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Household Finance and Consumption Network (HFCN)

This paper contains research conducted within the Household Finance and Consumption Network (HFCN). The HFCN consists of survey specialists, statisticians and economists from the ECB, the national central banks of the Eurosystem and a number of national statistical institutes.

The HFCN is chaired by Ioannis Ganoulis (ECB) and Oreste Tristani (ECB). Michael Haliassos (Goethe University Frankfurt), Tullio Jappelli (University of Naples Federico II) and Arthur Kennickell act as external consultants, and Sébastien Pérez-Duarte (ECB) and Jiri Slacalek (ECB) as Secretaries.

The HFCN collects household-level data on households' finances and consumption in the euro area through a harmonised survey. The HFCN aims at studying in depth the micro-level structural information on euro area households' assets and liabilities. The objectives of the network are:

1) understanding economic behaviour of individual households, developments in aggregate variables and the interactions between the two;
2) evaluating the impact of shocks, policies and institutional changes on household portfolios and other variables;
3) understanding the implications of heterogeneity for aggregate variables;
4) estimating choices of different households and their reaction to economic shocks;
5) building and calibrating realistic economic models incorporating heterogeneous agents;
6) gaining insights into issues such as monetary policy transmission and financial stability.

The refereeing process of this paper has been co-ordinated by a team composed of Pirmin Fessler (Oesterreichische Nationalbank), Michael Haliassos (Goethe University Frankfurt), Tullio Jappelli (University of Naples Federico II), Sébastien Pérez-Duarte (ECB), Jiri Slacalek (ECB), Federica Teppa (De Nederlandsche Bank), Oreste Tristani (ECB) and Philip Vermeulen (ECB).

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 language 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 11 percentage points more likely to save than similar households in the French-speaking part. In line with the existing literature, I show that these differences across language regions are consistent with different distributions of time preferences. By contrast, I do not find clear evidence for risk sharing during times of financial distress.

Keywords: Household Finance, Saving, Culture, Language, Household Economics

JEL Classification: Z1, D12, E21, D91

Non-technical summary

This paper analyses the extent to which households' exposure to cultural groups can affect their saving decisions. Moreover, it considers how culture affects these decisions. To do so, I focus on social groups that share a similar language as language is one of the major proxies for culture that have been analysed in the existing literature (e.g., Falk et al. (2015), Spolaore and Wacziarg (2015), Desmet et al. (2012), Gertler (2003)).

I exploit Switzerland as a suitable laboratory to analyse the role of households' exposure to different language groups in their intertemporal decisions. It is suitable as 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 have been stable over the last decades). 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 30% within 10 kilometres (the share of French-speaking individuals moves accordingly).

As almost all policies and laws are set either at the national or the cantonal level, there is no associated change in policies and institutions at the parts of this border that run through cantons. Besides, 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.

To do so, I employ survey data from the Swiss Household Panel (waves 1999 until 2014). 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). 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.

My primary empirical strategy is related to a spatial regression discontinuity design. Exploiting exogenous changes in the dominant language per municipality, I test for discontinuities in household savings at the language border.

I estimate the effect of households' exposure to language groups on their propensity to save. For this purpose, I employ three saving variables: First, I use a variable that indicates whether a household can save at least CHF 100 per month. Second, I employ a variable that indicates whether a household's income is higher than its expenses. Third, I use a variable that indicates whether a household saves in a voluntary retirement account. To investigate the aspects relevant to the cultural differences in household saving, I examine whether households in the German-speaking part are more patient (Cultural Aspect 1). Second, I test whether households in the German-speaking part are less likely to obtain transfer payments from their informal network during financial distress. In this case, they should be more likely to save ex-ante (Cultural Aspect 2).

I document that households in the German-speaking part are more than 11 percentage points more likely to save. The estimated effect more than doubles when implementing the local border contrast. I find evidence that there are differences in impatience that are consistent with the initial differences in household saving across language regions. There is no evidence of differences in obtaining transfers from informal networks in financial distress across these regions.

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. Moreover, it is important to understand household saving when it comes to designing appropriate pension systems. 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' saving decisions. 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 Fernández (2011)[1], 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 as language is one of the major proxies for culture that have been analyzed in the existing literature (e.g., Falk et al. (2015), Spolaore and Wacziarg (2015), Desmet et al. (2012), Gertler (2003)).[2] Moreover, it could be interpreted as 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, positive reciprocity and altruism can affect a household's saving decisions: Impatient households are more likely to consume today than to save for the future (e.g., Fisher (1930), Dohmen et al. (2015)). In addition, different levels of reciprocity and altruism can lead to effective risk sharing in informal networks. The expectation of mutual help in informal networks of family and friends in the case of adverse income or expenditure shocks might lead to lower ex-ante saving (Ortigueira and Siassi (2013)).

[1] see Guiso et al. (2006) for a similar definition of culture.

[2] The other major proxy is religion that has been discussed in the literature (e.g., Campante and Yanagizawa (2016), Becker and Woessmann (2009), Guiso et al. (2003), Basten and Betz (2013)).

Switzerland is a suitable laboratory to analyze the role of households' exposure to different language groups in their 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 have been stable over the last decades).[3] 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 30% within 10 kilometers (the share of French-speaking individuals moves accordingly).

As almost all policies and laws are set either at the national or the cantonal level, there is no associated change in policies and institutions at the parts of this border that run through cantons. Besides, 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. (2016)). 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. (2016)).

To isolate the effect of language group exposure on households' financial decisions, I employ survey data from the *Swiss Household Panel* (waves 1999 until 2014). 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). In addition, it contains a wide range of socio-economic household char-

[3] see, for example, Zimmerli (1891) for details.

acteristics, 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[4] per year, population at the municipality level per year and the number of bank branches at the ZIP code level (year-end 2012).

My primary empirical strategy is related to a spatial regression discontinuity design.[5] Exploiting exogenous changes in the dominant language per municipality, I test for discontinuities in household savings at the language border. The key identifying assumption of this local border contrast is that the expectations of potential outcomes[6] are continuous at the language border conditional on further covariates. I argue that this is reasonable to assume - especially for those parts of the language border that run through cantons.

I estimate the effect of households' exposure to language groups on their propensity to save. For this purpose, I employ three saving variables: First, I use a variable that indicates whether a household can save at least *CHF* 100 per month.[7] Second, I employ a variable that indicats whether a household's income is higher than its expenses. Third, I use a variable that indicates whether a household saves in a voluntary retirement account. To investigate the aspects 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 (*Cultural Aspect 1*). Second, I test whether households in the German-speaking part are less likely to obtain transfer payments from their informal network during financial distress. In this case, they should be more likely to save ex-ante (*Cultural Aspect 2*).

I document that households in the German-speaking part are more than 11 percentage points more likely to save. The estimated effect more than doubles when implementing the local border contrast. I find evidence that there are differences in impatience that are consistent with the initial differences in household saving across language regions. There is no evidence of differences in obtaining transfers from informal networks in financial distress across these regions.

[4]There are 148 districts in Switzerland (as of January 2013).
[5]Moreover, I apply a selection on observables strategy.
[6]which are the saving variables in my case.
[7]CHF 100 is about USD 96 (as of October 2014).

This paper contributes to several strands of the literature. While the role of short-term social interactions among peers 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 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. (2015), Bover et al. (2014), Breuer and Salzmann (2012)) and examining financial decisions of first- and second-generation immigrants to a country (Carroll et al. (1994), Haliassos et al. (2016)). 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 first- and second-generation immigrant groups from different countries 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 limitations by comparing the saving decisions of a representative and homogeneous sample of households not only within a country but within a small geographic scope. 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.

The present paper is closely related to Chen (2013) and Sutter et al. (2015) who analyze the role of language in individuals' intertemporal choices[8] within the framework of the recently developed linguistic savings hypothesis.[9] It contributes to this recent strand of the literature in two ways.

[8] In addition to individual saving decisions also decisions about schooling, labor market and health choices, pro-social behaviors, and family structure.

[9] According to it, languages differ in the way they grammatically mark future events: In some languages speakers are forced to explicitly distinguish between the present and the future by making use of constructions such as "Tomorrow the sun *will* shine" in English (so-called "strong future-time reference (s-FTR)"). By contrast, other languages allow their speakers to use the present tense to mark future events (e.g., "Morgen scheint die Sonne" (in German) (so-called "weak future-time reference (w-FTR)"). Chen (2013) argues that strong FTR languages may make the future feel more distant. This should imply that the speakers make less future-oriented choices as they are less patient.

First, it *qualifies* the results found by Chen (2013) and Sutter et al. (2015) in an important dimension. While Chen (2013) predominantly exploits cross-country variation to show how differences in language syntax affect individuals' intertemporal choices, the paper neglects the possibility that economic conditions (e.g., interest rates, access to saving products, employment possibilities) might not only vary within country but even within country regions. Hence, it is questionable whether the estimated effects of language allow for a causal interpretation. Sutter et al. (2015), by contrast, provide experimental evidence on intertemporal choices of primary school children of a bilingual city in Northern Italy. While their results allow for a causal interpretation, it is not clear whether these results hold only for school children or whether they are valid for the broader population. The present paper qualifies these results by estimating the effect of households' exposure to language groups for a *homogeneous* sample of households which is *representative* of the population (in contrast to Sutter et al. (2015)). Moreover, it estimates this effect *within a small geographic scope* which allows for a causal interpretation (in contrast to Chen (2013)).[10]

Second, the present paper differs conceptually in subtle but important dimension from Chen (2013) and Sutter et al. (2015): Instead of claiming that the syntax of the *spoken* language *per se* affects intertemporal choices through differences in time preferences, I consider a language group merely as a proxy of culture which is defined by a set of different norms and preferences. Hence, *any* preference or norm could be relevant to the observed differences in household saving. In addition to time preferences, also levels of altruism, positive and negative reciprocity, trust or risk aversion might differ across language groups (e.g., Falk et al. (2015)).

In this paper, I focus on the subset of preferences in norms that I believe are likely to influence households' saving decisions: time preferences and altruism, positive reciprocity.[11] First, more patient households should be - ceteris paribus - expected to save more.[12]

[10]By investigating household decisions in Switzerland, the present paper also relates to a strand of literature that investigates Swiss language regions to point out cultural differences with respect to the preference and demand for social insurance (Eugster et al. (2011)), valuation of publicly provided goods (Eugster and Parchet (2014)), attitudes towards work (Eugster et al. (2012)), and attitudes towards the labor force participations of mothers (Steinhauer (2013)). Besides, Egger and Lassmann (2015) analyze trade flows within Switzerland to assess the relevance of speaking a common language for international trade.

[11]In Figure 5 (in the Appendix), I provide a graphical illustration of the conceptual framework of this analysis.

[12]see, for example, Fisher (1930) for a discussion of intertemporal choice and Dohmen et al. (2015) for empirical evidence.

Second, both positive reciprocity[13] and altruism[14] have been shown to provide effective enforcement mechanisms for risk sharing through informal networks across households (Posner (1980), (Ravallion and Dearden (1988), Cox (1987)). The *expectation* of being helped by others through these informal networks should lead to lower ex-ante saving (Ortigueira and Siassi (2013)). Hence, in the present paper, I also analyze whether the degree of patience and risk-sharing across households are consistent with the observed differences in household saving (across language groups).

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 aspects of culture. Section 7 discusses the validity of the results and section 8 draws final conclusions.

[13]Reciprocity builds on the idea that one helps somebody else because one expects to be helped in the future ("quid pro quo").

[14]The concept of altruism and altruistic behavior build on the idea that there is an emotional reward for helping others (e.g., Andreoni (1989), Andreoni and Payne (2003)).

2 Theoretical Motivation

In this section, I motivate how different degrees of time preferences and risk sharing through transfer payments in the case of financial distress can affect households' saving decisions in a stylized framework. In particular, 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[15] it is (*Cultural Aspect 1*). I then go on to show that a household will not save *ex-ante* if it receives a transfer payment to cover the income shock once it materializes. This transfer payment can be interpreted as effective risk sharing in informal networks (e.g. due to altruistic or reciprocal behavior) (*Cultural Aspect 2*).

The following stylized example extends a simplistic two-period model of intertemporal choice[16] by a third period, uncertain labor income and the possibility of transfer payments.[17] In particular, I assume the following:

- 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 $0 < \beta \leq 1$.[18] Furthermore, I assume that there are two types of households depending on whether they obtain a transfer payment T in case the shock materializes. Type A household does not obtain a transfer payment in period 2. Type B

[15] Households with higher discount factors.

[16] In principle, it traces back to Fisher (1930). The discussion in this section builds on a simple formal application (Varian (2010)).

[17] I would like to emphasize that this stylized example is - by no means - meant to be a theory contribution. The present paper is empirical.

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

household obtains a transfer payment. In case of a negative income shock, it receives a transfer payment of $T = \sigma$, which it repays in period 3.[19]

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 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

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

strictly positive if its discount factor β is sufficiently high (see Appendix B.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 receive transfer payments 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 B.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 (*Cultural Aspect 1*).

Type B Household: Transfer payments 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 B.3 for details).

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

Hence, households that receive transfer payments which fully cover the income shock do not save ex-ante. Hence, effective risk-sharing through informal networks can lower ex-ante saving (e.g. due to altruistic or reciprocal behavior) (*Cultural Aspect 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 2014, 63.3 percent of the resident population of Switzerland declared German as their main language, 22.7 percent speak primarily French, 8.1 percent speak predominantely Italian, 0.5 percent speak primarily Romansh (and the rest speak predominantly another language).[20] 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).

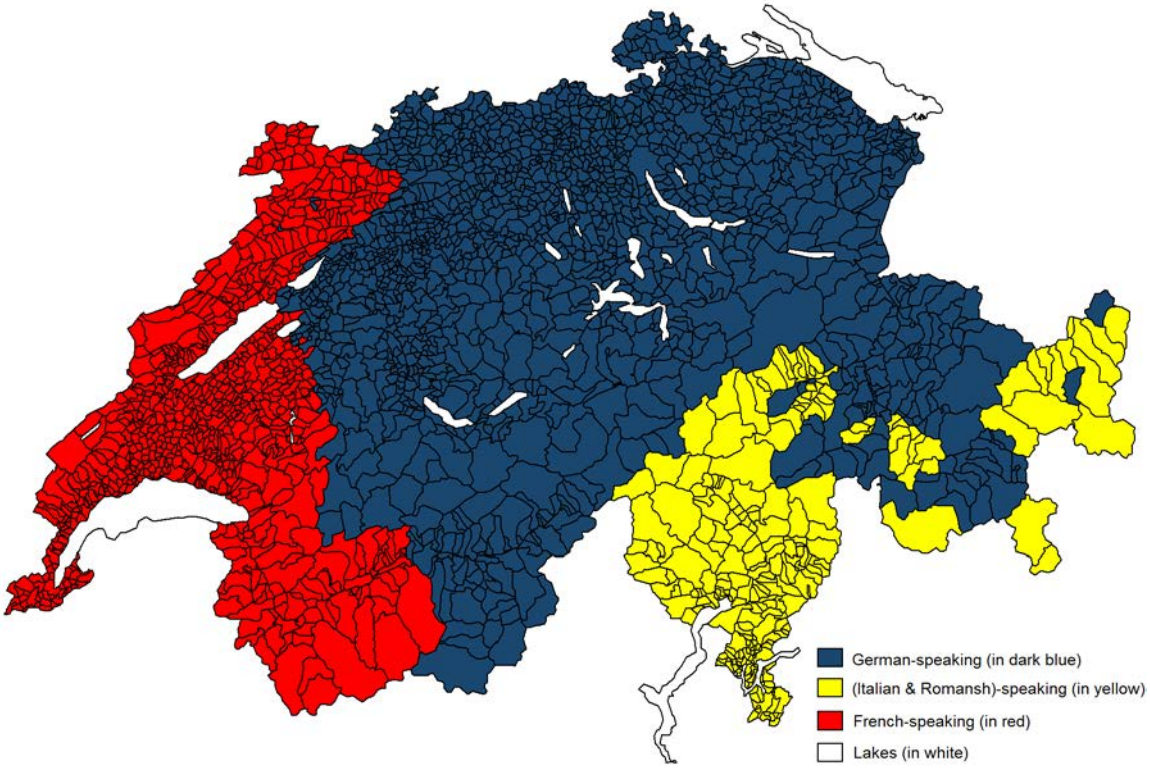
Figure 1 shows the preferred language spoken by the majority of residents of each municipality. It can be seen from this figure that the majority of residents in the north-eastern part of Switzerland speak predominantly German. In the western part of Switzerland, the majority of people speak French while 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 90% to about 30% within 10 kilometers.[21]

[20] Source: `http://www.bfs.admin.ch/bfs/portal/en/index/themen/01/05/blank/key/sprachen.html`, accessed on April 13th, 2016. The share of multilingual people is about 15.8% (source: `http://www.bfs.admin.ch/bfs/portal/de/index/news/medienmitteilungen.html?pressID=8089`, accessed on April 13th, 2016.

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

Figure 1: Language regions in Switzerland



This figure shows the main language by municipalities in Switzerland. The colour *dark blue* illustrates municipalities with a German-speaking majority. The colour *yellow* illustrates municipalities with an Italian-speaking majority or Romansh-speaking majority and *red* illustrates municipalities with a French-speaking majority (in 2000). Lakes are indicated by the colour *white*.
Source: *Swiss Population Census* in 2000. Further details are provided in Appendix A.

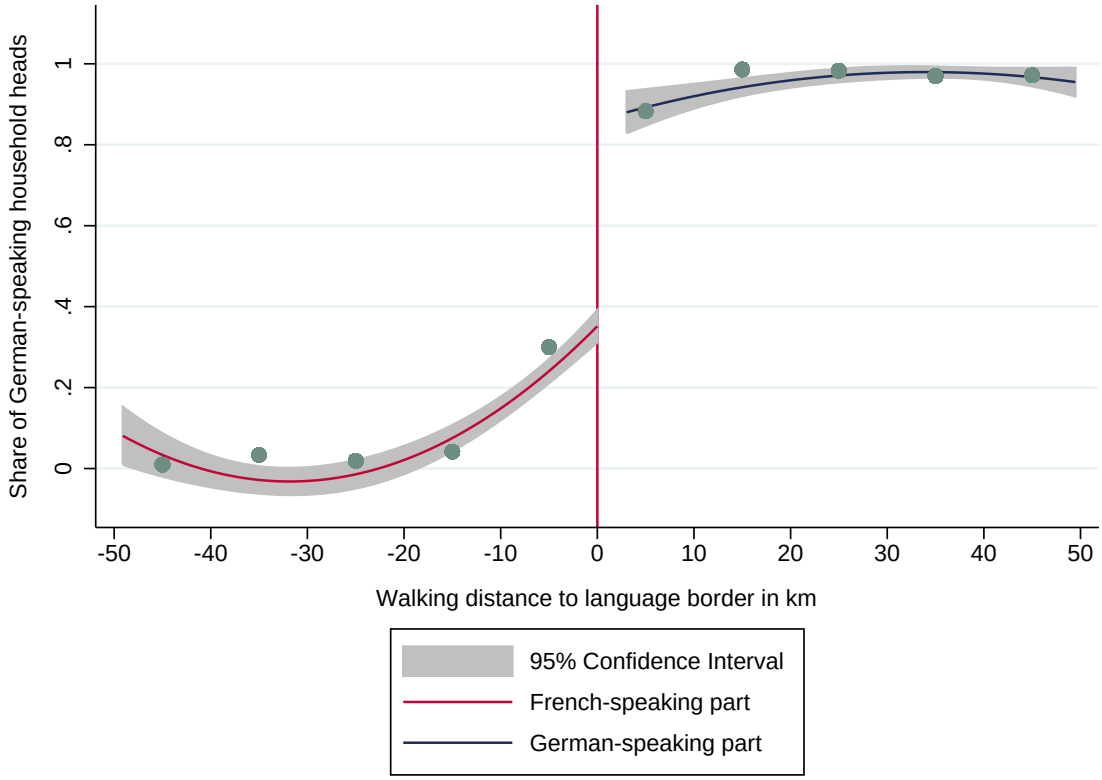
In Switzerland, most policies are set either at the federal or at the cantonal level.[22] For example, cantons have discretion in setting cantonal income and wealth tax rates. This is important, as it is not income before taxes but net income that affects household saving. Similarly, differences in net wealth could affect household saving. In addition, cantons 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) and I only compare

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

households located in the same canton.[23]

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 (1999-2014).*

3.2 Differences in Household Saving Rates

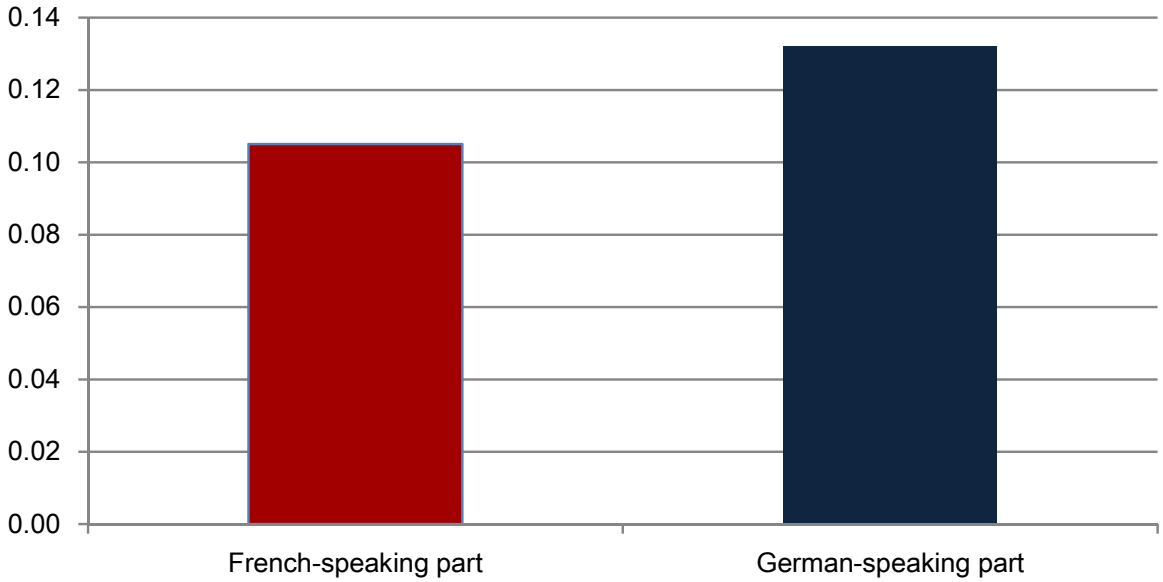
There is substantial heterogeneity across language regions regarding household saving. Figure 3 shows household saving rates in Switzerland in terms of language regions in 2011. These saving rates are calculated by subtracting all expenses from the entire household income and are obtained from the Swiss *Household Budget Survey*.[24] This figure sug-

[23]I argue that decisions made by the lowest administrative units, municipalities, do not affect households' saving decisions (as these decide on schools and welfare provision, energy supplies, roads or local planning). Yet, they also decide on municipal tax rates. It has been shown, however, that there are only small differences in municipal taxes due to tax competition wtihin a small geographic scope (see Eugster and Parchet (2014)).

[24]The *Household Budget Survey* 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

gests 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).

Figure 3: Household saving rates in terms of language region



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).*

This is first suggestive evidence that household saving rates differ indeed across language regions. However, the *Household Budget Survey (HBS) (2011)* does neither include further household characteristics nor the exact location of each household. Hence, it does not lend itself to a more rigorous analysis. Therefore the present paper exploits the *Swiss Household Panel*. This survey, however, does *not* elicit household saving *rates*. Instead it includes indicators of whether households can and do save a certain amount. In particular, it elicits whether households can save at least CHF 100, do save more than CHF 0 and whether households save in a voluntary retirement account. In this paper, I use these proxies for household saving. To make households comparable across language regions, 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

Federal Statistical Office[25]. 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.

explained by their different cultural exposure.

4 Data, Identification, Estimation

4.1 Data

The *Swiss Household Panel (SHP)* is a longitudinal survey of households whose members represent the non-institutional population resident in Switzerland. It comprises three samples drawn by the *Federal Statistical Office*[26]. The first sample was selected and interviewed in 1999 for the first time (it included 5,074 households and 7,799 persons). The second sample (2,538 households and 3,654 respondents) was interviewed in 2004 for the first time and the third sample was interviewed in 2013 for the first time. This last sample included 3,989 households and 6,090 persons (see Voorpostel et al. (2015) for a detailed overview).[27]

The present paper essentially uses two parts of the *Swiss Household Panel*: 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).

Intertemporal financial decisions

The first dependent variable in my empirical analysis is *Saving (> CHF 100)*, which indicates whether the household can save at least *CHF* 100 monthly.[28] The summary statistics provided in Table 6 (in the Appendix) show that about 83 percent of my representative sample of low- and middle-income households save at least *CHF* 100 monthly. This im-

[26] *Bundesamt für Statistik (BfS)*

[27] I would like to mention that some households appear between 2000-2003 and 2005-2012 and in 2014 because of (1) household splits (e.g. due to divorces), (2) household starting to answer all questions (e.g. on saving). At the household level, attrition rates were rather low and ranged typically between 6% and 10% per wave (Voorpostel et al. (2015)). Compared to the original data set, this final sample includes some missing values. I do not impute them but assume that they are random. Moreover, I would like to clarify that the individual observations are not weighted.

[28] The wording of the question is: *"Can you save at least 100 frs monthly?"*.

plies that about one-fifth of the households do not save a minimum share of their income. Employing this dependent variable might raise two concerns. First, households that report that they *can* save at least CHF 100 do not necessarily *actually* save at least CHF 100. Second, this binary variable is essentially an arbitrage cutoff point of the distribution of household saving within Switzerland (hence, it is unclear whether the differences in household saving would persist at different cutoff points (e.g., at *CHF 500*)).

Hence, I provide two alternative dependent variables: First, I employ the variable *Saving (> CHF 0)*, which indicates whether the household's income is higher than its expenses.[29] As indicated in Table 6 (in the Appendix), about 52 percent of households do save.[30] Second, I employ *Retirement saving*, which indicates whether the household saves voluntarily into a voluntary "pillar 3" retirement account.[31] It turns out that the share of households without such an account is more than one-third (see Table 6 in the Appendix).

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.[32] Table 6 (in the Appendix) shows that about 11 percent of all households fall into payment arrears each year.

Household and household head characteristics

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*), preferred language spoken (*German speaker*)[33] and other socio-economic characteristics (*Age*, *Swiss*).

Language by municipality, language region and distance

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

[29]The wording of the question is: *"If you consider the total of your household's income and expenses, would you say that currently your household can save money, your household spends what it earns, your household eats into its assets and savings, or your household gets into debts?"*.

[30]Notice that the share of households that report to save is substantially lower than the share of households that report that they *can* save at least *CHF 100*. This inconsistency might point to different interpretations of the survey questions.

[31]The wording of the question is: *"Do you save into a "pillar 3" scheme (for example a private pension fund, life insurance)?"*.

[32]Definitions of the variables are provided in Table 5 (in the Appendix). Summary statistics of all variables are provided in Table 6 (in the Appendix).

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

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 A.

Regional variables

As existing research has shown that unemployment expectations can have an effect on households' saving decisions (e.g., Basten et al. (2016)), I also control for regional unemployment rates. To do so, I employ information on regional unemployment rates by district and year from *State Secretariat for Economic Affairs (SECO)*. I acknowledge that existing unemployment rates are only a good predictor of future unemployment if one is willing to make the assumption that unemployment rates develop over time as a random walk with mean zero.[34] As the supply of saving products might differ across language regions, I use *Bank branches* which serves as a proxy for the availability of financial services. It indicates the number of bank branches at the ZIP code level in 2012 (these data were hand-collected and previously used by Brown et al. (2016)). In addition, I use *Population* which indicates the population per municipality (which I obtain from *Swiss Federal Statistical Office*[35])

Sample selection

I only consider survey respondents between 1999 and 2003 because the primary dependent variable *Saving (> CHF 100)* is only available in these survey waves.[36] Due to a high autocorrelation of *Saving (> CHF 100)* (and the other saving variables)[37] within household over time, I only include the first observation of each household in the final dataset.[38]

Additionally, I only include households that have their primary residence in one of the

[34] Therefore, as a robustness check, I employ the household heads' individual unemployment expectations as reported in the *Swiss Household Panel (SHP)*. The main results remain qualitatively similar. Due to a large number of missing values, I abstain from reporting these results as the main results.

[35] *Bundesamt für Statistik (BfS)*

[36] In section 7, I show that the results for the other saving variables (*Saving (> CHF 0)* and *Retirement saving*) stay similar when also including later time periods (2003-2014).

[37] E.g., almost all households that can save at least CHF 100 in 1999 report that they can save at least CHF 100 in 2000.

[38] That is why, the number of observations is equal to the number of households in the analysis.

three bilingual cantons (Bern, Fribourg and Valais). I also only include households whose household heads are non-retired[39] 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 575 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.[40]

The N=575 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 analyzing whether and how the exposure to a different dominant language group affects the saving decisions of households. In the main analysis, the outcome variable $Y_{i,m}$ stands for three saving proxies. First, I employ *Saving (> CHF 100)*, which indicates whether the household can save at least *CHF* 100 monthly. Second, I use *Saving (> CHF 0)*, which indicates whether the household's income is higher than its expenses. Third, I employ *Retirement saving*, which indicates whether the household saves voluntarily into a "pillar 3" retirement account.

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 aspects 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 transfer payments they receive after falling into payment arrears.

[39] I exclude households whose household heads are retired but do not exclude self-employed and unemployed household heads.

[40] 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 an empirical strategy which is closely related to a stylized spatial regression discontinuity design.[41,42] By doing so, I essentially compare 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)):

$$\delta = E[Y_{i,m}(1) - Y_{i,m}(0)|Distance_{i,m} = 0] = E^r(Y_{i,m}) - E^l(Y_{i,m}) \tag{11}$$

Discussion

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

$$E(Y_{i,m}(1)|Distance_{i,m} = x) \; and \; E(Y_{i,m}(0)|Distance_{i,m} = x) \tag{12}$$

are continuous at $x = 0$ (see Imbens and Lemieux (2008) for a detailed discussion).

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 German-speaking

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

[42] In section 7, I show that the results are qualitatively similar, when applying a selection on observables strategy and discuss differences of these strategies in terms of identifying assumptions and identified effects.

municipality, right across the *nearby* language border to the French-speaking side (vice versa we would not expect to see a jump for a household in a French-speaking municipality which was moved).

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 households' 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.[43] 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.[44] To make the assumption more plausible, I also provide estimates when additionally conditioning on household and regional characteristics.

4.3 Estimation

In the baseline analysis, I estimate this effect using the following parametric specification (similar to that used by Eugster et al. (2011)):

$$Y_{i,m} = \alpha + \delta G_{i,m} + \beta_{l1} Distance_{i,m} + \beta_{r1} G_{i,m} Distance_{i,m} + X'_{i,m}\gamma + \epsilon_{i,m} \qquad (13)$$

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 (which makes assumption in equation 12 more plausible conditional on further covariates). 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 spatial trends using the $Distance_{i,m}$ variable (in unreported robustness checks I also use non-linear spatial trends). 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

[43] 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.

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

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.

Given the relatively low number of survey respondents that are located in the three bilingual cantons in my sample, I estimate equation 13 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.[45]

I estimate this regression in two ways: I provide the results of a linear regression estimated using ordinary least squares (while clustering the standard errors on the municipality level). This approach allows for a within-canton and within-year comparison via the usage of the corresponding fixed effects. Acknowledging the drawbacks of this approach[46], I also estimate a logit model using a *Maximum Likelihood* estimation and report the corresponding marginal effects at the mean of all variables.[47] Given the relatively high number of observations per canton, I am not concerned about the well-known incidental parameter problem that might lead to inconsistent point estimates.[48,49]

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. 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.

[45] Estimating optimal bandwidths using a cross-validation techniques as discussed in Imbens and Lemieux (2008) proved to be unreliable due to an extremely high variance in the dependent variables (see Figure 4 for a graphical illustration). This is mainly due to the binary nature of these variables and the relatively low number of observations on both sides of the language border. That is why I opt for this - more robust - estimation using a parametric specification and fixing ad-hoc bandwidths.

[46] It might lead to biased and inconsistent estimates (Horrace and Oaxaca (2006)), misclassification in case of measurement error (Hausman et al. (1998)), and predictions outside of the unit interval in case of extreme values of covariates.

[47] Again I cluster standard errors on the municipality level.

[48] see, for example Greene (2004) for an in-depth discussion on the usage of fixed effects in non-linear models.

[49] In unreported robustness checks, I estimate conditional logit models for almost all specifications. Abrevaya (1996) explains the conditional logit model and provides an example of the bias due to the incidental parameter problem present in the simple logit model using fixed effects.

Panel A of Table 1 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 share of households that can 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. In line with this result, the share of households that actually do save more than *CHF 0* is about 17 percentage points higher in the German-speaking part than in the French-speaking part. This difference is qualitatively similar when considering the share of households that saves in a voluntary retirement account (difference of 11 percentage points between language regions).

While the households in this sample differ with respect to their saving decisions, they are similar in terms of other major dimensions. Panel B of Table 1 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 socio-economic characteristics - in particular gender *(Male)*, education *(University)*, nationality *(Swiss)*, and employment status *(Employed)*.

Table 1: Household decisions & socio-economic characteristics in terms of language region

Panel A. Households' financial decisions

	German-speaking part	French-speaking part	Difference
Saving (> CHF 100)	0.879	0.760	0.119***
	(N=321)	(N=254)	(N=575)
Saving (> CHF 0)	0.598	0.429	0.169***
	(N=321)	(N=254)	(N=575)
Retirement saving	0.682	0.571	0.111***
	(N=321)	(N=254)	(N=575)

Panel B. Household and household head characteristics

	German-speaking part	French-speaking part	Difference
Household characteristics			
Household income	10.467	10.421	0.045
	(N=321)	(N=254)	(N=575)
Household size	2.910	2.799	0.110
	(N=321)	(N=254)	(N=575)
Household head characteristics			
Male	0.464	0.413	0.051
	(N=321)	(N=254)	(N=575)
University	0.134	0.142	-0.008
	(N=321)	(N=254)	(N=575)
Age	41.483	39.406	2.077**
	(N=321)	(N=254)	(N=575)
Swiss	0.925	0.898	0.028
	(N=321)	(N=254)	(N=575)
Employed	0.757	0.783	-0.026
	(N=321)	(N=254)	(N=575)

This table compares households' saving decisions (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 5 (in the Appendix).

5.2 Household Saving by Language Region

In this section, I show that the univariate differences in household saving are robust to more rigorous empirical testing. Figure 4 illustrates average household saving decisions

depending on the language region and in terms of distance to the language border: In particular, it shows the share of households that can save at least *CHF 100* per month, the share of households that do save more than *CHF 0* per month and the share of households that save in a voluntary retirement account. Dots left of the vertical line indicate the share of household saving per 10km segments in the French-speaking part (vice versa dots right of the vertical line indicate the share of household saving per 10km segments in the German-speaking part).

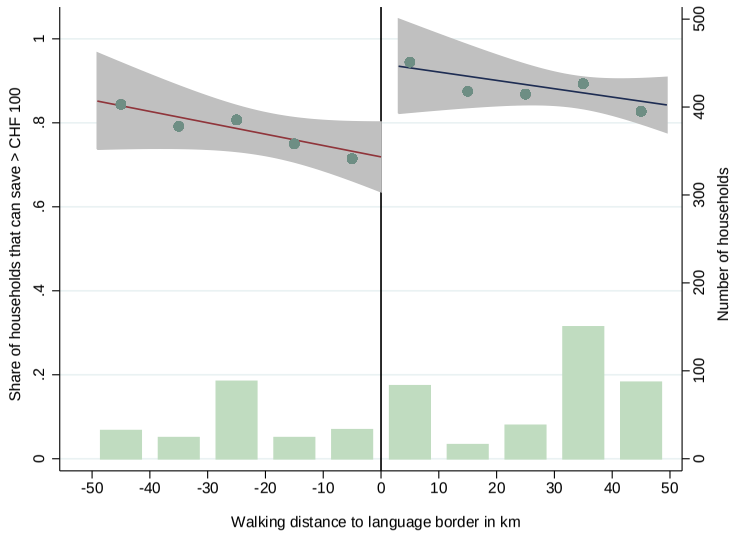
Analyzing all three saving variables, there are two stylized facts: First, it can be seen that the share of households that can and do save is substantially higher in the German-speaking part than in the French-speaking part. Second, there is evidence that the share of households that save jumps discontinuously at the language border, where the walking distance is zero.[50]

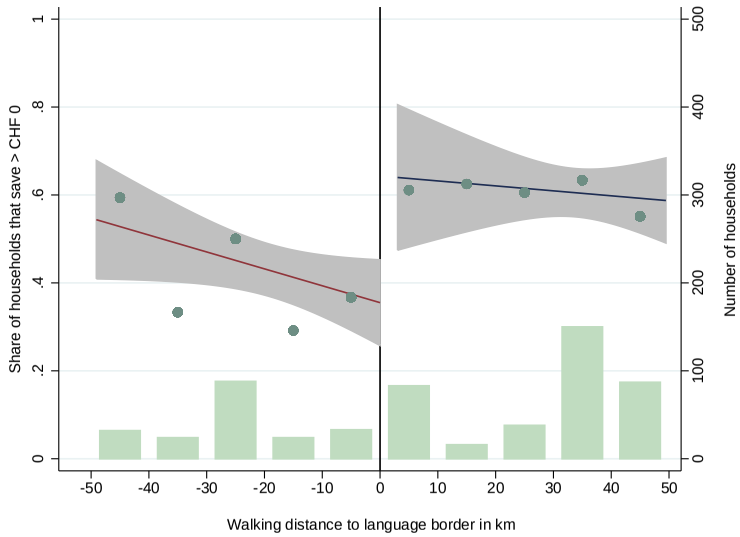
I am interested in whether the size of this discontinuity in household saving at the language border is economically meaningful and statistically different from zero. Therefore, I implement the regression in equation 13 and report the point estimate of the parameter δ. This estimate can be interpreted as the effect of households' exposure to a German-speaking language group on their saving behavior at the language border.

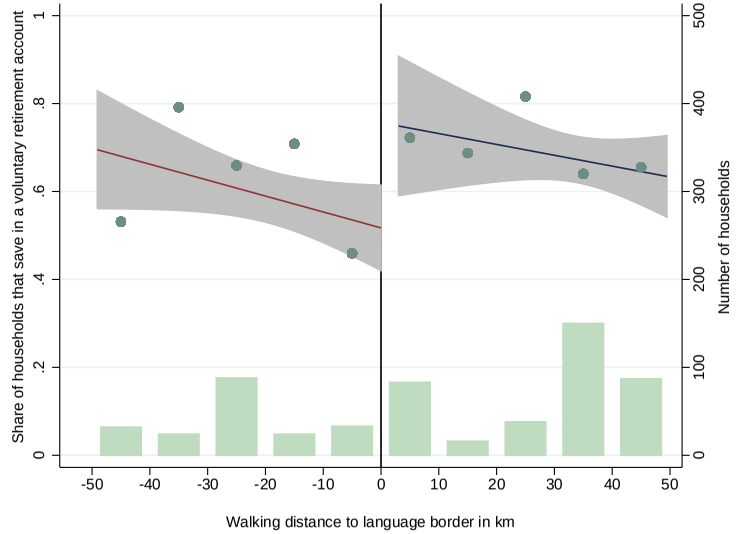
Table 2 reports my baseline estimates in my preferred sample of non-retired low- and middle-income households located within 50 km of the language border in the three bilingual cantons (Bern, Fribourg, Valais). This table reports the baseline point estimates estimated using OLS (which allows for within-canton and with-year comparisons via the usage of the corresponding fixed effects).

[50]This figure suggests that saving behavior becomes similar the further the households are located from the border. I would like to mention that that this descriptive finding does not necessarily contradict the role of culture in households saving decisions: The further away from the border, the more likely it is that the role of culture decreases and further factors differ. To elicit the role of further factors, I regress the distance variable and all covariates, I employed in the main analysis. I find that *Household size, University, Unemployment rate, Population* are statistically significant (these results are available upon request).

Figure 4: Household saving in terms of language region







This figure shows the share of households that report to save (*Saving (> CHF 100), Saving (> CHF 0), Retirement saving*) in terms of distance to the language border. Dots left of (right of) the vertical line indicate the share of households' saving decisions in 10km segments in the French-speaking part (German-speaking part). The colored bars indicate the number of households per 10km segments. Source: *Swiss Household Panel (1999-2003).*

The first column of Table 2 shows the effect of households' exposure to a German-speaking language group on their ability to save at least *CHF 100* per month when considering linear spatial trends (and canton and year fixed effects). The estimated effect is about 28 percentage points and statistically significant at all conventional significance levels. This gap slightly increases to 34 percentage points when controlling for household characteristics (*Household income, Household size, Male, University, Age, Swiss, Employed*)) and regional characteristics (*Unemployment rate, Population, Bank branches*) (see Column (2)).[51]

The estimated effect is similar in magnitude (20 percentage point vs. 24 percentage points) when analyzing the effect on the alternative outcome variable *Saving (> CHF 0)* (see Column (2) and Column (3)). Last, I obtain qualitatively similar results (38 percentage points vs. 32 percentage points) when analyzing the effect on *Retirement saving* (see Column (5) and Column (6)).

Acknowledging the drawbacks of using a linear regression technique, I also estimate a logit model using a *Maximum Likelihood* but now only considering canton fixed effects to mitigate concerns about the consistency of the point estimates. The marginal effects at the mean of all variables reported in Table 7 (in the Appendix) can confirm my results.

In unreported robustness checks, I show that these results are robust to decreasing and increasing the bandwidths by 20 km in both language regions and to the inclusion of quadratic spatial trends.[52] 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.

[51] In unreported robustness checks, I also control for wealth transfers (i.e. monetary gifts from family members outside the immediate household as well as inheritance, bequests and other sources of wealth worth more than CHF 50'000 in a year) (as used by Blickle and Brown (2015)) and the change of average house prices between 2003 and 2012 at the MS Region level (as employed by Brown and Guin (2015)). Indicators on the debt level of municipalities are not publicly available in Switzerland and information on household wealth is not available in the survey waves I employ.

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

Table 2: Household saving in terms of language region

	(1)	(2)	(3)	(4)	(5)	(6)
Survey Wave	1999-2003		1999-2003		1999-2003	
Bandwidth	50km		50km		50km	
Dependent variable	Saving (> CHF 100)		Saving (> CHF 0)		Retirement saving	
German-speaking part	0.279***	0.344***	0.200**	0.238**	0.382***	0.317***
	[0.044]	[0.065]	[0.081]	[0.099]	[0.098]	[0.107]
Distance	-0.004**	-0.006***	-0.002	-0.004*	-0.005*	-0.004
	[0.001]	[0.002]	[0.002]	[0.002]	[0.003]	[0.002]
German-speaking part	0.001	0.002	0.003	0.005	-0.000	-0.002
*Distance	[0.002]	[0.002]	[0.003]	[0.003]	[0.004]	[0.003]
Household income (Ln)		0.205***		0.184***		0.155***
		[0.033]		[0.038]		[0.047]
Household size		0.036***		0.000		0.074***
		[0.012]		[0.017]		[0.017]
Male		0.009		0.020		0.051
		[0.032]		[0.040]		[0.037]
University		0.124***		0.052		-0.018
		[0.046]		[0.052]		[0.064]
Age		0.000		-0.001		0.004***
		[0.001]		[0.002]		[0.002]
Swiss		0.146**		0.117*		0.176**
		[0.060]		[0.065]		[0.083]
Employed		0.034		0.002		-0.014
		[0.041]		[0.048]		[0.044]
Unemployment rate		0.042*		0.011		0.039
		[0.023]		[0.036]		[0.039]
Population		0.000		0.000*		-0.000
		[0.000]		[0.000]		[0.000]
Bank branches		-0.003		-0.002		-0.027***
		[0.007]		[0.012]		[0.010]
Year FE	YES	YES	YES	YES	YES	YES
Canton FE	YES	YES	YES	YES	YES	YES
Observations	575	575	575	575	575	575
Households	575	575	575	575	575	575
Municipalities	160	160	160	160	160	160
Share in German-speaking part	0.558	0.558	0.558	0.558	0.558	0.558
Mean of dependent variable	0.826	0.826	0.523	0.523	0.633	0.633
Adjusted R-squared	0.027	0.105	0.030	0.056	0.033	0.109
Method	OLS	OLS	OLS	OLS	OLS	OLS

This table displays the estimates of a linear model estimated using *OLS* where the dependent variables are *Saving (> CHF 100)* which is a binary variable indicating whether the household can save at least CHF 100 per month, *Saving (> CHF 0)* which indicates whether a household's income is higher than its expenses and *Retirement saving* which indicates whether the household saves in a voluntary retirement account. Definitions of the variables are provided in Table 5 (in the Appendix). 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.

6 Possible Cultural Aspects

In this section, I analyze whether the observed differences in household saving are consistent with different distributions of preferences and norms that vary across language groups and can affect households' saving decisions. In line with the existing literature, I test several specific dimensions of norms and preferences. Impatient households are more likely to consume today than to save for the future (e.g., Fisher (1930), Dohmen et al. (2015)). In addition, different levels of reciprocity and altruism can lead to effective risk sharing in informal networks. The expectation of mutual help in informal networks of family and friends in the case of adverse income or expenditure shocks might lead to lower ex-ante saving (Ortigueira and Siassi (2013)).[53] In this section, I analyze whether the degree of impatience and effective risk-sharing through informal networks differ across language regions.

6.1 Cultural Aspect 1: Impatience

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

To answer this question, I employ past tobacco consumption as a proxy for individual impatience and, hence, discount factors. Several existing studies have shown that there is a direct and positive relation between past smoking behavior and individual patience (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.

As in my main analysis, 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

[53] Figure 5 (in the Appendix) points out the conceptual framework of the present paper.

(Bern, Fribourg and Valais) in these years.

The share of household heads that have ever smoked tobacco is substantially higher among the 207 households in the French-speaking part (64%) than among the 309 households in the German-speaking part (55%). The difference of 9 percentage points is economically meaningful and statistically significant at the 5 percent significance level (see Column (1) of Table 3).[54]

To analyze whether the result of this descriptive difference in means persists when implementing a more rigorous empirical analysis, I again estimate the regression suggested in equation 13 but now change the dependent variable to *Tobacco smoked*. The point estimates reported in Column (2) of Table 3 show that the effect of households' exposure to a German-speaking language group increases the propensity to have smoked tobacco by about 22 percentage points (it is statistically significant at the five percent level). The magnitude and statistical significance remain qualitatively similar after controlling for socio-economic household characteristics (*Household income, Household size, Male, University, Age, Swiss, Employed*) and regional variables (Column (3)).

Overall, there is evidence of a discontinuity in this proxy of impatience at the language border: Housholds exposed to French-speaking municipalities show higher degrees of impatience than households exposed to German-speaking municipalities.[55] In Table 8 (in the Appendix), I show that these results are robust to using a non-linear estimation procedure. In addition, I can show that these results are similar when changing the ad-hoc bandwidths by 20 km and controlling for the religion of the household head (unreported robustess checks).

[54]Please notice that the number of households (& observations) now differ with respect to the main analysis presented in section 5 as the sample covers households in the years 2010 and 2011. Again I consider the first observation per household. That is why, the number of households equals the number of observations.

[55]The finding of household heads in the German-speaking part being more patient than household heads in the French-speaking part is consistent with Chen (2013) and Sutter et al. (2015). They argue and find that speakers of languages with weak future-time reference (w-FTR) (e.g. German) are more patient than speakers of languages with strong future-time reference (s-FTR) (e.g. French).

Table 3: Patience in terms of language region (linear)

	(1)	(2)	(3)
Survey Wave		2010 & 2011	
Bandwidth		50km	
Dependent variable		Tobacco smoked	
German-speaking part	-0.089**	-0.218**	-0.348***
	[0.045]	[0.093]	[0.107]
Distance		0.005**	0.005
		[0.003]	[0.003]
German-speaking part*Distance		-0.006*	-0.007*
		[0.003]	[0.004]
Household income (Ln)			-0.000
			[0.043]
Household size			-0.056***
			[0.016]
Male			0.100**
			[0.047]
University			0.030
			[0.053]
Age			-0.000
			[0.002]
Swiss			-0.119*
			[0.068]
Employed			-0.053
			[0.063]
Unemployment rate			-0.097**
			[0.041]
Population			0.000
			[0.000]
Bank branches			-0.006
			[0.012]
Year FE	NO	YES	YES
Canton FE	NO	YES	YES
Observations	516	516	516
Households	516	516	516
Municipalities	196	196	196
Share in German-speaking part	0.599	0.599	0.599
Mean of dependent variable	0.589	0.589	0.589
R-squared	0.008	0.022	0.067
Method	OLS	OLS	OLS

This table displays the estimates of a linear model estimated using *OLS* where the dependent variable is *Tobacco smoked* which indicates whether the household head has ever smoked tobacco. Definitions of the variables are provided in Table 5 (in the Appendix). 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.

6.2 Cultural Aspect 2: Expected Risk Sharing

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)).[56]

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 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 degrees of risk sharing measured by the propensity of taking *Informal credit* when being in the state of payment arrears.

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"*. 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).

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) between 1999 and 2014. Among these households, 407 fell into payment arrears at some point between 1999 and 2014. In total, there are 930 incidences of financial distress.[57]

A simple mean comparison suggests that households in the German-speaking part are

[56] Alternatively, these households might take *Formal credit* from financial institutions (e.g., Gertler et al. (2009)).

[57] This implies that there are several households that fell into payment arrears more than once. Notice that this sample is different from the one employed in section 5 as it only includes households that have fallen into payment arrears between 1999 and 2014.

not less but more likely to take *Informal credit* once they fall into payment arrears. The share of households that fell into payment arrears and took at least once *Informal credit* is about 5 percentage points higher among the 234 households in the German-speaking part (42%) than among the 173 households in the French-speaking part (36%) (see Column (1) of Table 4).

As before I estimate the effect of interest using the regression suggested in equation 13 but changing the dependent variable to *Informal credit*. I show these baseline results in Table 4. The estimated coefficients suggest that there is no evidence that households in the German-speaking part are less likely to rely on *Informal credit* once they fall into payment arrears. When implementing the regression, the effect remains statistically insignificant both not controlling for household and regional characteristics (Column (2) of Table 4) and controlling for them (Column (3) of Table 4).

Again, these point estimates remain qualitatively similar when decreasing and increasing the bandwidths by 20 km in both language regions. They remain robust when estimating the effect using a Logit model and reporting marginal affects at the mean of variables (Table 9 (in the Appendix)).

I conclude that there is no empirical evidence that the exposure to language groups affects the way households resolve financial distress by taking *Informal credit*.

Table 4: Informal credit in terms of language region (linear)

	(1)	(2)	(3)
Survey Wave		1999-2014	
Bandwidth		50km	
Dependent variable		Informal credit	
German-speaking part	0.050	-0.010	-0.051
	[0.049]	[0.088]	[0.091]
Distance		-0.001	-0.001
		[0.002]	[0.003]
German-speaking part*Distance		0.003	0.002
		[0.003]	[0.003]
Household income (Ln)			-0.057
			[0.049]
Household size			-0.018
			[0.016]
Male			0.003
			[0.045]
University			0.067
			[0.059]
Age			-0.011***
			[0.002]
Swiss			-0.043
			[0.068]
Employed			-0.021
			[0.078]
Unemployment rate			-0.051
			[0.033]
Population			0.000*
			[0.000]
Bank branches			-0.017
			[0.015]
Year FE	NO	YES	YES
Canton FE	NO	YES	YES
Observations	407	407	407
Households	407	407	407
Municipalities	164	164	164
Share in German-speaking part	0.575	0.575	0.575
Mean of dependent variable	0.393	0.393	0.393
R-squared	0.003	0.0587	0.144
Method	OLS	OLS	OLS

This table displays the estimates of a linear model estimated using OLS where the dependent variables are *Informal credit* which is a binary variable indicating whether the household has borrowed at least once from family or friends in case of financial distress. Definitions of the variables are provided in Table 5 (in the Appendix). 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.

7 Robustness & Validity

7.1 Concerns: Household Saving and Sample Selection

In the main empirical analysis presented in section 5, I employ three different proxies for household saving (*Saving (> CHF 100), Saving (> CHF 0)* and *Retirement saving*). These proxies might not take into consideration less explicit ways of how households might be saving. In particular, some households could 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 part of their income is used for mortgage amortization and interest payments).

To address this concern, I repeat my main analysis (as reported in Table 2) but I now control for home ownership. If different levels of home ownership were driving the observed differences in household saving across language groups, then controlling for it should lower the statistical and economic significance of households' exposure to *German-speaking part*. The results reported in Panel A of Table 10 (in the Appendix) suggest, however, that this is *not* the case. The point estimates of *German-speaking part* stay statistically significant and similar in magnitude compared to the baseline results reported in Table 2.

In addition, I mitigate concerns that might arise because of the selection of my sample. In section 5, I explicitly consider only low- and middle-income households to make the sample homogeneous in terms of income (moreover, it turns out that almost all high-income households can save at least CHF 100 and do save more than CHF 0. Hence, there is only little exploitable variation in this particular subsample of households). It remains questionable whether results hold for all households. Hence, I run a robustness test on the full sample of all households (include high-income households). The results reported in Panel B of Table 10 (in the Appendix) suggest that the point estimates of the language region remain robust when also including high-income households.

Moreover, while *Saving (> CHF 100)* is only available in the survey waves 1999-2003, the other saving proxies (*Saving (> CHF 0), Retirement saving*) are also available in subsequent survey waves. It remains questionable whether the estimated effects would have been the same in later waves. Therefore, I also run robustness tests now also covering the waves 2004-2014. The results reported in Panel C of Table 10 (in the Appendix) suggest that the point estimates of the language region remain robust when considering all time

periods between 1999 and 2014.[58]

7.2 Validity of the Results

In this section, I run a battery of validity checks. First, looking at the 1999-2003 sample of low- and middle-income households, there is a relatively high variation in household saving within both language regions (see, for example, Figure 4 for a nice illustration). This might raise the concern that the estimated discontinuities in average household saving *at the language border* are just arbitrary (and, hence, cannot be interpreted as local average treatment effects of households' exposure to language groups). To mitigate this concern, I employ two placebo tests: As suggested by Imbens and Lemieux (2008), I test whether there are discontinuities in household saving within the same language region. In particular, in each language region, I take the median distance (which is at 25km from the true language border) to the border as alternative ("placebo") borders. I then test whether there are discontinuities in household saving at these placebo borders. As illustrated by the results presented in Table 12 (in the Appendix), I do not find evidence for arbitrary discrete jumps in household saving when applying these placebo tests.[59]

Second, I address concerns that factors other than households' exposure to language groups drive the observed differences in household saving. As pointed out in section 4, a stylized spatial regression discontinuity design would require expected potential outcomes to be continuous in $Distance_{i,m}$. This assumption would be violated if factors that affect households' saving decisions but are unaffected by the dominant language in the municipality change discontinuously at this border. As pointed out in section 5, the simple mean-comparisons presented in Panel B of Table 1 suggest that the households do not differ in terms of most of the observable household characteristics that could be relevant for the household saving. While this result is interesting, it is only suggestive as not mean differences across language regions are relevant but differences at the language border. Hence, in addition, I provide a formal test of the discontinuity of all relevant household characteristics at the language border. As illustrated in Table 11 (in the Appendix), I do not find evidence for discrete jumps in most household covariates at the border.[60]

[58] Notice that I again provide the OLS results as they allow me to consider both canton and year fixed effects (in all estimations shown in Table 10). In unreported robustness checks, I verify that these results remain qualitatively similar to estimating a Logit model (including canton fixed effects) with *Maximum Likelihood* and calculating marginal effects at the mean of all variables.

[59] In unreported robustness tests, I also test the relevance of further placebo borders at other distances from the language border. Moreover, I also show that these results remain qualitatively similar to estimating a Logit model (including canton fixed effects) with *Maximum Likelihood*.

[60] Third, I analyze the residuals of the main regression shown in Column (2) of Table 2. If households in the French-speaking part differed in unobservable characteristics from households in the German-speaking

7.3 Alternative Empirical Strategy: Selection on Observables

Last, I apply an alternative identification strategy: I now control for all observable household and regional characteristics that I believe can influence households' saving decisions and could be correlated with the treatment variable (the dominant language per municipality). Formally, this "Unconfoundedness Assumption"[61] requires that potential outcomes are independent of the treatment variable $G_{i,m}$ conditional on further covariates $X^*_{i,m}$ (see, for example, Rosenbaum and Rubin (1983)), i.e.

$$Y_{i,m}(0), Y_{i,m}(1) \perp\!\!\!\perp G_{i,m} | X^*_{i,m} \tag{14}$$

I would like to clarify that this approach does not exploit the discrete change in the dominant language spoken at the language border. Instead it assumes that differences between households in the German-speaking part and the French-speaking part that share the same covariates $X^*_{i,m}$ are interpretable as average causal effects. This, however, is only an attractive assumption if one believes that distance per se is not an important confounder required by expression 14 (see, for example, Imbens and Lemieux (2008) for a detailed discussion). As there is no reason to believe this[62], $X^*_{i,m}$ includes all household and regional covariates as employed in previous regressions except for the distance to the language border.

In addition to using the dominant language per municipality as the treatment variable, I now also estimate the effect of the preferred language spoken on the propensity to save and report the results in Table 13 (in the Appendix). The results suggest that households in the German-speaking part are - on average - about 8 - 15 percentage points more likely to save. Using the preferred language spoken as the treatment variable (*German speaker*), I observe that this increases the propensity to save by about 5 - 16 percentage points.

Overall, there is empirical evidence supporting the hypothesis that households' exposure to language groups affects their saving decisions when exploiting this alternative empirical strategy.

part, the residuals of this regression should be systematically different. My results suggest that residuals are scattered randomly around zero on both sides of the language border.

[61] It is sometimes referred to as the "Conditional Independence Assumption" (e.g., Imbens and Wooldridge (2009)).

[62] Notice that Figure 4 suggests that distance per se matters for households' saving decisions. However, as indicated above, I argue that these distance variable merely catches up the effect of *Household size, University, Unemployment rate, Population.*

8 Conclusion

In this paper, I analyze the role of culture in households' saving decisions. In particular, I examine whether the exposure to specific language groups affects households' ability and decision to save a certain amount or to save in a voluntary retirement account. In addition, I elicit potential aspects of *how* the exposure to certain language groups affects these decisions.

To do so, I exploit not only within-country but even within-canton variation in a small geographic scope 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 strategy related to a stylized spatial regression discontinuity design, through which I am able to isolate cultural differences of a representative sample of the population from differences in economic (e.g., business cycle, interest rates and inflation), institutional (e.g., pension system, education system) and other conditions (e.g., access to financial services).

The analysis is mainly based on data from the *Swiss Household Panel*. This household survey includes a wide range of socio-economic household characteristics such as household income, household size and the exact location of each household at the municipality level. Furthermore, it includes characteristics of the person responsible for the management of household finances ("household head") (in particular his/her employment status, age, gender, and education), the preferred language spoken (French, Italian or German) and a variable that has been shown to be a good proxy for time preferences (past tobacco consumption). I complement the data with detailed information on language regions and further regional information about Switzerland (e.g., the number of bank branches at the ZIP code level, population per municipality, unemployment rates at the district level).

Considering all three proxies for household saving, I document that the share of households that report to be able to save and to actually save is more than 11 percentage points higher in the German-speaking part than in the French-speaking part. The estimated effect more than doubles when implementing the local border contrast. In line with the existing literature, I show that these differences in household saving across language regions are consistent with different distributions of time preferences. By contrast, I do not find clear evidence for risk sharing during times of financial distress.

Overall, this empirical evidence suggests that households' exposure to cultural groups can - at least partly - explain some of the observed cross-country differences in household saving. This finding is important as even small changes in aggregate saving can affect a country's growth path (e.g., Solow (1956)). Moreover, household saving translates directly into household wealth. Hence, low saving rates can lead to poverty among elderly and it might lower the level of homeownership if equity constraints are binding (e.g., Guiso and Jappelli (2002), Blickle and Brown (2015)). In the case of unexpected income or wealth shocks, this can affect household consumption (e.g., Christelis et al. (2015)) and might lead to household defaults (e.g., Mian and Sufi (2010)) (which both can imperil financial stability).

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A 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).

A.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).[63]

A.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.

A.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.[64] 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

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

[64] 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 ($Distance_{i,m} = 0$).

B Solution to the Stylized Model

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

The following first-order condition has to hold:

$$FOC : -\frac{1}{1-S_1} + \pi\beta\frac{1}{\frac{1}{2}+S_1+T} + (1-\pi)\beta\frac{1}{1+S_1} = 0 \tag{15}$$

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

$$2[(\frac{1}{2}+S_1+T)(1+S_1)] = \beta(1-S_1)[(1+S_1)+(\frac{1}{2}+S_1+T)] \tag{16}$$

Type A household does not obtain credit in distress ($T = 0$). Plugging in $T = 0$ in equation 16, we can solve for the optimal household saving $S^*_{1,A}$.[65]

$$S^*_{1,A} = \frac{-3+\frac{1}{2}\beta+\sqrt{12.25\beta^2+\beta+1}}{2(2+2\beta)} \tag{17}$$

Notice that β is non-negative by definition. Hence, the denominator of equation 17 is positive. Hence, optimal saving of this household type is strictly positive, $S^*_{1,A} > 0$, if:

$$\sqrt{12.25\beta^2+\beta+1} > 3-\frac{1}{2}\beta \tag{18}$$

As $0 < \beta \leq 1$, it follows from equation 18 that the following inequality has to hold.

$$\implies 12.25\beta^2+\beta+1 > (3-\frac{1}{2}\beta)^2 \tag{19}$$

Rearranging terms, we can find the strictly positive solution:

$$12\beta^2+4\beta-8 > 0 \tag{20}$$

Solving for β yields the critical discount factor β^*:[66]

$$\beta^* = \frac{2}{3} \quad \square \tag{21}$$

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

B.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.

$$\frac{\partial S_{1,A}^*}{\partial \beta} > 0, \forall \frac{2}{3} < \beta \leq 1 \tag{22}$$

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

$$S_{1,A}^* = \frac{-3 + \frac{1}{2}\beta + \sqrt{12.25\beta^2 + \beta + 1}}{2(2 + 2\beta)} \tag{23}$$

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

$$\frac{\partial S_{1,A}^*}{\partial \beta} = \frac{[\frac{1}{2} + \frac{1}{2}a^{-.5}(24.5\beta + 1)] \cdot (4 + 4\beta) - [-3 + \frac{1}{2}\beta + \sqrt{a}] \cdot 4}{(4 + 4\beta)^2} \tag{24}$$

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:

$$[\frac{1}{2} + \frac{1}{2}a^{-.5}(24.5\beta + 1)] \cdot (4 + 4\beta) - [-3 + \frac{1}{2}\beta + \sqrt{a}] \cdot 4 > 0 \tag{25}$$

which is equivalent to

$$[\frac{1}{2}a^{-.5}(24.5\beta + 1)] \cdot (4 + 4\beta) + [\frac{1}{2}(4 + 4\beta) - [-3 + \frac{1}{2}\beta + \sqrt{a}] \cdot 4] + \sqrt{2} - \sqrt{2} > 0 \tag{26}$$

Inequality 26 is true if the following inequalities 27 and 28 hold true:

$$\frac{1}{2}a^{-.5}(24.5\beta + 1) \cdot (4 + 4\beta) > \sqrt{2} \tag{27}$$

and

$$\frac{1}{2} \cdot (4 + 4\beta) - [-3 + \frac{1}{2}\beta + \sqrt{a}] \cdot 4 > -\sqrt{2} \tag{28}$$

It is straightforward to show that inequality 27 is true.

$$\Leftrightarrow (24.5\beta + 1) \cdot (2 + 2\beta) > \sqrt{2}\sqrt{a} \tag{29}$$

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

$$\Leftrightarrow 49\beta^2 + 51\beta + 2 > \sqrt{24.5\beta^2 + 2\beta + 2}, \quad \forall 0 < \beta \leq 1 \quad \square \tag{30}$$

Similarly, one can show that inequality 28 is true. Rearranging terms yields.

$$\Leftrightarrow 14 - 4\sqrt{a} > -\sqrt{2} \tag{31}$$

which is equivalent to

$$\Leftrightarrow \sqrt{a} < \frac{14 + \sqrt{2}}{4} \tag{32}$$

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

$$\Leftrightarrow \sqrt{12.25\beta^2 + \beta + 1} < \frac{14 + \sqrt{2}}{4} \tag{33}$$

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

$$\sqrt{14.25} < \frac{14 + \sqrt{2}}{4}, \quad \forall 0 < \beta \leq 1 \quad \square \tag{34}$$

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

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

In case of credit $T = \sigma$, the first-order condition (equation 15) simplifies to:

$$FOC : -\frac{1}{1 - S_1} + \pi\beta\frac{1}{1 + S_1} + (1 - \pi)\beta\frac{1}{1 + S_1} = 0 \tag{35}$$

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

$$\frac{1}{1 - S_1} = \beta\frac{1}{1 + S_1} \tag{36}$$

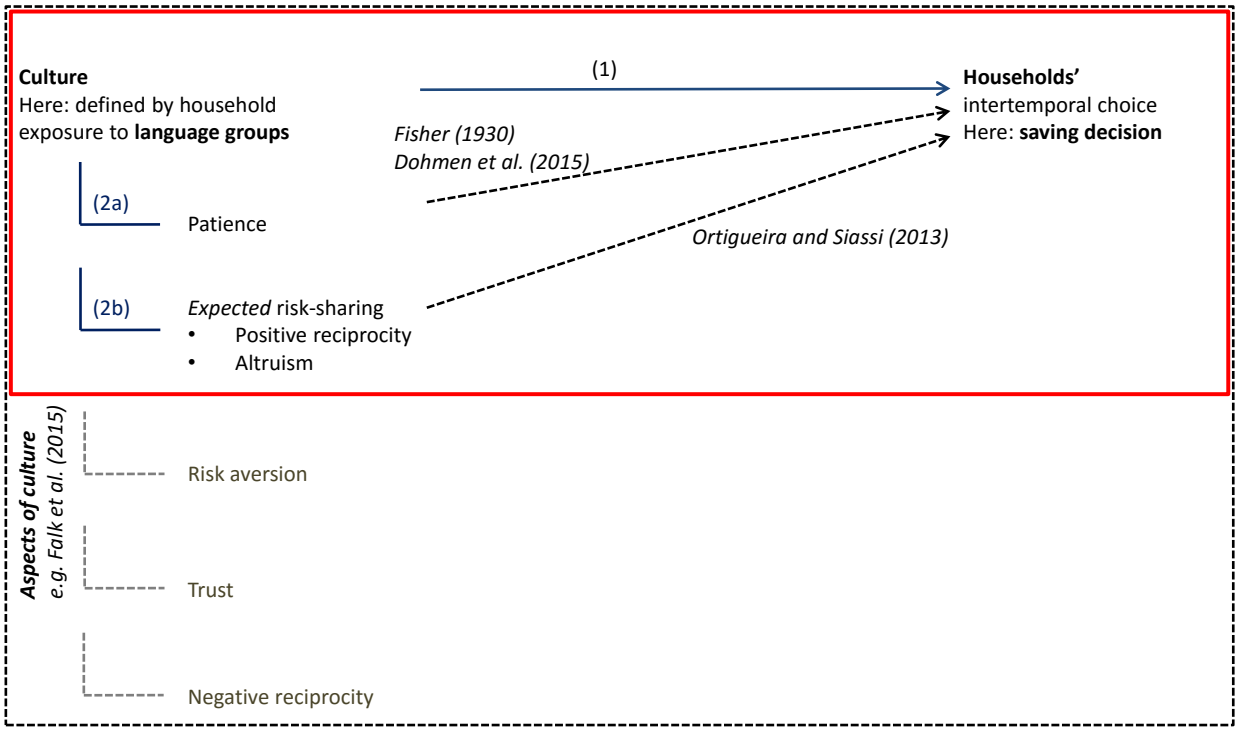
Solving for S_1 gives optimal precautionary saving of this household type $S^*_{1,B}$:

$$S^*_{1,B} = \frac{\beta - 1}{1 + \beta}, \forall 0 < \beta \leq 1 \tag{37}$$

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). □

C Additional Figures & Tables

Figure 5: Conceptual framework



This figure shows the conceptual framework of the present paper. The red box indicates the scope of the present paper which analyses the effect of households' exposure to language groups on their saving decisions. Solid blue lines indicate analyses presented in the paper: (1) Indicates the main analysis of the effect of households' exposure to language groups on household saving decisions. (2a) and (2b) indicate the the analyses on the relevant aspects of culture (where *expected* risk sharing evolves from altruism or positive reciprocity). Dotted black lines indicate relationships found in the existing literature.

Table 5: Variable definitions

Variable name	Definition	Source
Saving Decisions		
Saving (> CHF 100)	Binary variable = 1 if the household can save at least CHF 100 monthly, = 0 otherwise.	SHP 1999 - 2003
Saving (> CHF 0)	Binary variable = 1 if the household's income is higher than its expenses, = 0 otherwise.	SHP 1999 - 2003
Retirement saving	Binary variable = 1 if the household saves in a voluntary retirement account, = 0 otherwise.	SHP 1999 - 2003
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 - 2014
German speaker	Binary variable = 1 if the household head prefers to answer the survey questions in German, = 0 if French.	SHP 1999 - 2014
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 (Ln)	Net yearly Household income (Ln) in CHF (OECD equivalised) (natural logarithm).	SHP 1999 - 2014
Household size	Number of persons in household	SHP 1999 - 2014
Male	Binary variable = 1 if the household head is male, = 0 otherwise.	SHP 1999 - 2014
University	Binary variable = 1 if the household head holds a unversity degree, = 0 otherwise.	SHP 1999 - 2014
Age	Age of the household head in years.	SHP 1999 - 2014
Swiss	Binary variable = 1 if the household head is Swiss, = 0 otherwise.	SHP 1999 - 2014
Employed	Binary variable = 1 if the household head is employed, = 0 otherwise.	SHP 1999 - 2014
Homeowner	Binary variable = 1 if the household owns the property it lives in, = 0 otherwise.	SHP 1999 - 2014
Payment Arrears		
Payment arrears	Binary variable = 1 if the household has fallen into payment arrears within the preceding 12 months, = 0 otherwise.	SHP 2004 - 2014
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 2004 - 2014
Formal credit	Binary variable = 1 if the household has borrowed at least once from banks in case of financial distress, = 0 otherwise.	SHP 2004 - 2014
Impatience		
Tobacco smoked	Binary variable = 1 if the household head has ever smoked tobacco in her/his life, = 0 otherwise.	SHP 2010; 2011
Regional characteristics		
Unemployment rate	Unemployment rate per district and year (in percent) based on calculation by State Secretariat for Economic Affairs.	SECO 1999 - 2014
Population	Population per municipality and year from *Swiss Federal Statistical Office*.	BfS 1999 - 2014
Bank branches	Bank branches on the ZIP code level (year-end 2012).	Brown and Guin (2014)

Table 6: Summary statistics

Definitions of the variables are provided in Table 5 (in the Appendix).

Variable name	Mean	Std. Dev.	Minimum	Maximum	Observations
Saving Decisions					
Saving (> CHF 100)	0.83	0.38	0.00	1.00	575
Saving (> CHF 0)	0.52	0.50	0.00	1.00	575
Retirement saving	0.63	0.48	0.00	1.00	575
Language variables					
German-speaking part	0.63	0.48	0.00	1.00	1532
German speaker	0.61	0.49	0.00	1.00	1532
Distance	10.26	28.24	-49.09	49.47	1532
Distance >25km	0.60	0.49	0.00	1.00	1532
Socio-economic characteristics					
Household income (Ln)	10.67	0.55	7.82	12.47	1532
Household size	2.60	1.36	1.00	10.00	1532
Male	0.44	0.50	0.00	1.00	1532
University	0.14	0.35	0.00	1.00	1532
Age	41.54	12.54	17.00	81.00	1532
Swiss	0.90	0.30	0.00	1.00	1532
Employed	0.82	0.38	0.00	1.00	1532
Homeowner	0.42	0.49	0.00	1.00	1532
Payment Arrears					
Payment arrears	0.12	0.32	0.00	1.00	5967
Informal credit	0.41	0.49	0.00	1.00	278
Formal credit	0.10	0.30	0.00	1.00	278
Impatience					
Tobacco smoked	0.59	0.49	0.00	1.00	516
Regional characteristics					
Unemployment rate	2.63	1.03	0.72	6.44	1532
Population	19606	33443	95	130015	1532
Bank branches	2.78	2.90	0.00	11.00	1532

Table 7: Household saving in terms of language region (non-linear)

	(1)	(2)	(3)	(4)	(5)	(6)
Survey Wave	1999-2003		1999-2003		1999-2003	
Bandwidth	50km		50km		50km	
Dependent variable	Saving (> CHF 100)		Saving (> CHF 0)		Retirement saving	
German-speaking part	0.288***	0.299***	0.229***	0.248**	0.354***	0.263**
	[0.067]	[0.063]	[0.088]	[0.102]	[0.109]	[0.119]
Distance	-0.003**	-0.004***	-0.003	-0.005**	-0.005	-0.002
	[0.001]	[0.001]	[0.002]	[0.003]	[0.003]	[0.002]
German-speaking part	-0.001	0.001	0.004	0.006	-0.001	-0.003
*Distance	[0.002]	[0.002]	[0.003]	[0.003]	[0.004]	[0.004]
Household income (Ln)		0.160***		0.205***		0.156***
		[0.023]		[0.042]		[0.053]
Household size		0.030***		0.003		0.081***
		[0.011]		[0.018]		[0.020]
Male		0.014		0.022		0.057
		[0.030]		[0.044]		[0.042]
University		0.159***		0.061		-0.028
		[0.049]		[0.057]		[0.069]
Age		0.000		-0.001		0.005***
		[0.001]		[0.002]		[0.002]
Swiss		0.115***		0.128*		0.174**
		[0.036]		[0.069]		[0.086]
Employed		0.027		-0.002		-0.010
		[0.033]		[0.051]		[0.048]
Unemployment rate		0.025		-0.005		0.016
		[0.016]		[0.031]		[0.030]
Population		0.000		0.000**		-0.000
		[0.000]		[0.000]		[0.000]
Bank branches		-0.002		-0.001		-0.026**
		[0.007]		[0.013]		[0.013]
Year FE	NO	NO	NO	NO	NO	NO
Canton FE	YES	YES	YES	YES	YES	YES
Observations	575	575	575	575	575	575
Households	575	575	575	575	575	575
Municipalities	160	160	160	160	160	160
Share in German-speaking part	0.558	0.558	0.558	0.558	0.558	0.558
Mean of dependent variable	0.826	0.826	0.523	0.523	0.633	0.633
Pseudo R-squared	0.041	0.145	0.027	0.064	0.025	0.095
Method	ML	ML	ML	ML	ML	ML

This table displays the estimates of a logit model estimated using *Maximum Likelihood (ML)* where the dependent variables are *Saving (> CHF 100)* which is a binary variable indicating whether the household can save at least CHF 100 per month, *Saving (> CHF 0)* which indicates whether a household's income is higher than its expenses and *Retirement saving* which indicates whether the household saves in a voluntary retirement account. Marginal effects at the mean of all variables are reported. Definitions of the variables are provided in Table 5 (in the Appendix). 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.

Table 8: Time preferences in terms of language region (non-linear)

	(1)	(2)
Survey Wave	2010 & 2011	
Bandwidth	50km	
Dependent variable	Tobacco smoked	
German-speaking part	-0.232**	-0.391***
	[0.100]	[0.122]
Distance	0.006*	0.005*
	[0.003]	[0.003]
German-speaking part	-0.007**	-0.008*
*Distance	[0.003]	[0.004]
Household income (Ln)		-0.000
		[0.046]
Household size		-0.060***
		[0.017]
Male		0.108**
		[0.050]
University		0.032
		[0.056]
Age		-0.000
		[0.002]
Swiss		-0.138*
		[0.078]
Employed		-0.059
		[0.066]
Unemployment rate		-0.110**
		[0.045]
Population		0.000
		[0.000]
Bank branches		-0.006
		[0.013]
Year FE	NO	NO
Canton FE	YES	YES
Observations	516	516
Households	516	516
Municipalities	196	196
Share in German-speaking part	0.599	0.599
Mean of dependent variable	0.589	0.589
Pseudo R-squared	0.015	0.052
Method	ML	ML

This table displays the estimates of a logit model estimated using *Maximum Likelihood (ML)* where the dependent variable is *Tobacco smoked* which indicates whether the household head has ever smoked tobacco. Marginal effects at the mean of all variables are reported. Definitions of the variables are provided in Table 5 (in the Appendix). 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.

Table 9: Credit in financial distress in terms of language region (non-linear)

	(1)	(2)	(3)	(4)
Survey Wave	2004-2014		2004-2014	
Bandwidth	50km		50km	
Dependent variable	Informal credit		Formal credit	
German-speaking part	0.146	0.077	-0.026	-0.019
	[0.111]	[0.118]	[0.077]	[0.071]
Distance	-0.001	0.001	0.000	0.001
	[0.003]	[0.003]	[0.002]	[0.002]
German-speaking part	-0.001	-0.004	-0.000	-0.000
*Distance	[0.004]	[0.005]	[0.003]	[0.003]
Household income (Ln)		-0.136**		-0.002
		[0.062]		[0.022]
Household size		-0.033*		0.016*
		[0.019]		[0.009]
Male		0.045		0.019
		[0.062]		[0.034]
University		0.074		-0.060
		[0.077]		[0.046]
Age		-0.012***		-0.000
		[0.003]		[0.002]
Swiss		0.008		-0.062
		[0.091]		[0.049]
Employed		-0.064		-0.009
		[0.092]		[0.042]
Unemployment rate		-0.055		0.014
		[0.044]		[0.023]
Population		0.000		-0.000
		[0.000]		[0.000]
Bank branches		-0.008		0.014
		[0.023]		[0.013]
Year FE	NO	NO	NO	NO
Canton FE	YES	YES	YES	YES
Observations	278	278	278	278
Households	278	278	278	278
Municipalities	133	133	133	133
Share in German-speaking part	0.561	0.561	0.561	0.561
Mean of dependent variable	0.410	0.410	0.101	0.101
Pseudo R-squared	0.008	0.079	0.011	0.069
Method	ML	ML	ML	ML

This table displays the estimates of a logit model estimated using *Maximum Likelihood (ML)* where the dependent variables are *Informal credit* which is a binary variable indicating whether the household has borrowed at least once from family or friends in case of financial distress and *Formal credit* which is a binary variable indicating whether the household has borrowed at least once from banks in case of financial distress. Marginal effects at the mean of all variables are reported. Definitions of the variables are provided in Table 5 (in the Appendix). 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

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

Panel A. Saving (controlling for home ownership)

	(1)	(2)	(3)	(4)	(5)	(6)
Survey Wave	1999-2003		1999-2003		1999-2003	
Bandwidth	50km		50km		50km	
Dependent variable	Saving (> CHF 100)		Saving (> CHF 0)		Retirement saving	
German-speaking part	0.262***	0.339***	0.214***	0.241**	0.313***	0.308***
	[0.047]	[0.066]	[0.080]	[0.099]	[0.092]	[0.108]
Homeowner	0.049	0.039	-0.039	-0.023	0.189***	0.066
	[0.032]	[0.034]	[0.039]	[0.047]	[0.039]	[0.041]
Distance	Linear	Linear	Linear	Linear	Linear	Linear
Household controls	NO	YES	NO	YES	NO	YES
Regional controls	NO	YES	NO	YES	NO	YES
Canton FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	575	575	575	575	575	575
Households	575	575	575	575	575	575
Municipalities	160	160	160	160	160	160
Share in German-sp. part	0.558	0.558	0.558	0.558	0.558	0.558
Mean of dependent variable	0.826	0.826	0.523	0.523	0.633	0.633
R-squared	0.046	0.136	0.047	0.088	0.084	0.142
Method	OLS	OLS	OLS	OLS	OLS	OLS

Panel B. Saving (full sample of all households)

	(1)	(2)	(3)	(4)	(5)	(6)
Survey Wave	1999-2003		1999-2003		1999-2003	
Bandwidth	50km		50km		50km	
Dependent variable	Saving (> CHF 100)		Saving (> CHF 0)		Retirement saving	
German-speaking part	0.261***	0.296***	0.230***	0.223**	0.275***	0.155
	[0.036]	[0.049]	[0.085]	[0.087]	[0.105]	[0.109]
Distance	Linear	Linear	Linear	Linear	Linear	Linear
Household controls	NO	YES	NO	YES	NO	YES
Regional controls	NO	YES	NO	YES	NO	YES
Canton FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	663	663	663	663	663	663
Households	663	663	663	663	663	663
Municipalities	174	174	174	174	174	174
Share in German-sp. part	0.566	0.566	0.566	0.566	0.566	0.566
Mean of dependent variable	0.849	0.849	0.558	0.558	0.644	0.644
R-squared	0.028	0.123	0.033	0.096	0.019	0.098
Method	OLS	OLS	OLS	OLS	OLS	OLS

Panel C. Saving (entire time period)

	(1)	(2)	(3)	(4)	(5)	(6)
Survey Wave	1999-2003		1999-2014		1999-2014	
Bandwidth	50km		50km		50km	
Dependent variable	Saving (> CHF 100)		Saving (> CHF 0)		Retirement saving	
German-speaking part	0.279***	0.344***	0.109*	0.106*	0.175**	0.099*
	[0.044]	[0.065]	[0.061]	[0.058]	[0.084]	[0.059]
Distance	Linear	Linear	Linear	Linear	Linear	Linear
Household controls	NO	YES	NO	YES	NO	YES
Regional controls	NO	YES	NO	YES	NO	YES
Canton FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	575	575	1,526	1,525	1,519	1,518
Households	575	575	1,526	1,525	1,519	1,518
Municipalities	160	160	322	322	322	322
Share in German-sp. part	0.558	0.558	0.626	0.626	0.627	0.627
Mean of dependent variable	0.826	0.826	0.542	0.542	0.641	0.640
R-squared	0.042	0.134	0.032	0.106	0.043	0.168
Method	OLS	OLS	OLS	OLS	OLS	OLS

This table displays the estimates of a linear model estimated using *OLS* where the dependent variables are *Saving (> CHF 100)* which is a binary variable indicating whether the household can save at least CHF 100 per month, *Saving (> CHF 0)* which indicates whether a household's income is higher than its expenses and *Retirement saving* which indicates whether the household saves in a voluntary retirement account. Distance variables, household controls, regional controls are the same as the ones in Table 2. Definitions of the variables are provided in Table 5 (in the Appendix). 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.

Table 11: Validity: Covariates and language region

	1	2	3	4	5	6	7
Survey Wave				1999-2003			
Bandwidth				50km			
Dependent variable	Household income (Ln)	Household size	Male	University	Age	Swiss	Employed
German-speaking part	0.048	0.705**	0.197	-0.033	0.468	-0.070	-0.145
	[0.100]	[0.278]	[0.125]	[0.088]	[2.343]	[0.067]	[0.142]
Distance	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Household controls	YES	YES	YES	YES	YES	YES	YES
Regional controls	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Canton FE	YES	YES	YES	YES	YES	YES	YES
Observations	575	575	575	575	575	575	575
Households	575	575	575	575	575	575	575
Municipalities	160	160	160	160	160	160	160
Share in German-speaking part	0.558	0.558	0.558	0.558	0.558	0.558	0.558
Mean of dependent variable	10.45	2.861	0.442	0.137	40.57	0.913	0.769
Adjusted R-squared	0.198	0.178	0.0931	0.0476	0.0382	0.0238	0.0995
Method	OLS	OLS	OLS	OLS	OLS	OLS	OLS

This table displays the estimates of a linear model estimated using *OLS* where 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 5. 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.

Table 12: Validity: Placebo test of language region

Panel A. Households located in French-speaking part

	(1)	(2)	(3)	(4)	(5)	(6)
Survey Wave	1999-2003		1999-2003		1999-2003	
Bandwidth	50km		50km		50km	
Dependent variable	Saving (> CHF 100)		Saving (> CHF 0)		Retirement saving	
Distance >25km	0.046	0.027	-0.033	-0.030	-0.182	-0.207*
	[0.096]	[0.074]	[0.104]	[0.107]	[0.114]	[0.111]
Distance	Linear	Linear	Linear	Linear	Linear	Linear
Household controls	NO	YES	NO	YES	NO	YES
Regional controls	NO	YES	NO	YES	NO	YES
Canton FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	254	254	254	254	254	254
Households	254	254	254	254	254	254
Municipalities	73	73	73	73	73	73
Share in German-sp. part	0.00	0.00	0.00	0.00	0.00	0.00
Mean of dependent variable	0.760	0.760	0.429	0.429	0.571	0.571
Adjusted R-squared	0.010	0.086	0.003	0.073	0.026	0.108
Method	OLS	OLS	OLS	OLS	OLS	OLS

Panel B. Households located in German-speaking part

Survey Wave	1999-2003		1999-2003		1999-2003	
Bandwidth	50km		50km		50km	
Dependent variable	Saving (> CHF 100)		Saving (> CHF 0)		Retirement saving	
Distance >25km	0.038	0.020	0.002	-0.044	-0.214	-0.066
	[0.065]	[0.089]	[0.138]	[0.161]	[0.141]	[0.132]
Distance	Linear	Linear	Linear	Linear	Linear	Linear
Household controls	NO	YES	NO	YES	NO	YES
Regional controls	NO	YES	NO	YES	NO	YES
Canton FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	321	321	321	321	321	321
Households	321	321	321	321	321	321
Municipalities	87	87	87	87	87	87
Share in German-sp. part	1.00	1.00	1.00	1.00	1.00	1.00
Mean of dependent variable	0.879	0.879	0.598	0.598	0.682	0.682
Adjusted R-squared	0.013	0.098	0.015	0.029	0.047	0.107
Method	OLS	OLS	OLS	OLS	OLS	OLS

This table displays the estimates of a linear model estimated using OLS where the dependent variables are *Saving (> CHF 100)* which is a binary variable indicating whether the household can save at least CHF 100 per month, *Saving (> CHF 0)* which indicates whether a household's income is higher than its expenses and *Retirement saving* which indicates whether the household saves in a voluntary retirement account. *Distance >25km* indicates if the walking distance from the language border is greater than 25 km (= 0 otherwise). Definitions of the variables are provided in Table 5 (in the Appendix). 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.

Table 13: Alternative empirical strategy: Selection on observables

	(1)	(2)	(3)	(4)	(5)	(6)
Survey Wave	1999-2003		1999-2003		1999-2003	
Bandwidth	50km		50km		50km	
Dependent variable	Saving (> CHF 100)		Saving (> CHF 0)		Retirement saving	
German-speaking part	0.118***		0.150***		0.084	
	[0.045]		[0.056]		[0.063]	
German speaker		0.108***		0.156***		0.048
		[0.041]		[0.050]		[0.054]
Distance	NO	NO	NO	NO	NO	NO
Household controls	YES	YES	YES	YES	YES	YES
Regional controls	YES	YES	YES	YES	YES	YES
Canton FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	575	566	575	566	575	566
Households	575	566	575	566	575	566
Municipalities	160	159	160	159	160	159
Share in German-speaking part	0.558	0.558	0.558	0.558	0.558	0.558
Mean of dependent variable	0.826	0.827	0.523	0.523	0.633	0.633
Adjusted R-squared	0.089	0.084	0.055	0.057	0.101	0.098
Method	OLS	OLS	OLS	OLS	OLS	OLS

This table displays the estimates of a linear model estimated using OLS where the dependent variables are *Saving (> CHF 100)* which is a binary variable indicating whether the household can save at least CHF 100 per month, *Saving (> CHF 0)* which indicates whether a household's income is higher than its expenses and *Retirement saving* which indicates whether the household saves in a voluntary retirement account. Definitions of the variables are provided in Table 5 (in the Appendix). 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.

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