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## From rags to riches: how robust is the influence of culture on entrepreneurial activity?

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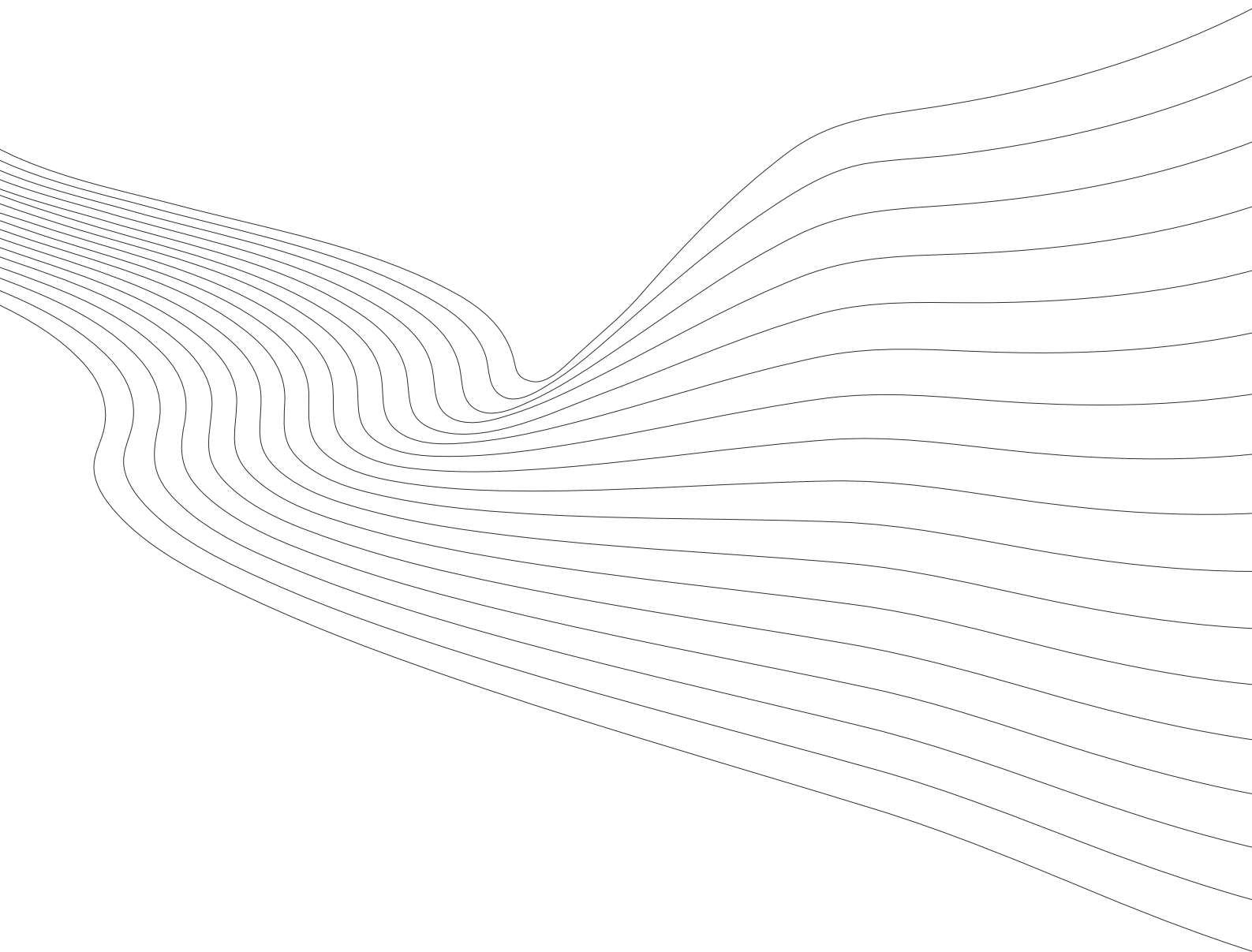
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# KOF Working Papers

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# From Rags to Riches: How Robust is the Influence of Culture on Entrepreneurial Activity?

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This Version: March 2010‡

## Abstract

Entrepreneurial activity differs substantially across countries. While cultural differences have often been proposed as an explanation, measuring a country's cultural characteristics suffers from various problems. In this paper, we test the hypothesis that cultural factors influence entrepreneurial behavior by looking at differences in self-employment rates between immigrant groups within the same market. Such an approach allows holding constant factors such as the institutional and economic environment. Using U.S. census data for the year 2000, we find significant differences in the propensity to become self-employed across immigrants which is in line with previous findings. However, previous studies could not relate self-employment rates in the U.S. to self-employment shares in the immigrants' home-countries which rejects cultural explanations. We improve over the existing literature by first using a more reasonable proxy for self-employment shares. Second, we additionally account for determinants of self-employment in the immigrants' home countries. Both of these modifications reverse the influence of home-country determinants compared with previous findings. Once we apply our modifications, we find evidence of a significantly positive relationship between self-employment rates of immigrants in the U.S. and entrepreneurial activity in their respective countries of origin. Our findings suggest that we cannot reject culture as a major determinant of entrepreneurial activity.

JEL classification: J21, J61, L26

Keywords: culture, entrepreneurship, migration, self-employment

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# 1 Introduction

The variation in entrepreneurial activity across countries is substantial. Trying to explain these vast differences, most of the literature has focused on individual characteristics of entrepreneurs and has successfully identified strong and robust determinants such as age, gender, education, and economic endowments. More recently, with improved cross-country data becoming available, there have as well been increased efforts to identify more fundamental explanations of entrepreneurial activity including institutions, geography and culture (e.g., Ardagna and Lusardi (2008); Glaeser (2007); Guiso et al. (2006); Klappper et al. (2007)). However, while geography and institutional aspects, such as corruption or the protection of property rights can be measured to some degree, culture is essentially unobservable. The analysis of the separate influences of culture and institutions is additionally complicated by the fact that both are correlated and proxies of entrepreneurial activity may be endogenous to the level of development or to other (often unmeasurable) characteristics across countries. As a consequence, cultural explanations have long been ignored as an explanation for economic outcomes by economists.

The main difficulty in identifying cultural determinants of economic outcomes is to separate the role of culture from the effects of economic conditions and alternative explanatory variables such as the institutional environment. One way to circumvent this problem is to evaluate the quasi-experiment of migration. The basic idea of such an “epidemiological approach” (Fernández (2008)) is the assumption that immigrants in the same country share by definition the same economic and institutional environment. Yet, for the migrants, the individual environment has changed, and they may transfer some aspects of their culture with them. As a result, this approach – by measuring differences of observed outcomes within the same market – allows holding constant a number of alternative explanatory variables such as the institutional environment.

In this paper, we try to shed light on the importance of culture in shaping entrepreneurial activity. Our approach is to estimate cultural differences in entrepreneurship by observing the probability of immigrants from different nations in the United States to become self-employed.<sup>1</sup> There is a rich literature showing persistent and significant differences in self-employment rates across immigrant groups in the United States. Since these studies are able to account for most of the determinants of entrepreneurial activity at the individual level, the remaining differences have often been attributed to cultural differences.

However, for cultural explanations to be valid, we should also observe similar differences in entrepreneurial activity across immigrants’ home countries since such a correlation – after accounting for personal characteristics – can only be explained by the cultural component. Yet, such epidemiological approaches failed to show evidence in favor of cultural explanations with regard to self-employment. More specifically, the literature has concluded that existing

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<sup>1</sup>I.e. we use a concept of culture that relates to differences across nations.

evidence does not support cultural explanations because of a lack of correlation with home-country proxies of entrepreneurial activity. More recent work, in contrast, tends to conclude with the puzzling finding of a negative relationship.

We try to account for this puzzle by extending the research in several respects. First, we argue that the difference is crucially due to differences in the definition of entrepreneurial activity employed. So far, the literature has mainly focused on self-employment including own-account workers. These overall self-employment rates may have some undesirable properties as a proxy for entrepreneurship, since in many countries, high self-employment rates are simply a result of a large subsistence economy. We therefore suggest to consider the share of employers as a second proxy for entrepreneurial activity. Using this alternative measure, we do indeed find an opposite influence.

Second, while previous research has chiefly explained immigrant differences by resort to observable characteristics of immigrants, we argue that part of the puzzle of a missing correlation with home-country proxies can be explained by additionally accounting for differences in the country of origin. Our basic argument is simple. Consider, for instance, the puzzle of why in Mexico roughly a quarter of the population is self-employed while Mexican immigrants in the U.S. have a self-employment ratio of about 6% (Fairlie and Woodruff (2006)). If we want to address this issue, we should not only look at the determinants of low self-employment of Mexican immigrants in the U.S. but also try to explain why average self-employment in Mexico is so high. Once we account for some proximate determinants of home-country self-employment, we find a reversed influence of home-country self-employment on the probability of migrants to become self-employed in the U.S.

Finally, we analyze how home-country influences on immigrants' behavior change over time. Epidemiological approaches that focus on recent migration experiences may suffer from more severe biases as migrants may be subject to shocks (language, knowledge about legal issues, uncertainty, etc.) which could induce a deviation from their normal behavior. However, migrants are exposed to a new environment which demands adapting their behavior. As a consequence, culture is not immutable. These two forces result in a trade-off. Home-country cultural proxies should have the strongest influence within a limited time span since arrival. Yet, the biases emerging from shocks and from the non-random selection are more severe in the short-run. We thus consider a sample of American born citizens with foreign ancestry to test the robustness of our results. We find evidence that cultural influences – proxied by past home-country self-employment rates – do show some long-lasting influences even though the strategy of focusing on origins of ancestors attenuates the strength of origin influences.

## 2 Related Literature

In studying the determinants of entrepreneurship, we can distinguish between determinants at the level of the individual and determinants at the macro level. High quality census data made the studying of entrepreneurship at the micro level particularly popular during the last 25 years. A large number of studies seek to explain differences in the choice of self-employment among individuals of different race and ethnic groups or from different countries conditional on socio-economic variables. The explanatory variables are largely driven by the availability of data and include age, gender, education, marital status, language proficiency, income, capital assets, and health limits. In general, self-employment is more prevalent among the male, the older, the better educated and the married population (see, e.g., Blanchflower et al. (2001)). Also, a larger holding of assets increases the likelihood that an individual chooses self-employment (see, e.g., Blanchflower and Oswald (1998); Evans and Jovanovic (1989); Evans and Leighton (1989)). Immigrant self-employment typically exceeds native-born self-employment. Furthermore, self-employment rates differ by race and ethnic group (see, e.g., Borjas and Bronars (1989); Fairlie and Meyer (1996); Rees and Shah (1986); Clark and Drinkwater (2000)).

The literature identifies various potential reasons for the significant differences in the probability to become self-employed among different groups or vis-à-vis native individuals. First, using dummies for immigrant cohorts, Borjas (1985) and Borjas (1986) shows that strong assimilation effects of immigrant self-employment and earnings exist. After 10 years of residence in the U.S., the probability to become self-employed is at least as large for immigrants as for natives. This finding gives support to the fact that setting up an own business requires assets that are not needed to enter paid employment. Second, a set of factors, e.g., discrimination and poor language skills, may push immigrants out of paid employment into self-employment. While Clark and Drinkwater (2000) find evidence of an influence of wage differentials in the United Kingdom, Fairlie and Meyer (1996) show that self-employment rates in the U.S. are higher among ethnic groups with higher estimated wage earnings. Moreover, restrictions related to the legal status of the immigrant (i.e., citizenship, visa) may influence self-employment in the country of immigration as shown by Constant and Zimmermann (2006) and Uwaifo Oyelere and Belton (2008). On the other hand, factors such as the existence of ethnic enclaves may pull immigrants into self-employment. Enclaves provide a self-sustaining environment creating a comparative advantage in catering group-specific needs. Further, large enclaves potentially provide less expensive co-ethnic labor supply. For these reasons, they may foster the likelihood of self-employment of immigrants (see, e.g., Aldrich and Waldinger (1990); Fairlie and Meyer (1996)). Using data at the very disaggregated geographic level, differences in self-employment rates of immigrants can be partly explained by enclave effects. Again, there is contradictory evidence. While Borjas (1986) finds positive evidence for Hispanics in the U.S., Clark and Drinkwater (2000) show that ethnic enclaves decrease the probability

to become self-employed in the United Kingdom.<sup>2</sup>

On a more fundamental level, individual decisions about self-employment and other forms of entrepreneurial activity are highly dependent on institutional, technological, demographic as well as economic and political environments that potential entrepreneurs face (see Stel et al. (2003)). For instance, Ardagna and Lusardi (2008) show how entry and labor market regulation and the contracting environment affect entrepreneurial activity. Klapper et al. (2006) find significant adverse effects of entry regulation on the creation of firms. According to Desai et al. (2003), institutional factors such as property rights protection and fairness have a positive effect on entry and survival and lower average firm size. More recently, research in economic geography explored the effect of location and industry characteristics on entrepreneurship. For instance, Glaeser (2007) shows that entrepreneurial activity is correlated with the presence of input suppliers. Finally, Wadhwa et al. (2007) find that immigrant entrepreneurs tend to be concentrated in technology clusters.

While these studies focus on observable conditions, an individual's decision will also depend on his preferences and beliefs about work and profession. The idea that cultural influences matter for entrepreneurial activity has been first raised by Max Weber's famous argument that "Protestant ethics" induced high savings, investment and the accumulation of wealth. More recently, there are a few interesting studies suggesting that culture matters for various economic outcomes (Landes (1998), Putnam (1993), Greif (1993, 1994)).

Since the notion of culture is so broadly defined and vague, economists have long been reluctant to rely on culture as an explanation for economic phenomena in quantitative empirical work. There are several reasons why cultural explanations are much more difficult to test. First, culture is much harder to measure than other determinants of economic activity such as institutions. Second, culture can be defined in many ways, and the channels through which culture may affect economic outcomes are manifold such that it is difficult to state refutable hypotheses (see Guiso et al. (2006)). Similarly, there are no clear hypotheses that give guidance as to which cultural traits or clusters of cultural traits should matter. Third, attempts to measure culture by resort to survey data suffer from severe cognitive biases ("Halo effects"). Fourth, culture often shows a remarkable degree of persistence, but eventually is not immutable over time. This complicates the use of historical events as instrumental variables since cultural change is potentially endogenous to the institutional environment. Finally, culture may not have an independent role in determining economic outcomes, but rather determine the selection between multiple equilibria (Greif (1993)). For all of these reasons, it is difficult to separate the effect of culture from institutions and other economic variables.

Two approaches are particularly acclaimed as an attempt to address these issues (see Fernández (2008)). First, survey-based studies analyze the beliefs and

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<sup>2</sup>Further hypotheses are mentioned in the literature, including the sectoral choice model, see, e.g., Fairlie and Meyer (1996), or the tax avoidance hypothesis, see Yuengert (1995).



preferences of people drawn from surveys like the World Value Survey (see e.g., Guiso et al. (2003, 2004)). Since this approach faces potential endogeneity problems, it is necessary to find appropriate instruments to rule out reverse causality (Tabellini (2005)).<sup>3</sup> Second, culture may be analyzed using epidemiological approaches that study the economic behavior of immigrants or their descendants (e.g., Carroll et al. (1994); Hendricks (2002); Ichino and Maggi (2000)). However, immigrants may deviate from their traditional behavior due to the exposure to the new environment and because immigrant groups are not necessarily a representative sample from their home country. As a consequence, epidemiological approaches run the risk of producing insignificant results for culture. Analyzing the behavior of second-generation immigrants is a common approach to mitigate problems of selection and omitted variables, although this approach attenuates the role of country of origin effects even further (e.g., Fernández and Fogli (2006, 2009)).

Our paper belongs to a small literature that has attempted to employ epidemiological approaches in the context of self-employment decisions. This approach is based on the hypothesis that culture shows some persistence over time and the individually changing environment may thus be exploited as a source of variation (Guiso et al. (2006)). An individual decision about self-employment depends on a variety of economic and institutional factors that differ across countries. The decision will also depend on the individual's preferences and beliefs. This means that the labor market decisions at the aggregate level will also depend on the prevailing beliefs and preferences in a country. If this aggregate variable has explanatory power for the behavior of migrants, after controlling for individual characteristics, the correlation can be attributed to the cultural component since the economic and institutional environment of the country of origin is no longer relevant. However, the beliefs and preferences embodied in these variables may still matter if migrants transplant them to the new environment (see Fernández and Fogli (2009) and Fernández (2008) for a thorough discussion). We therefore suspect that differences in aggregate self-employment in the home-country may have an impact on the likelihood to become self-employed in the country of immigration.

The sign and significance of an effect of home-country self-employment rates that empirical work has yielded differ strongly. Yuengert (1995) finds a positive and statistically significant effect of home-country self-employment rates relative to U.S. rates. However, his results may have been driven by the difference between immigrants and U.S. native citizens solely. Correcting for this, Fairlie and Meyer (1996) find that the coefficient on U.S. self-employment becomes insignificant and small in magnitude. Similarly, Tubergen (2005) shows that home-country self-employment is positively related but statistically insignifi-

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<sup>3</sup>A related strand of studies examines cultural differences in “latent” entrepreneurship, i.e. the probability of preferring to be self-employed, in different countries (see Grilo and Thurik (2005) and Blanchflower et al. (2001)). Using survey data, these studies compare latent preferences for entrepreneurial activity in varying institutional settings to actual entrepreneurial activity.

cant. More recent literature finds some evidence that aggregate self-employment shares of immigrants tends to be even negatively correlated with home-country self-employment (Akee et al. (2007)). These findings are in contradiction with further results of Akee et al. (2007) who also find a negative effect of previous self-employment experience of immigrants on the probability to become self-employed. Similarly, self-employment of parents tends to increase the probability of being self-employed, indicating an alternative influence of cultural aspects. Second, observed differences in home-country self-employment and self-employment in the country of immigration is puzzling from a perspective of some individual countries. For instance, Fairlie and Woodruff (2006) show that while in Mexico roughly a quarter of the population is self-employed, Mexican immigrants in the U.S. have a self-employment ratio of about 6%, even though immigrants on average have a higher probability to become self-employed than U.S. natives. Third, other determinants related to the home country may affect the individuals' choice of profession. For instance, since higher assets increase the probability to become self-employed, income in the home-country may also matter for self-employment in the country of immigration. Uwaifo Oyelere and Belton (2009) show that immigrants from developed countries have higher self-employment probabilities in the U.S.<sup>4</sup>

These results suggest that higher aggregate self-employment in the home country should be associated with higher self-employment of immigrants. There are some explanations for the adverse findings. In general, it is reasonable to have self-selection of migrants with respect to skills. Yet, much of the self-selection should be accounted for by observable differences in education, profession and other direct individual characteristics. However, even after accounting for these explanations, significant differences between immigrants persist. In addition, the relative wage differential in the U.S. compared to the country of origin should be higher for low-skilled workers since they are relatively more scarce. More generally, it is quite likely that immigrants have beliefs and preferences that are not representative of the average in their home country. Yet, this factor will tend to bias the estimations towards not finding any correlation with home-country self-employment but cannot explain a negative correlation.

In the remainder of this paper, we will show that the differences in empirical findings can be largely attributed to differences related to the time since migration, to differences in the proxies for entrepreneurial activity employed, and by additionally accounting for differences in the determinants of self-employment across home-countries. Finally, by studying the effect of ancestor-country self-employment on non-immigrant American citizens' employment status, we test the robustness of the cultural hypothesis by making use of the approach suggested by Fernández and Fogli (2006).

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<sup>4</sup>A counter-argument is provided by Tubergen (2005): since skills (i.e., qualifications) from lower-income countries may not be accredited in the country of immigration, self-employment in the new environment may be inversely related to home-country economic status.

### 3 Data and Empirical Strategy

We estimate cultural differences in entrepreneurial activity by measuring differences in observed outcomes of migrants within the same market, which allows holding constant a number of competing explanatory variables such as the institutional environment. This approach has been extensively used to study racial, ethnic or country differences conditional on socio-economic characteristics in self-employment. We use U.S. census data, more specifically, the 5% sample of the Integrated Public use Microdata Series (IPUMS) of the Minnesota Population Center for the year 2000 (Ruggles et al. (2008)). This dataset has a number of advantages. First, it covers a large number of immigrants. This is particularly important as the number of self-employed workers with respect to the overall population is very small. Having only a few confirming observations is a common problem in binary data regressions and possibly results in a severe bias. The total number of immigrants in the sample is over 1.2 million, including more than 98 thousand foreign-born self-employed individuals. Second, the dataset covers a wide range of demographic, social, and economic variables which have been found to explain the probability of being self-employed. These include age, gender, education, marital status, the number of children, proficiency in English, industry of employment and U.S. state. This allows us to control for the most systematic biases resulting from differences in educational background across immigrant groups or due to immigrant-self selection. Third, we can distinguish between incorporated, i.e. individuals that own an incorporated businesses or farm, and other self-employed individuals.

We use a dummy variable that is equal to 1 if an individual is self-employed and 0 otherwise. Although this measure of entrepreneurial activity has some limitations (e.g., it does not capture the size of the firm, the year the business was started, etc.), it may reasonably proxy the propensity to become an entrepreneur and is a measure commonly used in the literature.<sup>5</sup> We follow the literature and omit all individuals younger than 20 and older than 69 years. We also drop the observations from the sample that report to be unemployed and self-employed at the same time. A few other variables mentioned in the literature that may determine individual probability of becoming self-employed, such as inheritance, access to funding etc., are not available in the census dataset and are thus not accounted for. Similarly, the dataset offers only a relatively weak proxy for immigrants' wealth.

When using census data, we believe that overall self-employment rates should be used as a proxy for entrepreneurial activity with great caution. While certainly many of the individuals who report to be self-employed correspond to the notion of entrepreneurs, others, mainly in service sectors, the transport industry, and retail services, often do not have a choice of not being self-employed. The use of self-employment shares thus understates the role of push-factors. In some countries, people working in certain professions may be self-employed while

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<sup>5</sup>For a discussion see Blanchflower (2000) and Glaeser (2007).

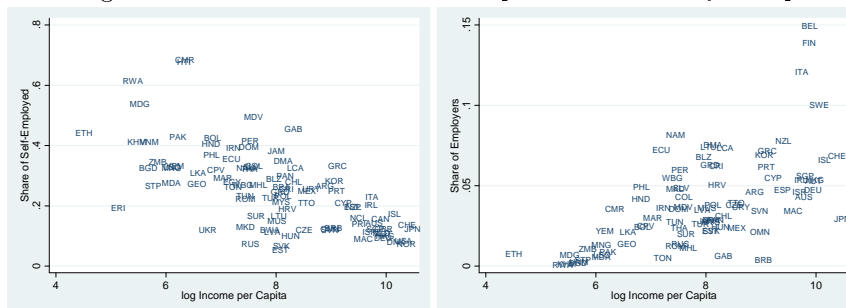
in others, the same jobs are mainly done by paid workers, further complicating cross-country analysis. In addition, if we have in mind a notion of entrepreneurs as building firms, growing through capital accumulation and investment, and creating employment, which seems to be the case in much of the literature, we certainly have to exclude most of these micro-entrepreneurs. For these reasons, we additionally focus on a more narrow definition of entrepreneurs, by accounting for differences among incorporated self-employed rather than for all people reporting to be self-employed (this measure has also been used, for instance, by Borjas (1986); Evans and Leighton (1989); Lofstrom and Wang (2006), however, in a different context).

We first use simple immigrant and regional dummies to explore the properties of and differences between our two main dependent variables. In this sample, the share of self-employed individuals among non-native Americans ranges from 2.8% for immigrants from Cape Verde to close to 20% for Greek immigrants. Since the transplanted behavior of immigrants fades over time and institutional factors and cultural norms within the country of immigration become more important, we examine the evolution of entrepreneurial activity of immigrants over time using interaction terms for each regional dummy with the duration of residence in the U.S. In order to exclude the very small businesses, these regressions are repeated with a restricted sample, including the incorporated self-employed instead of the sum of the incorporated and unincorporated self-employed as the dependent variable. The incorporated self-employment share then spans from 0.5% for immigrants from Cape Verde to 10% for immigrants from Greece.

The advantage of using dummy variables for origin is that they do not impose a linear relationship for the home-country influence. But they do not give any clues as to why origin may matter (Fernández and Fogli (2009)). In the second stage, we thus test whether entrepreneurial activity in the country of origin affects the propensity to become self-employed in the U.S. as such a correlation would lend to cultural hypotheses. We first start by exploring recent migrants behavior, and then turn to long-run persistence of home-country influences. As proxies for entrepreneurial activity in different countries, we use employment status data from the 1949/50, 1955, 1964, 1972 and 1973, 1984 and 1994 U.N. Demographic Yearbooks. From 1955, these distinguish between the number of employers and own-account workers. We calculate overall self-employment rates as the share of employers and own account workers of the total active population where total self-employment numbers are not available. The data is based on the latest census available for each country and may therefore refer to earlier years. Since later Yearbooks do not contain employment status data, we use annual ILO employment data that contain the number of employers, own-account workers as well as the total active population in order to calculate averages over the years 1990 to 2000.

The distinction between these two proxies of entrepreneurial activity is central to our approach. Employer shares refer to employers excluding micro-entrepreneurs, and most of the people working in agricultural sectors and ser-

Figure 1: Different Proxies for Entrepreneurial Activity Compared



vices that consider themselves as self-employed. We thus proxy the home-country determinants of the incorporated self-employed of the U.S. census sample by the employers' share rather than by overall self-employment. We include both of these variables separately in our regressions in order to test for the different influences. Figure 1 compares shares of overall self-employment with shares of employers across countries by plotting these variables against income per capita. The graphs indicate that the two proxies indeed capture different aspects of entrepreneurship. As we will explain below, we believe that overall self-employment seems to be driven largely by people working in the agricultural sectors, and is likely to be an outcome of underdevelopment. On the other hand, the share of employers seems much more reasonable as a proxy for a Schumpeterian type of entrepreneurial activity.

We further calculate ten-year averages of control variables from the World Development Indicators from 1960 to 2000. There are very few variables that are available for the whole time period, such as GPD per capita, total population, the share of urban population, the shares of the old and the young people on the total population, and agricultural employment shares. This imposes a major restriction on the inclusion of economic and institutional determinants of self-employment over time. We try to match the environment at the time of migration as closely as possible. In order to do so, we correspond the home-country variables with the years the individual has passed in the U.S. I.e., if a person passed 1 to 10 years in the U.S., we use home-country variables averaged over 1990 to 2000. This allows us to exploit the time dimension, or assimilation process of the first generation of immigrants in the U.S.. In addition, we are interested in studying whether a home-country effect significantly diminishes over time.

A more appropriate approach to evaluate long-term influences of immigrants' descent is to evaluate origin effects of non-immigrants, i.e. of inhabitants in the U.S. whose ancestors migrated from another country. While economic and institutional conditions of the country of origin should no longer matter for second-generation individuals, their parents may have transmitted the preferences and beliefs that prevail in their home country. Such an approach mitigates

the influence of shocks to immigrants as well as the biases resulting from non-random selection of migrants. It does, however, not rule out that wealth effects or other omitted variables that are inherited by the second generation, may bias the results. Preferably, one would like to consider second-generation Americans, as in Fernández and Fogli (2006).

Unfortunately, the census data does not contain questions relating to parents' birth place since the 1960-census. As an alternative, we provide some results using respondents' ancestry as a proxy for their origin. This variable does, whatsoever, not allow distinguishing between individuals whose families have been in the United States for several generations from those whose parents moved to the United States more recently. We therefore have to bear in mind that this is likely to produce a downward bias against finding significant results of a possible effect of culture.

In order to capture the economic environment of foreign ancestors of U.S. citizens, we have to make use of the earliest home-country data available. We thus calculate mean self-employment ratios from the (earliest available) U.N. Demographic Yearbooks 1949/1950 (only self-employment), 1955, and 1964. These are based on country censuses that may refer to earlier years. We also include control variables from the World Development Indicators (WDI) 2009 from 1960 (averages 1960 to 1965). We are not aware of any earlier dataset referring to self-employment. Since we are not able to match the home-country environment with the time of migration, our results should be interpreted with caution, possibly indicating the need for further research in this area. Nevertheless, we present these findings as we consider them as additional evidence in the light of the other results that emerge from this paper.

## 4 Empirical Results

### 4.1 Differences in Self-Employment Between Immigrants in the U.S.

In a first step, we restrict the sample to include 100,000 randomly selected U.S. native citizens. We estimate a logit function, regressing self-employment on the control variables mentioned above and include a dummy variable equal to one either if the individual is an immigrant or for each of the countries of origin. A common assertion states that immigrants arrive with a set of cultural values and behaviors different from those in the destination country. This is reflected in the possibility of a non-zero value of the country dummies in this stage.

Table 1 presents the coefficients from logit estimates with self-employment and incorporated self-employment of immigrants and U.S. born citizens as the dependent variable. All regressions include age, gender, education, marital status, the number of children, proficiency in English, and industry of employment as

control variables. The latter are of particular importance, as self-employment is systematically higher in some professions than others. We constructed these variables by aggregating dummy variables for those professions that yielded the largest fraction of self-employed persons. In particular, our dummy variables indicate whether a person works in one of the following branches: agriculture, building and construction, retail, services, transport and medical. Finally, we also included a dummy variable for household work.<sup>6</sup>

In Columns (1) and (2) of Table 1 we include a dummy variable which takes a value of 1 if the individual is an immigrant in the U.S. and 0 otherwise. The results indicate that the immigrant's overall probability of being self-employed is not significantly different from the probability of U.S. native citizens, conditional on the set of control variables mentioned above. However, the overall probability of being self-employed with incorporated status is significantly higher. In Columns (3) and (4) we present one explanation for the lack of significance of overall self-employment. We add an interaction term of the immigrant dummy with the years that have passed since immigration. The intuition for using an interaction term is that immigrants are assumed to arrive with a set of cultural values and behaviors that are different from U.S. born citizens. Over time, immigrants assimilate their behavior, and factors that determine self-employment of all inhabitants in the U.S. become more important. In addition, immigrants may possess less creditable experience and fewer assets which may lower their immediate probability to become self-employed. The individual coefficient on immigrants now presents the effects of immigrants' probability of being self-employed immediately after arrival. The regression results in Columns (3) and (4) that allow for assimilation effects clearly show that the immediate probability is significantly lower compared to an average U.S. native citizen. Yet, this effect fades over time. An illustration of this effect is depicted in Figure 2 for overall self-employment. The graph indicates that after approximately 15 to 20 years the probability of immigrants' being self-employed has converged to those of U.S. native citizens (indicated by the solid line) and is slightly higher afterwards.

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<sup>6</sup>Results are also robust to the inclusion of state dummies.

Table 1: Probability of Being Self-Employed by Immigrant Status and Region, Logit Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Overall	Inc	Overall	Inc	Overall	Inc	Overall	Inc
Immigrant	-0.011 (0.014)	0.116*** (0.023)	-0.223*** (0.016)	-0.124*** (0.027)				
Immigrant x Years US			0.008*** (0.000)	0.009*** (0.001)				
Middle East & North Africa (MENA)					0.474*** (0.022)	0.576*** (0.033)	0.053 (0.035)	0.105** (0.051)
Sub-Saharan Africa (SSA)					-0.226*** (0.031)	-0.144*** (0.049)	-0.672*** (0.050)	-0.605*** (0.078)
Western Europe (WEU)					0.180*** (0.015)	0.326*** (0.025)	0.148*** (0.025)	0.311*** (0.039)
Latin America & The Caribbean (LAC)					-0.356*** (0.015)	-0.264*** (0.026)	-0.515*** (0.019)	-0.492*** (0.033)
North America (NAM)					0.264*** (0.022)	0.312*** (0.036)	0.216*** (0.039)	0.321*** (0.061)
Eastern Europe & Central Asia (EECA)					-0.016 (0.020)	0.126*** (0.033)	-0.357*** (0.027)	-0.332*** (0.043)
South Asia (SAS)					0.011 (0.022)	0.268*** (0.033)	-0.637*** (0.034)	-0.405*** (0.049)
East Asia & Pacific (EAP)					0.013 (0.016)	0.086*** (0.027)	-0.359*** (0.022)	-0.249*** (0.036)
Oceania (OCEA)					-0.046 (0.042)	-0.058 (0.071)	-0.148* (0.077)	-0.218* (0.131)
MENA x Years US							0.020*** (0.001)	0.021*** (0.002)
SSA x Years US							0.027*** (0.003)	0.027*** (0.004)
WEU x Years US							0.001 (0.001)	-0.000 (0.001)
LAC x Years US							0.017*** (0.001)	0.022*** (0.001)
NAM x Years US							0.004*** (0.001)	0.007*** (0.001)
EECA x Years US							0.002 (0.001)	-0.000 (0.002)
SAS x Years US							0.038*** (0.002)	0.038*** (0.002)
EAP x Years US							0.017*** (0.001)	0.014*** (0.001)
OCEA x Years US							0.003 (0.003)	0.006 (0.005)
R-squared	0.153	0.116	0.154	0.117	0.159	0.122	0.160	0.124
Number of Observations	1324102	1310413	1324102	1310413	1324102	1310413	1324102	1310413

Notes: All regressions above are logit regressions for the year 2000 calculated with robust standard errors. The dependent variable is a dummy for being self-employed, where Overall includes the unincorporated and the incorporated self-employed; Inc includes the incorporated self-employed. The estimations included the following variables not shown in the Table above: age, age squared, gender, number of children, dummies for marital status, education, proficiency in english and industry of employment. \*\*\* significant on the 1%-level, \*\* significant on the 5%-level, \* significant on the 10%-level.

In the remaining columns of Table 1 we include variables indicating the region of immigrants' countries of origin. In Columns (5) and (6), where we do not account for assimilation effects, three points stand out. First, the differences in the coefficients are much larger than for the overall immigration effect shown in Columns (1) and (2). Second, the probability of immigrants from Western Europe, Canada, and Middle East and North Africa is significantly above average while immigrants from Latin America and Sub-Saharan Africa have a significantly lower probability of being self-employed for both measures. Third,



for the incorporated self-employed, all regional dummies except for Oceania are significant, while Eastern Europe, South Asia, and East Asia are not significant for all self-employed. Finally in Columns (7) and (8) we account for region-specific effects of the speed of assimilation. Again, the effects are much more pronounced with the immediate effects being lower in general. Together with the interaction terms, the regression results indicate that the differences across regions are larger if we account for differences in the speed of convergence. The results show that only immigrants from Western Europe and from Canada have a higher probability of being self-employed than U.S. born citizens even within a relatively short time since immigration.

Figure 2: Convergence of Immigrant Self-Employment Rates Over Time

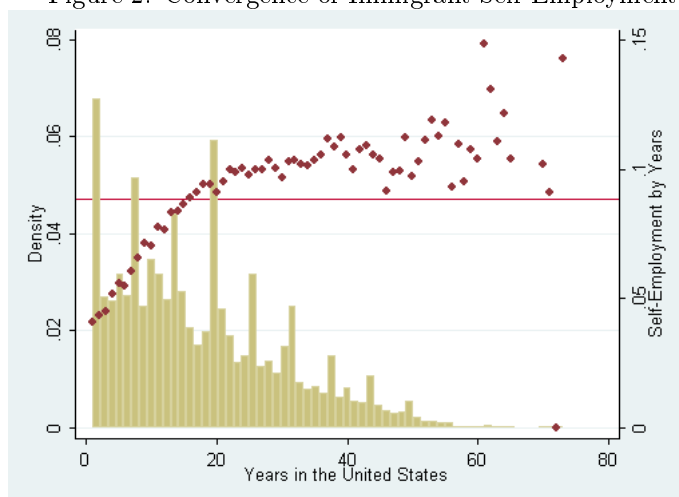
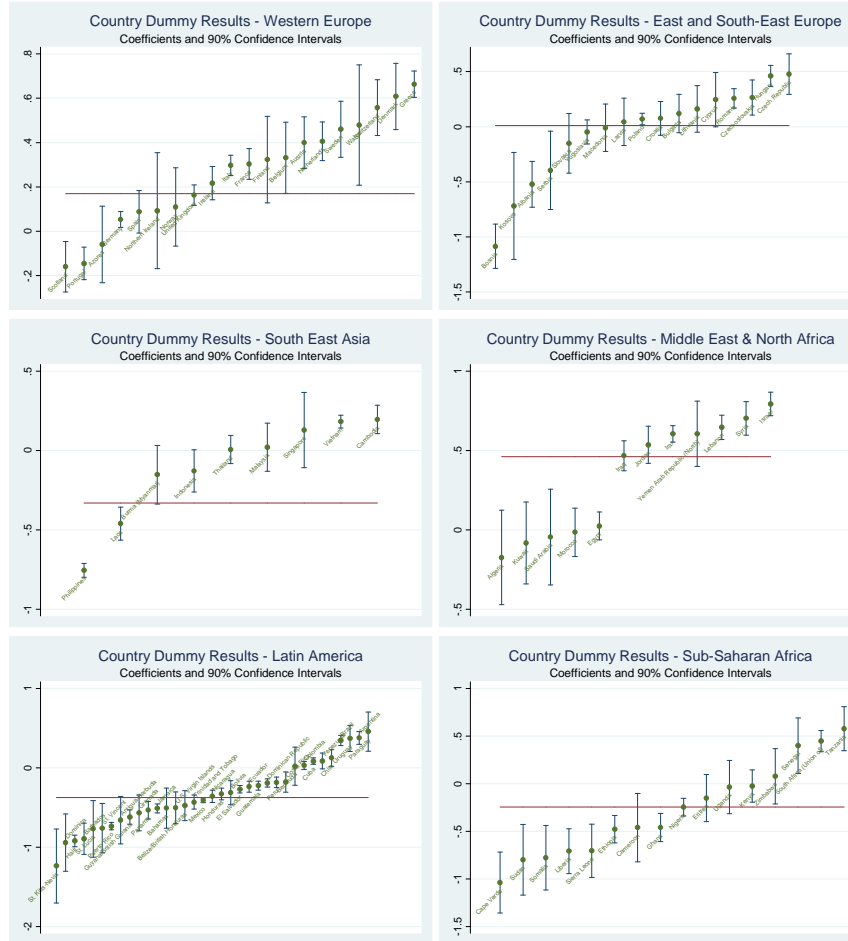


Figure 3 provides another explanation for why the aggregate regional coefficients are relatively small in magnitude besides the effects of convergence. The Figure shows estimated coefficients and confidence intervals of the dummy variables for all countries in each of the major regions. In addition, the solid lines indicate the estimated regional coefficients. Figure 3 shows that there is a substantial amount of variation within each region that is unexplained by the usual micro-level determinants. However, looking beyond the regional aggregates, only for some regions the ranking within each of the regions gives a more consistent picture. For instance, in Latin America, almost all of the Caribbean countries can be found below the regional average.

Figure 3: Estimated Differences in Self-Employment Rates Across Countries of Origin



In an earlier version of our paper, we have explored the use of country dummies in more detail. We found much stronger effects and differences than from using regional or immigrant dummies alone. However, since the use of country dummies does not give an explanation for why home-country influences may matter, we try to account for the differences between countries of origin by using home-country self-employment rates in the following sections. In doing so, we keep the focus on the distinction between employer and self-employment shares.

## 4.2 Cross-Country Differences in Self-Employment and Self-Employment in the U.S.

In this section, we test the hypothesis of home-country determinants of immigrant self-employment. If immigrants transport cultural and economic endowments into their new environment, we expect that differences in aggregate self-employment in the home-country may have an impact on the likelihood to become self-employed in the country of immigration. However, as argued before, previous studies point to either no or a rather puzzling negative correlation. By accounting for differences between the two proxies for self-employment, i.e., total self-employment shares and the share of employers, we address this issue.

In a second step, we add macro-level determinants of entrepreneurship in order to account for possible distortions of entrepreneurial activities across countries. Since higher assets increase the probability to become self-employed, income in the home-country may matter for self-employment in the country of immigration. For instance, Uwaifo Oyelere and Belton (2009) show that immigrants from developed countries have higher self-employment probabilities in the U.S.<sup>7</sup> Yet, differences in self-employment rates across countries can be due to diverse circumstances. While in some countries, a legal and financial environment that fosters the start-up of businesses may further the existence of entrepreneurs, people may be forced into self-employed work as a result of high unemployment, corruption or lack of paid work opportunities in others. If people with similar abilities emigrate from different countries, focusing on the country of origin may explain the differences between immigrant groups. Instead of focusing on immigrant differences solely, we thus try to explain the differences by including determinants of self-employment rates in the immigrants' home countries.

We first limit the regressions to include only immigrants within the first five years of migration for several reasons: First, we believe that cultural differences should be most pronounced within a limited time since immigration, and before migrants adjusted their behavior to the new environment. More specifically, we found strong evidence of convergence in immigrants' behavior to those of U.S. native citizens in the previous section. It is thus likely that home-country effects fade more quickly for self-employment rates than for other economic outcomes, such as labor market decisions of women. Second, the distribution of immigrants in our sample becomes smaller over time. Thus, long-term influences – which we explore below – are likely to be driven by fewer countries only. Third, by including home-country determinants, we try to match the environment migrants faced prior to the time they left their country as closely as possible. However, some of the variables that we include, in particular institutional variables, turn out to be unavailable for earlier periods. Finally, in order to obtain

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<sup>7</sup>A counter-argument is provided by Tubergen (2005): since skills (i.e., qualifications) from lower-income countries may not be accredited in the country of immigration, self-employment in the new environment may be inversely related to home-country economic status. Yet, on average, GDP per capita yields a positive and significant effect on self-employment.

home-country self-employment rates for earlier periods, we have to merge different data sources which turns to weaken the reliability of our specifications. For these reasons, we look at recent immigrants only in this section. However, this comes at the cost of possibly introducing more severe biases since migrants have been exposed to several shocks. We will address this issue by looking at long-term effects in the remaining sections of this paper.

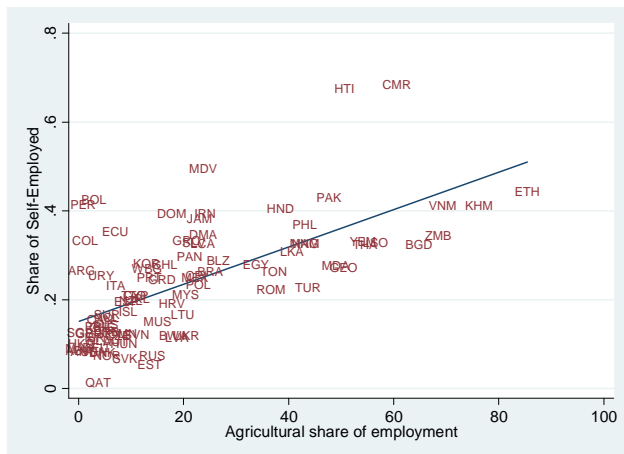
We add home-country determinants for two reasons. First, the inclusion of home-country variables allows us to further mitigate the impact of omitted variables for which we cannot control using the immigrant sample only. As argued by Fernández and Fogli (2006), most of the omitted variables should bias the results against finding a positive relationship with home-country variables. However, we are mostly concerned with omitting income per capita. Income levels are an important determinant of self-employment, because opening up a business is costly, or because income captures many unobserved influences, such as human capital. Immigrants' wealth likely depends systematically on aggregate levels of income in their home-country. Then, omitting income from the regression may severely bias our results with regard to home-country variables. This bias can be accounted for by adding income per capita in the country of origin to the conditioning set, as we do in all of the home-country specifications. It is also likely that immigrants' wealth differs from the average of those in their home-country since migrants are not randomly selected. Yet, notice again that in this case, the bias would prevent us from finding a correlation with home-country self-employment.

Second, as argued above, if we want to address the puzzle of why self-employment rates of immigrants are different from the rates found in their home countries, we should not only analyze observable differences between immigrants, but also determinants of self-employment in the country of origin. As an example, we pointed out that it is not the low self-employment of Mexican immigrants in the U.S. that we should be interested in, but also the relatively high share of self-employment in Mexico. To account for these determinants in the home-countries, we add a relatively random set of variables. Yet, as these variables serve to proxy for the environment potential entrepreneurs faced, and we are not interested in finding specific channels, the exact specification is of minor importance.<sup>8</sup> We suspect that the addition of home-country determinants is particularly important for overall self-employment as the decision to become self-employed may be distorted by various aspects of the economic environment. These factors may hide the true cultural influence that we are interested in. For instance, self-employment could simply be a result of lack of opportunities or poverty that drives people into working in subsistence economies or agriculture. Figure 4 highlights that there is indeed a high correlation of self-employment with the share of the population that works in agriculture.

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<sup>8</sup>As well, some of the control variables are strongly correlated with each other. As a result, taken together, these variables often are individually insignificant. However, we still include them together since most of them are individually highly significant, and because there are sound reasons to believe that they matter.

Figure 4: Self-Employment and Agricultural Employment



In all of the specifications comparing self-employment shares in the U.S. with their respective counterparts in the country of origin, we cluster the standard errors to account for both a general form of heteroskedasticity as well as for any intra-country correlation (Moulton, 1990). As a rule of thumb, the number of clusters should be around 50 in multilevel analysis integrating micro- and macro-data (Primo, Jacobsmeier and Milyo, 2006). Table 2 contains the same control variables as before. However, accounting for the critique by Fairlie and Meyer (1996), we do not scale self-employment rates to those of U.S. born citizens, but rather omit all U.S. observations from the regressions.<sup>9</sup>

Table 2 presents marginal effects of home-country determinants of immigrants. In all the specifications, we add all of the individual control variables to account for observable differences between immigrants. The coefficient on home-country self-employment in Column (1) is significantly different from zero, yet with a negative sign. This confirms some of the previous findings from the literature and the puzzle that has been raised.<sup>10</sup> We will address this results in the remainder of the empirical sections by several means. In columns (4) to (6) of Table 2, we first analyze the differences between overall self-employment ratios and our more narrow definition of entrepreneurs. The definitions are not

<sup>9</sup>Clustering has a relatively large impact on the standard errors. For instance, if we do not restrict the sample to recent immigrants, we find that after correcting the standard errors by clustering them at country level there is no significant relationship between the self-employment share of immigrants in the U.S. with the aggregate self-employment shares of the respective countries of origin. Without accounting for intra-cluster correlation the relationship is actually negative and highly significant. This may explain why some studies find significant home-country effects and others do not.

<sup>10</sup>When we extend the sample to all migrants, we obtain an insignificant coefficient on the home-country self-employment share. The difference in timing may thus, together with the clustering of the standard errors, partly explain why some studies find an insignificant effect while others do find a statistically significant negative influence.

entirely consistent across the two datasets, but, as argued before, we try to define entrepreneurs in such a way that the two concepts correspond as closely as possible. While we calculate incorporated self-employment as the dependent variable from the iPUMS dataset, the cross-country variable calculated from ILO data refers to employers as a share of the total active population.

As expected, the results in Column (4) yield a positive influence of the share of employers in the country of origin on the share of incorporated self-employed immigrants in the U.S. which is significantly different from zero at the 5% level.<sup>11</sup> Notice that in this specification, the dummy variable indicating household work in the U.S. contains no self-employed individuals and thus has to be omitted. This further confirms the validity of this variable. These strikingly different results indicate that overall self-employment rates should be used cautiously as a proxy for entrepreneurship and that using a more narrow definition of entrepreneurs may be recommendable, depending on the specific question.

Table 2: U.S. Self-employment and Home-country Shares, Logit regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	Overall self-employment			Incorporated		
Unemployment		-0.000 (0.001)	-0.001 (0.001)		0.000 (0.000)	0.000 (0.001)
Agricultural Employment		-0.000 (0.000)	-0.001 (0.001)		-0.000 (0.000)	-0.000 (0.000)
Old Population		-0.002* (0.001)	-0.007*** (0.002)		-0.000 (0.000)	-0.003** (0.001)
Young Population		-0.002*** (0.001)	-0.003*** (0.001)		-0.000** (0.000)	-0.001 (0.001)
Distance from Equator		0.022 (0.024)	0.092*** (0.027)		0.007 (0.008)	0.041** (0.017)
Urban Population		0.000 (0.000)	-0.000 (0.000)		-0.000 (0.000)	-0.000 (0.000)
Log GDP per Capita		-0.001 (0.003)	-0.002 (0.004)		-0.001 (0.001)	0.001 (0.004)
Self-employment share	-0.035* (0.020)	0.067** (0.029)	0.151*** (0.050)			
Employer share				0.062** (0.026)	0.049*** (0.018)	-0.037 (0.083)
Immigrants' Wealth			0.012*** (0.001)			0.006*** (0.001)
Pseudo R-squared	0.13	0.13	0.16	0.07	0.08	0.16
Number of Observations	159'512	159'512	9'168	139'148	139'148	6'894
Number of Clusters	65	65	65	60	60	60

Notes: All regressions above are logit regressions for the year 2000 calculated with clustered standard errors. The dependent variable is a dummy for being self-employed (immigrants only). The estimations included the following variables not shown in the Table above: years in the U.S., age, age squared, gender, number of children, dummies for marital status, education, proficiency in english and industry of employment. The home-country self-employment share is defined as the share of the sum of own-account workers and employers for regressions including overall US self-employment, as the share of employers for regressions including incorporated US self-employment (Source: ILO Laborsta Database). \*\*\* significant on the 1%-level, \*\* significant on the 5%-level, \* significant on the 10%-level.

<sup>11</sup>In contrast to the self-employment variable, this effect is robust over differences in years since immigration, while the coefficient even increases slightly over cohorts with a longer duration.

### 4.3 Cross-Country Determinants of Self-Employment

Differences in self-employment rates between immigrants from different countries have often been interpreted as cultural differences. However, for culture to be relevant, we should observe a correlation with similar measures in the country of origin which recent literature could not confirm. A part of this puzzle seems to be attributable to different concepts of entrepreneurship. In a second step, we try to explain this puzzle not only by observing differences of immigrants' attributes but also with resort to systematic differences in their home countries. For instance, poverty or lack of alternatives may drive people into subsistence economies, or institutional constraints may prevent potential entrepreneurs from becoming actual entrepreneurs. If this is the case, we may have to account for these distortions.

As a baseline, we add several determinants of entrepreneurial activity across countries in our regressions shown in Table 2. A convenient way to account for such systematic differences is to include levels of income per capita. The effect of income may work through resources that immigrants bring with them but also through various alternative channels, such as better access to capital and thus more entrepreneurial experience (see Uwaifo Oyelere and Belton (2009) for a discussion).<sup>12</sup> Other control variables we include are the unemployment rate, the share of employment in agriculture, the share of young (ages 0 to 14) and old (ages 65 and older) people at the overall population, the share of urban population, and distance from the equator. The latter variable is commonly used in the institutions and geography literature, and has been argued to capture many influences including the disease environment, availability of arable land, but also labor conditions, work effort, as well as some aspects of the institutional environment.

Most surprisingly, we find that with the large conditioning set, the share of overall self-employed in the home country turns out to be positively correlated with the share of self-employed U.S. immigrants. This highlights the importance of accounting for various home-country determinants of entrepreneurship and confirms our intuition that the puzzle raised in the introduction can in fact be partly explained by structural differences in entrepreneurship across countries. Most significantly, since we add income per capita and the unemployment rate, we account for two of the most important determinants of immigrant self-selection. In Column (4), we can also confirm a significant effect of home-country employers shares in the emigration countries with the share of incorporated self-employed U.S. immigrants.

To give a sense of the magnitude of the estimated coefficients in Column (3); for the lowest value of self-employment across countries in the sample, which is 6.7% in Slovakia, the probability of self-employment for immigrants is 2.4%.

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<sup>12</sup>Including the level of per capita income is also a good way to test whether we omitted important variables from our regressions since income levels are highly correlated with many institutional and non-institutional determinants of entrepreneurship.

With an increase in home-country self-employment up to the highest value of 68% in Cameroon, the predicted value of an immigrant in the United States is raised to 6%. This difference corresponds to more than 20% of the actually observed aggregate variation between immigrants from different nationalities. Similarly, raising home-country employer shares from the lowest value of 0.2% (Bangladesh) to highest observed employers' share (16%, Egypt), increases the predicted probability of being incorporated self-employed as an immigrant in the U.S. from 0.7% to 1.3%. This seems to be a small increase. But given that the distribution of incorporated self-employed immigrants ranges only from 1.2% to 3.4%, the relative magnitude of the home-country effect is even larger.

Among the control variables in Columns (2) and (5), the demographic variables are most important. Including these variables separately shows that most of them have a relatively strong influence. The only exception is the unemployment rate. However, we think that it is nevertheless important to include this variable for theoretical reasons. The share of agricultural employment has no effect in the incorporated regression, but is highly significant in the overall self-employment regression with a negative sign. Again, we interpret this as confirming our hypothesis that the difference between U.S. immigrants and the overall effect in their home-country is largely due to the environment in the country of origin.

One issue related to the regression results in Table 2 may be that immigrants from richer countries differ in their wealth and may thus be more inclined to become entrepreneurs, in particular within the first years upon arrival. A common way to account for differences in endowments is to include a variable that measures the income individuals earn from interests and dividends which should be highly correlated with the wealth they hold. However, this is only an indirect proxy and the data is likely to be relatively unreliable. For instance, we cannot separate individuals with no interest income and those who do not report. In our dataset, the number of individuals reporting positive interest income amounts to about 13% of the whole sample. Nevertheless, in Column (6) of Table 2, we repeat the estimation of incorporated self-employed with interest and dividend income as an additional control variable. Despite the largely reduced sample size that results from this additional restriction, the influence of national background remains robust to accounting for wealth in the overall self-employment regression. When we include our wealth proxy in the employers-share regressions in Column (6), the home-country variable turns out to be insignificant. However, there are so few observations left that it doesn't seem reasonable to rule out home-country effects in this case. In fact, if we omit the home-country control variables from the specification in Column (6), in order to obtain a reasonably large sample, the employer share remains significant with the inclusion of our wealth proxy.

In an earlier version of the paper, we have also explored whether there is an additional correlation with proxies of the home-country institutional environment. However, while some of the institutional measures are significantly correlated, we could not prove that the correlation with self-employment rates in the coun-



try of origin is in fact due to the more fundamental institutional environment of entrepreneurial activity.

#### 4.4 Convergence and Long-Term Influences

In the previous section, we have shown that for recent immigrants, home-country determinants do have an influence on the observed differences in behavior in the United States. However, we suspected these influences to fade over time as people adjust to the new environment and as the determinants that coined their behavior in the countries of origin slowly become less formative. We would thus expect the home country determinants to exhibit less influence on self-employment of immigrants in the United States over time.

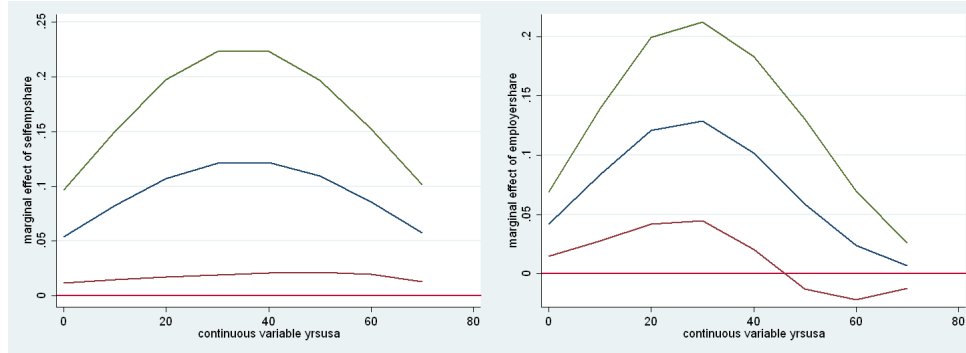
In order to test this hypothesis, we estimate the same regressions as before but include all immigrants within 60 years since migration. We account for home-country determinants by using the longer sample from the UN yearbooks and World Development Indicators as described before. Given the adjustment process shown in Figure 2, we do not only control for the years that have passed since immigration but also add the duration of stay as a squared term in order to account for the diminishing speed of convergence. This ensures that the results are not driven by a general assimilation effect towards the average of U.S. native citizens that all immigrants exhibit. We then calculate the marginal effects of home-country self-employment at different values of years spent in the U.S. which allows us to evaluate the influence of home-country determinants over time.

Columns (1) and (2) of Table 3 confirm our previous findings. While the home-country share of employers is significant in both specifications, the overall self-employment share becomes significant only when we control for some of the proximate causes of the economic environment across countries. In the lower panel of Table 3 we present marginal effects conditional on the time that has passed since the immigrant moved to the United States. The results indicate that, for both variables, home-country effects at first have an increasing influence which peaks at around 30 years after immigration and fades afterwards. Figure 5 provides a graphical illustration of the conditional marginal effects and the corresponding confidence intervals. This result is not driven by immigrants' convergence to the new environment since we are controlling for the non-linearity in the duration of stay directly in the regressions. We obtain similar effects for the remaining home-country variables as far as they are significant (not shown).

Table 3: Home-Country Influences over Time, Logit Regressions

	Total Self-Employment		Employers	
<i>Estimated Coefficients</i>				
Years	0.031*** (0.011)	0.065*** (0.011)	0.075*** (0.015)	0.091*** (0.012)
Years squared	-0.001** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)
Self-employment Share	-0.327 (0.598)	1.459** (0.716)	6.881** (3.177)	4.314** (1.754)
<i>Marginal Effects Evaluated at Different Years:</i>				
Immediate		0.054** (0.026)		0.042** (0.016)
10 Years in the US		0.083** (0.041)		0.084** (0.034)
20 Years in the US		0.107* (0.055)		0.121** (0.048)
30 Years in the US		0.121* (0.062)		0.128** (0.051)
40 Years in the US		0.122** (0.061)		0.102** (0.049)
50 Years in the US		0.109** (0.053)		0.059 (0.043)
60 Years in the US		0.086** (0.040)		0.024 (0.028)
R-squared	0.16	0.15	0.11	0.10
Number of Clusters	95	95	73	73
Observations	689038	689038	411974	411974
Home-Country Control Variables	NO	YES	NO	YES
Notes: All regressions above are logit regressions for the year 2000 calculated with clustered standard errors. The dependent variable is a dummy for being self-employed (immigrants only). The estimations included the following variables not shown in the Table above: age, age squared, gender, number of children, dummies for marital status, education, proficiency in english and industry of employment. The home-country self-employment share is defined as the share of the sum of own-account workers and employers of active population for regressions including overall US self-employment; as the share of employers of active population for regressions including incorporated US self-employment (Source: UN Demographic Yearbooks and ILO Laborsta Database). *** significant on the 1%-level, ** significant on the 5%-level, * significant on the 10%-level. Source of other home-country control variables: World Development Indicators 2009.				

Figure 5: Marginal Effects of Home-Country Determinants over Time



For self-employment, the home-country effects remain significantly different from zero over the whole time span analyzed. For the employers share, the home-country effects converges slightly faster towards zero, such that the influence disappears after about 50 years. We also experimented with two- and three-way interactions of home-country self-employment and the years in the U.S. which more or less yielded the same results. Since the home-country influence in these cases is even less precisely estimated at later years, there is not much evidence that accounting for additional interaction improves the specification. However, given the distribution of immigrants in the sample, as depicted in Figure 2 above, the imprecise measurement at later years are likely to be driven by the relatively few observations that remain in the sample. As a consequence, even though we do find evidence that supports the hypothesis of fading home-country influence, we cannot effectively reject the hypothesis of long-term influences of home-country variables for the given sample by analyzing conditional marginal effects. We thus finally look at whether there is also an influence of the origin of ancestries in a sample of non-immigrants in the following section.

#### 4.5 Home-Country Influences According to Ancestor's Influences

In the previous sections we could not reject a cultural component in explaining the entrepreneurial behavior of first-generation immigrants in the U.S. We first focused on recent immigrants since we believe cultural influences should be observed best before people adjust to the new environment. But we could also observe an origin effect that proved persistent over decades. A more appropriate test of long-term cultural influences has been suggested by Fernández and Fogli (2006) and applied to the case of work and fertility behavior of woman, or by Giuliano (2007) to the case of living arrangements. By analyzing the behavior of second-generation Americans, this approach allows to study a group of people who have never been exposed to the economic and institutional conditions of

their country of ancestry but are influenced by the preferences and beliefs of their parents and ancestors. As such, it helps mitigate potential biases that emerge from the analysis of migrants.

The year-2000 census data does not contain information on an individual's parents' birthplace but only on the ancestry of the respondent. As argued before, this variable does not allow to separate whether the parents migrated or whether the ancestry stems from an earlier generation. We therefore have to bear in mind that this is likely to produce a downward bias against finding significant results of a possible effect of culture. Furthermore, this approach does not rule out that wealth effects, enclave effects or other omitted variables that are inherited by the second generation, may bias the results. In order to capture the economic environment of foreign ancestors of U.S. citizens, we have to make use of past home-country data. Since ancestors most likely emigrated from their home countries before WWII, we use the full set of our previous control variables at the earliest time available.<sup>13</sup>

Column (1) of Table 4 shows that including our proxy for total self-employment without controlling for other determinants at the level of the country of origin, as before, does not produce any significant results. However, this result may be driven by omitting determinants of the home-country economic environment as described in previous chapters. Including the control variables that we already used in our previous regression indeed yields positive results for the home-country self-employment share that are significant at the 10 percent level as shown in Column (2). An increase in home-country self-employment rates at the sample mean by one percentage point increases the probability to be self-employed in the U.S. by 0.09. If we look at employer shares, we find a positive and significant result with and without control variables. According to Column (3) an increase in the employer share by one percentage point raises the probability to become incorporated self-employed in the U.S. by 0.08. This result is significant at the 10 percent level. However, including control variables yields results that are statistically significant at the 1 percent level as shown in Column (4). An increase in home-country employer shares augments the probability to be self-employed in the U.S. by 0.2. Together, these results provide evidence in favor of an impact of the culture of ancestors on entrepreneurial behavior of second- or higher-generation American citizens. In addition, these results confirm the robustness of a cultural component of immigrant self-employment.

## 5 Conclusions

There is a large literature showing how individual characteristics of immigrants account for much of the variation in self-employment across immigrant groups

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<sup>13</sup>I.e., we calculate 1960 to 1965 averages for the WDI dataset and use self-employment rates from the 1964 U.N. Demographic Yearbook to match these variables. Unemployment is the only variable that is not available at these points in time.

Table 4: Long-run Home-Country Influences, Logit Regressions

	All Self-Employed		Incorporated Self-Employed	
	(1)	(2)	(3)	(4)
Log GDP per capita		0.007 (0.005)		0.009** (0.004)
Share of Old Population (> Age 65)		-0.000 (0.001)		-0.001*** (0.000)
Share of Young Population (Age 0-14)		-0.001*** (0.000)		-0.000** (0.000)
Agricultural employment of total population		-0.080 (0.067)		0.179*** (0.058)
Share of Urban Population		-0.000 (0.000)		0.000*** (0.000)
Self-employment share	-0.088 (0.054)	0.092* (0.055)		
Employer share			0.083* (0.041)	0.219*** (0.059)
Pseudo R-squared	0.18	0.19	0.12	0.13
Number of Clusters	838862	838862	726599	726599
Number of Observations	45	45	36	36

Notes: All regressions above are logit regressions for the year 2000 calculated with clustered standard errors. The dependent variable is a dummy for being self-employed (immigrants only). The estimations included the following variables not shown in the Table above: age, age squared, gender, number of children, dummies for marital status, education, proficiency in english and industry of employment. The home-country self-employment share is defined as the share of the sum of own-account workers and employers of active population for regressions including overall US self-employment; as the share of employers of active population for regressions including incorporated US self-employment (Source: Mean of UN Demographic Yearbooks 1950, 1955 and 1964). \*\*\* significant on the 1%-level, \*\* significant on the 5%-level, \* significant on the 10%-level. Source of other control variables: World Development Indicators 2009.

and between immigrants and U.S. natives. However, even after accounting for most of these individual influences, there remains a large difference between immigrants from different regions, nations, and cultures. The significant and quantitatively large differences in self-employment rates across immigrants in the U.S. have generally been interpreted as indicating the importance of cultural differences. However, studies tracing back these differences to similar indicators in the immigrants' home countries did not confirm such a hypothesis. More recent studies rather point to a negative effect of home-country influences on the probability to become self-employed in the U.S.

Our paper addresses this puzzle in several ways. In comparison with previous literature, we obtained the strongest results when we accounted for additional macro-determinants of self-employment in the immigrants countries of origin. The idea behind this approach is that if immigrants from some countries have a systematically lower probability of being self-employed in comparison with the average in their home-country, then we do not only have to look at systematic differences between immigrants but also at what determines entrepreneurial activity across countries. Once we account for systematic differences that are captured by income levels and other factors, behavioral persistence across borders seems to exist. In fact, our indicator of home-country self-employment even reversed the sign of its influence.

We also suggested the use of an improved proxy for entrepreneurship that relates to the share of employers rather than the commonly used overall self-employment rates since the latter is likely to be more distorted by the institutional environment in immigrants' home countries. They showed that share of employers is a more plausible proxy for entrepreneurial activity in the cross-country setting. One reason for this finding is that self-employment includes own-account workers that are prevalent in subsistence economies and is thus highly correlated with the share of people working in the agricultural sector. Comparing these two proxies we could indeed find strong differences in the influence on immigrants' entrepreneurial behavior.

In order to mitigate potential biases that result from focusing on immigrants, we extended our analysis to consider ancestor effects in a non-immigrant sample. Finally, we showed that some minor modifications that relate to the proper empirical specification and to the evolution of home-country influences over time were as well able to account for some of the differing results that the literature has brought up so far. Taken together, we could show a strong influence of corresponding proxies of self-employment on the probability of immigrants of becoming self-employed in the U.S. With all of these modifications to the literature, we could reconcile empirical evidence with cultural explanations of entrepreneurial activity.

Does this mean that there is a causal influence of culture on entrepreneurship? We think our results should be interpreted very carefully with regard to cultural explanations for several reasons. First, epidemiological approaches, as the one we used in this paper, still rely on residual explanations. Although most of the omitted variables should bias our results towards not finding a correlation with home-country self-employment, residual explanations can by definition not rule out the problem of omitted variables. Second, even though ancestor effects mitigate some of the selection and endogeneity problems further, wealth or other unobservable heritages can also be transmitted to second generations, similar to cultural beliefs and preferences. Finally, our approach allowed us to implicitly control for institutions and the economic environment, but it did not give an explanation with regard to the channel of transmission. If culture matters for the choice of self-employment, then we should try to explain which cultural aspects may matter for entrepreneurship. The bottom line thus concludes that we can not prove a cultural influence on entrepreneurship. But – in contrast to previous literature –, and given the results that we brought forward in this paper, we cannot reject a cultural explanation either.

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