Papers in Evolutionary Economic Geography

12.16

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Andrés Rodríguez-Pose and Viola von Berlepsch

Utrecht University
Urban & Regional research centre Utrecht

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by

Andrés Rodríguez-Pose and Viola von Berlepsch

[1] Department of Geography and Environment, London School of Economics, Houghton St, London WC2A 2AE. E-mail: a.rodriguez-pose@lse.ac.uk; viola.vberlepsch@googlemail.com.

Acknowledgements: The authors are grateful to participants at conferences in Kiel and Bratislava for their stimulating comments to earlier version of this paper. The financial support of the European Research Council under the European Union's Seventh Framework Programme (FP7/2007- 2013)/ERC grant agreement nº 269868 is gratefully acknowledged. The usual disclaimer applies.

When migrants rule: the legacy of mass migration on economic development in the US

Abstract: This paper examines the extent to which the distinct settlement pattern of migrants arriving in the US during the big migration waves of the late 19th and early 20th centuries has left a legacy on the economic development of the counties where they settled and whether this legacy can be traced until today. Using data from the 1880, 1900 and 1910 censuses, we first look at the geography of migration across US counties in the 48 continental states. We then link this settlement pattern of migrants to current levels of local development – proxied by GDP per capita at county level in 2005 – while controlling for a number of factors which may have influenced both the location of migrants at the time of migration, as well as for the economic development of the county today. The results of the econometric analysis including instrumental variables underline that the big migration waves have left an indelible trace on territories which determines their economic performance until today. US counties which attracted large numbers of migrants more than a century ago are still more dynamic today than counties that did not. The results also show that the territorial imprint of migration has become more pervasive than all other local characteristics which would have determined and shaped economic performance in the late 19th and early 20th centuries.

Keywords: Migration, economic development, institutions, culture, long-term legacy, counties, US

Introduction

The United States (US) has always been regarded as a country of migrants. Despite some historical ebbs and flows in migration trends, mainly linked to changes in legislation, the perception that the US was built by migrants is in its very DNA. The spirit of the migrant is considered to be at the heart of the ambition, risk-taking, entrepreneurship and economic dynamism which popularly characterizes the US.

There is certainly no shortage of studies explaining the positive impact of migration on the overall economic trajectory of the US (e.g. Gordon, 1964; Neal and Uselding, 1972; Romer, 1996; Hirschman and Mogford, 2009). However, the specific long-term impact of mass migration – especially during the second half of the 19th century and the first 15 years of the 20th-century – on current disparities in development and on the evolution of these disparities has attracted much less attention and is still relatively poorly understood. Did late 19th and early 20th century migrants leave a legacy in those places where they settled in big numbers? Or was the settlement pattern of migrants irrelevant for ensuing economic development? If that legacy existed, can it be traced until today? Or did it wane and ultimately disappear as migrants and their descendants became assimilated in the US or moved to other parts of the country?

This paper addresses this gap in the literature and assesses the above questions. It first uses US census data from 1880, 1900 and 1910 in order to determine the geographical settlement pattern of migrants coming to the US at county level. It then analyses the connection between the geographical concentration of migrants and 21st century levels of development – proxied by GDP per capita at county level in 2005 – while controlling for factors which may have influenced the location of migrants at the time of the big migration, as well as for those which may affect economic development today. The aim of the study is to examine whether the geographical settlement pattern of migrants during the major migration waves have left a territorial imprint which can be felt in the current level of development of US counties.

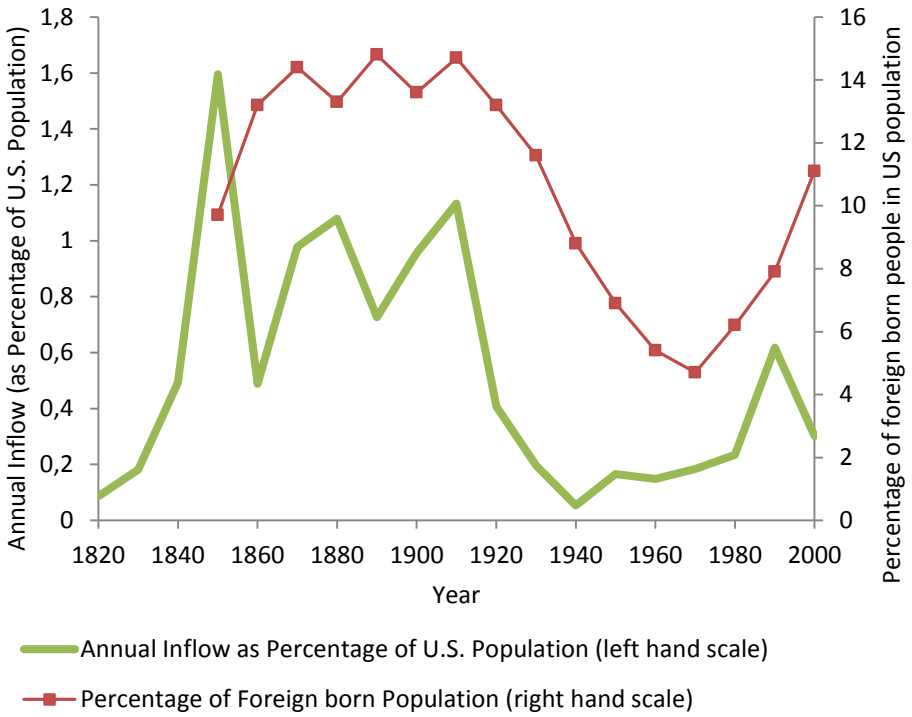
Our hypothesis is that in areas where migrants settled in larger numbers, a culture associated with the values of migrants (entrepreneurship, risk-taking, dynamism) was generated and that this migrant culture and the institutions it created have left an indelible trace on territories. We also posit that this trace has determined the economic trajectory of US regions and counties over the last century and is still very much visible today. Our view is that the territorial imprint associated with migrant culture and institutions has become more pervasive than all

other local characteristics which would have determined and shaped economic performance at the time of the mass migration of the late 19th and early 20th centuries.

European mass migration to America – a short overview

During the period between 1860 and World War I (WWI), more than 40 million people left Europe to move to the 'new world' (Hatton and Williamson, 1994). The main destination for about two thirds of the migrants was North America, in particular the US, followed by South America and Australasia (Hatton and Williamson, 1994; Bertocchi and Strozzi, 2006). In the US alone the number of foreign born increased from almost 4 million in 1860 to little under 14 million in 1920 (Gibson and Jung, 2006). This rapid increase of foreign born population is portrayed in Figure 1 as percentage of total US population. The figure also displays the annual inflow of foreign population as a percentage of total US population over time. Absolute numbers are presented in Table 1. All nationalities, except for the Chinese whose migration to the country was mostly prevented by the Chinese Exclusion Act of 1882, were free to enter the country en masse and to roam freely (Carter and Sutch, 2006).

Figure 1. Annual inflow of migrants and foreign born as percentage of US population.



Source: US Immigration and naturalization Service, Statistical Yearbook 1994 and Gibson and Jung, 2006; own calculations

Table 1. Foreign born population in the United States.

year	1850	1860	1870	1880	1890	1900	1910	1920
total population US	23,191,876	31,443,321	38,558,371	50,155,783	62,622,250	75,994,575	91,972,266	105,710,620
native population	20,947,274	27,304,624	32,991,142	43,475,840	53,372,703	65,653,299	78,456,380	91,789,928
foreign born population	2,244,602	4,138,697	5,567,229	6,679,943	9,249,547	10,341,276	13,515,886	13,920,692
total of Europeans	2,031,867	3,807,062	4,941,049	5,751,823	8,030,347	8,881,548	11,810,115	11,916,048
% native population	90.3	86.8	85.6	86.7	85.2	86.4	85.3	86.8
% foreign born population	9.7	13.2	14.4	13.3	14.8	13.6	14.7	13.2
% of Europeans in foreign born population	92.2	92.1	88.8	86.2	86.9	86	87.4	85.7

Source: Gibson and Jung, 2006, own calculations

From the multiple peaks shown in Figure 1, two main waves of mass migration to the US can be identified. Commonly, a distinction between old and new 19th century migration is made. The old or first wave of immigrants started to arrive in the US in the pre-Civil War period, slowed down during the war and picked up speed again in the post-war era. This wave is clearly indicated by the first large peak in annual inflow of foreign population in Figure 1 around 1850. First-wave immigrants mainly originated from northern and western European countries, such as England, Ireland, Germany and Scandinavia. In 1870, 4.7 of the 5.5 million foreign-born residents in the United States mentioned these countries as their birthplaces (Alexander, 2007).

While the first wave of migration continued at a strong rate, a second or new wave of immigrants first became evident in the 1880s, gained strength in the 1890s, and surpassed the number of total arriving immigrants from first wave countries already by 1896. In Figure 1, this second wave is distinguishable during the time period between 1880 and 1910. This wave displayed a fundamental shift in the geographical origin of immigrants. Southern and eastern European countries, such as Italy, Greece, Poland, Austria-Hungary, Russia and other former Soviet countries, now provided the bulk of the immigrant flow. By the early 1900s, the number of southern and eastern Europeans arriving in the US doubled those migrants from old immigration countries (Alexander, 2007).

Many studies undertaken for individual countries of origin have analyzed the composition of migration flows to the US and reached similar results. Generally, outward migration affected every profession and all classes of people. However, concentration was highest in the middle and lower-middle ranks of society (Baines, 1992). A large part of the old-wave and the great majority of the new-wave migrants originated from rural or so-called proto-industrial areas, "where there were many agriculturalists but little agriculture" (Kamphoefner, 1976, p. 182). In these areas, a high birth rate combined with unprofitable agriculture left large parts of the population without a possibility of inheriting or marrying into existing estates. Due to this low land access, as observed for instance in the rural parts of Ireland, Germany or in the south of Italy, landless laborers had to seek employment and a better quality of life elsewhere (Fitzpatrick, 1983).

The reasons for this massive migration movement out of Europe are manifold. However, in 19th century Europe, some general factors can be identified which served as push- and pull-factors and affected the migration decision of those evaluating relocation.

Next to the European famine and revolutionary movements, migration was triggered by the changing economic structure combined with the 'old world's' incapacity to absorb the vast amount of landless farmers. High unemployment, decreasing real wages and generally limited economic opportunities thus became powerful push-factors. In addition, the situation was aggravated by a rapid population growth. Mandatory military conscription, discrimination and religious or political persecution also spurred the migration decision of many (Hatton and Williamson 1994, 2005; Alexander, 2007).

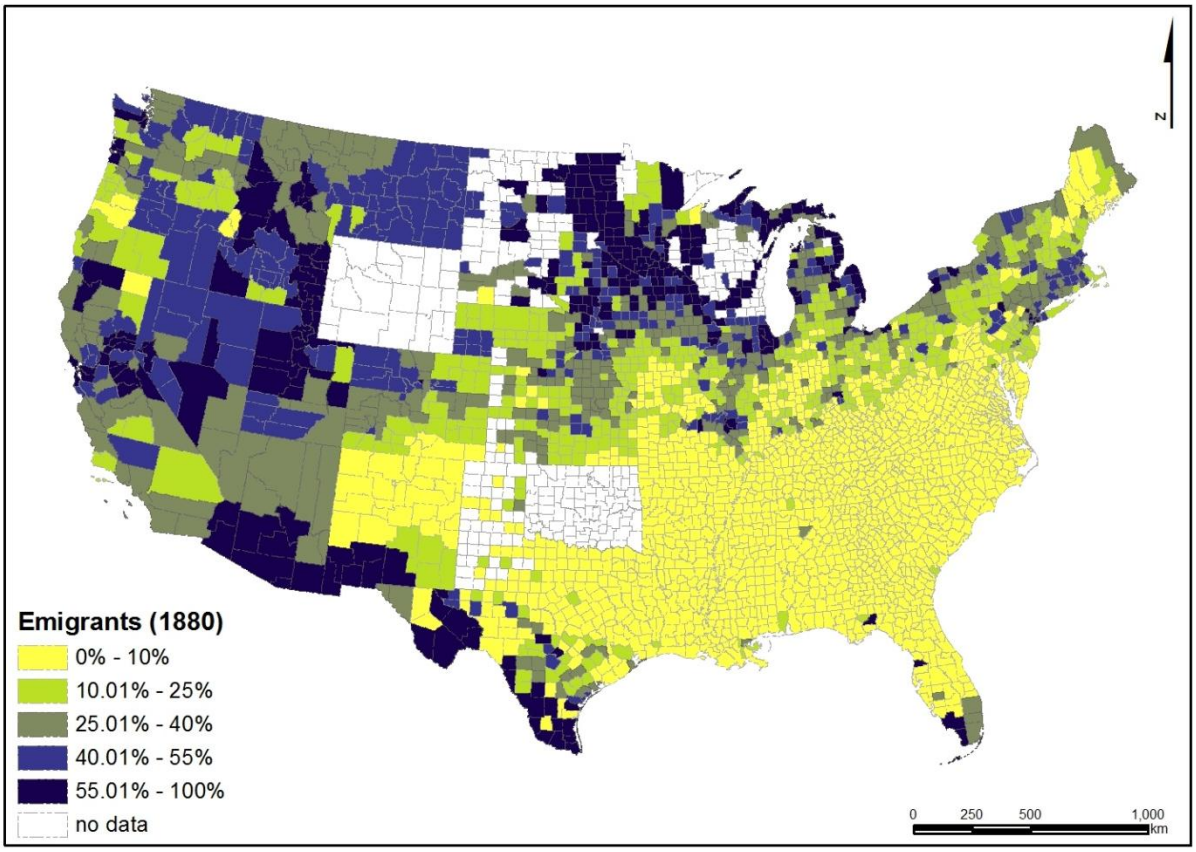
On top of the push-factors, there were a number of important pull-factors. The US was seen as the 'new world', where economic opportunity, as well as religious and political freedom was believed to await. The large income differences between both continents and the high degree of industrialization in the US were further aspects boosting immigration. The rapidly developing US industry "was creating a voracious demand for unskilled laborers" (Alexander, 2007) and was therefore able to rapidly absorb those seeking to improve their lives. Moreover, the relatively young population of the US further stimulated immigration flows, as most of the emigrants tended to be young adults. Another decisive role in attracting migrants was played by religious and political institutions. As discussed in Engerman and Sokoloff (2002), destination countries such as the US displayed far more advanced systems than Europe, where democratization – with a few notable exceptions – had only gradually started to evolve. One example is enacted emigration policies in receiving countries which in the US

included provisions for access to land and public education (Engerman and Sokoloff, 2002). In addition, during the time period considered, European emigration flows were not hindered by any sort of federal US legislation. The state only intervened in those individual cases "likely to become a burden on the community, such as convicts and paupers" (Gordon, 1961, p.267). The most important pull-factors, however, were the network effects, established by already settled migrants (Bertocchi and Strozzi, 2006). Personal ties were strong forces fostering mass migration. Already settled migrants frequently sent letters home containing information about the living conditions, the land, the jobs and the wages in the US. Sometimes, these letters even contained the boat ticket or money to buy passages. Between autumn 1907 and summer 1910, nearly 94 percent of all those arriving at US ports claimed to join either family or friends (Alexander, 2007).

Country-specific studies draw the average profile of those leaving their homeland and migrating to the US. The average migrant in the period between 1860 and WWI was male,[1] single, young, poor, and unskilled [e.g. Carlsson, 1976; Bodnar, 1992 (Sweden); Erickson, 1972 (Great Britain); Fitzpatrick, 1984 (Ireland)]. This migrant profile had changed over time as early immigrants tended to be married couples with children (Alexander, 2007). As most migrants were supported and assisted by previous migrants in the areas of destination, newcomers tended to settle down in the same places as their relatives, friends or acquaintances, creating path dependence and a persistence in migration flows (e.g. Vedder and Gallaway, 1972; Levy and Wadycki, 1973; Duntlevy and Gemery, 1977) Therefore, even though the vast majority of migrants between 1870 and 1920 entered the country through the port of New York, they ended up settling down in different parts of the country, leading to the formation of strong migrant communities from particular national or even local origins. While first-wave immigrants tended to migrate fundamentally to rural areas, searching for farmland to cultivate, second-wave immigrants at first followed in the footsteps of their predecessors, but were later mostly drawn to the US cities and industrial areas (Alexander, 2007). Their geographical settlement pattern, according to the 1880 Census, is portrayed in Figure 2.

[1] 64 percent of all immigrants to the US between 1851 and 1910 were male,usually between the ages of 15 and 25.

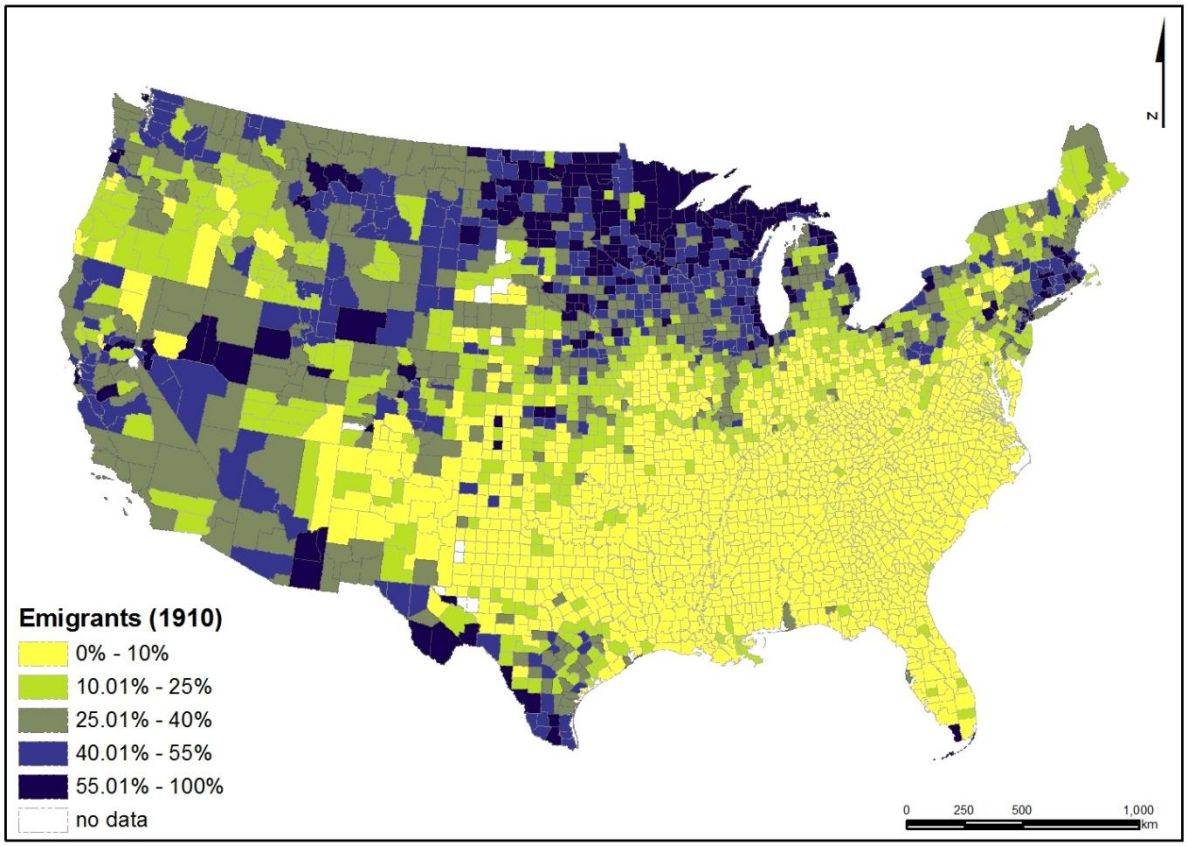
Figure 2. Percentage of migrants or children of migrants by county in 1880.



Source: Own elaboration.

Figure 2 shows the situation at the end of the first migration wave. After entering the US generally through the port of New York, most settlers moved to the north and further west. The 'old' South remained mostly out of bounds for migrants and inhabited by native born residents. In this wave, migrants, primarily from Germany, Ireland, England, and the Scandinavian countries, tended to settle in the countryside of Minnesota, Wisconsin, Michigan, Iowa, and northern Illinois. Further to the west, sparsely populated counties in Idaho, Utah, Arizona, Montana, Nevada, and parts of California, as well as southern Texas and the southern tip of Florida in the south, also witnessed high percentages of first-wave migrants.

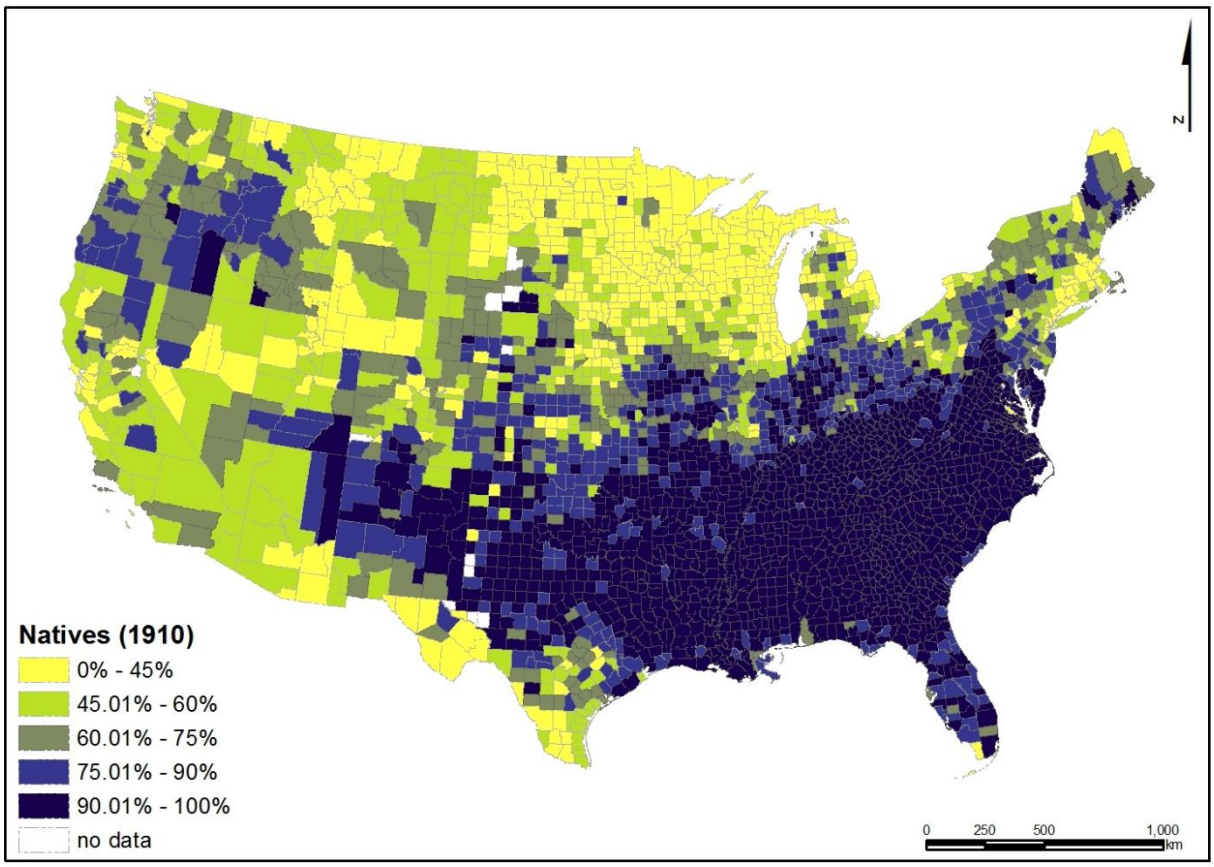
Figure 3. Percentage of migrants or children of migrants by county in 1910.



Source: Own elaboration.

The situation thirty years later, at the peak of the second-wave of migration, did not show a massive change in the settlement pattern (Figure 3). The English, Irish, Scandinavian, and Germans of the first-wave had been gradually replaced by Italians, Poles, Russians, Greeks and other nationalities, but the 'old' South remained firmly out of bounds for migrants. Poles and Russians settled in droves in Minnesota, Wisconsin, Iowa and northern Michigan – following in the footsteps of Germans and Scandinavians – but also stayed in New York and in the cities of New England, the preferred destination for Italians and, to a large extent, Irish.

Figure 4. Percentage of US-born residents by county in 1910.



Source: Own elaboration.

By contrast, US-born residents were overwhelmingly dominant in the South. They made also large majorities in parts of the Mid-West, as was the case in Ohio or Indiana, and in isolated states, such as Maine, New Mexico, or Oregon (Figure 4).

Migration and economic development

What is the link between migration and long-term economic development? Many scholars claim immigration to be a major driving force behind the economic development of countries. In the case of the US, Hirschman and Mogford (2009) consider migrants in the 19th century to have been a fundamental force behind the industrial transformation of the country's economy between 1880 and 1920. According to Neal and Uselding (1972), the US capital stock in 1912 would have been approximately 13 to 42 percent lower without the mass immigration of the previous decades. They further assume the migrants' impact on human capital to have been at least as great.

But how is this impact achieved? In the scholarly literature evaluating host country effects, concerns about the effects of immigrants on host country wages (i.e. Borjas, Freeman and Katz, 1992; Friedberg and Hunt, 1995), on the economic prospects of the native population (i.e. Borjas, 1994a, 1999; Card, 2005), on jobs (i.e. Friedberg and Hunt, 1995; Altonji and Card, 1991; Borjas, 1989), and on overall economic growth (i.e. Reichlin and Rustichini, 1993) have dominated the discussion. Hence, three different types of theoretical models prevail: labor market- (the biggest and most widely analyzed, i.e. Borjas 1995, 2000), growth- (i.e. Reichlin and Rustichini, 1993; Walz, 1995; Lundborg and Segerstrom 1999, 2002) and trade models (i.e. Bhagwati and Srinivasan, 1983; Ethier, 1985; Schiff, 1996).

In the context of this paper, we will focus only on the strand of literature evaluating the impact of migration on economic development and growth in the host or receiving country. By and large, most scholarly literature dealing with this topic tends to consider the influx of migrants as a positive force for economic development. This is generally achieved by a number of mechanisms, which include increasing returns to scale, changes in the composition of the labor force and the effects on wages and innovation.

1. Immigration and returns to scale

Immigration leads to an expansion of the labor force and, therefore, of the size of the market. Moreover, as most of the immigrants to the US during late 19th century tended to be male and young, their participation rate in the labor force exceeded that of native-born Americans (Hirschman and Mogford, 2009). Hence the increase in population size and in labor participation would have resulted in a rise of the productivity of labor. Chenery (1960), after examining the productivity of manufacturing workers in 63 countries, established that doubling a country's size, ceteris paribus, enhances workers' productivity by up to 20 percent. This size effect combined with the creation of new interaction possibilities between workers and firms would have generated considerable positive externalities in the US at the time (Reichlin and Rustichini, 1993; Borjas, 1995), leading to an increase in the stock of production factors and to new knowledge. Consequently, "even though production technology at the firm level has constant returns to scale, the external effects resulting from immigration might lead to increasing returns to the aggregate" (Borjas, 1995, p.11). Growing unemployment or a crowding-out effect of natives due to increased immigration has been ruled out by Ortega and Peri (2009), whose results further imply an increase in the total GDP of the host country without necessarily dragging down labor productivity.

Another argument in favor of the link between immigration and increasing returns to scale centers around the generation of economies of scale, and of an increased demand for industrial goods (Romer, 1996; Abramovitz and David, 2000). The US industry in the late 19th century could thus take advantage of the inflow of workers flocking into the large American cities of the North East or into Chicago, Detroit, Buffalo, or Cleveland. With growing efficiencies in production, more and more profits could be reinvested in technology, which would have, in turn, further increased production (Hirschman and Mogford, 2009). The demand side, and hence economic growth, was further stimulated through the immigrants' growing demand for housing, urban development and other amenities (Easterlin, 1968). This demand was principally met through an increase and a greater diversity of local production (Mazzolari and Neumark, 2009).

2. Immigration and the composition of the labor force

A large influx of heterogeneous labor into a host country's economy also triggers important changes in the composition of the labor force and, in particular, in the ratio of skilled to unskilled workers. While an increase in the ratio unambiguously yields positive growth rates, a decrease strongly depends on the elasticity of substitution between skilled and unskilled labor (Lundborg and Segerström, 1999, 2002). Put differently, the greater the difference in skills between immigrants and natives, the larger the benefits for the receiving economy. Therefore, the impact of immigration would be larger "if the host country admits immigrants who most complement the skilled native workers or unskilled immigrants [...] as well as if the host country admits immigrants who most complement the native-owned capital, or skilled immigrants" (Borjas, 1999, p. 1706). In late 19th century America, the transformation of the economy caused an ever growing demand for unskilled labor. The large influx of unskilled or differently skilled immigrants perfectly satisfied this need, thus contributing to rapid increases in labor productivity. Furthermore, "immigration allows domestic workers to be used more productively, specializing in producing goods at which they are relatively more efficient" (Smith and Edmonston, 1997, p.5). Migration therefore allowed even the less-educated native labor force to specialize in more productive complementary jobs, due to their comparative advantage vis-à-vis the masses of immigrants. Their knowledge of English and local institutions upgraded their appeal to local employers (Peri and Spaber, 2009). This complementarity between native and foreign-born population became a source of increased productivity and economic development. The sheer size of the US further contributed to enhance this complementarity effect (Lundborg and Segerström, 2002).

3. Immigration and wages

Immigration is also generally considered to boost economic development in the receiving countries by increasing wages, although this positive effect is still controversial. The large recent inflow of unskilled labor onto the US labor market has led to a boom in the literature analyzing the impact of low-skilled migrants on the wages of US-born Americans (i.e. Borjas, 1995; Friedberg and Hunt, 1995; Borjas, Freeman and Katz, 1997). Some studies have argued that late 20th century migration into the US has resulted in a loss of around 3 percent of the real value of the wages of US-born workers (i.e. Borjas, 2003; Borjas and Katz, 2007; Borjas 2006). According to these estimations, for uneducated native workers without a high school degree, the loss in wages reached almost 9 percent. However, Carter and Sutch (2006), concentrating on 19th century immigration, as well as Ottaviano and Peri (2006), focusing on late 20th century immigration, have found a significant positive effect of immigration on native workers' wages in both migration rounds. Ottaviano and Peri (2006) reported a significant increase in the long-run average wage of U.S.-born workers of 1,8 percent following immigration. In the short-run the increase was of 0.7 percent. For the least educated, their results showed a decrease of 1.1 percent. All other groups of US-born workers with at least a high school degree (90 percent of the population) gained significantly from immigration. Similarly, Carter and Sutch (2006) identify only positive effects on wages derived from the large immigrant inflows of the late 19th century. In the period between the Civil War and WWI, real wages rose, and this growth was particularly robust during the time of strongest immigration between 1900 and 1910. In particular, conditions on the labor market improved as a consequence of the rising capital-labor ratio as masses of immigrants were entering the country (Carter and Sutch, 1997). Cities with a large share of foreign-born population displayed the highest wages (Goldin, 1994).

4. Immigration and innovation

Mass immigration is also deemed to stimulate productivity by means of innovation and specialization. Rapidly growing urban agglomerations during the different migration waves into the US generated positive externalities for economic development by boosting innovation and growth (i.e. Gordon and McCann, 2005). In addition, with increasing production and increasing demand, more opportunities for innovation arose. The importance of learning-by-doing grew and led to the creation of new product and process innovations (Carter and Sutch, 1997). Furthermore, the very characteristics of the average migrant – young, entrepreneurial, and risk-prone – would have nurtured innovation (i.e. Poot, 2008). According to Partridge and

Furtan (2008), a 10 percent increase in immigrants displaying an adequate knowledge of the local language could boost regional patent applications by 7.3 percent. Moreover, the diversity brought by migrants of different national origins would also have bred externalities at the root of new innovation (Jacobs, 1969). Historical proof of these mechanisms at work was provided by Higgs (1971), who detected a link between patenting activity and urbanization in the US between 1870 and 1920. Ozgen et al. (2011) support this line of argumentation when they evaluate the impact of large shares of migrants on innovation in the regions of Europe. Their results show that migration affects innovation positively. However, the driving force for technological progress is the diversity in the composition of the immigrant community originating from different backgrounds rather than the sheer size of it.

5. The time dimension of the economic impact of migration

While all the above-mentioned factors have an important influence on the economic activity of host countries and regions, their impact can generally only be felt in the short term. Receiving territories remain dynamic while immigration lasts and migration can, in turn, help preserve the dynamism of the host areas, creating a virtuous circle of development and a path dependency that make places dynamic while inward migration lasts. But, what happens to these areas once migration flows stop? How do areas which where former recipients of mass migration fare over the course of a few decades? Most migration literature only takes into account short- or medium-run consequences on the aggregate production function or redistribution effects. The majority of these studies focuses on a time frame of a maximum of 20 years and tends to neglect the potential far reaching implications of migration on places over longer periods of time. Consequently, the long-run impact of migration is still poorly understood and there are very few studies which have tried to assess the impact on migration on the economic development of places over the long-term.

A way to circumvent this problem is to resort to the burgeoning literature dealing with the economic influence of institutional factors. The long-term economic impact of institutional constructs has become a hotly debated topic in socio-economic research. North (1981), for example, considers that the economic performance of a certain region or society depends heavily on its social, economic, legal, and political organization. Some territories have institutions that enhance growth and development, while in other cases local institutions emerge as sources of stagnation. Similarly, Tabellini (2006) supports the idea that exogenous cultural institutions developed in history have a strong effect on current economic development. Inherited social norms, trust, respect for others, and confidence in individual

self-determination create an institutional inheritance which often determines differences in regional economic development, even after controlling for factors such as education, urbanization and national effects. Acemoglu et al. (2001) – just to cite probably the most prominent contribution in the empirical literature on this topic – have linked the institutional heritage left by the colonial powers in the American continent to the degree of economic development that ensued. They used cross-country comparisons, analyzing differences in European mortality rates in order to unveil a significant relationship between the institutions left by the European colonial powers and current economic performance. New settlers from the colonial powers brought in their habits, customs and institutions which have shaped social interaction and economic activity in the receiving areas. As a consequence, differences in income per capita today are the result of institutional constructs which developed a long time ago (Acemoglu et al., 2001).

Similar mechanisms – albeit deprived of the political influence associated with colonialism – may have been triggered by mass migration into the US in the late 19th and early 20th centuries. In places heavily settled by migrants, the new inhabitants would have brought with them not only their skills and capacity to toil, but also their beliefs, habits and customs, leading to the formation of institutional constructs which would have differed from those of the local US society they encountered. Migrants would have contributed to shape the institutions of the places where they settled; a transformation which would have been greater the larger the percentage of migrants from a similar origin living in any given US county or region. After all, "the mode of interaction [of migrants in a foreign country] is not conditioned solely by the parameters of the migration causes and the majority society, but also by the baggage they are carrying in the way of culture, religion, social networks and links with the society of origin" (Joly, 2000, page 30). The institutions mass migration brought into the US are likely to have transformed the regions where migrants settled in large numbers to a much larger extent than in those areas where migration hardly featured. In large swaths of the US – and as indicated by the previous maps in states such as Minnesota or Wisconsin, just to mention two of the main destinations of migrants – late 19th century migration would have renovated whole societies, often following the model of the associations, political organizations, press, banks, businesses, and religious groups of the countries the migrants left behind (Joly, 2000). Often migrants retained their languages, habits, manners, customs and principles and preserved them within their cultural community overseas (Gordon, 1961). Indeed, a number of studies have identified strong correlations between the cultural institutions developed by US immigrants and the civic culture of their country of origin (i.e.

Rice and Feldman, 1997, when focusing on civic culture and democratic values; Putnam, 2000 when evaluating social capital). The influence of home-country institutions could be felt in all areas of daily life. Fernandez and Fogli (2009), for example, find that the labor force participation of US-immigrant women was highly influenced by their mothers' home countries. Home-country specific institutions would also have spurred innovation, technology and therefore economic development (Rosenberg, 1972). In brief, migrants would have brought a "social infrastructure [...] determined historically by location and other factors captured in part by language" (Hall and Jones, 1999, page 83), which would have shaped the economic dynamism of different areas of the US.

Although these institutional constructs are supposed to last for a long time, there are, nevertheless, few studies which have assessed the economic impact of migration in the US in the long-run. Some studies have concentrated on the long-term transmission of cultural institutions. Algan and Cahuc (2010), for example, evaluate the persistence of inherited trust as social institution over time. They find that values or beliefs such as trust have a persistent component over generations. Inherited trust displayed by descendants of former US immigrants is shown to be significantly influenced by their ancestors' country of origin. And although Algan and Cahuc (2010) hypothesize that inherited trust greatly influences regional economic development, there is little empirical demonstration that this is the case.

However, the vision of the long-lasting effects of imported institutional constructs goes against the dominant view of US society as a melting-pot. When faced with better and more efficient institutions in the US than in their country of origin, migrants would have progressively abandoned their imported habits and behavior and embraced US habits and customs. Hence, although migration would have had an undeniable short-term impact on the economic development of the recipient cities and regions, the dominant melting-pot view of US society implies that migrants would have relatively rapidly embraced the new environment, and not the other way round (Gordon, 1964). Internal migration within the US would have further contributed to a reduction of the heterogeneity of US population. Rhode and Strumpf (2000) have shown that migration has been a major force behind the population homogenization across US countries. Migration led to a radical decrease of the number of blacks living in black majority counties: from 48 percent in 1890 to 9 percent in 1990 (Rhode and Strumpf, 2003). Strong internal migration within the US would also thus be expected to erode cultural, ethnic or linguistic heterogeneity within the US relatively rapidly. Therefore, a rapid adaption process of immigrants and their offspring to the culture, way of life, and labor

market in the host country would have quickly whittled down links with home country institutions. Adaptation and internal migration means that two or three generations after arrival in the US, the American-born descendants of former immigrants would have lost their diverse national and cultural traits and merged into the American melting-pot, forming a homogenous group, ultimately indistinguishable from the native population (Gordon, 1964).

Whether this is the case, at least for territories, still needs to be proved. As indicated by Borjas (1992), ethnic characteristics, differences in skills and even earnings can be transmitted across generations. According to Borjas (1992, page 124) "ethnicity acts as an externality in the human capital accumulation process" and increases the productivity of the supplied labor. Skills can be also transferred to the next generation by the parents, as well as by the ethnic or cultural environment. If the ethnic externality proves to be strong enough, "ethnic differences in skills observed in this generation are likely to persist for many generations (and may never disappear)" (Borjas, 1992, page 124). The convergence process of skill differentials among different cultural and/or ethnic groups developed as a consequence of the mass migration movement to the US between 1880 and 1910 may last longer. For Borjas (1994b), a minimum of four generations – the equivalent of 100 years – is required for differences in skills, as well as earnings among groups of different national origin to disappear. Hence, "ethnicity matters and it matters for a very long time" (Borjas, 1994b, page 25).

In this paper we hypothesize that the institutional constructs generated by mass migration in the late 19th and early 20thcentury to the US have left a territorial legacy which can still be felt in the level of development of the counties and regions of the US today. We argue that the concentration of migrants in certain places and not in others has resulted in the transfer of the dynamic entrepreneurial character of migrants to territories and that this legacy or imprint of migration still shapes the character of US counties today, long after the original migration wave that led to its generation has ended. Hence, cities and regions in the US which received a mass influx of migrants during the big migration waves of the late 19th and early 20th century would have kept features of the migrant character until now which have helped them become richer and more dynamic over the last century, just as other characteristics which may have determined the attraction of migrants at the time of the migration waves have waned.

Model and data

The Model

The model used in order to test whether this is the case for US counties adopts the following form:

$$y_{i,t} = \alpha + \beta Mig_{i,t_0} + \lambda X_{i,t-k} + \theta Z_{i,t_0} + \mu_s + \varepsilon_i \qquad (1)$$

where *y* is the income per capita of county *i* in period *t* (*t* =2005, 1990, 1960); *Mig* is the percentage of migrants (measured as the combination of foreign born citizens and US residents whose parents were both foreign) in a given county *i* in t_0 corresponding either to 1880, 1900 or 1910; *X* is a vector of variables which are assumed to influence the level of development of any given county at time *t-k* (*t-k*=1990, 1980, 1950); while *Z* represents a similar vector of factors which may have influenced the development of the county or the type of migration at time t_0 and thus contributed to shape the attractiveness of the county to migrants. Finally, μ depicts unobservable state-specific effects, while ε represents the error term.

The regression is also run using the percentage of locals instead of migrants as the independent variable of interest. In this case the model adopts the following form:

$$y_{i,t} = \alpha + \beta Loc_{i,t_0} + \lambda X_{i,t-k} + \theta Z_{i,t_0} + \mu_s + \varepsilon_i \qquad (2)$$

Where *Loc* represents the percentage of locals – defined as the percentage of US residents whose parents were both born in the US – living in any given county *i* at time t_0.

The Data

The data used for the dependent variable depict income per capita in 2005, 1990 and 1960 respectively. These data are extracted from the US Bureau of Economic Analysis (BEA) and the CPS tables (current population survey) of the US Bureau of Labor Statistics (BLS). One factor worth noting is that GDP per capita in US counties in any of these years is completely disconnected from our independent variable of interest, migration levels at county level in 1880, 1900, and 1910 – as indicated by the map of the distribution of GDP per capita across US counties in 2005 (Appendix 1). The wealthiest counties are located along the Washington-Boston corridor, along the California coast and in isolated states, such as Colorado or

Wyoming. The poorest countries are in Appalachia, but also in places like Texas and a number of mountain states (Appendix 1).

Migration and nativity variables, the independent variables of interest, were constructed using the IPUMS USA database (Integrated Public Use Microdata Series). This database consists of more than fifty samples of the American population extracted from the US Censuses and from the American Community Surveys for the period between 1850 and 2010. We aggregated the birthplaces and nativity data of a sample of 5,791,531 individuals in 1880, 3,852,852 individuals in 1900 and 923,153 individuals in 1910, and allocated them to the counties were individuals lived. Any local resident in any given US county who was either born abroad or both whose parents were born abroad was classified as a migrant. Local citizens born in US and with both parents also born in the US were classified as locals. In order to account for the changing number of counties in the 48 US contiguous states over time (2,875 counties in 1880, 3,090 in 1900 and 3,123 in 1910), their modified size and geographical location, we matched counties for the three periods with respect to their geographical position, weighting them by their population and density of population today.

As our goal was to identify the effect of past migration on current income, we introduced two clearly differentiated sets of control variables in our model. The first set consisted of controls which could have accounted for migration trends in the late 19^{th} and early 20^{th} centuries as well as influenced the level of development of the county at the time of the migration waves. For the specific migration year, namely 1880, 1900 or 1910, we controlled for mean income, literacy rate, female participation rate in the labor force, percentage of black population, and the percentage of population employed in agriculture. All of these control variables were extracted from the IPUMS USA dataset, using the same method as for the dependent variable: extracting the microdata from the sample and aggregating it by county. We expect the former three controls to be positively linked, the latter two to be negatively linked to current income per capita.

Similarly, for the *t-k* time dimension of our model (10 or 15 years before the period considered for the dependent variable), we controlled for population size, education (percentage of people with college education), female participation in the labor force, unemployment, percentage of black population, infant mortality and the percentage of inhabitants employed in the agricultural sector. All of these variables are assumed to influence the level of development of any given county at time *t-k*. We expect the former three variables to have a positive association with county GDP per capita and the latter four to display a

negative one. The control variables for the *t-k* time dimension were equally obtained from the US BEA and the US BLS. In addition, the IPCSR (Inter-University Consortium for Political and Social Research) and the CDC (Centers for Disease Control and Prevention) databases were employed to complete the set of control variables ranging from 1950 to 2005. Both datasets supply aggregated data at county level.

We addressed the potential problem of biased estimators due to endogeneity using two different methods. As it is distinctly plausible that wealthy counties in the late 19th century and early 20th century attracted more migrants and then in turn generated a greater economic dynamism, we first lagged all independent variables by a minimum of 10 years (and 15, in the case of the regressions considering GDP capita by county in 2005). Second, we also resorted to an instrumental variable regression (2SLS) as a means to reveal the underlying true effect. We first resorted to the most common instrument used by the scholarly literature on this and related topics: the inverse of the natural log of the distance to New York (see, for example, Peri, 2009). As alternative instruments we turned to religion and used the percentage of Baptists and Catholics living in US counties in 1930, as well as their combination. These instruments are likely to be highly correlated with migration without simultaneously being correlated with the error term – an overwhelming majority of migrants in the late 1800s and early 1900s entered the country through the port of New York, and Catholics made the largest group. Baptists, which are the largest Protestant group in the US, are associated to earlier migration waves, having established their first church in the US in 1639. Both the inverse of the distance to New York (NYC), measured as the inverse of the distance from any specific county to NYC in km of flight distance, as well as the religious data – retrieved from the ARDA (Association of Religion Data Archives) dataset – are identified as strong instruments according to the results of the Staiger and Stock (1997) tests for weak instruments. In addition, when comparing the Cragg and Donald minimum eigenvalue statistics with the Stock and Yogo (2002) critical values for tests of weak instruments, all four different variable sets (distance to New York, Catholics, Baptist, Catholics and Baptists) reject the weak instruments hypothesis, even if we decided only to accept a 5 percent relative bias. In any case the three instruments linked to religion proved to be significantly stronger instruments than the inverse of the distance to New York.

Analysis of results

Table 2 reports the results of the estimation of equation (1) for our main variable of interest, the percentage of migrants or children of migrants living in county i in 1880, and its impact

on income per capita in 2005. All regressions include state controls in order to take into account state-specific factors affecting county wealth in the US and to minimize the problem of spatial correlation.

The results of the analysis underline the significance of the percentage of migrants living in any given US county in 1880 for current levels of GDP per head. The percentage of migrants living in a county in 1880 is strongly and robustly associated with the level of income of the county in 2005. Counties which attracted large numbers of migrants more than 130 years ago tend to be richer today – after controlling for factors which may determine current levels of wealth – than counties that were bypassed by the migrants. The coefficient for the percentage of migrants living in any given country in 1880 is always positive and significant, regardless of the instrument considered (Table 2).

This represents a strong contrast with respect to all the other control variables for 1880. All other 1880 controls, which would have determined to a large extent which counties in the US were better off and more suitable and welcoming for migrants in 1880, have, in virtually all cases, no relationship whatsoever to current levels of GDP per capita. This means that while the massive influx of migrants in 1880 helped shape the character of a city or locality in a way that can still be felt in the level of development of the county today, other factors – such as the local mean income in 1880, the percentage of women working, the level of education of the population, the sectoral composition of the local economy or the percentage of black population at that time – did not. Those factors may have contributed to attract or dissuade migrants from coming in 1880, but seem to have no bearing whatsoever on the current level of development of the county.

Of particular interest here is the contrast between the coefficients of the variables representing the income of the county and its migrant population in 1880, respectively. Richer counties in 1880 are not necessarily rich in 2005 – indeed there is a negative and significant association between income in 1880 and income in 2005 when the inverse of the distance of the county to New York City and the presence of Baptists are used as instruments (Table 2, Regressions 4 and 8) – but counties which attracted a large number of migrants in the two decades before the 1880s (regardless of whether they were rich or poor at that time) tend to be richer today. Hence, we can draw the conclusion that the percentage of migrants in a county seems to be a better predictor of future wealth than income per capita at the time.

As could be expected, the controls for 1990 tend to be significant (with the exception of black population and infant mortality) and have the expected signs. Larger, better educated and more inclusive counties in 1990 tended to be richer in 2005 than smaller counties with a lower endowment of skills and less female participation in the labor force. Once everything else is controlled for, rural counties have an edge with respect to more urban ones.

These results prove to be robust to the introduction of the instruments (Table 2, Regressions 3 to 10). This underlines that the direction of causality goes from the presence of migrant groups in 1880 to GDP per head in 2005 and not vice versa.

Table 2	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dep. Variable:	OLS	OLS	IV	IV	IV	IV	IV	IV	IV	IV
income p.c. 2005	migrants	migrants	distance to NY	distance to NY	Catholics	Catholics	Baptists	Baptists	Catholics Baptists	Catholics Baptists
migrants 1880	0.0415**	0.0406**	0.701**	0.985*	0.103**	0.110*	0.267**	0.376**	0.121**	0.128**
	(0.0178)	(0.0190)	(0.332)	(0.517)	(0.0516)	(0.0627)	(0.121)	(0.187)	(0.0499)	(0.0616)
population 1990	0.0159***	0.0159***	0.00933*	0.00914*	0.0153***	0.0154***	0.0137***	0.0136***	0.0151***	0.0153***
	(0.00305)	(0.00306)	(0.00483)	(0.00545)	(0.00306)	(0.00307)	(0.00331)	(0.00345)	(0.00307)	(0.00307)
black population 1990	0.00997	0.00964	0.00366	0.0143	0.00952	0.0100	0.00845	0.0119	0.00940	0.0102
	(0.0258)	(0.0259)	(0.0312)	(0.0353)	(0.0256)	(0.0256)	(0.0263)	(0.0270)	(0.0257)	(0.0257)
education 1990	1.362***	1.361***	1.352***	1.368***	1.364***	1.365***	1.366***	1.372***	1.364***	1.365***
	(0.0534)	(0.0535)	(0.0650)	(0.0746)	(0.0530)	(0.0530)	(0.0544)	(0.0560)	(0.0531)	(0.0531)
female participation 1990	0.301***	0.303***	0.330***	0.348***	0.303***	0.306***	0.309***	0.317***	0.304***	0.306***
	(0.0571)	(0.0572)	(0.0696)	(0.0801)	(0.0567)	(0.0567)	(0.0582)	(0.0601)	(0.0567)	(0.0568)
unemployment 1990	-1.982***	-1.989***	-2.079***	-2.090***	-1.991***	-1.996***	-2.012***	-2.022***	-1.993***	-1.998***
	(0.121)	(0.121)	(0.151)	(0.171)	(0.120)	(0.120)	(0.124)	(0.127)	(0.120)	(0.120)
agriculture 1990	0.164***	0.161***	0.160***	0.168**	0.164***	0.162***	0.164***	0.165***	0.164***	0.162***
	(0.0495)	(0.0496)	(0.0598)	(0.0677)	(0.0492)	(0.0492)	(0.0504)	(0.0518)	(0.0492)	(0.0493)
infant mortality 1990	-0.0494	-0.0482	-0.00465	-0.00657	-0.0454	-0.0453	-0.0343	-0.0335	-0.0442	-0.0445
	(0.0305)	(0.0305)	(0.0432)	(0.0474)	(0.0304)	(0.0304)	(0.0321)	(0.0328)	(0.0304)	(0.0304)
black population 1880		-0.0156		0.187		-0.00190		0.0538		0.00195
		(0.0293)		(0.114)		(0.0316)		(0.0495)		(0.0315)
income 1880		-0.00107		-0.0109*		-0.00173		-0.00444*		-0.00192
		(0.00138)		(0.00555)		(0.00150)		(0.00237)		(0.00149)
female participation 1880		-0.00594		-0.336*		-0.0300		-0.121		-0.0363
		(0.0571)		(0.188)		(0.0602)		(0.0870)		(0.0601)
agriculture 1880		-0.00812		0.378*		0.0208		0.130		0.0283
		(0.0311)		(0.214)		(0.0394)		(0.0829)		(0.0391)
literacy 1880		-0.0211		0.0923		-0.0161		0.0136		-0.0140
		(0.0309)		(0.0736)		(0.0315)		(0.0384)		(0.0315)
state controls	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	2,875	2,873	2,874	2,872	2,874	2,872	2,874	2,872	2,874	2,872
R-squared	0.619	0.620	0.429	0.278	0.618	0.618	0.598	0.578	0.617	0.617

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

When instead of focusing on migrants, we shift our attention to the presence of local US residents (individuals born in the US whose parents were both American) in 1880, following model (2), we obtain symmetrical results. When migrants are substituted by locals – keeping the same control variables – the percentage of locals (or natives) living in any given US county in 1880 is significantly and negatively associated with income per capita in 2005 (Table 3). This implies that counties which were less affected by the big migration waves to the US of the second half of the 19th century have tended to perform significantly worse over the last century and a half than those which received large numbers of migrants. This is the only change in the analysis, as the substitution of migrants by locals, leaves the coefficients for either the 1880 or 1990 control variables virtually unchanged (Table 3). These results also prove to be robust to the introduction of the different instruments, as the coefficients remain negative and significant throughout regressions 3 to 10 in Table 3.

Table3	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dep.var:	OLS	OLS	IV	IV	IV	IV	IV	IV	IV	IV
income p.c. 2005	locals	locals	distance NY	distance NY	Catholics	Catholics	Baptists	Baptists	Catholics Baptists	Catholics Baptists
local population 1880	-0.0403**	-0.0396**	-0.745**	-1.120*	-0.0926**	-0.0991*	-0.232**	-0.326**	-0.110**	-0.117**
	(0.0167)	(0.0179)	(0.368)	(0.649)	(0.0466)	(0.0567)	(0.105)	(0.161)	(0.0448)	(0.0555)
population 1990	0.0159***	0.0159***	0.00844	0.00805	0.0154***	0.0155***	0.0139***	0.0139***	0.0152***	0.0153***
	(0.00305)	(0.00306)	(0.00535)	(0.00644)	(0.00306)	(0.00306)	(0.00327)	(0.00336)	(0.00306)	(0.00306)
black population 1990	0.00998	0.00973	0.00354	0.0180	0.00960	0.0102	0.00870	0.0123	0.00949	0.0104
	(0.0258)	(0.0258)	(0.0326)	(0.0393)	(0.0256)	(0.0256)	(0.0261)	(0.0267)	(0.0256)	(0.0257)
education 1990	1.362***	1.362***	1.358***	1.378***	1.364***	1.365***	1.367***	1.372***	1.365***	1.365***
	(0.0534)	(0.0534)	(0.0684)	(0.0839)	(0.0530)	(0.0530)	(0.0541)	(0.0555)	(0.0531)	(0.0531)
female participation 1990	0.301***	0.303***	0.328***	0.350***	0.302***	0.305***	0.306***	0.314***	0.303***	0.306***
	(0.0571)	(0.0572)	(0.0727)	(0.0887)	(0.0566)	(0.0567)	(0.0579)	(0.0594)	(0.0567)	(0.0568)
unemployment 1990	-1.982***	-1.989***	-2.074***	-2.083***	-1.988***	-1.994***	-2.004***	-2.012***	-1.990***	-1.995***
	(0.121)	(0.121)	(0.158)	(0.187)	(0.120)	(0.120)	(0.123)	(0.126)	(0.120)	(0.120)
agriculture 1990	0.164***	0.161***	0.152**	0.162**	0.163***	0.161***	0.161***	0.162***	0.163***	0.161***
	(0.0495)	(0.0496)	(0.0625)	(0.0744)	(0.0491)	(0.0492)	(0.0502)	(0.0513)	(0.0492)	(0.0492)
infant mortality 1990	-0.0495	-0.0484	-0.00227	-0.00564	-0.0462	-0.0462	-0.0369	-0.0372	-0.0450	-0.0455
	(0.0305)	(0.0305)	(0.0458)	(0.0526)	(0.0304)	(0.0303)	(0.0316)	(0.0321)	(0.0304)	(0.0303)
black population 1880		-0.0152		0.235		-0.00238		0.0490		0.00158
		(0.0293)		(0.153)		(0.0315)		(0.0471)		(0.0314)
income 1880		-0.00100		-0.0107*		-0.00150		-0.00350*		-0.00165
		(0.00138)		(0.00607)		(0.00144)		(0.00200)		(0.00144)
female participation 1880		-0.00668		-0.412*		-0.0292		-0.113		-0.0357
		(0.0571)		(0.249)		(0.0600)		(0.0834)		(0.0599)
agriculture 1880		-0.00551		0.520		0.0242		0.135		0.0327
		(0.0313)		(0.317)		(0.0406)		(0.0843)		(0.0403)
literacy 1880		-0.0217		0.0943		-0.0185		0.00392		-0.0167
		(0.0309)		(0.0822)		(0.0312)		(0.0357)		(0.0312)
State controls	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	2,875	2,873	2,874	2,872	2,874	2,872	2,874	2,872	2,874	2,872
R-squared	0.619	0.620	0.375	0.121	0.618	0.619	0.602	0.586	0.617	0.618

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In order to test the validity of our results, we conduct the same exercise for the presence of migrants in 1900 (Appendix 1) and in 1910 (Table 4). When we analyze the link between the peak of early 20th century migration, 1910, and current GDP per head in the US, the results are very similar to those reported for the first migration wave of 1880 (Table 2). The significant and positive coefficients of our main variable of interest, *migrants1910*, reveal that counties which attracted the highest percentage of migrants in 1910 are counties which tend to have higher levels of income per head a century later. The results are, however, somewhat weaker than for 1880, as only two of the four instruments used – the inverse of the distance to New York and the percentage of Baptist living in the county – report positive and significant coefficients.

Nevertheless, despite having an association between migration in 1910 and income per capita in 2005 which is somewhat weaker than that reported for the percentage of migrants in 1880, the connection between migration in 1910 and current levels of county wealth is considerably stronger than for any of the control variables for 1910. The great majority of the coefficients of the controls for 1910 are statistically insignificant (Table 4). The only exceptions are agricultural employment in some regressions (Table 4, Regressions 2, 6 and 10), which is negatively associated to recent levels of county wealth and, more tellingly, the average income of the county in 1910. As was the case in the regressions looking at the situation in 1880, when other factors are controlled for, rich counties in 1910 are not necessarily rich in 2005 and in some cases distinctly poorer (Table 4, Regressions 4 and 8). By contrast, counties which attracted the most migrants in 1910 may not have been necessarily the wealthiest at that time, but are significantly better off one century later (Table 4).

The coefficients for the 1990 control variables are similar to those reported in Tables 2 and 3. The controls for 1990 tend to be significant and have the expected sign (the main difference is that infant mortality becomes negative and significant) (Table 4).

When performing the same estimations for the 1900 Census, the results are virtually a carbon copy of those reported for 1910 (Appendix 3). The percentage of migrants living in a county in 1900 have got by far the strongest connection with levels of development in 2005 of any of the variables which might have affected migration in the first place around 1900. When migrants are substituted by locals, both for 1900 and 1910, no significant alteration is found with respect to those reported in Table 3.[2]

[2] These results can be made available upon request.

Table 4	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
dep. var.:	OLS	OLS	IV	IV	IV	IV	IV	IV	IV	IV
income p.c. 2005	migrants	migrants	distance to NY	distance to NY	Catholics	Catholics	Baptists	Baptists	Catholics Baptists	Catholics Baptists
migrants1910	0.0494***	0.0423**	0.512**	0.571**	0.0419	0.00301	0.373**	0.448*	0.0625	0.0165
	(0.0191)	(0.0200)	(0.221)	(0.260)	(0.0541)	(0.0653)	(0.167)	(0.251)	(0.0532)	(0.0645)
population 1990	0.0165***	0.0164***	0.0129***	0.0138***	0.0166***	0.0166***	0.0141***	0.0146***	0.0164***	0.0166***
	(0.00299)	(0.00299)	(0.00359)	(0.00348)	(0.00298)	(0.00298)	(0.00333)	(0.00336)	(0.00298)	(0.00298)
black population 1990	0.0102	0.00857	0.00599	0.0106	0.0103	0.00820	0.00887	0.0118	0.0102	0.00836
	(0.0259)	(0.0260)	(0.0280)	(0.0285)	(0.0257)	(0.0257)	(0.0269)	(0.0275)	(0.0257)	(0.0257)
education 1990	1.329***	1.327***	1.304***	1.305***	1.329***	1.327***	1.324***	1.324***	1.329***	1.327***
	(0.0531)	(0.0532)	(0.0574)	(0.0584)	(0.0526)	(0.0527)	(0.0551)	(0.0561)	(0.0526)	(0.0527)
female participation 1990	0.258***	0.261***	0.290***	0.284***	0.258***	0.260***	0.276***	0.274***	0.259***	0.260***
	(0.0555)	(0.0556)	(0.0610)	(0.0614)	(0.0551)	(0.0551)	(0.0583)	(0.0592)	(0.0551)	(0.0551)
unemployment 1990	-1.985***	-1.984***	-2.055***	-2.060***	-1.984***	-1.978***	-2.027***	-2.034***	-1.987***	-1.981***
	(0.115)	(0.115)	(0.127)	(0.130)	(0.114)	(0.114)	(0.121)	(0.125)	(0.114)	(0.114)
agriculture 1990	0.146***	0.145***	0.150***	0.161***	0.146***	0.144***	0.152***	0.161***	0.146***	0.145***
	(0.0478)	(0.0480)	(0.0518)	(0.0536)	(0.0474)	(0.0476)	(0.0497)	(0.0515)	(0.0474)	(0.0476)
infant mortality 1990	-0.0804***	-0.0809***	-0.0679**	-0.0715**	-0.0807***	-0.0817***	-0.0713**	-0.0733**	-0.0801***	-0.0814***
	(0.0309)	(0.0309)	(0.0339)	(0.0342)	(0.0306)	(0.0307)	(0.0323)	(0.0329)	(0.0306)	(0.0306)
black population 1910		-0.00885		0.0471		-0.0135		0.0330		-0.0115
		(0.0235)		(0.0369)		(0.0241)		(0.0358)		(0.0241)
income 1910		-0.000764		-0.0111**		0.000108		-0.00857*		-0.000268
		(0.00184)		(0.00535)		(0.00218)		(0.00520)		(0.00217)
female participation 1910		0.0102		-0.0229		0.0128		-0.0132		0.0116
		(0.0355)		(0.0415)		(0.0354)		(0.0401)		(0.0354)
agriculture 1910		-0.0654**		-0.00724		-0.0703**		-0.0213		-0.0682**
		(0.0315)		(0.0445)		(0.0320)		(0.0430)		(0.0319)
literacy 1910		-0.0338		0.106		-0.0455		0.0702		-0.0404
		(0.0351)		(0.0763)		(0.0383)		(0.0741)		(0.0381)
state controls	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	3,123	3,121	3,122	3,120	3,123	3,121	3,123	3,121	3,123	3,121
R-squared	0.604	0.605	0.526	0.511	0.604	0.604	0.567	0.552	0.604	0.604

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In order to verify whether our results are consistent over time, we regressed the percentage of migrants in 1880 in US counties first on income per capita in 1990 and subsequently on income per capita in 1960. Tables 5 and 6 display the results of the analysis.

When looking at the connection between the presence of migrants in 1880 and GDP per capita in 1990 (Table 5), the results are very similar to those reported in Table 2. We once again find that the GDP per capita of counties in 1990 was not only determined by the conditions of the respective county in 1980 (mainly the size of the county, the percentage of college educated people, the percentage of black population, and, with a negative sign, unemployment and female participation), but also by the influx of inward migrants right before 1880 as indicated by the significant and positive coefficient of migrants in 1880.

As in the case of the 2005 regressions, most of the controls for 1880 are irrelevant when evaluating their impact on income per capita in 1990 (Table 5). The main exception is agricultural employment in 1880 which is positively associated with GDP per head in 1990.

However, as we go back in time, the results of the analysis start to change. In Table 6, we control for the situation in 1960. As for 2005 and 1990 we find that migration in 1880 is positively and significantly associated with income per capita in 1960. The main difference with respect to previous analyses is that many of the coefficients for the 1880 controls are now significant. Therefore, counties with a higher GDP per capita in 1960 tended to be those with a higher level of education of the population, with a greater percentage of agricultural employment, and with a larger percentage of black people in 1880. The level of female participation in the labor market in 1880 was negatively associated with GDP per head in 1960. Interestingly, income in 1880 is the only control variable for that period which is completely dissociated from income per capita in 1960.

From this more dynamic part of the analysis, we can deduce a very interesting result. While the legacy of the majority of 1880 county features for which we control seems to influence the level of wealth of a county for a certain number of years, beyond a specific time threshold – which, in the case of US counties, does not seem to last beyond 80 years – the influence of the majority of these local conditions wanes. In the case of income per capita, its link to future county wealth is even more ephemeral. The only exception is migration, which seems to shape the character of US counties and regions not only to a greater extent than education, agriculture, female participation, the presence of a large minority group, or income, but also well beyond any other local factor which we have controlled for.

Table 5	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dep.Var:	OLS	OLS	IV	IV	IV	IV	IV	IV	IV	IV
Income p.c. 1990	migrants	migrants	distance to NY	distance to NY	Catholics	Catholics	Baptists	Baptists	Catholics Baptists	Catholics Baptists
migrants 1880	0.0304	0.0386	1.284**	1.811**	0.186***	0.250***	0.0844	0.0868	0.173***	0.235***
	(0.0235)	(0.0251)	(0.517)	(0.858)	(0.0687)	(0.0841)	(0.148)	(0.213)	(0.0659)	(0.0818)
population 1980	0.0139***	0.0138***	0.00544	0.00560	0.0128***	0.0128***	0.0135***	0.0135***	0.0129***	0.0128***
	(0.00482)	(0.00483)	(0.00758)	(0.00888)	(0.00483)	(0.00485)	(0.00488)	(0.00488)	(0.00482)	(0.00484)
black population 1980	0.0602*	0.0676*	0.0536	0.0854	0.0595*	0.0697**	0.0600*	0.0680*	0.0596*	0.0696**
	(0.0352)	(0.0353)	(0.0497)	(0.0595)	(0.0351)	(0.0353)	(0.0349)	(0.0350)	(0.0351)	(0.0353)
education 1980	0.620***	0.621***	0.714***	0.789***	0.634***	0.644***	0.626***	0.628***	0.633***	0.643***
	(0.0846)	(0.0846)	(0.129)	(0.168)	(0.0846)	(0.0852)	(0.0847)	(0.0864)	(0.0845)	(0.0850)
female participation 1980	-0.496***	-0.511***	-0.484***	-0.561**	-0.497***	-0.520***	-0.497***	-0.514***	-0.497***	-0.519***
	(0.131)	(0.131)	(0.185)	(0.219)	(0.131)	(0.131)	(0.130)	(0.130)	(0.130)	(0.131)
unemployment 1980	-1.159***	-1.148***	-1.319***	-1.367***	-1.180***	-1.176***	-1.167***	-1.156***	-1.179***	-1.174***
	(0.135)	(0.135)	(0.201)	(0.247)	(0.135)	(0.136)	(0.135)	(0.137)	(0.135)	(0.136)
agriculture 1980	-0.0107	-0.00980	0.0175	0.0179	-0.00760	-0.00693	-0.00982	-0.00937	-0.00787	-0.00714
	(0.0199)	(0.0199)	(0.0306)	(0.0359)	(0.0199)	(0.0200)	(0.0200)	(0.0200)	(0.0199)	(0.0200)
infant mortality 1980	0.354	0.297	0.596	0.379	0.389	0.315	0.369	0.305	0.387	0.314
	(0.398)	(0.398)	(0.571)	(0.663)	(0.397)	(0.399)	(0.396)	(0.395)	(0.397)	(0.399)
black population 1880		-0.0752*		0.324		-0.0287		-0.0651		-0.0319
		(0.0398)		(0.202)		(0.0438)		(0.0615)		(0.0435)
income 1880		0.000526		-0.0177*		-0.00159		6.88e-05		-0.00144
		(0.00183)		(0.00921)		(0.00201)		(0.00281)		(0.00199)
female participation 1880		0.155**		-0.488		0.0778		0.137		0.0830
		(0.0774)		(0.331)		(0.0829)		(0.109)		(0.0824)
agriculture 1880		0.0890**		0.820**		0.177***		0.110		0.171***
		(0.0413)		(0.359)		(0.0531)		(0.0965)		(0.0524)
literacy 1880		0.0233		0.240*		0.0447		0.0259		0.0430
		(0.0413)		(0.124)		(0.0425)		(0.0477)		(0.0424)
state controls	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	2,816	2,814	2,815	2,813	2,815	2,813	2,815	2,813	2,815	2,813
R-squared	0.386	0.388			0.377	0.373	0.385	0.388	0.378	0.375

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
dep.var:	OLS	OLS	IV	IV	IV	IV	IV	IV	IV	IV
income p.c. 1960	migrants	migrants	distance to NY	distance to NY	Catholics	Catholics	Baptists	Catholics	Catholics Baptists	Catholics Baptists
migrants 1880	0.0868***	0.114***	0.402	0.575	0.156**	0.287***	0.178	0.299	0.157**	0.288***
	(0.0207)	(0.0209)	(0.371)	(0.509)	(0.0652)	(0.0733)	(0.203)	(0.251)	(0.0642)	(0.0724)
population 1950	-0.00455	0.00457	-0.0110	-0.00329	-0.00606	0.00150	-0.00653	0.00128	-0.00608	0.00149
	(0.00376)	(0.00372)	(0.00882)	(0.00976)	(0.00397)	(0.00393)	(0.00578)	(0.00580)	(0.00396)	(0.00393)
black population 1950	-0.404***	-0.614***	-0.366***	-0.577***	-0.396***	-0.602***	-0.394***	-0.601***	-0.396***	-0.602***
	(0.0258)	(0.0396)	(0.0509)	(0.0575)	(0.0266)	(0.0400)	(0.0348)	(0.0437)	(0.0265)	(0.0400)
education 1950	0.960***	0.800***	0.959***	0.771***	0.959***	0.787***	0.958***	0.786***	0.959***	0.787***
	(0.0806)	(0.0785)	(0.0831)	(0.0910)	(0.0800)	(0.0788)	(0.0801)	(0.0808)	(0.0800)	(0.0788)
female participation 1950	0.963***	0.799***	0.932***	0.772***	0.956***	0.788***	0.953***	0.787***	0.955***	0.788***
	(0.0655)	(0.0663)	(0.0780)	(0.0778)	(0.0654)	(0.0666)	(0.0687)	(0.0684)	(0.0654)	(0.0666)
unemployment 1950	-2.122***	-2.094***	-2.485***	-2.529***	-2.209***	-2.266***	-2.236***	-2.279***	-2.210***	-2.267***
	(0.332)	(0.328)	(0.568)	(0.610)	(0.339)	(0.336)	(0.416)	(0.413)	(0.339)	(0.335)
agriculture 1950	-0.825***	-0.818***	-0.828***	-0.852***	-0.826***	-0.832***	-0.827***	-0.833***	-0.826***	-0.832***
	(0.0261)	(0.0257)	(0.0276)	(0.0476)	(0.0259)	(0.0263)	(0.0262)	(0.0323)	(0.0259)	(0.0263)
infant mortality 1950	-1.174***	-0.791***	-1.221***	-0.795***	-1.184***	-0.791***	-1.188***	-0.791***	-1.184***	-0.791***
	(0.240)	(0.234)	(0.254)	(0.251)	(0.239)	(0.234)	(0.241)	(0.235)	(0.239)	(0.234)
black population 1880		0.444***		0.512***		0.471***		0.473***		0.471***
		(0.0416)		(0.0912)		(0.0431)		(0.0578)		(0.0431)
income 1880		-9.60e-05		-0.00462		-0.00182		-0.00194		-0.00183
		(0.00153)		(0.00532)		(0.00169)		(0.00293)		(0.00168)
female participation 1880		-0.284***		-0.405***		-0.331***		-0.334***		-0.331***
		(0.0651)		(0.154)		(0.0679)		(0.0945)		(0.0679)
agriculture 1880		0.0657*		0.236		0.130***		0.135		0.130***
		(0.0358)		(0.193)		(0.0444)		(0.0998)		(0.0442)
literacy 1880		0.383***		0.436***		0.404***		0.405***		0.404***
		(0.0354)		(0.0707)		(0.0364)		(0.0462)		(0.0364)
state controls	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	2,863	2,861	2,862	2,860	2,863	2,861	2,863	2,861	2,863	2,861
R-squared	0.817	0.831	0.803	0.801	0.817	0.826	0.816	0.826	0.817	0.826

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Conclusion

In a country like the US, built mainly by migrants, it comes as no surprise that the economic consequences of migration have been thoroughly scrutinized. The impact of migration on economies of scale, the labor market, wages, or innovation has been analyzed from all angles. However, one important shortcoming of the majority of these analyses is that their focus tends to be short-term. Most migration studies look at what would be the immediate impact of migration on, say, wages or the composition of the labor force. In the best of cases, some of these analyses have ventured over the medium-term, by looking at the potential implications over one or two decades.

However, mass migration of the type experienced by the US in the second half of the 19th century and the first 15 years of the 20th century – and then again during the last decade of the 20th century – is bound to have left a profound impact on institutions and culture, especially in those places where migrants settled in large numbers. According to the literature on institutions, these important institutional shocks are likely to have long-lasting effects on economic outcomes (Acemoglu et al. 2001; Tabellini, 2010). Whether this is the case is still debated. Most views would, however, tend to dismiss the long-term economic impact of large migration waves on the basis that, given the superiority of US institutions relative to those in the countries of origin, migrants would slowly adapt to the conditions of the host country and not vice versa (Gordon, 1964), and that high population mobility within the US would over the period of maximum two generations have undermined the strength of the institutional constructs brought by migrants. Hence, the prevailing view is that migrants would have been relatively easily absorbed into the US melting-pot, making any sort of long-term economic legacy of migration difficult to identify, if at all. Nevertheless, there are very few studies which are capable of corroborating this hypothesis and virtually none which has looked at whether this is the case from a territorial perspective.

This paper set out to fill in this gap in the literature, by analyzing to what extent the geographically distinct settlement pattern of migrants arriving in the US in the late 19th and early 20th centuries left a legacy on the economic development of the counties where they settled and, if that legacy ever existed, whether it could be traced until today. In order to do this, we looked at the 1880, 1900, and 1910 US censuses, classified individuals as locals or migrants, and allocated them to the county where they lived at the census date. This method provided us with a geography of the places where migrants settled at different times in US

history. We then used this geography to assess – after controlling for a number of factors which would have determined the attractiveness of a place for migrants at the time of the big migration waves, as well as for others which are expected to influence current levels of development – whether the institutional constructs derived from the largest waves of migration into the US could still be felt in current levels of development.

The results of our analysis are strong and clearly contradict the dominant view about the (ir)relevance of migration for long-term economic performance. Almost a century and a half after the first large migration wave of the late 19th century, those places where migrants settled in big numbers are significantly better off than those which were virtually untouched by the migration wave. Migration is the only factor related to the period of the migration waves which is still strongly connected to current levels of development. Factors such as the level of income of the county at the end of the 19th century or early 20th century, the level of education of the population, the percentage of black population, the participation of women in the labor force, or whether the county was rural or urban – which would have determined the attractiveness of a county to migrants in the first place – have no bearing whatsoever on the current level of development of US counties. While their influence on a county's wealth and, consequently, on its economic dynamism has disappeared long ago, migration has left an imprint which still affects economic performance. And this result is robust to controlling for different migration waves and to the introduction of a series of instruments, which point in the direction that past migration affects current levels of development and not the other way around.

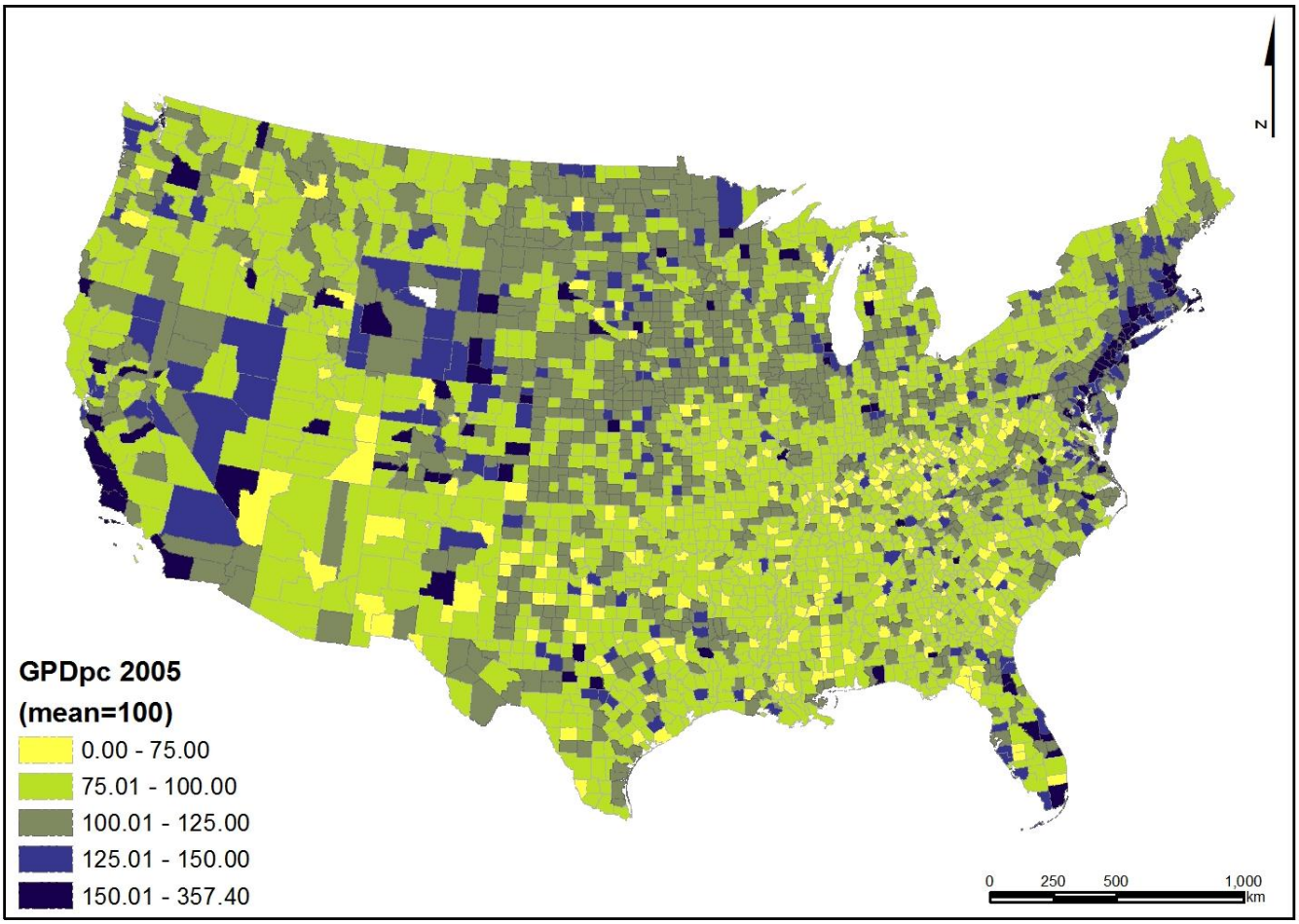
Given the data we have, we cannot directly test for the mechanisms which determine the strength of this connection. However, the original migrants are long gone and their descendants have not only long-ago become part of the American melting-pot, but have also moved over the last generations around the country. Hence, it is most likely that the mechanisms through which mass migration in the late 19th and early 20th century influences current development levels in US do not take place through direct intergenerational transfers, but through territories. Mass migration could have created a shock capable of altering the institutions of the places where migrants settled, giving them a unique character which still pulls them apart from other areas in the US. However, greater research is needed in order to unveil the exact mechanisms through which this transmission takes place.

Finally, the results of the analysis provide some food for policy thought. In a period where the debate in the US is about strongly limiting migration or, if at all, encouraging highly selective

migration on the basis of skills and training, the results of our analysis raise a warning sign. The arrival in the late 19th and early 20th century of large hoards of young, generally uneducated and often difficult to assimilate migrants – precisely the type of migration that the US wants to put a cap on these days – has left a positive economic legacy which can still be felt today. It is true that the circumstances have changed and that the conditions of late 19th century America are very different from those of early 21st century America, but our results highlight that mass migration has been a powerful and, as we have seen, very enduring force behind local economic development in US. Consequently, the potential consequences of considerably curbing migration flows will certainly be felt in the long run. The economic dynamism of the US and its constituent parts a century down the line are therefore bound to be a consequence of decisions regarding migration, making migration policy today crucial for the economic health of the US for decades to come.

Appendix

Appendix I – GDP per capita in the United States in 2005



Appendix II – Variable Description

Variable	Description	Source	Expected Sign
Dependent Variables			
*income**	Income per capita in county *i* in year □	US BEA and US BLS	
Main independent variables:			
*migrants**	percentage of migrants in county *i* (migrants = foreign born population + locals with foreign born parents) in year □	IPUMS USA	
*local population**	percentage of local population in county *i* (both parents born in the US) in year □	IPUMS USA	
Instruments:			
distance to NY	inverted distance from respective county to New York City	own calculations	
Catholics	percentage of Catholics in population	ARDA	
Baptists	percentage of Baptists in population	ARDA	
Catholics & Baptists	percentage of Catholics and Baptists in population	ARDA	
Controls:			
*population**	Log of total population in county *i* in year □	ICPSR	(+)
*black population**	Percentage of black population of county *i* in year □	ICPSR	(-) 1880 (?) 1990
*education**	Percentage of population of county *i* with college degree in year □	ICPSR	(+)
*female participation**	Female participation rate in the labor force in county *i* in year □	ICPSR	(+)
*unemployment**	unemployment rate in county *i* in year □	ICPSR, US BEA and US BLS	(-)
*agriculture**	percentage of the labor force employed in agriculture in county *i* in year □	ICPSR, US BEA and US BLS	(-)
*infant mortality**	infant mortality rate in county *i* in year □	CDC	(-)
*income**	mean income of population in county *i* in year □	US BEA and US BLS	(+)
*literacy**	literacy rate in county *i* in year □	ICPSR	(+)
state controls	state dummies		

* indicates a certain year ranging from 1880 to 2005

APPENDIX III	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
dep.var.:	OLS	OLS	IV	IV	IV	IV	IV	IV	IV	IV
income p.c. 2005	migrants	migrants	distance to NY	distance to NY	Catholics	Catholics	Baptists	Baptists	Catholics Baptists	Catholics Baptists
migrants1900	0.0558***	0.0512**	0.540**	0.725**	0.0476	0.0173	0.352**	0.628*	0.0784	0.0445
	(0.0207)	(0.0229)	(0.228)	(0.329)	(0.0605)	(0.0842)	(0.152)	(0.327)	(0.0586)	(0.0831)
population 1990	0.0161***	0.0158***	0.0120***	0.0126***	0.0161***	0.0160***	0.0137***	0.0132***	0.0159***	0.0158***
	(0.00301)	(0.00301)	(0.00367)	(0.00366)	(0.00302)	(0.00301)	(0.00330)	(0.00359)	(0.00301)	(0.00300)
black population 1990	0.0100	0.00893	-0.00221	0.00955	0.0102	0.00880	0.00394	0.0112	0.00958	0.00891
	(0.0261)	(0.0261)	(0.0283)	(0.0293)	(0.0259)	(0.0259)	(0.0269)	(0.0285)	(0.0259)	(0.0259)
education 1990	1.327***	1.328***	1.309***	1.314***	1.327***	1.328***	1.327***	1.331***	1.327***	1.328***
	(0.0533)	(0.0533)	(0.0574)	(0.0600)	(0.0528)	(0.0528)	(0.0545)	(0.0580)	(0.0528)	(0.0527)
female participation 1990	0.268***	0.269***	0.322***	0.308***	0.267***	0.267***	0.297***	0.298***	0.270***	0.268***
	(0.0563)	(0.0565)	(0.0642)	(0.0651)	(0.0561)	(0.0561)	(0.0596)	(0.0636)	(0.0561)	(0.0560)
unemployment 199090	-1.981***	-1.985***	-1.971***	-2.001***	-1.982***	-1.985***	-1.968***	-1.989***	-1.980***	-1.985***
	(0.118)	(0.118)	(0.127)	(0.132)	(0.117)	(0.117)	(0.121)	(0.128)	(0.117)	(0.117)
agriculture 1990	0.145***	0.144***	0.144***	0.130**	0.145***	0.145***	0.147***	0.137**	0.146***	0.145***
	(0.0488)	(0.0488)	(0.0524)	(0.0548)	(0.0483)	(0.0483)	(0.0499)	(0.0533)	(0.0483)	(0.0483)
infant mortality 1990	-0.0897***	-0.0899***	-0.0649*	-0.0601	-0.0901***	-0.0914***	-0.0741**	-0.0638*	-0.0885***	-0.0902***
	(0.0314)	(0.0314)	(0.0358)	(0.0382)	(0.0313)	(0.0314)	(0.0331)	(0.0373)	(0.0313)	(0.0313)
black population 1900		-0.0418*		0.0761		-0.0477*		0.0575		-0.0430
		(0.0245)		(0.0624)		(0.0280)		(0.0622)		(0.0279)
income 1900		-0.00129		-0.0178**		-0.000464		-0.0153*		-0.00112
		(0.00226)		(0.00831)		(0.00298)		(0.00829)		(0.00296)
female participation 1900		0.0788		-0.0100		0.0830		0.00649		0.0796
		(0.0505)		(0.0694)		(0.0510)		(0.0685)		(0.0510)
agriculture 1900		-0.00320		0.213*		-0.0140		0.180		-0.00534
		(0.0406)		(0.113)		(0.0478)		(0.113)		(0.0476)
literacy 1900		-0.0486		0.291*		-0.0655		0.238		-0.0520
		(0.0419)		(0.169)		(0.0579)		(0.169)		(0.0575)
state controls	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*Yes*
Observations	3,090	3,090	3,089	3,089	3,090	3,090	3,090	3,090	3,090	3,090
R-squared	0.605	0.606	0.531	0.490	0.605	0.606	0.578	0.523	0.605	0.606

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

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