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International migration and the role of institutions

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ABSTRACT

We study the determinants of international migration with special attention to the role of institutional factors other than economic and demographic fundamentals. We evaluate the impact of political institutions and of those institutions specifically targeted at attracting migrants. For a dataset on 19th century migration, we find that economic and demographic differentials play a major role, but that the quality of institutions also matter. We produce evidence that both political and migration institutions represent significant factors of attraction, even after controlling for their potential endogeneity through a set of instruments exploiting colonial history and the institutions inherited from the past.

JEL Classification Numbers: F22, P16, O15.

Key Words: International migration, institutions, democracy, migration policy, colonial history.

1 Introduction

A central question in the current economic debate is the importance of institutional factors in determining economic phenomena. In this paper we focus our attention on the determinants of international migration, with an effort to establish the relevance of different sets of institutions. In particular, we evaluate the impact of political institutions, which are linked to the general level of democracy, and of those institutions which are more specifically targeted at attracting migrants. We conduct this investigation for a sample of those countries that more actively participated in the historical experience of mass migration that took place across the Old and the New World between the middle of the 19th century and the First World War.

The impact of institutions on this specific historical episode has not yet been fully investigated, even though the countries involved exhibited stark contrasts in this respect. Political institutions, for instance, were far more advanced in North America than in Europe, while Latin America took from the beginning very different routes of development, as reported by Engerman and Sokoloff (2002). Within the Old World, during the decades under consideration there is also considerable variation, both across countries and over time, with a general evolution toward democratization and a gradual extension of the voting franchise, which can be explained by the pressure of social unrest and by the need of modernization, as suggested by Acemoglu and Robinson (2000) and by Lizzeri and Persico (2004), respectively.

Despite the fact that the period under investigation is usually depicted as an era of unrestricted migration, countries also developed different policies toward potential migrants. Engerman and Sokoloff (2002) provide a historical comparison of the policies enacted in various American countries, which included a variety of provisions regarding access to land and public education, all meant to attract those contemplating relocation. Citizenship policy, which can be instrumental in enabling migrants to enjoy the benefits of the voting franchise and in facilitating integration (Weil 2001), was also deeply differentiated, and subject to a slow evolution. Goldin (1994) analyzes the gradual immigration policy restrictions in the United States around the turn of the 19th century, with a focus on the debate that eventually led to the restrictive 1917 Literacy Act, while Timmer and Williamson (1998) document the

cross-country and time-series variations in immigration policy for five destination countries in the 1860-1930 period.

The relevance of migration within the debate on institutions, in a broader context, has been stressed by recent research which has identified migration as a crucial channel of transmission between institutions and economic outcomes. Acemoglu et al. (2001) link colonial migration to the shaping of institutions themselves, and in turn to subsequent economic development. Engerman and Sokoloff (2002) argue that the evolution of factor endowments and the extent of inequality in New World economies crucially affected the evolution of strategic institutions including migration policy. Fernandez (2007) develops an epidemiological approach that treats differences in countries of ancestry as cultural proxies which affect economic outcomes.

Recent research on 19th century mass migration - summarized in Hatton and Williamson (2005) - has uncovered a number of economic and demographic determinants of this historical event. Income differentials, usually captured by a measure of the wage gap, had a paramount impact, with richer countries attracting larger inflows. The demographic structure of the population also mattered, because of the higher propensity to migrate of young adults. The degree of industrialization and the consequent reallocation of the labor force away from agriculture had offsetting effects on emigration, since a fall in the agricultural share tended to make labor more mobile, but also to reduce the wage incentive to leave. Network effects established through the stock of previous migrants facilitated emigration.

Given the potential relevance of institutions for the mass migration experience, in this paper we review the determinants of migration in the 1870-1910 period with special attention to the role of institutional factors. We first assess the relevance of the standard economic and demographic determinants highlighted in the literature, in particular income differentials, the level of development, the demographic structure of the population, and network effects. Next, we evaluate the impact of institutional factors. We consider two separate sets of institutions. The first focuses on political institutions, which capture how a country fares in terms of political rights, not only from the perspective of migrants but also from that of its natives. This set includes information on the level of democracy and the extension of suffrage. The second set focuses on migration institutions, i.e., those policies specifically

aimed at making a country attractive to migrants. This set includes information on the kind of citizenship laws (i.e., jus soli vs. jus sanguinis), land distribution policy, public education policy, and immigration policy attitudes. To come up with a single measure of institutional quality, we also construct a general index based on the six variables described above.

The results of our empirical investigation confirm that economic and demographic fundamentals played a significant role in determining 19th century mass migration. However, we also find evidence of an influence of institutional factors, with the general index of institutional quality exerting a positive impact on immigration. Moreover, we find that both political and migration institutions positively contribute to the effectiveness of our general index, and thus to the level of attractiveness of a country toward migrants. Our results hold after accounting for the potential endogeneity of the institutional variables, through a set of instruments exploiting colonial history and the quality of institutions inherited from the past.

The rest of the paper is organized as follows. In Section 2 we review the related literature. Section 3 presents the basic stylized facts of 19th century mass migration. Section 4 introduces a simple model of international migration. Our dataset is described in Section 5. Section 6 illustrates the empirical strategy. Section 7 presents the results. Section 8 concludes and indicates directions for future research. The Data Appendix collects detailed information about the data employed and illustrates how we compiled the citizenship laws dataset.

2 Related literature

This paper represents a contribution to the literature on the economic impact of institutions. Moreover, it adds to research on the political economy of migration and on the determinants of international migration in a long-term perspective. It is therefore related to several separate branches of the literature.

The connection between economic and political decisions is at the heart of the vast and growing public choice field, whose approach has come to influence the entire economic literature, as effectively illustrated by Mueller (2003). Classic references in this field are Arrow

(1951), Downs (1957) and Olson (1965). Moreover, the seminal work of North (1981) has established that the social, economic, legal, and political organization of a society is a primary determinant of economic performance. Among recent contributions, the most relevant to our approach are the following. Acemoglu et al. (2001) estimate the effect of institutions on economic performance by exploiting differences in the mortality rates of European colonizers. Acemoglu and Johnson (2005) progress along this research line by comparing the relative strength of different sets of institutions, i.e., property rights vs. contracting institutions, for economic outcomes. Persson and Tabellini (2006) decompose the impact of different forms of democracy, i.e., electoral rules and forms of government. Engerman and Sokoloff (2002, 2005) perform a broad comparative analysis of the evolution of institutions in connection with growth in the Americas. Finally, La Porta et al. (1998) start a research line that has uncovered the impact of legal origin on a variety of economic issues. Our innovation with respect to this line of research is to select migration as the specific economic outcome for which we test the potential impact of an appropriately selected set of institutions, i.e., political and migration institutions.

More specifically, we contribute to the literature that has modeled the political economy of migration policy, following Kimenyi et al. (1986), Benhabib (1996), Razin et al. (2002), and Gradstein and Schiff (2006), since the empirical evidence we present corroborates the relevance of migration policy for the decision to migrate. Pritchett (2006) and DeVoretz (2006) discuss the politics of today's labor mobility and migration policies. Rotte and Vogler (2000) find evidence of the relevance of the political situation in sending countries on migration to Germany. Recent work on attitudes toward immigrants, by Mayda (2006) and O'Rourke and Sinnott (2006), can also be related to our approach.

The historical experience of 19th century mass migration has been the focus of a number of empirical studies, which have addressed both its causes and its consequences, and are summarized in Hatton and Williamson (2005). Recent developments in the debate on the economics of contemporary immigration are surveyed by Borjas (1994). While most of the available research has analyzed bilateral flows from one source country to one destination, or aggregate migration from a single source country or to a single destination, we broaden our perspective to international migration flows. Moreover, we stress their institutional

determinants, beside its economic and demographic ones.

3 The stylized facts of 19th century mass migration

The period that runs from 1860 until the First World War is usually referred to as the age of mass migration. Table 1 presents gross migration rates in the 1870-1910 period for the 14 countries on which our empirical investigation is based. The table divides countries into two groups: Old World and New World. The Old World consists of Western European countries, which for the period all display negative rates. Most of the European emigrants were young, poor, and unskilled. While Ireland and Britain were the main sources of emigration initially, Germany, Scandinavia and then Southern and Eastern Europe joined in during the subsequent decades. The New World is represented in the table by Australia, Canada and the United States, which were on the receiving side. Out of a much scarcer local population, these countries thus exhibit highly positive rates of immigration. The main destination was North America, followed by South America (which is not included in our sample) and Australasia.

To assess the relative importance of the phenomenon on a wider time span, Table 2 presents a long-term perspective of migration patterns for the 1870-1998 period for a sample of countries similar to ours. The table confirms the magnitude of the early, mass migration waves, with high net flows of migrants for the 1870-1913 period. Migratory movements slow down drastically in the interwar period, to resume in the 1950s, even if it is only after 1974 that they reach a size comparable to the early one, and that yet only in absolute terms. While data refer here to net migration, rather than gross, this distinction is unimportant for most of the 19th century due to the high cost of returning, even if return migration did become more significant over time.

Going further back, Chiswick and Hatton (2003) describe the deep differences among the 1860-1913 mass migration and the previous historical waves, i.e., the contracted and coercive migration of the 1600-1790 period, and the pioneer migration of the 1790-1850 period. It is only in the middle of the 19th century that migration flows reached the massive size that was then sustained for over 50 years, until the outbreak of the First World War. Among

the factors that made this surge possible, there are on the one hand the improvement of the technology of transport and communication, and on the other the European famine and revolution.

Economic and demographic determinants certainly had a paramount role in 19th century migration, with richer countries attracting larger inflows, and poor countries with younger populations and larger shares in agriculture experiencing heavier emigration, further reinforced by network effects. Indeed these fundamental differences between the countries on the sending and the receiving sides were large, and such as to justify the massive relocation of workers that we have witnessed. As argued in the introduction, however, the substantial institutional differences which characterized the countries involved may also have played a yet unexplored role in the process under examination.

4 A simple theoretical framework

In this section we present a simple model to guide our understanding of the potential determinants of international migration. To capture the fact that migration decisions are made over a long horizon, and taking into account also the welfare of the offspring (including for instance citizenship status), we consider a dynamic model with bequests where each individual lives for a single period and gives birth to a single child, to whom she leaves a bequest. Each individual has a choice between remaining in her home (or source) country and migrating into a foreign (or destination) country. All individuals are identical. Each individual's preferences are given by

$$u_t = (1-\theta)\log x_t + \theta \log b_{t+1}, \tag{1}$$

where x_t is the individual level of consumption, b_{t+1} is a bequest for the individual's child, and θ is a preference parameter, such that $0 < \theta < 1$. A standard 'joy of giving' bequest motive and a logarithmic functional form are assumed in order to obtain a closed-form solution. Each individual maximizes her utility subject to the following budget constraint:

$$x_t + b_{t+1} \leq y_t, \tag{2}$$

where y_t is individual income. The solution to the individual optimization problem is given

by the following consumption and bequest functions:

$$x_t = (1-\theta)y_t \tag{3a}$$

$$b_{t+1} = \theta y_t. \tag{3b}$$

Substituting the optimal solutions into (1), we can derive the indirect utility function as

$$v_t = \log y_t + \xi, \tag{4}$$

where $\xi = (1-\theta)\log(1-\theta) + \theta \log \theta$. It follows that the level of utility an individual can achieve depends on her income level. We can now analyze how the latter is determined.

We assume that individuals are simply endowed with a unit of labor which they supply inelastically to receive a wage income, which depends on location. The migration choice affects individual income as follows: $y_t^H = w_t^H + \delta \pi_t^H$ is the income level if the individual remains in the home country, where w_t^H is the level of the home wage, π_t^H is the institutional quality of the home country, and δ is a positive parameter. Similarly, $y_t^F = w_t^F + \delta \pi_t^F - c$ is the income level if the individual migrates to the foreign country, where w_t^F is the level of the foreign wage, π_t^F is the institutional quality of the foreign country, and c is the cost of migration. We assume that the level of institutional quality generates direct or indirect material gains, and can therefore be included among the determinants of the income level, weighted by the parameter δ. (Alternatively, we could have modeled it as an appropriately weighted argument in the utility function.) Note that the income level constrains not only the individual's consumption, but also the bequest she can transfer to her offspring, and that a component of institutional quality is represented by the ability to transmit citizenship rights. It follows that an individual decides to migrate if and only if $y_t^F > y_t^H$, i.e., if and only if $w_t^F + \delta \pi_t^F - c > w_t^H + \delta \pi_t^H$. The gain from migration is positive when the sum of the wage gap, $w_t^F - w_t^H$, and the weighted gap in the quality of institutions, $\delta(\pi_t^F - \pi_t^H)$, is larger that the cost of migration. In other words, the decision to migrate, d_t, can be formalized as

$$d_t = (w_t^F - w_t^H) + \delta(\pi_t^F - \pi_t^H) - c > 0. \tag{5}$$

Aggregating over individuals, the migration rate will be higher for countries with higher wages relative to the rest of the world and for countries with more attractive institutions.

Other factors previously discussed in the literature can be embedded into the model as follows. The agricultural share of labor has been associated with larger emigration, even though in an early stage a large share may prevent emigration by acting as a poverty constraint, while higher manufacturing wages may reverse the effect in later stages. These considerations could be accounted for by assuming that the wage gap in favor of the foreign country is increasing in the agricultural share of the home country. The available literature has also highlighted that the demographic structure of the population matters for migration, since the decision to emigrate is more likely to be taken by young individuals, so that countries with a higher share of young population tend to be associated with larger emigration. Since in our framework the wage rate really captures life-long earning potentials, these considerations could be easily embedded into a multi-period variant of the model through the wage differential. Another potential determinant of migration is the presence of a stock of previous migrants. This network effect can be captured by a reduction of the direct cost c.

The quality of institutions is determined by two separate sets of factors, political and migration institutions, which affect the migration decisions through the following channels. The quality of a country's political institutions can be an element of attraction, because of the pecuniary and non-pecuniary costs and benefits associated with democracy. A more democratic environment can improve the quality of the migrants' life per se, because it may be associated with a higher degree of equality, and because it may imply, through the franchise, control over the welfare state and the associated system of taxes and transfers. Turning to the institutions affecting migration more directly, more liberal land and education policies would facilitate relocation and integration by providing direct and indirect sources of income. While it is true that public education policies are more likely to affect second generation migrants, in a context where generations are linked through a bequest motive, like ours, the implied material gain is going to affect the decision made by the first generation. Moreover, an easier ascension to citizenship, with the implied full membership in a state, should also increase migration into a country. This applies also to provisions, such as a jus soli policy, granting automatic citizenship to second generation migrants which - as previously mentioned - an individual values because of its impact on her offspring. To be noticed is that, even if in practice institutional factors may have also directly affected the

wage differential or the cost of migration, our simple formulation is designed to disentangle the impact of institutions on migration decisions from that of standard variables.

5 Data

We use a dataset that is based on the sample of the 14 countries selected by Taylor and Williamson (1997) for their econometric analysis of international convergence in the 1870-1910 period. The countries are: Belgium, Denmark, France, Germany, Great Britain, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Australia, Canada, and the United States. For these countries we assemble a panel with four observations for each country, one for each decade under consideration. In particular, we employ data on decade averages of gross migration rates.[1] Moreover, we collect from various sources (details are provided in the Data Appendix) data on the wage gap with respect to the other countries in the sample, the agricultural labor share, and the young adult share of the population. The latter variable is meant to proxy for the demographic structure of the population, while we proxy for network effects using the lagged value of the dependent variable. The resulting dataset allows to replicate, with an appropriate adaptation, previous analyses focused on economic and demographic determinants.

We complete our dataset with variables that describe the institutional environment. We start from political institutions, which we capture using two indicators. The first indicator is a standard measure of the degree of democracy represented by the Polity variable from the Polity IV (2002) dataset. This variable includes information on the institutionalized procedures regarding the transfer of executive power, the extent to which executives are chosen through competitive elections, the opportunity for non-élites to attain executive office, the de facto independence of the chief executive, the development of institutional structures for political expression, and the extent to which non-élites are able to access institutional structures for political expression. Our second indicator for the quality of political institutions is a more direct, quantitative measure of the extension of suffrage, which is proxied by the fraction of registered voters over total population.

[1]Data on bilateral flows across all countries in our sample are not available for this time period.

Next, we select a set of institutions which can be interpreted as components of a broad migration policy package, and thus are more likely to make a country more attractive to migrants. A first indicator focuses on the kind of laws that regulated ascension to citizenship. As a proxy for this indicator, we employ citizenship laws at birth at the beginning of each decade for each country, distinguishing between legislations based on jus soli (i.e., by birthplace) and jus sanguinis (i.e., by descent). This variable is defined by a dummy taking on the value of 1 if a country applies jus soli, and 0 if it applies jus sanguinis. Details on this variable, which we collect and codify, can be found in the Data Appendix, Part B.

Despite the potential relevance of citizenship policy for the decision to migrate, the use of our citizenship laws variable as a regressor for migration can be subject to a number of objections. First, since the return migration rate was very high by the turn of the century, and varied a lot by country, the impact of this variable might have faded over time and may have played a different role across countries. Generally speaking, however, even temporary migrants may have cared about the general attitude toward integration to which jus soli policies testified. Second, British emigrants were actually in a special position when moving to countries belonging to the British Empire, such as Canada and Australia, since they were dual citizens of both Britain and Empire countries. We do not have information on bilateral flows, but Hatton (1995) estimates that about 54% of British emigrants in the 1870-1913 period actually went to the United States, while only about 42% went to Canada, Australia and New Zealand. Therefore this objection, even if taken literally, would affect only a minority of the migrants included in our sample. An additional objection may come from the fact that all receiving countries in our sample apply a jus soli policy, so that there is no variation in this dimension across them. However, this does not invalidate our empirical strategy, since ex ante a country with a high wage gap could turn out to be an attractive destination even in the absence of jus soli, or vice versa. Indeed, the period witnessed internal migration within Continental Europe, in particular toward jus sanguinis countries such as Belgium and Germany. Likewise, a jus soli country could be associated with an unappealing earnings differential and therefore be discarded as a possible destination. The latter is the case, for example, for jus soli Portugal.

A second indicator of migration institutions is a measure of land distribution policy,

proxied with data on land inequality. Since land inequality data are only available at the end of the period under consideration, we assume that policies that facilitated access to land throughout the period must have resulted in more equal land distribution at the end of it. A third indicator in this set is a measure of public education policy aimed at capturing to what degree countries adopted liberal policies toward public schools. We proxy this indicator taking primary and secondary school enrollment per capita. Finally, we also consider the index of immigration policy attitudes constructed by Timmer and Williamson (1998) for five immigration countries, three of which - Australia, Canada and the United States - are in our sample. The index, which is constructed on the basis of a detailed historical analysis of immigration policy measures over the 1860-1930 period, is designed to reflect political sentiment and attitudes toward immigration rather than the effectiveness of regulation.[2] A positive score indicates a pro-immigration, and a negative score an anti-immigration policy attitude. A null score can therefore be interpreted as policy neutrality, or laissez faire. Data for the remaining countries in our sample are not available but, since these are emigration countries which did not develop active immigration policies during the relevant time span, we assign them a null score. While this procedure severely limits the reliability of the resulting index, it allows us to retain crucial information. To be noticed, however, is that information on citizenship laws is not included in this index.[3] Therefore, the two indicators do not overlap and each retains independent relevance.[4]

To come up with a single measure of institutions, we construct a general index of institutional quality based on the six variables described above, i.e., democracy, suffrage extension, citizenship laws, land distribution policy, public education policy, and immigration policy attitudes. Each variable enters the index with equal weight. Our index has the advantage of summarizing complex, multi-dimensional issues. Its Cronbach's alpha reliability coefficient,

[2]Indeed, while attitudes changed significantly for the worse in the period under consideration as a reaction to the fact that migrants tended to be less skilled, the actual regulation did not change much until the First World War, as confirmed by Hatton and Williamson (2005).

[3]Those three countries which are also in our dataset adopted jus soli throughout the relevant period.

[4]A more open citizenship policy could also be related to democracy, since one of the benefits of citizenship comes from the ability to vote. However, in practice a democratic country could well adopt a jus sanguinis policy, while there are also historical examples of jus soli autocracies.

which indicates the extent to which our indicator can be treated as measuring a single latent variable, is 0.60, a value which is usually found acceptable in similar contexts. We also decompose our general index into separate dimensions, in the effort to extract from our indicators different basic packages of institutional characteristics. By applying factor analysis to the dataset, we discover that our variables can be explained by three factors.[5] A first factor is common to the two indicators we selected for political institutions, i.e., the variables democracy and suffrage. The Cronbach's alpha of the index that we construct using these two variables (each entering with equal weight) is now higher at 0.76. A second factor is common to three of the four indicators that are designed to describe migration institutions, i.e., citizenship laws, land distribution policy, and public education policy, while the index of migration policy attitudes is mainly correlated with a third factor. Nevertheless, following economic intuition, we construct an index of migration institutions including all four variables (each entering with equal weight). Its Cronbach's alpha is 0.57. Since migration policy attitudes are correlated with a third factor, in the subsequent analysis we also gauge its potential impact separately.

Beside ease of interpretation, a major advantage of relying on indexes, rather than on single variables, rests on the fact that data limitations for this historical period make the direct use of the latter highly problematic. By construction, our indexes span a larger set of observations than most individual sources, thus permitting comparisons of institutions across a broader set of countries than would be possible using any single source.[6]

Finally, to complete our dataset, we also collect information on additional variables which have been employed in research on the impact of institutions. We include colonial history, as captured by a dummy which takes on the value of 1 if a country has been, or still is in the period under consideration, a colony, and legal origin, as captured by a dummy that takes on the value of 1 if a country has a common law legal origin, and 0 if it has civil law.[7]

[5]We perform maximum-likelihood factor analysis and find that the retained factors are three. The results are similar if we use instead principal factors.

[6]More specifically, in creating the indexes, if an observation is missing for an institutional variable, then the index is created using the remaining information.

[7]We refer to Acemoglu et al. (2001) and Bertocchi and Canova (2002) for early work exploiting colonial history and to La Porta et al. (1998) for the legal origins approach.

Table 3 reports summary statistics for the variables in our sample, including the indexes. The (unreported) pairwise correlations among our institutional variables show that democracy and suffrage are highly correlated (0.61), and so are land and education policies (0.66), while in turn citizenship policy is highly correlated with land policy (0.45) but not with the political indicators. Migration policy attitudes are uncorrelated with the other institutional variables. The correlation between the colony dummy and the common law dummy is 0.65. The pairwise correlations between gross migration and our institutional variables can be summarized as follows: there is a significant and positive correlation of migration with democracy (0.53), suffrage (0.60), citizenship laws (0.33), land distribution policy (0.48), and public education policy. Moreover, migration is positively correlated with the wage gap (0.77). Finally, evidence on the cross-sectional and time-series variations of the variables in our panel dataset reveals that, for each variable, between-variability is much larger than within-variability. Within-variability is especially limited for the institutional variables.

6 Empirical strategy

6.1 Empirical specification

We apply the intuition derived from theory and we investigate the determinants of international migration using the following empirical specification:

$$M_{it} = a_0 + E'_{it}a_1 + I'_{it}a_2 + \varepsilon_{it}, \tag{8}$$

where M_{it} is the gross migration rate in country i in period t (with $i = 1, ..., 14$ and $t = 1, ..., 4$ - each country observation corresponding to each of the four decades included in the period 1870-1910). E_{it} is a vector including economic and demographic variables which have been traditionally used to explain the evolution of migration flows in the age of mass migration: the wage gap, the agricultural share, the share of young population, and lagged migration as a way to capture network effects. I_{it} is an index reflecting institutional determinants and ε_{it} is the error term.

We implement a pooled OLS specification with robust standard errors clustered at coun-

try level. Clustering is employed because of the presence of groupwise heteroscedasticity and serial correlation at country level, as revealed by the appropriate tests.[8] We also consider fixed- and random-effects specifications. Fixed effects are significant at the 5% level in most cases, but a fixed-effects model produces unsatisfactory results because of the large loss of degrees of freedom. Random effects are insignificant, and a random-effects model produces results that are nearly identical to those obtained from the pooled data. Time effects prove insignificant and are therefore omitted.

We can now suggest a number of specific hypotheses regarding the potential role of the above-mentioned factors, starting with the economic and demographic variables. We expect a positive effect on a country's rate of migration for the wage gap. The impact of the agricultural share is potentially ambiguous, as previously discussed in Section 1, but a negative coefficient would signal a negative impact on migration of a low development level. Similarly, the share of young in the population should exert a negative impact by increasing emigration. Moreover, an interaction term between the latter two variables could capture the fact that the impact of the agricultural share on migration may be influenced by demographic factors.[9] Finally, if lagged migration captures important network effects, its coefficient should be positive.

Turning to institutions, since our indexes are designed to capture their quality, we expect a positive coefficient for the general index of institutional quality, as well as for the two sub-indexes capturing political and migration institutions. More specifically, for each variable entering our indexes of institutional quality, we can justify its positive contribution to the overall impact as follows. The level of democracy and the extension of suffrage should both represent factors of attraction for potential migrants, assuming that these factors are actually taken into account. The same can be argued for more generous land distribution and public education policies, for more welcoming attitudes toward immigrants, and for more inclusive citizenship laws based on the jus soli principle.

[8]Test results are available upon request.

[9]If the level of fertility were simply assumed to be increasing, in a linear fashion, with the agricultural share, the same link would be captured by a significant coefficient of the squared value of the agricultural share itself.

6.2 Instrumentation strategy

When dealing with institutions and their impact on the economic environment, we need to account for their potential endogeneity, due to the fact that these variables may themselves change over time under the influence of the economic environment. To deal with this issue, we use instrumental-variables (IV) regressions, as described below.

It is easier to start our discussion of instrument selection from our indexes for political and migration institutions, taken separately. The potential endogeneity of political institutions with respect to the general level of development has been the subject of a long research line.[10] Within the present context, political institutions may turn out to be endogenous with respect to migration, since for instance a large pool of relatively poor migrants may push toward political change. Therefore, we run IV regressions where we instrument political institutions with their initial value, i.e., the level of democracy and the extension of suffrage in the first decade of the sample. The argument is that initial political institutions could affect current political institutions, but should have no direct effect on current migration.

The potential endogeneity of migration institutions with respect to migration is explained by the fact that, in principle, a country could respond to migration in selecting its land, education and citizenship policy, and in forming its attitudes toward immigrants. For instance, a country could add jus soli elements under the pressure of the existing immigrants, or could instead orient its legislation toward jus sanguinis in the presence of a large stock of emigrants. To address this issue, we run IV regressions where we instrument migration institutions with four variables: the initial citizenship laws, education policies, migration policy attitudes (i.e., their value in the first decade), and the dummy capturing colonization.[11] While the choice of the first three variables again reflects the assumption that initial policies can affect current policies, but not current migration, the choice of the colonial dummy comes from a tradition of investigation which has stressed the relevance of colonial heritage for a country's general development level. One possible objection to the use of this instrument is that the potential

[10] See, for example, Barro (1999) on the determinants of democracy and Acemoglu et al. (2005) on the impact of democracy on income.

[11] Information on land inequality at the beginning of the sample is not available, therefore we cannot apply an analogous instrumentation strategy for the land policy component.

presence of colonial migration, i.e., those bilateral migration flows occurring between any metropolitan country and its colonies, may invalidate our strategy by violating the exclusion restriction, because of a direct impact of the instrument on the dependent variable. However, international migration in the period under consideration was a more complex phenomenon than what colonial migration patterns could explain. For example, British migrants were directed not just to the British colonies, while a large part of the inflows into British colonies actually came from Continental Europe. As an alternative to the dummy capturing colonization, we also experiment with the dummy capturing legal origin. The two are related through the fact that legal systems are adopted or transplanted through colonial heritage.

To sum up, for each separate set of potentially endogenous institutions we propose a separate instrument, in order to disentangle its impact on migration. In addition, we also develop an instrumentation strategy for our general institutional index, by employing a combination of the above selected instruments.

7 Results

Table 4 reports our regression results on the determinants of migration in the 1870-1910 period, when only economic and demographic factors are taken into account. Note that a positive coefficient of a variable means that an increase in this variable induces immigration to the country, whereas a negative coefficient means that it induces emigration from the country. In column 1 the coefficient of the wage gap is positive and highly significant, confirming its crucial role as uncovered in previous studies. The agricultural share, which captures the level of development, turns out to display a significant negative impact, induced by large emigration out of the less industrialized countries. The share of the young population, which proxies for the emigration intensive cohort, also has a significantly negative coefficient, as expected. The positive and significant impact of the interaction term between the latter two regressors can be explained by the fact that the incentive to migrate, for an agricultural worker, is weakened in the presence of high fertility rates, i.e., in countries which are not

yet beyond the demographic transition.[12] In other words, the fact that a country may be still trapped by a poverty constraint depends on its agricultural share, but also on its demographic structure.[13]

The relevant literature has stressed the potential endogeneity of the wage gap, because of its gradual reduction due to convergence, which is in turn accelerated by migration. Therefore, for the same basic specification, we also run a regression where the wage gap is replaced by its lagged value. As column 2 shows, the previous conclusions hold and are actually reinforced, even though in the subsequent specifications including institutions we prefer to retain the current value of the wage gap to avoid a drastic reduction of our sample size. In column 3 we explore the potential role of the lagged value of the dependent variable, in the effort to assess the importance of network effects.[14] As expected, lagged migration has a positive effect, but it is insignificant, and remains so in combination with a lagged wage gap specification (column 4).

Since the theory presented in Section 4 suggests that we should expect a positive sign for the coefficients of the wage gap, the lagged wage gap and the lagged migration rate, and a negative sign for the coefficient of the share of young over population, we also perform one-sided tests, which imply a noticeable improvement in the significance of some coefficients. In particular, the wage gap becomes significant at 5% in column 3, while the share of young population becomes significant at 1% in columns 1 and 4, and at 5% in column 3.

Despite the fact that these regressions exhibit a potential omitted-variable problem which will be confirmed once institutional variables are added, nevertheless we present them for the sake of comparison with the available literature, and also because they allow us to perform the above preliminary robustness checks with respect to alternative economic covariates in the simplest possible set up.[15]

[12]The squared value of the agricultural share, which is commonly used to test the presence of a poverty constraint, is found insignificant in (unreported) regressions.

[13]The non-monotonic relationship between development and demographic forces is investigated theoretically within a complete dynamical system by Galor and Weil (1996).

[14]Network effects would be best captured by immigrant stocks by source countries. However, we do not have information on these data.

[15]To be noticed is that with the cluster option the degrees of freedom of each regression are determined by the number of clusters. This is due to the fact that the clusters - not the observations - are the independent

In Table 5 we add institutional variables to the standard economic and demographic regressors which appear in the basic specification (column 1) of Table 4. We start with our general index of institutional quality, which displays a significantly positive coefficient, while the role of the standard regressors is confirmed and the R-squared is improved. We then decompose institutions into their separate components. Both the political institutions index and the migration institutions index display positive coefficients (columns 2 and 3), revealing that both components contribute to the success of the general index, even though only the second one is significant.[16]

As for Table 4, we also perform one-sided tests for the significance of the coefficients for which our theoretical predictions imply either a positive or a negative sign. Using one-sided tests, the political institutions index becomes positively significant at 10% in column 2 and the share of young over population becomes negatively significant at 1% in column 3.

In Table 6 we control for the potential endogeneity of institutions by running 2SLS regressions. In Panel A we show the second stages, while in Panel B we show the corresponding first stages. In column 1 we consider our general index, whose positive and significant impact is confirmed when instrumented by the following two sets of instruments: the first is the instrument we select for political institutions (including the initial values of democracy and suffrage), the second is the instrument for migration institutions (including initial citizenship laws, education policy and migration policy attitudes, plus colonial history). In column 2 we show that the political institutions index also exerts a significantly positive impact when appropriately instrumented. In column 3 we run the same exercise for the migration institutions index, and its positive role is still present even though it is now less precisely estimated. Finally, in column 4 we consider political and migration institutions jointly. The second stage in Panel A shows that the joint significance of the two regressors entered in column 4 is preserved even allowing for their potential endogeneity, while the corresponding first stage regressions in Panel B (columns 4a and 4b) show that the set of instruments we select for political institutions has no influence on migration institutions, and

pieces of information we have. Of course, this has implications for the significance levels of the regression coefficients.

[16]Factor analysis in Section 5 suggests the presence of a separate factor for migration policy attitudes, so we also gauge their impact separately. An (unreported) regression confirms their positive impact.

vice versa. Therefore, this multiple instrumentation strategy allows to unbundle the role of the two separate sets of institutions when jointly considered, i.e., it ensures that they do not affect the dependent variable through the same channels.[17] In all above specifications, we also replace the colony dummy with the common law dummy, but the results are not satisfactory. To be noticed is that for Table 6 the significance of all coefficients, both in the first- and second-stage regressions, is always unaltered when one-sided tests are performed.

To test the validity of our instruments, i.e., to test the hypothesis that the instruments are not correlated with the errors, we perform the Hansen J-test for overidentification restrictions. This test is appropriate only for the general index of institutional quality, since only in that case do we have more than one instrument for the same endogenous variable. As we can see from Table 6A, column 1, the p-value of the Hansen J-statistic tells us that our instruments are valid. We test the quality of our instruments in three ways. First, we look at the individual t-statistics for the coefficients. Then we look at the F-statistic for the null hypothesis that all the instruments' coefficients are equal to zero. Finally we perform the Anderson-Rubin test for weak instruments. As we can see from Table 6B, the t-statistics reveal that our instruments are adequate, while the F-test that the instruments' coefficients are zero always rejects the null. The Anderson-Rubin test shows that, in three out of four estimations, the null hypothesis is rejected at 1%, while in one is rejected at 5% (see Table 6A). Finally, we produce evidence that the variables we denote as endogenous are really endogenous, on the basis of additional endogeneity tests not reported and available upon request.

Overall, we can therefore conclude that international migration in the 1870-1910 period was driven by economic and demographic fundamentals but was also influenced by institutions, since a better institutional quality proves to be a significant factor of attraction for migrants. Moreover, we disentangle the effect of political and migration institutions, and show that each exerts a distinct, significant impact. Finally, the potential feedback between the presence of migrants and institutions does not affect our conclusions, even accounting for multiple sources of endogeneity.

[17] Acemoglu and Johnson (2005) similarly unbundle the impact of contracting and property rights institutions.

8 Conclusion

In this paper we study the role of institutional factors among the determinants of international migration. For a dataset on 1870-1910 migration, we first assess the relevance of economic and demographic forces and confirm their major role as the determinants of this historical event. The migrants that left Continental Europe for the New World were certainly motivated by material needs and viewed their destination as the land of economic opportunity. However, we find evidence that institutions mattered as well, with better institutions being associated with higher rates of migration. These results concern not only the impact of those institutions more specifically targeted at attracting migrants, such as citizenship, land and education policies, but also the impact of political institutions, with more democratic countries with broader suffrage proving to be more attracting destinations, other things equal.

Our conclusions carry implications for the current policy debate on international migration and help to understand the implications of today's restrictive policies toward labor mobility and immigration, in a context where economic pressure to move from poor to rich countries is high and growing, but discrepancies in the quality of institutions are also persistently large.

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DATA APPENDIX

A) Data definitions and sources

All data are decade averages of the corresponding annual figures, except when indicated. The reference decades are the four decades in the 1870-1910 period.

Migration: Gross immigration rates. The source is Taylor and Williamson (1997).
Wage Gap: Log of the wage ratio, where the numerator is a country's real wage and the denominator is a simple average of the other countries' real wages. The source is Williamson (1995). We cannot include in the denominator only the relevant destination countries' wages, since information on bilateral migration flows across all countries in our sample is not available.
Agricultural Share: Percent work force engaged in agriculture. The source is Banks (2001).
Share of Young Population: Ratio between the young (i.e., aged 15-29) population and total population, from Census data. The source is Mitchell (2003). For each decade we take the Census closer to the year ending in 0. Note the following exceptions: for the Netherlands the age reported is 10-29 (except in 1900), for Spain it is 16-30.

Democracy: Polity variable from Polity IV (2002).

Suffrage: Registered voters over population. The source is Banks (2001).

Land Distribution Policy: Inverse of the Gini coefficient of land holdings in the first available year after 1910 (with the exception of Germany, for which the year is 1907). The source is Frankema (2006).

Public Education Policy: Primary plus secondary school enrollment per capita. The source is Banks (2001).

Citizenship Laws: Dummy for countries that have a jus soli policy at the beginning of each decade. The sources are Weil (2001), Joppke (1998), Brubaker (1992), and a variety of library sources. More details on this variable are available below (Data Appendix, Part B).

Migration Policy Attitudes: Index of attitudes toward migration policy based on the index compiled by Timmer and Williamson (1998) for three of the countries in our sample, i.e., Australia, Canada, and United States. We thank J. G. Williamson for providing these data to us. We assign a zero score to the remaining countries. Details are in the text.

Institutional Quality Index: Includes the variables democracy, suffrage, land distribution policy, public education policy, citizenship laws, and attitudes toward migration. Each variable enters with equal weight.

Political Institutions Index: Includes the variables democracy and suffrage. Each variable enters with equal weight.

Migration Institutions Index: Includes the variables land distribution policy, public education policy, citizenship laws and migration policy attitudes. Each variable enters with equal weight.

British Colony: Dummy for countries that were at any time British colonies. The source is the "Correlates of War 2 Project" (2004).

Common Law: Dummy for countries with a common law legal origin. The source is La Porta et al. (1999).

B) The citizenship laws variable

Historical and legal background Each country of the world has developed a system of legal rules that govern the attribution of citizenship, and therefore regulate the inclusion

of newcomers. Citizenship is associated with a precise set of rights and duties. It provides benefits such as the right to vote, better employment opportunities, the ability to travel without restrictions, and legal protection in case of criminal charges. There are also costs to citizenship, such as the military draft, renunciation of the original citizenship, and the pecuniary and non pecuniary costs that may be required for naturalization. Therefore, citizenship policy can be viewed as part of broader migration policy package, even though, contrary to other current migration policy measures such as quotas and visa requirements, that respond to short term business fluctuations and/or the outcome of political elections, citizenship laws reforms tend to be the outcome of long-term processes of adaptation often involving constitutional amendments.

Our codification effort focuses on the laws governing citizenship acquisition at birth, which are therefore especially relevant for second-generation immigrants, even though they are part of the migration decision of any parent who cares for her children and their future. These laws originally come from the two broad traditions of common and civil law. The former applies the jus soli principle, according to which citizenship is attributed by birthplace. This implies that the child of an immigrant is a citizen, as long as she is born in the country of immigration. The latter applies the jus sanguinis principle, which attributes citizenship by descent, so that a child inherits citizenship from her parents, independently of where she is born.

In 18th century Europe jus soli was the dominant criterion, following feudal traditions which linked human beings to the lord who held the land where they were born. The French Revolution broke with this heritage and with the 1804 civil code reintroduced the ancient Roman custom of jus sanguinis, only to reintroduce elements of jus soli in 1889 for military reasons related to the draft. During the 19th century the jus sanguinis principle was adopted throughout Europe and then transplanted to its colonies. On the other hand, the British preserved their jus soli tradition and spread it through their own colonies, starting with the United States where it was later encoded in the Constitution. By the beginning of the 20th century, the process of nation-state formation and the associated codification effort were completed in Continental Europe. At the same time, the revolutionary phase was over in those countries that had been the subject of the earlier colonization era, and 19th century

colonization had extended the process of transplantation of legal tradition to the rest of the world. Therefore, by the end of the period of interest, most countries had completed a slow process of adjustment of their legislation regarding citizenship acquisition, in response to a variety of largely exogenous impulses. On the other hand, after the Second World War, with the decolonization phase and the collapse of the socialist system, citizenship laws have started a process of further adaptation, with a marked acceleration under the pressure of international migration. The evolution of citizenship laws in the 1950-2000 period is investigated by Bertocchi and Strozzi (2007).

Codification We classify the countries in our dataset on the basis of the kind of citizenship laws (i.e., jus soli vs. jus sanguinis) in place at the beginning of each decade under consideration. The panel we obtain for the 1870-1910 period can be described as follows. Within Europe, the jus sanguinis model tends to dominate, but with several exceptions. Britain, as previously mentioned, always remains a jus soli country, and so does Portugal. Scandinavian countries, as well as the Netherlands, are late-comers that embrace jus sanguinis only towards the end of the 19th century. France, on the other hand, leads the introduction of jus sanguinis but switches to jus soli in 1889. Outside Europe, jus soli dominates not only in the former British colonies, but also in Latin America. Despite their civil law tradition, these latter countries chose jus soli at independence as a way to break with the colonial political order and to prevent the metropoles from making legitimate claims on citizens born in the new countries.

To be noticed is that the citizenship laws, colony, and common law dummies - even though potentially interrelated because British colonization is associated with the spread of both the common law legal system and the jus soli citizenship laws - are positively but not perfectly correlated, i.e., they do capture different institutional characteristics. The correlation between the jus soli and the common law dummies is not perfect because some civil law countries were at times associated with jus soli. This is the case of the Scandinavian countries, which adopted jus sanguinis only toward the end of the sample, of France, which abandoned jus sanguinis in 1889, and of Portugal, which always applied jus soli.

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Table 1
Gross migration rates (Migrants/1,000 Population), 1870-1910

Old World	*-4.17*
Belgium	-2.12
Denmark	-2.78
France	-0.19
Germany	-1.47
Great Britain	-5.15
Italy	-9.25
Netherlands	-4.18
Norway	-6.55
Portugal	-4.35
Spain	-4.54
Sweden	-5.25
New World	*12.21*
Australia	14.43
Canada	14.35
United States	7.86

Source: Taylor and Williamson (1997).

Table 2
Net migration (1,000), 1870-1998

	1870-1913	1914-49	1950-73	1974-98
Old World	*-13,996*	*-3,662*	*9,381*	*10,898*
France	890	-236	3,630	1,026
Germany	-2,598	-304	7,070	5,911
Italy	-4,459	-1,771	-2,139	1,617
Japan	n.a.	197	-72	-179
United Kingdom	-6,415	-1,405	-605	737
Others*	-1,414	54	1,425	1,607
New World	*17,856*	*7,239*	*12,663*	*21,639*
Australia	885	673	2033	2151
New Zealand	290	138	247	87
Canada	861	207	2,126	2,680
United States	15,820	6,221	8,257	16,721

*Includes Belgium, Netherlands, Norway, Sweden and Switzerland. Source: Maddison (2001).

Table 3
Summary statistics

Variable	*Observations*	*Mean*	*Stand. Dev.*	*Minimun*	*Maximum*
Migration	53	-1.510	6.983	-17.970	22.640
Wage Gap	56	-0.081	0.474	-0.894	0.765
Agricultural Share	51	43.912	15.255	8.945	69.730
Share of Young	55	26.291	2.664	23.338	35.846
Democracy	53	1.825	5.475	-7	10
Suffrage	40	15.973	11.959	2.020	64.100
Citizenship Laws	56	0.589	0.496	0	1
Land Distribution Policy	56	1.565	0.233	1.264	2.053
Public Education Policy	49	14.010	4.293	4.424	20.502
Migration Policy Attitudes	56	0.092	0.647	-1.682	2.250
Institutional Quality Index	56	0.476	0.191	0.155	0.912
Political Institutions Index	53	0.415	0.273	0	1
Migration Institutions Index	56	0.505	0.216	0.187	0.978
Colony	56	0.286	0.456	0	1
Common Law	56	0.286	0.456	0	1

Table 4
The non-institutional determinants of migration

Dependent variable is Migration				
	(1)	(2)	(3)	(4)
Wage Gap	14.311		14.298	
	[7.30]***		[2.17]*	
Agricultural Share	-0.948	-1.437	-0.864	-1.584
	[-2.20]**	[-3.82]***	[-1.72]	[-2.68]**
Share of Young	-1.534	-2.295	-1.452	-2.534
	[-2.57]**	[-4.50]***	[-2.04]*	[-2.98]**
Agricult. Sh. X Sh. of Young	0.041	0.062	0.039	0.068
	[2.53]**	[4.32]***	[1.82]*	[2.67]**
Lagged Wage Gap		17.041		17.373
		[7.51]***		[2.57]**
Lagged Migration			0.179	-0.081
			[0.41]	[-0.20]
Constant	34.819	53.166	31.509	58.59
	[2.15]**	[3.80]***	[1.90]*	[2.95]**
Adjust. R^2	0.66	0.78	0.74	0.78
Observations	50	38	37	37

Pooled OLS. Robust t statistics clustered by country in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5
The impact of institutions on migration

	(1)	(2)	(3)	(4)
Wage Gap	10.061	11.934	12.765	8.849
	[7.93]***	[6.17]***	[11.25]***	[5.24]***
Agricultural Share	-1.092	-1.053	-1.028	-1.207
	[-2.88]**	[-3.19]***	[-2.35]**	[-4.03]***
Share of Young	-1.617	-1.539	-1.632	-1.679
	[-3.13]***	[-3.33]***	[-2.74]**	[-4.11]***
Agric. Sh. X Sh. of Young	0.046	0.045	0.044	0.05
	[3.31]***	[3.60]***	[2.75]**	[4.51]***
Institut. Quality Index	12.799			
	[4.28]***			
Political Institut. Index		5.374		7.382
		[1.75]		[2.47]**
Migration Institut. Index			5.432	7.715
			[4.80]***	[3.99]***
Constant	30.903	33.094	34.572	32.098
	[2.13]*	[2.57]**	[2.12]*	[2.74]**
Adjust. R^2	0.71	0.68	0.68	0.71
Observations	50	50	50	50

Pooled OLS. Robust t statistics clustered by country in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6
The impact of institutions on migration: IV estimates

PANEL A: Dependent variable is Migration (Second-stage regressions)					
	(1)	(2)	(3)	(4)	
Wage Gap	8.885	10.758	11.285	6.902	
	[5.69]***	[4.27]***	[7.38]***	[5.84]***	
Agricultural Share	-1.146	-1.115	-1.105	-1.304	
	[-3.46]***	[-3.63]***	[-2.44]**	[-5.02]***	
Share of Young	-1.704	-1.603	-1.725	-1.764	
	[-3.73]***	[-4.14]***	[-2.86]***	[-4.90]***	
Agric. Sh. X Sh. of Young	0.049	0.047	0.047	0.054	
	[4.00]***	[4.16]***	[2.87]***	[5.53]***	
Institutional Quality Index	15.39				
	[3.38]***				
Political Institutions Index		7.402		10.2	
		[2.25]**		[4.74]***	
Migration Institutions Index			10.633	9.34	
			[2.00]**	[2.75]***	
Constant	31.447	33.622	34.336	32.13	
	[2.35]**	[3.16]***	[2.00]**	[3.06]***	
Adjust. R^2	0.72	0.67	0.66	0.7	
Observations	49	49	50	50	
Anderson Rubin χ^2	32.03	8.11	3.9	32.03	
p-value of A. R. χ^2	0	0	0.05	0	
Hansen J	2.58	0	0	0	
p-value of Hansen J	0.11				
PANEL B: First-stage regressions					
	(1)	(2)	(3)	(4a)	(4b)
	Dep. Variable: Institut. Quality	*Dep. Variable: Political Institutions*	*Dep. Variable: Migration Institutions*	*Dep. Variable: Political Institutions*	*Dep. Variable: Migration Institutions*
Wage Gap	-0.051	0.108	0.018	0.039	-0.091
	[-0.67]	[0.95]	[0.25]	[0.31]	[-0.83]
Agricultural Share	0.014	0.024	0.014	0.025	0.016
	[1.53]	[0.92]	[0.90]	[0.95]	[0.93]
Share of Young	0.02	0.027	0.016	0.029	0.025
	[1.27]	[0.69]	[0.74]	[0.77]	[1.02]
Agric. Sh. X Sh. of Young	-0.001	-0.001	-0.001	-0.001	-0.001
	[-1.65]	[-0.93]	[-1.01]	[-0.99]	[-1.10]
Political Instit. Instrument	0.28	0.594		0.639	0.13
	[4.69]***	[3.14]***		[3.34]***	[1.01]
Migration Instit. Instrument	0.541		0.613	0.107	0.729
	[5.66]***		[4.52]***	[0.99]	[5.13]***
Constant	-0.326	-0.578	-0.141	-0.69	-0.433
	[-0.81]	[-0.52]	[-0.22]	[-0.63]	[-0.62]
Adjust. R^2	0.81	0.66	0.63	0.66	0.67
Observations	49	49	50	49	49
F of joint significance of IV	F(6,12)=30.26	F(5,12)=33.16	F(5,13)=18.25	F(6,12)=42.53	F(6,12)=16.35
p-value of F	0.0000	0.0000	0.0000	0.0000	0.0000

Pooled 2SLS. Robust t statistics clustered by country in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

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