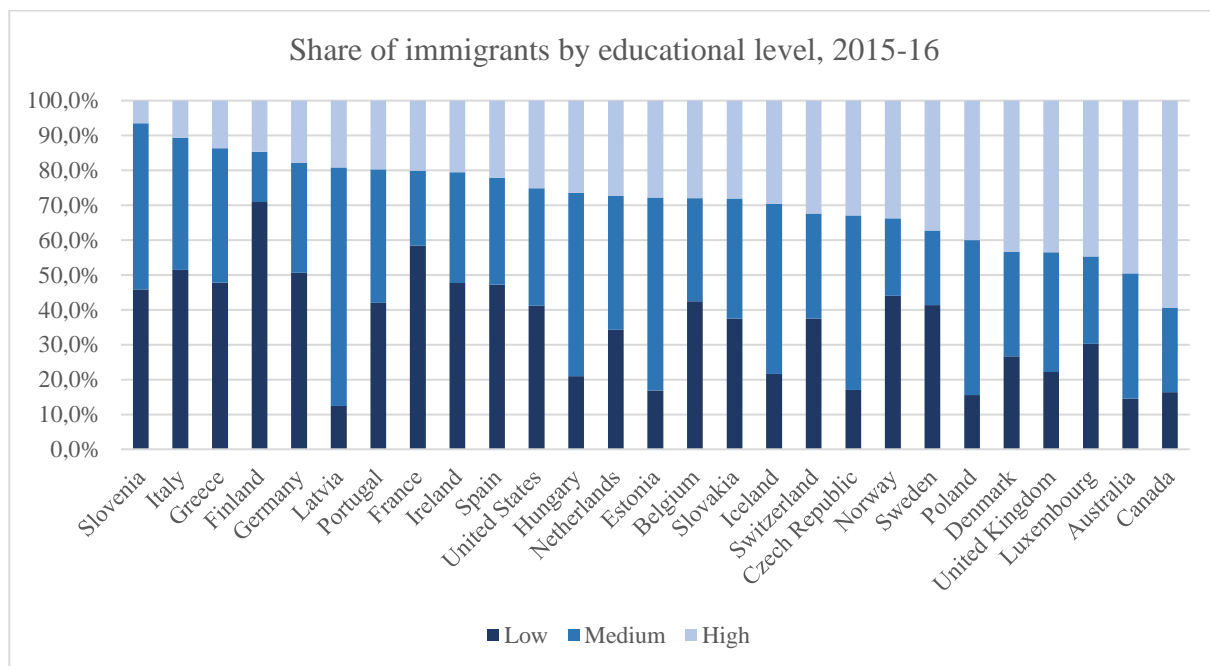
⁷¹ Currently, in Italy there are people of little less than 200 nationalities. In 2017, the first ten citizenships alone accounted for 63.7 per cent of the total foreign residents. The most widely represented community is Romanian, which on January 1st, 2017 represented 23.1 per cent of the total amount of foreigners, followed by Albanian (8.6 per cent), Moroccan (8.1 per cent), Chinese (5.7 per cent), and Ukrainian (4.6 per cent) (ISTAT, 2018).

⁷² Foreigners in Italy have mainly settled in the North and Center of the country, where they account for more than 10 per cent of total residents, and in large metropolitan cities. In the South, the foreigners' presence remains more contained even if it is gradually increasing in the last years (ISTAT, 2018).

⁷³ This percentage was 6.5 in 2008 and 7.4 in 2011. Furthermore, the net balance of businesses lead by foreigners is constantly growing, the opposite of what is happening to firms owned by nationals.

manufacturing, and personal-service sectors)⁷⁴. As pointed out by Del Boca and Venturini (2003), this is essentially due to two main factors. First, most of foreign residents in Italy are characterized by relatively low levels of education. As shown by Figure 3.3, among developed countries, Italy is one of those with the lowest share of highly educated immigrants⁷⁵. In 2015-16, low-medium skilled foreigners accounted for 89.4 per cent of total immigrants, compared to 79.9 per cent in France, 77.9 per cent in Spain, 67.6 per cent in Switzerland, and 56.5 per cent in the United Kingdom – just to mention a few.

Figure 3.3: Share of immigrants by educational level in Italy and in selected OECD countries, 2015-2016.



Source: own elaboration based on data available on the Database on Immigrants in OECD and non-OECD Countries (DIOC).

The second reason why immigrants in Italy are greatly employed as manual workers is that even highly qualified foreigners are willing to accept low-skilled and low-paid occupations, highlighting a substantial difficulty in finding a job on par with their education and training.

Therefore, in summary, Italy appears to be particularly attractive for immigrants coming from developing countries, which end up working in manual-intensive jobs. This is partly due to its favorable geographical position, which makes it a perfect destination for immigrants coming from North Africa and South-Eastern Europe, generally areas with a low level of

⁷⁴ In 2016, 37 per cent of foreigners were employed in low-skilled jobs compared to the 8 per cent of Italian workers, while these percentages were totally reversed when looking at technical, highly qualified occupations (Fondazione Leone Moressa, 2017).

⁷⁵ Strictly speaking, according to the International Standard Classification of Education (ISCED), highly educated means a person with a tertiary or post-tertiary education, medium educated stands for a person with an upper secondary education, while low educated is referred to a person with lower secondary education or less.

educational attainment. But this mostly happens because of the characteristics of the Italian productive structure; domestic firms are mainly specialized in traditional industries that are intensive in low-skilled labor. Moreover, the steady ageing process of Italian population⁷⁶ results in an increasing demand for personal care and household services that are predominantly accomplished by less-educated people (Brunello *et al.*, 2019, p.8).

After this brief, necessary contextualization, we can finally go deeper into understanding the effects of low-skilled immigrants on Italian manufacturing firms' performance and on general innovative activity.

3.2. Focus on profitability and efficiency of manufacturing firms

This paragraph illustrates the empirical analyses carried out in order to investigate the presence of an impact of low-skilled immigration on profitability and efficiency of Italian manufacturing firms over the period 2008-2017.

3.2.1. Data description and dataset construction

Data used to construct the final dataset, on which the empirical analyses have been performed, were collected from different free-access databases.

First of all, information on manufacturing firms were drawn from AIDA - Bureau Van Dijk, a firm-level database that allows for the search, consultation, analysis, and processing of economic, financial, and commercial information of Italian incorporated enterprises. This database contains not only companies' financial statements but also a variety of other information – including the juridical situation, the management and ownership composition, the group structure, M&A deals, company rating, and so on.

Data have been collected for manufacturing companies⁷⁷ that were active for the whole ten-year period considered and had a turnover of more than 500 thousand euros in at least one of the years under investigation. The resulting sample consists of 92,521 firms, which implies, in principle, a panel with 925,210 observations. However, the real dimension of the samples analyzed in this section is quite lesser than the theoretical one. This is due to two main issues: i) data contained some gaps, i.e. not all information required was available for each company for the entire period under analysis, and ii) some anomalies were discovered in the data – e.g. negatives values of sale – and so the correspondent observations were dropped. For each firm

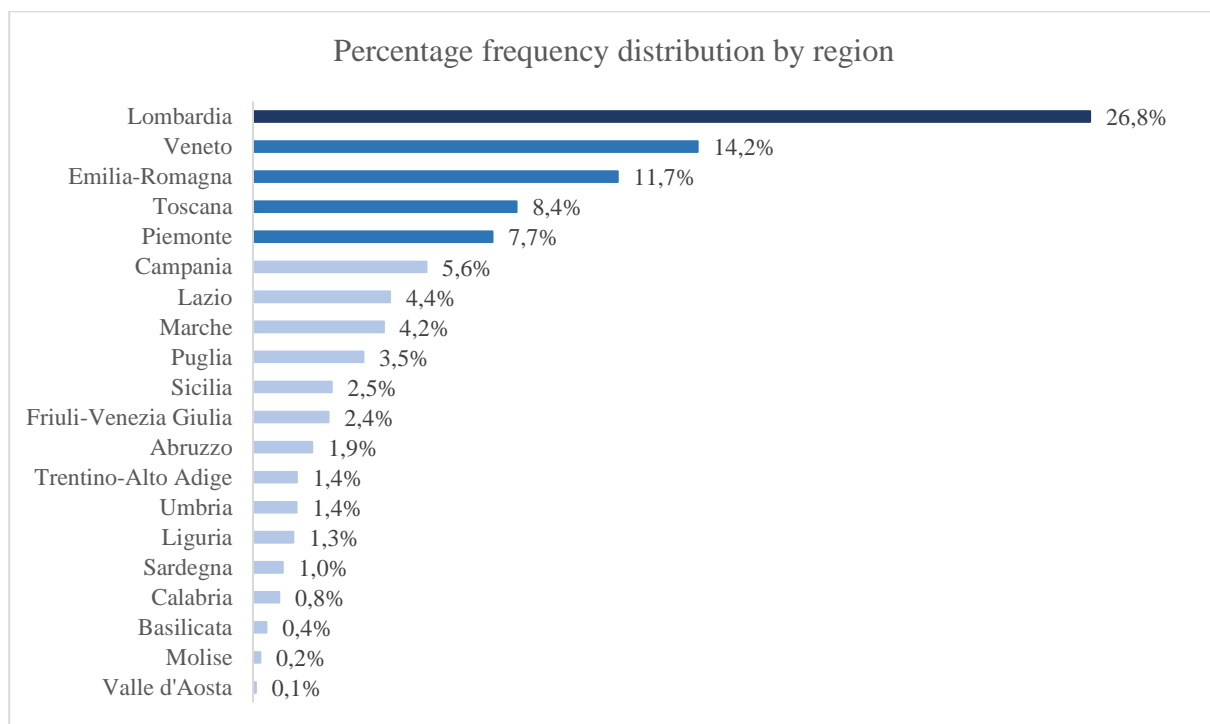
⁷⁶ According to ISTAT (2017), Italian residents aged 65 or more grew from 11.7 million in 2007 to 13.5 million in 2017, 20.1 percent and 22.3 percent of total population respectively.

⁷⁷ Manufacturing companies were identified according to the ATECO 2007 classification of economic activities, which is the Italian version of the European NACE Rev.2. In particular, the focus was on firms that fall within section C (manufacturing activities), which corresponds to divisions from 10 to 33.

in the sample, the following information was extracted from AIDA: i) company name, ii) business address⁷⁸, iii) year of incorporation, iv) legal form (i.e. type of business entity), v) number of companies belonging to the same corporate group, vi) ATECO code (i.e. industry identification), and vii) a set of financial statement figures⁷⁹.

Figure 3.4 illustrates the percentage frequency distribution by region of companies in the sample. As can be noted, more than a quarter of firms are located in Lombardia (24,804 out of 92,521 companies), while the first five most represented regions – i.e. Lombardia, Veneto, Emilia-Romagna, Toscana, and Piemonte – account for almost 70 per cent of all firms. This is in line with the well-known difference in the level of industrialization of Southern Italy, when compared to the North and Center of the country.

Figure 3.4: Percentage frequency distribution of firms in the sample by region.



Source: own elaboration, based on AIDA data.

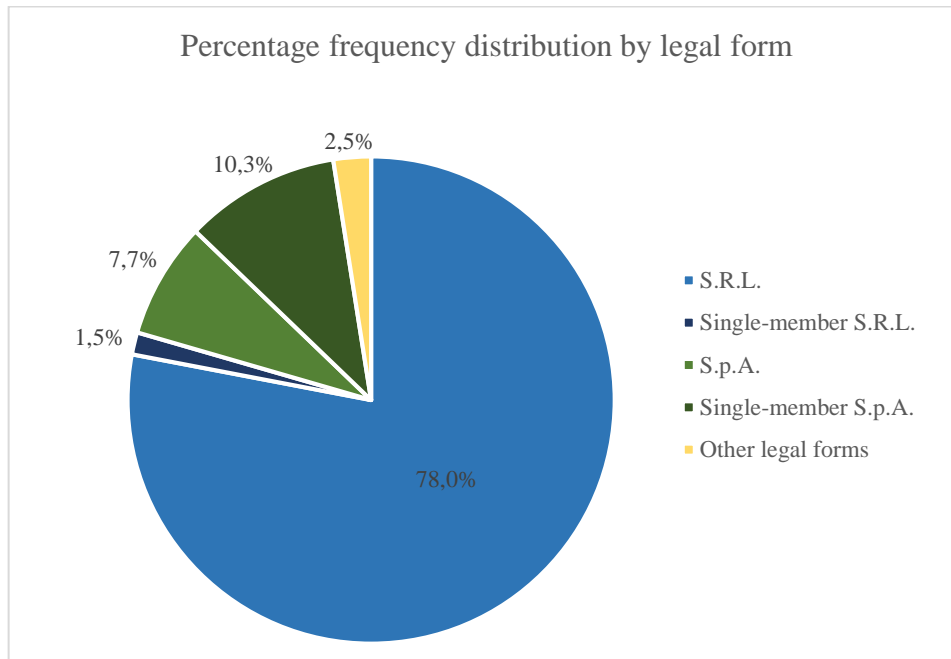
Figure 3.5, instead, shows the percentage frequency distribution by legal form of the 92,521 firms selected. The majority of them, almost 80 per cent, is a SRL (*Società a Responsabilità Limitata*). The remaining part is represented by SpAs (*Società per Azioni*) –

⁷⁸ The business address, also known as operating office, is the place where the real activities of the company, i.e. its day-to-day operations, are carried out. For the purpose of the analyses performed hereinafter, it has been deemed to be more relevant than the broadly used legal address. This is because the macroeconomic dimensions measured at local level, on which the empirical investigations are based, are presumed to have a direct influence on firms that really operate in that particular territory.

⁷⁹ These selected financial statement accounts will be detailed later on, when the computation of the variables of interest will be illustrated.

which account for 18 per cent of total companies – and other types of legal forms, including partnerships (*Società di Persone*), consortia, and cooperatives. In fact, according to the Italian National Institute of Statistics (ISTAT), beyond all different types of self-employment, the SRL is the most commonly chosen legal form among Italian firms. Moreover, this is coherent with the fact that in Italy there are many small-medium sized companies, which require a certain degree of flexibility in their structure.

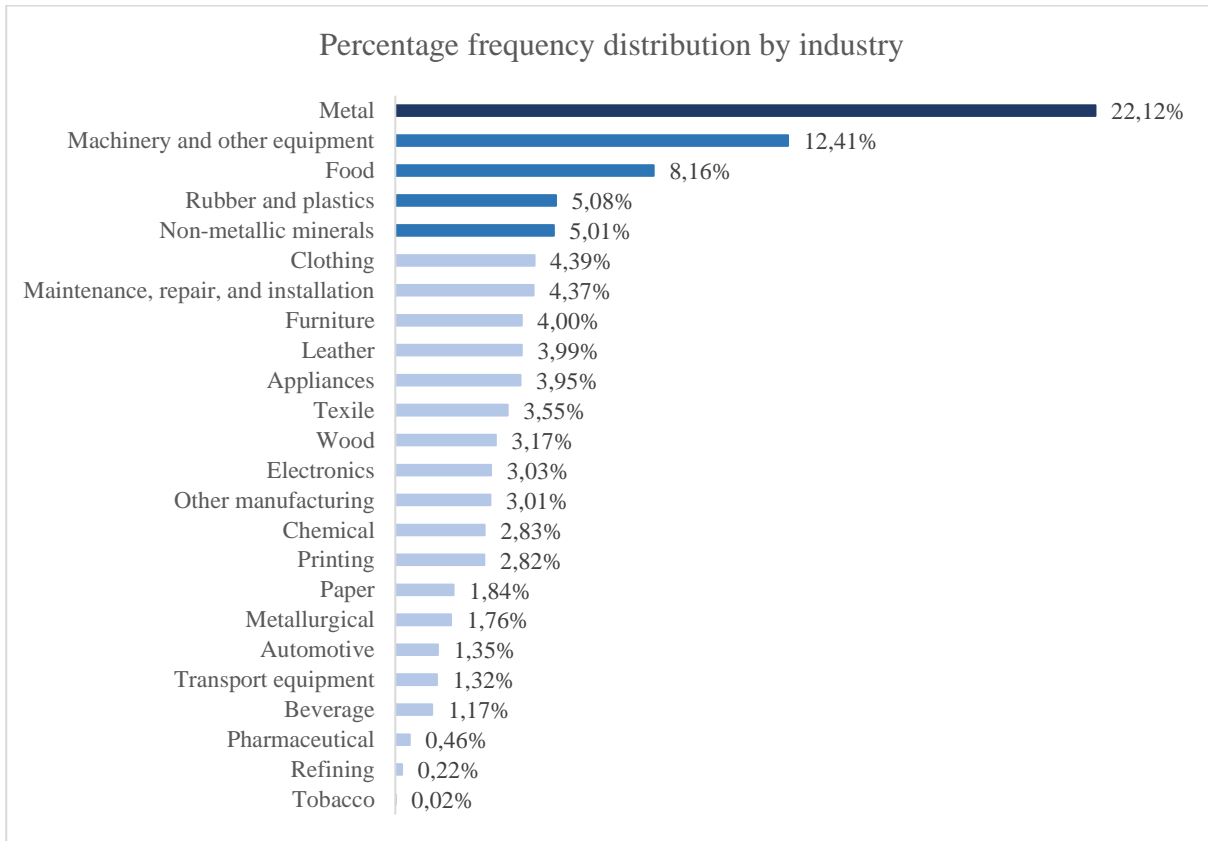
Figure 3.5: Percentage frequency distribution of firms in the sample by legal form.



Source: own elaboration, based on AIDA data.

Finally, Figure 3.6 depicts the percentage frequency distribution by industry of firms in the sample. It can be noted that more than one fifth of them (22.12 per cent) manufacture metal products. Following there are companies devoted to production of machineries and other equipment (12.41 per cent), food (8.16 per cent), rubber and plastic items (5.08 per cent), and non-metallic mineral products (8.01 per cent). These five industries alone gather more than half of the companies in the sample.

Figure 3.6: Percentage frequency distribution of firms in the sample by industry.



Source: own elaboration, based on AIDA data.

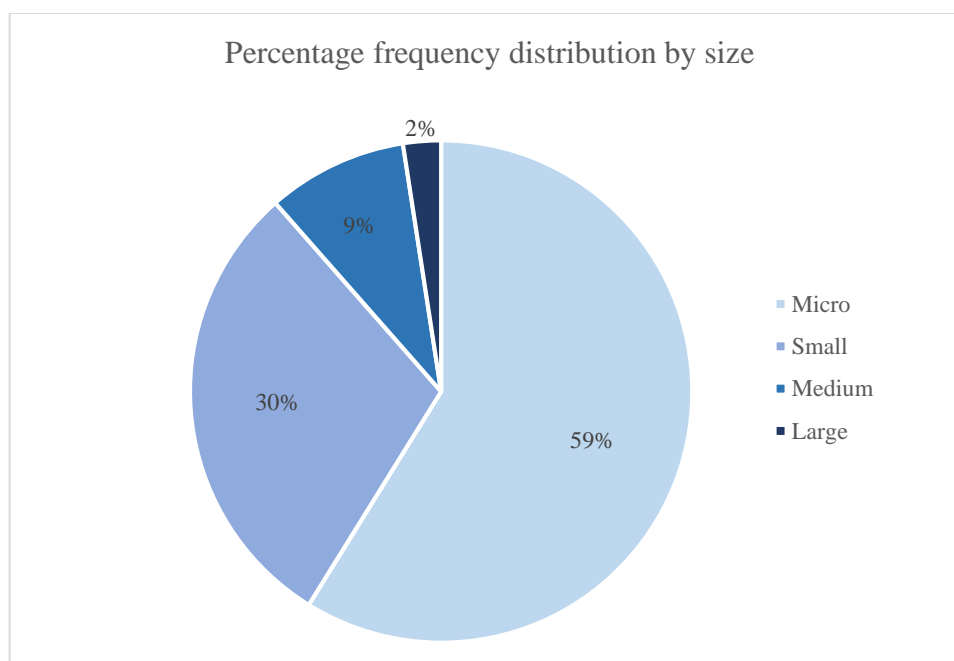
Before going on with the explanation of the dataset construction, it is worth pointing out why any kind of information linked to company's employment has been totally neglected in the analysis. The reason for this choice is that, in the last years, Italian firms – and particularly those belonging to the manufacturing sector – have made an extensive, if not massive, use of services offered by temporary employment agencies. Because of this behavior, reported values of employment underestimate the real number of people working for the firm, since those hired through temporary employment agencies do not figure among firm's employees. This implies also an underestimation of labor costs reported in the financial statements, since fees paid to temporary employment agencies fall within cost of services. Therefore, even though it would have been interesting to estimate the effect of immigration on firm's productivity (e.g. in terms of Value Added per employee), it was decided to disregard this aspect because productivity would have been overestimated in the available data.

The firm-level dataset obtained from AIDA database was subsequently combined with macroeconomic data pertaining to some dimensions that may affect a company's performance. These data has been aggregated at the local labor market (LLM) level. LLMs (also referred to as labor market areas, LMAs, or travel to work areas, TTWAs,) are clusters of municipalities whose borders are defined according to commuting patterns, i.e. using the flows of daily home-

to-work movements. Therefore, LLMs can be understood as areas where people both reside and work and where establishments can find the most of their required labor force. What is interesting is that LLMs are totally independent by the configuration of larger administrative divisions (e.g. provinces or regions). For this reason, LLMs are deemed the most appropriate territorial unit on the basis of which to aggregate local measures of interest.

In order to create a unique dataset made of both firm-level and local-level dimensions, the business address was used to assign to each company in the sample its pertaining LLM⁸⁰. Unfortunately, this assignment procedure is inevitably liable to errors; the main issue is linked to the fact that medium-large firms are likely to be multi-plant companies – i.e. may have more than just one plant –, and establishments belonging to the same enterprise may be located in different LLMs. However, this error is assumed to be mitigated by the fact that, as shown in Figure 3.7, the vast majority of firms in the sample are micro and small enterprises (89 per cent of the total), while only 2 per cent of them can be classified as large ones⁸¹.

Figure 3.7: Percentage frequency distribution of firms in the sample by size.



Source: own elaboration, based on AIDA data.

⁸⁰ According to the 2001 definition provided by ISTAT, local labor markets considered in this paper are 686.

⁸¹ The criteria used to classify companies by size are those suggested by the European Community in the Recommendation 2003/361/EC. In particular, companies with an annual turnover i) not exceeding 2 million euros are defined as microenterprises; ii) higher than 2 million but not exceeding 10 million euros are classified as small enterprises, iii) higher than 10 million but not exceeding 50 million euros are considered as medium enterprises, and iv) higher than 50 million euros are treated as large enterprises.

In the empirical specifications illustrated in the following subparagraph, all macroeconomic dimensions, aggregated at the LLM level, will represent the explanatory variables, while firm-level indicators, based on companies' financial statement figures, will be treated as responding variables. Hereinafter, it will be detailed extensively how each of these variables, both input and output ones, have been computed for the purpose of the subsequent analyses.

EBITA Margin

Companies' *EBITA margin* was used as outcome variable in the analysis of the impact of immigration on firms' *operating profitability*. EBITA margin has been chosen instead of the absolute value of EBITA, since it allows for a comparison of one company's profitability to others in the same industry, irrespective of their sizes. Data to compute this measure can be easily found on a company's financial statement and were all collected from AIDA database. This operating ratio has been calculated by the following expression:

$$EBITAmargin_{it} = \frac{EBITDA_{it} - Depreciation_{it}}{Revenues_{it}} \times 100 \quad (1)$$

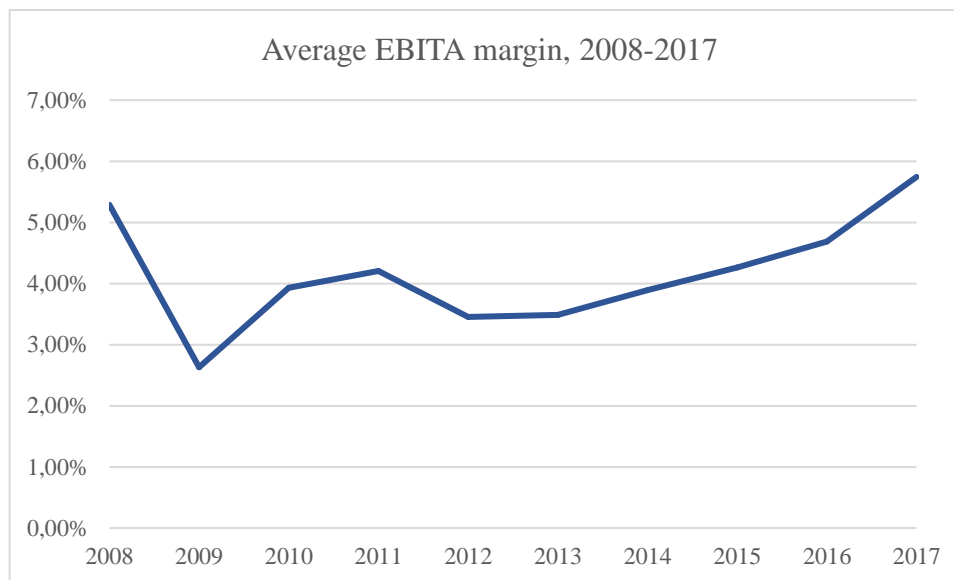
where companies are indexed by i and years by t . $EBITDA_{it}$ are earnings before interests, taxes, depreciation, and amortization (EBITDA) of company i at the end of year t , $Depreciation_{it}$ is the annual depreciation of company i at the end of year t , and $Revenues_{it}$ are sales revenue of company i at the end of year t . The EBITA margin reveals how many operating profits a company is able of generate in proportion to its sales. The higher the margin, the higher the firm's operating profitability. Moreover, this margin can also be interpreted as a measure of a company's cost-cutting efforts effectiveness. The higher a company's EBITA margin is, the lower its operating expenses are in relation to total revenues.

It is worth explaining why, in this context, earnings before interests, taxes, and amortization (EBITA) has been preferred to the more widely used EBITDA measure. Companies that operate in the manufacturing sector, like those included in the sample, generally require significant investments in fixed assets. Therefore, using EBITDA to evaluate these companies may distort the real firm's profitability by ignoring the considerable depreciation of those assets. This is the reason why the EBITA dimension has been deemed a more appropriate measure of operating profitability.

Figure 3.8 illustrates the evolution of the average EBITA margin, among all firms in the sample, between 2008 and 2017. As can be seen, companies' profitability exhibited a sharp decrease in 2009, from 5.29 to 2.63 per cent. This is allegedly linked to the fact that, precisely in 2009, the world economy was definitely affected by the consequences of the financial crisis,

which previously arose in the United States and intensified at the end of 2008. After a partial recovery, there was a second, minor decrease in 2012 – another very negative year for the Italian economy. After 2013, the average EBITA margin started to increase quite constantly until 2016, and then more rapidly in 2017 when it reached a value of 5.74 per cent.

Figure 3.8: Evolution of average EBITA margin from 2008 to 2017.



Source: own elaboration, based on AIDA data.

Asset Turnover Ratio

Companies' *asset turnover ratio* was instead exploited as outcome variable in the analysis of the impact of immigration on firms' *efficiency*. Also this ratio was obtained using companies' financial statement data drawn from AIDA database. In particular, it has been computed as follows:

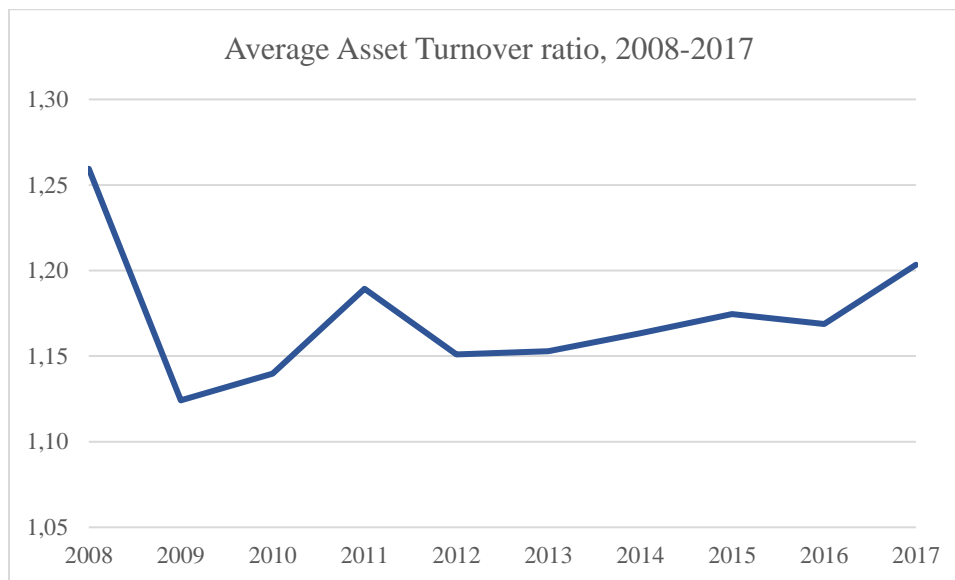
$$AssetTurnover_{it} = \frac{Revenues_{it}}{TotAssets_{it}} \quad (2)$$

where companies are indexed by i and years by t . $Revenues_{it}$ are sales revenue of company i at the end of year t and $TotAssets_{it}$ are total assets of company i at the end of year t ⁸². The asset turnover ratio represents how many revenues the company is generating from each euro invested in its assets. The higher the ratio, the better the firm is performing in terms of *efficiency*.

⁸² To be exact, since this ratio compares a flow measure (sales revenue) with a stock one (total assets), it would be more precise to use at the denominator the average between total assets at the beginning and at the end of the year. However, computing the average values would have provoked the loss of an entire year of observations, and, since there were already several gaps in the data, it was preferred to avoid this additional loss of information.

Figure 3.9 shows the evolution of the companies' average asset turnover ratio between 2008 and 2017. As can be noted, the displayed pattern is quite similar to that of EBITA margin. The major decrease in the ratio occurred in 2009, when it dropped from 1.26 to 1.12. However, unlike EBITA margin, which reached in 2017 a higher value than in 2008, the average asset turnover ratio in 2017 (1.20) remained lower than in 2008 (1.26).

Figure 3.9: Evolution of average Asset Turnover ratio from 2008 to 2017.



Source: own elaboration, based on AIDA data.

Low-skilled immigrant percentage share

Theoretically, to conduct a precise analysis on the effects of low-skilled immigration on firms' performance, it would be necessary to have information about the proportion of less-educated foreigners employed by companies. However, since this detailed information was not available, another dimension, which could have been significant for the purpose of the analysis, had to be identified. Taking advantage of the fact that immigrants are more geographically concentrated than natives are, and hence that firms have a different degree of exposure to immigrants depending on where they are located, foreigners' presence in the territory has been considered a good proxy in this context.

Therefore, in both the empirical specifications used to investigate the effects of immigration on firms' profitability and efficiency, the *low-skilled immigrant percentage share* has been used as key explanatory variable. It has been defined as follows:

$$LSImmShare_{jt} = \frac{LSImmigrants_{jt}}{Residents_{jt}} \times 100 \quad (3)$$

where local labor markets are indexed by j and years by t . $LSImmigrants_{jt}$ is the number of low-skilled immigrant residents in LLM j at the beginning of year t , while $Residents_{jt}$ is the number of total residents in LLM j at the beginning of year t . These two dimensions are both drawn from I.Stat, the warehouse that collects the statistics produced by ISTAT.

In particular, the stock of national residents by LLM – the denominator in Eq. (3) – has been computed on the basis of two main statistics: i) *Resident population by municipality on January 1st* for the years from 2012 to 2017, and ii) *Inter censuses estimated resident population by municipality on January 1st* for the years from 2004⁸³ to 2011. Data has been collected both for total population and for males and females separately, in the event of a prospective robustness analysis.

With regard to the administrative subdivision on the Italian territory, it is important to specify that in the period considered – i.e. between 2004 and 2017 – both the municipality and the province configuration has changed. The variations occurred over time, in particular at the municipal level, concerned mainly merges, spin-offs, or name changes of existing territorial units⁸⁴. Only in order to simplify the process of aggregation of data at the LLM level, the administrative subdivision in 110 provinces and 7,998 municipalities⁸⁵ was considered.

Due to the aforementioned changes, before being manipulated, the data extracted from I.Stat have been made uniform across the different time periods. LLMs have been subsequently assigned to each municipality according to the 2001 definition available on ISTAT website, and figures have been finally aggregated at the LLM level in order to compute, for all LLMs in each period, the number of total residents on January 1st.

The stock of low-skilled immigrant residents by LLM – the numerator in Eq. (3) – has been also derived from I.Stat, using the statistic *Resident foreigners by Citizenship*⁸⁶ and *municipality on January 1st* for the whole period from 2004 to 2017. Data has been collected both for total foreigners and for males and females separately, in the perspective of a subsequent robustness analysis.

Unfortunately, data provided by ISTAT do not include any information about foreigners' educational attainment. To overcome this issue, in order to take into consideration

⁸³ Data were collected also for years from 2004 to 2007 since they were needed for the analysis of the impact of immigration on innovation propensity, which will be presented in the third paragraph of this chapter.

⁸⁴ In general, there has been a diminishing trend in the number of municipalities – which varied from 8,100 in 2004 to 7,978 in 2017 –, while the number of provinces first increased – from 103 in 2004 to 110 in 2009 – and then decreased again in 2016 – reaching the current number of 107.

⁸⁵ This corresponds to the administrative municipal subdivision in force in 2016.

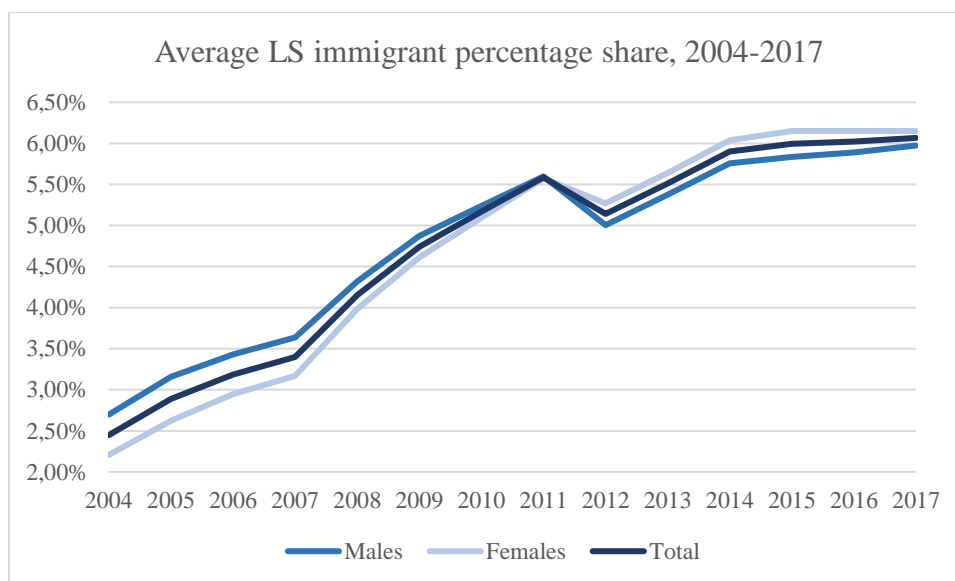
⁸⁶ For ISTAT, *citizenship* is the decisive criterion for distinguishing residents between “locals” and immigrants. However, other national statistical institutes and organizations often adopt different criteria, like for instance country of birth.

only low-skilled immigrants, foreigners coming from *developed countries*⁸⁷ are assumed to be high skilled and are therefore excluded from the collected data to compute the number of low-skilled foreign residents by municipality.

Subsequently, these data have undergone the same manipulation and aggregation process carried out on the stock of total residents, in order to obtain, for all LLMs in each period, the number of low-skilled foreign residents on January 1st.

Figure 3.10 shows the evolution of the average low-skilled immigrant percentage share among local labor markets, as computed by Eq. (3), between 2004 and 2017. The graph details also the average shares by gender. First of all, it should be noted the strong average increase in the share of low-skilled foreigners, in particular from 2004 to 2011. The average share grew from 2.45 per cent in 2004 to 5.59 per cent in 2011 and then to 6.07 per cent in 2017. Moreover, it is interesting to point out that the average share computed for males lied above the average total share, while the average share of females lied below the average, until 2011, when things reversed. However, the gap between the share of males and that of females has narrowed significantly – from 0.49 per cent in 2004 to 0.18 per cent in 2017.

Figure 3.10: Evolution of average low-skilled immigrant percentage share from 2004 to 2017.



Source: own elaboration, based on I.Stat data.

⁸⁷ Developed countries refer to member countries of the Organization for Economic Co-operation and Development (OECD) in 2017, except for Mexico, Turkey, and Chile, which were still considered emerging countries by the World Bank.

Table 3.2 shows some summary statistics for the low-skilled immigrant share by local labor market, both globally and separately by gender⁸⁸. The average value of overall low-skilled immigrant share is 5.43 per cent, ranging from a minimum of 0.09 to a maximum of 16.61 per cent. Average low-skilled immigrant share for males (5.39 per cent) is below the overall mean, whereas the average for females (5.47 per cent) is above. For the purpose of the analyses on manufacturing firms, data on the explanatory variable, i.e. the low-skilled immigrant share, consists of panel information about each LLM for the whole 10-year period. Therefore, the overall variation can be split in the *between variation*, which stands for variation among LLMs regardless of the time dimension, and the *within variation*, which refers to variation for a single LLM across time. By looking at these variations, it can be observed that, in general, the low-skilled immigrant share exhibits a much higher variation among LLMs than across time. This is in line with the fact that, immigrants are not equally distributed in the Italian territory, but prefer to locate in the Northern and Center of the country.

Table 3.2: Low-skilled Immigrant share by LLM from 2008 to 2017, summary statistics.

	Overall	Male	Female
	LSImmShare	LSImmShare	LSImmShare
	(%)	(%)	(%)
Overall Mean	5.43	5.39	5.47
Minimum	0.09	0.04	0.04
Maximum	16.61	18.10	16.51
Median	4.67	4.61	4.74
5th percentile	1.00	0.80	1.12
95th percentile	11.86	12.38	11.60
Overall Standard Deviation	3.60	3.76	3.49
Between Standard Deviation	3.52	3.68	3.39
Within Standard Deviation	0.76	0.77	0.83

Source: own elaboration, based on I.Stat data.

⁸⁸ Summary statistics are computed for the years from 2008 to 2017, the 10-year time period considered in the analyses on manufacturing firms' performance.

Gross Domestic Product

In addition to the explanatory variable of interest, some *local confounders* has been added to the empirical models specified in the subsequent subparagraph. It is important to control for these additional variables because, beyond the low-skilled immigrant share, there exist many other LLM-level factors that may have an impact on a company's performance.

The first local confounder taken into account is the *Gross Domestic Product (GDP)*. Data on this measure for the years from 2004 to 2017 have been drawn from the online database provided by the European Statistical Office (EUROSTAT), in particular from the statistic *Gross domestic product (GDP) at current market prices by NUTS 3 regions*. Since data were only available at the provincial level, they had to be reorganized in order to identify the GDP by LLM. The adopted two-step rearrangement procedure can be illustrated by the following equation:

$$GDP_{jt} = \sum_{m(j)t} \left(GDP_{p(m)t} \times \frac{Residents_{j(m)t}}{Residents_{p(m)t}} \right)_{m(j)t} \times \frac{Residents_{m(j)t}}{Residents_{jt}} \quad (4)$$

where municipalities are indexed by m , provinces by p , local labor markets by j , and years by t . The first step consists in the calculation in brackets, where $GDP_{p(m)t}$ is GDP of province p – to which municipality m belongs – in year t , $Residents_{j(m)t}$ is the number of total residents in LLM j – to which municipality m belongs – at the beginning of year t , and $Residents_{p(m)t}$ is the number of total residents in province p – to which municipality m belongs – at the beginning of year t ⁸⁹. The second step consist in the summation, for each municipality m – belonging to LLM j – and year t , of previously computed values weighted by the share of residents in municipality m – belonging to LLM j – at the beginning of year t , $Residents_{m(j)t}$, out of total residents in LLM j at the beginning of year t , $Residents_{jt}$. After performing all the steps for each period from 2008 to 2017, the outcome of Eq. (4) is the GDP in LLM j in year t , GDP_{jt} , the first control variable that was needed.

Adding local GDP in the empirical model specifications allows controlling for *local productivity*, and it is expected to show a positive correlation with the firms' performance indicators under consideration.

Table 3.3 displays some summary statistics for GDP by local labor market. The average value is 2,392 million euros, ranging from a minimum of 65 to a maximum of 164,767. Since also data on control variables is shaped like a panel dataset, the overall variation can be better

⁸⁹ The stock of total residents by province has been computed from data at the municipal level, assigning to each municipality the province it belongs to and then aggregating the number of residents by province.

understood by looking at the *between* and *within* variations. As can be noted, GDP varies much more among LLMs than for a single local labor market over time. Hence, it can be said that gross domestic product strictly depends on the peculiarities of each LLM.

Table 3.3: Gross Domestic Product by LLM from 2008 to 2017, summary statistics.

	GDP (mln)
Overall Mean	2,392
Minimum	65
Maximum	164,767
Median	744
5th percentile	141
95th percentile	7,371
Overall Standard Deviation	8,728
Between Standard Deviation	8,726
Within Standard Deviation	367

Source: own elaboration, based on EUROSTAT data.

Unemployment rate

The second local confounder, which has been added to the empirical specifications, is *unemployment rate*. Data on this measure for the years from 2004 to 2017 have been collected from I.Stat, using the statistic *Unemployment rate at provincial level*⁹⁰. Also these data were only available by province and had therefore to be adjusted in order to ascribe them to LLMs. The imputation procedure can be summarized by the following equation:

$$UR_{jt} = \sum_{m(j)t} UR_{p(m)t} \times \frac{Residents_{m(j)t}}{Residents_{jt}} \quad (5)$$

where municipalities are indexed by m , provinces by p , local labor markets by j , and years by t . The unemployment rate of LLM j in year t , UR_{jt} , is computed by summing up, for each municipality m – belonging to LLM j – and year t , the unemployment rate of province p – to which municipality m belongs – in year t , $UR_{p(m)t}$, multiplied by the share of residents in

⁹⁰ Data were kept also for males and females separately in the event of a prospective robustness analysis.

municipality m – belonging to LLM j – at the beginning of year t , $Residents_{m(j)t}$, out of total residents in LLM j at the beginning of year t , $Residents_{jt}$.

This second control variable, local unemployment rate, has been computed to all years from 2008 to 2017 in order to be included in the regressions to control for *local employment opportunities*. Naturally, it is expected to exert a negative impact on firms' performance.

Table 3.4 shows some summary statistics for unemployment rate by local labor market, both globally and separately by gender. The average value of global unemployment rate is 11.62 per cent, ranging from a minimum of 1.87 to a maximum of 31.46 per cent. Average male unemployment rate (10.43 per cent) is below the overall mean, whereas average female unemployment rate (13.42 per cent) is above. Moreover, it can be highlighted that, in general, unemployment rate displays a higher variation among LLMs than across time. This is in line with the fact that, as is well known, its value differs a lot between the North and South of Italy.

Table 3.4: Unemployment rate by LLM from 2008 to 2017, summary statistics.

	Overall UR (%)	Male UR (%)	Female UR (%)
Overall Mean	11.62	10.43	13.42
Minimum	1.87	1.47	1.87
Maximum	31.46	32.64	38.17
Median	10.45	9.11	12.15
5th percentile	3.99	3.08	4.82
95th percentile	22.82	21.55	25.44
Overall Standard Deviation	5.94	5.85	6.54
Between Standard Deviation	5.18	4.99	5.80
Within Standard Deviation	2.91	3.06	3.03

Source: own elaboration, based on I.Stat data.

Industrial intensity ratio

The third and last control variable is what has been called *industrial intensity ratio*. It has been defined as follows:

$$IndInt_{jt} = \frac{MLocUnits_{jt}}{Residents_{jt}} \times 1000 \quad (6)$$

where local labor markets are indexed by j and years by t . $MLocUnits_{jt}$ is the number of manufacturing local units in LLM j in year t , while $Residents_{jt}$ is, as usual, the number of total residents in LLM j at the beginning of year t .

To compute this measure, data on the number of manufacturing local units⁹¹ – the numerator in Eq. (6) – were gathered from: i) the statistic *Local units and persons employed by municipalities*, available on I.Stat, for the years from 2012 to 2017, and ii) the tables produced by the Statistical register of Local Units (ASIA - LU) and published on ISTAT website, for the years from 2004 to 2011. Data from this second source were already provided by LLM, while data from I.Stat, which was at the municipal level, have been manipulated to deal with changes in municipalities and then aggregated at the LLM level.

This last control, $IndInt_{jt}$, can be intended as the number of manufacturing local units per 1,000 inhabitants in LLM j at time t , and represents a measure of the *intensity of competitiveness* among manufacturing firms in that particular local labor market. Therefore, it is expected to have a negative influence on company performance measures.

Table 3.5: Industrial Intensity ratio by LLM from 2008 to 2017, summary statistics.

	IndInt (%)
Overall Mean	7.80
Minimum	2.22
Maximum	37.89
Median	6.85
5th percentile	3.77
95th percentile	14.68
Overall Standard Deviation	3.79
Between Standard Deviation	3.74
Within Standard Deviation	0.65

Source: own elaboration, based on I.Stat data.

⁹¹ Manufacturing local units are intended as local units of firms that fall within section C in the ATECO 2007 classification of economic activities.

Table 3.5 illustrates some summary statistics for this industrial intensity ratio by local labor market. The average value of this ratio is 7.80 per 1,000 inhabitants, ranging from a minimum of 2.22 to a maximum of 37.89. Moreover, it can be seen that almost all variation in industrial intensity is between variation, implying that this ratio varies very little over the time period considered.

All variables presented so far have been combined to obtain a unique panel dataset on the basis of which the empirical analyses has been carried out. Tables 3.6 and 3.7 display the summary statistics for all the variables in the panel dataset.

In particular, Table 3.6 shows the summary statistics of both the outcome variables, before and after discarding extreme values. By looking at their minimum and maximum values – as well as at the 5th and 95th percentiles – before discarding, it is very clear that some observations were totally out of scale. Since this might have been due to some anomalies in the collected data, the very extreme values – i.e. below the 1st and above the 99th percentile – have been discarded before running the empirical regressions⁹².

By examining the statistics computed on the outcome variables after discarding extreme values, it can be noted that both of them present mean and median values that are quite close to each other, implying that their distributions are rather symmetrical. The EBITA margin variable has an average of 5.31 per cent and displays both negative and positive values – in particular, approximately 12 per cent of observations are below zero⁹³. The asset turnover ratio exhibits an average of 1.14, with a minimum of zero and a maximum of 3.42. With regard to their variation, both variables exhibit a higher between than within variation; this is consistent with the fact that these financial ratios are strictly related to companies' features – like, for instance, the industry they belong to.

⁹² Considering that AIDA database proved to be not free from reporting errors, it was preferred to potentially lose some information about few companies performing extremely good or bad than to include flawed observations in the analysis.

⁹³ This means that firm's operating profit (EBITA) was not always positive along the period considered; this might have happened because either sales revenues were not enough to cover the operating expenses or the company was not sufficiently cost-effective.

Table 3.6: Outcome Variables in the sample from 2008 to 2017, summary statistics before and after discarding extreme values.

	EBITA margin (%)	Asset Turnover	EBITA margin (%)	Asset Turnover
	Before discarding		After discarding	
Overall Mean	4.10	1.17	5.31	1.14
Minimum	-997.63	0	-48.21	0
Maximum	100.00	1,345.73	37.34	3.42
Median	4.70	1.07	4.70	1.08
5th percentile	-8.25	0.27	-6.32	0.31
95th percentile	20.67	2.28	19.22	2.19
Overall Std. Dev.	25.85	2.35	8.37	0.58
Between Std. Dev.	17.86	2.28	6.56	0.53
Within Std. Dev.	21.22	1.83	5.94	0.29
Observations	715,698	724,136	701,384	709,652
Firms in the sample	92,421	92,435	92,139	92,061
Variable type	Outcome ₁	Outcome ₂	Outcome ₁	Outcome ₂

Source: own elaboration.

Table 3.7 illustrates the summary statistics of the explanatory variables. What can be pointed out, among other things, is that all variables but one display a quite symmetrical distribution. Only gross domestic product exhibits average and median values that are definitely different from each other; in particular, its distribution appears to be right-skewed since the mean is above the median. This is mainly due to the influence of some outliers that present very large values. In order to scale down the variance and reduce the effect of these observations, the *natural-logged* GDP, instead of GDP expressed in millions, has been entered into the regression models. This will also make the observations values more comparable to each other.

Table 3.7: Explanatory Variables in the sample from 2008 to 2017, summary statistics.

	LSImmShare	GDP	UR	IndInt
	(%)	(mln)	(%)	(‰)
Overall Mean	8.55	24,007	8.47	9.95
Minimum	0.09	83	1.87	2.22
Maximum	16.61	164,767	31.46	37.89
Median	9.06	6,464	7.41	9.35
5th percentile	2.01	761	3.71	4.26
95th percentile	13.49	146,939	18.53	17.02
Overall Std. Dev.	3.40	42,892	4.44	4.41
Between Std. Dev.	3.27	42,835	3.88	4.34
Within Std. Dev.	0.93	2,222	2.15	0.77
Observations	925,210	925,210	925,210	925,210
LLMs in the sample	671	671	671	671
Variable type	Key Regressor	Control	Control	Control

Source: own elaboration.

Speaking of the panel dimensions, it can be observed that only 671 LLMs out of 686 are represented in the sample; this means that there were no companies, which met the requirements, located in the 15 missing LLMs. Moreover, considering that some data were missing and that, for the reasons previously explained, some observations have been canceled out, the EBITA margin has been computed (at least for one time period) for 92,139 firms out of the 92,521 that were at first identified from AIDA database, while the asset turnover ratio has been calculated only for 92,061 firms. Therefore, the analysis of immigration effects on firms' profitability has been carried out over 701,384 observations and the analysis on firms' efficiency has been executed over 709,652 observations.

3.2.2. Estimation strategy: econometric model specifications

The sample illustrated so far is therefore structured as a panel dataset, where manufacturing firms represent the *cross-sectional* dimension and years from 2008 to 2017 denote the *time series* dimension. Unfortunately, since not all firm-level information was available for each company in every period, this panel is quite *unbalanced*. Nevertheless, this

was not a big problem, as omitted observations could be assumed to be missing *at random*⁹⁴; in this case, most statistical software automatically makes the appropriate adjustments for unbalanced panel data without causing inconsistency of the estimators used.

The general empirical model used in the analyses of immigration effects on firms' performance is represented by the following equation:

$$y_{i(j)t} = \boldsymbol{\beta}\mathbf{X}_{j(i)t} + \alpha_{i(j)} + \delta_t + u_{i(j)t} \quad (7)$$

with $i = 1, \dots, N, j = 1, \dots, n, \text{ and } t = 1, \dots, T$

where firms are indexed by i , local labor markets where i is located by j , and years by t . $y_{i(j)t}$ is the dependent variable referred to firm i – located in LLM j – at time t , $\boldsymbol{\beta}$ is the $K \times 1$ vector of parameters for the K explanatory variables, $\mathbf{X}_{j(i)t}$ is the $1 \times K$ vector of local-level explanatory variables computed for LLM j – where firm i is located – at time t , $\alpha_{i(j)}$ are individual-specific effects, δ_t are time-specific effects, $u_{i(j)t}$ are the idiosyncratic errors.

That in Eq. (7) is a so-called *unobserved effects model (UEM)*. Its basic assumption is the existence of *unobserved heterogeneity* across firms in the sample, i.e. omitted firm-specific variables that do not change over time and that affect the outcome variable⁹⁵. $\alpha_{i(j)}$ in Eq. (7) identifies these peculiar time-invariant characteristics of each firm, which can be interpreted as the leftover variation in the dependent variable that cannot be explained by the explanatory variables.

In addition, time-specific effects are added to the model since it is presumed that unexpected variation, or year-by-year shocks, may also have an influence on the outcome variable⁹⁶. δ_t in Eq. (7) captures these unobservable variables that change over time but are common to all firms, e.g. disregarded changes in macroeconomic conditions. In practice, time fixed effects are taken into account through $T - 1$ time dummy variables and an intercept, so Eq. (7) becomes:

$$y_{i(j)t} = \alpha + \boldsymbol{\beta}\mathbf{X}_{j(i)t} + \delta_2 T_2 + \dots + \delta_T T_T + \alpha_{i(j)} + u_{i(j)t} \quad (8)$$

with $i = 1, \dots, N, j = 1, \dots, n, \text{ and } t = 1, \dots, T$

where α is the intercept which reflects the effects of year 1, the base year, $\delta_2, \dots, \delta_T$ are the coefficients of the $T - 1$ time binary regressors, and T_2, \dots, T_T are the $T - 1$ time dummies.

⁹⁴ Observations are *randomly missing* when the reason for the information loss is not correlated with the idiosyncratic errors.

⁹⁵ This assumption has been confirmed by running the *Breusch and Pagan Lagrangian multiplier test* on the panel dataset. The null hypothesis of zero variance across firms has been rejected, and therefore the use of an unobserved effects model can be claimed to be the most appropriate in this context.

⁹⁶ The need to add time fixed effects has been confirmed by running a *Wald test* on time dummies coefficients.

By combining both firm and time fixed effects, the empirical model illustrated by Eqs. (7) and (8) allows to eliminate bias from factors that differ across entities but are constant over time and simultaneously control for unobservables that change over time but are constant over entities.

In order to choose the best estimation strategy for model in Eqs. (7) and (8), it was fundamental to identify a *consistent* and *efficient* estimator⁹⁷. In this respect, it was firstly necessary to clarify whether the individual-specific effects $\alpha_{i(j)}$ were correlated with the regressors or not. In this context, the unobserved effect $\alpha_{i(j)}$ has been allowed to be correlated with the explanatory variables and this means that the *fixed-effects assumption* has been deemed to hold. The assumption of uncorrelation between the individual effects and the explanatory variables, instead, is referred to as *random-effects assumption*. To confirm that the fixed-effects assumption was valid, that is for each regressor (regressors are indexed by k):

$$\text{Cov}(x_{j(i)tk}, \alpha_{i(j)}) \neq 0$$

with $i = 1, \dots, N, j = 1, \dots, n, t = 1, \dots, T, \text{ and } k = 1, \dots, K$

a *Durbin–Wu–Hausman test*, also known as *Hausman specification test*, has been run. This test assesses whether there is a systematic difference between the fixed effects (FE) and random effects (RE) estimators. The null hypothesis is that the two estimators lead to the same estimates, and therefore the RE estimator should be preferred because it is both consistent and efficient – the FE one is also consistent but less efficient. The alternative hypothesis points out at significant differences between the two estimators, so the FE estimator should be used because it is consistent, whereas the RE one is not. By running the Durbin–Wu–Hausman test on the available dataset, the null hypothesis has been rejected, hinting at the validity of the fixed-effects assumption.

Therefore, nor the *pooled ordinary least squares (OLS) estimator* – which would have been bias and inconsistent – nor the *random effects (RE) estimator* – which would have been inconsistent as well – were appropriate to estimate the empirical model of Eqs. (7) and (8). Thus, the adopted estimation strategy was based on the *fixed effects (FE) estimator*, also called *within estimator*, because it exploits the within variation (i.e. over time) to obtain *time-*

⁹⁷ A *consistent* estimator is one for which, as number N of observations in the dataset increases, the estimates converge in probability to the parameter to be estimated. That is $\text{plim } \widehat{\beta}_N = \beta$. Consistency is based on the *law of large numbers* and implies more precise and accurate estimates as the dimension of the sample increases. An *efficient* estimator is one that estimates the coefficients of the regression displaying the minimum variance relative to specific classes of estimators. Having both a consistent and efficient estimator is preferred, but when it is not possible, consistency is deemed to be more important.

demeaned variables. The procedure consists in averaging, for each firm i (located in LLM j), Eq. (7) over time, obtaining:

$$\bar{y}_{i(j)} = \boldsymbol{\beta} \bar{\mathbf{X}}_{j(i)} + \alpha_{i(j)} + \bar{\delta} + \bar{u}_{i(j)} \quad (9)$$

with $i = 1, \dots, N$, and $j = 1, \dots, n$

where $\bar{y}_{i(j)} = \frac{1}{T} \sum_{t=1}^T y_{i(j)t}$, and the same goes for $\bar{\mathbf{X}}_{j(i)}$, $\bar{\delta}$, and $\bar{u}_{i(j)}$. Obviously, $\alpha_{i(j)}$ does not vary over time, so it remains the same as in Eq. (7). By subtracting Eq. (9) from Eq. (7), the model with time-demeaned variables is obtained:

$$(y_{i(j)t} - \bar{y}_{i(j)}) = \boldsymbol{\beta} (\mathbf{X}_{j(i)t} - \bar{\mathbf{X}}_{j(i)}) + (\delta_t - \bar{\delta}) + (u_{i(j)t} - \bar{u}_{i(j)}) \quad (10)$$

with $i = 1, \dots, N$, $j = 1, \dots, n$, and $t = 1, \dots, T$

The important thing about this demeaning procedure is that the unobserved individual effects $\alpha_{i(j)}$ cancel out⁹⁸. Therefore, the *heterogeneity bias* is no longer an issue and an OLS estimation of the time-demeaned dependent variable on the time-demeaned regressors can be now run to Eq. (10)⁹⁹. Hence, the fixed effects – or within – estimator, is nothing but a pooled OLS estimator that is based on the time-demeaned variables.

After discussing about the general features of the econometric methodology applied in this paper, the models to be estimated on the panel dataset can be examined in more detail. The first one, used to analyze the effects of low-skilled immigration on manufacturing firms' *profitability*, can be represented as follows:

$$\begin{aligned} EBITmargin_{i(j)t} &= \beta_1 LSImmShare_{j(i)t} + \beta_2 \ln GDP_{j(i)t} + \beta_3 UR_{j(i)t} \\ &+ \beta_4 IndInt_{j(i)t} + \alpha_{i(j)} + \delta_t + u_{i(j)t} \end{aligned} \quad (11)$$

with $i = 1, \dots, 92,139$, $j = 1, \dots, 671$, and $t = 2008, \dots, 2017$

where the dependent variable, $EBITmargin_{i(j)t}$, is the operating profit margin of company i – located in LLM j – at the end of year t . The explanatory variable of interest, $LSImmShare_{j(i)t}$, is the low-skilled immigrant percentage share in LLM j – where firm i is located – at the beginning of year t . The other variables are the local controls; $\ln GDP_{j(i)t}$ is the natural logarithm of total GDP in LLM j – where firm i is located – in year t , $UR_{j(i)t}$ is the

⁹⁸ However, even if it allows to control for heterogeneity, the within transformation wipes out all time-invariant variables that do not vary within an entity (e.g. size, legal form, industry). Since deviations of time-invariant variables from their average are all zero, their impact on the dependent variable cannot be analyzed.

⁹⁹ Actually, the statistical software employed – namely Stata 14 – uses the *modified within deviation* – i.e. it adds back the overall mean to each variable – and then runs the OLS estimation on the following model:

$$(y_{i(j)t} - \bar{y}_{i(j)} + \bar{y}) = \boldsymbol{\beta} (\mathbf{X}_{j(i)t} - \bar{\mathbf{X}}_{j(i)} + \bar{\mathbf{X}}) + (\delta_t - \bar{\delta} + \bar{\delta}) + (u_{i(j)t} - \bar{u}_{i(j)} + \bar{u})$$

unemployment rate of LLM j – where firm i is located – in year t , and $IndInt_{j(i)t}$ is the industrial intensity ratio of LLM j – where firm i is located – in year t . All these dimensions have already been defined in detail in the previous subparagraph 3.2.1.

The coefficient of interest in Eq. (11) is, therefore, β_1 , which captures the correlation between the low-skilled immigrant share at the LLM level and the firms' EBITA margin. This correlation is conditional to the firm-specific effects, $\alpha_{i(j)}$, the time fixed effects, δ_t , and the other LLM-level controls.

The second empirical model is aimed at investigating the impact of low-skilled immigration on manufacturing firms' *efficiency* and it is based on the following equation:

$$AssetTurnover_{i(j)t} = \beta_1 LSImmShare_{j(i)t} + \beta_2 \ln GDP_{j(i)t} + \beta_3 UR_{j(i)t} + \beta_4 IndInt_{j(i)t} + \alpha_{i(j)} + \delta_t + u_{i(j)t} \quad (12)$$

with $i = 1, \dots, 92,061$, $j = 1, \dots, 671$, and $t = 2008, \dots, 2017$

where the dependent variable, $AssetTurnover_{i(j)t}$, is the asset turnover ratio of company i – located in LLM j – at the end of year t , as previously defined in subparagraph 3.2.1. In all other respects, Eq. (12) is perfectly analogous to Eq. (11).

Clearly, this time the coefficient of interest, β_1 , detects the correlation, *ceteris paribus*, between the low-skilled immigrant share at the LLM level and the firms' asset turnover ratio.

3.2.3. Assumptions violation: heteroskedasticity, serial correlation and endogeneity issues

Dealing with heteroskedasticity and serial correlation: the clustering approach

The fixed effects estimator works well under a set of assumptions on data behavior¹⁰⁰. Among them, it is worth mentioning the assumptions of *homoskedasticity* and *no autocorrelation* of the idiosyncratic errors. Homoskedasticity refers to a situation in which the variance of the regression residuals is constant, namely:

$$Var(u_{i(j)t} | \mathbf{X}_{i(j)}, \alpha_{i(j)}) = Var(u_{i(j)t}) = \sigma_\mu^2 \text{ for all } t$$

with $i = 1, \dots, N$, $j = 1, \dots, n$, and $t = 1, \dots, T$

If data do not meet this assumption, that is when the error terms are not identically distributed, there is rather evidence of *heteroskedasticity*.

¹⁰⁰ For more details on these assumptions see Wooldridge (2013, pp. 509-511).

Instead, the assumption of absence of autocorrelation implies that the idiosyncratic errors are independent from each other, specifically:

$$\text{Cov}(u_{i(j)t}, u_{i(j)s} | \mathbf{X}_{i(j)}, \alpha_{i(j)}) = 0 \text{ for all } t \neq s$$

with $i = 1, \dots, N, j = 1, \dots, n, \text{ and } t, s = 1, \dots, T$

If this assumption is violated, the error terms display autocorrelation, also referred to as *serial correlation*. This happens when the errors associated with a given time period carry over into subsequent time periods¹⁰¹.

When (one or both of) these two key assumptions are violated, performing inference using the FE approach induces inefficient estimates. Moreover, although the estimated coefficients are still consistent and unbiased¹⁰², the same cannot be said for their estimated standard errors; this means that they are too high or too low, and that the reported t-statistics, p-values, and confidence intervals cannot be relied on. However, heteroskedasticity and serial correlation represent a big issue in *long* panels, i.e. panels with small N and large T ; when the opposite holds, i.e. when N is substantially larger than T , the assumptions violation is a minor concern. In fact, in *short* panels, like the one employed in this paper, the *clustering approach* is enough to deal with heteroskedasticity and autocorrelation and to obtain fully robust standard errors and test statistics.

In order to investigate whether the collected data entailed homoskedasticity or heteroskedasticity, a modified *Wald test* for (groupwise) heteroskedasticity in the residuals of the fixed effects regressions has been run on the panel dataset. The null hypothesis of homoskedasticity has been rejected, and therefore heteroskedasticity appeared to be present in the data.

Subsequently, also a *Wooldridge test* for autocorrelation in the panel dataset has been executed. In this test, the null hypothesis is the absence of first-order serial correlation, and again the alternative hypothesis has been preferred, implying that the data displayed also autocorrelation of the idiosyncratic errors.

Given these results, the clustering methodology has been adopted in order to fix both the heteroskedasticity and serial correlation issues. Since observations of firms located in the same LLM are likely to be related to each other, clustering at the LLM level produces standard

¹⁰¹ There might occur different types of serial correlation. The most common is *first-order autocorrelation*, which means that the error in one period is correlated with the error in the following period; it can be either *positive* or *negative*. *Second-order autocorrelation*, instead, requires that the error in one period affects the error two periods later; this often happens when data have seasonal features. Orders higher than second-order do happen, but very rarely.

¹⁰² An estimator is said to be *unbiased* when it does not show systemic bias away from the real value, on average, for any sample size N . That is $E(\widehat{\beta}_k) = \beta_k$ with $k = 1, \dots, K$, irrespectively of sample size.

errors that are robust to both cross-sectional heteroskedasticity and within-panel (serial) correlation¹⁰³. In particular, these robust standard errors involve the computation of the *Huber-White variance estimator*, also known as *sandwich variance estimator*, for all the coefficients in the regression.

The last issue in this respect is that the Hausman specification test – previously run to assess whether the empirical model into consideration was a FE or RE model – could not be used. This is because it is based on the assumption of efficiency of the RE estimator under the null hypothesis. However, in the presence of heteroskedasticity and/or serial correlation, the RE is not fully efficient. Therefore, a cluster-robust version of the Hausman specification test as well as a *Sargan-Hansen test* have been executed on the panel dataset¹⁰⁴. Both tests confirmed the validity of the fixed effect model.

Dealing with endogeneity: the instrumental variable approach

Besides the loss of efficiency linked to heteroskedasticity and autocorrelation, the presence of *endogeneity*¹⁰⁵ is a far more relevant issue. Indeed, in order to produce accurate and reliable estimates, the FE estimator needs all the explanatory variables in the model to be exogenous. In other words, under a strict *exogeneity* assumption on the explanatory variables, the FE estimator is unbiased. A variable is referred to as exogenous when it is uncorrelated with the idiosyncratic error across all time periods. This means that, in the general regression model presented above, the following condition must hold:

$$\text{Cov}(x_{j(i)tk}, u_{i(j)}) = 0 \text{ for all } k, t$$

with $i = 1, \dots, N, j = 1, \dots, n, t = 1, \dots, T, \text{ and } k = 1, \dots, K$

However, the low-skilled immigrant share in Eqs. (11) and (12) cannot at all be assumed to behave as an exogenous variable¹⁰⁶. This is due to three main reasons. First of all, immigrants are not randomly distributed across local labor markets; on the contrary, they tend to move to areas that offer favorable economic, geographical, or institutional conditions. Because of this, there are likely to be local *omitted variables* that affect both the number of immigrants and the

¹⁰³ Since data, in fact, displayed three dimensions – the firm, the LLM, and the time dimensions –, clustering at the LLM level has been preferred to the usual clustering at the firm level. Another reason for this choice was that all regressors – both the explanatory variable and the control variables – were actually computed at the LLM level.

¹⁰⁴ These two tests do not require one of the two estimators in question to be fully efficient under the null hypothesis, and therefore can be used when the data display heteroskedasticity and/or autocorrelation in the error terms.

¹⁰⁵ Endogeneity can be brought on by different causes; the most common include: i) measurement errors, ii) omitted variables, and iii) reverse causality, or simultaneity.

¹⁰⁶ Endogeneity of the key regressor has been confirmed running specific *Davidson-MacKinnon tests of exogeneity*. The null hypothesis that the supposed endogenous regressor can actually be treated as exogenous has been rejected for both model specifications. The rejection of the null indicates that the endogenous regressor's effect on the estimates is meaningful, and instrumental variables techniques are thus required.

firms' performance in a particular LLM. Second, *simultaneity* may occur in the event that the firms' performance in turn influences the location decision of immigrants looking for a job. Third, there might also be some concerns about the *measurement* of the key explanatory variable due to the presence of undocumented immigrants¹⁰⁷. According to the estimates released by the ISMU Foundation, the amount of foreigners without a regular residence permit in Italy were about 491 thousand on January 1st, 2017. Unfortunately, these undocumented immigrants are not included in the official statistics, and therefore the low-skilled immigrant share computed for the analyses is inevitably lower than it should actually be.

Because of the above-mentioned reasons, it would not have been possible to identify a *causal* effect of low-skilled immigration on manufacturing firms' performance. Hence, an *instrumental variable (IV) approach* has been adopted in order to address the endogeneity of the share of low-skilled immigrants in the population. As in most of the relevant literature on this subject¹⁰⁸, the IV strategy has been built on the basis of ethnic enclaves, i.e. taking advantage of the fact that immigrants of a given nationality prefer to locate in areas where previous immigrants of the same nationality already live¹⁰⁹.

The procedure used to construct the instrument subsequently employed in the empirical analyses can be divided into three steps. First of all, data on foreign residents by citizenship on January 1st, 1991 have been collected for each LLM. This information has been used to construct the LLM-level share of immigrants by citizenship in 1991, as follows:

$$\theta_{jc1991} = \frac{Immigrants_{jc1991}}{Immigrants_{c1991}} \quad (13)$$

where LLMs are indexed by j and citizenships by c . $Immigrants_{jc1991}$ is the number of immigrants with citizenship c in LLM j at the beginning of year 1991, $Immigrants_{c1991}$ is the number of total immigrants with citizenship c at the beginning of year 1991, and therefore θ_{jc1991} is the share of immigrants with citizenship c in LLM j at the beginning of year 1991.

Thus, the historical LLM-level share of foreign residents has been exploited to predict the current number of immigrants by LLM. In detail:

¹⁰⁷ Illegal immigration, indeed, is an issue that affects almost all European immigration countries.

¹⁰⁸ Another methodology frequently used in the empirical research is the *natural experiment approach*. It consists in taking advantage of rapid and unexpected refugees' waves, often due to events such as civil wars and natural catastrophes, in order to avoid endogeneity concerns when analyzing immigration impacts.

¹⁰⁹ This is confirmed by the fact that in Italy there exist very large communities of foreigners coming from the same countries. For instance, 19.6 per cent of Romanians live in Lazio, while 8.3 per cent of Ukrainians in Campania. Moreover, there are large Chinese communities around Milan, Rome, Florence-Prato, and in the Northeast of the country (ISTAT, 2018).

$$\widehat{Immigrants}_{jt} = \sum_c (\theta_{jc1991} \times Immigrants_{ct}) \quad (14)$$

where LLMs are indexed by j , citizenships by c , and time by t . θ_{jc1991} is defined by Eq. (13), $Immigrants_{ct}$ is the number of total immigrants with citizenship c at the beginning of year t , and $\widehat{Immigrants}_{jt}$ is the predicted number of total immigrants in LLM j at the beginning of year t .

Finally, the predicted number of foreigners has been used to compute the instrument for the low-skilled immigrant share, as follows:

$$Z_{jt} = \frac{\widehat{Immigrants}_{jt}}{Residents_{j1991}} \quad (15)$$

where $\widehat{Immigrants}_{jt}$ is defined by Eq. (14), $Residents_{j1991}$ is the number of total residents in LLM j at the beginning of year 1991, and therefore Z_{jt} is the instrument for the low-skilled immigrant share in LLM j at the beginning of year t . It is worth specifying that – differently from other studies – in the denominator of Eq. (15), the population in year 1991 has been preferred to the population in year t in order to avoid all possible sources of endogeneity¹¹⁰. In particular, the total population in a given year is likely to depend on the number of immigrants in that year, at least for two reasons: i) obviously foreign residents are included in the total amount of residents, and ii) immigrants may cause natives to move to other areas (i.e. *outmigration*), again influencing the total population in the LLM.

Thus, by interacting foreign presence by citizenship with immigrants' past geographical distribution, the instrument in Eq. (15) allows to capture the immigrant share that is exogenous to local characteristics and, therefore, can be used to identify the causal impact of immigration on the firm's performance. The exogeneity of the instrument relies on the fact that the historical distribution across LLMs more than 15 years before the beginning of the sample period is likely to be unrelated to the current local conditions and economic shocks, which also affect the firms' performance¹¹¹.

¹¹⁰ In this respect, the choice of 1991 as base year was not random, since it is the year before the signing of the *Maastricht Treaty*, officially known as the *Treaty of European Union*. In fact, it was a fundamental treaty for the EU because it i) laid the foundations for economic and monetary union, ii) established a common foreign and security policy, iii) enacted closer cooperation between EU governments, the police and the judiciary on justice and home affairs, and iv) introduced the concept of European citizenship, allowing citizens to reside in and move freely between Member States. Moreover, 1991 considerably foreruns the EU Eastern enlargements in 2004 and 2007, and the Western Balkans enlargement in 2013. Both the Maastricht Treaty and the EU enlargements represent important historical changes, so past (i.e. in 1991) and current (i.e. from 2008 and 2017) local shocks can be deemed to be uncorrelated.

¹¹¹ Unfortunately, the instrument exogeneity cannot be tested since those considered in the analyses are *just-identified models*, i.e. they employ exactly one instrument for one endogenous variable. However, it is believed that the arguments put forward to support instrument exogeneity can be deemed to be convincing.

Resuming the structural models of Eqs. (11) and (12), the causal effect of low-skilled immigration on manufacturing firms' profitability and efficiency has been investigated using a *two-stage least squares (2SLS) estimation method*. As the name itself suggests, this procedure consists of two steps. In the first one, the following reduced form equation has been estimated with only exogenous regressors:

$$LSImmShare_{j(i)t} = \gamma_1 Z_{j(i)t} + \gamma_2 \ln GDP_{j(i)t} + \gamma_3 UR_{j(i)t} + \gamma_4 IndInt_{j(i)t} + \alpha_{i(j)} + \delta_t + e_{j(i)t} \quad (16)$$

This first stage removes the variability of $LSImmShare_{j(i)t}$ correlated with $u_{i(j)}$ and, therefore, allows to isolate its exogenous component. In the second stage, the value predicted through Eq. (16), $\widehat{LSImmShare}_{j(i)t}$, has been replaced in the structural Eqs. (11) and (12) to determine the *causal* impact of low-skilled immigration on both the firms' EBITA margin and asset turnover ratio. In detail:

$$EBITAmargin_{i(j)t} = \beta_1 \widehat{LSImmShare}_{j(i)t} + \beta_2 \ln GDP_{j(i)t} + \beta_3 UR_{j(i)t} + \beta_4 IndInt_{j(i)t} + \alpha_{i(j)} + \delta_t + u_{i(j)t} \quad (17)$$

with $i = 1, \dots, 92,139, j = 1, \dots, 671$, and $t = 2008, \dots, 2017$

$$AssetTurnover_{i(j)t} = \beta_1 \widehat{LSImmShare}_{j(i)t} + \beta_2 \ln GDP_{j(i)t} + \beta_3 UR_{j(i)t} + \beta_4 IndInt_{j(i)t} + \alpha_{i(j)} + \delta_t + u_{i(j)t} \quad (18)$$

with $i = 1, \dots, 92,061, j = 1, \dots, 671$, and $t = 2008, \dots, 2017$

Obviously, in order to produce efficient and consistent estimates, the IV (2SLS) estimator has to rely on a *valid* instrumental variable. In order to be valid, an instrument must be simultaneously *relevant* and *exogenous*¹¹². Instrument relevance implies that $Cov(LSImmShare_{j(i)}, Z_{j(i)}) \neq 0$, i.e. the instrument has to be correlated with the endogenous regressor – the low-skilled immigrant share. This means that, in Eq. (16), γ_1 has to be significantly different from zero. Instrument exogeneity, instead, entails that $Cov(Z_{j(i)}, u_{i(j)}) = 0$, i.e. the instrument has to be uncorrelated with the idiosyncratic error, and therefore with the dependent variable.

¹¹² If the instrument is not relevant, the IV estimates are inefficient, while if the instrument is not exogenous, the IV estimates are inconsistent.

3.2.4. Regression findings

This subparagraph illustrates the regression findings of the models specified above. First of all, the baseline results for both model specifications will be disclosed. The models have been implemented by adding first the key regressor – the low-skilled immigrant share – and then the local controls one by one, in order to gradually check the effect that each explanatory variable had on others already accounted for. Clearly, two different regressions have been run for the two dependent variables considered – the EBITA margin and the asset turnover ratio – and both the fixed-effects (FE) and the instrumental variables (IV) estimates will be reported. Subsequently, a set of robustness checks, performed in order to test the validity of the baseline results, will be illustrated. And finally, some heterogeneity analyses conducted on the data will be also presented; in this respect, the overall sample has been split in different subsamples according to various criteria, and then separate IV regressions have been conducted in order to investigate the presence of potentially different effects of low-skilled immigration.

Baseline results

Table 3.8 illustrates the fixed effects estimates of model in Eq. (11). Columns from (1) to (3) deal with the progressive model implementation mentioned above; as can be noted, the coefficient of interest remained always negative and significant as controls were gradually added to the model. Column (4) presents the FE estimates of the final model designed to investigate the low-skilled immigration effects on manufacturing firms' profitability. It appears that a higher presence of foreigners in the population of a given LLM is correlated with lower operating profitability of firms located in the same area. In particular, a one-percentage point increase in the low-skilled immigrant share is associated, on average, with a decrease of firms' EBITA margin by about 0.19 percentage points.

Table 3.8: FE estimates with firm and time fixed effects.
Dependent variable: manufacturing firms' EBITA margin.

	(1)	(2)	(3)	(4)
	EBITAMargin	EBITAMargin	EBITAMargin	EBITAMargin
LSImmShare	-0.1497*** (0.0453)	-0.1913*** (0.0425)	-0.1851*** (0.0424)	-0.1893*** (0.0374)
lnGDP		4.9734*** (0.8365)	3.8930*** (0.9364)	3.5379*** (0.8874)
UnemplRate			-0.0730*** (0.0157)	-0.0619*** (0.0155)
IndInt				-0.2598*** (0.0802)
Constant	7.1909*** (0.3200)	-36.9813*** (7.3626)	-26.9894*** (8.2755)	-20.8589*** (7.8780)
Within R ²	0.0086	0.0089	0.0091	0.0092
LSDV R ²	0.5008	0.5010	0.5010	0.5011
Rho	0.5183	0.7024	0.6496	0.6447
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	701,384	701,384	701,384	701,384
No. of firms	92,139	92,139	92,139	92,139
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses. 671 clusters based on 2001 LLMs definition (15 LLMs missing in the sample). *, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Before moving forward, it is worth making some clarifications. To begin with, the constant term reported in Table 3.8 stands for the average value of the firm fixed effects, and it can be said to be not particularly meaningful for the purpose of the analysis¹¹³. Moreover, time fixed effects have been estimated using nine time dummies as clarified in subparagraph 3.2.2; the corresponding coefficients, which are not reported in Table 3.8, are all negative and significant – at least at the 10 per cent level –, except for year 2017.

The table displays two different measures of the goodness of fit of the model, the within R-squared and the LSDV R-squared. The first one pertains to the fixed effects (FE) estimation

¹¹³ This is linked to the fact that, in a fixed effects model, the “standard constant term” and the “individual fixed effects” are inherently unidentified, and their values can only be obtained by imposing some *arbitrary constraint*. A popular constraint is setting α equal to zero; however, the statistical software employed adopts a less-intuitive constraint and forces the sum of all panel fixed effects to be zero (with unbalanced panels the α_i are effectively weighted by the number of observations in the panel). This choice is motivated by a set of advantages that make the results interpretation easier and more intuitive.

procedure and describes the proportion of variation in the dependent variable *over time* that is explained by the model; hence, it can be seen as a measure of how well the explanatory variables account for changes in the output variable *within firms*. The second measure, instead, is related to the *least squares dummy variables (LSDV) procedure*¹¹⁴ and represents the overall fit of the model when also the cross-sectional fixed effects are taken into consideration. Therefore, it illustrates the proportion of the overall variation in the dependent variable that can be explained by *all* the independent variables in the model, including the fixed effects. As can be noted by looking at the R-squared values reported in Table 3.8, both of them are quite low and did not increase that much as regressors were added to the model; this shall be interpreted as a signal of the presence of an inherently high amount of unexplainable variability in the data. Nevertheless, the purpose of the analyses presented in this paper is not obtaining a high level of fit of the models, but rather investigating whether a real causal relationship exists between the regressor of interests and the response variable. And statements can be made about this matter even with low R-squared.

Another interesting index shown in Table 3.8 is rho, also referred to as *intraclass correlation*; it represents the fraction of variance due to differences across firms and shows the proportion of variation explained by the individual-specific term, $\alpha_{i(j)}$ ¹¹⁵. In column (4), the rho of 64.5 per cent implies that firm-fixed effects account for most of the variation, the rest is due to the idiosyncratic error, $u_{i(j)t}$.

Table 3.9 exhibits the fixed effects estimates of model in Eq. (12). By looking at columns from (1) to (3), again, it can be pointed out that the key coefficient continued to be negative and strongly significant as control variables were progressively taken into consideration. As above, column (4) displays the FE estimation results of the final model, which this time was aimed at examining the relationship between low-skilled immigration and manufacturing firms' efficiency. The estimates point to a higher share of less-educated immigrants in a certain LLM to be related to lower efficiency of firms located in the same territory. Notably, when the low-skilled immigrant share rises by one percentage point, the firms' asset turnover ratio decreases, on average, by 0.01.

As far as time fixed effects are concerned, the unreported estimated coefficients of the nine time dummies proved to be all negative and significant at the one per cent level. Moreover, the same considerations expressed above can be made with respect to the reported R-squared

¹¹⁴ The LSDV estimator produces the same estimates of the FE one, but it is based on an empirical model that uses $N - 1$ firm dummy variables – instead of the demeaning procedure – in order to control for the unobserved heterogeneity in the data.

¹¹⁵ Having high values of rho is good since it means that, albeit it is not known where the variation comes from, it can still be ascribed to a particular firm.

measures, even if their values are a bit higher in this second regression. Also the intraclass correlation, rho, is above that in Table 3.8; in fact, this time as much as 76.8 per cent of the variation is due to the firm-fixed effects.

**Table 3.9: FE estimates with firm and time fixed effects.
Dependent variable: manufacturing firms' Asset Turnover ratio.**

	(1)	(2)	(3)	(4)
	AssetTurnover	AssetTurnover	AssetTurnover	AssetTurnover
LSImmShare	-0.0088*** (0.0025)	-0.0105*** (0.0026)	-0.0102*** (0.0026)	-0.0103*** (0.0026)
lnGDP		0.1918*** (0.0484)	0.1558*** (0.0522)	0.1539*** (0.0503)
UnemplRate			-0.0024*** (0.0005)	-0.0024*** (0.0009)
IndInt				-0.0014 (0.0046)
Constant	1.3470*** (0.0182)	-0.3565 (0.4212)	-0.0236 (0.4559)	0.0091 (0.4297)
Within R ²	0.0266	0.0268	0.0269	0.0269
LSDV R ²	0.7448	0.7449	0.7449	0.7449
Rho	0.7463	0.7807	0.7681	0.7682
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	709,652	709,652	709,652	709,652
No. of firms	92,061	92,061	92,061	92,061
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses. 671 clusters based on 2001 LLMs definition (15 LLMs missing in the sample). *, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

In addition to what previously said, it can be noticed that the coefficients of the three local control variables appear to display the expected sign in both models implemented. Furthermore, they are all statistically significant, except for the industrial intensity ratio in the second specification.

Table 3.10 illustrates the instrumental variable estimates of both empirical models. In particular, columns (1) and (3) report the first stages – as per Eq. (16) – of the 2SLS estimation of models in Eqs. (17) and (18), respectively; due to the fact that the observations and firms in the sample are different between the two models, results are slightly dissimilar but clearly

comparable. It can be observed that the coefficient of the instrument Z , which represents its marginal effect on the low-skilled immigrant share, is positive and significant at the one per cent level; this implies that the selected instrument is definitely relevant. In addition, instrument relevance has been confirmed running an underidentification Lagrangian multiplier test of whether the first stage equation was identified. Since standard errors were clustered, this test has been based on the *Kleibergen-Paap LM rk statistic*, which led to the rejection of the null hypothesis that the equation was underidentified. A rejection of the null implies also that the “excluded” instrument is relevant.

However, instrument relevance is not enough. The correlation between the instrument and the endogenous regressor has to be strong, otherwise statistical inference can be misleading. To check whether the instrument was not weak, the cluster-robust *Kleibergen-Paap Wald rk F statistic* has been employed. As can be seen in columns (1) and (3), the value of this F statistic, which is associated to the exclusion of the instrument Z from the first stage equation, is definitely higher than the 10 per cent Stock-Yogo critical value in both models. Therefore, the instrument employed in this context was not weak.

Column (2) displays the results of the fixed-effects IV estimation of Eq. (17). With respect to the previous FE estimation of Table 3.8, it can be noted that the coefficient of interest kept the negative sign and increased in magnitude; moreover, it is still significant, but only at the 10 per cent level. Therefore, it can be said that a higher presence of less-educated foreigners in a given LLM is likely to lead to a reduction in the operating profitability of manufacturing firms in the same area. In particular, it is found that a one-percentage point increase in the low-skilled immigrant share causes, on average, a decrease of firms’ EBITA margin by about 0.29 percentage points after one year.

Similar considerations can be made for column (4), which exhibits the results of the fixed-effects IV estimation of Eq. (18). Comparing the reported values with those in Table 3.9, it can be pointed out that the key coefficient continued to be negative and increased in its absolute value; it also remained significant at the one per cent level. Hence, it can be concluded that a higher share of immigrants in a particular LLM causes a reduction in the efficiency of firms located in that area. Specifically, estimates indicate that an increase in the low-skilled immigrant share by one percentage point entails a decline, on average, by about 0.03 in the firms’ asset turnover ratio a year later.

Table 3.10: First stage and IV estimates with firm and time fixed effects.
Dependent variables: manufacturing firms' EBITA margin and Asset Turnover ratio.

	1 st stage LSImmShare	2 nd stage EBITAMargin	1 st stage LSImmShare	2 nd stage AssetTurnover
LSImmShare		-0.2914* (0.1617)		-0.0283*** (0.0096)
lnGDP	3.0309** (1.3831)	3.9439*** (1.1965)	3.0298** (1.3827)	0.2256*** (0.0689)
UnemplRate	0.0216 (0.0135)	-0.0601*** (0.0166)	0.0217 (0.0135)	-0.0020** (0.0009)
IndInt	-0.0762 (0.0738)	-0.2641*** (0.0811)	-0.0747 (0.0735)	-0.0021 (0.0048)
Z	0.2615*** (0.0585)		0.2626*** (0.0586)	
Constant	-20.8178* (12.4825)	-23.7361** (9.8697)	-20.8392*** (12.4805)	-0.4996 (0.5587)
Within R ²	0.7481	0.0092	0.7485	0.0261
Rho	0.9930	0.6639	0.9930	0.7942
F statistic	22.98		23.10	
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	701,384	701,384	709,652	709,652
No. of firms	92,139	92,139	92,061	92,061
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses. 671 clusters based on 2001 LLMs definition (15 LLMs missing in the sample). *, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Robustness checks

Regression findings displayed above are definitely different from what was expected, since they seem to differ from the results of the extant literature on the subject. Indeed, the (few) previous empirical studies that investigated the effects of immigration on firms' performance generally tend to conclude that immigration exerts a positive (or slightly positive) impact.

Therefore, in order to confirm the structural validity of the empirical models implemented so far, a set of robustness checks have been run on the available data. First of all, a vector of time-varying firm-level controls have been added to the model specification. The aim was to assess whether the impact of low-skilled immigration on firms' performance

indicators would have changed by taking into account more regressors – namely, the firm’s age, the (logged) debt-to-equity ratio, and the (logged) shareholders’ equity.

Table 3.11: IV estimates with both local- and firm-level controls.
Dependent variables: manufacturing firms’ EBITA margin and Asset Turnover ratio.

	(1) EBITAMargin	(2) AssetTurnover
LSImmShare	-0.3227*** (0.1197)	-0.0285*** (0.0091)
Age	-0.1504*** (0.0283)	-0.0166*** (0.0017)
lnDtoE	0.0989*** (0.0195)	-0.0121*** (0.0012)
lnShareholdersEquity	2.2968*** (0.0241)	0.0183*** (0.0017)
lnGDP	3.5802*** (1.0307)	0.2183*** (0.0670)
UnemplRate	-0.0498*** (0.0137)	-0.0018** (0.0009)
IndInt	-0.2697*** (0.0694)	-0.0020 (0.0047)
Constant	-30.9912*** (8.8892)	-0.2623 (0.5550)
Within R ²	0.0762	0.0291
Rho	0.6652	0.7896
Firm fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Observations	701,364	709,632
No. of firms	92,138	92,061
Time series length	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses. 671 clusters based on 2001 LLMs definition (15 LLMs missing in the sample). *, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Results of these additional regressions are shown in Table 3.11, which reports IV estimates only. As can be noted by looking at column (1), the estimate of the key coefficient did not change its sign and went back to being significant at the one per cent level; the negative effect on firms’ EBITA margin of a one-percentage point increase in the low-skilled immigrant share rose from 0.29 to 0.32 percentage points. In addition, the goodness of fit of the model improved significantly since the within R-squared jumped from 0.01 to 0.08. Instead, with

respect to immigration effects of firms' efficiency, it can be said by examining column (2) that the results for the second model remained almost unaffected by the additional controls.

Another potential source of bias, which could have caused the results to differ from what was expected, is the presence of outliers in the sample; very small firms and, especially, very large ones may exert a strong influence on the data, which can sometimes distort the regression findings. In order to check whether this was the case, it has been considered a subsample made of "regular" firms, i.e. those between the 1st and 99th percentile in terms of *both* revenues and total assets. Therefore, firms that were too small or too big, as far as *either* annual turnover *or* total assets are concerned, were excluded from these additional analyses. Table 3.12 displays the IV estimates of the coefficient of interest for these subsamples. It seems clear that results do not differ much from those obtained on the whole samples, therefore outliers are deemed not to influence the empirical findings to the point of altering them significantly.

Table 3.12: IV estimates of the impact of the low-skilled immigrant share on subsamples of "regular" firms in terms of Revenues and Total Assets. Dependent variables: manufacturing firms' EBITA margin and Asset Turnover ratio.

	(1)	(2)	(3)	(4)
	EBITAMargin	EBITAMargin	AssetTurnover	AssetTurnover
LSImmShare	-0.2977* (0.1634)	-0.3213*** (0.1199)	-0.0312*** (0.0098)	-0.0314*** (0.0093)
Local-level controls	Yes	Yes	Yes	Yes
Firm-level controls	No	Yes	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	689,607	689,588	697,483	697,464
No. of firms	91,395	91,394	91,311	91,311
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses. 671 clusters based on 2001 LLMs definition (15 LLMs missing in the sample). *, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Moreover, since the baseline samples consisted of a very large number of observations, some further tests have been conducted in order to verify whether the same results would have continued to hold in a much more restricted sample. In this respect, firms have been initially reduced keeping only those with sales revenue higher than (or equal to) 500 thousand euros for the *entire* period under investigation. Results obtained from this subsample are exhibited in Table 3.13. Subsequently, another attempt has been made by keeping only firms for which observations were always available between 2008 and 2017, thereby considering a smaller but strongly balanced panel dataset. IV estimates for this second experiment are reported in Table

3.14. As can be noted, in both cases the estimated effect of low-skilled immigration on the company indicators under consideration continued to be negative and definitely significant.

Table 3.13: IV estimates of the impact of the low-skilled immigrant share on subsamples of firms with revenues always higher than (or equal to) 500 thousand euros. Dependent variables: manufacturing firms' EBITA margin and Asset Turnover ratio.

	(1)	(2)	(3)	(4)
	EBITAMargin	EBITAMargin	AssetTurnover	AssetTurnover
LSImmShare	-0.3129** (0.1279)	-0.3207*** (0.0867)	-0.0248*** (0.0082)	-0.0249*** (0.0084)
Local-level controls	Yes	Yes	Yes	Yes
Firm-level controls	No	Yes	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	490,364	490,350	489,939	489,926
No. of firms	59,979	59,979	59,876	59,876
No. of clusters	648	648	649	649
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses.

*, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Table 3.14: IV estimates of the impact of the low-skilled immigrant share on subsamples of firms with observations available for the whole time period. Dependent variables: manufacturing firms' EBITA margin and Asset Turnover ratio.

	(1)	(2)	(3)	(4)
	EBITAMargin	EBITAMargin	AssetTurnover	AssetTurnover
LSImmShare	-0.3687*** (0.0964)	-0.3590*** (0.0761)	-0.0227*** (0.0066)	-0.0227*** (0.0067)
Local-level controls	Yes	Yes	Yes	Yes
Firm-level controls	No	Yes	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	267,720	267,708	277,990	277,983
No. of firms	26,772	26,772	27,799	27,799
No. of clusters	574	574	575	575
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses.

*, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

So far, the impact of the low-skilled immigrant share on firms' performance has been estimated by looking at total population, independently of the gender. Therefore, another test aimed at assessing the consistency of the results obtained so far restricts the explanatory variables to males and females separately. Table 3.15 illustrates the IV estimates obtained using as key regressor the low-skilled immigrant share computed either on the male or female population only¹¹⁶. It can be immediately noticed that, in all regressions, the estimates are higher when using the female rather than the male immigration share. In particular, the estimated coefficients of the effects on the EBITA margin obtained employing the female share are about 0.06 percentage points higher than those obtained when using the overall immigrant share, while those achieved using the male share are about 0.05 percentage points lower. The same can be said for the estimates of the impact on asset turnover, which are 0.005 points higher with the female share and 0.004 points lower with the male share. Anyway, despite this slight variation, all estimates remained definitely negative and statistically significant.

Table 3.15: IV estimates of the impact of the low-skilled immigrant share computed separately for males and females.
Dependent variables: manufacturing firms' EBITA margin and Asset Turnover ratio.

	(1)	(2)	(3)	(4)
	EBITAMargin	EBITAMargin	AssetTurnover	AssetTurnover
LSImmShare for males	-0.2421** (0.1313)	-0.2713*** (0.0940)	-0.0242*** (0.0077)	-0.0244*** (0.0073)
LSImmShare for females	-0.3447* (0.1958)	-0.3813** (0.1540)	-0.0332*** (0.0109)	-0.0335*** (0.0116)
Local-level controls	Yes	Yes	Yes	Yes
Firm-level controls	No	Yes	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	701,384	701,364	709,652	709,632
No. of firms	92,139	91,138	92,061	92,061
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses. 671 clusters based on 2001 LLMs definition (15 LLMs missing in the sample). *, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

In the light of the robustness tests presented above, it can be affirmed that the empirical analyses conducted so far are quite persuasive; the available evidence suggests that a higher presence of low-skilled immigrants worsens both profitability and efficiency of manufacturing

¹¹⁶ The same has been done for the unemployment rate.

firms. Anyway, it should not be forgotten that much also depends on the assumptions made in the data-gathering and sample-building phases¹¹⁷ and on the empirical methodologies adopted.

Heterogeneous effects

The results presented above are based on the implicit assumption that the effects of low-skilled immigration on Italian manufacturing firms' performance do not change across firms. However, the immigration impact is likely to be different according to firms' characteristics – especially their geographical location and the industry in which they operate. Therefore, a set of analyses have been performed in order to assess the existence of possible heterogeneous effects.

First of all, firms have been split in three subsamples based on the geographical area in which they are located, i.e. North, Center, and South, in line to the ISTAT partition. In this respect, it is well known that there are significant differences between the North and the South of the country, in terms of both level of industrialization and presence of foreigners, and therefore it was worth investigating whether this diversity would be reflected in the data.

Table 3.16: IV estimates of the impact of the low-skilled immigrant share on subsamples based on the geographical area.
Dependent variable: manufacturing firms' EBITA margin.

	All sample EBITAmargin	North EBITAmargin	Center EBITAmargin	South EBITAmargin
LSImmShare	-0.3227*** (0.1197)	-0.1978*** (0.0627)	-0.2880 (0.2365)	-0.2271 (0.3481)
Local-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	701,364	476,149	124,743	100,472
No. of firms	92,138	60,452	16,980	14,706
No. of clusters	671	236	132	316
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses.

*, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

By running three separate regressions on the subsamples, it appeared that the adverse effect of low-skilled immigration on firms' operating profitability was lower in the North of the

¹¹⁷ The assumptions and considerations on the basis of which data were collected and adapted to build up the samples have been largely detailed in subparagraph 3.2.1.

country when compared to the whole sample, while it became no longer statistically significant when looking only at the Center and at the South areas (see Table 3.16). With regard to the impact on asset turnover, instead, it seemed that foreigners' presence had a stronger negative effect on firms located in the Center of Italy when compared to those located in the North, whereas its effect is rather small and no more statistically significant in the South. Again, the negative effect on efficiency of firms in the North appeared lower when contrasted to firms considered altogether (see Table 3.17).

Table 3.17: IV estimates of the impact of the low-skilled immigrant share on subsamples based on the geographical area.
Dependent variable: manufacturing firms' Asset Turnover ratio.

	All sample AssetTurnover	North AssetTurnover	Center AssetTurnover	South AssetTurnover
LSImmShare	-0.0285*** (0.0091)	-0.0178*** (0.0033)	-0.0373*** (0.0115)	-0.0066 (0.0201)
Local-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	709,632	482,029	125,747	101,856
No. of firms	92,061	60,474	16,961	14,626
No. of clusters	671	236	132	316
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses.
 *, **, and *** denote significance at 10%, 5%, and 1% level, respectively.
 Source: own elaboration.

Subsequently, firms have been split in four subsamples according to the sector they operate in. Following the classification of manufacturing industries provided by EUROSTAT, firms have been classified as operating in low-tech (LT), medium-low-tech (MLT), medium-high-tech (MHT), and high-tech (HT) industries. Previous academic researches generally pointed out that the effect of immigration is stronger when firms operating in LT and MLT industries are concerned; hence, an attempt has been made in order to analyze whether this was also the case. Concerning the impact on firms' EBITA margin, results of the separate regression displayed a slightly more negative effect for LT and MLT industries, when compared to the whole sample, whereas the coefficients were lower but no statistically significant for MHT and HT industries (see Table 3.18). Also the negative impact on firms' efficiency appeared to decrease as the level of technology of the industry increased, but this time the coefficient estimates were all significant, at least at 10% level (see Table 3.19).

Table 3.18: IV estimates of the impact of the low-skilled immigrant share on subsamples based on the firms' industry.
Dependent variable: manufacturing firms' EBITA margin.

	LT EBITAMargin	MLT EBITAMargin	MHT EBITAMargin	HT EBITAMargin
LSImmShare	-0.3513*** (0.1239)	-0.3543* (0.2061)	-0.3090 (0.2071)	0.1125 (0.2119)
Local-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	248,700	268,253	158,831	25,580
No. of firms	33,292	35,516	20,129	3,201
No. of clusters	641	621	522	305
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses.
*, **, and *** denote significance at 10%, 5%, and 1% level, respectively.
Source: own elaboration.

Table 3.19: IV estimates of the impact of the low-skilled immigrant share on subsamples based on the firms' industry.
Dependent variable: manufacturing firms' Asset Turnover ratio.

	LT AssetTurnover	MLT AssetTurnover	MHT AssetTurnover	HT AssetTurnover
LSImmShare	-0.0463*** (0.0140)	-0.0219** (0.0094)	-0.0203*** (0.0115)	-0.0137* (0.0082)
Local-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	249,302	271,895	162,039	26,396
No. of firms	33,183	35,505	20,164	3,209
No. of clusters	641	622	522	305
Time series length	10 yrs	10 yrs	10 yrs	10 yrs

Standard errors clustered by LLM in parentheses.
*, **, and *** denote significance at 10%, 5%, and 1% level, respectively.
Source: own elaboration.

In an unreported experiment, the sample has been also split in four subsamples, according to the dimension of the corporate group the companies belong to. Firms have been classified as being part of a small group when it involved 2 to 5 companies, medium group when it was made of 6 to 15 companies, and large group when it embodied 16 companies or

more. It has been observed that the negative effect on EBITA margin appeared to increase its magnitude as long as the group dimensions rose; the coefficient for firms in large groups was almost three times that obtained for the whole sample, whereas it was definitely lower (and not even statistically significant) for firms belonging to no group. The impact of low-skilled immigration on firms' efficiency, instead, seems to be more homogeneous and in line with the results obtained for all companies; only the estimated coefficient for firms in medium groups was slightly more negative.

Another, last investigation on heterogeneous effects of immigration according to firms' characteristics has been carried out by looking at companies' legal form. The negative effect of the low-skilled immigrant share on firm's profitability appeared to be a little bit higher for SRLs and lower for SPAs, when contrasted to the all sample; the coefficient was positive for partnerships and strongly negative for firms with other legal forms, but in both cases it was not statistically significant. With respect to firms' efficiency, instead, all coefficients remained negative and significant, showing stronger effects for SPAs.

3.3. Focus on Italian propensity to innovate

So far, the discussion was focused on manufacturing firms' profitability and efficiency, two aspects that are both linked to how well a company is performing¹¹⁸. From previous analyses, it emerged a negative, significant effect of low-skilled immigration on both indicators taken into account. Therefore, from the available data, it can be inferred that a high presence of less-educated foreigners in a given area worsens, on average, the performance of firms in that area.

Anyway, there is still much that can be done in order to understand what the channels of influence are and which specific mechanisms come into play. Hence, this last paragraph aims at taking the analyses a little step further. Since many scholars argued that innovation is one of the main drivers of firms' performance and growth, some additional empirical investigations have been accomplished with the purpose of examining whether the presence of low-skilled immigrants exerted also an influence on the propensity to innovate of Italian firms.

¹¹⁸ These two measures are strictly related to each other, and combining them together is it possible to have an idea of how profitable a company is relative to its total assets. In fact, the product of these two indicators is called Return on Assets, or ROA, and is a widely used measure of how efficient a firm is at using its assets to generate earnings.

3.3.1. Data description and dataset construction

In this respect, it has been possible to build a strongly balanced panel dataset. The focus was on *patent applications*, an innovation outcome that is readily observable and commonly used as a tangible proxy for innovation more broadly¹¹⁹.

Before going any further, it is important to make a clarification. Italian firms can claim patent protection either at the Italian Patent and Trademark Office (*Ufficio Italiano Brevetti e Marchi*, UIBM) or at the European Patent Office (EPO). Nothing prevents a company from applying both at the national and European level, so granted European patents can also be validated in Italy. Luckily, it was possible to collect data for both types of patent applications, and therefore perform a more robust investigation.

Italian patent applications

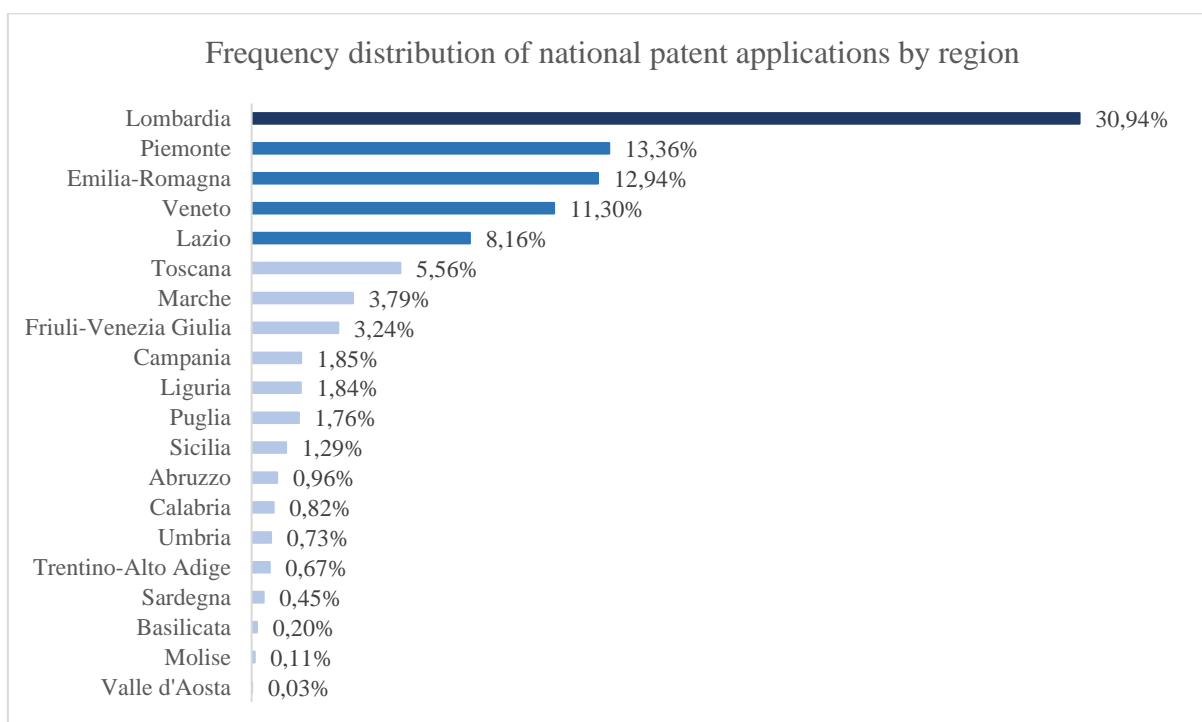
Data on national patent applications has been drawn from the database available on the UIBM website. The UIBM, which pertains directly to the Italian Ministry of Economic Development (*Ministero dello Sviluppo Economico*, MISE), deals with all forms of intellectual property protection – namely, patents and utility models¹²⁰, trademarks, and designs. For the purpose of the analyses presented hereinafter, data have been collected on the number of patent (and utility model) applications by province (NUTS 3 region) for years from 2004 to 2016. Unfortunately, municipal-level information was not available; nevertheless, the geographical scale at provincial level can be deemed to be sufficiently small to control for those differences in institutional and socio-economic factors, which are not observable and may contribute to both attracting new immigrants and increasing the innovation potential of a given area.

Figure 3.11 illustrates the distribution of the average number of national patent applications by region. As can be noted, on average, more than 30 per cent of requests came from individuals or firms resident in Lombardia, while the first five most represented regions – i.e. Lombardia, Piemonte, Emilia-Romagna, Veneto, and Lazio – account for more than 75 per cent of the total.

¹¹⁹ As a proxy for innovation, the number of patent applications have been preferred to the already available values of R&D expenditures reported on firms' financial statements. The reason for this choice is that the financial statement data may be not totally reliable. Since the Italian tax authority, in order to encourage investments in innovation, recognizes a tax credit up to 50 per cent of incremental annual R&D expenses, firms tend to report higher costs than those really incurred.

¹²⁰ Utility models are a form of protection dealt with at national level only.

Figure 3.11: Percentage frequency distribution of the average number of national patent applications by region, 2004-2016.



Source: own elaboration, based on UIBM data.

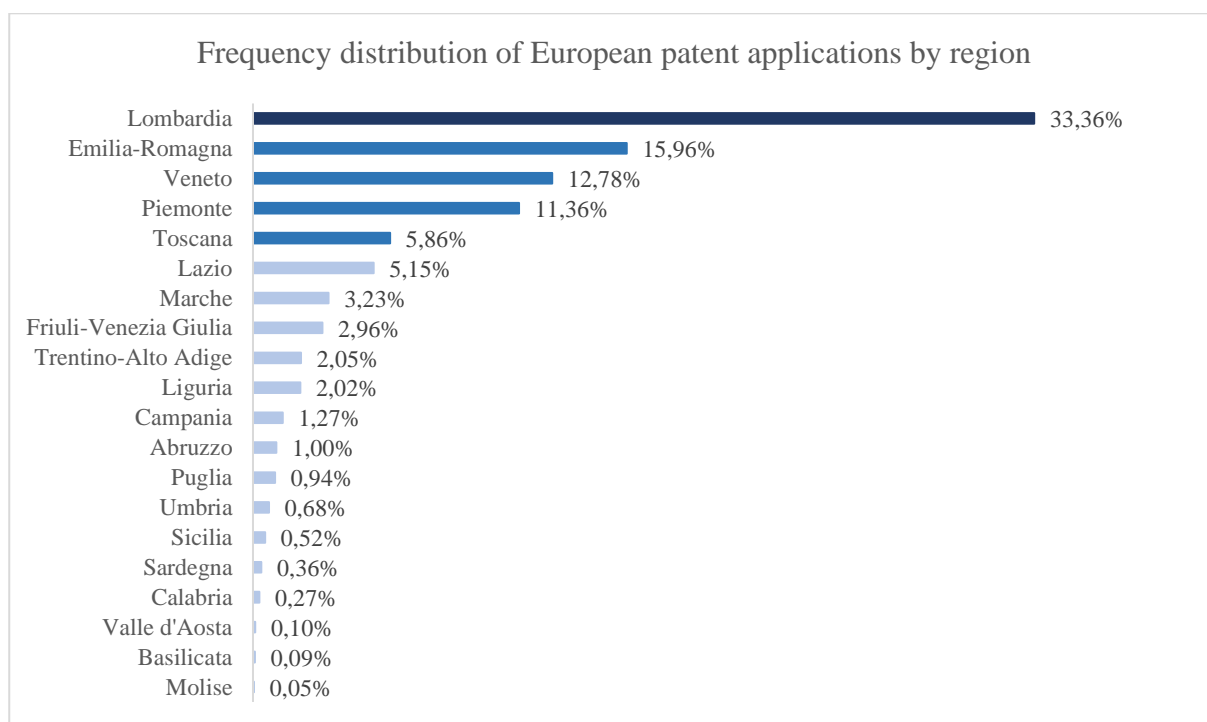
European patent applications

Information on European patent applications has been collected from PATSTAT, the EPO's Worldwide Patent Statistical Database. It is a relational database that contains bibliographical and legal patent data from all over the world and allows to run queries directly in the EPO's databases, conduct statistical analyses, visualize the data and download it for offline elaboration. Information made available was at the micro level; for each parent application, among other information, it was detailed the identification number, the filing date, and the name and province of residence of the applicant(s).

Data have been extracted about patent applications presented at the EPO by Italian residents between 2004 and 2016. Subsequently, they have been aggregated in order to obtain the number of patent applications by province for each year¹²¹.

¹²¹ In order to be aggregated, patent applications that were presented by more than one individual or firm have been weighed according to their province of residence.

Figure 3.12: Percentage frequency distribution of the average number of European patent applications by region, 2004-2016.

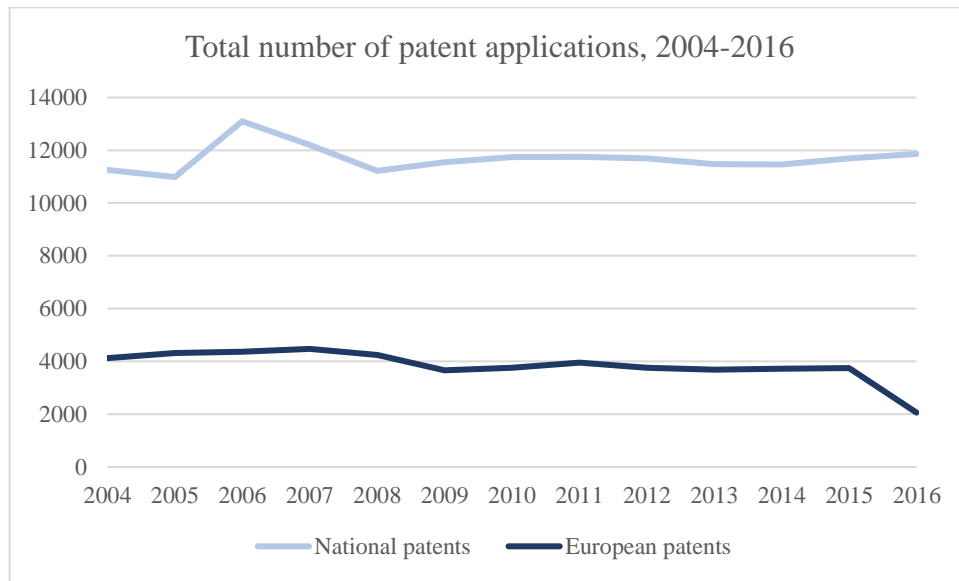


Source: own elaboration, based on PATSTAT data.

Figure 3.12 depicts the distribution of the average number of European patent applications by region. As can be observed, on average, one third of requests came from individuals or firms resident in Lombardia, while the first five most represented regions – i.e. Lombardia, Emilia-Romagna, Veneto, Piemonte and Toscana – account for almost 80 per cent of the total.

Figure 3.13 presents the evolution of the total number of both Italian and European patent applications between 2004 and 2016. It appears that the trend of requests remained fairly stable for the whole period considered; applications at the national office only exhibited a small peak in 2006, while those presented at the EPO almost halved in 2016.

Figure 3.13: Evolution of the total number of Italian and European patent applications from 2004 to 2016.



Source: own elaboration, based on UIBM and PATSTAT data.

Low-skilled immigrant percentage share

As in the previous analyses on firm-level data, the key regressor – used to investigate the impact of immigration on innovative activity – was the *low-skilled immigrant percentage share*. This time data collected from I.Stat have been aggregated at the provincial level in order to obtain the low-skilled immigrant share defined as follows:

$$LSImmShare_{pt} = \frac{LSImmigrants_{pt}}{Residents_{pt}} \times 100 \quad (19)$$

where provinces are indexed by p and years by t .

Other local controls

Again, in addition to the explanatory variable of interest, some local independent variables are taken into account to control for their potential influence on innovation. Similarly to what has been done previously for the analyses on companies' performance, these local confounders added to the empirical model specifications include the GDP and the unemployment rate at provincial level. As said before in subparagraph 3.2.1, data on these measures for the years from 2004 to 2016 were readily available on the online databases provided by the EUROSTAT and ISTAT, respectively.

The third and last control variable is what has been called *business intensity ratio*. It has been defined as follows:

$$BussInt_{pt} = \frac{LocUnits_{pt}}{Residents_{pt}} \times 100 \quad (20)$$

where provinces are indexed by p and years by t . $LocUnits_{pt}$ is the number of total local units in province p in year t , while $Residents_{pt}$ is the number of total residents in province p at the beginning of year t .

To compute this measure, data on the number of total local units – the numerator in Eq. (20) – were collected from: i) the statistic *Local units and persons employed by provinces*, available on I.Stat, for the years from 2012 to 2016, and ii) the tables produced by the Statistical register of Local Units (ASIA - LU) and published on ISTAT website, for the years from 2004 to 2011. This last control, $BussInt_{pt}$, can be understood as the number of local units per 100 inhabitants in province p at time t , and represents a measure of the whole *intensity of competitiveness* in that particular province.

Data on all variables mentioned above have been put together to construct a unique panel dataset made up of 1,430 observations, in which the 110 provinces represent the *cross-sectional dimension* and years from 2004 to 2016 denote the *time series dimension*. Tables 3.20 and 3.21 present the summary statistics for all the variables in the panel dataset.

In particular, by examining Table 3.20, it is immediately evident that both outcome variables present average and median values that certainly differ from each other. Notably, the mean is much higher than the median, which implies a right-skewed distribution. By comparing their maximum values with the 95th percentiles, it is clear that this is due to the presence of few, very large values. Therefore, in order to reduce the effect of these observations and to partially fix the skewness in the data, the natural logarithmic transformation has been applied to the number of patent applications before running the empirical regressions.

Table 3.20: Outcome Variables in the dataset from 2004 to 2016, summary statistics.

	IT patent applications	EU patent applications
Overall Mean	106	35
Minimum	0	0
Maximum	3,150	847
Median	22	8
5th percentile	2	0
95th percentile	380	137
Overall Std. Dev.	329	80
Between Std. Dev.	329	78
Within Std. Dev.	30	19
Observations	1,430	1,430
Provinces	110	110
Variable type	Outcome ₁	Outcome ₂

Source: own elaboration.

Moreover, from Table 3.20 it can be noted that both outcome variables exhibit a much higher between than within variation; this confirms that the number of patent applications is strictly related to local characteristics that do not vary much over time.

Table 3.21, instead, illustrates the summary statistics of the explanatory variables. As before, it can be pointed out that all variables display, as expected, a higher between than within variation, implying that they all vary more between provinces than over time. Moreover, all regressors except GDP appear to have a quite symmetrical distribution; hence, the log-transformed GDP has been used as control variable in the empirical regressions.

Table 3.21: Explanatory Variables in the dataset from 2004 to 2016, summary statistics.

	LSImmShare	GDP	UR	BussInt
	(%)	(mln)	(%)	(%)
Overall Mean	5.43	14,535	9.57	7.99
Minimum	0.21	870	1.87	5.01
Maximum	15.58	170,793	31.46	12.50
Median	5.17	8,809	8.34	8.17
5th percentile	0.86	2,683	3.28	5.45
95th percentile	11.11	36,149	20.36	10.35
Overall Std. Dev.	3.34	21,281	5.33	1.53
Between Std. Dev.	2.97	21,309	4.50	1.51
Within Std. Dev.	1.56	1,616	2.89	0.30
Observations	1,430	1,430	1,430	1,430
Provinces	110	110	110	110
Variable type	Key Regressor	Control	Control	Control

Source: own elaboration.

3.3.2. Estimation strategy: econometric model specifications

Also these additional empirical analyses are based on an unobserved effects model (UEM), since it is likely to exist some unobserved heterogeneity across provinces that affects patent applications and that somehow has to be taken into account. Therefore, the general empirical model employed is represented by the following equation:

$$y_{pt} = \boldsymbol{\beta} \mathbf{X}_{pt} + \alpha_p + \delta_t + u_{pt} \quad (21)$$

with $p = 1, \dots, P$, and $t = 1, \dots, T$

where provinces are indexed by p and years by t . y_{pt} is the dependent variable referred to province p at time t , $\boldsymbol{\beta}$ is the $K \times 1$ vector of parameters for the K explanatory variables, \mathbf{X}_{pt} is the $1 \times K$ vector of local-level explanatory variables computed for province p at time t , α_p are province-specific effects, δ_t are time-specific effects, u_{pt} are the idiosyncratic errors.

The model of Eq. (21) includes both provincial fixed effects – i.e. time-invariant differences across provinces that would influence the dependent variable – and time fixed

effects – i.e. time-specific factors that would also affect the dependent variable, like for instance macroeconomic cycles or changes in the patent regulations¹²².

The detailed models to be estimated on the panel dataset are presented hereinafter. The first one, used to analyze the effects of low-skilled immigration on *national* patent applications, can be represented as follows:

$$\begin{aligned} \ln(ITPatAppl)_{pt} = & \beta_1 LSImmShare_{pt} + \beta_2 \ln GDP_{pt} + \beta_3 UR_{pt} \\ & + \beta_4 BussInt_{pt} + \alpha_p + \delta_t + u_{pt} \end{aligned} \quad (22)$$

with $p = 1, \dots, 110$ and $t = 2004, \dots, 2016$

where the dependent variable, $\ln(ITPatAppl)_{pt}$, is the natural logarithm of the number of patent applications presented at the UIBM by residents in province p in year t .

Analogously, the second empirical model, aimed at investigating the impact of low-skilled immigration on *European* patent applications, is based on the following equation:

$$\begin{aligned} \ln(EUPatAppl)_{pt} = & \beta_1 LSImmShare_{pt} + \beta_2 \ln GDP_{pt} + \beta_3 UR_{pt} \\ & + \beta_4 BussInt_{pt} + \alpha_p + \delta_t + u_{pt} \end{aligned} \quad (23)$$

with $p = 1, \dots, 110$ and $t = 2004, \dots, 2016$

where the dependent variable, $\ln(EUPatAppl)_{pt}$, is the natural logarithm of the number of patent applications presented at the EPO by residents in province p in year t . In Eqs. (21) and (22) the key explanatory variable and the local controls are exactly the same and have already been defined above. The coefficient of interest, β_1 , captures the correlation, *ceteris paribus*, between the low-skilled immigrant share at the provincial level and the number of either national or European patent applications.

3.3.3. Assumptions violation: heteroskedasticity, serial correlation and endogeneity issues

As has been done before for the main analyses on the immigration effects on firms' performances, it was necessary to investigate whether the collected data showed heteroskedasticity and/or serial correlation. In this regard, a modified Wald test for heteroskedasticity and a Wooldridge test for autocorrelation revealed that both were present in

¹²² The presence of both types of fixed effects has been confirmed running the specific tests on the data, namely the Breusch and Pagan Lagrangian multiplier test and the Wald test on time dummies coefficients.

the panel dataset. Therefore, in order to account for both heteroskedasticity and serial correlation, standard errors have been adjusted for clustering at the provincial level.

In addition, the low-skilled immigrant share – even if computed at the provincial level – carried along the same endogeneity problems; clearly, the reasons for the presence of endogeneity are identical to those described in subparagraph 3.2.3. Thus, in order to be capable of identifying a potential *causal* effect of low-skilled immigration on innovation, the IV methodology have been employed¹²³. In particular, estimations have been obtained using the 2SLS technique, in which the first stage is expressed by the following reduced form equation:

$$\begin{aligned} LSImmShare_{pt} = & \gamma_1 Z_{pt} + \gamma_2 \ln GDP_{pt} + \gamma_3 UR_{pt} \\ & + \gamma_4 BussInt_{pt} + \alpha_p + \delta_t + e_{pt} \end{aligned} \quad (24)$$

Hence, resuming the structural Eqs. (22) and (23), the second stage regression equations, used to investigate the presence of a *causal* impact of low-skilled immigration on both national and European patent applications, are:

$$\begin{aligned} \ln(ITPatAppl)_{pt} = & \beta_1 \widehat{LSImmShare}_{pt} + \beta_2 \ln GDP_{pt} + \beta_3 UR_{pt} \\ & + \beta_4 BussInt_{pt} + \alpha_p + \delta_t + u_{pt} \end{aligned} \quad (25)$$

with $p = 1, \dots, 110$ and $t = 2004, \dots, 2016$

$$\begin{aligned} \ln(EUPatAppl)_{pt} = & \beta_1 \widehat{LSImmShare}_{pt} + \beta_2 \ln GDP_{pt} + \beta_3 UR_{pt} \\ & + \beta_4 BussInt_{pt} + \alpha_p + \delta_t + u_{pt} \end{aligned} \quad (26)$$

with $p = 1, \dots, 110$ and $t = 2004, \dots, 2016$

3.3.4. Regression findings

In this last subparagraph, these additional regression findings are finally illustrated. Again, the baseline results for the regressions of the two dependent variables – the number of Italian and European patent applications – will be presented first, using both the fixed-effects

¹²³ Since the instrument used in the previous analyses was available at the local labor market level, it has been adjusted in order ascribe it to provinces. The imputation procedure can be summarized by the following equation: $Z_{pt} = \sum_{m(p)t} Z_{j(m)t} \times \frac{Residents_{m(p)t}}{Residents_{pt}}$, where municipalities are indexed by m , provinces by p , local labor markets by j , and years by t . therefore, the instrument for province p in year t , Z_{pt} is computed by summing up, for each municipality m – belonging to province p – and year t , the instrument for LLM j – to which municipality m belongs – in year t , $Z_{j(m)t}$, multiplied by the share of residents in municipality m – belonging to province p – at the beginning of year t , $Residents_{m(p)t}$, out of total residents in province p at the beginning of year t , $Residents_{pt}$.

(FE) and the instrumental variables (IV) estimation procedures. Subsequently, also some robustness checks and heterogeneity analyses will be briefly described.

Baseline results

Table 3.22 shows the fixed effects estimates of models in Eqs. (22) and (23). Column (1) presents the results obtained from the model designed to investigate the low-skilled immigration effects on Italian patent applications. By looking at the coefficient of interest, it emerges a small negative correlation between the outcome variable and the key regressor, but this effect seems to be not significantly different from zero.

**Table 3.22: FE estimates with firm and time fixed effects.
Dependent variables: Italian and European patent applications.**

	(1)	(2)
	lnITPatAppl	lnEUPatAppl
LSImmShare	-0.0044 (0.0345)	-0.0516*** (0.0182)
lnGDP	0.0829 (0.6153)	-0.0709 (0.4810)
UnemplRate	-0.0070 (0.0088)	0.0036 (0.0075)
BussInt	0.1821** (0.0858)	-0.0885 (0.0678)
Constant	1.0244 (5.6622)	3.7008 (4.3960)
Within R ²	0.1032	0.1605
LSDV R ²	0.9300	0.9405
Rho	0.9049	0.9515
Local fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Observations	1,430	1,430
Provinces	110	110
Time series length	13 yrs	13 yrs

Standard errors clustered by province in parentheses. 110 clusters based on the 2009 administrative subdivision.

*, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Nonetheless, different assertions can be made in respect to the results obtained for the regression of European patent applications, which are displayed in column (2). This time, the estimate of the marginal effect of immigration on innovation displays a strong statistical significance and points to a higher share of less-educated immigrants in a given province to be

associated with a lower number of patent applications made by residents in the same area. Notably, when the low-skilled immigrant share rises by one percentage point, the number of European patent application decreases, on average, by 5.16 per cent.

As an aside, it can be said that: i) both models display high intraclass correlation, i.e. 0.90 and 0.95 respectively; ii) both local productivity and employment opportunities seem to be not related to the number of patent applications, since all coefficients' estimates are not statistically different from zero; iii) local competition, instead, appears to be positively associated with national patent applications, but not with European ones.

Table 3.23 illustrates the 2SLS instrumental variable estimates of both empirical models. In particular, column (1) reports the first stage results as per Eq. (24), which are exactly the same for both models in Eqs. (25) and (26). It can be noted that the coefficient of the instrument Z , which represents its marginal effect on the low-skilled immigrant share, is positive and significant at the one per cent level; as before, this indicates that the instrument is relevant¹²⁴. Moreover, since the cluster-robust Kleibergen-Paap Wald rk F statistic is higher than the 15 per cent Stock-Yogo critical value, the instrument can also be deemed to be not weak.

Column (2) displays the results of the fixed-effects IV estimation of Eq. (25). With respect to the previous FE estimation of Table 3.20, it can be observed that the coefficient of interest is still negative although lower in its absolute value; but, more importantly, it continued to be statistically insignificant. Therefore, it can be said that the presence of low-skilled foreigners does not exert a causal effect on patent applications, at least as far as those presented at the Italian patent office are concerned.

Different conclusions can be drawn by looking at column (3), which exhibits the results of the fixed-effects IV estimation of Eq. (26). Comparing the reported values with those in Table 3.20, it can pointed out that the key coefficient continued to be negative and even doubled in magnitude; however, it displays a lower statistical significance. Hence, it can be affirmed that a higher share of less-educated immigrants in a certain province is likely to cause a reduction in the number of European patent applications presented by residents in the same area. Specifically, a one-percentage point increase in the low-skilled immigrant share seems to lead to a decline, on average, by about 11 per cent in the number of patent applications presented at the EPO.

¹²⁴ Instrument relevance has been corroborated running an underidentification Lagrangian Multiplier test, which proved that the first stage equation was indeed identified.

**Table 3.23: First stage and IV estimates with firm and time fixed effects.
Dependent variables: Italian and European patent applications.**

	1 st stage LSImmShare	2 nd stage lnITPatAppl	2 nd stage lnEUPatAppl
LSImmShare		-0.0012 (0.1617)	-0.1087* (0.0659)
lnGDP	1.1496 (0.9204)	0.0771 (0.6267)	0.0322 (0.5027)
UnemplRate	0.9203* (0.0159)	-0.0071 (0.0090)	0.0051 (0.0076)
BussInt	-1.6170*** (0.2976)	0.1880 (0.1347)	-0.1947 (0.1366)
Z	0.2108*** (0.0654)		
Constant	4.7052 (9.1808)	1.0204 (5.6619)	3.7714 (4.3732)
Within R ²	0.8833	0.1031	0.1550
Rho	0.9854	0.9046	0.9596
F statistic	11.26		
Local fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Observations	1,430	1,430	1,430
Provinces	110	110	110
Time series length	13 yrs	13 yrs	13 yrs

Standard errors clustered by province in parentheses. 110 clusters based on the 2009 administrative subdivision.
*, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Robustness checks

Regression findings displayed above can be said to be quite in line with those presented in the extant literature on the subject. In fact, as far as low-skilled immigration is concerned, most of previous studies failed to report a significant negative effect of immigration on innovation.

Anyway, some (limited) robustness checks have been run on the available data. What has been done in this respect consists in initially restricting the explanatory variables to males and females separately. Indeed, Table 3.24 illustrates the IV estimates obtained using as key regressor the low-skilled immigrant share computed either on the male or female population

only¹²⁵. By looking at column (1), which shows the estimates for the effect on national patent applications, it can be noticed that both coefficients are very low, even if that obtained employing the male share is slightly negative and that obtained with the female share is slightly positive; however, neither of them is significantly different from zero. Column (2), instead, reports the estimates of the impact on European patent application made by Italian firms. This time, the coefficients are both negative and quite similar in magnitude, but only that obtained using the female share is statistically different from zero – even if only at the 10 per cent level.

Table 3.24: IV estimates of the impact of the low-skilled immigrant share computed separately for males and females. Dependent variables: Italian and European patent applications.

	(1) lnITPatAppl	(2) lnEUPatAppl
LSImmShare for males	-0.0033 (0.0680)	-0.1054 (0.0667)
LSImmShare for females	0.0006 (0.0732)	-0.1138* (0.0667)
Local-level controls	Yes	Yes
Local fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Observations	1,430	1,430
Provinces	110	110
Time series length	13 yrs	13 yrs

Standard errors clustered by province in parentheses. 110 clusters based on the 2009 administrative subdivision. *, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Given that a very low statistical significance emerged only for some coefficient estimates, in particular when employing as dependent variable the European patent applications, the existence of a negative causal effect of low-skilled immigration on innovation cannot be deemed to be confirmed for sure. Therefore, in this respect, considering that in 2016 the number of requests for patent protection presented at the EPO by Italian residents were extraordinary below the average (see Figure 13.3), observations for that specific year have been excluded from the data and then regressions have been run again. Hence, Table 3.25 contrasts the IV estimates with and without observations for 2016. It is immediately clear that the negative effect of low-skilled immigration on European patent applications is no longer statistically significant, for none of the coefficients reported. And these results are eventually

¹²⁵ The same has been done for the unemployment rate.

in line with those obtained from regressions carried out using the number of national patent applications as outcome variable.

**Table 3.25: IV estimates with and without observations for year 2016.
Dependent variable: European patent applications.**

	With 2016 lnEUPatAppl	Without 2016 lnEUPatAppl
LSImmShare	-0.1087* (0.0659)	-0.0708 (0.0664)
LSImmShare for males	-0.1054 (0.0667)	-0.0684 (0.0658)
LSImmShare for females	-0.1138* (0.0667)	-0.0758 (0.0682)
Local-level controls	Yes	Yes
Local fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Observations	1,430	1,320
Provinces	110	110
Time series length	13 yrs	12 yrs

Standard errors clustered by province in parentheses. 110 clusters based on the 2009 administrative subdivision. *, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Obviously, like all robustness tests, also the analyses presented above may be questionable and considered not fully conclusive. However, given that the estimates of the core coefficient are systematically negative, it can be said that a negative effect of low-skilled immigration on innovation cannot be excluded for sure.

Heterogeneous effects

As has been done before for the analyses on the impact of low-skilled immigration on firms' performance, some additional investigations have been conducted in order to disclose the presence of any heterogeneous effect. Hence, the Italian provinces have been divided in three larger geographical areas – namely North, Center, and South, in line to the ISTAT partition of the Italian territory – in order to investigate whether some diversity in the effect of low-skilled immigration would have emerged among these three areas.

As far as national patent applications are concerned, Table 3.26 illustrates the estimates of the coefficient of interest obtained by running separate regressions on the three subsamples of provinces. It can be observed that the marginal effect of low-skilled immigration turned out

to be positive for the North and slightly positive for the Center, whereas it appeared to be strongly negative in the South. However, despite this apparent heterogeneity, the effect of low-skilled immigration on national patent application never proved to be statistically different from zero.

Table 3.26: IV estimates of the impact of the low-skilled immigrant share on subsamples based on the geographical area. Dependent variable: Italian patent applications.

	All sample lnITPatAppl	North lnITPatAppl	Center lnITPatAppl	South lnITPatAppl
LSImmShare	-0.0012 (0.1617)	0.3487 (0.2151)	0.0067 (0.1530)	-1.4985 (1.4442)
Local-level controls	Yes	Yes	Yes	Yes
Local fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	1,430	611	286	533
Provinces	110	47	22	41
Time series length	13 yrs	13 yrs	13 yrs	13 yrs

Standard errors clustered by province in parentheses.
*, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Table 3.27: IV estimates of the impact of the low-skilled immigrant share on subsamples based on the geographical area. Dependent variable: European patent applications.

	All sample lnEUPatAppl	North lnEUPatAppl	Center lnEUPatAppl	South lnEUPatAppl
LSImmShare	-0.1087* (0.0659)	-0.2116 (0.1627)	0.0552 (0.1266)	-1.1248 (1.1591)
Local-level controls	Yes	Yes	Yes	Yes
Local fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	1,430	611	286	533
No. of firms	110	47	22	41
Time series length	13 yrs	13 yrs	13 yrs	13 yrs

Standard errors clustered by province in parentheses.
*, **, and *** denote significance at 10%, 5%, and 1% level, respectively.

Source: own elaboration.

Table 3.27, instead, shows the estimates for the effect of less-educated foreigners on European patent applications. Again, the coefficient estimates differ between the three areas; the marginal effect of the low-skilled immigrant share is negative in the North and strongly negative in the South, but positive in the Center. However, none of the estimates obtained are statistically significant.

CONCLUSIONS

The work presented in this paper could be assimilated to the quite limited group of empirical researches that investigate the impact of immigration on innovation and firms' performance. However, this study can be deemed to be quite peculiar, at least in two aspects. The first peculiarity is linked to the dimensions of the sample considered; in fact, the baseline analyses are conducted on observations belonging to more than 92,000 manufacturing companies, and this number, compared to other firm-level studies, can be said to be quite remarkable. The second peculiarity concerns the type of outcome variables selected for the empirical investigations; as far as is known, there are no notable studies that focus on firms performance indicators like those employed in this paper. Most of the academic literature that analyzes the effects of immigration on company dimensions, rather aims attention at absolute values of profits or capital stocks. Hence, the use of financial statement ratios as dependent variables in this type of studies can be said to be quite a novelty. Clearly, empirical findings based on ratios may differ from those based on absolute measures; indeed, there are a variety of company dynamics that contribute to determine financial ratios, and focusing also on this type of indicators may provide a wider picture on the effects of immigration on domestic firms.

Specifically, the present work is primarily focused on investigating the (causal) effects exerted by low-skilled immigration on the operating profitability and efficiency of Italian manufacturing firms. In order to do so, different regression analyses have been conducted employing both the fixed-effects and the instrumental variables methodologies. These analyses have been run on a large panel dataset, which combines firm-level and local-labor-market-level dimensions collected for the ten-year period between 2008 and 2017. In all empirical specifications, the local share of low-skilled immigrants out total population has been exploited as key regressor, assuming it as being a good proxy for the number of foreigners employed by firms. In addition, a set of local controls have been added to the model to account for macro dimensions that may also affect firms' performance. In order to investigate the impact of immigration on firms' operating profitability and efficiency, the EBITA margin and the asset turnover ratio have been adopted, respectively, as outcome variables.

Results point to a significant negative effect of low-skilled immigration on both profitability and efficiency of manufacturing firms. In other words, a higher share of immigrants in a given area causes a reduction, on average, in both EBITA margins and asset turnover ratios

of companies located in the same area. These findings are confirmed when adding also firm-level controls to the model specification and prove to be robust to different types of sample reductions. Moreover, some heterogeneous effects analyses suggest, in general, a sharper effect for companies located in the Center of the country and for companies operating in low-tech and medium-low-tech industries.

In the light of the above, some additional investigations have been performed in order to check whether low-skilled immigration might have negatively influenced firms' profitability and efficiency through its impact on innovation propensity. For this purpose, the number of patent applications – presented both at the national and at the European offices – has been employed as proxies for innovation activity more broadly. Data on patent applications have been combined with other provincial level data to build a second panel dataset for the years between 2004 and 2016. Results obtained using analogous empirical strategies suggest a possible negative effect of the low-skilled immigrant share on both patent dimensions. Even if the estimated coefficients are not statistically different from zero in all model specifications, they are systematically negative; these findings point to the eventuality that a higher presence of low-skilled immigrants into a particular province might have slacken the innovative propensity of firms located in the same area.

At first glance, the results came to light in this work may appear to clash with those emerged from previous empirical researches; however, a more careful analysis may reveal that they simply tell the story from another perspective. Obviously, a higher presence of less-educated foreigners in a region causes a shift in the local labor supply towards cheap manual-intensive labor. Thus, labor-intensive companies – as most of those operating in the manufacturing sector are – are likely to hire more immigrant workers, driven by the opportunity of easily reducing their payroll costs, thereby increasing their profits. This is in line with findings presented by Brunello *et al.* (2019), who observe a reduction in firms' labor costs and a slightly positive increase in their profits. However, immigrants may bring along some communication and integration issues that may also exert an influence on firms' performance, but in a more subtle way. For instance, to perform the same tasks, foreign workers are likely to require more on-the-job training than natives, both because they have a relatively low educational attainment and because face substantial linguistic barriers that hinder their communication and learning. Hence, companies might incur in higher costs, in broad sense, mainly in terms of discontent among native workers and of resulting general laxity in the working environment. These dynamics, altogether, may have negative effects on the overall firm productivity, which in turn may trigger a deterioration of efficiency and profitability indicators. In fact, this could be consistent with evidence provided by Parrotta *et al.* (2010) for

Denmark, Nicodemo (2013) for Spain, and Brunello *et al.* (2019) for Italy, who all discover a negative effect of immigration on firm productivity.

Moreover, in the light of the results emerged with regard to patent applications, it can be said that the initial cost reduction linked to hiring more foreign workers might discourage firms' investments in innovation over time. This behavior, in the long run, is likely to reduce companies' competitiveness, forcing them to lower their prices, thereby decreasing their profitability. In addition, companies that do not innovate and renovate their capital investments are forced to face problems due to obsolescence that further reduce their efficiency and profitability over time. This possibility is also in accordance with conclusions reported by Lewis (2011), who observes that firms respond to increases in the relative supply of low-skill labor by reducing their investments in technology.

Obviously, those presented above are just hypotheses that represent a possible interpretation of the results emerged in this paper and may be seen also as suggestions for further analyses on these topics. Essentially, these potential explanations are based on the assumption that Italian firms' may prefer short-term profits to longer-term benefits. This behavior can be deemed reasonable if we think that the majority of manufacturing firms in Italy are small firms, often undercapitalized, that struggle to generate sufficient cash flows to stay competitive and develop innovative projects. Such companies could have easily preferred higher immediate profits, even if this would have meant sacrificing long-term profitability and efficiency, especially in the years following the economic crisis that so harshly affected Italian firms.

However, it should not be forgotten that those analyzed in this work are simple indicators that conceal complex business dynamics and require a set of additional information to be interpreted at best. Furthermore, empirical results strictly depend on the assumptions made in order to select the sample and to construct the database, as well as on the statistical methodologies employed.

To conclude with some considerations regarding the limitations of this study, it can be said that, as is confirmed by the low r-squared obtained in the analyses, the large sample of firms employed entails high unexplained variability. Perhaps, restricting the sample may allow reducing some of this variability, however leading to less general conclusions. Nevertheless, this heterogeneity can even be assumed as intrinsic of a business environment that, like the Italian one, is characterized by a multitude of small and medium enterprises.

Another possible issue may be linked to the identification of the firms' location through the reported operating address. Since some companies are likely to have more than one single establishment, the analyses may be partially influenced by this assumption. Obviously, having

more detailed information about the different plants' location may lead to more accurate empirical analyses. Similarly, also the use of the immigrant presence in the territory as a proxy for the number of foreign workers employed by firms can to some extent be misleading, and the use of information on companies' employment may produce more reliable results.

Besides all these considerations, what is clear is that migration is likely to continue to be important in the near future, because of ongoing strong pressures towards globalization, capitalistic demand for cheap labor, and people's desire to move in order to improve their life opportunities. Hence, given its strict relation to human development and economic prosperity, immigration will remain a top priority for the foreseeable future. And is beyond doubt that there is still so much left to investigate in the way in which immigration affects domestic dynamics.

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