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Two Empirical Essays in Labour Economics

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Introduction

This thesis includes two essays which empirically deal with topics in labour economics. Both chapters are co-authored with Luca Nunziata and Lorenzo Rocco, and employ data from Swiss Census, a rich dataset providing a large set of information, at individual level, on the whole population of residents in Switzerland. My contribution to both papers regards the definition of the research question, the analysis of literature review, the design and implementation of the empirical strategy, the elaboration of data and the econometric estimates.

In the first chapter we explore the link between the propensity to engage in entrepreneurship and language, at individual level. We focus on one structural feature of languages' grammar: the way time is encoded and, in particular, how languages differ in the syntactic expression of future events, i.e. whether they require or not the use of an explicit future marker. The heterogeneity across languages, along this dimension, may indeed affect cognitive domain and the way individuals perceive time, potentially leading to a difference in economic behaviours, especially those involving intertemporal choices. Starting from Chen (2013) linguistic-investment hypothesis, which relates the way languages' grammar prescribes to mark future events and intertemporal decision (savings, healthy behaviours), we use data from 2000 Swiss Census in order to investigate the relationship between language and propensity to be entrepreneur. Our baseline estimates rely on the sample of natives, but we run a counterfactual analysis on first and second generation of immigrants. The empirical strategy aims at disentangling the individual effect of language future reference from regional and cultural effects nested in linguistic affiliation. We find that, in line with the theoretical hypothesis, *futureless* languages speakers (Weak Future Refence) are more likely to be entrepreneur with respect to Strong Future Reference languages speakers.

In the second chapter we analyse the impact of immigration on three labour market outcomes among native workers: the decision to be entrepreneur, the transition to high skilled occupations and the displacement from the professional sector of specialization embodied by their vocational education or training. We employ data from four waves of the complete Swiss Population Census covering the period 1970-2000 to build a panel dataset at the district level and adopt a quasi-experimental setting to deal with endogeneity of migration inflows. Our estimates show

that an increase in immigration positively affects the share of native entrepreneurs, including low skilled, and leads to a higher regional share of natives in high skilled occupations. As regards sector displacement, native workers tend to move from their sector of specialization as a response to an increase in immigration, although they tend to stay within their macro-professional sector of origin, and move less across macro-sectors. Finally, we find that foreign-born inflows are correlated to natives movements to occupation with a higher degree of cognitive, communicational and analytical skills.

Talking (and Thinking) Business: Language Time Encoding and Entrepreneurship

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Abstract

We explore the link between the propensity to engage in entrepreneurship and language, at individual level. We focus on one structural feature of languages' grammar: the way time is encoded and, in particular, how languages differ in the syntactic expression of future events, i.e. whether they require or not the use of an explicit future marker. The heterogeneity across languages, along this dimension, may indeed affect cognitive domain and the way individuals perceive time, potentially leading to a difference in economic behaviours, especially those involving intertemporal choices. Starting from Chen (2013) linguistic-investment hypothesis, which relates the way languages' grammar prescribes to mark future events and intertemporal decision (savings, healthy behaviours), we use data from 2000 Swiss Census in order to investigate the relationship between language and propensity to be entrepreneur. Our baseline estimates rely on the pooled populations of natives, first and second generation immigrnats. The empirical strategy employes several techniques which aim at disentangling the individual effect of language future reference from regional and cultural effects nested in linguistic affiliation. We find that, in line with the theoretical hypothesis, *futureless* languages speakers (Weak Future Refence) are more likely to be entrepreneur with respect to Strong Future Reference languages speakers.

Keywords: Entrepreneurship, Language, Culture, Migration, Switzerland.

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1 Introduction

A recent strand of the literature on the cultural determinants of economic activity has concentrated on how languages incorporate a set of cultural traits that can affect individual behaviour. Among the structural feature of languages' grammar, one aspect of particular interest for economists is the way time is encoded and, in particular, how languages differ in the syntactic expression regarding the prediction of future events, i.e. whether they require or not the use of an explicit future marker. Some languages, indeed, prescribe to predict events in the future by means of an explicit future marker through either periphrastic (eg. English, *I will go* or *I am going*) or inflectional (e.g. Italian, *Io andrò*, tr. *I-will-go*) forms. In other languages, for example German, the explicit marking through future tense is not prescribed when referring to future events (*I will go* = *Ich gehen*, tr. *I-go).*

This heterogeneity across languages may affect cognitive domain and the way individuals perceive time, potentially leading to a difference in economic behaviours, especially those involving an intertemporal decision. Speakers of *Futureless*-languages (Thieroff, 2000) are then less induced to create a partition between events distant in time, and should, thus, feel future less distant and have higher propensity toward future-oriented behaviours. The link between language and human choices has been mainly analyzed in the philosophy of language by Sapir (1921) and Whorf (1956). The Sapir-Whorf hypothesis states that, since languages vary in the expression of concepts, they may influence cognitive habits as regards conceptualization of reality. Dahl (2000) introduces a taxonomy of languages based on the existence of inflectional form of future tense, while Thieroff (2000) classifies languages in Europe, according to whether or not the expression of future events in prediction-based contexts (i.e. non intentional) should be marked through inflectional or periphrastic forms. Thieroff distinguishes between *Weak-Future Reference* (Weak-FTR, e.g. German and Dutch) and *Strong-Future Reference* (Strong-FTR, e.g. French, English and Italian) languages.

Building on previous work in the linguistics literature, Chen (2013) empirically investigates the relationship between languages and economic behaviour. Chen adopts the classification of languages, as in Thieroff, between *Weak-Future Reference* (Weak-FTR, henceforth) and *Strong-Future Reference* (Strong-FTR, henceforth) languages, hypothesizing that speakers of Weak-

FTR languages, that are not required to use future markers in prediction-based contexts, may have a closer perception of future rewards and be more willing to future-oriented behaviours, in particular saving decisions, with respect to Strong-FTR languages speakers. The empirical analysis exploits both cross-countries and within-countries estimations, employing micro-data from World Value Survey, and reveals that speakers of Weak-FTR languages tend to save more and have higher propensity to healthy behaviours (not smoking, safer sex, lower obesity) than speakers of Strong-FTR languages.

However, the work by Chen has attracted some skepticism among linguists. In particular, Dahl (2013) emphasizes a number of problematic aspects in Chen's work. The first relates to the actual interpretation of the empirical correlation highlighted by the data. According to Dahl, since most cultural traits come in bundle, it is difficult to identify languages future marking as the actual predictor of economic behaviour. Indeed, most Weak-FTR languages are concentrated in Northern Europe, among those (largely small) countries that Inglehart and Welzel (2010) define as Protestant Europe. Other omitted cultural factors may therefore explain Chen's findings, suggesting that the correct way to investigate the effect of language future reference on economic behaviour should be using a within country approach. Second, the choice of savings as an example of future oriented economic behaviour may be problematic since a weak reference to the future in the language may also lead to a less precise, and therefore uncertain, perception of future (as also remarked by Chen, 2013). As a result a weak FTR language may induce more savings for precautionary reasons, rather than for a genuine forward-looking motivation.

Our aim is to solve the two main limitations of Chen's approach, by providing the first large scale analysis of the effect of language future reference on individual economic choices within the same country, to control for omitted sources of heterogeneity that plague a cross-country analysis (Dahl, 2013). We look at Switzerland, that represents an ideal case study for our analysis because of the historical and substantial linguistic heterogeneity among natives (4 native linguistic groups: German, French, Italian and Romansh.[1]; and the large share of immigrants on total population (21.8%, 1st and 2nd generation immigrants combined, Census 2000) which even increases linguistic variation. Our analysis exploits micro-data from the complete 2000's

[1]See the Appendix section on the evolution and the degree of multilingualism in Switzerland

Swiss Census, and it is based on multiple complementary evidence, since we focus on both samples of natives, first and second generation immigrants, and we group immigrants depending on whether their mother tongue is one of the Swiss languages or not. We use the classification of language proposed by Thieroff (2000), which distinguishes between Strong-FTR and Weak-FTR languages.

We focus on one peculiar economic dimension that represents future oriented behaviour, that is the choice to be an entrepreneur, a choice that is eminently forward looking, as any entrepreneurial activity requires an initial investment, either in equipments, in promotion and advertising, in the creation of own pool of customers, or in learning-by-doing, opposite to a later expected reward, which is typically uncertain. We adopt a broad definition of entrepreneur which includes all those individuals that risk on their own, self-organize their work schedule, often manage dependent employees and are residual claimants on the revenues from their activity. Our definition spans from business leaders to self-employed professionals and small business owners.

A substantial part of the economic research on entrepreneurship has focused on the determinants of the individual decision to become an entrepreneur.[2] According to the theoretical economic literature, the selection into entrepreneurship, in the context of general equilibrium models, is affected by innate entrepreneurial abilities (Lucas Jr, 1978) and risk-aversion (Kihlstrom and Laffont, 1979). The psychological literature identifies the determinants of the propensity for entrepreneurship in some individual traits, such as the need for achievement, the desire for independence, self-confidence and the attitude toward risk (McClelland, 1967; Cuervo, 2005). Douglas and Shepherd (2002) provide empirical support on the role played by risk tolerance and desire for independence on the choice to start an enterprise. Evans and Leighton (1989) find that individuals with a more internal locus of control, i.e. those who believe their performance depends on their own actions, are more likely to become entrepreneurs. Several other analysis focus on the role played by individual wealth and financial constraints (Evans and Jovanovic, 1989; Blanchflower and Oswald, 1998) and social networks (Le, 1999; Allen, 2000). No paper has investigated yet how language future marking may affect entrepreneurship.

Our analysis is part of a broader debate on the relationship between culture and socioeconomic

[2]See Parker et al., 2005 for an exhaustive survey of findings and methods.

outcomes. We define culture as the set of beliefs, preferences and attitudes which are shared within a social (e.g. religious, ethnic, national) group and persistent over time through intergenerational transmission.

Social scientists have long debated on what is the direction of the link between culture and economic performance. Marx's vision (Marx, 1867) considered culture as a superstructure, one of the products of society's productive relationships. This hypothesis was challenged by Weber (1904), who traced in the Protestant revolution, through its individualistic principles and work ethic, a crucial step in the development of modern capitalism. Although one cannot exclude that the cultural variation across the world is the long-term result of differences in the economic structure, most of the recent economic literature on the cultural determinants of economic choices focuses on those cultural traits that individuals inherit through intergenerational transmission, and consider them as an exogenous endowment of cultural capital (Becker, 1996). Cultural features may even be transmitted by parents and be persistent even when not efficient (Grusec and Kuczynski, 1997; Bisin and Verdier, 2000).

The bulk of empirical research in this field focuses on either religion or ethnicity as cultural factors which may affect socioeconomic outcomes. Alesina and La Ferrara (2005) find significant differences in preference for redistribution across different religious and ethnic groups. Religion affiliation and ethnicity, identified by country of birth of ancestors, also matter in explaining the level of trust (Guiso, Sapienza, and Zingales, 2006). Botticini and Eckstein (2005) observe how the educational reform promoted by religious authorities among Jewish rural population in the 1st century fostered literacy and higher selection of Jews into urban areas and high-skilled occupations. Figlio, Giuliano, Özek, and Sapienza (2016) and Sarid, Galor, and Ozak (2017), using data on second generation immigrants in the U.S., show that school performance is positively correlated with the degree of Long-Term Orientation of culture of origin (using a measure developed by Hofstede, Hofstede, and Minkov, 2010) and with the lack of future reference in the spoken language.

Another branch of literature in economics of culture has tested Weber's theory about the implication of Protestant reform on economic development. Becker and Woessmann (2009) argue that, rather than through its ethical principles, Protestantism had an effect on economic activity through the precept of personal reading of the Bible, which led to higher education.

Nunziata and Rocco (2016), on the other hand, exploiting the higher internalization of religious principles among minorities, find that Protestants are more likely to be entrepreneur than Catholics, suggesting, thus, that Protestant ethic, characterized by the need for individual achievement, appreciation of worldly success and different taste for work, created the moral incentives to prompt entrepreneurial activity.

Language itself, is an expression and an integral part of a culture. Ethnicity often has, indeed, a perfect identification with the affiliation to a particular linguistic group. Language, with its structural characteristics, can be, hence, considered a vector of preferences, attitudes and beliefs embedded in a culture. We add to the debate in cultural economics and contribute to the scarce literature in the economics of language by investigating the relationship between language time encoding and the propensity to be entrepreneur.

Starting from a linguistic-investment hypothesis as in Chen (2013) (see Section 2 for further details about the model), we find that, in each sample, Weak-FTR languages speakers are more likely to be entrepreneurs, in line with the literature which assumes that the absence of future-marking in prediction-based context could make perceive future rewards as less distant and therefore provide stronger incentives to invest in an entrepreneurial activity. Thanks to the rich administrative information provided by the Census, we are able to control for district (LAU-1 level) fixed effects and to control for all the unobservable factors that may affect entrepreneurship at the local level, overcoming the issue of unobserved regional heterogeneity that affects previous cross-country or even within-country estimations.

The estimates on the pooled populations of natives, first and second generation immigrants are robust to different checks, which aim at disentangling the individual language effect from both linguistic region effects and non-linguistic cultural influence embedded in linguistic affiliation. In particular, the core of the empirical strategy focuses on multilingual cantons, in which at least two of the four Swiss native languages coexist and are recognized as official. We hence expect an environment not dominated by a single linguistic group.

We then analyse the sample of immigrants only, which enables us to enrich the spectrum of observed languages and cultural backgrounds. The evidence for both first and second generation immigrants is robust to country of origin fixed effects and to several checks aiming at comparing

observations from countries with similar characteristics or immigrants with similar degree of linguistic and socioeconomic assimilation. In the case of first generation immigrants, we also present estimates where Swiss languages speakers are excluded, in the attempt to overcome the substantial dichotomy between German vs non German speakers affecting the results on the whole population.

The paper unfolds as follows: Section 2 presents the theoretical model describing the mechanisms through which language future reference affects individual entrepreneurial investment decisions; Section 3 describes the data and the research design; in Section 4 we present our empirical findings, with a list of empirical issues that we face by selecting particular subsamples, each with its own advantages and limitations; Section 5 provides further evidence under several robustness checks; finally Section 6 concludes.

2 Individual investment choice and linguistic hypothesis

Following Chen (2013), an individual has to decide whether or not to pay a cost C now, for a reward $R > C$ in the future. The uncertainty in the model is about the timing of reward t, with the decision-maker holding belief about it with distribution $F(t)$. If she discounts future rewards at a rate δ, she will invest if and only if:

$$C < \int e^{-\delta t} R dF(t) \tag{1}$$

There are two mechanisms through which language may affect this decision:

(i) the discount rate δ;

(ii) the first moment of the distribution of belief $F(t)$.

The linguistic-investment hypothesis stems from the distinction between Weak and Strong FTR languages. In particular, according to Thieroff (2000), in prediction-based contexts, Weak-FTR languages tend to use the present tense in order to refer to future events, and by doing so they may perceive them as less distant in the future.

The difference in the perception of time-distance may lead to:

1. Weak-FTR speakers to have a lower discount rate $\delta_W < \delta_S$, which will translate in:

$$\int e^{-\delta_W t} R dF(t) > \int e^{-\delta_S t} R dF(t) \tag{2}$$

2. or a shift in the distribution of belief $F(t)$, such that $F_S(t)$ would first-order stochastically dominate $F_W(t)$. In this case:

$$\int e^{-\delta t} R dF_W(t) > \int e^{-\delta t} R dF_S(t) \tag{3}$$

Chen's linguistic investment hypothesis, originally devised to explain saving decisions, may easily be extended to the context of entrepreneurship, since the latter is a future-oriented activity that implies the comparison of an immediate investment in human or physical capital with returns expected in the future. Nevertheless, one's decision to start his/her own business is certainly more complex than the one approximated in saving-decision model. One possible concern would arise if language future reference influences not only time-distance perception but also the agent's risk-aversion. Chen suggests that language future reference may also affect the saving decision by inducing a different precision of beliefs. If this is the case, Weak-FTR speakers should have less precise beliefs and a distribution of belief $F_w(t)$ characterized by higher uncertainty with respect to Strong-FTR speakers. As a result, saving may become more attractive for Weak-FTR speakers, but should sort an opposite effect on the probability of being an entrepreneur, which is typically negatively associated with uncertainty and risk-aversion. The probability to engage in entrepreneurship represents, then, a proper output to investigate the relationship between language future reference and future-oriented choice since it allows to understand, through the direction of the estimated coefficient, which mechanism, among those proposed by Chen, may be at work.

Falk, Becker, Dohmen, Enke, Huffman, and Sunde (2015), analyse the source of heterogeneity in preferences at country and individual level, finding that futureless language speakers have a significant higher level of patience, measured in an experimental setting with intertemporal choice, with respect to Strong-FTR speakers. No differences are found for what concerns risk-

aversion. A further insight on the coevolution of languages' structure of time encoding and cultural traits is provided by Sarid, Galor, and Ozak (2017), who investigate the economic pre-industrialization determinants of language features across the world. The authors argue that regional variation in pre-industrial returns to agricultural investments, measured with pre-1500 CE crop productivity, led to cultural differences in long-term orientation that were reflected into the presence of future reference across languages. The mechanism described in the paper claims that geographical factors and the corresponding economic incentives have fostered the formation of cultural traits, such as long term orientation, and triggered the development of language structures that were complementary to the same cultural values. The nature of language as a communication device of knowledge and values, moreover, has affected the intergenerational cultural transmission and contributed to the diffusion and persistence of cultural traits. Their estimates show a negative correlation between the existence of future reference in a language with pre-1500 CE crop productivity and long term orientation as measured by Hofstede, Hofstede, and Minkov (2010). The results are robust to the geographical characteristics of actual languages' homelands and regional fixed-effects.

This literature suggests that language future reference is significantly correlated to the cultural trait regarding time perception and intertemporal preferences, and orthogonal to other cultural characteristcs, in particular to those related to risk-aversion, which can be a significant determinant of selection into entrepreneurship and future-oriented activities in general. We can therefore focus on the single dimension of future reference as an indicator of long term orientation and investigate how such specific cultural dimension may affect entrepreneurship.

3 Data and Methodology

We use micro-data from the Swiss Census collected in 2000. Switzerland represents an ideal environment to analyse the relationship between language and economic activity since it provides an historically determined linguistic heterogeneity among natives (4 linguistic groups: Germans, French, Italians and Romansh) and a large immigrants' share of resident population (21.76 %, second generation of immigrants included, 2000 Swiss Census), which even increases the linguistic variation in the country.

The analysis is restricted to those Swiss residents who are employed and aged over 25. They amount to about $2,340,000$ natives; $750,000$ first generation immigrants and $80,000$ second generation immigrants.

Natives are identified as those born in Switzerland, with Swiss nationality and speaking one of the four Swiss native languages. First generation immigrants are defined as those individuals born abroad. The set of second generation immigrants includes those born in Switzerland but with foreign nationality as well as those born in Switzerland, with Swiss nationality, who live in a household with one or two (first generation) immigrant parents. Because of lack of data we are unable to classify as second generation immigrants those individuals who are born from immigrant parents, with Swiss nationality and who live on their own at the time of the interview. These observations, therefore, will be classified as natives. The pool of second generation immigrants, hence, includes individuals on average younger than the total, as shown in the summary statistics in Table 2 (an average of around 33 years of age versus around 43).

The information provided by the 2000 Census on language is classified as the main language spoken at home or at the workplace, rather than mother tongue, which is typically the language transmitted by parents. Thus some immigrants may have switched to one of the Swiss languages as a result of social integration.

Knowing immigrants' main spoken language is useful because it allows to focus on those immigrants who speak one of the Swiss languages (but have a non-Swiss cultural heritage) and exploit the linguistic heterogeneity among Swiss languages, given the same cultural background through a specification with country of origin fixed effects. We can therefore disentangle the effect of inherited culture from the effect of language. Moreover, we will perform an estimation on the sample of first generation immigrants where we consider, rather than the main spoken language at individual level, the most spoken language in the country of birth as a proxy of the mother tongue.

The variable of interest is *Weak-FTR*, a dummy equal to one if the individual speaks a language which does not require the marking of future events with future tense in a predictive context. The reference category is, by reverse, the speaking of a Strong-FTR language, which marks prediction-based contexts with future tense.

Our baseline estimates consider the pooled population of natives, first and second generation immigrants. We specify a linear probability model where the dependent variable *Entrepreneur*, a dummy equal to 1 if individual i living in district d and originating from area c is an entrepreneur, is regressed on the dummy *Weak-FTR*. The vector $\boldsymbol{X}$ encloses demographic controls such as: gender, age, age squared, household characteristics (marital status, number of children in household), education and religion dummies. We also include two further dummies: $Years\ in\ Switzerland$, which is equal to one for first generation immigrants living in Switzerland for less than five years, and $Swiss\ National$, equal to one for natives and first generation immigrants with Swiss citizenship. The parameter μ_d accounts for Districts of residence (LAU-1 level) fixed effects. The District is the intermediate administrative level between Canton (NUTS-3) and Municipality (LAU-2)[3]. A specification with Municipality fixed effects would lead to a tighter identification, but, given the small size of many of them in terms of population (most of Municipalities in Switzerland have indeed less than 1000 inhabitants), we choose a model with District fixed effects which guarantees a higher variability[4]. Area of origin fixed effects are captured by the parameter υ_c. We identify as area of origin the Canton of birth for natives, country of birth for first generation immigrants and country of nationality for second generation immigrants[5]. The latter set of fixed effects allows to estimate the effect of language future reference for individuals who share the same unobserved time-unvarying characteristics nested at the area of origin level. Standard errors are clustered at Municipality level.

$$Entrepreneur_{idc} = \alpha + \beta\ WeakFTR_{idc} + \boldsymbol{\gamma X_{idc}} + \upsilon_c + \mu_d + \varepsilon_{idc} \tag{4}$$

In Table 1 we present the summary classification between Weak and Strong FTR for all languages represented in our sample, specifying which languages are attached to natives, first and second generation immigrants. Table 2 introduces some descriptive statistics regarding entrepreneurship engagement rates and other controls variables in both Weak and Strong FTR

[3]Switzerland territory is divided, according to 2000's administrative classification, in 26 Cantons, 184 District, 2896 Municipalities

[4]Estimates with municipality fixed effects yield similar results and are available on request

[5]As our data detail only the most common countries of origin and aggregate the others by continent, we restrict the sample to immigrants whose country of origin can be precisely identified. We can identify 33 countries of origin from the 2000 Swiss Census. See Table A3 in the Appendix for the distribution of immigrants by country of origin.

groups.

TABLES 1 & 2 HERE

4 Findings

We investigate the effect of Strong versus Weak future reference in spoken language on the probability to be an entrepreneur by, first, showing the baseline estimates on the whole population of employed, over-25-years-old residents. We then highlight the potential sources of bias affecting our analysis and try to partially overcome these issues through a set of regressions which focus on different samples, each characterized by particular advantages and limitations.

4.1 Baseline Estimates: Whole Population

Table 3 collects the OLS estimation results regarding the whole population of over-25-years-old employed residents, where we pool Swiss natives, first and second generation immigrants, according to the specification defined in Equation (4). After introducing all controls, as in Column 2, being a Weak FTR language speaker is associated with an increase of 2.3 p.p. in the probability of being an entrepreneur. This represents a 13.8% increase in the probability, considering that the share of entrepreneurs in the analyzed population is equal to 16.7%.

Part of the effect found in the last estimates may be, however, identified by the fact that immigrants from a given country, when in Switzerland can either speak one of the Swiss languages or retain their mother tongue. However, the former could be those that have been better assimilated or integrated, and the latter those that remained marginalized in the Swiss context or bounded within cultural enclaves. The estimated effect may therefore be confounded by the degree of assimilation, that in turn may be correlated with entrepreneurship. In order to filter out the possible interference of a differential assimilation rate, in Columns 3 and 4 we only consider individuals who speak one of the four Swiss native languages. These regressions allows us to compare immigrants who share a common cultural origin (by means of area of origin fixed effects) and are linguistically assimilated.

We point out that among Swiss native languages only German is a Weak FTR language. Thus the parameter we estimate is the effect of speaking German versus all other Swiss language. If Swiss languages did non differ only for their FTR, then our estimate would not capture the effect of FTR but the joint effect of all those linguistic characteristics that vary between German on the one hand and French, Italian and Romansh on the other hand. We shall return on this issue later.

When we limit our analysis to the within-Swiss native languages heterogeneity, and all controls are introduced, in Column 4, German speakers are, on average, more likely by 2.9 p.p. to engage in entrepreneurship with respect to non German-speaking counterparts.

TABLE 3 HERE

4.2 Empirical Issues

Most of the linguistic diversity in Switzerland's population originates from the variation among native languages. While only the German language is characterized by Weak FTR, all the other Swiss languages, i.e. French, Italian and Romansh are classified as Strong FTR.

Two orders of limitations may thus affect our previous estimates, and derive from (i) the territorial distribution of Swiss native languages, and (ii) their limited heterogeneity along the future reference dimension (German speaking=Weak FTR vs non German=Strong FTR).

First, Swiss languages are clustered at geographical level. While Italian speakers are concentrated in the South, the French speakers reside to the West, the Romansh speakers are confined in a few valleys in the Graubunden canton and the German speakers cover the central and northern part of the country. On the one hand if language influences entrepreneurship, this clustering of languages across regions will generate an uneven geographical distribution of entrepreneurship. As long as the decision to become entrepreneur is influenced also by the geographical entrepreneurial density, because of possible economic and technological spillovers, the language will affect the decision to become an entrepreneur both directly and indirectly trough a peer effect. On the other hand, the comparison between weak and strong FTR language entails the comparison of individuals residing in different regions. It is thus key to adequately

control for the different contextual effects.

The second confounding factor is culture. As long as languages are correlated to cultural traits that favor or discourage entrepreneurship, the effect of the latter could superimpose to the effect of FTR. If for instance Germans valued more self-realization and independence than other cultures did, then the German culture would favour entrepreneurship and we would observe a positive sign in β even if the effect of FTR were nihil.

In what follows, we will employ several empirical strategies in order to disentangle the individual effect of language future reference on entrepreneurship from the two kind of confounding factors listed above.

4.2.1 Linguistic regions and multilingual cantons analysis

The distribution of natives' linguistic groups across the Swiss national territory is not random. Although more than one native languages are represented in each Swiss district, when we consider the linguistic majorities at the district level, we notice that within-canton linguistic heterogeneity is, indeed, very low. Only 4 of 26 cantons have more than one linguistic majority at the district level: Bern, Fribourg and Valais (German and French district-level majorities) and Graubünden (German, Italian and Romansh majorities). The rest of the cantons are linguistically homogeneous, with most of them being German.

Figure 1 shows the distribution of linguistic groups in Switzerland among natives. In the figure, a district has a linguistic majority if at the least 60% of natives' population speaks the same language. Only in one district in the Graubünden canton we do not observe a clear language majority. The same pattern can be observed if we take the municipality level as unit of investigation. Figure 2 shows the distribution of majorities by municipality determined with a threshold of 60% language speaking natives. Only in the Graubünden canton the picture is less homogeneous, with the presence of some linguistic municipality-level enclaves in districts that would be considered linguistically homogeneous at the district level.

FIGURES 1 & 2 HERE

Overall, Switzerland is divided into three linguistic regions, each characterized by a linguistic majority, plus two Romansh enclaves in the Graubünden canton. We observe therefore an almost perfect correspondence between linguistic regions and canton borders.

The geographic clustering of Swiss languages is not easy to accommodate. The possibility of including district fixed effects to effectively control for contextual effects, depends on the presence of linguistic minorities at the district level. Indeed thanks to minorities, even within district there is variation in the FTR of the spoken languages. However, while sizable linguistic native minorities exist in many districts, these might be the result of past internal migration flows. If so, comparing speakers of weak and strong FTR languages within district entails to compare individuals born in the district with individuals moved to the district. In this case our estimates may be biased if internal migration were selective with respect to the propensity to entrepreneurship. To illustrate, let us pretend that weak FTR languages (German in particular) favor entrepreneurship and consider a district in the German linguistic region with a French (strong FTR) minority or residents. Suppose that the latter is the outcome of past migration, composed of entrepreneurial individuals attracted by the enhanced business opportunities offered by the German context thriving of entrepreneurial activity. In this case, the estimated effect of weak FTR on entrepreneurship would be downward biased because the non-german speakers would be positively selected as regards their entrepreneurship.

Secondly, there might be complementarity between the effects of a language FTR at individual and community level. Suppose again that weak FTR favors entrepreneurship so that the German speakers are more entrepreneurial, ceteris paribus. Then in the regions where residents speak in large majority German, we should observe more entrepreneurial density and social networks, formal and informal institutions and infrastructures that support businesses. In this context, it could also be possible that a German speaker (i.e. a member of the linguistic majority) could access more easily to these facilities than a speaker of another language. The estimated effect of weak FTR would then be upward biased.

In the specifications in Columns 1 to 4 of Table 3 we include area of origin fixed effects. As regards natives, we therefore account for time-unvarying characteristics related to the canton of birth, comprising those which may determine across-cantons natives' migration flows. In Column 5 and 6, we go further and keep only those Swiss natives who reside in their canton of

birth to account for the problem of selection of linguistic minorities we have discussed above. Despite the number of observations drops by nearly fifty percent, the coefficient of interest is still positive and significant, with German speakers more likely to be entrepreneur by 3.1 p.p. when we control for all socio-demographic variables.

In order to account for the possible complementarity between individual and community effects of speaking a weak FTR language, in Table 4 we focus on the multilingual cantons, i.e Bern, Fribourg, Valais and Graubünden. In the first three cantons there exist both districts where at least 60% of the native residents speak French and districts where, conversely, at least 60% of the natives residents speak German. In Graubünden there are 8 German-dominated districts, 3 Romansh, 2 Italian and 1 district with no clear linguistic majority (see Figure 3).

FIGURE 3 HERE

In multilingual cantons, citizens have the right of dealing with the cantonal authorities in each of the official languages. In Fribourg, Valais and Bern the German and French zones are clearly separated. Hence education is offered in the main language in use in each zone. In Graubünden the distribution of languages is more irregular and each municipality decides its own official language as well as the language used in the educational system (Grin and Korth, 2005). In multilingual cantons the presence of more than one native linguistic group is rooted in history and it is not the result of subsequent migration. Each language is recognized as official and cantonal and language boundaries do not overlap. These advantages come at the cost that the number of observations drop substantially (slightly more than 600000 in the baseline specification).

We decide to exclude Graubünden from the analysis. The reason is that in this canton German is the dominant language at the cantonal level and Romansh and Italian speakers need to know and speak German for most practical purposes (Rash, 2002). The inclusion of Graubünden, however, does not alter the significance and direction of our findings (estimates are available on request).

As shown in Table 4, Column 2, with all controls included, weak FTR speakers are more likely to select into entrepreneurship with respect to strong-FTR speakers by 2.7 p.p.. In Columns 3

and 4, we only consider French and German speakers, since these are the official languages in the multilingual cantons under investigation. We find that the magnitude of the coefficient is even higher, with German speakers more likely than French speakers to be entrepreneur by 3.5 p.p. (Column 4). In Column 5 and 6, we drop migrants from other cantons, and the effect for German speakers does not change much, at 3.1 p.p..

TABLE 4 HERE

With the aim of further reducing the institutional and geographical heterogeneity in the data, in Table 5 we further consider multilingual cantons, but restrict our analysis to those administrative units (district or municipality, according to the specification) laying on the linguistic border. The linguistic border is meant as the border between German and non German speaking regions in the cantons of Fribourg, Valais and Bern.[6]

In Panel A, the borders between German and non German regions are defined on the basis of linguistic majorities at the district (LAU-1) level with a threshold of 60% of native speakers. Figure 4 displays the districts used in the analysis. In Panel B, the border is defined on the basis of linguistic majorities at the municipality (LAU-2) level with a threshold of 60% of native speakers (see Figure 5). In Columns 2 and 4 only the residents born in multilingual cantons are considered. The higher entrepreneurial propensity of Weak FTR speakers is confirmed by the analysis at the linguistic border. When the estimates are limited to multilingual cantons' linguister borders, the effect is estimated to be in the interval between 3.1 and 3.8 p.p., i.e. not largely dissimilar to the estimates obtained in larger samples.

FIGURES 4 & 5 HERE

TABLE 5 HERE

One limitation to the approach used in Columns 2 to 6, in both Tables 4 and 5, is, however, represented by the fact that the identification only relies on the comparison between two languages. Even if we are able to isolate an individual language effect, there is still the possibility

[6]The canton of Graubünden is excluded for the same reason as before. Estimates where Graubünden is included yield similar results and are available on request.

that other linguistic differences between French and German, rather than just future reference, are responsible for our findings. We analyse the discrepancies between German and French for what concerns their linguistic features in order to check whether other characteristics may theoretically affect the perception of time and future events and influence the propensity to be entrepreneur[7].

The data about on the linguistic differences between the two languages are derived from the WALS (World Atlas of Language Structures, Dryer and Haspelmath, 2013), which classifies languages over several structural, phonological and grammar dimensions. Beyond differing in the coding of future tense, we observe that German and French are dissimilar over 38 linguistic features among all the ones that are available in the WALS dataset. More than half (27) pertain to the areas of phonology, morphology, order of words, simple clauses and complex sentences. Other differences regard the number of genders, the use of cases and other categories such as the coding of numerals and pronouns. None of the these characteristics anyway seems to be related to the conceptualization of time. The only verbal category, beyond future tense, on which the two languages differ, is the distinction between perfective and imperfective aspects[8]. Differently from French, German does not present a grammar marker for imperfective and relies on the perfective aspect to describe ongoing or habitual actions. Even if the last difference may affect the conceptualization of events in either the past or the present, we do not find any theoretical connection with the perception of future. The marking of future tense is hence, among all the linguistic differences between French and German, the only plausible candidate to affect perception of events in the future and the propensity for entrepreneurship.

4.2.2 An Epidemiological Analysis of Immigrants in Switzerland

In this section we restrict our study to the sample of immigrants. The advantage of focusing on immigrants is that we can observe a higher variability of languages on both strong and weak FTR sides. The previous results, indeed, may be driven by Swiss natives, who represents most of population, and are characterized by a linguistic heterogeneity, along the future reference

[7]The complete list of linguistic differences, according to the WALS dataset, between German and French are displayed in the Appendix Table A2

[8]Perfective aspect is used to describe an action that is concluded (e.g. *I went*), while imperfective is used for an ongoing or habitual action (e.g. *I used to go*).

dimension, limited to the dichotomy German vs non German speakers. In addition, by looking at immigrants, we overcome the collinearity of weak vs strong FTR languages with German vs non German cultures we face in the population of natives. The disadvantage is that immigrants self-select and not necessarily self-selection is independent of their language future reference. The analysis on the sample of immigrants is split in two parts, i.e. we use, respectively, first and second generation immigrants. The former category is identified with those born abroad, the latter with those born in Switzerland but with foreign nationality.

4.2.2.1 First generation immigrants

In Table 6 we present our estimates for the population of first generation immigrants. Every specification includes country of birth fixed effects. Since immigrants may either use one of the Swiss languages or their mother tongue as the main language spoken at home or at work, we can compare individuals speaking languages with different future reference, but with the same cultural background as identified by their country of origin as in Sarid, Galor, and Ozak (2017). In Panel A we take into account all languages, while in Panel B only Swiss native languages speakers.

As regards Panel A, in Column 1, we only consider first generation immigrants from countries bordering with Switzerland. The ratio of this regression is to reproduce in the immigrant sample the limited linguistic and cultural heterogeneity observed in the natives' sample. With a much smaller sample of 304, 154 observations, our estimated effect is in line with what found in Section 4.1, with a point estimate equal to 2.9 p.p..

In Columns 2 we only consider immigrants coming from other European countries, whereas Column 3 considers the whole sample of first generation immigrants, including those from outside Europe. The estimated effect is positive and significant, with slightly smaller point estimates, close to 2.3 p.p. in both cases.

The test in Column 4 is of a particular relevance, since we exclude those immigrants from countries where one of the Swiss native languages is official or widely spoken (we basically exclude immigrants speaking one of the native Swiss languages coming from Germany, Austria,

France, Italy, Belgium, Liechtenstein, Algeria and Tunisia). The purpose analyzing this sample is twofold. One the one hand, we estimate a Weak FTR effect excluding those cultures that were included in the estimations of the previous section. On the other hand, we drop those individuals coming from other countries who are likely to be already linguistically assimilated and, hence, potentially advantaged in the selection into entrepreneurship with respect to immigrants from the rest of the world. Our effect of interest is still positive and strongly significant, although slightly smaller (1.8 p.p.).

Finally, in Columns 5 and 6 we split the whole sample of origin countries in two sub-samples, according to the share of workers in high skilled occupations (ISCO categories 1 to 3, i.e. managers, intellectual, and scientific professionals and professional intermediaries) attached to each country of origin. The scope of the test is to check whether the effect of language FTR differs according to the degree of labour market performance across countries of origin.We define for each country of origin the share of workers in high skilled occupations and we can distinguish between high labour-market performance countries, i.e. those with a share above the average, and low performing countries, i.e. those below the average. The effect of language FTR is always positive and significant, with a smaller point estimate for high performing countries (1.4 p.p.) compared to low performing countries (2.3).

The estimates reported in Panel A of Table 6 are identified by the fact that immigrants from a given country, when in Switzerland can either speak one of the Swiss languages or retain their mother tongue. However, the former could be those that have been better assimilated or integrated, and the latter those that remained marginalized in the Swiss context or bounded within cultural enclaves. The estimated effect may therefore be confounded by the degree of assimilation, that in turn may be correlated with entrepreneurship. In order to filter out the possible interference of a differential assimilation rate, in Panel B we consider only immigrants who speak one of the four Swiss native languages, in the same way as in Columns 4 and 5 of the previous tables. These estimates allow to compare immigrants who share a common cultural origin and are linguistically assimilated. As in the previous similar estimations, the linguistic difference is identified by the German vs non German language distinction. Also in this case, results are consistent across all specifications, showing a higher propensity to be entrepreneur for immigrants speaking the German language, with point estimates ranging from

1.6 p.p. (Columnn 4, sample without immigrants from Swiss language speaking countries) to 3.4 p.p. (Columnn 6, sample of immigrants from low labour market performance countries).

TABLE 6 HERE

In Table 7 we replicate the analysis on first generation immigrants but we only focus on the bilingual cantons of Bern, Fribourg and Valais, where German and French are both official languages, and we expect the institutional environment not to be dominated by a single linguistic group. Although Graubünden is a multilingual canton as well, we decide to exclude it from these estimates for the same reasons as in Section 4.2.1, i.e. the advantage of speaking German language with respect to Italian and Romansh. Similarly to Table 6, we consider in Panel A all languages, while in Panel B only Swiss native languages speakers, who in these case are either German or French speakers, since these are the only official languages in the cantons under investigation. Across all specifications, Weak FTR speakers (Germans in panel B) are more likely to engage in entrepreneurship, with the effect estimated to be in the interval 1.7 to 2.8 p.p. when we consider all languages (Panel A), and between 2.1 and 3.8 p.p. when only French and German speakers are taken into account (Panel B).

TABLE 7 HERE

The empirical evidence on the sample of first generation immigrants points to a significant effect of language future reference on entrepreneurship. Our research design has tried to select sets of countries of birth which are quite similar for what concerns potential linguistic, cultural and socioeconomic assimilation. Nevertheless, most of the linguistic variability among first generation immigrants still relies on the heterogeneity among Swiss native languages[9]. As shown in Table 2, Swiss native languages speakers (German, Italian and French combined) amount to almost 70% of foreign-born population of over-25-years-old employed residents. This is explained only partially by the high migration inflows from Swiss languages speaking countries[10], who represent almost 50% of the stock of first generation immigrants in our population. The remaining share of Swiss native languages speakers is represented by immigrants who switched

[9]With the exception of Romansh, which is spoken by few hundreds of foreign-born residents.
[10]Germany, Austria, France, Italy, Belgium, Liechtenstein, Algeria and Tunisia.

to one of local languages as result of integration. The so far estimated effect could mainly be ascribed, thus, to the German vs non German speakers comparison, rather than to language future reference.

In order to overcome the latter limitation, we perform, in Table 8, a series of estimates where we exclude Swiss languages speakers. For this purpose, in Panel A, we only keep those individuals who speak one of the official languages in the country of birth. This implies dropping those with a mismatch between main spoken language and the official language in the country of origin, who may represent suspicious outliers. In this setting, however, we cannot include country of birth fixed effects, because of the perfect correspondence between spoken language and country of birth. We specify therefore a model with continent of birth fixed effects. We maintain the same structure of exposition as in the rest of this section of immigrants, but we exclude the estimates on the sample of immigrants from bordering countries, given that Swiss native languages are official there.

Being a weak FTR speaker is associated with a higher probability of being an entrepreneur. This positive correlation is significant across all specifications, except for the subsample of immigrants from countries with below-the-average labour market performance (Column 6 of Panel A). When we consider the set of all available countries of birth, the point estimate amount to 2.33 p.p..

In Panel B, on the other hand, we again drop Swiss languages speakers, but we attach to each foreign-born individual the future reference of the official language spoken in the country of birth, independently from his/her main spoken language. We find a similar pattern as in Panel A, with the a positive and significant estimated coefficient across all subsamples, ranging from 0.8 to 3.4 p.p..

TABLE 8 HERE

4.2.2.2 Second generation immigrants

The study of second generation immigrants presents peculiar advantages. First, second generation immigrants are all born in Switzerland and are influenced by the local cultures since birth.

As a result, they share the cultural factors of their parents less deeply than the first generation immigrants. Moreover, they may be characterized by a higher propensity, with respect to first generation, to speak one of the Swiss languages as a result of an assimilation process which is less dependent on individual willingness to be assimilated, since the knowledge of one of the native languages is a condition for the permanence in the Swiss education system. [11]

Table 9 presents the empirical findings for second generation immigrants, maintaining the same structure of exposition used in previous tables. In Panel B we present our favorite estimates, those based on the sample of immigrants, where we only include Swiss languages speakers who are, plausibly, similarly well integrated. These immigrants should be comparable to native Swiss in many respects excepting for their inherited culture which is a combination of the Swiss culture, likely acquired at school, and their culture of origin, that we capture by nationality fixed effects. All results highlight a positive and significant association between speaking a weak FTR language (German) and entrepreneurship. The estimate in Column 4 of Table 11 is of particular interest, since we only consider countries of origin where Swiss native languages are not widely spoken. In this case German speakers are 3.6 p.p. more likely to be entrepreneurs.

TABLE 9 HERE

4.2.3 Language and Cultural effects

The single most important concern in the analysis of Swiss natives, is the perfect collinearity between 1) the partition in speakers of a weak and a strong FTR language; and 2) the partition in individuals with German cultural heritage and non German cultural heritage. This problem is rather general in this literature and depends on the fact that each nationality develops a specific culture and a own language over the centuries. It is relevant to investigate this issue, considering that natives represent more than 75% of the analyzed population and likely to significantly drive the results found in Sections 4.1 and 4.2.1.

[11] The model specified for second generation immigrants also includes also the language spoken by the majority of native population in the municipality where individual i was born. This variable is a dummy equal to one if i was born in a municipality with a non German majority. The purpose is that of controlling for the native culture and language to which individual i was exposed since birth. In order to assign one of the Swiss native cultures to each observation, we define a majority using a threshold equal to 50% of residents. Incidentally, using a 60% threshold it would be impossible to define a clear majority in some municipalities.

Language is, hence, a vector of cultural elements that:

- are not tied to geographical contexts, but can move with individuals;
- are residual with respect to the structural characteristics of a language (of which future reference is one component), and may affect the propensity to be entrepreneur in an independent fashion;
- cannot be empirically distinguished from the structural characteristics of a language.

This implies that if we aim at estimating the effect of future orientation embedded in each language, we need to control not only for the confounding contextual effects that arise because linguistic communities cluster in different regions, but also for the cultural specificities associated with a linguistic affiliation. The only chance of disentangling the effect of FTR from the effect of a broader set of values, world views and attitudes that form a culture is that of exploiting possible variation in culture among the speakers of a given language. In this regards, Switzerland is an interesting case because cultures originating outside its borders get in touch and contaminate each others. German, French and Italian originated in three large bordering countries that developed rater specific and strong cultural traits, whose influence extended across the national borders in Switzerland. These three influences meet in Switzerland and mix to form an original blend. We conjecture that the more distant a speaker of language j resides from the border between Switzerland and the country where language j originated, the more blended will be his or her culture. Thus residents at the border with Germany, France and Italy respectively, will be indistinguishable from German, French and Italian nationals as regards their culture, while the residents more distant from the border, living in inner Switzerland, will have a more blended culture, regardless of their language. In other words, a Swiss German speaker will also have a German culture if he or her resides at the border with Germany while he or her will have a culture that combines German, French and Italian elements if he resides far from the border.

Accordingly, we define the variable $CulturalDistance_{im}$ that assign to each individual i, born in municipality m, the distance of municipality m from the border of the country where i's spoken language originates[12]. We interpret this variable as a proxy of cultural assimilation.

[12]To exemplify, we assign i the distance of m from France, if i is a French speaker

Next, we specify the following linear probability model:

$$\begin{aligned} Entrepreneur_{idm} = \alpha_0 + \alpha_1 weakFTR_{idm} + \alpha_2 Cult.Dist._{im} + \\ + \alpha_3 weakFTR_{idm} * Cult.Dist._m + \boldsymbol{\beta X_{idm}} + \nu_d + \varepsilon_{idm} \end{aligned} \tag{5}$$

where we aim at controlling for the intensity of the cultural influence of the originating countries at individual level and test whether variations in culture modify the effect of weak FTR on entrepreneurship.

We point out that also in equation (5) district fixed effects are included. Then, to guarantee common support within district and avoid extrapolations, we retain only the districts where the distance from the German and, respectively, the French or the Italian border are similar. To operationalize this requirement, we discretize the distance from each border into 24 segments, each 10 km long and define a grid of "district by cultural distance" cells.For all cells we drop the natives immigrated from other cantons and, finally, we drop those cells where the distances from the borders were not comparable.

Our estimates are shown in Table 10. We see how the introduction of our measure of cultural distance from the border and its interaction with *weak FTR* does not change our estimates. Compared to weak FTR speakers, strong FTR speakers are less likely to engage in entrepreneurship by 3.6 p.p. No significant effect is found for neither the cultural distance variable nor the interaction term. This result is reassuring as it supports the hypothesis that there are no differential cultural effects among the German, the French and the Italian speakers that confound the effect of future reference.

TABLE 10 HERE

Nevertheless, this conclusion rests on the assumption that culture varies within Switzerland with the distance from the border. Were either this assumption wrong or the amount of variation insufficient to be detectable with our data under the common support requirement, our test would be inconclusive.

4.3 Further limitations

4.3.1 Language future reference and cultural traits: a cross-country analysis

In the spirit of Sarid, Galor, and Ozak (2017), we here run a comparison across countries in order to assess the correlation between the existence of future reference in the language mainly spoken in a given country and the cultural traits defined at the national level. The ratio of the following test is to check whether future reference is associated, beyond long term orientation, with other country-specific cultural traits that may affect the propensity for entrepreneurship at the individual level. We consider, as country-wide measure of cultural values, the 6 cultural dimensions defined, on a range from 0 to 100, by Hofstede, Hofstede, and Minkov (2010), namely:

- *Long Term Orientation.* Low scores on this dimension are attached to countries characterized by a culture which preserves traditions and norms, while high scores to cultures which promote societal changes and efforts, especially in education.
- *Uncertainty Avoidance.* This dimension quantifies the degree to which individuals living in a country feel uncomfortable with uncertainty.
- *Individualism.* It ranks societies according to how much individuals are expected to take care of themselves and families, rather than expecting other groups' support in exchange for loyalty.
- *Power Distance.* In countries scoring high on this dimension, the less powerful members of society accept and expect an unequal distribution of power and hierarchical structures.
- *Masculinity.* This dimension expresses the degree of need for achievement, heroism, assertiveness and material rewards for success, in a culture.
- *Indulgence versus Restraint.* Indulgent cultures allow relatively free gratification of basic and natural human drives related to enjoying life and having fun, as opposed to suppression of these needs by means of strict social norms.

The sample only includes countries where there is almost a perfect identification with only one language. We exclude, therefore, countries with high linguistic fractionalization.

Table 11 presents our cross-country OLS estimates of the correlation between *Weak FTR*, a dummy equal to 1 if the main spoken language in that country has a weak future reference, and each national cultural dimension[13]. All specifications include continent fixed effects and several geographic and institutional controls at the country level (latitude, land quality, elevation, temperature, precipitation, distance to waterways, percentage of arable land, genetic diversity, legal origin dummies, Old World dummy). Our findings confirm a positive association between Long Term Orientation and the probability that a country language is characterized by a weak future reference. No significant correlation is found between *Weak FTR* and any other cultural dimension. When all six cultural dimensions are included in the model, we find that a one percentage point increase in Long Term Orientation is associated with a 1.1 percentage point increase in the probability of speaking a weak future reference language.

The last results are in line with the literature (in particular Sarid, Galor, and Ozak (2017) and Falk, Becker, Dohmen, Enke, Huffman, and Sunde (2015)), and signal that language future reference have a significant correlation to the cultural trait regarding time perception and intertemporal preferences, while there is no evidence of association to other cultural characteristcs, in particular to those related to risk-aversion (*Uncertainty Avoidance* among cultural values in Hofstede, Hofstede, and Minkov (2010)), which can be a significant determinant of selection into entrepreneurship and future-oriented activities in general.

TABLE 11 HERE

4.3.2 Self-employment in low skilled occupations

One possibility is that our findings may be driven from self-employed individuals in low-skilled occupations, which may not typically represent future-oriented activities since no substantial initial investments are required[14]. We check whether this is the case by excluding workers in

[13] See Table A1 in the Appendix for information about the countries represented in the sample, together with the respective main spoken languages and values of Hofstede's cultural dimensions

[14] A typical example is street vendors.

low-skilled occupations, defined as ISCO categories 5 (service workers and shop and market sale workers) and 9 (elementary occupation). As shown in Table 12, where we run a similar estimation as the one in Table 3, the exclusion of low-skilled workers does not affect our estimates.

TABLE 12 HERE

5 Further Robustness Checks

Our estimates based on native individuals and first and second generation immigrants point in the same direction, i.e. a positive and significant association between being a weak FTR speaker and the probability to be entrepreneur. The large numner of observations in Swiss Census allows us to provide further checks on the robustness of our findings. In this section we employ the same specification as in Column 2 of Table 3 with the complete set of control variables and fixed effects, considering the pooled population of Swiss natives, first and second generation immigrants.

5.1 Estimates by sector

Table 13 shows the estimates by sector of economy in order to check whether our findings are driven by a specific sector. In principle, the timing of entrepreneurial rewards may be sector-specific and therefore the effect of FTR may be the result of such specificities.

Furthermore, each sector may be characterized by a different investment duration and, hence, a different average timing of rewards. Analyzing sector-specific estimates may therefore clarify whether the effect of language FTR is heterogeneous.

We notice that the point estimates are positive and significant across sectors. Weak FTR speakers are more likely to be entrepreneurs than strong-FTR speakers, in each sector. If anything, the effect is lower in secondary sector (0.8 p.p.).

TABLE 13 HERE

5.2 Estimates by religion

All the estimates in this paper account for religion affiliation. Still, religion and, Protestantism in particular, has been shown to be a powerful cultural factor behind the propensity to be entrepreneur, mainly through its work ethic (see Nunziata and Rocco, 2016). Here we test whether an interaction effect between religion and language future reference exist, given that different religions may differently affect the propensity for entrepreneurship. We consider 4 subsamples: Catholics, Protestants, members of other religions and atheists. Our findings are consistent across all religious groups. The point estimate for *Weak FTR* is slightly larger in absolute value among Protestants than Catholics. However, it is even slightly larger among atheists (2.6. p.p.).

TABLE 14 HERE

5.3 Estimates by age and gender

In Table 15 we split the whole natives sample into four gender-by-age groups. We separately consider males and females belonging to two age intervals: between 25 and 55 years old, and over 55 years old. The spirit of this test, similar to the one with religion, is to verify whether there exists an interaction effect of language future reference with age and gender, i.e. two exogenous factors that may affect the likelihood of being an entrepreneur.

Our findings, again, confirm the significance of future reference as a strong predictor of the probability to be entrepreneur. In the subsample of men above 55 years old, the magnitude of the coefficient is higher than among the younger male counterparts. As regards females, there exists a positive and significant correlation in the subsample of observations with less than 55 years old, whereas, among females above that threshold, the effect is still positive but not significant. The latter result is mainly driven by immigrant femal workers above 55 years old, who may be characterized by a lower labour market participation. When we consider only female natives, indeed, German speakers are significantly more likely to be entrepreneur.

TABLE 15 HERE

6 Conclusions

The relationship between language and economic behaviour has only recently started to be investigated by the economic literature. The main contribution in that sense has been provided by Chen (2013) who, starting from the classification of Weak and Strong Future Reference languages (Dahl, 2000; Thieroff, 2000), provides a first empirical test of the linguistic-investment hypothesis. According to his findings, Weak-FTR languages speakers have higher propensity to future-oriented behaviours, such as savings, safer sex, no smoking and healthy life styles.

This paper provides new comprehensive empirical evidence on the link between the way languages encode future events and entrepreneurship, i.e. one of the most important economic choice involving investment decisions. Our empirical strategy is based on data collected by the 2000 Swiss Census and considers the whole population of individuals, i.e. we pool togther natives, first and second generation immigrants. The focus on Switzerland is motivated by the fact that it is a country characterized by a substantial historically determined linguistic fractionalization and around 28% of the population in 2000 was born abroad or had an immigrant background. These elements provide us with an ideal laboratory where we have the chance to observe a great linguistic heterogeneity in a relatively small geographic area, which is quite homogeneous as regards economic conditions.

In line with our theoretical hypothesis, we find that Weak-FTR languages speakers, who are not required to mark the expression of future events in a predictive context with future tense, are more likely to be entrepreneur than Strong-FTR languages speakers. The main issue affecting our identification strategy regards the possibility to disentangle the individual language effect on time perception from regional and cultural effects. Language has often, indeed, a strict link with a particular country/region and its institutions, and it is also a vector of other cultural factors at the individual level.

In our estimates we are able to control for unobservable regional effects. This is particularly relevant in the case of the natives, who represent more than 70% of the analyzed population. Since each of the Swiss native linguistic groups are located in specific regions, and only Germans are listed among Weak-FTR speakers, there is therefore the possibility for the individual-level language effect to be confounded with linguistic region effects. We address this issue by

employing a series of tests aiming at reducing the heterogeneity in the regional framework of our analysis. First, we specify a model with district fixed effects. Afterward, we focus on multilingual cantons and administrative units at the linguistic border, in order to reduce at the minimum the differences at the regional level.

The separate analysis on immigrants data allows us to enrich the spectrum of languages in the sample and the variation in cultural backgrounds. Our results are coherent with what found when considering the whole population, and robust to country of origin fixed effects and to several checks aiming at comparing immigrants with the same degree of assimilation. Moreover, we perform a series of estimations in which we exclude Swiss native languages speakers, and hence overcome the dichotomy German vs non German speakers, which is likely to affect the other estimates.

We also make an attempt to net out the influence of cultural factors at the individual level, embedded in linguistic affiliation, by assuming that, for each of the main Swiss linguistic groups in Switzerland (German, French and Italian), the intensity of adhesion to the culture of reference is somehow related to the distance of municipality of birth from the Swiss border with the country in which the same language is spoken.

Our empirical findings are robust to all different models' specifications, and show that language, and the syntactic expression of future events, may influence entrepreneurial investment decisions, in line with the results and theoretical hypothesis by Chen (2013).

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7 Figures

Figure 1. Switzerland, linguistic majorities per district (threshold=60% of natives). Census 2000.

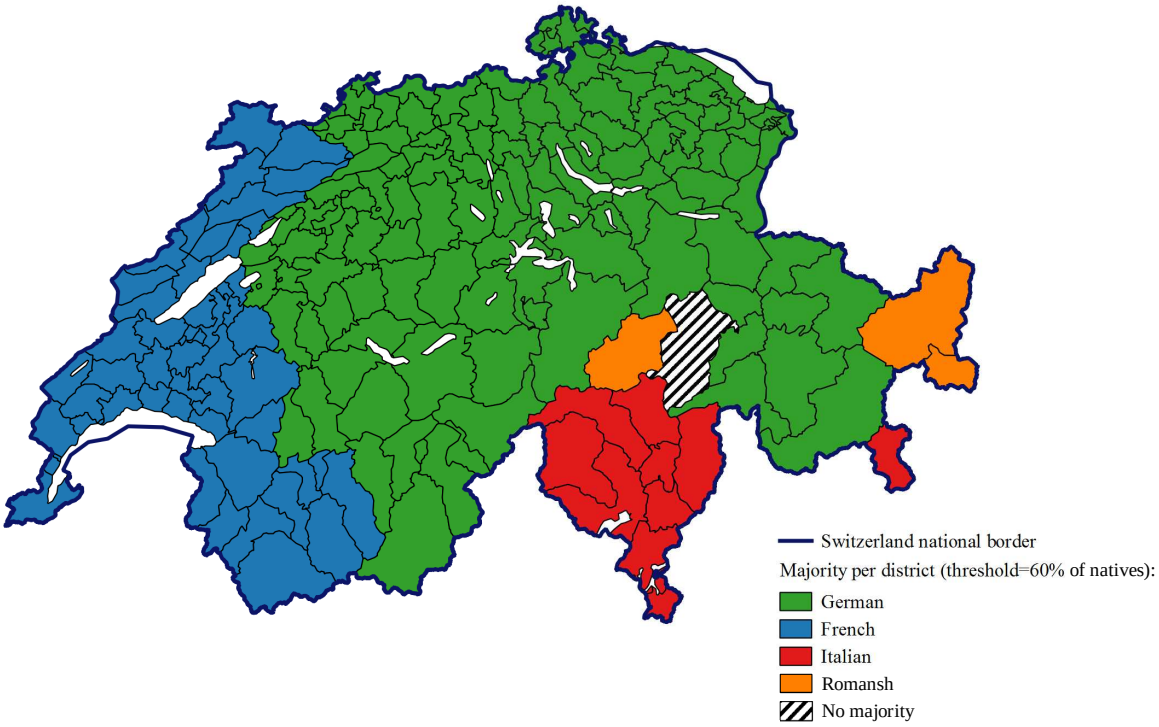

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Figure 2. Switzerland, linguistic majorities per municipality (threshold=60% of natives). Census 2000.

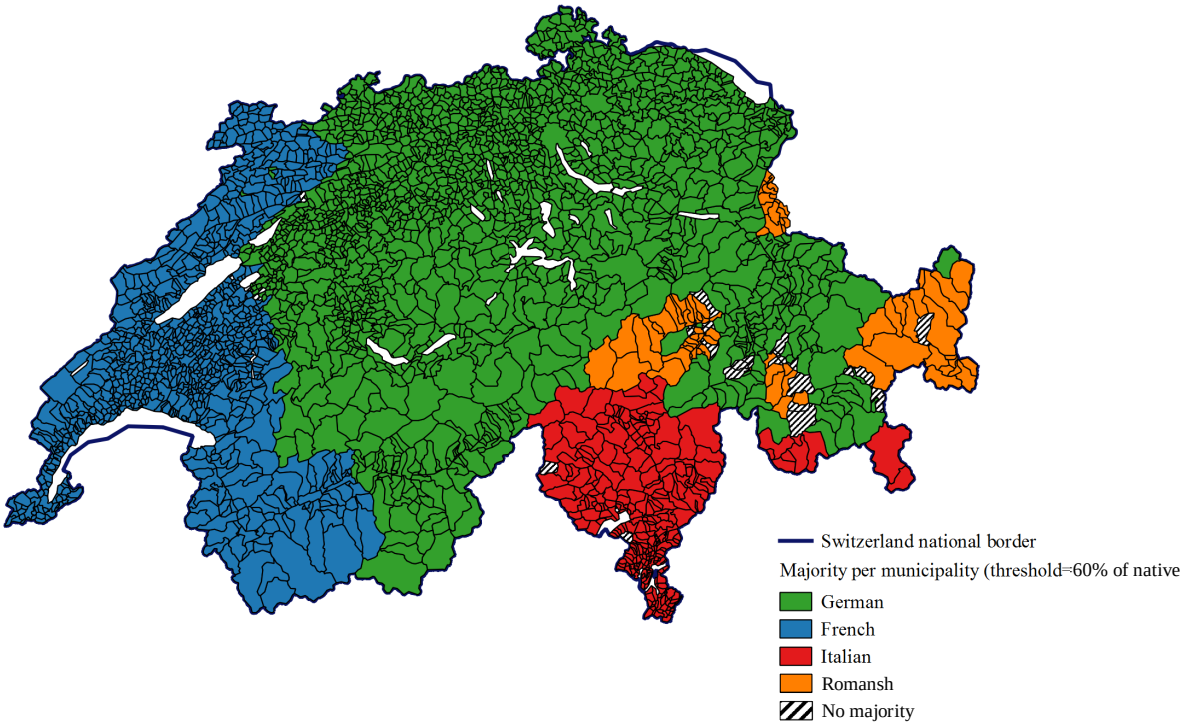

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Figure 3. Switzerland, multi-linguistic cantons. Census 2000.

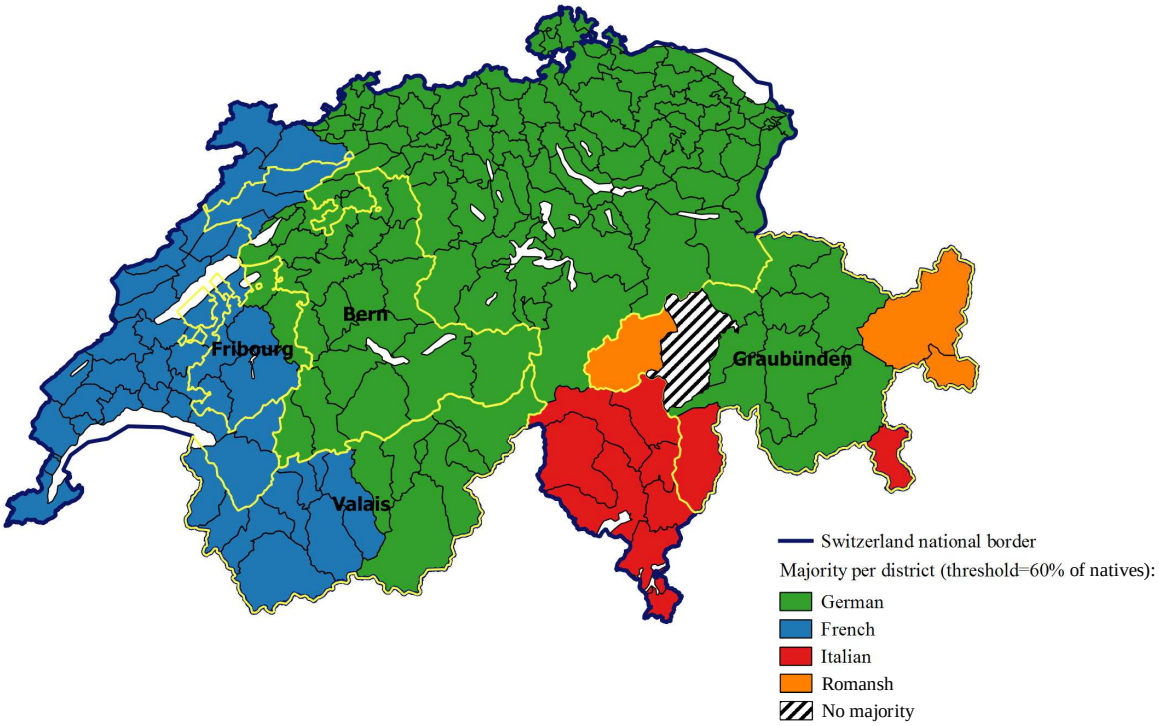

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Figure 4. Switzerland, districts at the linguistic border *in multi-linguistic* cantons. Census 2000.

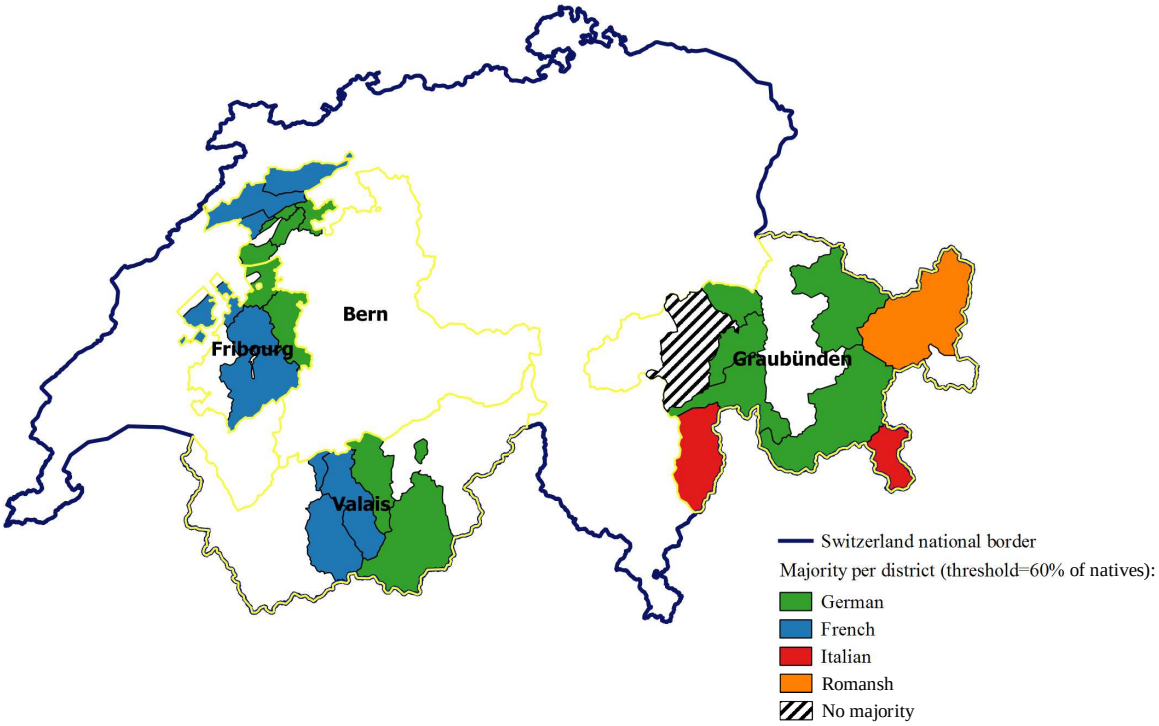

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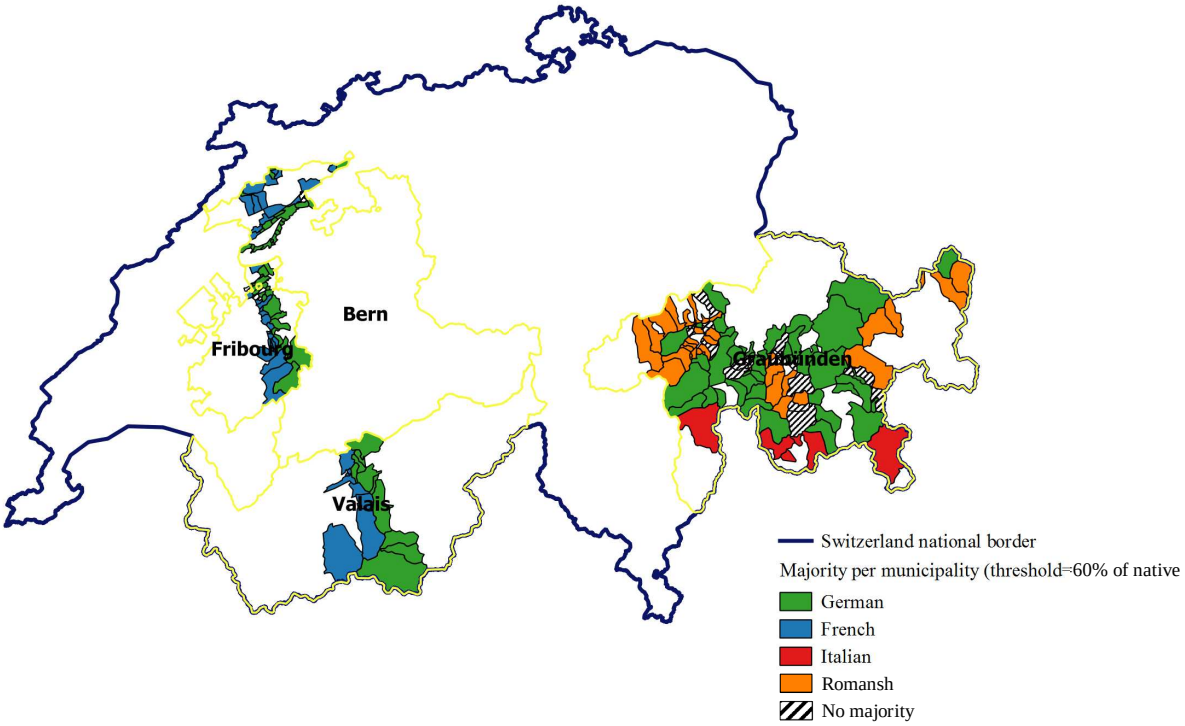
Figure 5. Switzerland, municipalities at the linguistic *border in* multi-linguistic cantons. Census 2000.



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8 Tables

Table 1. Future Reference (FTR) classification of Languages Population of over 25 years old employed.

	Natives		1st Generation Immigrants		2nd Generation Immigrants	
	Freq.	**Perc.**	**Freq.**	**Perc.**	**Freq.**	**Perc.**
Strong FTR						
French	436,394	19.2	117,419	18.3	17,971	24.9
Italian	76,386	3.4	108,844	17.0	12,101	16.8
Romansh	14,104	0.6	567	0.1	33	0.0
Arabic			2,574	0.4	10	0.0
Czech/Slovak			2,852	0.4	8	0.0
English			23,045	3.6	258	0.4
Greek			2,18	0.3	79	0.1
Hungarian			2,504	0.4	8	0.0
Iranian			1,024	0.2	3	0.0
Israeli			515	0.1	2	0.0
Portuguese			42,027	6.6	586	0.8
Romanian			1,047	0.2	4	0.0
Slavic			52,319	8.2	830	1.1
Spanish			28,507	4.4	1,267	1.8
Turkish			18,296	2.8	543	0.7
Vietnamese			2,204	0.3	13	0.0
SubTotal	551,416		405,924		33,716	
Weak FTR						
German	1,743,352	76.8	220,330	34.4	38,238	53.1
Chinese			2,167	0.3	10	0.0
Dutch			5,974	0.9	24	0.0
Finnish			1,411	0.2		
Japanese			1,383	0.2	24	0.0
Scandinavian			3,942	0.6	8	0.0
SubTotal	1,743,352		235,207		38,304	
Total	2,270,236	100	641,131	100	72,020	100

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Table 2. Descriptive statistics. Population of over 25 years old employed

	Natives			1st Gen. Immigrants			2nd Gen. Immigrants		
Variables (perc.)	**Whole pop.**	**Weak FTR**	**Strong FTR**	**Whole pop.**	**Weak FTR**	**Strong FTR**	**Whole pop.**	**Weak FTR**	**Strong FTR**
Entrpreneurs	18.2	18.6	16.7	12.7	15.6	11.1	12.1	13.4	10.6
Females	43.3	43.4	43.2	43.2	46.6	41.1	37.6	37.9	37.3
Age (average)	43.2	43.3	42.7	43.2	43.7	42.9	33.6	33.3	34.1
Married (or even been married)	73.2	72.9	74.1	85.3	80.8	87.9	57.6	54.5	61.18
N. children in household (average)	0.9	0.9	0.9	1.0	0.8	1.0	0.9	0.9	0.93
Swiss nationality				27.9	40.2	20.7			
Less than 5 years in Switzerland				11.9	13.7	10.8			
Education:									
Lower than secondary	16.1	15.5	17.9	42.9	23.9	54.0	25.4	21.1	30.25
Secondary education	25.2	25.0	26.2	25.4	34.9	19.9	16.7	17.6	15.72
Tertiary education	58.6	59.5	55.9	31.6	41.1	26.1	57.9	61.3	54.0
Religion:									
Catholics	42.0	38.6	53.1	52.3	36.4	61.5	74.2	69.9	79.0
Protestants	44.4	48.1	32.1	11.6	24.3	4.3	5.0	7.1	2.5
Muslims	0.2	0.1	0.2	8.6	8.9	8.4	4.3	5.9	2.5
Other religions	0.8	0.7	1.0	9.3	7.4	10.5	4.7	5.0	4.4
Atheist	12.7	12.4	13.6	18.1	23.0	15.3	11.8	12.1	11.5

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Table 3. Whole population. Census 2000

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole population		Swiss languages speakers only		Natives born in Canton only	
Weak FTR	0.0232***	0.0238***	0.0296***	0.0293***	0.0339***	0.0312***
	(0.00154)	(0.00140)	(0.00201)	(0.00187)	(0.00463)	(0.00453)
Observations	3,045,972	2,989,146	2,816,224	2,770,869	1,459,873	1,444,248
R^2	0.014	0.048	0.011	0.047	0.008	0.054
Age and Gender		YES		YES		YES
Household controls		YES		YES		YES
Religion dummies		YES		YES		YES
Education dummies		YES		YES		YES
Area of origin FE	YES	YES	YES	YES		
District FE	YES	YES	YES	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.

[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).

[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

[4] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics); Swiss nationality dummy (always equal to 1 for natives, equal to 0 for 2nd generation immigrants); dummy for residents in Switzerland for less than 5 years (equal to 1 only for 1st generation immigrants who have been living in Switzerland for less than 5 years); dummy for 2nd generation immigrants;

[5] All specifications with district (LAU-1 level) fixed effects. Area of origin fixed effects are taken into account by means of Canton of birth dummies for natives, country of birth dummies for 1st generation immigrants, country of nationality dummies for second generation immigrants.

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Table 4. Multilingual Cantons. Census 2000

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole population		Swiss languages speakers only		Natives born in Canton only	
Weak FTR	0.0275***	0.0269***	0.0354***	0.0347***	0.0336***	0.0311***
	(0.00508)	(0.00433)	(0.00509)	(0.00491)	(0.00673)	(0.00651)
Observations	612,413	603,079	565,900	558,508	392,551	388,444
R^2	0.015	0.052	0.012	0.050	0.009	0.054
Age and Gender		YES		YES		YES
Household controls		YES		YES		YES
Religion dummies		YES		YES		YES
Education dummies		YES		YES		YES
Area of origin FE	YES	YES	YES	YES		
District FE	YES	YES	YES	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.

[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).

[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

[4] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics); Swiss nationality dummy (always equal to 1 for natives, equal to 0 for 2nd generation immigrants); dummy for residents in Switzerland for less than 5 years (equal to 1 only for 1st generation immigrants who have been living in Switzerland for less than 5 years); dummy for 2nd generation immigrants;

[5] All specifications with district (LAU-1 level) fixed effects. Area of origin fixed effects are taken into account by means of Canton of birth dummies for natives, country of birth dummies for 1st generation immigrants, country of nationality dummies for second generation immigrants.

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Table 5. Multilingual Cantons. Census 2000
Districts and municipalities at the linguistic border

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole population		Swiss languages speakers only		Natives born in Canton only	
A) Districts at the linguistic border						
Weak FTR	0.0369***	0.0338***	0.0389***	0.0352***	0.0377***	0.0313***
	(0.00515)	(0.00505)	(0.00628)	(0.00587)	(0.00744)	(0.00688)
Observations	195,614	192,223	179,198	176,570	116,750	115,480
R^2	0.016	0.050	0.011	0.047	0.006	0.050
District FE	YES	YES	YES	YES	YES	YES
B) Municipalities at the linguistic border						
Weak FTR	0.0388***	0.0383***	0.0378***	0.0370***	0.0355***	0.0323***
	(0.00606)	(0.00611)	(0.00663)	(0.00630)	(0.00718)	(0.00707)
Observation	195,614	192,223	179,198	176,570	116,750	115,480
R^2	0.016	0.050	0.011	0.047	0.006	0.050
Municipality FE	YES	YES	YES	YES	YES	YES
Age and Gender		YES		YES		YES
Household controls		YES		YES		YES
Religion dummies		YES		YES		YES
Education dummies		YES		YES		YES
Area of origin FE	YES	YES	YES	YES		

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.
[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).
[3] The linguistic border is meant as the border between German and non German speaking regions. In panel A, the border is defined on the basis of linguistic majorities for districts (LAU-1 level), determined with a threshold of 60% of natives. In panel B, the border is defined on the basis of linguistic majorities for municipalities (LAU-2 level) with a threshold of 60% of natives .
[4] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).
[5] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics); Swiss nationality dummy (always equal to 1 for natives, equal to 0 for 2nd generation immigrants); dummy for residents in Switzerland for less than 5 years (equal to 1 only for 1st generation immigrants who have been living in Switzerland for less than 5 years); dummy for 2nd generation immigrants;
[6] All specifications with either district (LAU-1 level, panel A) or municipality (LAU-2 level, panel B) fixed effects. Area of origin fixed effects are taken into account by means of Canton of birth dummies for natives, country of birth dummies for 1st generation immigrants, country of nationality dummies for second generation immigrants.

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Table 6. First generation immigrants population. Census 2000

	(1)	(2)	(3)	(4)	(5)	(6)
	Bordering countries	European countries	All countries	Swiss languages-speaking countries excluded	High labour market performance countries	Low labour market performance countries
A) All languages						
Weak FTR	0.0295***	0.0232***	0.0226***	0.0177***	0.0142***	0.0234***
	(0.00276)	(0.00160)	(0.00153)	(0.00196)	(0.00289)	(0.00179)
Observations	304,154	569,008	641,131	327,970	235,024	406,107
R^2	0.040	0.047	0.047	0.051	0.050	0.038
B) Swiss languages speakers only						
Weak FTR	0.0318***	0.0312***	0.0319***	0.0161***	0.0193***	0.0342***
	(0.00290)	(0.00229)	(0.00234)	(0.00488)	(0.00406)	(0.00278)
Observations	301,943	414,563	447,160	137,698	188,140	259,020
R^2	0.040	0.044	0.044	0.057	0.054	0.036
Age and Gender	YES	YES	YES	YES	YES	YES
Household controls	YES	YES	YES	YES	YES	YES
Swiss nationality and years in Switz.	YES	YES	YES	YES	YES	YES
Religion dummies	YES	YES	YES	YES	YES	YES
Education dummies	YES	YES	YES	YES	YES	YES
Country of birth FE	YES	YES	YES	YES	YES	YES
District FE	YES	YES	YES	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.

[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).

[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

[4] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; Swiss nationality dummy; dummy for residents in Switzerland for less than 5 years; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics).

[5] All specifications with district (LAU-1 level) fixed effects.

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Table 7. First generation immigrants population. Multilingual Cantons. Census 2000

	(1)	(2)	(3)	(4)	(5)	(6)
	Bordering countries	European countries	All countries	Swiss languages-speaking countries excluded	High labour market performance countries	Low labour market performance countries
A) All languages						
Weak FTR	0.0199***	0.0210***	0.0209***	0.0175***	0.0282***	0.0165***
	(0.00683)	(0.00419)	(0.00369)	(0.00433)	(0.00714)	(0.00421)
Observations	36,477	75,831	84,263	60,300	30,456	53,807
R^2	0.045	0.055	0.055	0.055	0.058	0.042
B) Swiss languages speakers only						
Weak FTR	0.0225***	0.0261***	0.0278***	0.0211***	0.0377***	0.0207***
	(0.00715)	(0.00566)	(0.00564)	(0.00690)	(0.00989)	(0.00639)
Observations	36,223	53,484	57,512	34,055	25,029	32,483
R^2	0.045	0.051	0.051	0.052	0.059	0.041
Age and Gender	YES	YES	YES	YES	YES	YES
Household controls	YES	YES	YES	YES	YES	YES
Swiss nationality and years in Switz.	YES	YES	YES	YES	YES	YES
Religion dummies	YES	YES	YES	YES	YES	YES
Education dummies	YES	YES	YES	YES	YES	YES
Country of birth FE	YES	YES	YES	YES	YES	YES
District FE	YES	YES	YES	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.

[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).

[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

[4] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; Swiss nationality dummy; dummy for residents in Switzerland for less than 5 years; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics).

[5] All specifications with district (LAU-1 level) fixed effects.

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Table 8. First generation immigrants population. Swiss languages speakers excluded. Census 2000

	(1)	(2)	(3)	(4)	(5)
	European countries	All countries	Swiss languages-speaking countries excluded	High labour market performance countries	Low labour market performance countries
(A) Weak FTR of most spoken language					
Weak FTR	0.0273***	0.0246***	0.0268***	0.00720*	0.0139
	(0.00541)	(0.00447)	(0.00457)	(0.00425)	(0.0143)
Observations	155,095	209,906	208,154	50,086	159,820
R^2	0.038	0.038	0.038	0.041	0.024
(C) Weak FTR of most spoken language in country of origin					
Weak FTR in country of origin	0.0347***	0.0282***	0.0279***	0.00853*	0.0285**
	(0.00511)	(0.00464)	(0.00534)	(0.00450)	(0.0113)
Observations	184,213	222,555	218,652	45,979	176,576
R^2	0.035	0.038	0.037	0.045	0.021
Age and Gender	YES	YES	YES	YES	YES
Household controls	YES	YES	YES	YES	YES
Swiss nationality and years in Switz.	YES	YES	YES	YES	YES
Religion dummies	YES	YES	YES	YES	YES
Education dummies	YES	YES	YES	YES	YES
Continent of birth FE	YES	YES	YES	YES	YES
District FE	YES	YES	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.
[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).
[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).
[4] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; Swiss nationality dummy; dummy for residents in Switzerland for less than 5 years; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics).
[5] All specifications with district (LAU-1 level) fixed effects.

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Table 9. Second generation immigrants sample. Census 2000

	(1)	(2)	(3)	(4)	(5)	(6)
	Bordering countries	European countries	All countries	Swiss languages-speaking countries excluded	High labour market performance countries	Low labour market performance countries
A) All languages						
Weak FTR	0.0215***	0.0210***	0.0210***	0.0135*	0.0486***	0.0165***
	(0.00447)	(0.00414)	(0.00410)	(0.00783)	(0.00881)	(0.00412)
Observations	55,145	69,685	72,020	16,678	17,563	54,457
R^2	0.028	0.027	0.027	0.032	0.049	0.023
B) Swiss languages speakers only						
Weak FTR	0.0213***	0.0224***	0.0223***	0.0362**	0.0707***	0.0189***
	(0.00450)	(0.00435)	(0.00427)	(0.0145)	(0.0171)	(0.00422)
Observations	55,044	66,669	68,343	13,112	15,981	52,362
R^2	0.028	0.028	0.028	0.039	0.051	0.024
Age and Gender	YES	YES	YES	YES	YES	YES
Household controls	YES	YES	YES	YES	YES	YES
Religion dummies	YES	YES	YES	YES	YES	YES
Education dummies	YES	YES	YES	YES	YES	YES
Country of nationality FE	YES	YES	YES	YES	YES	YES
District FE	YES	YES	YES	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.

[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).

[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

[4] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics).

[5] All specifications with district (LAU-1 level) fixed effects.

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Table 10. Natives sample. Census 2000
Distance from same speaking country border test.

	(1)	(2)	(3)
Weak FTR	0.0417***	0.0440***	0.0358***
	(0.00513)	(0.00656)	(0.0112)
Same speaking country border distance (10s km)		0.000782	0.000890
		(0.00126)	(0.00129)
Weak FTR × Same speaking country border distance			0.00291
			(0.00263)
Observations	386,331	375,712	375,712
R^2	0.054	0.053	0.053
Age and Gender	YES	YES	YES
Household controls	YES	YES	YES
Religion dummies	YES	YES	YES
Education dummies	YES	YES	YES
District FE	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.
[2] *German (Weak FTR)* is a dummy equal to 1 if i's main spoken language is German, which does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).
[3] The sample of natives includes only speakers of Swiss native language (German, French, Italian and Romansh).
[4] The variable *Same language speaking country border distance* is the distance of i's municipality of birth from same as i's language speaking countries' border with Switzerland (Germany, Austria or Liechtenstein for German speaking natives; France for French speakers; Italy for Italian speakers).
[5] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).
[6] Controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics).
[7] All specifications with district (LAU-1 level) fixed effects.

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Table 11. Cultural dimensions and language future reference, across countries analysis

	(1) Weak FTR	(2) Weak FTR	(3) Weak FTR	(4) Weak FTR	(5) Weak FTR	(6) Weak FTR	(7) Weak FTR
Long Term Orientation	0.00706***						0.0110**
	(0.00244)						(0.00394)
Uncertainty Avoidance		-0.00583					-0.00126
		(0.00396)					(0.00546)
Individualism			0.00681*				0.00151
			(0.00345)				(0.00528)
Power Distance				-0.00456			-0.00442
				(0.00367)			(0.00414)
Masculinity					0.00381		0.00174
					(0.00311)		(0.00394)
Indulgence versus Restraint						0.00463	0.00666
						(0.00341)	(0.00458)
Observations	68	52	52	52	52	67	47
R^2	0.615	0.637	0.639	0.626	0.623	0.529	0.743
Geographic and Institutional controls	YES	YES	YES	YES	YES	YES	YES
Continent FE	YES	YES	YES	YES	YES	YES	YES

[1] The dependent in all specifications is *Weak FTR*, a dummy equal to 1 if the main spoken language in the country does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).
[2] Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1).
[3] Geographic and institutional controls: legal origin dummies (ref. Uk legal origin), Old World dummy, geographic variables (latitude, land quality, elevation, temperature, precipitacion, distance to waterays, perc. of arable land), genetic diversity index.

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Table 12. Whole population. Census 2000
Low skilled occupations (ISCO groups 5 & 9) excluded

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole population		Swiss languages speakers only		Natives born in Canton only	
Weak FTR	0.0226***	0.0249***	0.0298***	0.0311***	0.0365***	0.0337***
	(0.00166)	(0.00152)	(0.00223)	(0.00209)	(0.00526)	(0.00512)
Observations	2,659,154	2,606,564	2,472,437	2,430,369	1,291,921	1,277,411
R^2	0.015	0.050	0.012	0.050	0.010	0.059
Age and Gender		YES		YES		YES
Household controls		YES		YES		YES
Religion dummies		YES		YES		YES
Education dummies		YES		YES		YES
Area of origin FE	YES	YES	YES	YES		
District FE	YES	YES	YES	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.
[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).
[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).
[4] Excluded low skilled occupations are defined as ISCO group 5 (service workers and shop and market salel workers) and 9 (elementary occupations).
[5] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics); Swiss nationality dummy (always equal to 1 for natives, equal to 0 for 2nd generation immigrants); dummy for residents in Switzerland for less than 5 years (equal to 1 only for 1st generation immigrants who have been living in Switzerland for less than 5 years); dummy for 2nd generation immigrants;
[6] All specifications with district (LAU-1 level) fixed effects. Area of origin fixed effects are taken into account by means of Canton of birth dummies for natives, country of birth dummies for 1st generation immigrants, country of nationality dummies for second generation immigrants.

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Table 13. By sector of activity estimates. Census 2000
Whole population

	(1)	(2)	(3)
	Primary sector	Secondary sector	Tertiary sector
Weak FTR	0.0292***	0.00799***	0.0196***
	(0.00903)	(0.00239)	(0.00161)
Observations	108,098	674,861	1,851,500
R^2	0.234	0.031	0.046
Age and Gender	YES	YES	YES
Household controls	YES	YES	YES
Religion dummies	YES	YES	YES
Education dummies	YES	YES	YES
Area of origin FE	YES	YES	YES
District FE	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.

[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).

[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

[4] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics); Swiss nationality dummy (always equal to 1 for natives, equal to 0 for 2nd generation immigrants); dummy for residents in Switzerland for less than 5 years (equal to 1 only for 1st generation immigrants who have been living in Switzerland for less than 5 years); dummy for 2nd generation immigrants;

[5] All specifications with district (LAU-1 level) fixed effects. Area of origin fixed effects are taken into account by means of Canton of birth dummies for natives, country of birth dummies for 1st generation immigrants, country of nationality dummies for second generation immigrants.

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Table 14. By religion estimates. Census 2000
Whole population

	(1)	(2)	(3)	(4)
	Catholics	Protestant	Other religions	Atheists
Weak FTR	0.0234***	0.0259***	0.0138***	0.0261***
	(0.00176)	(0.00346)	(0.00229)	(0.00290)
Observations	1,351,914	1,068,782	154,497	413,953
R^2	0.047	0.050	0.051	0.047
Age and Gender	YES	YES	YES	YES
Household controls	YES	YES	YES	YES
Religion dummies			YES	
Education dummies	YES	YES	YES	YES
Area of origin FE	YES	YES	YES	YES
District FE	YES	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.

[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).

[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

[4] Individual controls: dummy for females; age and square of age; dummy for married (or ever been married); number of children in household; education level dummies (ref. lower than secondary education); religion dummies (only in Column 3); Swiss nationality dummy (always equal to 1 for natives, equal to 0 for 2nd generation immigrants); dummy for residents in Switzerland for less than 5 years (equal to 1 only for 1st generation immigrants who have been living in Switzerland for less than 5 years); dummy for 2nd generation immigrants;

[5] All specifications with district (LAU-1 level) fixed effects. Area of origin fixed effects are taken into account by means of Canton of birth dummies for natives, country of birth dummies for 1st generation immigrants, country of nationality dummies for second generation immigrants.

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Table 15. By gender and age estimates. Census 2000
Whole population

	(1)	(2)	(3)	(4)
	Males 25 - 55 years old	Males > 55 years old	Females 25 - 55 years old	Females > 55 years old
Weak FTR	0.0288***	0.0390***	0.0162***	0.00685
	(0.00177)	(0.00443)	(0.00153)	(0.00443)
Observations	1,419,985	275,007	1,126,827	167,327
R^2	0.036	0.054	0.020	0.041
Age	YES	YES	YES	YES
Household controls	YES	YES	YES	YES
Religion dummies	YES	YES	YES	YES
Education dummies	YES	YES	YES	YES
Area of origin FE	YES	YES	YES	YES
District FE	YES	YES	YES	YES

[1] The dependent variable in all specifications is *Entrepreneur*, a dummy equal to 1 if i reports to be entrepreneur.

[2] *Weak FTR* is a dummy equal to 1 if i's main spoken language does not prescribe the use of future tense in prediction-based contexts (see Dahl (2000) and Thieroff (2000)).

[3] Standard errors clustered at municipality level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

[4] Individual controls: age and square of age; dummy for married (or ever been married); number of children in household; education level dummies (ref. lower than secondary education); religion dummies (ref. Catholics); Swiss nationality dummy (always equal to 1 for natives, equal to 0 for 2nd generation immigrants); dummy for residents in Switzerland for less than 5 years (equal to 1 only for 1st generation immigrants who have been living in Switzerland for less than 5 years); dummy for 2nd generation immigrants;

[5] All specifications with district (LAU-1 level) fixed effects. Area of origin fixed effects are taken into account by means of Canton of birth dummies for natives, country of birth dummies for 1st generation immigrants, country of nationality dummies for second generation immigrants.

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A Appendix - Multilingualism in Switzerland

A distinctive characteristic of Switzerland is that its four current languages, German, French, Italian and Romansh, are native to her soil and have been spoken in the area over many centuries (Pap, 1990).

More than two thirds of Swiss citizens speak German, one fifth speaks French, about 5% Italian and less than 1% Romansh. Swiss communities do not feel part of the mainland French, German or Italian nations (Grin, 1999). Actually, they never were part of these nations and developed quite independently from them. To French speakers, France is not "the kin state", and German speakers are not "in fact" Germans (Grin and Korth, 2005). In particular the French speakers have always stressed their independence from France and at the beginning of XIX century they started to use the word *romand* in order to emphasize Swiss dissimilarity from France and French culture (Kużelewska, 2016).

French language is a highly reputed. In the past it was considered the educated language also among the German elites. Partly this status depends on the fact that the French community speaks the standard French while both the German and Italian communities speak dialects, rather different from the corresponding standard languages, that have only an oral form and rest on the standard language for their written form (Grin and Korth, 2005).

While Swiss French and Swiss Italian are resilient to the influence of other languages and do not absorb vocabulary, structures or pronunciation, the Swiss German absorbs heavily, especially from French. Thus the German Swiss do not hold a majoritarian outlook vis-a-vi the Francophone minority (Schmid, 1981). Furthermore, mainly because of the traditional cantonal organization, Switzerland is not a country in which a majority (the German speakers) concedes some kind of autonomy to minorities (speakers of French, Italian, and Romansh) (Grin and Korth, 2005).

The first people that inhabited the area which is now Switzerland were Celtic tribes, the

Helvetians to the West and the Rhaetians to the East, in particular in the current canton of Graubunden. The Romans occupied the area in the early first century after Christ and shared it between the provinces of the Gallia Belgica and Rhaetia. In the former province Latin mixed with Celtic dialects while the latter adopted the vulgar Latin. In 260 AD the German tribes of the Alemannii invaded Helvetia (the Northern and North-Western part of the country) and the Burgundians advanced to the West. While the Alemannii preserved their German language, the Burgundians adopted the Latin. Among the Rhaetians the vulgar Latin slowly evolved to the current Romansh. After the Romans abandoned the area in around 400 AD the Romance and German areas underwent some adjustment but, eventually, the their western and southern frontiers were largely stable by 1100. Instead, the German-Romansh language boundary continued to move south-eastward from the 11th to the 15th century and stabilized only in 1464 when Chur, the capital town of Graubunden, was germanized. Since then Romansh has been spoken only in a number of language islands in a German-speaking sea, and the number of speakers have continued to decline (Rush, 2002).

Today's languages are the heirs of Latin and German dialects. The multilingual nature of the country have been preserved over the centuries largely because of the peculiar evolution of its institutions, centred on the cantons, mini-states jealous of their autonomy. The initial three cantons that formed the Old Confederation (1291) were all German. German were also the additional 5 cantons that joined by 1353. In the following centuries other cities territories entered in the league and among the 13 original cantons that fought against the Emperor and won Swiss independence from the Empire (1648) only Fribourg was French speaking. Overtime a number of territories in the West and the South entered in the sphere of influence of the confederation and became either allies or subject territories. In these areas French and Italian languages were prevalent. Although German was the official language of the Old Confederation, each canton or territory was free to preserve its traditional language (Pap, 1990)). In the Napoleonic Era Switzerland was transformed from a loose federation into a unitary republic, the Helvetic Republic (1798), the dependent territories (allied or subject) surged to the status of cantons and the multilingualism established the facto for centuries, was also formally acknowledged. After the Restauration (1815), cantons regained their autonomy

and reformed a confederation. To the cantons forming the Helvetic Republic the French speaking city of Geneva was added as the 22nd canton.

The constitution of 1848 stated that German, French and Italian were the three official languages of the country. In 1938 also Romansh, spoken by about 40,000 people, was added as a national language and its use was allowed in the relationships between the federal government and the Romansh speakers. According to an interpretation of the Federal Tribunal (Supreme Court) the constitutional principle regulating multilingualism in Switzerland is the principle of territoriality (Grin, 1999) which states that the cantons, within their boundaries, have the right to secure the extent and homogeneity of their language territory. Each canton has the right to establish what is its official language. All administrative affairs have to be regulated in the official language, education is provided only in the official language and immigrants are practically forced to learn the official language, although everyone has the right to speak privately in his own language. Such constitutional norm contributed to preserve the stability of the language boundaries in recent times when internal and external migration have significantly increased (Kużelewska, 2016). Similarly, the stability of the language boundaries is also supported by the fact that media have a cantonal diffusion and adopt the local language.

While most cantons are monolingual, three are officially bilingual (German and French), Fribourg, Valais and Bern and one, Graubunden, is trilingual (German, Italian and Romansh). In the multilingual cantons citizens have the right of dealing with the cantonal authorities in each of the official language. In Fribourg, Valais and Bern, the German and French zones are clearly separated. Hence education is offered in the main language of use of each zone. In Graubunden where the distribution of languages is more irregular, each municipality decides its own official language and the language of instruction (Grin and Korth, 2005). Nonetheless, German is the dominant language and Romansh and Italian speakers need to know and speak German for most practical purposes. In Fribourg four districts are French-speaking, one is German-speaking and two are mixed. In Valais, the western part is francophone and the eastern part is germanophone. After the secession of the French-speaking canton of Jura (1979), only a small proportion of the remaining territory of the canton of Bern (8 percent) is

inhabited by French-speakers.

At the canton level institutions promote language uniformity. It is possible to live by using the canton official language without the need to learn another national language. Hence the proportion of Swiss that are bilingual is small (about 15 % overall; Rush, 2002). The Swiss learn another national language at school, as a foreign language, but eventually a substantial proportion of Swiss do not know a second language, and certainly not properly (Pap, 1990). Typically the French Swiss learn German, the German and the Italian Swiss learn French. However results especially in the past were rather poor and language instruction underwent several reforms (Grin and Korth, 2005). Bilingualism partly depends on internal migration that for the major part is between different language areas rather than within the same area. Germans are more likely to move to the French or Italian areas than viceversa (Pap, 1990). As a result the francophone region has over 10% germanophone inhabitants while the German-speaking areas have only 1.9% French speakers. Despite a rather large internal migration, the Franco-German boundary is neat and corresponds to the boundary already established by 1100. There are very few bilingual municipalities, the most important of which are of Fribourg and Biel (canton of Bern). According to the official definition of bilingual municipalities adopted in a federal decree of 1963 (i.e. containing a language minority which represents at least 30% of the community's total population) out of a total of about 3000 Swiss communities in 1970 only thirty-five were French-German bilingual (Pap, 1990). Generally language boundaries do not coincide with geographical, religious or administrative and political boundaries. The Franco-German boundary follows geographical lines only in the Jura and in the Valais, while it develops in open and plain areas in the canton of Bern and Fribourg (Pap, 1990). Protestantism and Catholicism are largely present in both French and German areas and, as we have seen, four cantons are multilingual. Actually, according to Weiss (1947) also the cultural boundaries do not coincide with the language boundary.

Weiss suggested that a marked cultural separation can be observed along the Brünig-Napf-Reuss line, between 50 to 100 km eastern from the Franco-German language boundary. The Brünig-Napf-Reuss line separate for instance the type of cards used to play a popular card game (jass), Christmas and New Year's customs, and the breeds of cattle raised in the countryside.

This line corresponds to the frontier between Burgundy and Alemannia in the Lower Middle Ages and predates the formation of the modern linguistic communities.

A Appendix Tables

Table A1. Hofstede's national cultural dimensions and language future reference Descriptive statistics

Country	Main spoken langauge	Strong FTR	LTO	UAI	PDI	IDV	MAS	IVR
Albania	Albanian	1	61,46					14,51
Algeria	Arabic	1	25,94					32,37
Argentina	Spanish	1	20,40	86	49	46	56	61,83
Armenia	Armenian	1	60,96					
Australia	English	1	21,16	51	38	90	61	71,43
Austria	German	0	60,45	70	11	55	79	62,72
Azerbaijan	Azerbaijani	1	60,71					21,65
Bangladesh	Bengali	1	47,10	60	80	20	55	19,64
Belarus	Belorussian	1	80,86					14,96
Belgium	Dutch	0	81,86	94	65	75	54	56,70
Bosnia and Herzegovina	Bosnian	1	69,77					44,20
Brazil	Portuguese	1	43,83	76	69	38	49	59,15
Bulgaria	Bulgarian	1	69,02	85	70	30	40	15,85
Burkina Faso	French	1	27,46					18,08
Canada	English	1	36,02	48	39	80	52	68,30
Chile	Spanish	1	30,98	86	63	23	28	68,00
China	Mandarin	0	87,41	30	80	20	66	23,66
Colombia	Spanish	1	13,10	80	67	13	64	83,04
Costa Rica	Spanish	1		86	35	15	21	
Croatia	Croatian	1	58,44	80	73	33	40	33,26
Cyprus	Greek	1						69,87
Czech Republic	Czech	1	70,03	74	57	58	57	29,46
Denmark	Danish	0	34,76	23	18	74	16	69,64
Dominican Republic	Spanish	1	13,10					54,24
Ecuador	Spanish	1		67	78	8	63	
Egypt	Arabic	1	6,80					4,24
El Salvador	Spanish	1	19,65	94	66	19	40	88,84
Estonia	Estonian	0	82,12	60	40	60	30	16,29
Ethiopia	Amharic	0						46,00
Finland	Finnish	0	38,29	59	33	63	26	57,37
France	French	1	63,48	86	68	71	43	47,77

[1] Legend: LTO=Long Term Orientation; UAI=Uncertainty Avoidance; IDV=Individualism; PDI=Power Distance; MAS=Masculinity; IVR=Indulgency versus Restraint

Table A1 (part2). Hofstede's national cultural dimensions and language future reference Descriptive statistics

Country	Main spoken langauge	Strong FTR	LTO	UAI	PDI	IDV	MAS	IVR
Georgia	Georgian	1	38,29					31,92
Germany	German	0	82,87	65	35	67	66	40,40
Ghana	English	1	3,53					72,32
Greece	Greek	1	45,34	100	60	35	57	49,55
Guatemala	Spanish	1		98	95	6	37	
Hong Kong	Cantonese	0	60,96	29	68	25	57	16,96
Hungary	Hungarian	1	58,19	82	46	80	88	31,47
Iceland	Icelandic	0	27,96					66,74
Indonesia	Indonesian	0	61,96	48	78	14	46	37,72
Iran	Persian	1	13,60	59	58	41	43	40,40
Iraq	Arabic	1	24,94					16,74
Ireland	English	1	24,43	35	28	70	68	64,96
Israel	Hebrew	1	37,53	81	13	54	47	
Italy	Italian	1	61,46	75	50	76	70	29,69
Jamaica	English	1		13	45	39	68	
Japan	Japanese	0	87,91	92	54	46	95	41,74
Jordan	Arabic	1	16,12					43,08
Kyrgyzstan	Kirghiz	1	65,99					39,29
Latvia	Latvian	1	68,77	63	44	70	9	12,95
Lithuania	Lithuanian	1	81,86	65	42	60	19	15,63
Luxembourg	Luxembourgish	0	63,98	70	40	60	50	56,03
Macedonia	Macedonian	1	61,71					35,27
Malaysia	Malay	0	40,81	36	100	26	50	57,14
Mali	French	1	20,15					42,63
Malta	Maltese	1	47,10	96	56	59	47	65,63
Mexico	Spanish	1	24,18	82	81	30	69	97,32
Moldova	Romanian	1	71,03					19,20
Montenegro	Montenegrin	1	75,31					19,87
Morocco	Arabic	1	14,11	68	70	46	53	25,45
Netherlands	Dutch	0	67,00	53	38	80	14	68,30
New Zealand	English	1	32,75	49	22	79	58	74,55

[1] Legend: LTO=Long Term Orientation; UAI=Uncertainty Avoidance; IDV=Individualism; PDI=Power Distance; MAS=Masculinity; IVR=Indulgency versus Restraint

Table A1 (part3). Hofstede's national cultural dimensions and language future reference Descriptive statistics

Country	Main spoken langauge	Strong FTR	LTO	UAI	PDI	IDV	MAS	IVR
Norway	Norwegian	0	34,51	50	31	69	8	55,13
Pakistan	English	1	49,87	70	55	14	50	0,00
Panama	Spanish	1		86	95	11	44	
Peru	Spanish	1	25,19	87	64	16	42	46,21
Poland	Polish	1	37,78	93	68	60	64	29,24
Portugal	Portuguese	1	28,21	99	63	27	31	33,26
Puerto Rico	Spanish	1	0,00					89,96
Romania	Romanian	1	51,89	90	90	30	42	19,87
Russia	Russian	1	81,36	95	93	39	36	19,87
Rwanda	English	1	18,39					37,28
Saudi Arabia	Arabic	1	35,52					52,23
Serbia	Serbian	1	52,14	92	86	25	43	28,13
Slovak Republic	Slovak	1	76,57	51	100	52	100	28,35
Slovenia	Slovene	1	48,61	88	71	27	19	47,54
South Korea	Korean	1	100,00	85	60	18	39	29,46
Spain	Spanish	1	47,61	86	57	51	42	43,53
Suriname	Dutch	0		92	85	47	37	
Sweden	Swedish	0	52,90	29	31	71	5	77,68
Taiwan	Mandarin	0	92,95	69	58	17	45	49,11
Tanzania	Swahili	1	34,01					38,39
Thailand	Thai	1	31,74	64	64	20	34	45,09
Trinidad and Tobago	English	1	12,59	55	47	16	58	80,13
Turkey	Turkish	1	45,59	85	66	37	45	49,11
Uganda	Swahili	1	23,68					52,46
Ukraine	Ukrainian	1	86,40					14,29
United Kingdom	English	1	51,13	35	35	89	66	69,42
United States	English	1	25,69	46	40	91	62	68,08
Uruguay	Spanish	1	26,20	98	61	36	38	53,35
Venezuela	Spanish	1	15,62	76	81	12	73	100,00
Vietnam	Vietnamese	1	57,18	30	70	20	40	35,49
Zambia	English	1	30,23					42,19

[1] Legend: LTO=Long Term Orientation; UAI=Uncertainty Avoidance; IDV=Individualism; PDI=Power Distance; MAS=Masculinity; IVR=Indulgency versus Restraint

Table A2. Linguistic differences between German and French. WALS dataset

Category	**French**	**German**	**Area**
Genus	Romance	Germanic	
The Velar Nasal	No velar nasal	No initial velar nasal	Phonology
Vowel Nasalization	Contrast present	Contrast absent	Phonology
Fixed Stress Locations	Right-edge: Ultimate or penultimate	Right-oriented: One of the last three	Phonology
Weight-Sensitive Stress	Prominence	Coda consonant	Phonology
Weight Factors in Weight-Sensitive Stress Systems	Undetermined	Trochaic	Phonology
Exponence of Selected Inflectional Formatives	No case	Case + number	Morphology
Inflectional Synthesis of the Verb	4-5 categories per word	2-3 categories per word	Morphology
Locus of Marking in the Clause	No marking	Dependent marking	Morphology
Locus of Marking: Whole-language Typology	Inconsistent or other	Dependent-marking	Morphology
Number of Genders	Two	Three	Nominal Categories
Plurality in Independent Personal Pronouns	Person-number stem + nominal plural affix	Person-number stem	Nominal Categories
The Associative Plural	No associative plural	Unique periphrastic associative plural	Nominal Categories
Pronominal and Adnominal Demonstratives	Different stem	Identical	Nominal Categories
Indefinite Pronouns	Generic-noun-based	Mixed	Nominal Categories
Number of Cases	No morphological case-marking	4 cases	Nominal Categories
Asymmetrical Case-Marking	No case-marking	Syncretism in relevant NP-types	Nominal Categories
Position of Case Affixes	Prepositional clitics	Case suffixes	Nominal Categories
Ordinal Numerals	First, second, three-th	First, two-th, three-th	Nominal Categories
Distributive Numerals	No distributive numerals	Marked by preceding word	Nominal Categories
Perfective/Imperfective Aspect	Grammatical marking	No grammatical marking	Verbal Categories
The Future Tense	Inflectional future exists	No inflectional future	Verbal Categories
Suppletion According to Tense and Aspect	Tense and aspect	Tense	Verbal Categories
Order of Subject, Object and Verb	SVO	No dominant order	Word Order
Order of Object and Verb	VO	No dominant order	Word Order
Order of Object, Oblique, and Verb	VOX	No dominant order	Word Order
Order of Adjective and Noun	Noun-Adjective	Adjective-Noun	Word Order
Position of Polar Question Particles	Initial	No question particle	Word Order
Relationship between the Order of Object and Verb and the Order of Adposition and Noun Phrase	VO and Prepositions	Other	Word Order
Alignment of Case Marking of Full Noun Phrases	Neutral	Nominative - accusative (standard)	Simple Clauses
Nonperiphrastic Causative Constructions	Both	Morphological but no compound	Simple Clauses
Negative Indefinite Pronouns and Predicate Negation	Mixed behaviour	No predicate negation	Simple Clauses
Polar Questions	Question particle	Interrogative word order	Simple Clauses
Purpose Clauses	Deranked	Balanced/deranked	Complex Sentences
Reason Clauses	Balanced/deranked	Balanced	Complex Sentences
SVNegO Order	OptDoubleNeg	No SVNegO	Word Order
Position of Negative Word With Respect to Subject, Object, and Verb	OptDoubleNeg	More than one position	Word Order
SNegVO Order	OnlyWithAnotherNeg	No SNegVO	Word Order
SVONeg Order	No SVONeg	NoDoubleNeg	Word Order
Position of negative words relative to beginning and end of clause and with respect to adjacency to verb	Immed postverbal	End, not immed postverbal	Word Order
Order of Negative Morpheme and Verb	OptDoubleNeg	Type 1 / Type 2	Word Order

Table A3. Immigrants distribution by country of origin

	1st Generation			2nd Generation		
Country	Freq.	Percent	Share High skill jobs	Freq.	Percent	Share High skill jobs
Belgium	5,735	0.89	0.61	141	0.20	0.55
Denmark	2,366	0.37	0.49	60	0.08	0.5
Germany	95,984	14.97	0.50	4,268	5.93	0.46
Finland	2,340	0.36	0.56	20	0.03	0.5
France	50,424	7.86	0.42	1,629	2.26	0.38
Greece	3,471	0.54	0.32	548	0.76	0.36
United Kingdom	14,608	2.28	0.58	375	0.52	0.50
Italy	129,543	20.21	0.17	46,842	65.04	0.30
Ex-Yugoslavia	96,843	15.11	0.08	3,970	5.51	0.06
Liechtenstein	1,509	0.24	0.43	263	0.37	0.44
Netherlands	10,012	1.56	0.56	402	0.56	0.49
Austria	26,694	4.16	0.33	2,143	2.98	0.39
Portugal	5,691	0.89	0.45	31	0.04	0.31
Poland	63,118	9.84	0.05	1,493	2.07	0.06
Romania	3,256	0.51	0.52	11	0.02	0.14
Sweden	3,909	0.61	0.54	71	0.10	0.41
Spain	39,593	6.18	0.15	7,304	10.14	0.32
Czechoslovakia	8,124	1.27	0.46	41	0.06	0.34
Turkey	28,811	4.49	0.10	1,931	2.68	0.13
Hungary	5,788	0.90	0.43	73	0.10	0.41
Algeria	3,272	0.51	0.35	22	0.03	0.27
Tunisia	3,388	0.53	0.25	34	0.05	0.10
Chile	2,954	0.46	0.28	29	0.04	0.10
Canada	4,260	0.66	0.61	29	0.04	0.65
United States	10,309	1.61	0.62	100	0.14	0.64
China	3,147	0.49	0.35	62	0.09	0.36
India	2,882	0.45	0.47	30	0.04	0.30
Iran	2,591	0.40	0.44	18	0.02	0.09
Israel	1,016	0.16	0.52	3	0.00	0.40
Japan	1,876	0.29	0.46	18	0.02	0.26
Cambodia	617	0.10	0.17	8	0.01	0.06
Lebanon	2,344	0.37	0.38	14	0.02	0.07
Vietnam	4,656	0.73	0.28	37	0.05	0.04
Total	641,131	100	Average=0.38	72,020	100.00	Average=0.31

Immigration and Natives' Labour Market Performance: New Evidence from Switzerland

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Abstract

We analyse the impact of immigration on three labour market outcomes among native workers: the decision to be entrepreneur, the transition to high skilled occupations and the displacement from the professional sector of specialization embodied by their vocational education or training. We employ data from four waves of the complete Swiss Population Census covering the period 1970-2000 to build a panel dataset at the district level and adopt a quasi-experimental setting to deal with endogeneity of migration inflows. Our estimates show that an increase in immigration positively affects the share of native entrepreneurs, including low skilled, and leads to a higher regional share of natives in high skilled occupations. As regards sector displacement, native workers tend to move from their sector of specialization as a response to an increase in immigration, although they tend to stay within their macro-professional sector of origin, and move less across macro-sectors. Finally, we find that foreign-born inflows are correlated to natives movements to occupations with a higher degree of cognitive, communicational and analytical skills.

Keywords: Immigration, Entrepreneurship, Skills, Switzerland.

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1 Introduction

Immigration, and its effects on receiving regions, has been a relevant issue in the political and economic debate for the last decades. Moreover, the recent increase in foreign population inflows, as a result of economic and political distress in poorer areas of the World, has significantly affected the public attitude toward immigrants and raised even more the level of attention to this topic.

Economists devoted most of their efforts to test whether immigration leads to negative labour market externalities for natives, especially as regards wages and employment among low educated workers. Using U.S. macro-data, part of the empirical literature suggests that large immigrants inflows, especially with low human capital, negatively affect the relative wages of low skilled natives with respect to highly educated ones, and supports the idea that immigrants are perfect substitutes of native workers within a comparable level of skills (Borjas, Freeman, Katz, Di Nardo, and Abowd, 1997; Borjas, 2003, 2006; Borjas and Katz, 2005). Other authors exploit the within-country heterogeneity in immigration penetration at the regional level, and reveal a different picture by showing that immigration has a small or no significant impact on wages of low skilled natives (Card, 1990, 2001; Card and Lewis, 2007; Friedberg, 2001; Friedberg and Hunt, 1995; Lewis, 2005). The underlying assumption in these studies is that immigration does not affect the natives' outflows from local labour markets, influencing labour supply at the regional level and, hence, inducing a bias in the estimated effect. Using U.K. Data, Dustmann, Frattini, and Preston (2013) find that immigration put a downward pressure on the wages at the bottom of the distribution, while the average effect on the rest of the distribution of natives' wages is positive.

The view that natives and foreign born workers are perfect substitutes, conditional on skills, is challenged by a series of studies that point out that the two categories of workers are complementary in production, and, hence, natives' wages and employment should not be negatively affected by immigration inflows. Ottaviano and Peri (2006, 2012) claim that U.S. native and immigrant workers within the same "education-job experience" cell are imperfect substitutes, and find that immigration leads to an increase in natives' average wage, and a smaller then previously predicted effect on the earnings of U.S. workers without high school degree. Ev-

idence in favour of low elasticity of substitution between native and foreign workers is also brought by Cortes (2008), exploiting across-cities variation in U.S., and Manacorda, Manning, and Wadsworth (2006), with U.K. data.

A further insight on the nature of natives' and immigrants' skills complementarity is provided by Peri and Sparber (2009). The authors suggest that immigrants supply manual and physical skills comparable to low educated natives' ones, but are imperfect substitutes for what concerns communication skills, requiring higher language proficiency. Natives have, thus, a comparative advantage in jobs with more communication-intensive tasks with respect to foreign workers. Their U.S. State-level analysis shows that immigration "pushes" low skilled natives to occupations with a higher intensity of communication-skills use, and yields higher wages, as a result also of the increase in the supply of complementary physical and manual skills by foreign labour force. These dynamics are confirmed by Foged and Peri (2016), who, exploiting the random allocation of refugees across Danish municipalities, find that low-skilled workers inflows push low educated natives to less manual jobs, and have a positive effect on wages and across-establishments mobility.

We add to the debate on the endogenous response of natives to immigration by assessing the impact of plausibly exogenous migration inflows at the regional level on the career opportunities and choices of native workers. In particular, we focus on three natives' labour market outcomes: the decision to be entrepreneur, the transition to high skilled occupations (ISCO categories 1, 2, 3 and 6), and professional sector mobility/displacement with respect to the specialization acquired through education or professional training.

We argue that immigration may foster entrepreneurship among natives by means of the potential downward pressure on wages created by the increase in labour supply, generated by the inflows of foreign workers, especially low skilled ones. The lower cost of labour may generate an incentive to invest in an enterprise, given the higher expected profitability of starting a business. In addition, if local and immigrant workers are characterized by a certain degree of substitution on the labour market, larger immigration inflows may reduce the expected future wage from dependent work and make self-employment more attractive. The latter effect may be stronger for low skilled natives, since they are more likely to work in sectors with higher concentration of low skilled immigrants and hence experience a substantial competition pressure.

We also analyze the effect of immigration inflows on the mobility of local labour force to occupations requiring different skills, following the findings by Ottaviano and Peri (2006, 2012), Peri and Sparber (2009), Foged and Peri (2016). If immigrants, indeed, tend to supply physical and manual skills which are complementary to natives' communication and "soft" skills, an increase in the immigrant labour force, then, should lead to movements of native workers to occupations requiring a higher degree of communication and cognitive abilities or technical knowledge. We classify as high skilled occupations those belonging to ISCO (International Standard Classification of Occupations) categories 1 (legislators, senior officials and managers), 2 (professionals), 3 (technicians and associate professionals) and 6 (skilled agricultural, forestry and fishery workers). These are occupations in which workers are expected to provide managerial skills and other abilities connected to the organization and scheduling of production, technical knowledge and expertise. We check whether immigration is linked to shifts in the composition of native labour force toward those highly ranked jobs.

We employ micro-data from the complete Swiss Population Census, spanning from 1970 to 2000 with 10 years intervals, in order to build a panel dataset at the district (LAU-1) level and exploit both the cross-sectional and over-time variation in the data. This rich dataset provides detailed information about the universe of all resident workers in Switzerland and allows us to construct precise statistics of immigrant concentration and average natives' outcomes per district. Switzerland is an appropriate case for our analysis because it is characterized by an homogeneous economic environment and a substantial foreign-born concentration on the labour force, mostly including low educated workers.

One of the peculiar features of the Swiss education system is the supply of a high variety of professional (vocational) specializations, both at secondary and tertiary education level. Swiss Census provides information on both the individual sector specialization during education and actual professional sector (SSCO classification). We can, hence, track those natives employed in a professional sector that is different than the one he/she has specialized for, and check whether there is a relationship between immigration and the number of natives displaced from the professional sector of competence, as a further evidence of labour market mobility among natives in response to foreign-born inflows.

Our empirical strategy overcomes the endogeneity related to the non-random allocation of

immigrants across Districts, by using an instrumental variable for the regional change in immigration as developed by Card (2001), similarly to Bianchi, Buonanno, and Pinotti (2012). This approach isolates the component of migration inflows which is driven by supply-push factors from countries of origin, such as economic crisis or political conflicts.

Our findings suggest that an increase in the immigrant share of labour force: (i) positively affects the share of native entrepreneurs on employed natives, even in the case of low skilled workers; (ii) leads to a higher share of low skilled natives in high skilled occupations. The analysis on professional sector displacement is split between the evaluation of the magnitude of displacement, and the identification of the direction of professional movements in terms of the skills (cognitive and communicational vs physical) of the new occupation. As regards the first aspect, we distinguish movements across macro-professional sectors and within macro-sectors. Results show that natives tend to move less across macro-sectors, and to move more within macro-professional sectors as a response to an increase in immigration. For what concerns the direction of displacement, we find that immigration leads to a higher number of movements, among natives, low skilled included, to occupations characterized by a more intensive supply of "soft" skills (cognitive and communicational abilities). We finally provide evidence that migration is not linked to local workers' transition out of employment and within-Switzerland geographical sorting, which could bias our previous estimates at the district level.

The paper unfolds as follows. Section 2 describes the data and introduces our empirical strategy. Section 3 presents our empirical findings. Section 4 provides our concluding remarks.

2 Data and Empirical Strategy

Our analysis relies on micro-data from the four waves of the complete Swiss Population Census. These data are structured as a repeated cross-section spanning, with ten years intervals, from 1970 to 2000[1]. Swiss Census represents a complete source of information, at the individual level, on the universe of resident population in the country. The availability of information on

[1] The population of employed natives, who completed their studies, includes 2,088,625 observations in 1970; 2,174,254 in 1980; 2,390,412 in 1990; 2,474,021 in 2000. The figure for immigrants (foreign-born) amounts to 734,284 workers in 1970; 679,470 in 1980; 909,499 in 1990; 930,822 in 2000

the whole population of Swiss residents allows us to overcome one of the main problems plaguing the empirical migration literature, i.e. the sampling error attached the the available measures of local immigration penetration due to the sampling nature of most data (both censuses and surveys) used in this literature, resulting in a likely attenuation bias in the estimates (Aydemir and Borjas, 2011; Nunziata, 2015).

Given that we observe the universe of Swiss residents, differently from previous studies we can measure the true share of immigrants at the district level in each year. One factor that we are not able to observe, similarly to most studies in the literature, is the presence of illegal immigrants. Longchamp, Aebersold, Rousselot, and Ratelband-Pally (2005) estimate the number of irregular immigrants, *sans-papiers*, in Switzerland in 2005 to be in a range between 80,000 and 100,000 units. Most of them are settled in urbanized areas characterized by a large presence of regular immigrants, and work in low skilled occupations, in particular in private households (e.g. cleaning services or elderly care) or the construction sector. All these elements suggest that there exists a strong positive correlation between regular immigration and the relatively small share of illegal immigrants. Assuming that the correlation is stable over time, our estimates should not be dramatically affected. For each wave we observe a detailed set of variables recording individual labour market characteristics and geographical location. These are:

- municipality (LAU-2), district (LAU-1) and Canton (NUTS3) of birth, residence and employment;
- immigration status, by means of country of birth and/or nationality (classified across 38 countries/areas of origin[2]);
- employment status, type of establishment (public/private) and position in workplace (owner/employee);
- education achievement: we distinguish low skilled workers, with high school degree or lower, from high skilled ones, with completed tertiary education;

[2]The list of 38 countries/macro-areas identifiable from the Swiss Census is the following: Belgium, Denmark, Germany, Finland, France, Greece, United Kingdom, Italy, Ex-Yugoslavia, Liechtenstein, Netherlands, Austria, Poland, Portugal, Romania, Sweden, Spain, Czech and Slovak Republic, Turkey, Hungary, Algeria, Tunisia, Other Countries of Africa, Chile, Canada, United States, Other Countries of Central-Southern America, China, India, Iran, Israel, Japan, Cambodia, Lebanon, Vietnam, Other Countries of Asia, Oceania.

- professional sector, along two standards: (i) ISCO, one of the most widespread type of classification in economic research, which allows to identify the kind of occupation according to the skill level; (ii) SSCO (Swiss Standard Classification of Occupations) which provides, with the same 5-digit coding, information about the professional sector where the workers are actually employed and the one in which they specialized through education.

For privacy reasons we do not have an individual identifier that allows to exploit the individual-level panel dimension in the data, and thus exploit a within-individual variation in our outcomes. In order to gain heterogeneity over time, we then collapse our micro-data at the district level and build a panel in which the variables of interest are population averages per district/year.

One issue we need to take into consideration is that districts may not identify a labour market entity, but rather be part of a spatial network within a larger working area or commuting zone. If we considered resident individuals in each district to construct our district-level averages, we would not be able to identify the labour market dimension of each district, given the existence of commuting workers. For this reason, we build our regional statistics on immigration and natives' labour market dynamics by considering all individuals employed in a particular district. We classify native workers as those individuals who are employed, born in Switzerland, with Swiss nationality and who have completed their studies, while immigrants include foreign-born employed individuals. As usual in the literature, we label the latter as first generation immigrants.

We specify a linear model for district d at time t equal to:

$$Y_{d,t} = \alpha_0 + \alpha_1 log(M/Emp)_{d,t} + \gamma log(Pop.)_{d,t} + \nu_d + \delta_t + \pi_d t + \varepsilon_{d,t} \quad (1)$$

The dependent variable is the outcome of interest Y observed among natives working in district d at time t. In the analysis of entrepreneurship, for instance, Y will be the logarithm of the share of native entrepreneurs over the total native employment in the district. The treatment variable is $log(M/Emp)$, i.e. the logarithm of the share of foreign-born workers on total employed population, i.e. native plus foreign-born workers employed in d. We run estimates on the whole population of natives and, separately, on the population of low skilled natives. In addition,

we assess the impact of the inflows of all foreign-born as well as low-skilled only. This level of disaggregation may help us to better understand which foreign-born inflows are responsible for each specific effect of interest and to check on which skill segment of the natives' population it is taking place. The parameters ν_d and δ_t account, respectively, for district time-invariant unobserved characteristics and year common trends, while $\pi_d t$ captures district-specific linear time trends. Moreover, we control for the log of total employed population in district d.

Still, even if in the model in Equation (1) we control for time and district fixed effects, time-varying factors may still bias our analysis. District-specific shocks affecting both immigration and the outcome of interest may determine a non random distribution of foreign-born workers across Districts. Time-varying pull-demand factors, for example, can influence both the demand for unskilled immigrants and for natives in high skilled occupations. Or some district-level shock may benefit entrepreneurship and increase demand for foreign workers as well.

We tackle endogeneity by employing an instrumental variable approach, as first developed by Card (2001), which had a number of varied applications in the migration literature. The ratio of this type of instruments is to isolate an exogenous component in the migration flows by country of origin, driven by supply-push factors, such as economic and political crisis or natural calamities. These migration flows are then allocated across regions on the base of the beginning-of-the-period concentration of immigrants by area of origin, exploiting the enclave effect, i.e. the fact that new immigrants are more likely to settle in regions where same-origin-immigrants presence is higher, and benefit from the resulting network on the labour market (Munshi, 2003; Jaeger, 2007; McKenzie and Rapoport, 2010).

We adopt a specification of the instrument as in Bianchi, Buonanno, and Pinotti (2012), who identify, as a plausibly exogenous migration inflow from a country/area a to country c, the change in the stock of immigrants from a in other countries than c. In our analysis, the instrument for the log change in the share of foreign-born workers flows in district d between t and $t-10$ will thus be:

$$\Delta log(\widehat{M/Emp})_{d,t} \approx IV\Delta(M)_{d,t} = \sum_{a=1}^{38} \Delta\widehat{M}_{a,d,t} = \sum_{a=1}^{38} S_{a,d,t-10} \times \Delta log(M^{WE})_{a,t} \qquad (2)$$

$\Delta\widehat{M_{a,d,t}}$ is the predicted migration flow from country/area a to district d, in time t, and it is the product of two components:

(i) $\Delta log(M^{WE})_{a,t}$: the log change in the foreign population from country/area a to the whole Western Europe except Switzerland, which should represent an exogenous variation in immigration, given that Switzerland is a small economy and cannot influence migration to other Western-European countries;

(ii) $S_{a,d,t-10} = \frac{M_{a,d,t-10}}{M_{d,t-10}}$; the beginning-of-the-period (ten years before) share in district d of foreign born employed population from a over total foreign born employed population in d.

The data on immigration to Western European countries are taken from the World Bank's Global Bilateral Migration Database, which provides, for each possible pair of countries, the bilateral stocks of foreign residents from 1960 to 2000, with 10 years intervals. We select migration flows to 17 Western European countries [3] and match these data with the Swiss Census entries of countries/areas of origin (38 countries or macro-areas of origin identifiable from our Census data). The final instrument for migration to district d, $IV\Delta(M)_{d,t} = \sum_{a}^{38} \Delta\widehat{M_{a,d,t}}$, is obtained from the summation of the predicted migration flows from all 38 area of origin in our population. We run a Two Stages Least Square estimation and turn to a specification in differences for district d, between t and $t-10$, and exploit the variation, hence, over 552 $d \times t$ cells (184 districts $\times$ 3 10 years-time intervals). Equation (3) defines our first-stage regression, where we predict the log change in the share of foreign-born over employed population working in d, $\Delta log(M/Emp)_{d,t}$, with the instrument for the migration inflows, $IV\Delta(M)_{d,t}$, as in Bianchi, Buonanno, and Pinotti (2012). Our second stage regression is represented by Equation (4).

$$First\ Stage: \Delta log(M/Emp)_{d,t} = \beta_0 + \beta_1 IV\Delta(M)_{d,t} + \gamma\Delta log(Pop.)_{d,t} + \mu_d + \zeta_t + \epsilon_{d,t} \quad (3)$$

$$Second\ Stage: \Delta log(Y)_{d,t} = \alpha_0 + \alpha_1\Delta log(\widehat{M/Emp})_{d,t} + \gamma\Delta log(Pop.)_{d,t} + \mu_d + \zeta_t + \epsilon_{d,t} \quad (4)$$

We perform separate first-stage estimates to predict, first, the log change in the share of all

[3] The list of destination countries selected from the World Bank's Global Bilateral Migration Database is the following: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, United Kingdom, Sweden

foreign-born workers, and secondly, the share of low skilled first generation immigrants only. In both cases we employ the same configuration of the instrument, which is constructed using the pre-determined share $S_{a,d,t-10}$ of all foreign-born from a employed in d. The set of fixed effects, ν_d and δ_t, mainly aims at controlling for district and year specific unobservable factors related to the composition of the immigrant population. Standard errors are clustered at the district level, in order to take into account the correlation over time within the local labour market unit.

Table 1 displays some descriptive statistics regarding immigration at the district level, by year. Foreign born workers represent a significant part of the employed population, across all Census waves. In the top panel of Table 1, where we consider all first generation immigrants, the average percentage per district amounts to more than 20% in 1970, 1990 and 2000. We observe a decrease in the average in 1980, as a result of the economic crisis that hit Switzerland in the late 1970s and lasted until almost the mid-1980s. Panel 2 of Table 1 focuses on low educated foreign-born workers, indicating that the largest share of employed immigrants consists of low skilled workers. These descriptive statistics provide ground for our analysis on the impact of immigration on entrepreneurship, via lower labour costs, and on the natives' transition toward high skilled occupations, through a change in the supply of low-skilled labour. Table 2 provides some descriptive statistics on our dependent variables, considering, respectively, all natives and low skilled natives, per year. The district-level average share of entrepreneurs decreased slightly from 1970 to 1980, moving from 19.5 % to 17.4, but then it experienced a positive trend in the following two decades, peaking 21.5 % in 2000. The same pattern can be found for what concerns the share of entrepreneurs among low skilled natives, which is generally lower than the one observed for the whole native population. The average share of natives working in high skilled occupations amounts to more than one third of the total employed population, in all Census waves. This share dropped from the peak of 42 % in 1990 to around 36 % in 2000, when the whole population of natives is considered. A similar reduction occurred for low-skilled workers. The statistics on displacement the professional specialization show, perhaps surprisingly, that across-macro-sectors movements (changes in the first digit of SSCO code) are more frequent than within-macro-sectors movements (changes in the second digit of SSCO code).

TABLES 1 & 2 HERE

3 Findings

In this section we present the first stage estimates of immigration at district level, and the empirical findings regarding each of the outcomes analyzed in this paper, namely: entrepreneurship, transition to high skilled occupations and professional displacement with respect to the specialization embodied in vocational education or training. Every subsection introduces the dependent variable of interest which is always specified at district level, and after shows the OLS and 2SLS estimation results.

3.1 First Stage

Table 3 presents the results of the first stage, where we predict the log change of the share of foreign-born on total population per district with our shift-share instrument, which aims at isolating supply-push factors from areas of origin as an exogenous measure for migration inflows.

In the first three columns we instrument the ten-years-change in the regional concentration of all first generation immigrants. In Column 1 the dependent variable is the change in the logarithm of the share of foreign-born employed over the total employed population working in district; in Column 2 we consider the employed population resident in district, while in Column 3 we take into account the active foreign-born population, i.e. employed immigrants working in d and active unemployed immigrants resident in d.

The instrument is, in both cases, positive and significant at 1 % significance level. Point estimates tell us that an increase in the instrumental variable leads to 0.44 % increase in the share of employed foreign-born working in district, and to 0.52 % increase in the share of resident employed foreign-born over total employed individuals resident in district. When we consider the active immigrants concentration, the point estimate for the instrument amounts to 0.6%. The instrument has a sufficient predictive power as highlighted by the F-test statistics

for weak instruments, well above the critical threshold of 10.[4]

The estimates in Columns 4 to 6 focus on low skilled first generation immigrants only. We again distinguish between the share of employed immigrants working in district, employed immigrants who reside in district and active population of immigrants. The coefficients are both positive and significant and the Weak Instrument Tests signal that the instrument has slightly more predicted power for the inflows of low skilled immigrants than those with tertiary education. This finding is consistent with the beneficial effects that the presence of a pre-existing network of same-origin foreigners may have on low educated immigrants, compared to high skilled ones.

Since we are interested in local labour markets represented by each district's employment pattern, our preferred instrument is the one constructed using the employment shares in each district, as displayed in columns 1 an 3[5]. However, we use the instrument based on the resident shares, displayed in columns 2 and 4, when we analyze the resident natives' geographical displacement as a possible response to immigration. In what follows, we present our empirical findings related to each of our dependent variables.

TABLE 3 HERE

3.2 Immigration and Entrepreneurship

In our analysis, we adopt a broad definition of entrepreneur, from large business leaders to small business owners, including, thus, all those individuals who are residual claimant on the revenues of their activity. The model for the second stage estimation is the following:

$$\Delta log(Nat.\ Entr./Emp.\ Nat.)_{d,t} = \alpha_0 + \alpha_1 \Delta log(\widehat{M/Emp})_{d,t} + \gamma \Delta log(Pop.)_{d,t} + \mu_d + \zeta_t + \epsilon_{d,t} \quad (5)$$

where the dependent variable is the ten-year-change in the logarithm of the share of native entrepreneurs over the total population of employed natives working in district d. Our objective is to test whether immigration benefits entrepreneurship among natives through an

[4] See Stock and Yogo (2002).

[5] We also perform all the estimates included in this paper by considering the population, per district, of active first generation immigrants. They yield similar results and are available on request.

increase in expected profitability generated by a reduction in labour costs following an increase in labour supply.[6] Immigration may also reduce expected wages among dependent employees and make self-employment more attractive, especially among low skilled natives, who are potentially more exposed to the labour market competition, since they may have a higher degree of substitutability with immigrant workers. (Card, 2001).

Table 4 presents our findings on the impact of immigration on entrepreneurship. In the top panel *A* we consider the population of all natives per district. The OLS estimates' coefficients, in Columns 1 and 3, where we only consider low skilled immigrants inflows, are both positive but significant, with a an increase in the share of entrepreneurs of around 0.15% in both cases. In Columns 2 and 4 we display the second stage estimates for the inflows of, respectively, all first generation immigrants and low skilled ones only. Both coefficients are positive and significant at the 1 percent significance level: a 1 % increase in the share of foreign-born workers is associated to a 1.3 % increase in the share of native entrepreneurs on total employed natives. When we consider low skilled immigrants, the point estimate is slightly lower but not statistically different than in the previous model, which indicates that the overall effect is mainly driven by low educated immigrants. A plausible explanation for the downward bias in the OLS results, may be district-specific time-varying factors, such as labour demand shocks that may push more natives to dependent jobs and, at the same time, attract immigrant workers inflows.

In Panel *B* we estimate the effect on the population per district of low skilled natives. Our findings suggest that immigration induces an increase in entrepreneurship among low human capital natives as well. A 1 % increase in the share of foreign-born workers is associated with a 1.2 % increase in the share of low skilled native entrepreneurs over all low skilled natives working in the district (Column 2). The point estimate is slightly lower at 1.1 when only low skilled foreign-born workers are considered (Column 4).

TABLE 4 HERE

In order to interpret our findings, we need to check whether they are mainly driven by natives sorting into self-employment in low skilled occupations, as a result of limited alternative options

[6] See Dustmann, Frattini, and Preston (2013) for a study of the downward pressure exerted by immigration inflows on the lower percentiles of the wage distribution.

in the labour market, rather than a genuine forward-looking business investment in a risk-taking enterprise. A typical example of the latter is low capital intensive street vendors, which may fit in the self-employment category, but they may be actually generated by underemployment.

We check this by excluding, from the district count of native entrepreneurs, those self-employed individuals working in low skilled occupations, defined as ISCO categories 5 (service workers and shop and market sale workers) and 9 (elementary occupations). Our results do not change, as illustrated in Table 5, whose point estimates are almost the same as the ones in Table 4. A 1 % increase in immigration leads to almost a 1.3 % rise in entrepreneurship among all natives (Panel *A*, Column 2), and 1.2 % among low skilled ones (Panel *B*, Column 2). The coefficients are not significantly different when we estimate the effect of the inflows of low skilled foreign workers only (columns 4 in Panel *A* and *B*).

Our findings suggest that an increase in immigration induces a rise in the entrepreneurship rate among natives, concentrated in medium and high-skilled occupations. The effect is mainly driven by low skilled immigrants, confirming that one plausible channel may be the increase in the availability of cheap labour. In the next section we examine whether natives are more likely to select into high skilled occupations as a result of immigration.

TABLE 5 HERE

3.3 Immigration and High Skilled Occupations

We define high skilled occupations as those classified in the following ISCO (International Standard Classification of Occupations, version 88) major groups: 1, legislators, senior officials and managers; 2, professionals; 3, technicians and associate professionals; and 6, skilled agricultural, forestry and fishery workers. Occupations in groups 1, 2 and 3 rank at the top as regards the human capital requirements, usually tertiary or vocational secondary and post-secondary education, and complexity of skills. The set of abilities expected for this jobs includes decision-making, creative thinking, technical and professional knowledge, and communication and managerial skills. Occupations in ISCO-major group 6 do not usually employ highly educated workers, but require anyway a certain degree of vocational knowledge and the capacity of

scheduling production and organizing sales. A transition to these jobs represents a step forward in the occupational prestige of low skilled workers.

Immigration may affect the regional native occupations' skill composition because of the complementarity between immigrants' and natives' skills. New foreign-born workers are more likely to settle in occupations requiring a more intensive use of physical skills, which may be complementary with natives' "soft" abilities. An increase in the supply of immigrants should then push natives to higher ranked jobs (Peri and Sparber, 2009; Foged and Peri, 2016).

The estimated model is the following, with the dependent variable being the log change in the district share of natives employed in high skilled occupations over the total native labour force working in district d:

$$\Delta log(H.\ Sk.\ Occ.\ Nat./Emp.\ Nat.)_{d,t} = \alpha_0 + \alpha_1 \Delta log(\widehat{M/Emp})_{d,t} + \gamma \Delta log(Pop.)_{d,t} + \mu_d + \zeta_t + \epsilon_{d,t} \tag{6}$$

The estimation results are presented in Table 6, where a change in immigration is found to positively and significantly affect the share of natives working in high skilled occupations in 2SLS estimation, while in the OLS we observe a negative but not significant coefficient . Panel A displays the estimates for the whole district population of natives: a 1 % increase in the share of first generation immigrants workers is associated with about a 0.21 % increase in the share of natives in high skilled jobs (Column 2). The effect amounts to 0.19 % if we consider low skilled foreign workers only.

A similar pattern emerges when we consider low skilled natives only, as in Panel B. The 2SLS point estimates tell us that a 1 % increase in the share of foreign born workers is associated with an increase of almost 0.25 % in the share of low skilled natives in high skilled jobs. A comparable effect is found when a change in low skilled immigrants is considered, with a second stage coefficient equal to 0.218, in Column 4.

These findings are in line with the previous empirical literature on the endogenous natives' response to immigration (Ottaviano and Peri, 2006, 2012; Peri and Sparber, 2009; Foged and Peri, 2016), and confirm the existence of complementarity between immigrants' and natives' skills, with the natives shifting toward more complex job-related skills as a response to an

increase in immigration. These findings open the question on whether immigration also affects the natives' sector displacement. This is the topic of the next section.

TABLE 6 HERE

3.4 Immigration and Displacement from Professional Sector of Competence

We want to check whether immigration is related to the natives' labour market mobility along a further dimension, which has not been previously explored in the literature, i.e. the displacement from the professional sector of competence. We define professional sector displacement as the mismatch between the professional specialization attained through education, or other forms of trainings, and the actual professional sector of employment.

We are able to track across-sectors movements thanks to two variables contained in the Swiss Census: the professional specialization acquired in education and/or training, and the professional sector related to current employment. Both variables are coded according to the same classification standard: the SSCO (Swiss Standard Classification of Occupations), which identifies 5-digits professional classes, mainly at the branch of economic activity level.

We are interest in assessing two aspects: (i) the magnitude of professional displacement, i.e. how far from sector of specialization natives move in response to immigration; (ii) the direction of professional movements as regards the skills content of occupations to which natives have been displaced.

In order to investigate the first issue, we aggregate the 5-digits professions in SSCO at the 2-digits (41 professional sectors) and 1-digit level (9 professional macro-sectors), as in the example shown in 7.

TABLE 7 HERE

We take into consideration two type of sector movements. We first define displacements across-macro-sectors as the first digit mismatch between the sector of specialization and the actual

sector of employment. One example of first-digit movement, displayed in 7, is related to an individual who specialized as electric technician (1-digit SSCO 3), and now works as a mechanic (1-digit SSCO 2). For what concerns within-macro-sector displacements, they represent a change in the second digit only, as, for instance, moving from a specialization as mechanic (2-digit SSCO 24) to a job in the sector of vehicle construction (2-digit SSCO 25). While the latter type of displacement represents a shift to a professional area that is close to the specialization one, within the same macro-branch of activity, the former one identifies a displacement to a more distant area. Our objective is to investigate how immigration affects these professional displacements.

In this section, we only consider natives with a professional specialization, and exclude those with a general (not vocational) secondary (high school diploma) or tertiary (university degree) educational attainment, for whom, hence, we cannot identify a specific professional background. We proceed, as before, by running different estimates for the population of all natives and for low skilled natives only. Our dependent variable is the log change of the share of sector-displaced natives (both at first and second digit level) over the native population working in each district, as in the following model:

$$\Delta log(Sect.\ Displaced\ Nat./Emp.\ Nat.)_{d,t} = \alpha_0 + \alpha_1 \Delta log(\widehat{M/Emp})_{d,t} + \gamma \Delta log(Pop.)_{d,t} + \mu_d + \zeta_t + \epsilon_{d,t} \quad (7)$$

Table 8 presents our findings regarding across-macro-sectors displacements, i.e. the mismatches in the 1st-digit-SSCO code between sector of specialization and the one of actual employment. The 2SLS models indicate that only for low skilled natives immigration seems to affect across-macro-sectors movements, as displayed in Panel B. In particular, A 1 % increase in the foreign-born share is associated with a reduction of almost 0.27 % in the share of across-macro-sectors movers. The drop amounts to 0.24 % for low skilled immigrants inflows. Low educated natives seem, then, to move less to macro-sectors that are different from the one of competence, when facing larger migration inflows in the district of employment.

TABLE 8 HERE

When we look at district-level movements within-macro-sectors, i.e. mismatches at the 2nd-

digit-SSCO code between sector of specialization and area of employment, results show an opposite empirical evidence. Natives, indeed, tend to move more from their sector of competence. Table 9 displays positive and statistically significant coefficients, in our instrumental variable estimates, across all specifications. In Panel B, Column 4, for example, a 1 % percent increase in the share of low skilled immigrants leads to a 1 % increase in the share of within-macro-sector displaced low skilled natives. These findings suggest that immigration may be related to labour market mobility among native workers, and, in particular, to a relocation within macro-branches of economic activity. Migration inflows seem to affect professional displacements, especially of low skilled natives, through two opposite dynamics: (i) a reduction in movements toward occupations that are distant from the professional specialization background acquired through education or training; (ii) an increase in movements toward different occupations that are still related to the background acquired through education or training. Immigration is found to shape natives' labour market mobility (also highlighted from the findings in Table 6), but the re-allocation across professional areas is mainly directed toward occupations requiring skills and knowledge acquired through education or training. The displacements toward other macro-sectors of competence seem instead to be discouraged by immigration. This may be a further sign of complementarity between native and immigrants, with natives being able to shift toward new occupations that are consistent with their professional background when immigration penetration increases.

TABLE 9 HERE

As a second step, we need to understand what are the mechanisms linking immigration and natives' incentives to move from their specialization sector. One question regards the type of occupation they move to, and in particular what kind of skills are required in the new profession. For example, as suggested by the literature, they may move to jobs requiring more complex abilities.

We qualify professional displacement, in terms of skills required by the new occupation, by using the US Department of Labor's O*NET database, which attaches to each occupation[7] a numerical value quantifying the importance of 52 different skills measures. We use the SOC-

[7] classified according to the Standard Occupational Classification, (SOC).

ISCO crosswalk to merge the occupation-specific skills measures in O*NET with individual data in 2000 Swiss Census, and, as in Peri and Sparber (2009), each of the 52 skill measure is rescaled, between zero and one, to the percentile score in 2000[8]. If, for instance, an occupation, represented in our data from 4-digits ISCO, has a score of 0.3 for a skill, then 30% of workers in Switzerland are occupied in occupations where that skill is less intensively exploited. The ISCO classes' percentile scores in 2000 are then assigned to observations in three waves of Swiss Census from 1970 to 1990. Similarly to Peri and Sparber (2009), we split the 52 O*NET skills measures in two categories as in Table 10: (i) 34 physical skills, including those regarding movement, strength and sensory-perception; (ii) 18 "soft" skills attaining to communication, cognitive, analytical and vocal abilities. We compute, at 4-digits ISCO class level, $\overline{soft_j}$ and $\overline{physical_j}$, the mean scores in, respectively, soft and physical skills, obtained by averaging the percentile scores for the skills in each of the two groups, e.g. the occupation-specific score for the soft skills is the arithmetic average of the scores in the group of 20 soft skills. We create, for each ISCO occupation class j, the ratio between mean scores in soft and physical skills, $\overline{soft_j}/\overline{physical_j}$, which indicates the relative importance of soft abilities/tasks relative to physical ones in that ISCO occupation class.

TABLE 10 HERE

To transpose the ISCO-based soft/physical skills ratio into the SSCO classes, used to identify professional displacement, we: consider the 5-digits SSCO classification of workers' actual occupation (variable *pber* in Swiss Census); compute for each of the 5-digits SSCO classes, and separately per Census wave, the average soft/physical skills ratio, which will be the result of their year-specific distribution over 4 digits-ISCO occupations cells[9]; assign the latter 5 digits-SSCO soft/physical skills ratio to the sector of professional specialization acquired through education or training (variable *erlb* in Swiss Census).

It is now possible to identify two possible directions of professional displacement, i.e. movements to an occupation characterized by either a higher or lower soft/physical skills ratio with respect

[8] We perform the same estimates as in this section but using the cardinal values of the O*NET skills measures (ranging from 1 to above 6). Results are similar and available on request.

[9] Most of workers in one 5 digits-SSCO class tend to be employed in one 4 digits-ISCO cell. We are then almost able to identify a one-to-one correspondence between the two standard of classification of occupations.

to the professional sector of specialization. We can hence track the displacement to sectors requiring either a more or less intensive use of soft abilities. For each district d in year t, we count the number of both those native workers who have moved to an occupation with a higher soft/physical skills ratio, $movers^{up}_{d,t}$, and those natives who have moved to one characterized by a lower ratio, $movers^{down}_{d,t}$. We take the difference $movers^{up}_{d,t} - movers^{down}_{d,t}$ and standardize it by the employed native population working in district d at time t. We finally specify the following linear model in differences:

$$\Delta(movers^{up}_{d,t} - movers^{down}_{d,t} / Emp.\ Nat.)_{d,t} = \alpha_0 + \alpha_1 \Delta log(\widehat{M/Emp})_{d,t} + \gamma \Delta log(Pop.)_{d,t} + \mu_d + \zeta_t + \epsilon_{d,t} \tag{8}$$

The aim of this test is to check whether immigration affects, at district level, the displacement of native workers to occupations which require a more intensive supply of soft skills relatively to physical skills, net of the movements in the opposite direction. Since the difference $movers^{up}_{d,t} - movers^{down}_{d,t}$ may have negative values, we drop the logarithm specification for the output variable.

Table 11 collects the results on by skill professional displacement. The point estimates are positive and significant across all specifications, both in OLS and 2SLS estimations. As regards instrumental variable estimates, a 10% increase in the share of immigrants employed in district leads to a 3.1 p.p. increase in the net number of movements to occupations with higher soft/physical skills ratio over total employed native population (Panel A, Column 2). The increase amounts to almost 2.8 p.p. if we consider the inflows of low educated immigrants (Panel A, Column 4). This evidence is confirmed when we only take into account low skilled natives, in Panel B. a 10% increase in the share of foreign-born workers, indeed, is correlated with a 3.2 p.p. increase in the output variable (Panel B, Column 2), while the estimated effect is equal to a rise of 2.8 p.p. when we only focus on low skilled immigrants only (Panel B, Column 4).

This section innovates the literature on immigration-induced labour mobility of natives by analyzing the displacement from the professional specialization embodied in education or training, which represents a set of skills acquired as a result of investment in human capital. The empirical evidence provided here shed light on the magnitude of these professional movements, and, most importantly, on their direction, signaling that immigration is associated with a higher

number of natives displaced to occupations where the degree of complexity is higher. The latter result, in particular, represents a confirmation of the complementarity between immigrants' and natives' skills, with the natives shifting toward more complex job-related skills as a response to an increase in immigration, and are in line with the results in Section 3.3 and with previous empirical literature on the endogenous natives' response to immigration (Ottaviano and Peri, 2006, 2012; Peri and Sparber, 2009; Foged and Peri, 2016).

TABLE 11 HERE

3.5 Immigration and Natives' Outflows

Two potential sources of bias may affect our previous findings: (i) natives may respond to immigration by moving to other districts for motives that are related to the presence of foreign-borns (either to places where immigrants are more or less present); (ii) immigrants may push natives out of employment. If any of these dynamics is at work, we may have some selection issues in the definition of the outcomes by district. The positive effect of immigration on entrepreneurship, for instance, may be partly due to native employees' movements out of district, which may increase the share of entrepreneurs in the local area.

For what concerns the within-Switzerland sorting of native workers, we cannot track, from Census data, the changes in the district of employment at the individual level. We are able, however, to observe the district of residence five years before the interview. Thanks to this information, we can build a measure of resident natives' net migration flows between t and $t-5$ per district, and assess whether it is influenced by ten-years-changes in migration. We thus write a model as follows:

$$\begin{aligned}(Net\ Mig.\ Emp.\ Res.\ Nat./Emp.\ Res.\ Nat.)_{d,t(5)} = \alpha_0 + \alpha_1 \Delta log(M/Emp)_{d,t(10)} \\ +\gamma \Delta log(Pop.)_{d,t} + \mu_d + \zeta_t + \epsilon_{d,t} + \varepsilon_{d,t}\end{aligned} \tag{9}$$

The dependent variable is the five-year net migration flow (i.e. inflows − outflows) of employed resident natives over the total native employed resident population in district d at year $t-5$, that we regress on the ten-years change in the log share of employed immigrants working in d.

Since net migration may assume negative values, we do not log transform the share outcome variable. Given the time discrepancy between the outcome and the explanatory variables the model allows a five years delay in the natives' migration response to foreign-born workers inflows.

Table 12 presents the findings of our OLS and 2SLS estimates using the share of employed immigrants over the population made up of working in each district. As a second empirical strategy, in Table 13 we link all employed first generation immigrants to the district where they live and we use, in the second stage estimates, the predicted migration flows for the immigrant employed population that resides in the district, similarly to what we do in the models whose first stage is depicted in columns 2 and 4 of Table 3. Both specifications yield a negative and significant correlation in the OLS estimates, signaling a negative association between migration and inflows of natives, but when we isolate a plausible exogenous variation in immigration, in 2SLS estimates, we do not observe any significant point estimate. Similar findings are obtained for the population of low skilled natives.

TABLES 12 & 13 HERE

Finally, we check whether immigration is responsible for a reduction in natives' employment level. We construct the employment rate per district, by counting employed workers in the district of employment, as well as active unemployed in the district of residence. Table 14 show the estimates of the effect of migration inflows on the log change in natives' employment rate. No significant impact of immigration on the natives' employment is found. This empirical evidence is line with previous studies on immigration and employment in Switzerland (see, for example, Basten and Siegenthaler, 2013).

TABLE 14 HERE

4 Conclusions

We assess the impact of a change in the regional concentration of foreign-born workers on three labour market outcomes among natives: the decision to become entrepreneur, the natives' shift

toward high skilled occupations, and the mobility from the natives' sector-specific professional specialization acquired during education and their actual occupation.

We employ data from four waves of the complete Swiss Population Census and perform a district-level analysis, in which our variables of interest are regional averages measured with no sampling error since we observe the universe of Swiss residents. Our analysis is based on a quasi-experimental setting, i.e. we adopt an instrumental variable approach that allows to overcome the issue of non random allocation of immigrants across districts.

We find that the district share of foreign-born workers positively affects entrepreneurship among employed natives, with the effect being significant among low skilled workers too. We suggest that this effect derives from the downward pressure induced by immigration on labour cost, that may ease business profitability.

Our findings show that immigration also pushes a larger portion of natives into high skilled occupations (ISCO categories 1, 2, 3 and 6), confirming that natives' and immigrants' skills are complementary (Ottaviano and Peri, 2006, 2012; Peri and Sparber, 2009; Foged and Peri, 2016).

Finally, we study the natives' professional sector displacement from the specialization acquired through education or training. We first distinguish between movements across macro-professional sectors and within macro-sectors. Native workers tend to move less across macro-sectors, and to move more within macro-professional sectors as a response to an increase in immigration. Moreover, we check whether professional displacement is directed to occupations in which a different mix of skills is required, and find that, higher immigration inflows lead natives, including low skilled ones, to move to jobs where a higher degree of cognitive, analytical and communicational abilities are required with respect to the professional specialization embodied in vocational education or training.

Our analysis suggests that foreign born inflows have a significant impact on the host country labour market dynamics. Native individuals are more likely to engage in entrepreneurship and to access highly ranked occupations. Moreover, natives' observed professional sector displacement, as a response to immigration, does not seem to cause professional downgrading, but rather result in a shift to more complex jobs, where the supply of physical skills is low relatively

to soft skills. Our empirical findings, hence, suggest that immigration may be regarded as a push factor for natives, including low educated ones, toward better professional careers, while no negative externalities on labour market performances has been found.

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5 Tables

Table 1. Descriptives about Immigration in Switzerland

District percentage of 1st generation immigrant workers on employed population (natives + foreign-born)

	1970	**1980**	**1990**	**2000**
All foreign-born workers				
Average	21.8	19.5	23.6	23.1
Standard Deviation	9.0	8.3	8.1	7.6
Min	3.0	3.4	6.7	6.0
Max	48.2	52.0	50.3	51.0
Low skilled foreign-born workers				
Average	20.7	17.9	21.0	19.5
Standard Deviation	8.5	7.5	7.0	6.1
Min	2.8	3.0	6.0	5.0
Max	47.2	50.0	43.4	36.3
Observations	184	184	184	184

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Table 2. Descriptives about Outcomes among Natives in Switzerland

District average (×100) on native employed population

	All natives				Low skilled natives (perc. on Low skilled natives)			
	1970	**1980**	**1990**	**2000**	**1970**	**1980**	**1990**	**2000**
Entrepreneurs share								
Average	19.5	17.4	18.8	21.5	19.2	16.8	17.3	19.4
Standard Deviation	7.1	6.4	6.4	5.3	7.3	6.6	6.5	5.1
Min	6.5	6.0	6.8	10.3	5.4	4.6	5.0	8.3
Max	36.8	33.5	35.5	34.2	37.3	33.8	35.4	33.4
Workers in high skilled occupations share								
Average	37.7	38.7	42.0	36.3	35.2	34.8	36.7	30.0
Standard Deviation	7.8	6.0	4.7	4.7	8.7	7.3	4.9	3.8
Min	20.1	26.0	27.9	22.2	17.1	22.0	25.2	18.6
Max	61.0	57.6	56.6	52.2	60.4	56.1	54.9	41.1
Movers across macro-professional sectors (1st digit SSCO)								
Average	29.0	30.0	34.4	36.2	25.9	26.4	29.2	28.4
Standard Deviation	3.9	3.1	3.7	3.8	3.6	2.8	3.2	2.9
Min	18.0	22.1	23.3	26.8	15.9	19.0	19.9	20.7
Max	39.6	41.1	47.0	49.3	34.6	37.7	39.0	37.4
Movers within macro-professional sectors (2nd digit SSCO)								
Average	8.1	6.9	7.6	8.5	5.6	5.3	5.9	6.0
Standard Deviation	2.4	1.4	1.8	1.8	1.6	1.0	1.1	1.0
Min	1.6	2.4	3.3	4.0	1.2	2.2	3.1	3.0
Max	13.2	10.2	14.6	15.5	9.9	9.0	11.7	10.1
Observations	184	184	184	184	184	184	184	184

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Table 3. First stage. Immigration inflows at District level

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
	$\Delta log(Share\ Employed\ Immigrants)_{t,d}$			$\Delta log(Share\ Employed\ Low\ Skilled\ Immigrants)_{t,d}$		
	Working in District	Residents in District	Active in District	Working in District	Residents in District	Active in District
$IV\Delta(Immigrants)_{t,d}$	0.443***	0.519***	0.607***	0.498***	0.477***	0.547***
	(0.117)	(0.107)	(0.124)	(0.122) (0.113)	(0.126)	
Observations	552	552	552	552	552	552
R^2	0.665	0.661	0.666	0.659	0.660	0.654
Weak Instrument Test	14.29	23.49	14.93	16.80	28.66	18.78
Year Fixed Effects	YES	YES	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES	YES	YES

[1] The dependent variable in Columns 1-3 is the log change, per district d (LAU-1 level), between t and $t-10$, in the share of employed first generation immigrants (foreign-born) over total employed population (natives+foreign born). In Columns 4-6, we only consider low skilled (below tertiary education) first generation immigrants. In Colums 1 and 4, we track foreign-born workers by their district of employment, in Columns 2 and 5, we consider employed foreign-born by their district of residence, in Columns 3 and 6, we count both employed immigrants working in d and unemployed immigrants resident in d.

[2] The instrument $IV\Delta(Immigrants)_{t,d}$, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[3] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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Table 4. Immigration and Entrepreneurship among Natives

A) Dep. Var.: $\Delta log(Native\ Entrepreneurs/Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	0.160***	1.298***		
	(0.0372)	(0.286)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			0.144***	1.153***
			(0.0339)	(0.240)
Observations	552	552	552	552

B) Dep. Var.: $\Delta log(LS\ Native\ Entrepreneurs/LS\ Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	0.186***	1.212***		
	(0.0430)	(0.270)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			0.163***	1.077***
			(0.0391)	(0.230)
Observations	552	552	552	552
Year Fixed Effects	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES

[1] The dependent variable in Panel (A) is the log change, per district d (LAU-1 level), between t and $t-10$, in the share of entrepreneur natives over total employed population of natives. In Panel (B), the dependent variable is the log change in the share of low skilled (below tertiary education) entrepreneur natives over total employed population of low skilled natives.

[2] The endogenous explanatory variable in Columns 1 and 2 is the log change, per district d, between t and $t-10$, in the share of employed first generation immigrants (foreign-born) over total employed population (natives+foreign born). In Columns 3 and 4, we only consider low skilled (below tertiary education) first generation immigrants.

[3] The instrument in 2SLS, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[4] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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Table 5. Immigration and Entrepreneurship among Natives

Self-employed in Low Skilled Occupations (ISCO 5 & 9) excluded from Entrepreneurs

A) Dep. Var.: $\Delta log(Native\ Entrepreneurs/Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	0.158***	1.338***		
	(0.0402)	(0.300)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			0.142***	1.188***
			(0.0369)	(0.253)
Observations	552	552	552	552

B) Dep. Var.: $\Delta log(LS\ Native\ Entrepreneurs/LS\ Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	0.190***	1.231***		
	(0.0470)	(0.284)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			0.167***	1.093***
			(0.0426)	(0.242)
Observations	552	552	552	552
Year Fixed Effects	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES

[1] The dependent variable in Panel (A) is the log change, per district d (LAU-1 level), between t and $t-10$, in the share of entrepreneur [except those self-employed in low skilled occupations (ISCO 5 & 9)] natives over total employed population of natives. In Panel (B), the dependent variable is the log change in the share of low skilled (below tertiary education) entrepreneur natives over total employed population of low skilled natives.

[2] The endogenous explanatory variable in Columns 1 and 2 is the log change, per district d, between t and $t-10$, in the share of employed first generation immigrants (foreign-born) over total employed population (natives+foreign born). In Columns 3 and 4, we only consider low skilled (below tertiary education) first generation immigrants.

[3] The instrument in 2SLS, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[4] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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Table 6. Immigration and High Skilled Occupations among Natives

A) Dep. Var.: $\Delta log(Native\ High\ Skilled\ Occupations/Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	-0.0383	0.215**		
	(0.0263)	(0.0900)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			-0.0311	0.191**
			(0.0240)	(0.0781)
Observations	552	552	552	552

B) Dep. Var.: $\Delta log(LS\ Native\ in\ High\ Skilled\ Occupations/LS\ Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	-0.0534	0.245**		
	(0.0411)	(0.107)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			-0.0397	0.218**
			(0.0364)	(0.0935)
Observations	552	552	552	552
Year Fixed Effects	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES

[1] The dependent variable in Panel (A) is the log change, per district d (LAU-1 level), between t and $t-10$, in the share of natives in high skilled occupations (ISCO 1,2,3 and 6) over total employed population of natives. In Panel (B), the dependent variable is the log change in the share of low skilled (below tertiary education) natives in low skilled occupations over total employed population of low skilled natives.

[2] The endogenous explanatory variable in Columns 1 and 2 is the log change, per district d, between t and $t-10$, in the share of employed first generation immigrants (foreign-born) over total employed population (natives+foreign born). In Columns 3 and 4, we only consider low skilled (below tertiary education) first generation immigrants.

[3] The instrument in 2SLS, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[4] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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Table 7. SSCO method of aggregation at 1st and 2nd digit.

5d-code	professional sector	2d-code	1d-code
31106	Ingénieurs-électriciens	31	3
32101	Techniciens-électriciens	32	3
25301	Professions de la construction de véhicules	25	2
24401	Mécaniciens	24	2

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Table 8. Immigration and Across-Macro-Sectors Displacement among Natives (1st dig. ch.)

A) Dep. Var.: $\Delta log(Displaced\ Natives/Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	-0.00787	-0.0181		
	(0.0453)	(0.0967)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			-0.00108	-0.0159
			(0.0417)	(0.0848)
Observations	552	552	552	552

B) Dep. Var.: $\Delta log(Displaced\ LS\ Natives/LS\ Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	-0.0369	-0.276**		
	(0.0493)	(0.114)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			-0.0260	-0.242**
			(0.0454)	(0.0980)
Observations	552	552	552	552
Year Fixed Effects	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES

[1] The dependent variable in Panel (A) is the log change, per district d (LAU-1 level), between t and $t-10$, in the share of across-macro-sectors displaced (1st digit-SSCO changes with respect to the specialization embodied in vocational training or education) native workers over total employed population of natives. In Panel (B), the dependent variable is the log change in the share of low skilled (below tertiary education) disaplaced natives over total employed population of low skilled natives.

[2] The endogenous explanatory variable in Columns 1 and 2 is the log change, per district d, between t and $t-10$, in the share of employed first generation immigrants (foreign-born) over total employed population (natives+foreign born). In Columns 3 and 4, we only consider low skilled (below tertiary education) first generation immigrants.

[3] The instrument in 2SLS, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[4] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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Table 9. Immigration and Within-Macro-Sectors Displacement among Natives (2nd dig. ch.)

A) Dep. Var.: $\Delta log(Displaced\ Natives/Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	-0.00311	0.981***		
	(0.122)	(0.342)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			-0.00195	0.860***
			(0.114)	(0.291)
Observations	552	552	552	552

B) Dep. Var.: $\Delta log(Displaced\ LS\ Natives/LS\ Employed\ Natives)_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	-0.0421	1.142***		
	(0.103)	(0.397)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			-0.0309	1.002***
			(0.0974)	(0.337)
Observations	552	552	552	552
Year Fixed Effects	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES

[1] The dependent variable in Panel (A) is the log change, per district d (LAU-1 level), between t and $t-10$, in the share of within-macro-sectors displaced (1st digit-SSCO changes with respect to the specialization embodied in vocational training or education) native workers over total employed population of natives. In Panel (B), the dependent variable is the log change in the share of low skilled (below tertiary education) disaplaced natives over total employed population of low skilled natives.

[2] The endogenous explanatory variable in Columns 1 and 2 is the log change, per district d, between t and $t-10$, in the share of employed first generation immigrants (foreign-born) over total employed population (natives+foreign born). In Columns 3 and 4, we only consider low skilled (below tertiary education) first generation immigrants.

[3] The instrument in 2SLS, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[4] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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Table 10. O*NET database abilities measures: classification between physical and soft skills

Category	Sub-category	O*NET variables
Physical	Movement and strength	Arm-hand steadiness; manual dexterity; finger dexterity; control precision; multilimb coordination; response orientation; rate control; reaction time; wrist-finger speed; speed of limb movement extent flexibility; dynamic flexibility; gross body coordination; gross body equilibrium strength Static strength; explosive strength; dynamic strength; trunk strength; stamina
	Sensory-perception	Perceptual speed; spatial orientation; visualization; selective attention; time sharing near vision; far vision; visual color discrimination; night vision; peripheral vision; depth perception; glare sensitivity hearing sensitivity; auditory attention; sound localization
Soft	Communication	Oral comprehension; oral expression
	Cognitive, analytical and vocal	Fluency of ideas; originality; problem sensitivity; category flexibility; mathematical reasoning; number facility; deductive reasoning; inductive reasoning; information ordering; memorization; speed of closure; flexibility of closure; Speech recognition; speech clarity

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Table 11. Immigration and by Skills Sector-Displacement among Natives

A) Dep. Var.: $\Delta(Movers^{up}_{d,t} - Movers^{down}_{d,t}/Employed\ Natives)_{t,d}$	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	0.0375**	0.313***		
	(0.0179)	(0.0859)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			0.0384**	0.276***
			(0.0161)	(0.0707)
Observations	552	552	552	552
B) Dep. Var.: $\Delta(LS\ Movers^{up}_{d,t} - LS\ Movers^{down}_{d,t}/LS\ Employed\ Natives)_{t,d}$	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	0.0405*	0.318***		
	(0.0218)	(0.0876)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			0.0413**	0.281***
			(0.0196)	(0.0723)
Observations	552	552	552	552
Year Fixed Effects	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES

[1] The dependent variable in Panel (A) is the change, per district d (LAU-1 level), between t and $t-10$, in the net number of native workers who moved to an occupation (5 digit-SSCO) characterized by an higher ratio of soft/physical skills (*ONET classification) with respect to the specialization embodied in vocational education, over total employed population of natives. In Panel (B), the dependent variable is built up in the same way but by only considering low skilled (below tertiary eduction) native workers.

[2] The endogenous explanatory variable in Columns 1 and 2 is the log change, per district d, between t and $t-10$, in the share of employed first generation immigrants (foreign-born) over total employed population (natives+foreign born). In Columns 3 and 4, we only consider low skilled (below tertiary education) first generation immigrants.

[3] The instrument in 2SLS, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[4] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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Table 12. Employed Immigrants and Natives' Internal Resident Migration Flows

A) Dep. Var.: $(\boldsymbol{Employed\ Natives\ Net\ Migration/Employed\ Resident\ Natives})_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\boldsymbol{\Delta log(Share\ of\ Immigrants)_{t,d}}$	-0.0263***	-0.0207		
	(0.00817)	(0.0363)		
$\boldsymbol{\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}}$			-0.0275***	-0.0185
			(0.00778)	(0.0324)
Observations	552	552	552	552

B) Dep. Var.: $(\boldsymbol{LS\ Employed\ Natives\ Net\ Migration/LS\ Employed\ Resident\ Natives})_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\boldsymbol{\Delta log(Share\ of\ Immigrants)_{t,d}}$	-0.0258***	-0.00564		
	(0.00837)	(0.0380)		
$\boldsymbol{\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}}$			-0.0261***	-0.00504
			(0.00814)	(0.0340)
Observations	552	552	552	552
Year Fixed Effects	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES

[1] The dependent variable in Panel (A) is the net emigration (outflows - inflows), per district d (LAU-1 level), between t and $t-5$, of employed resident natives, over total employed resident population of natives in $t-5$. In Panel (B), the dependent variable is built by considering the outflows of employed resident low skilled (below tertiary education) natives.

[2] The endogenous explanatory variable in Columns 1 and 2 is the log change, per district d, between t and $t-10$, in the share of employed, resident in d, first generation immigrants (foreign-born) over total employed resident population (natives+foreign born). In Columns 3 and 4, we only consider low skilled (below tertiary education) first generation immigrants.

[3] The instrument in 2SLS, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[4] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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Table 13. Resident Immigrants and Natives' Internal Resident Migration Flows

A) Dep. Var.: $(\boldsymbol{Employed\ Natives\ Net\ Migration/Employed\ Natives})_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\boldsymbol{\Delta log(Share\ of\ Immigrants)_{t,d}}$	-0.0188**	-0.0296		
	(0.00870)	(0.0318)		
$\boldsymbol{\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}}$			-0.0218***	-0.0253
			(0.00819)	(0.0271)
Observations	552	552	552	552

B) Dep. Var.: $(\boldsymbol{LS\ Employed\ Natives\ Net\ Migration/LS\ Employed\ Natives})_{t,d}$

	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\boldsymbol{\Delta log(Share\ of\ Immigrants)_{t,d}}$	-0.0178**	-0.0140		
	(0.00845)	(0.0332)		
$\boldsymbol{\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}}$			-0.0197**	-0.0120
			(0.00828)	(0.0284)
Observations	552	552	552	552
Year Fixed Effects	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES

[1] The dependent variable in Panel (A) is the net emigration (outflows - inflows), per district d (LAU-1 level), between t and $t-5$, of employed resident natives, over total employed resident population of natives in $t-5$. In Panel (B), the dependent variable is built by considering the outflows of employed resident low skilled (below tertiary education) natives.

[2] The endogenous explanatory variable in Columns 1 and 2 is the log change, per district d, between t and $t-10$, in the share of first generation immigrants (foreign-born), employed in d, over total employed population (resident in d employed natives+working in d employed foreign born). In Columns 3 and 4, we only consider low skilled (below tertiary education) first generation immigrants.

[3] The instrument in 2SLS, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[4] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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Table 14. Immigration and Employment among Natives

A) Dep. Var.: $\Delta log(Native\ Employment\ Rate)_{t,d}$	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	-0.000648	-0.0129		
	(0.00123)	(0.00945)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			-0.000850	-0.0111
			(0.00121)	(0.00789)
Observations	552	552	552	552
B) Dep. Var.: $\Delta log(LS\ Native\ Employment\ Rate)_{t,d}$	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
$\Delta log(Share\ of\ Immigrants)_{t,d}$	-0.000543	-0.0102		
	(0.00134)	(0.00971)		
$\Delta log(Share\ of\ Low\ Skilled\ Immigrants)_{t,d}$			-0.000725	-0.00878
			(0.00132)	(0.00818)
Observations	552	552	552	552
Year Fixed Effects	YES	YES	YES	YES
District Fixed Effects	YES	YES	YES	YES

[1] The dependent variable in Panel (A) is the log change, per district d (LAU-1 level), between t and $t-10$, in the employment rate ((*employed natives working in d*)/(*employed natives working in d + unemployed natives resident in d*). In Panel (B), the dependent variable is the log change in employment rate among low skilled (below tertiary education) natives.

[2] The endogenous explanatory variable in Columns 1 and 2 is the log change, per district d, between t and $t-10$, in the share of employed first generation immigrants (foreign-born) over total employed population (natives+foreign born). In Columns 3 and 4, we only consider low skilled (below tertiary education) first generation immigrants.

[3] The instrument in 2SLS, for each specification, is the sum of log changes in the stock of immigrants from 38 areas of origin, between t and $t-10$, experienced by 17 Western European countries except Switzerland (Global Bilateral Migration Database - World Bank Data), weighted by the pre-determined share of foreign-born individuals from origin area a, over the total population of first generation immigrants, living in d in $t-10$.

[4] Each specification includes district and time fixed effects, and controls for the log change in the district population (natives+foreign-born). Standard errors clustered at district level in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

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