Culture and Household Saving

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Abstract

This paper examines the role of culture in households' saving decisions. Exploiting the historical language borders within Switzerland, I isolate the effect of households' exposure to certain cultural groups from economic, institutional, demographic and geographic factors for a homogeneous and representative sample of households. The analysis uses the *Swiss Household Panel* which I complement with geographic and socio-economic data. I show that low- and middle-income households located in the German-speaking part are more than 12 percentage points more likely to save than similar households in the French-speaking part. I show that these differences across language regions are consistent both with different distributions of time preferences, and norms of obtaining formal and informal consumer credit during times of financial distress.

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1 Introduction

There are tremendous differences in household saving and accumulated wealth across countries. Understanding these differences is important, as even small changes in aggregate savings rates can affect a country's growth path. In addition, low wealth buffers can imperil an economy's financial stability in the case of adverse income or expenditure shocks. Typically, economists attempt to explain these differences by economic, institutional, demographic and geographic conditions which vary across countries. As these attempts have been only partly successful in explaining the observed differences, this paper analyzes the extent to which exposure to cultural groups can affect households' intertemporal financial decisions - in particular their decision to save. Moreover, it considers how culture affects these decisions.

What is culture and why should it affect households' intertemporal decisions? Only recently, economists have transformed the notion of culture from a vague concept by providing a clear definition that allows for the development of testable empirical predictions. In line with Guiso et al. (2006) and Fernández (2011), I define cultural differences as

systematic variation in norms and preferences shared within social groups.

In this paper, I focus on social groups that share a similar language. I argue that speaking a similar language is a specific dimension of culture and a necessary condition for any form of social interaction. It enables the transmission of beliefs and preferences from parents to their children (*vertical transmission*) or from their peers (*horizontal transmission*). In line with the existing literature, I test several specific dimensions of norms and preferences. I argue that different distributions of time preferences and norms of obtaining formal or informal consumer credit in financial distress can affect a household's decision to save. Impatient households are more likely to consume today than to save for the future (Sutter et al., 2013). In addition, the norm of mutual help in informal networks of family and friends in the case of adverse income or expenditure shocks might lead to lower precautionary saving (Ortigueira and Siassi (2013), Bloch et al. (2008)).

Switzerland is a suitable laboratory to analyze the role of exposure to different language groups in households' intertemporal decisions. In Switzerland, there are two major language groups: German and French (in addition to Italian and Romansh). The speakers of these languages are located in separate regions for historical reasons. These regions are geographically close and share a common language border. At this border, the share of

German-speaking individuals falls from 90% to about 20% within 5 kilometers (the share of French-speaking individuals moves accordingly).

As almost all policies and laws are set either at the national or on the cantonal level, there is no associated change in policies and institutions at the parts of this border that run through cantons. In addition, there is no change in geographic conditions, as the main geographical border, the Alps, runs in an East-West direction, while the language border separating the German-speaking region from the French-speaking region runs in a North-South direction. In addition, it is reasonable to assume that economic conditions that are relevant for households' saving decisions do not change at the language border (e.g., business cycles, inflation, interest rates and supply of financial products).

Hence, by comparing the financial decisions of similar households on the German-speaking side of the language border to those of the households on the French-speaking side, I am able to isolate the effect of the exposure to these language groups on individual decisions from institutional, economic and geographic differences. Being able to do this is important as institutional conditions can affect households' propensity to save through differences in tax incentives (Duflo et al., 2006), pension systems (Börsch-Supan et al., 2008) and unemployment insurance (Engen and Gruber, 2001). Economic conditions might lead to different saving behavior in the case of differences in interest rates, inflation (Carroll and Summers, 1987), business cycles (Carroll et al., 2000) or unemployment expectations (Basten et al., 2012). Finally, geographic proximity to financial institutions might be relevant to the access and use of financial products (Degryse and Ongena (2005), Agarwal and Hauswald (2010), Brown et al. (2014)).

To isolate the effect of language group exposure on households' financial decisions, I employ survey data from the *Swiss Household Panel* (waves 1999 until 2012). It includes characteristics of the person responsible for the management of household finances ("household head") (e.g., age, gender, education, etc.), the preferred language spoken (German, French or Italian) and that person's religious views. In addition, it contains a wide range of socio-economic household characteristics, such as income, employment status and the exact location of each household at the municipality level. Moreover, it includes variables that have been shown to be good proxies for impatience (e.g., past tobacco consumption) (e.g., Chabris et al. (2008), Khwaja et al. (2006)). I complement this data set with data on local unemployment rates at the district level.[1]

[1]There are 148 districts in Switzerland (as of January 2013).

The empirical strategy is a spatial local border contrast. I test for discontinuities in household savings at the language border. The key identifying assumption of this local border contrast is that only the dominant language of each municipality, but no other *pre-determined variable*[2], changes household saving at the language border. I argue that this is reasonable to assume - especially for those parts of the language border that run through cantons, as opposed to those that separate cantons.

I estimate the effect of households' exposure to language groups on their propensity to save and to spend excessively. I mainly rely on a variable that indicates whether a household can save at least *CHF* 100 per month.[3] Alternatively, I employ variables that indicate whether the household saves voluntarily in a pension fund and whether a household's expenditures are higher than its income. To investigate the channels relevant to the cultural differences in household saving, I complement the main analysis with two further empirical exercises. First, I test whether different initial distributions of time preferences are consistent with the observed differences in saving. In particular, I examine whether households in the German-speaking part are more patient (*Channel 1*). Second, I test whether households in the French-speaking part are more likely to obtain formal or informal consumer credit during financial distress. In this case, they should be less likely to save ex-ante (*Channel 2*).

I document that low- and middle-income households in the German-speaking part are more than 12 percentage points more likely to save and 6 percentage points less likely to spend excessively than are similar households in the French-speaking part. These results are robust, even in terms of more formal testing, when implementing the local border contrast. I find evidence that there are differences in norms of obtaining credit in financial distress and impatience that are consistent with the initial differences in household saving across language regions.

This paper contributes to several strands of the literature. While the role of short-term social interactions among peers[4] has been shown to affect households' decisions to consume (Kuhn et al. (2011), Angelucci and De Giorgi (2009), Luttmer (2005)), assume debt (Georgarakos et al., 2014), save for retirement (Duflo and Saez, 2002) and participate in the stock market (Kaustia and Knüpfer (2012), Brown et al. (2008), Hong et al. (2004), Christelis et al. (2011)), evidence on the role of the long-term vertical dimension of culture

[2]all variables that are not affected by the dominant language themselves.
[3]CHF 100 is about USD 96 (as of October 2014).
[4]I interpret these as the horizontal dimension of culture.

in households' financial decisions is still scarce.

Existing research has analyzed the role of culture in household debt and portfolios using cross-country comparisons (e.g., Christelis et al. (2013), Bover et al. (2014), Breuer and Salzmann (2012)) and examining financial decisions of immigrants to a country (Carroll et al. (1994), Haliassos et al. (2014)). While the first strand of the literature faces the problem of convincingly disentangling country-specific institutional and economic factors from cultural factors, the second strand faces multiple sample selection issues that arise when comparing different immigrant groups with one another and with the non-immigrant population (Bauer and Sinning (2011), Sinning (2011), Piracha and Zhu (2012)). In addition, in both strands of the literature, it remains unclear which norms and preferences that are common within cultural groups are relevant to the observed differences in financial decisions. The present paper overcomes these methodological drawbacks by comparing the financial decisions of a representative and homogeneous sample of households within a country. Hereby, I am able to isolate the effect of culture on financial decisions from differences in institutional, economic and geographic conditions and from differences in household characteristics.

By examining the channels at work, this paper contributes to the existing literature on how culture shapes differences in norms and preferences. In particular, the results of this paper can be interpreted as empirical evidence in favor of the recently developed linguistic-saving hypothesis. It argues that the future orientation of language can shape individual time preferences (Chen (2013)). These can, in turn, determine intertemporal financial decisions. There is evidence in favor of this hypothesis found from controlled laboratory experiments (Sutter et al. (2014)) and cross-country comparisons (Chen, 2013). The present paper provides evidence for it both *within country* and for a *representative and homogeneous* sample of households.

However, in contrast to Sutter et al. (2014) and Chen (2013), I do not claim that it is language syntax that shapes time preferences. Instead, I consider the exposure to a certain language group merely as a necessary condition for the transmission of preferences and beliefs. Hence, *any* form of preference or norm could be relevant to the observed differences in household saving. In particular, an alternative strand of the literature argues that social norms imply non-pecuniary costs of defaulting on loans (e.g. Guiso et al. (2013), Fay et al. (2002) and Gross and Souleles (2002)). This paper contributes to this strand of literature by showing that there are substantial differences in how households resolve financial distress across cultural groups. These differences are likely to be consistent with

non-pecuniary costs, such as the social stigma of obtaining consumer credit in financial distress.

The remainder of the paper is organized as follows: Section 2 discusses the theoretical motivation. Section 3 describes the institutional background to the paper. Section 4 presents the data and methodology. Section 5 shows the empirical results of the role of culture for household saving. Section 6 examines the competing channels of culture. Section 7 discusses the validity of the results and section 8 draws final conclusions.

2 Theoretical Motivation

In this section, I motivate how different distributions of time preferences and norms of taking credit in financial distress can affect a household's saving decision. I assume that a household is faced with the possibility of an uncertain adverse income shock. The household can insure itself *ex-ante* (before the income shock materializes) by implementing precautionary savings. It can be shown it saves more *ex-ante*, the more patient[5] it is (*Channel 1*). Moreover, a household will not save *ex-ante* if it takes credit to cover the income shock once it materializes (*Channel 2*).

In this framework, I assume that a household lives for three periods.

- In period 1, the household earns exogenous income $Y_1 = Y$. It can save a portion of this income $S_1 \in [0, Y_1]$. It spends the remaining income on the consumption of a non-durable good $C_1 = Y_1 - S_1$.
- In period 2, the household gets back its initial saving S_1 (for simplicity I assume that the interest rate is zero) and earns income $\tilde{Y_2}$. With probability $1 - \pi$ it does not receive an adverse income shock and earns income $Y_2 = Y$. With probability π the household receives an adverse income shock of $\sigma < Y$ and earns income of $Y_2 = Y - \sigma$. In period 2, the household spends its entire wealth on the consumption of a non-durable good.
- In period 3, the household receives retirement income of $Y_3 = Y$.

I assume that the household discounts consumption of each subsequent period with a discount factor of $0 < \beta \leq 1$.[6] Furthermore, I assume that there are two types of households depending on whether they use credit T in case the shock materializes. Type A household does not use credit in period 2. Type B household does have access to credit. In case of a negative income shock, it receives a transfer payment of $T = \sigma$, which it repays in period 3.[7]

In the first period, the household decides on its initial saving S_1 without knowing about its second-period income $\tilde{Y_2}$. In the following section, I discuss how this saving decision

[5] Households with higher discount factors.

[6] Note that the discount factor β relates to the discount rate ρ as follows: $\beta \equiv \frac{1}{1+\rho}$. A high discount factor implies patience.

[7] I again assume that interest rate is zero. Hence, this household weakly prefers obtaining credit as $0 < \beta \leq 1$.

depends on the individual discount factor β and the type of the household.

To obtain a closed-form solution, I make the following assumptions: First, I assume that utility follows a logarithmic form such that the precautionary saving motive is preserved (e.g., Kimball (1990)). Second, I normalize income to one ($Y = 1$). Third, I assume that negative income shocks occur with probability $\pi = \frac{1}{2}$ and are of magnitude $\sigma = \frac{1}{2}Y = \frac{1}{2}$.

In period 1, the household decides on its optimal amount of precautionary saving. Hereby, it maximizes the expected utility of its lifetime (depending on its anticipated borrowing in period 2):

$$\max_{S_1} \; U(C_1) + \pi \; \beta \; [U(C_{2L}) + \beta \; U(C_{3L})] + (1 - \pi) \; \beta \; [U(C_{2H}) + \beta \; U(C_{3H})] \tag{1}$$

$$s.t. \;\; C_1 = Y_1 - S_1 = 1 - S_1 \tag{2}$$

$$C_{2L} = Y_2 + S_1 - \sigma + T = \frac{1}{2} + S_1 + T \tag{3}$$

$$C_{3L} = Y_3 - T = 1 - T \tag{4}$$

$$C_{2H} = Y_2 + S_1 = 1 + S_1 \tag{5}$$

$$C_{3H} = Y_3 = 1 \tag{6}$$

It is straightforward to see that the following first-order condition has to hold:

$$FOC : -\frac{1}{1 - S_1} + \pi\beta\frac{1}{\frac{1}{2} + S_1 + T} + (1 - \pi)\beta\frac{1}{1 + S_1} = 0 \tag{7}$$

In the following paragraphs, I briefly discuss the saving decisions of both households types.

Type A Household: No credit to cover income shock ($T = 0$)
First, I consider the case of the household that does not use credit to cover the adverse income shock. Solving equation 7 for S_1, it can be shown that its optimal saving $S^*_{1,A}$ is strictly positive if its discount factor β is sufficiently high (see Appendix A.1 for details).

$$S^*_{1,A} > 0, \quad \forall\beta \in (\frac{2}{3}, 1] \tag{8}$$

This implies that a household that does not take credit will always save *ex-ante*, if it is sufficiently patient.

Moreover, it can be shown this optimal precautionary saving $S^*_{1,A}$ is increasing in the discount factor β (see Appendix A.2 for details).

$$\frac{\partial S^*_{1,A}}{\partial \beta} > 0, \quad \forall \beta \in (\frac{2}{3}, 1] \tag{9}$$

This implies that a household will save more the more patient it is (*Channel 1*).

Type B Household: Credit to cover negative income shock ($T = \sigma$)
If the household obtains credit once the income shock occurs, it is straightforward to show that it would not save (see Appendix A.3 for details).

$$S^*_{1,B} = 0, \quad \forall 0 < \beta \leq 1 \tag{10}$$

This implies that households do not save if they obtain credit once income shocks occur. Hence, they save less than households that would not take credit if income shocks occur (*Channel 2*).

Discussion
In this theoretical discussion, I assume that interest rates are the same and zero for all households. Moreover, income risk is essentially the same for all households (independent of their cultural exposure). This implies, in particular, that the risk of becoming unemployed is similar across all social groups and all households have similar access to social insurance (e.g., unemployment benefits). Last, I assume that households in the third period that are in retirement, neither borrow nor save.
My empirical research design accounts for these prerequisites by considering only households that are located within a small geographic scope. Hereby, it is reasonable to assume that interest rate differences do not exist due to arbitrage. Besides, households have the same access to social insurance and should face similar risk of unemployment.
Besides, in the empirical part I will only consider households that are non-retired (which should be equivalent to households that live in period 1 or period 2 in this stylized framework).

3 Background

3.1 Languages in Switzerland

In Switzerland, there are four official languages: German, French, Italian and Romansh. According to the Federal Population Census of 2000, 64.1 percent of the resident population of Switzerland declared German as their main language, 20.4 percent speak primarily French, 6.5 percent speak predominantely Italian, 0.5 percent speak primarily Romansh (and the rest speak predominantly another language).[8] In most of the 26 cantons of Switzerland, there is only one major language. There are seventeen German-speaking cantons (e.g., Zurich, St.Gallen and Basel), four French-speaking cantons (Geneva, Jura, Neuchatel and Vaud) and one Italian-speaking canton (Ticino). In addition, there are several cantons with more than one official language: the cantons of Bern, Valais, and Fribourg are bilingual (French and German) and Graubünden is officially trilingual (German, Romansh, and Italian).

Figure 1 shows the preferred language spoken by the majority of residents of each municipality. It can be seen from this figure that the majority of residents in the north-eastern part of Switzerland speak predominantly German. In the western part of Switzerland, the majority of people speak French while the majority of the residents in the southern part speak Italian (in addition to Romansh). These language regions are geographically close and share common language borders.

At these language borders, the share of German-speaking households changes abruptly. Figure 2 shows the share of household heads that prefer to speak German in terms of distance from the language border separating German from French-speaking municipalities. It can be easily seen from this figure that the share of German-speaking household heads changes at the border from about 0.90 to 0.20.[9]

In Switzerland, most policies are set either at the federal or at the cantonal level.[10] For example, cantons have much discretion in setting cantonal income and wealth tax rates. This is important, as it is not income before taxes but net income that affects household saving. Similarly, differences in net wealth could affect household saving. In addition, can-

[8]Source: http://www.bfs.admin.ch/bfs/portal/en/index/themen/01/05/blank/key/sprachen.html, accessed on October 30th, 2014.

[9]By definition there is no French-speaking municipality on the German side of the language border (and vice versa).

[10]Source: https://www.admin.ch/gov/en/start/federal-council/political-system-of-switzerland/swiss-federalism.html, accessed on October 17th, 2015.

tons set the curricula of primary and secondary schools, hence, literacy and - in particular - financial literacy levels could vary across cantons. These factors might themselves affect household saving.

As I intend to isolate cultural factors from differences in institutional, economic, demographic and geographic conditions, it is crucial that I focus on multilingual cantons which have the language border running through them. For this reason, I focus my empirical analysis on the three bilingual cantons (Bern, Fribourg and Valais). In addition, I only compare households located in the same canton.

3.2 Differences in Household Saving

While households in Switzerland have similar incentives to save a substantial amount of their income, there is substantial heterogeneity across language regions. Figure 3 shows household saving rates in Switzerland in terms of language regions in 2011 (these saving rates are calculated by subtracting all expenses from the entire household income).[11] This figure suggests that households in the German-speaking part save a higher share of their income (about 13.2 percent) than do households in the French-speaking part (about 10.5 percent).

My empirical analysis uses the *Swiss Household Panel*, which includes indicators of whether households can and do save a certain amount. In particular, I analyze whether households can save at least *CHF* 100 per month. Figure 4 shows the share of households that save at least *CHF* 100 per month by income levels and by language region in the three bilingual cantons (Bern, Fribourg, Valais) between 1999-2003. Low income households are in the lowest quartile of the income distribution in Switzerland per year. Middle and high income households are in the second & third quartile, and the highest quartile of the income distribution, respectively. This figure illustrates two stylized facts: First, almost all households in the highest income group save at least *CHF* 100 per month irrespective of the language region they are in. This share is substantially lower among low-income (around 60 percent) and among middle-income households (about 80 percent). Second, the share of households that save seems to be more than 10 percentage points lower among

[11] Data are obtained from the Swiss *Household Budget Survey*, which is conducted across the seven major regions of Switzerland. About 3'000 households take part each year. They are chosen randomly from the random sample register of the *Federal Statistical Office*. The *Household Budget Survey* is conducted by means of telephone interviews and written questionnaires. Source: http://www.bfs.admin.ch, accessed on October 17th, 2015.

households located in the French-speaking region than among the ones in the German-speaking region of Switzerland.

In this paper, I investigate these heterogeneities in household saving. I focus on the subsample of low- and middle-income households and ask whether the observed differences between households in the French and German-speaking regions can be explained by their different cultural exposure.

4 Data, Identification, Estimation

4.1 Data

The empirical analysis uses the *Swiss Household Panel*. It is a longitudinal survey of households whose members represent the non-institutional population resident in Switzerland. It was first conducted in 1999 and consists of two parts. The first part is a household questionnaire that contains information on the composition of the household (for example, household size, household income, etc.). In the second part of the survey, each household member is interviewed individually about his or her personal characteristics (age, gender, education, etc.) and whether he or she is responsible for the household finances. For each household, I only consider the person that is responsible for the household financial management ("household head") and match his/her responses to the information about the household he/she lives in. The survey was conducted by telephone interviews. The household interviews typically lasted 15 minutes (compared to about 35 minutes required for the individual interviews).

Financial decisions and household characteristics

The main dependent variable in my empirical analysis is *Saving*, which indicates whether the household can save at least *CHF* 100 monthly. As shown in Table 1, about 83 percent of my representative sample of low- and middle-income households save at least *CHF* 100 monthly - which implies that about one-fifth of the households do not save a minimum share of their income.

The share of non-savers is even higher when analyzing which households save into a retirement savings account. As an alternative dependent variable, I employ *Saving (3rd pillar)*, which indicates whether the household saves into a "pillar 3" pension fund. It turns out that the share of households without such an account is more than one-third (Table 1). Finally, I employ the variable *Overspending*, which indicates whether the household's expenses are higher than its income. As indicated in Table 1, about 8 percent of households

spend more than they earn.

In addition, I employ the variable *Payment arrears* as a proxy for households' financial distress. This variable indicates whether the household has fallen into payment arrears within the preceding 12 months.[12] Table 1 shows that about 11 percent of all households fall into payment arrears each year.

Language by municipality, language region and distance to the language border

I complement the household-level data of the *Swiss Household Panel* with further information on the municipality in which the household is located. In particular, I add information on the dominant language of each municipality. The binary variable $G_{i,m}$ indicates whether the majority of citizens in municipality m, in which the household i is located, prefer to speak German (French otherwise).

Hence, I define a language region as the set of municipalities that have the same dominant language (French or German). Furthermore, I use the location of each municipality m in which household i is located to calculate the walking distance to the language border in kilometers as represented by the variable $Distance_{i,m}$. I provide further details on the calculation of these variables in Appendix B.

Household covariates

I employ several household and household head covariates in the empirical analysis. Household variables are *Household income* and *Household size*. I also use household head variables that serve as proxies for gender (*Male*), education (*University*), employment status (*Employed*, *Self employed*, *Unemployed*), preferred language spoken (*German speaker*)[13] and other socio-economic characteristics (*Age*, *Swiss*).

Unemployment rates

As existing research has shown that unemployment expectations can have an effect on households' saving decisions (e.g., Basten et al. (2012)), I also control for regional unemployment rates. Therefore, I have obtained information on regional unemployment rates by district and year from *State Secretariat for Economic Affairs (SECO)*.

[12] Definitions of the variables are provided in Table 12. Summary statistics of all variables are provided in Table 1.

[13] I only observe the choice of the survey language but not the preferred language in daily life.

As my preferred dependent variable *Saving* is only available in the surveys waves conducted between 1999 and 2003, I only consider survey respondents from this time period. Additionally, I only include households that have their primary residence in one of the three bilingual cantons (Bern, Fribourg and Valais). I also only include households whose household heads are active in the labor market[14] and that are in the lowest three quartiles of the income distribution in Switzerland for each wave of the survey. My final sample consists of 577 households that represent the non-institutional low- and middle-income population in the three bilingual cantons (Bern, Fribourg, Valais) between 1999 and 2003.

4.2 Identification

To clarify the parameter of interest, I make use of the Potential Outcomes Framework. This enables me to define the causal effect before discussing the assignment mechanism and without specifying functional form and distributional assumptions.[15]

The N=577 households covered in my sample are indexed by $i = 1, ..., N$. In the analysis, the treatment variable, $G_{i,m}$, can assume two different values: $G_{i,m} = 1$ if household i is located in a municipality m in which German is the dominant language. Similarly, $G_{i,m} = 0$, if household i is located in a municipality m in which French is the dominant language. This definition of the treatment variable is mutually exclusive (as there is only one dominant language). In addition, it is exhaustive as I consider only municipalities where either French or German is the dominant language.

I am interested in discovering whether and how the exposure to a different dominant language group affects the intertemporal decisions of households - in particular, their decision to save. In the main analysis, the binary outcome variable $Y_{i,m}$ assumes the value of one, if the household i can save at least CHF 100 monthly (zero otherwise). Given the definition of the treatment, there are two potential outcomes: $Y_{i,m}(1)$ denotes the saving decision that would be made if household i were located in a German-speaking municipality m; and $Y_{i,m}(0)$ denotes the saving decision that would be made if household i were located in a French-speaking municipality m. When analyzing the channels of how households' exposure to certain language groups affects the observed differences in household saving, the outcome variable $Y_{i,m}$ represents proxies for households' time preferences and their willingness to obtain credit in financial distress.

[14] I exclude households whose household heads are retired.

[15] See Imbens and Wooldridge (2009) for a more detailed discussion.

Relating household saving decisions $Y_{i,m}$ to the type of municipality $G_{i,m}$ can be confounded by variables such as interest rates, inflation rates, unemployment risk, and access to financial services. These might vary even within Switzerland. Not controlling for all factors might lead to biased point estimates. To overcome this problem, I apply a *Local Border Contrast*[16] which compares households that live on one side of the language border to households that are located on the other side. By considering only households that are located very close to the border, the importance of confounding variables decreases while differences in culture are preserved.

In order to implement this local border contrast, I define $E^l(Y_{i,m})$ as the limit of the expectation of $Y_{i,m}$ on the French-speaking side of the language border: i.e., $E^l(Y_{i,m}) = lim_{\epsilon \to 0-} E(Y_{i,m}|Distance_{i,m} = \epsilon)$. Similarly, I define $E^r(Y_{i,m})$ as the limit of the expectation of $Y_{i,m}$ on the German-speaking side of the language border: i.e., $E^r(Y_{i,m}) = lim_{\epsilon \to 0+} E(Y_{i,m}|Distance_{i,m} = \epsilon)$. The treatment effect of interest is as follows (Imbens and Lemieux, 2008):

$$\delta = E[Y_{i,m}(1) - Y_{i,m}(0)|Distance_{i,m} = 0] = E^r(Y_{i,m}) - E^l(Y_{i,m})$$

Discussion

The identification of this *Local Average Treatment Effect* relies on the assumption that the potential outcome variable is continuous in the running variable $Distance_{i,m}$. That is,

$$E(Y_{i,m}(1)|Distance_{i,m} = x) \; and \; E(Y_{i,m}(0)|Distance_{i,m} = x), \quad \forall x \approx 0 \tag{11}$$

are continuous in x. This assumption means that two households located in two different, but geographically close municipalities (that have the same dominant language) have essentially the same propensity to save. In particular, it implies that we would *not* expect to see an increase in household saving if we moved a household, together with its French-speaking municipality, right across the *nearby* language border to the German side (and vice versa).

This assumption would be violated if, at the language border, there was a change in not only the dominant language in the municipality, but also in factors that affect house-

[16] See Hahn et al. (2001) for a detailed discussion.

holds saving decisions but are unaffected by the dominant language in the municipality. In particular, these could be economic conditions such as deposit interest rates, inflation rates or unemployment rates.[17] I argue that this condition has to hold due to arbitrage. For example, if deposit interest rates were actually higher in the French-speaking part than in the German-speaking part, then households in the German-speaking part would start depositing money in banks in the French-speaking part. They would be able to do this as transaction costs close to the border are negligible. This increase in the supply of deposits would decrease equilibrium interest rates in the French-speaking part.[18]

In addition, this assumption would be violated if *pre-determined* household covariates that affect household saving changed discontinuously at the language border (for example, gender of the household head). However, it does *not* imply that *all* household covariates have to be similar at the border. Instead, I *expect* some household covariates to be endogenous to the exposure to the dominant language. If, for example, time preferences actually differed across language regions, then we would expect different education and employment choices. Different savings rates could translate into different wealth levels over time.

4.3 Estimation

I estimate this effect using the following linear parametric specification.[19]

$$Y_{i,m} = \alpha + \delta G_{i,m} + \beta_{l1} Distance_{i,m} + \beta_{r1} G_{i,m} Distance_{i,m} + X'_{i,m}\gamma + \epsilon_{i,m} \qquad (12)$$

where $G_{i,m}$ is a binary variable that takes on the value of 1 if the majority of the municipality in which the household i is located speaks German (zero otherwise). $X_{i,m}$ is a vector of variables that captures differences between households and municipalities and contains socio-economic household characteristics. Moreover, this vector contains canton fixed effects. The latter are important as they ensure that I compare only households that are located in the same canton. I consider different linear (and non-linear) spatial trends using the $Distance_{i,m}$ variable. Here, the parameter β_{l1} estimates the linear spatial trend in the outcome variable. Similarly, β_{r1} measures the linear spatial trend in the outcome variable on the German-speaking side of the language border that is different from the trend on the French side. Since $E[Y_{i,m}|Distance_{i,m} = 0, G_{i,m} = 1] = \alpha + \delta + X'_i\gamma$ and $E[Y_{i,m}|Distance_{i,m} = 0, G_{i,m} = 0] = \alpha + X'_i\gamma$, the parameter of interest is the estimate of δ.

[17] It is important to understand that this assumption does allow for differences between distant parts of the two language regions but not for differences across language regions close to the border.

[18] Similar arguments can be made for unemployment rates or inflation rates.

[19] Similar to that used by Eugster et al. (2011).

Given the relatively low number of survey respondents that are located in the three bilingual cantons in my sample, I estimate equation 12 including only the households that are located within 50 kilometers of the language border (similar to the procedure by Eugster et al. (2011)). In unreported robustness checks, I show that the results are robust when varying this ad-hoc bandwidth within a range of 30km to 70km.
I estimate this linear regression using ordinary least squares while clustering the standard errors on the municipality level. In robustness checks, I show that the effects are robust to nonlinear estimation.[20]

5 Language Region and Household Saving

5.1 Household Characteristics & Decisions by Language Region

In this section, I document that the low-and middle-income households located in the German-speaking part are more likely to save and are less likely to spend more than they earn. Besides, I show that the households that I consider in my sample are similar in terms of the household characteristics relevant for the individual saving decision.

Panel A of Table 2 presents a univariate analysis comparing the individual saving decisions of non-retired low- and middle-income households located in the German-speaking part of Switzerland to the ones located in the French-speaking region. It only considers households located within 50 km of the language border in the three bilingual cantons (Bern, Fribourg, Valais) between 1999 and 2003. The table shows that the propensity to save at least *CHF* 100 is about 12 percentage points higher among households located in the German-speaking part (88 percent) than among households in the French-speaking part (76 percent). This difference is statistically significant at all conventional significance levels. It is qualitatively similar when considering the share of households that saves explicitly into a "pillar 3" pension fund (differences of 11 percentage points). In addition, households in the French-speaking part seem to be about 6 percentage points more likely to spend more than they earn.

While the households I consider in the sample differ with respect to their intertemporal financial decisions, they are similar in terms of other major dimensions. Panel B of Table 2 shows that there are no differences in *Household income* or *Household size*. Furthermore, the household heads differ not at all or only marginally with respect to major

[20] I use a Probit estimation reporting marginal effects. The results are available upon request.

socio-economic characteristics *(Male, University, Age, Swiss, Employed, Self employed, Unemployed)*.

5.2 Local Border Contrast: Household Saving

In this section, I show that the univariate differences in household saving are robust to more rigorous empirical testing. Figure 5 illustrates the share of households that can save at least *CHF* 100 per month in terms of their distance from the language border. First, it can be seen that the share of households that save more than *CHF* 100 is substantially lower in the French-speaking part than in the German-speaking part. Second, there is evidence that the share of households that save at least *CHF* 100 jumps discontinuously at the language border, where the walking distance is zero.

I am interested in whether the size of this discontinuity in household saving at the language border is economically meaningful and statistically different from zero. Therefore, I implement the regression in equation 12 and report the point estimate of the parameter δ. This estimate can be interpreted as the effect of a change in the language region on households' saving behavior at the language border.

Table 3 reports my baseline estimates in my preferred sample of non-retired low- and middle-income households located within 50 km of the language border in the three bilingual cantons (Bern, Fribourg, Valais). The first column shows that the effect of language region on household saving is about 12 percentage points (without controlling for spatial trends or any household or regional characteristics). When controlling for linear spatial trends, canton fixed effects and year fixed effects, this gap increases to 29 percentage points (column 2). The magnitude and statistical significance remains qualitatively similar after controlling for socio-economic household characteristics (*Household income, Household size, Male, University, Age, Swiss, Employed, Self employed*) and regional unemployment rates (columns 3 & 5). Moreover, it remains robust to the inclusion of quadratic spatial trends (columns 4 & 5).[21]

In unreported robustness checks, I show that these results are robust to decreasing and increasing the bandwidths by 20 km in both language regions. Moreover, these results are robust to a non-linear estimation. Besides, the results remain qualitatively similar when additionally controlling for the main religion of the household head (*Catholic, Protestant* or *Other*). Overall, there is strong empirical evidence that the exposure to certain language groups affects households' saving behavior.[22]

[21]The results are robust to the inclusion of higher order distance polynomials.

[22]This gap persists when considering households' decisions to have a "pillar 3" pension fund and to

6 Possible Channels

In this paper, I argue that different distributions of time preferences and norms of using formal or informal consumer credit in financial distress can affect households' decision to save. In this section, I explore whether these preferences and norms actually differ across language regions and whether these differences are consistent with the observed differences in household saving.

6.1 Channel 1: Time Preferences

Household heads might differ with respect to their individual discount factors. Higher discount factors imply that households consume less today and shift more wealth to the future, that is, they save more. It is a natural question to ask whether households in German-speaking municipalities save more because they have higher discount factors and are, hence, more patient.

To answer this question, I employ past tobacco consumption as a proxy for individual impatience and, hence, a discount factor. Several existing studies have shown that there is a direct relationship between past smoking behavior and individual impatience (e.g., Chabris et al. (2008), Khwaja et al. (2006)). The 2010 & 2011 waves of the *Swiss Household Panel* ask household heads whether they had *"ever smoked cigarettes, cigars or a pipe?"*. The binary variable *Tobacco smoked* takes on the value of one if the household head responds with *"Yes"* to this question. In this case, it indicates that the household head has a low discount factor. If the household head responds with *"No"* to this question, the binary variable *Tobacco smoked* takes on the value of zero. It then indicates that the household head has a high discount factor.

Again, I test for significant differences in this variable across language regions. As this variable is only available in the survey waves of 2010 & 2011, I consider households located within 50 km of the language border in the three bilingual cantons (Bern, Fribourg and Valais) in these years.

The results in Table 4 show that the percentage of household heads that have ever smoked tobacco is substantially higher in the French-speaking part (64%) than in the German-speaking part (55%). The difference of 9 percentage points is economically meaningful and statistically significant at all conventional significance levels. Considering lin-

consume excessively.

ear spatial trends (and canton and year fixed effects), the French-German gap increases in magnitude (to 23 percentage points) and is statistically significant at the five percent level. The magnitude and statistical significance remains qualitatively similar after controlling for socio-economic household characteristics (*Household income, Household size, Male, University, Age, Swiss, Employed, Self employed*) and regional unemployment rates (columns 3 & 5). Moreover, I find similar results after additionally considering quadratic spatial trends (columns 4 & 5).

Overall, there is evidence of a discontinuity in my proxy of impatience at the language border. In unreported robustness checks, I show that these results are similar when changing the ad-hoc bandwidths by 20 km and using a non-linear estimation procedure.

6.2 Channel 2: Formal or Informal Credit in Financial Distress

Households face uncertainty regarding future adverse income and expenditure shocks (for example, due to unemployment, lower bonus payments or unanticipated medical expenses in case of illness). Ex-ante insurance against these events is often infeasible if insurance markets are incomplete and do not offer insurance for all contingencies. Besides, ex-ante insurance might often not be expedient if the insurance premiums offered are not actuarially fair. If this is the case, households might conduct higher ex-ante precautionary savings to accumulate enough wealth that might serve as a buffer against these negative shocks. Alternatively, households may rely on their informal networks of family and friends to share the risks of these adverse shocks and smooth consumption. That is, they may take *Informal credit* from their networks of family and friends once income shocks materialize and the household is in financial distress (e.g., Ortigueira and Siassi (2013), Bloch et al. (2008), Hayashi et al. (1996), Ligon (1998)). Alternatively, these households might take *Formal credit* from financial institutions to smooth consumption (e.g., Gertler et al. (2009)).

In this section, I investigate whether households in the French-speaking part are less likely to save because they expect to take credit from their informal networks or from banks when adverse income shocks materialize. I argue that the households I compare in the empirical analysis are faced with similar conditions on the formal insurance market, as (i) they are similar in terms of major socio-economic characteristics and (ii) they are located in geographic proximity within the same canton. Hence, lower savings among households could be rooted in different norms of taking *Formal credit* or *Informal credit* in financial distress.

I suggest an indirect test of this hypothesis by pointing out differences in how households resolve financial distress. In the survey, the respondents are asked whether they are in payment arrears and how they resolve such arrears. In particular, they are asked whether they react to these financial problems *"(...) by borrowing from relatives or friends"* or *"(...) by borrowing from banks"*. In the following analysis, I rely on the binary variable *Informal credit* which takes on the value of one, if the household head has borrowed at least once from family members or friends in case of financial problems (zero otherwise). Similarly, *Formal credit* takes on the value of one, if the household head has borrowed at least once from banks in the time period considered (zero otherwise).

As these questions are asked in each survey wave, I consider all households located within 50 km of the language border in the three bilingual cantons (Bern, Fribourg, Valais) over time (1999-2012). Among these households, 308 fell into payment arrears at some point between 1999 and 2012. In total, there are 740 incidences of financial distress. (This implies that there are several households that fell into payment arrears more than once).

Table 5 illustrates that there is some evidence that households in the French-speaking part are more likely to rely on *Informal credit* once they fall into payment arrears. The simple mean comparison suggests that these households are on average two percentage points more likely to take *Informal credit*. Yet, this difference is not statistically significant (column 1). When controlling for linear spatial trends (columns 2 & 3) and additionally controlling for quadratic spatial trends (columns 4 & 5), there is evidence that households in the French-speaking parts are about 11 - 27 percentage points more likely to take *Informal credit*. Again, these point estimates remain qualitatively similar when decreasing and increasing the bandwidths by 20 km in both language regions.

In Table 6, I test for differences in relying on *Formal credit* when falling into payment arrears. A simple mean comparison reveals that households in the German-speaking part are about 8 percentage points less likely to take *Formal credit* than are households in the French-speaking part (column 1). When linear spatial trends (columns 2 & 3) are considered and additionally quadratic spatial trends are controlled for (columns 4 & 5), this difference increases slightly in economic magnitude but remains largely statistically significant (columns 1, 4 and 5).

I conclude that there are some differences in how households in the French-speaking part resolve financial distress compared to how households do so in the German-speaking

part. There is some evidence that the former are more likely to rely on an informal network of family and friends once they fall into payment arrears than are the latter. Given that the households are similar in terms of relevant dimensions and assuming that there are no differences in the supply of financial products, I interpret this as evidence for higher risk-sharing among French-speaking households.

In addition, there is also weak evidence that households in the French-speaking part are more likely to take consumer credit from banks once they fall into payment arrears than are households in the German-speaking part. A higher degree of risk-sharing and a higher willingness to take *Formal credit* might ultimately lead to lower precautionary saving (e.g., Ortigueira and Siassi (2013)).

7 Robustness & Validity

7.1 Measuring Household Saving and Sample Selection

My preferred outcome variable *Saving* indicates whether a household can save at least CHF 100 per month. Using this variable might raise three concerns. First, households that report that they *can* save at least CHF 100 do not necessarily *actually* save. Second, this binary variable is essentially an arbitrage cutoff point of the distribution of household saving within Switzerland. Third, this variable only asks for explicit saving of money but does not take into consideration other forms of saving. In particular, households in the French-speaking part might be more inclined to put money into housing - for example, by taking a mortgage to buy a house. In this case, they might have less available income to save as they have to pay back their mortgage.

In this section, I run several tests to mitigate these concerns. First, I employ two different measures of household saving. I use *Saving (3rd pillar)* which indicates whether the household saves into a "pillar 3" pension fund. I also employ the variable *Overspending* which indicates whether the household's expenses are higher than its income. Both variables ask households not only whether they *can* save but whether they actually *do* save. Panel A and Panel B of Table 7 suggest that there are - indeed - differences in households' saving behavior across language regions employing these variables. This result should mitigate concerns that saving behavior might be different at other cutoffs in the saving distribution and that households' *actual* saving behavior might not be appropriately represented by my preferred saving variable.

Furthermore, I repeat my main analysis (as reported in Table 3) but now controlling for home ownership. If different levels of home ownership were driving the observed differences in households' saving behavior, then controlling for it should lower the statistical and economic significance of the point estimate of the variable *German-speaking part*. Panel A of Table 8, however, shows that this is *not* the case. The point estimates stay statistically significant and similar in magnitude.

Last, I mitigate concerns that arise due to the selection of my sample. I explicitly considered only the low- and middle-income households as almost all high-income households can save at least CHF 100. To mitigate concerns of data mining, I run a robustness test on the full sample of all households. The results reported in Panel B of Table 8 suggest that the point estimates of the language region remain robust when considering the full sample of all households.

7.2 Validity of the Research Design

For robustness, I run a battery of tests that verify the validity of my research design (as suggested by Imbens and Lemieux (2008)). First, I test for differences in household characteristics across language regions. The mean-comparisons presented in Panel B of Table 2 indicate that the households do not differ in terms of most of the observable household characteristics that could be relevant for the households' saving decisions. In addition, I provide a formal test of the discontinuity of all relevant household characteristics at the language border. As illustrated in Table 9, I do not find evidence for discrete jumps in most household covariates at the border.

Second, I test whether there are discontinuities in household saving within the same language region. As suggested by Imbens and Lemieux (2008), I employ two placebo tests. In each language region, I take the median distance to the border as a alternative ("placebo") borders. I then test whether there are discontinuities in household saving at these borders. As illustrated in Table 10, I do not find evidence for discrete jumps in household saving when applying these placebo tests.

Third, I analyze the residuals of the main regression shown in column 2 of Table 3. If households in the French-speaking part differed in unobservable characteristics from households in the German-speaking part, the residuals of this regression should be systematically different. Figure 6 shows that this is not the case: The residuals are scattered randomly around zero on both sides of the language border.

Last, I apply an alternative identification strategy. Instead of using the language region as the treatment variable, I estimate the effect of the preferred language spoken on the propensity to save. I control for all observable household and regional characteristics that I believe can determine the individual saving decision and could be correlated with the language spoken. I find that French-speaking households are about 11 to 12 percentage points less likely to save at least *CHF* 100 per month and are 10 to 11 percentage points more likely to spend more money than they earn (Table 11).

8 Conclusion

In this paper, I analyze the role of culture in households' intertemporal financial decisions making. In particular, I examine whether the exposure to specific language groups affects households' decision to save or to overspend. In addition, I elicit potential channels of how the exposure to certain language groups affects these decisions.

Hereby, I exploit within-country variation of historically determined language regions in Switzerland. I compare the financial decisions of a representative and homogeneous sample of low- and middle income households, which are similar on major relevant socio-economic characteristics on the German-speaking side of the language border, to the ones on the French-speaking side. To do so, I implement a spatial local border contrast design, through which I am able to isolate cultural differences of a representative sample of the population from differences in economic (e.g., business cycles, interest rates and inflation), institutional (e.g., pension systems, education) and other conditions (e.g., access to financial services).

The analysis is based on data from the *Swiss Household Panel*. This survey includes a wide range of socio-economic household characteristics such as income, the employment status and the exact location of each household. Furthermore, it includes characteristics of the person responsible for the management of household finances ("household head") (in particular age, gender, and education), the preferred language spoken (French, Italian or German) and variables that have been shown to be good proxies for time preferences (for example, past tobacco consumption). I complement the data with detailed information on language regions and further geographic information about Switzerland.

I document that households in the German-speaking part are more than 12 percentage points more likely to save and 6 percentage points less likely to spend excessively. These

results are robust in comparison with more formal testing when implementing the local border contrast. I find evidence that the greater use of formal credit in financial distress, of informal networks of friends and family, and higher time discount rates among French-speaking households can explain these differences.

Overall, this empirical evidence suggests that culture can - at least partly - explain some of the observed differences in saving rates we observe across countries.

References

Agarwal, S. and R. Hauswald (2010). Distance and Private Information in Lending. *Review of Financial Studies*, 1–32.

Angelucci, M. and G. De Giorgi (2009). Indirect Effects of an Aid Program: How Do Cash Transfers Affect Ineligibles' Consumption? *American Economic Review 99*(1), 486–508.

Basten, C., A. Fagereng, and K. Telle (2012). Saving and portfolio allocation before and after job loss. *Working Paper* (672).

Bauer, T. K. and M. G. Sinning (2011). The savings behavior of temporary and permanent migrants in Germany. *Journal of Population Economics 24*, 421–449.

Bloch, F., G. Genicot, and D. Ray (2008). Informal insurance in social networks. *Journal of Economic Theory 143*(1), 36–58.

Börsch-Supan, A., A. Reil-Held, and D. Schunk (2008). Saving incentives, old-age provision and displacement effects: evidence from the German pension reform. *Journal of Pension Economics and Finance 7*, 295–319.

Bover, O., J. M. Casado, S. Costa, P. D. Caju, Y. McCarthy, E. Sierminska, P. Tzamourani, E. Villanueva, and T. Zavadil (2014). The distribution of debt across euro area countries: the role of individual characteristics, institutions and credit conditions. *Deutsche Bundesbank Discussion Paper* (1).

Breuer, W. and A. J. Salzmann (2012). National Culture and Household Finance. *Global Economy and Finance Journal* (5).

Brown, J. R., Z. Ivkovic, P. A. Smith, and S. Weisbenner (2008). Neighbors Matter: Causal Community Effects and Stock Market Participation. *Journal of Finance LXIII*(3), 1509–1531.

Brown, M., B. Guin, and S. Morkötter (2014). Deposit Withdrawals from Distressed Commercial Banks. Working Paper.

Carroll, C., J. Overland, and D. N. Weil (2000). Saving and Growth with Habit Formation. *American Economic Review 90*(3), 341–355.

Carroll, C., B.-K. Rhee, and C. Rhee (1994). Are there cultural effects on saving? Some cross-sectional evidence. *Quarterly Journal of Economics 3*, 685–699.

Carroll, C. and L. H. Summers (1987). Why Have Private Savings Rates in the United States and Canada Diverged? *Journal of Monetary Economics 20*, 249–279.

Chabris, C., D. Laibson, C. Morris, J. Schuldt, and D. Taubinsky (2008). Individual laboratory-measured discount rates predict field behavior. *Journal of Risk and Uncertainty 37*, 237–269.

Chen, K. (2013). The Effect of Language on Economic Behavior: Evidence from Savings Rates, Health Behaviors, and Retirement Assets. *American Economic Review 103*(2), 690–731.

Christelis, D., M. Ehrmann, and D. Georgarakos (2013). Exploring Differences in Household Debt across Euro Area Countries and the US. *Working Paper*, 1–38.

Christelis, D., D. Georgarakos, and M. Haliassos (2011). Stockholding: Participation, location, and spillovers. *Journal of Banking and Finance 35*, 1918–1930.

Degryse, H. and S. Ongena (2005). Distance, Lending Relationships, and Competition. *Journal of Finance 60*(1), 231–266.

Duflo, E., W. Gale, J. Liebman, P. Orszag, and E. Saez (2006). Saving Incentives for Low- and Middle-Income Families: Evidence from a Field Experiment with H&R Block. *Quarterly Journal of Economics* (November), 1311–1346.

Duflo, E. and E. Saez (2002). Participation and investment decisions in a retirement plan: the influence of colleagues choices. *Journal of Public Economics 85*, 121–148.

Engen, E. M. and J. Gruber (2001). Unemployment insurance and precautionary saving. *Journal of Monetary Economics 47*, 545–579.

Eugster, B., R. Lalive, A. Steinhauer, and J. Zweimüller (2011). The Demand for Social Insurance: Does Culture Matter? *Economic Journal 121*, 413–448.

Fay, S., E. Hurst, and M. White (2002). An Empirical Analysis of Personal Bankruptcy and Delinquency. *American Economic Review 92*(3), 706–718.

Fernández, R. (2011). *Does Culture Matter?* (1A ed.), Volume 1. Elsevier.

Georgarakos, D., M. Haliassos, and G. Pasini (2014). Household Debt and Social Interactions. *Review of Financial Studies*.

Gertler, P., D. Levine, and E. Moretti (2009). Do microfinance programs help families insure consumption against illness? *Health Economics 18*(3), 257–273.

Gross, D. and N. Souleles (2002). An Empirical Analysis of Personal Bankruptcy and Delinquency. *Review of Financial Studies 15*(1), 319–347.

Guiso, L., P. Sapienza, and L. Zingales (2006). Does Culture Affect Economic Outcomes? *Journal of Economic Perspectives 20*(2), 23–48.

Guiso, L., P. Sapienza, and L. Zingales (2013). The Determinants of Attitudes toward Strategic Default on Mortgages. *Journal of Finance LXVIII*(4), 1473–1515.

Hahn, J., P. Todd, and W. V. der Klaauw (2001). Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design. *Econometrica 69*(1), 201–209.

Haliassos, M., T. Jansson, and Y. Karabulut (2014). Incompatible European Partners? Cultural Predispositions and Household Financial Behavior. *Working Paper*, 1–65.

Hayashi, F., J. Altonji, and L. Kotlikoff (1996). Risk-Sharing between and within Families. *Econometrica 64*(2), 261–294.

Hong, H., J. D. Kubik, and J. C. Stein (2004). Social Interaction and Stock-Market Participation. *Journal of Finance LIX*(1), 137–163.

Imbens, G. M. and T. Lemieux (2008). Regression Discontinuity Designs: A guide to practice. *Journal of Econometrics 142*, 615–635.

Imbens, G. M. and J. M. Wooldridge (2009). Recent Developments in the Econometrics of Program Evaluation. *Journal of Economic Literature 47*(1), 5–86.

Kaustia, M. and S. Knüpfer (2012). Peer performance and stock market entry. *Journal of Financial Economics 104*, 321–338.

Khwaja, A., F. Sloan, and M. Salm (2006). Evidence on preferences and subjective beliefs of risk takers: The case of smokers. *International Journal of Industrial Organization 24*, 667–682.

Kimball, M. (1990). Precautionary Savings in the Small and in the Large. *Econometrica 58*(1), 53–73.

Kuhn, P., P. Kooreman, A. Soetevent, and A. Kapteyn (2011). The Effects of Lottery Prizes on Winners and Their Neighbors: Evidence from the Dutch Postcode Lottery. *American Economic Review 101*, 2226–2247.

Ligon, E. (1998). Risk Sharing and Information in Village Economies. *Review of Economic Studies 65*, 847–864.

Luttmer, E. F. (2005). Neighbors as Negatives: Relative Earnings and Well-Being. *Quarterly Journal of Economics 120*(3), 963–1002.

Ortigueira, S. and N. Siassi (2013). How important is intra-household risk sharing for savings and labor supply? *Journal of Monetary Economics 60*, 650–666.

Piracha, M. and Y. Zhu (2012). Precautionary savings by natives and immigrants in Germany. *Applied Economics 44*(21), 2767–2776.

Sinning, M. G. (2011). Determinants of savings and remittances: empirical evidence from immigrants to Germany. *Review of Economics of the Household 9*(1), 45–67.

Sutter, M., S. Angerer, D. Glätzle-Rützler, and P. Lergetporer (2014). The effects of language on children's intertemporal choices. *Working Paper*.

Sutter, M., M. Kocher, D. Glätzle-Rützler, and S. Trautmann (2013). Impatience and Uncertainty: Experimental Decisions Predict Adolescents' Field Behavior. *American Economic Review 103*(1), 510–531.

Figure 1: Language regions in Switzerland

This figure shows the main language by municipality in Switzerland. Orange illustrates municipalities with an Italian-speaking majority, dark navy illustrates municipalities with a German-speaking majority, and red illustrates municipalities with a French-speaking majority (in 2000).

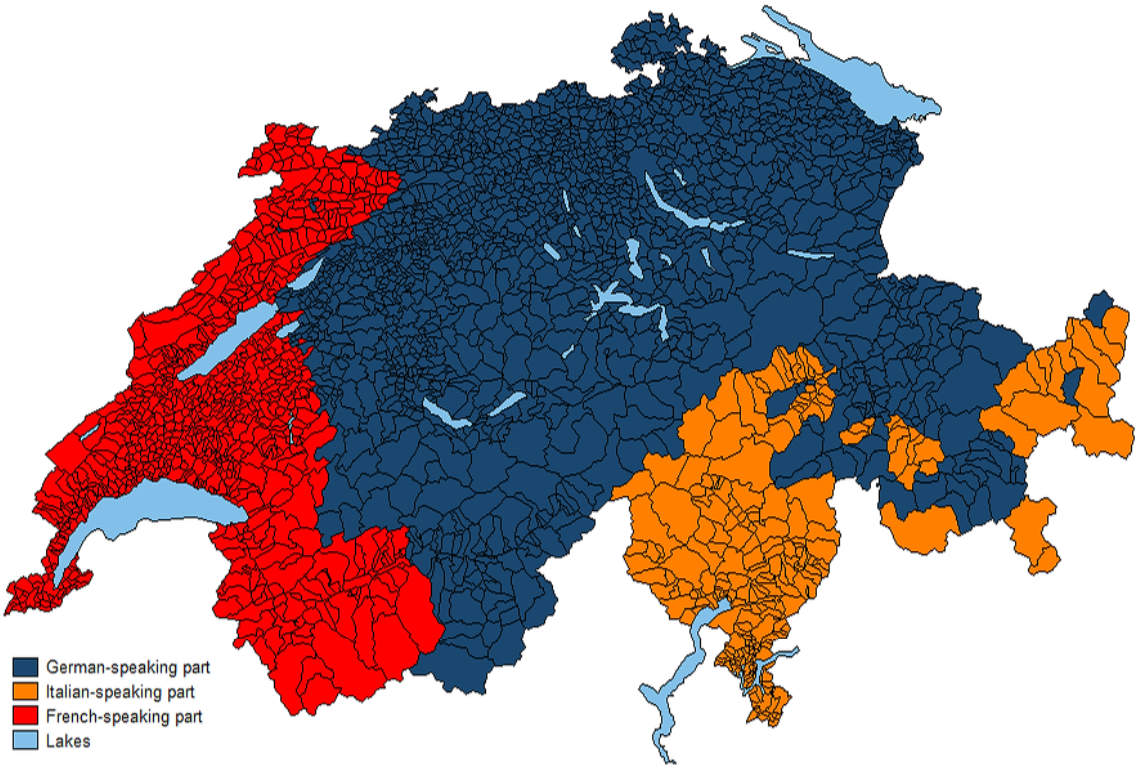

Figure 2: German speakers and distance to the language border

This figure shows the share the share of German-speaking household heads depending on the distance to the language border. The vertical line indicates the language border as detailed in the text. Dots left of (right of) the vertical line indicate the share of German-speaking household heads in 10km segments in the French-speaking part (German-speaking part). Source: *Swiss Household Panel (1999-2012).*

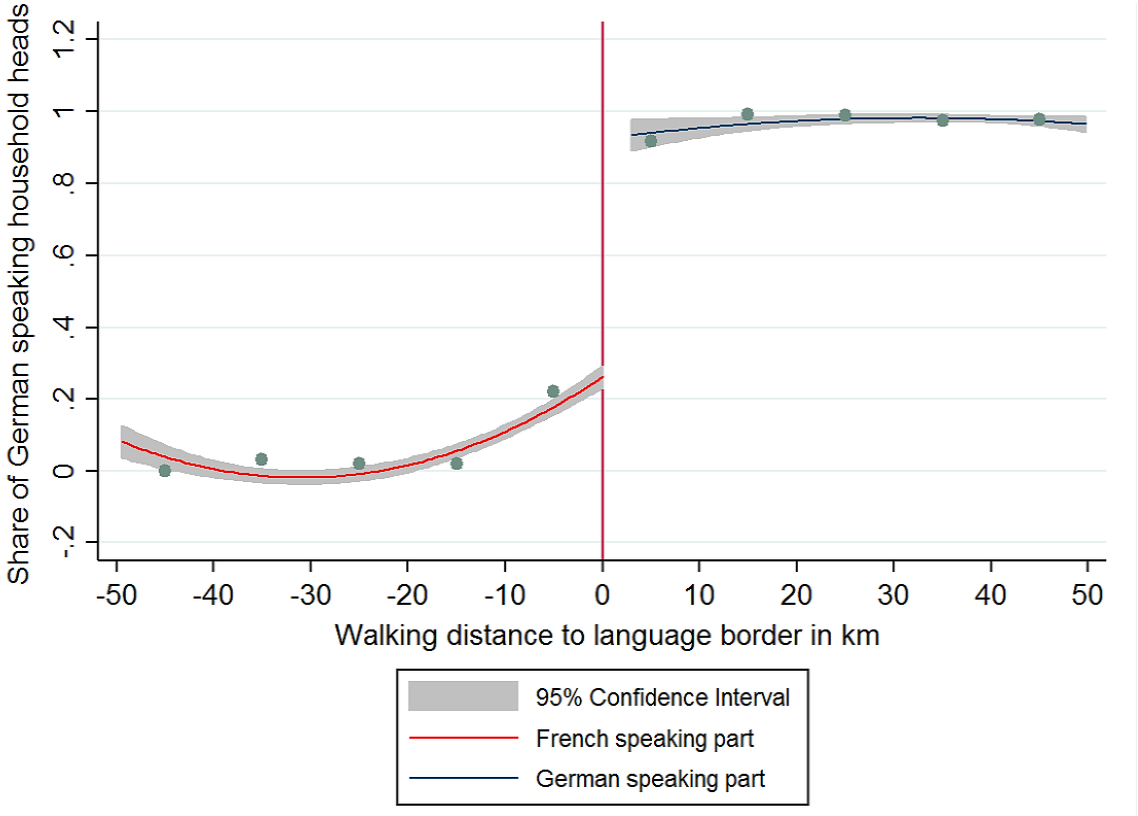

Figure 3: Household saving in terms of language region in Switzerland

This figure shows the saving rates of households in Switzerland in terms of language regions in 2011. The household saving rate is calculated by subtracting all expenses from the entire household income. Source: *Household Budget Survey (HBS) (2011).*

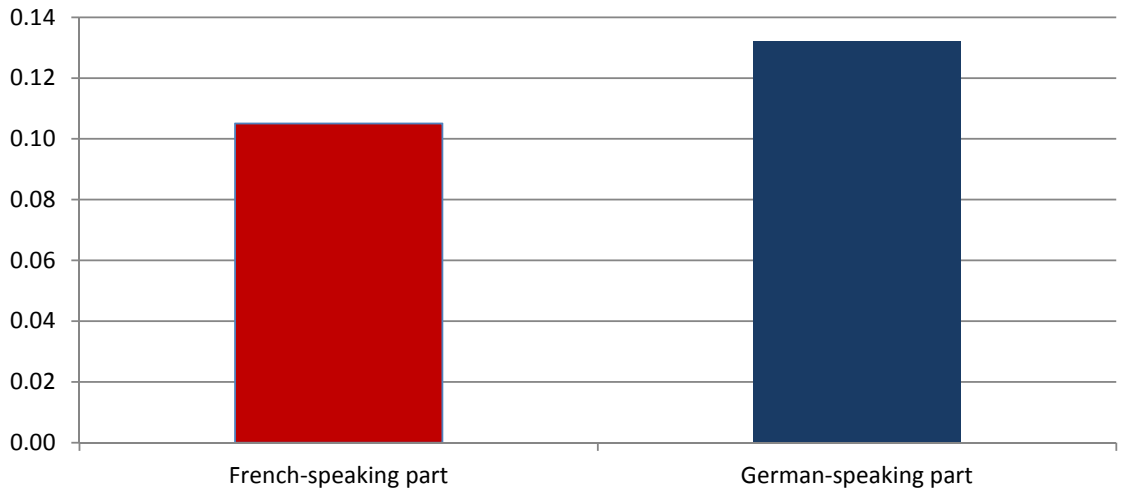

Figure 4: Household saving by language regions and income in Switzerland

This figure shows the share of households that can save at least CHF 100 per month in terms of income levels and language regions in the three bilingual cantons (Bern, Fribourg, Valais) in 1999-2003. Low-income (middle-income, high-income) households are households whose household income is in the lowest quartile (second and third quartile, highest quartile) of the income distribution in Switzerland per survey wave. Source: *Swiss Household Panel (1999-2003)*.

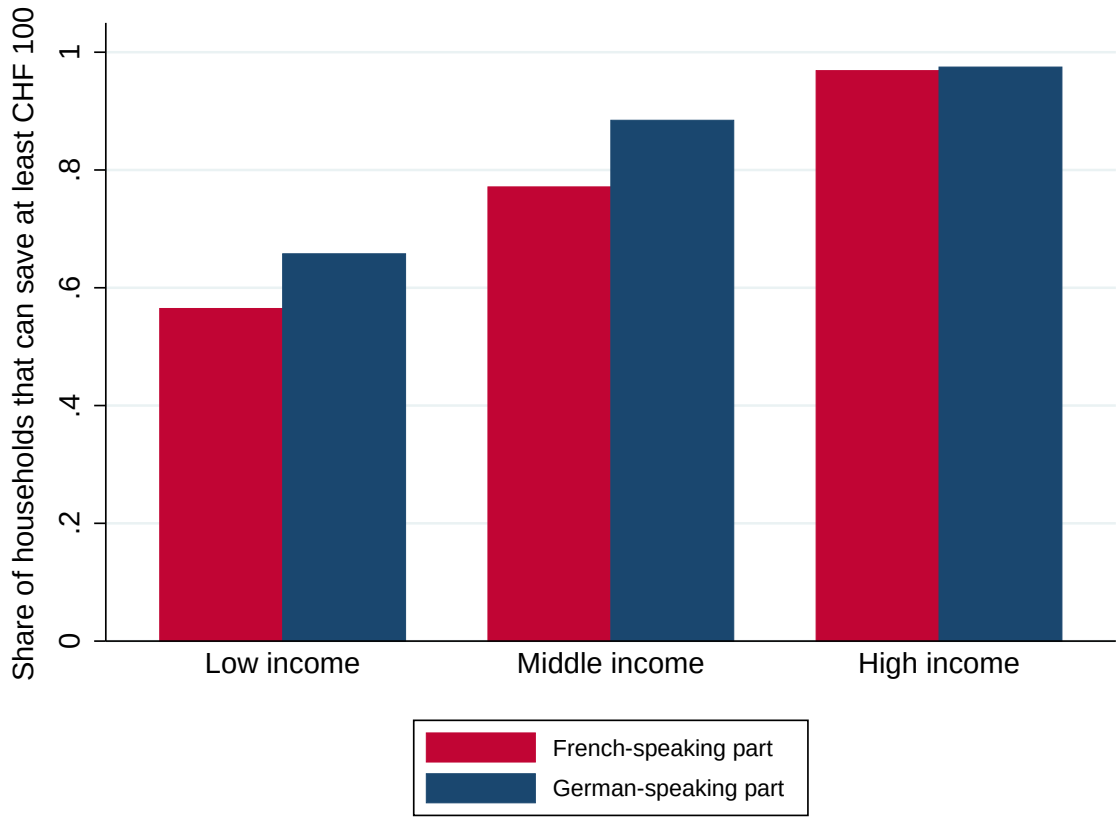

Figure 5: Saving in terms of language region

This figure shows the share of households that can save at least CHF 100 per month depending on the distance to the language border. The vertical line indicates the language border as detailed in the text. Dots left to (right to) the vertical line indicate the share of households that can save at least CHF 100 per 10km segments in the French-speaking part (German-speaking part). Source: *Swiss Household Panel (1999-2003).*

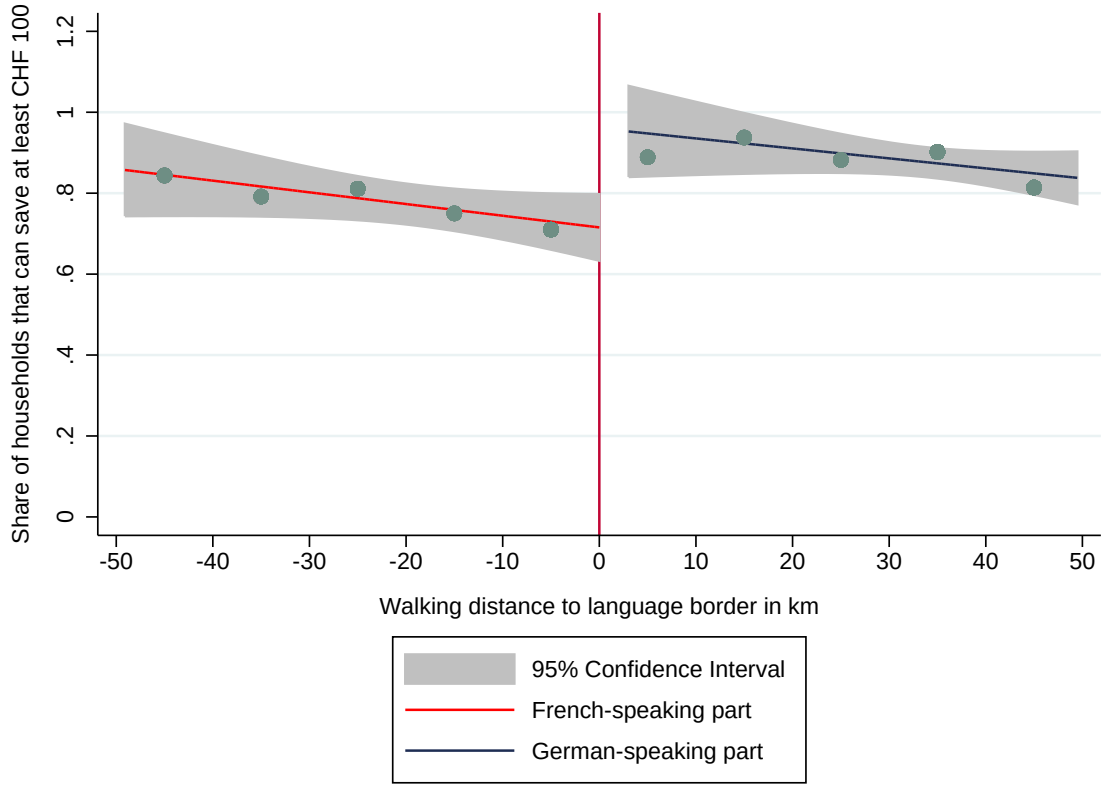

Figure 6: Residuals in terms of language region

This figure shows the residuals of the regression specified in Table 3 Column 2 in the three multilingual cantons (Bern, Fribourg, Valais) depending on the distance to the language border. The vertical line indicates the language border as detailed in the text. Dots left to (right to) the vertical line indicate average residuals per 10km segments in the French-speaking part (German-speaking part). Source: *Swiss Household Panel (1999-2003).*

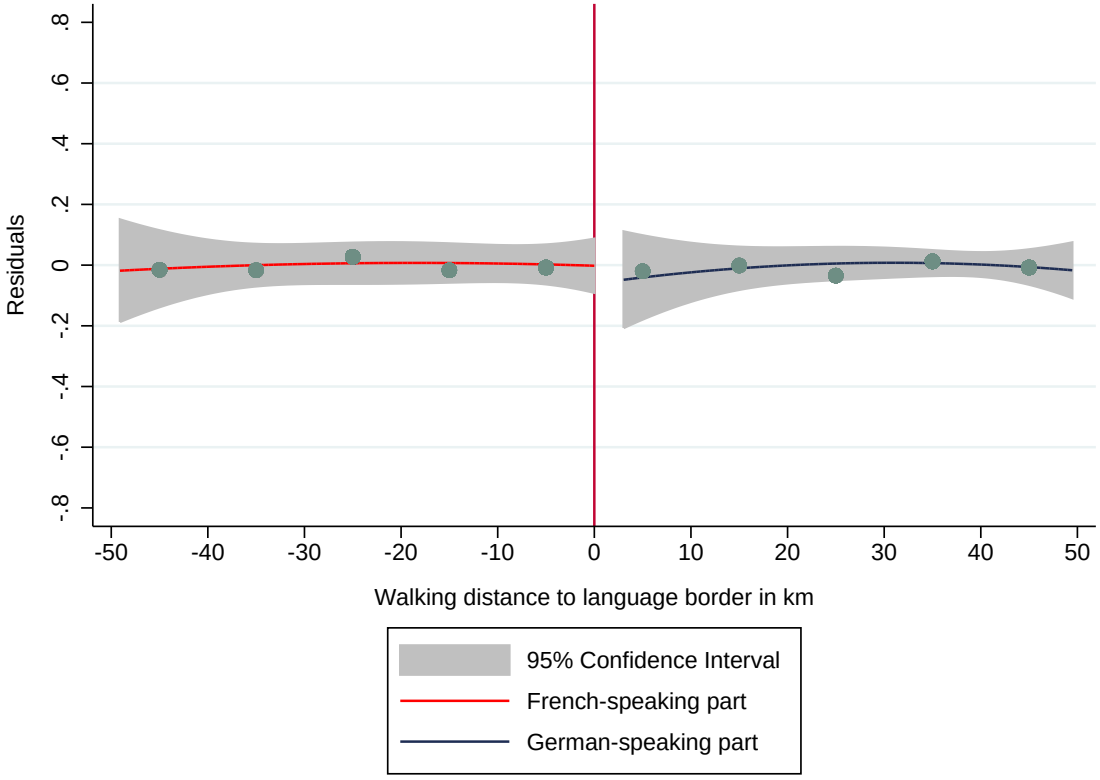

Table 1: Summary statistics

Definitions of the variables are provided in Table 12.

Variable name	Mean	Std. Dev.	Minimum	Maximum	Observations
Intertemporal Financial Decisions					
Saving	0.83	0.38	0.00	1.00	577
Saving (3rd pillar)	0.63	0.48	0.00	1.00	577
Overspending	0.08	0.26	0.00	1.00	577
Homeowner	0.42	0.49	0.00	1.00	577
Payment arrears	0.11	0.32	0.00	1.00	6'592
Language variables					
German-speaking part	0.55	0.50	0.00	1.00	577
German speaker	0.55	0.50	0.00	1.00	577
Distance	9.17	29.40	-49.09	49.47	577
Distance >25km	0.86	0.34	0.00	1.00	577
Socio-economic characteristics					
Household income	10.46	0.49	8.29	11.13	577
Household size	2.81	1.39	1.00	7.00	577
Male	0.44	0.50	0.00	1.00	577
University	0.14	0.35	0.00	1.00	577
Age	40.35	11.82	19.00	68.00	577
Swiss	0.91	0.28	0.00	1.00	577
Employed	0.77	0.42	0.00	1.00	577
Self employed	0.02	0.15	0.00	1.00	577
Unemployed	0.02	0.14	0.00	1.00	577
Resolving Payment Arrears					
Informal credit	0.36	0.48	0.00	1.00	308
Formal credit	0.16	0.36	0.00	1.00	308
Impatience & Planning					
Tobacco smoked	0.59	0.49	0.00	1.00	508
Regional characteristics					
Unemployment	2.22	0.99	0.72	5.20	577

Table 2: Household decisions & socio-economic characteristics in terms of language region

This table compares households' saving and expenses (Panel A) and household and household head characteristics (Panel B) of non-retired low- and middle-income households located in the German-speaking part of Switzerland to those of the ones located in the French-speaking part of Switzerland between 1999 and 2003. It only considers households located within 50 km of the language border. The last column tests the differences in means (t-test). The number of household observations (N) is reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively. Definitions of the variables are provided in Table 12.

Panel A. Households' financial decisions			
	German-speaking part	**French-speaking part**	**Difference**
Saving	0.881	0.760	0.121***
	(N=319)	(N=258)	(N=577)
Saving (3rd pillar)	0.674	0.566	0.108***
	(N=319)	(N=258)	(N=577)
Overspending	0.049	0.109	-0.061***
	(N=308)	(N=247)	(N=555)
Panel B. Household and household head characteristics			
	German-speaking part	**French-speaking part**	**Difference**
Household characteristics			
Household income	10.485	10.424	0.061
	(N=319)	(N=258)	(N=577)
Household size	2.859	2.748	0.111
	(N=319)	(N=258)	(N=577)
Household head characteristics			
Male	0.458	0.407	0.051
	(N=319)	(N=258)	(N=577)
University	0.141	0.147	-0.006
	(N=319)	(N=258)	(N=577)
Age	41.179	39.318	1.861*
	(N=319)	(N=258)	(N=577)
Swiss	0.925	0.895	0.029
	(N=319)	(N=258)	(N=577)
Employed	0.762	0.787	-0.025
	(N=319)	(N=258)	(N=577)
Self employed	0.034	0.008	0.027**
	(N=319)	(N=258)	(N=577)
Unemployed	0.025	0.016	0.010
	(N=319)	(N=258)	(N=577)

Table 3: Household saving in terms of language region

The dependent variable *Saving* is a binary variable indicating whether the household can save at least CHF 100 per month. *German-speaking part* is a binary variable indicating whether the household is located in the German-speaking part of Switzerland (*French-speaking part* of Switzerland otherwise). Household control variables are *Household income, Household size, Male, University, Age, Swiss, Employed, Self employed*. The regional control variable is the *Unemployment rate* at the district level. Definitions of the variables are provided in Table 12. Standard errors are clustered on the municipality level and are reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively.

	1	2	3	4	5
Survey Wave	1999-2003	1999-2003		1999-2003	
Bandwidth	50km	50km		50km	
Dependent variable	Saving	Saving		Saving	
German-speaking part	0.121***	0.294***	0.359***	0.280***	0.355***
	[0.031]	[0.045]	[0.061]	[0.057]	[0.079]
Distance	NO	Linear	Linear	Quadratic	Quadratic
Household controls	NO	NO	YES	NO	YES
Regional controls	NO	NO	YES	NO	YES
Year FE	NO	YES	YES	YES	YES
Canton FE	NO	YES	YES	YES	YES
Observations	577	577	577	577	577
Households	577	577	577	577	577
Share in German-speaking part	0.55	0.55	0.55	0.55	0.55
Municipalities	157	157	157	157	157
Mean of dependent variable	0.83	0.83	0.83	0.83	0.83
R-squared	0.025	0.048	0.137	0.050	0.137
Method	OLS	OLS	OLS	OLS	OLS

Table 4: Time preferences in terms of language region

The dependent variable *Tobacco smoked* indicates whether the household head has ever smoked tobacco. *German-speaking part* is a binary variable indicating whether the household is located in the German-speaking part of Switzerland (*French-speaking part* of Switzerland otherwise). Household control variables are *Household income, Household size, Male, University, Age, Swiss, Employed, Self employed.* The regional control variable is the *Unemployment rate* at the district level. Definitions of the variables are provided in Table 12. Standard errors are clustered at the municipality level and are reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively.

	1	2	3	4	5
Survey Wave	2010 & 2011	2010 & 2011		2010 & 2011	
Bandwidth	50km	50km		50km	
Dependent variable	Tobacco smoked	Tobacco smoked		Tobacco smoked	
German-speaking part	-0.091**	-0.226**	-0.324***	-0.208*	-0.256**
	[0.046]	[0.098]	[0.107]	[0.107]	[0.119]
Distance	NO	Linear	Linear	Quadratic	Quadratic
Household controls	NO	NO	YES	NO	YES
Regional controls	NO	NO	YES	NO	YES
Canton FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Observations	508	508	508	508	508
Households	508	508	508	508	508
Share in German-speaking part	0.60	0.60	0.60	0.60	0.60
Municipalities	194	194	194	194	194
Mean of dependent variable	0.59	0.59	0.59	0.59	0.59
R-squared	0.008	0.022	0.066	0.034	0.077
Method	OLS	OLS	OLS	OLS	OLS

Table 5: Informal credit in financial distress in terms of language region

The dependent variable *Informal credit* is a binary variable indicating whether the household has borrowed at least once from family or friends in case of financial distress. *German-speaking part* is a binary variable indicating whether the household is located in the German-speaking part of Switzerland (*French-speaking part* of Switzerland otherwise). Household control variables are *Household income, Household size, Male, University, Age, Swiss, Employed, Self employed*. The regional control variable is the *Unemployment rate* at the district level. Definitions of the variables are provided in Table 12. Standard errors are clustered at the municipality level and are reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively.

	1	2	3	4	5
Survey Wave	1999-2012	1999-2012		1999-2012	
Bandwidth	50km	50km		50km	
Dependent variable	Informal credit	Informal credit		Informal credit	
German-speaking part	-0.020	-0.122	-0.111	-0.271***	-0.258**
	[0.057]	[0.094]	[0.108]	[0.079]	[0.108]
Distance	NO	Linear	Linear	Quadratic	Quadratic
Household controls	NO	NO	YES	NO	YES
Regional controls	NO	NO	YES	NO	YES
Canton FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Observations	308	308	308	308	308
Households	308	308	308	308	308
Share in German-speaking part	0.56	0.56	0.56	0.56	0.56
Municipalities	131	131	131	131	131
Mean of dependent variable	0.36	0.36	0.36	0.36	0.36
R-squared	0.000	0.064	0.154	0.075	0.164
Method	OLS	OLS	OLS	OLS	OLS

Table 6: Formal credit in financial distress in terms of language region

The dependent variable *Formal credit* is a binary variable indicating whether the household has borrowed at least once from banks in case of financial distress. *German-speaking part* is a binary variable indicating whether the household is located in the German-speaking part of Switzerland (*French-speaking part* of Switzerland otherwise). Household control variables are *Household income, Household size, Male, University, Age, Swiss, Employed, Self employed*. The regional control variable is the *Unemployment rate* at the district level. Definitions of the variables are provided in Table 12. Standard errors are clustered at the municipality level and are reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively.

	1	2	3	4	5
Survey Wave	1999-2012	1999-2012		1999-2012	
Bandwidth	50km	50km		50km	
Dependent variable	Formal credit	Formal credit		Formal credit	
German-speaking part	-0.076**	-0.075	-0.083	-0.117*	-0.126*
	[0.038]	[0.061]	[0.068]	[0.062]	[0.075]
Distance	NO	Linear	Linear	Quadratic	Quadratic
Household controls	NO	NO	YES	NO	YES
Regional controls	NO	NO	YES	NO	YES
Canton FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Observations	308	308	308	308	308
Households	308	308	308	308	308
Share in German-speaking part	0.56	0.56	0.56	0.56	0.56
Municipalities	131	131	131	131	131
Mean of dependent variable	0.16	0.16	0.16	0.16	0.16
R-squared	0.011	0.137	0.138	0.140	0.140
Method	OLS	OLS	OLS	OLS	OLS

Table 7: Household saving in terms of language region (other dependent variables)

The dependent variable *Saving (3rd pillar)* indicates whether the household has a "3rd pillar" pension fund. *Overspending* indicates whether the household's expenses are higher than the household's income. *German-speaking part* is a binary variable indicating whether the household is located in the German-speaking part of Switzerland (*French-speaking part* of Switzerland otherwise). Household control variables are *Household income, Household size, Male, University, Age, Swiss, Employed, Self employed.* The regional control variable is the *Unemployment rate* at the district level. Definitions of the variables are provided in Table 12. Standard errors are clustered at the municipality level and are reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively.

Panel A. Saving (3rd pillar)

	1	2	3	4	5
Survey Wave	1999-2003				
Bandwidth	50km				
Dependent variable	Saving (3rd pillar)				
German-speaking part	0.108	0.381***	0.297**	0.595***	0.501***
	[0.066]	[0.106]	[0.116]	[0.097]	[0.127]
Distance	NO	Linear	Linear	Quadratic	Quadratic
Household controls	NO	YES	YES	YES	YES
Regional controls	NO	NO	YES	NO	YES
Canton FE	NO	YES	YES	YES	YES
Observations	577	577	577	577	577
Households	577	577	577	577	577
Share in German-speaking part	0.55	0.55	0.55	0.55	0.55
Municipalities	157	157	157	157	157
Mean of dependent variable	0.63	0.63	0.63	0.63	0.63
R-squared	0.012	0.053	0.127	0.081	0.147
Method	OLS	OLS	OLS	OLS	OLS

Panel B. Overspending

	1	2	3	4	5
Survey Wave	1999-2003				
Bandwidth	50km				
Dependent variable	Overspending				
German-speaking part	-0.061***	-0.102***	-0.150**	-0.120***	-0.178***
	[0.023]	[0.036]	[0.059]	[0.027]	[0.050]
Distance	NO	Linear	Linear	Quadratic	Quadratic
Household controls	NO	YES	YES	YES	YES
Regional controls	NO	NO	YES	NO	YES
Canton FE	NO	YES	YES	YES	YES
Observations	555	555	555	555	555
Households	555	555	555	555	555
Share in German-speaking part	0.55	0.55	0.55	0.55	0.55
Municipalities	155	155	155	155	155
Mean of dependent variable	0.08	0.08	0.08	0.08	0.08
R-squared	0.013	0.026	0.055	0.028	0.057
Method	OLS	OLS	OLS	OLS	OLS

Table 8: Household saving in terms of language region (robustness)

The dependent variable *Saving* is a binary variable indicating whether the household can save at least CHF 100 per month. *German-speaking part* is a binary variable indicating whether the household is located in the German-speaking part of Switzerland (*French-speaking part* of Switzerland otherwise). *Homeowner* indicates whether the household owns the property it lives in. Household control variables are *Household income, Household size, Male, University, Age, Swiss, Employed, Self employed.* The regional control variable is the *Unemployment rate* at the district level. Definitions of the variables are provided in Table 12. Standard errors are clustered on the municipality level and are reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively.

Panel A. Saving (controlling for home ownership)

	1	2	3	4	5
Survey Wave			1999-2003		
Bandwidth			50km		
Dependent variable			Saving		
German-speaking part	0.120***	0.278***	0.355***	0.259***	0.349***
	[0.030]	[0.048]	[0.062]	[0.063]	[0.081]
Homeowner	0.063*	0.043	0.041	0.041	0.040
	[0.035]	[0.032]	[0.032]	[0.032]	[0.032]
Distance	NO	Linear	Linear	Quadratic	Quadratic
Household controls	NO	YES	YES	YES	YES
Regional controls	NO	NO	YES	NO	YES
Canton FE	NO	YES	YES	YES	YES
Observations	577	577	577	577	577
Households	577	577	577	577	577
Share in German-speaking part	0.55	0.55	0.55	0.55	0.55
Municipalities	157	157	157	157	157
Mean of dependent variable	0.83	0.83	0.83	0.83	0.83
R-squared	0.032	0.051	0.138	0.052	0.139
Method	OLS	OLS	OLS	OLS	OLS

Panel B. Saving (Full sample)

	1	2	3	4	5
Survey Wave			1999-2003		
Bandwidth			50km		
Dependent variable			Saving		
German-speaking part	0.115***	0.263***	0.293***	0.242***	0.307***
	[0.029]	[0.041]	[0.050]	[0.050]	[0.064]
Distance	NO	Linear	Linear	Quadratic	Quadratic
Household controls	NO	YES	YES	YES	YES
Regional controls	NO	NO	YES	NO	YES
Canton FE	NO	YES	YES	YES	YES
Observations	659	659	659	659	659
Households	659	659	659	659	659
Share in German-speaking part	0.56	0.56	0.56	0.56	0.56
Municipalities	171	171	171	171	171
Mean of dependent variable	0.85	0.85	0.85	0.85	0.85
R-squared	0.025	0.043	0.146	0.047	0.148
Method	OLS	OLS	OLS	OLS	OLS

Table 9: Validity: Covariates and language region

The dependent variables are *Household income, Household size, Male, University, Age, Swiss, Employed, Self employed.* *German-speaking part* is a binary variable indicating whether the household is located in the German-speaking part of Switzerland (*French-speaking part* of Switzerland otherwise). The regional control variable is the *Unemployment rate* at the district level. Definitions of the variables are provided in Table 12. Standard errors are clustered at the municipality level and are reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively.

	1	2	3	4	5	6	7	8
Survey Wave				1999-2003				
Bandwidth				50km				
Dependent variable	Household income	Household size	Male	University	Age	Swiss	Employed	Self employed
German-speaking part	-0.182	1.211***	0.181	-0.095	1.429	-0.020	-0.126	0.090
	[0.138]	[0.342]	[0.131]	[0.103]	[2.547]	[0.084]	[0.122]	[0.057]
Distance	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic
Household controls	NO	NO	NO	NO	NO	NO	NO	NO
Regional controls	YES	YES	YES	YES	YES	YES	YES	YES
Canton FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	577	577	577	577	577	577	577	577
Households	577	577	577	577	577	577	577	577
Share in German-speaking part	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Municipalities	157	157	157	157	157	157	157	157
Mean of dependent variable	10.46	2.81	0.44	0.14	40.34	0.91	0.77	0.02
R-squared	0.021	0.040	0.006	0.023	0.016	0.011	0.008	0.018
Method	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS

Table 10: Household saving in terms of language region (robustness)

The dependent variable *Saving* is a binary variable indicating whether the household can save at least CHF 100 per month. *German-speaking part* is a binary variable indicating whether the household is located in the German-speaking part of Switzerland (*French-speaking part* of Switzerland otherwise). Household control variables are *Household income, Household size, Male, University, Age, Swiss, Employed, Self employed*. The regional control variable is the *Unemployment rate* at the district level. Definitions of the variables are provided in Table 12. Standard errors are clustered on the municipality level and are reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively.

Panel A. Households located in French-speaking part

	1	2	3	4
Survey Wave			1999-2003	
Bandwidth			25km	
Dependent variable			Saving	
Distance >25km	-0.027	-0.018	-0.055	-0.035
	[0.090]	[0.087]	[0.099]	[0.097]
Distance	Linear	Linear	Quadratic	Quadratic
Household controls	NO	YES	NO	YES
Regional controls	NO	YES	NO	YES
Canton FE	YES	YES	YES	YES
Observations	258	258	258	258
Households	258	258	258	258
Share in German-speaking part	0.00	0.00	0.00	0.00
Municipalities	73	73	73	73
Mean of dependent variable	0.76	0.76	0.76	0.76
R-squared	0.043	0.149	0.044	0.149
Method	OLS	OLS	OLS	OLS

Panel B. Households located in German-speaking part

	1	2	3	4
Survey Wave			1999-2003	
Bandwidth			25km	
Dependent variable			Saving	
Distance >25km	0.027	0.067	0.168	0.167
	[0.065]	[0.074]	[0.113]	[0.122]
Distance	Linear	Linear	Quadratic	Quadratic
Household controls	NO	YES	NO	YES
Regional controls	NO	YES	NO	YES
Canton FE	YES	YES	YES	YES
Observations	319	319	319	319
Households	319	319	319	319
Share in German-speaking part	1.00	1.00	1.00	1.00
Municipalities	84	84	84	84
Mean of dependent variable	0.88	0.88	0.88	0.88
R-squared	0.029	0.132	0.033	0.134
Method	OLS	OLS	OLS	OLS

Table 11: Alternative empirical strategy: Selection on observables

The dependent variable *Saving* is a binary variable indicating whether the household can save at least CHF 100 per month. The dependent variable *Overspending* indicates whether the household's expenses are higher than the household's income. *German speaker* is a binary variable indicating whether the household head prefers to answer the survey questions in German (French otherwise). Household control variables are *Household income, Household size, Male, University, Age, Swiss, Employed, Self employed.* The regional control variable is the *Unemployment rate* at the district level. Definitions of the variables are provided in Table 12. Standard errors are clustered at the municipality level and reported in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05 and 0.10-levels, respectively.

	1	2	3	4
Survey Wave	1999-2003		1999-2003	
Dependent variable	Saving		Overspending	
German speaker	0.108***	0.102**	-0.097***	-0.107***
	[0.037]	[0.042]	[0.026]	[0.031]
Household controls	YES	YES	YES	YES
Religious controls	NO	YES	NO	YES
Regional controls	NO	YES	NO	YES
Year FE	YES	YES	YES	YES
Canton FE	YES	YES	YES	YES
Observations	569	569	547	547
Households	569	569	547	547
Share in German-speaking part	0.55	0.55	0.56	0.56
Municipalities	156	156	154	154
Mean of dependent variable	0.83	0.83	0.08	0.08
R-squared	0.113	0.113	0.060	0.061
Method	OLS	OLS	OLS	OLS

Table 12: Variable definitions

This table provides definitions of variables.

Variable name	Definition	Source
Intertemporal Financial Decisions		
Saving	Binary variable = 1 if the household can save at least CHF 100 monthly, = 0 otherwise.	SHP 1999 - 2003
Saving (3rd pillar)	Binary variable = 1 if the household saves into a "pillar 3" scheme, = 0 otherwise.	SHP 1999 - 2003
Overspending	Binary variable = 1 if the household's expenses are higher than the household's income, = 0 otherwise.	SHP 1999 - 2003
Homeowner	Binary variable = 1 if the household owns the property it lives in, = 0 otherwise.	SHP 1999 - 2003
Payment arrears	Binary variable = 1 if the household has fallen into payment arrears within the preceding 12 months, = 0 otherwise.	SHP 1999 - 2012
Language variables		
German-speaking part	Binary variable = 1 if the household is located in the German-speaking part of Switzerland, = 0 if French-speaking part.	SHP 1999 - 2003
German speaker	Binary variable = 1 if the household head prefers to answer the survey questions in German, = 0 if French.	SHP 1999 - 2003
Distance	Walking distance from the language border in km.	Search.ch
Distance >25km	Binary variable = 1 if the walking distance from the language border is greater than 25 km, = 0 otherwise.	Search.ch
Socio-economic characteristics		
Household income	Net yearly household income in CHF (OECD equivalised) (natural logarithm).	SHP 1999 - 2003
Household size	Number of persons in household	SHP 1999 - 2003
Male	Binary variable = 1 if the household head is male, = 0 otherwise.	SHP 1999 - 2003
University	Binary variable = 1 if the household head holds a unversity degree, = 0 otherwise.	SHP 1999 - 2003
Age	Age of the household head in years.	SHP 1999 - 2003
Swiss	Binary variable = 1 if the household head is Swiss, = 0 otherwise.	SHP 1999 - 2003
Employed	Binary variable = 1 if the household head is employed, = 0 otherwise.	SHP 1999 - 2003
Self employed	Binary variable = 1 if the household head is self employed, = 0 otherwise.	SHP 1999 - 2003
Unemployed	Binary variable = 1 if the household head is unemployed, = 0 otherwise.	SHP 1999 - 2003
Resolving Payment Arrears		
Informal credit	Binary variable = 1 if the household has borrowed at least once from family or friends in case of financial distress, = 0 otherwise.	SHP 1999 - 2012
Formal credit	Binary variable = 1 if the household has borrowed at least once from banks in case of financial distress, = 0 otherwise.	SHP 1999 - 2012
Impatience & Planning		
Tobacco smoked	Binary variable = 1 if the household heads have ever smoked tobacco in their lives, = 0 otherwise.	SHP 2010; 2011
Regional characteristics		
Unemployment	Unemployment rate per district and year (in percent) based on calculation by State Secretariat for Economic Affairs (SECO).	SHP 1999 - 2003

A Solution to the Stylized Model

A.1 Type A household ($T = 0$): Saving decision in t=1

The following first-order condition has to hold:

$$FOC : -\frac{1}{1-S_1} + \pi\beta\frac{1}{\frac{1}{2}+S_1+T} + (1-\pi)\beta\frac{1}{1+S_1} = 0 \tag{13}$$

Assuming that the probability of income shocks is $\pi = \frac{1}{2}$, this is equivalent to:

$$2[(\frac{1}{2}+S_1+T)(1+S_1)] = \beta(1-S_1)[(1+S_1)+(\frac{1}{2}+S_1+T)] \tag{14}$$

Type A household does not obtain credit in distress ($T = 0$). Plugging in $T = 0$ in equation 14, we can solve for the optimal household saving $S^*_{1,A}$.[23]

$$S^*_{1,A} = \frac{-3+\frac{1}{2}\beta+\sqrt{12.25\beta^2+\beta+1}}{2(2+2\beta)} \tag{15}$$

Notice that β is non-negative by definition. Hence, the denominator of equation 15 is positive. Hence, optimal saving of this household type is strictly positive, $S^*_{1,A} > 0$, if:

$$\sqrt{12.25\beta^2+\beta+1} > 3-\frac{1}{2}\beta \tag{16}$$

As $0 < \beta \leq 1$, it follows from equation 16 that the following inequality has to hold.

$$\implies 12.25\beta^2+\beta+1 > (3-\frac{1}{2}\beta)^2 \tag{17}$$

Rearranging terms, we can find the strictly positive solution:

$$12\beta^2+4\beta-8 > 0 \tag{18}$$

Solving for β yields the critical discount factor β^*:[24]

$$\beta^* > \frac{2}{3} \quad \square \tag{19}$$

[23] Notice: We are only interested in the solution where $S^*_{1,A} \geq 0$.

[24] Notice: We are only interested in the solution where $0 < \beta^* \leq 1$.

A.2 Type A household ($T = 0$): Optimal saving and discount factor

We want to show that optimal precautionary saving S_1^* is strictly increasing in β, i.e.

$$\frac{\partial S_{1,A}^*}{\partial \beta} > 0, \forall \frac{2}{3} < \beta \leq 1 \tag{20}$$

We know from Appendix A.1 that optimal precautionary saving for this household type is:

$$S_{1,A}^* = \frac{-3 + \frac{1}{2}\beta + \sqrt{12.25\beta^2 + \beta + 1}}{2(2 + 2\beta)} \tag{21}$$

We check the sign of the first partial derivative with respect to β:

$$\frac{\partial S_{1,A}^*}{\partial \beta} = \frac{[\frac{1}{2} + \frac{1}{2}a^{-.5}(24.5\beta + 1)] \cdot (4 + 4\beta) - [-3 + \frac{1}{2}\beta + \sqrt{a}] \cdot 4}{(4 + 4\beta)^2} \tag{22}$$

where $a \equiv 12.25\beta^2 + \beta + 1$.

Notice that the denominator, $(4 + 4\beta)^2$, is positive. Hence, the partial derivative $\frac{\partial S_{1,A}^*}{\partial \beta} > 0$ is positive if:

$$[\frac{1}{2} + \frac{1}{2}a^{-.5}(24.5\beta + 1)] \cdot (4 + 4\beta) - [-3 + \frac{1}{2}\beta + \sqrt{a}] \cdot 4 > 0 \tag{23}$$

which is equivalent to

$$[\frac{1}{2}a^{-.5}(24.5\beta + 1)] \cdot (4 + 4\beta) + [\frac{1}{2}(4 + 4\beta) - [-3 + \frac{1}{2}\beta + \sqrt{a}] \cdot 4] + \sqrt{2} - \sqrt{2} > 0 \tag{24}$$

Inequality 24 is true if the following inequalities 25 and 26 hold true:

$$\frac{1}{2}a^{-.5}(24.5\beta + 1) \cdot (4 + 4\beta) > \sqrt{2} \tag{25}$$

and

$$\frac{1}{2} \cdot (4 + 4\beta) - [-3 + \frac{1}{2}\beta + \sqrt{a}] \cdot 4 > -\sqrt{2} \tag{26}$$

It is straightforward to show that inequality 25 is true.

$$\Leftrightarrow (24.5\beta + 1) \cdot (2 + 2\beta) > \sqrt{2}\sqrt{a} \tag{27}$$

Substituting $a \equiv 12.25\beta^2 + \beta + 1$ back in, it is equivalent to.

$$\Leftrightarrow 49\beta^2 + 51\beta + 2 > \sqrt{24.5\beta^2 + 2\beta + 2}, \quad \forall 0 < \beta \leq 1 \quad \square \tag{28}$$

Similarly, one can show that inequality 26 is true. Rearranging terms yields.

$$\Leftrightarrow 14 - 4\sqrt{a} > -\sqrt{2} \tag{29}$$

which is equivalent to

$$\Leftrightarrow \sqrt{a} < \frac{14 + \sqrt{2}}{4} \tag{30}$$

Substituting $a \equiv 12.25\beta^2 + \beta + 1$ back in.

$$\Leftrightarrow \sqrt{12.25\beta^2 + \beta + 1} < \frac{14 + \sqrt{2}}{4} \tag{31}$$

We can plug in $\beta = 1$ in a (as a is strictly increasing in β, for all $0 < \beta \leq 1$):

$$\sqrt{14.25} < \frac{14 + \sqrt{2}}{4}, \quad \forall 0 < \beta \leq 1 \quad \square \tag{32}$$

Hence, optimal precautionary saving $S^*_{1,A}$ is increasing in β. $\square$

A.3 Type B household ($T = \sigma$): Saving decision in t=1

In case of credit $T = \sigma$, the first-order condition (equation 13) simplifies to:

$$FOC : -\frac{1}{1 - S_1} + \pi\beta\frac{1}{1 + S_1} + (1 - \pi)\beta\frac{1}{1 + S_1} = 0 \tag{33}$$

Assuming that the probability of income shocks is $\pi = \frac{1}{2}$, this is equivalent to:

$$\frac{1}{1 - S_1} = \beta\frac{1}{1 + S_1} \tag{34}$$

Solving for S_1 gives optimal precautionary saving of this household type $S^*_{1,B}$:

$$S^*_{1,B} = \frac{\beta - 1}{1 + \beta}, \forall 0 < \beta \leq 1 \tag{35}$$

As $\frac{\partial S^*_{1,B}}{\partial \beta} > 0$ and $S^*_{1,B} < 0, \forall 0 < \beta \leq 1$, we conclude that this household type never saves, i.e. $S^*_1 = 0$ (as saving cannot be negative by definition). $\square$

B Data Appendix

In this section, I provide further details on the calculation and sources of the language variables. These data rely to a large extent on distance data used by Eugster et al. (2011).

B.1 Dominant language per municipality $G_{i,m}$

The *Swiss Population Census* in 2000 conducted by the *Federal Statistical Office* provides information on each person's main language spoken at home. I use this information to determine the major language of each municipality. The variable $G_{i,m}$ takes on the value of one if household i is located in a municipality m where more than 50% of the population prefer to speak German at home (zero otherwise).[25]

B.2 Language region

I define a *Language region* as being the set of municipalities that have the same major language. For example, the French-speaking region of Switzerland includes *all* municipalities in which the majority of the population prefer speaking French. Similarly, the German-speaking region of Switzerland includes *all* municipalities in which the majority of the population prefer speaking German. This definition is important for the empirical strategy that I point out in section 4. As can be seen in Figure 1, there are several enclaves (i.e. German-speaking municipalities entirely surrounded by French-speaking municipalities). In this baseline definition, these German-speaking municipalities are part of the German-speaking language region. In unreported robustness checks I exclude these enclaves. I can show that the results remain qualitatively similar.

B.3 Distance to the language border

To calculate the distance to the language border, I use data on the driving distance in kilometers between any pair of municipalities in Switzerland.[26] For each municipality in the German language region, I define the shortest distance among the distances to all municipalities in the French language region as being the distance to the language border. Equivalently, for each French-speaking municipality I take the shortest driving distance to a municipality in the German-speaking part as being the distance to the language border. The variable $Distance_{i,m}$ then takes negative values for municipalities

[25] I rely on year 2000 data assuming that the composition of the language speakers has not changed substantially over time.

[26] The matrix of all distance pairs was obtained from the online platform search.ch.

in the French-speaking part and takes positive values for municipalities in the German-speaking part. The municipalities that serve as the closest municipalities for at least one municipality on the opposite side of the language border are assigned distance values of zero ($Distance_{i,m} = 0$).