

DOES CULTURE AFFECT UNEMPLOYMENT?*

EVIDENCE FROM THE *Röstigraben*

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Abstract

This paper studies the role of culture in shaping unemployment outcomes. The empirical analysis is based on local comparisons across a language barrier in Switzerland. This *Röstigraben* separates cultural groups, but neither labor markets nor political jurisdictions. Local contrasts across the language border identify the role of culture for unemployment. Our findings indicate that differences in culture explain differences in unemployment duration on the order of 20 %. Moreover, we find that horizontal transmission of culture is more important than vertical transmission of culture and that culture is about as important as strong changes to the benefit duration.

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1 Introduction

Economists have long been interested in understanding the role of culture in explaining economic outcomes. On one hand, there is tremendous variation in culture – the set of beliefs and values – across countries and regions. For instance, Alexis de Tocqueville (1848) was fascinated by the differences between the United States of America and France and Britain in terms of the core values that shape the ways democracies work. On the other hand, important economic decisions and market outcomes also vary tremendously across time and space. Akerlof (1984) argues that social customs regarding the "fair wage" will give rise to equilibrium unemployment. Lindbeck and Nyberg (2006) argue that work norms are central for equilibrium work offer. Yet, it is to date unclear to what extent cultural differences in work norms and values affect unemployment. While labor economics has contributed to understanding the role of institutions in shaping equilibrium unemployment outcomes (Nickell and Layard, 1999), this literature can not rationalize one of the most important facts in unemployment research – the existence of strong differences in unemployment across regions of the same country (OECD 2005).

In this paper, we study how unemployment is affected by differences in culturally determined attitudes towards work within a narrowly defined geographic area. Our focus is Switzerland, a country that is divided into two culturally distinct language regions: "Latin-speaking" (i.e. French, Italian, or Romansh) regions and "German-speaking" regions. These regions are characterized by strong differences in residents' attitudes towards the importance of work. For instance, 78 % of people living in the German speaking part of Switzerland state that "I would work even if I did not need the money", yet only 50 % of French or Italian-speaking survey respondents agree with this statement. What is more, these differences in attitudes towards work also translate into differences in actual voting behavior. Voters living in the Latin-speaking regions tend to support limits to weekly working time much more strongly than people living in the German-speaking regions of the country.

We explore to which extent these cultural differences in work attitudes affect unemployment. The key idea is to focus on unemployment differences at the border between language regions. Swiss language areas are associated with specific cultural traits and the country is divided by an important cultural border: the *Röstigraben*. This term – referring to the German-Swiss way to prepare potatoes, *Rösti* – has become a metaphor for the general cultural divide within the country.¹ The cliché is that German-Swiss are hard working, historically used to spartan living conditions, being proud of their independence and deriving their identity from the founding myth of the Swiss federation. In contrast, Latin-Swiss are bon-vivants enjoying the fruits of their temperate climate and, being a minority in the own country, are much more outward-oriented (towards France and Italy, and the EU as a whole).²

¹Many commentators have written about the differences between these two cultural areas and speculated about the implications of this cultural divide for the political and socio-economic stability of the country. For an interesting recent contribution summarizing and taking stock of the debate, see Büchi (2003).

²Historically, Switzerland was founded by the German-speaking cantons Schwyz, Uri and Unterwalden, located in the center of the country and was successively enlarged by the entrance of Berne, Zurich, Lucerne and other

There are four features of this language border which are of particular interest in the present context. *First*, the dominant native language changes sharply at the Röstigraben. Within a geographical distance of 5 kilometers, the fraction of Latin speaking Swiss residents falls from more than 90 percent to less than 5 percent (and vice versa for German native speakers). *Second*, language is central to the spreading of beliefs and norms and determines an individual's social identity. Consistent with this, we find that support for national work time regulations changes sharply at the language border. The language barrier represents a sharp cultural barrier. *Third*, important segments of the language border do not coincide with the borders of political jurisdictions, i.e. cantons. This means we can separate effects of culture from effects of institutions. *Fourth*, an in-depth analysis of key determinants of job search success suggests that these determinants do not vary at the language border to an extent that could rationalize observed differences in unemployment. This suggests that the language border is permeable and markets are integrated. These four aspects allow separating the effects of culture on unemployment from the effects of institutions and markets on unemployment.

To analyze language-border differentials in unemployment outcomes we use data from two sources. The first data source comprises the universe of individuals entering unemployment over the period 1998-2003. The main focus of our analysis is on Swiss men in the age group 25-60 – more than 170,000 unemployment spells. A nice feature of this data set is that it provides information on how the post-unemployment job was found: whether an individual found a new job by own initiative or by placement via the local labor office. This information is helpful in understanding the relative importance of individual search effort as a determinant of observed unemployment differences at the language border. The second data source provides information on all residents' employment status in the year 2000. This data source allows discussing the role of culture in shaping other margins of labor supply – labor force participation and weekly hours worked.

Our empirical results suggest that culture affects unemployment strongly. The *first* main finding indicates a robust difference in unemployment durations at the language border. Individuals living in Latin-speaking border communities – facing observationally identical labor markets – tend to leave unemployment 7 weeks later than their neighbors living in German speaking communities. This is a very large effect comparable to the impact of a drastic change in the unemployment insurance system.³ Observed unemployment differences at the *Röstigraben* are unlikely to reflect differences in labor demand on locally segregated labor markets. On the one hand, commuting times are very similar on either side of the language border. On the other hand, we do not see major differences in unemployment durations at the Röstigraben among cities of the German speaking part. Until the French invasion at the turn of the 19th century large parts of French Switzerland were ruled by the German-speaking elites of Berne and Fribourg. In 1848, the new constitution with 26 cantons (of which 4 French speaking, 1 Italian speaking, 3 bilingual (French / German), 1 trilingual (German / Italian / Romansh), and 17 German-speaking cantons) was adopted.

³Katz and Meyer (1990) estimate that a 10 week increase in potential benefit duration increases the average duration of unemployment by about 1 week. Hence the difference in unemployment durations generated at the Röstigraben to an increase in potential benefit duration by more than one year.

migrants who neither speak German nor a Latin language. This group of immigrants is subject to the same local labor market conditions but is unlikely to share native residents' attitudes and norms concerning work effort and job search behavior.

Our *second* main finding concerns the way in which unemployed individuals find a new job. We find that Latin-speaking job seekers are much less likely to find a job on their own initiative and slightly more likely to find a job mediated by the local labor office than German-speaking job seekers. This result provides further support for the claim that differences in local labor market conditions are unlikely to account for observed unemployment outcomes. It also rules out that discrimination by employers against Latin-speaking job seekers is the main explanation for observed unemployment differences. If lack of jobs and/or discrimination were the main drivers, the two exit channels would both account for the observed unemployment differences. In contrast, if unemployment differences are generated by differential values and norms concerning job seekers' adequate search effort, we will see a direct impact on the probability to find a job by own initiative but no negative impact on the rate of job offers mediated by the public employment office.

Our *third* main finding concerns the relative importance of vertical versus horizontal transmission of culture. To separate these two channels we contrast the role of the *individual's* native language to the role of the dominant native language of one's *community* in explaining unemployment duration. An individual's native language is a proxy for the vertical transmission of culture, i.e. values and norms transmitted from parents to their children (conditional on ability to speak the dominant language spoken in the local labor market). In contrast, a community's dominant native language proxies the norms and values prevalent in an individual's place of residence. Our results indicate that cultural attitudes towards work in one's community are more important than individual attitudes. This suggests that the horizontal transmission of cultural values and the impact of attitudes towards work and job search are quantitatively important determinants of unemployment durations.

Our paper is related to a rapidly expanding literature on the role of culture on various labor market outcomes. Alesina, Glaeser and Sacerdote (2006) investigate why Americans work so much more than Europeans. They argue European labor market regulations influenced leisure patterns and created a "leisure culture" through a social multiplier (the returns to leisure are higher when more people are taking longer vacations). A model based on such complementarities in leisure performs better in explaining US-European differences in working hours than a model that is based on differences in taxation (Prescott 2004). Fernández and Fogli (2006, 2009) find that work (and fertility) behavior of married second-generation immigrant women is significantly affected by the country of heritage. This is consistent with the hypothesis that current economic outcomes are affected by the culture of the country of origin. Fernández (2007) shows that attitudes in the country of ancestry towards women's market work and housework have explanatory power for current labor market participation. The particular role of "family culture" on labor market outcomes are investigated in Algan and Cahuc (2005) and Alesina and Giuliano (2007). These studies find that strong family ties reduce labor force participation. Ichino and

Maggi (2000) study cultural differences in the propensity to shirk (absenteeism and misconduct) using data from a large Italian bank. A further related strand of the literature has focused on the emergence and support for labor market institutions such as the unemployment insurance system. Algan and Cahuc (2009) argue that cultural differences can explain why some countries implement different mixes of employment protection and unemployment insurance. Lindbeck et al. (2003), and Lindbeck and Nyberg (2006) consider the dynamics of work ethics and how these dynamics interact with the evolution of welfare state provisions.⁴

This paper contributes to the literature in at least three respects. *First*, this paper provides novel quasi-experimental evidence on the role of culture for unemployment outcomes. Limiting the empirical analysis to a narrowly defined geographic area helps separating the cultural component of unemployment from other relevant explanations for differences in unemployment. *Second*, we separate the role of vertical and horizontal transmission. In doing so, we complement the results from the epidemiological approach to studying culture (Fernández, 2007) and results from the IV approach to studying the role of culture (Guiso et al. 2006). Both the epidemiological approach and the IV approach do not discuss the relevance of social spillovers – the fast moving aspect of culture. Understanding this is important from an economic point of view. If cultural differences in individual norms and values do not spill over to other individuals, culture will not be able to rationalize much of the variance in regional unemployment. However, if culturally shaped attitudes towards working spill over to other individuals, small individual differences in attitudes build up to large aggregate differences in behavior. *Third*, to our knowledge, our paper provides the first study that assesses the causal impact of culture on unemployment. In this sense we shed light on the role of culture in shaping one of the most important socio-economic outcomes which has not been studied so far.

The remainder of this paper is organized as follows. In the next section we provide background on unemployment and the unemployment insurance in Switzerland as well as on the language regions and their cultural differences. Section 3 presents the identification strategy used, namely the spatial regression discontinuity design, and describes the various data sources that we use in the empirical analysis. Sections 4 to 6 detail our empirical strategy to assess the impact of culture on unemployment, present our main empirical results and provide sensitivity analyzes. Section 7 concludes.

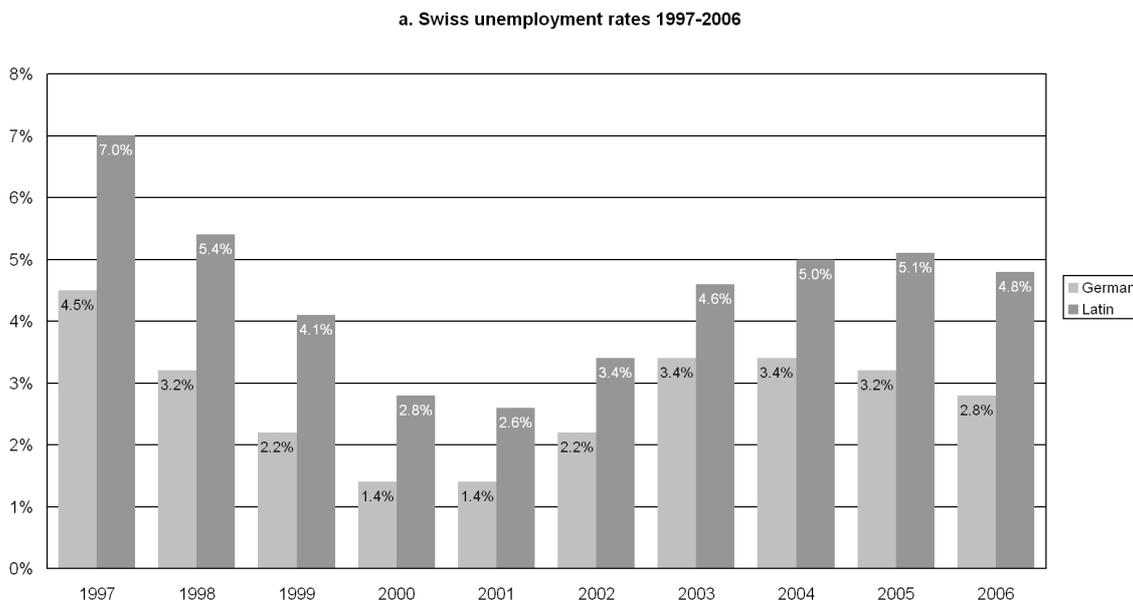
⁴Three further strands of the literature are related. First, a theoretical strand considers the transmission of cultural values from parents to children. See e.g. Bisin and Verdier (2000, 2001, 2004) on marriage and religion, Hauk and Saez Marti (2002) on corruption, Doepke and Zilibotti (2008) on class-specific preferences and the industrial revolution. Second, other studies have looked at the role of of culture in explaining the demand for redistribution (Alesina and Fuchs-Schündeln 2007), economic performance (Tabellini 2005), or trade (Guiso et al. 2009), and horizontal spillovers in unemployment outcomes (Clark 2003; Stutzer and Lalive 2004; Kolm 2005). The third strand argues that economic institutions may shape important elements of a group’s culture. See Thoenig et al (2009) for a recent study of trade on cultural diversity and Bowles (1998) for a survey on the effects of markets on preferences.

2 Institutions and Language Regions

2.1 Unemployment and unemployment insurance in Switzerland

One crucial fact, puzzling policy makers and researchers alike, are large and persistent differences in unemployment rates between the German-speaking and the Latin-speaking parts of the country. Figure 1 shows that, during the period 1997-2006, unemployment rates were between 1.5 and 2 times as large in Latin-Swiss as compared to German-Swiss cantons. This difference is to a large extent driven by a longer duration of unemployment spells in Latin-speaking regions. The percentage long-term unemployed – the fraction of individuals being in the unemployment pool since more than a year – has been up to twice as large in Latin-speaking cantons during the period 1997-2006. This suggests that differences in unemployment durations are key to understand differences in unemployment rates between language regions in Switzerland.

Figure 1: Unemployment rates in Latin-speaking versus German-speaking cantons



Source: data from Federal Statistical Office (FSO), Neuchâtel.

To what extent can these differences be rationalized by differences in unemployment insurance? Unemployment insurance is organized at the *national* level. Federal unemployment benefit rules are relatively generous. Maximum benefit duration is 2 years. The marginal replacement rate is 70 % or 80 % depending on the presence of dependent family members and previous income. Job seekers are entitled to these benefits if they have paid unemployment insurance taxes for at least six months in the two years prior to registering at the public employment service (PES) and if they are capable of doing a regular job. Entitlement criteria to unemployment benefits also include compliance with job search requirements and participation in active labor market programs. Potential job offers are supplied by the public vacancy in-

formation system of the PES, from private temporary help firms or from the job seeker's own pool of potential jobs. Non-compliance with any of these obligations is sanctioned by complete withdrawal of benefits for a period that can last up to 30 work days (see Lalive et al 2005 for details on the Swiss sanction system). This means that differences in benefit duration and level can not explain differences in regional unemployment. Yet regions have an important role in implementing counseling and monitoring practices thus potentially contributing to regional differences in unemployment (Lalive et al 2005, Gerfin and Lechner 2002, Froelich and Lechner 2004). The empirical analysis will pay particular attention to the role of differences in policy implementation in explaining regional unemployment.

2.2 Language regions and attitudes towards work

To which extent can regional differences in unemployment be explained by cultural differences between language regions? To shed light on this issue we look across language regions. Historically, Switzerland was founded by the German-speaking cantons Schwyz, Uri and Nidwalden, located in the center of the country and was successively enlarged by the entrance of Berne, Zurich, Lucerne and other cities of the German speaking part. Until the French invasion at the turn of the 19th century large parts of French Switzerland were ruled by the German-speaking elites of Berne and Fribourg. In 1848, the new constitution with 26 cantons was established. Four cantons are French speaking, one is Italian speaking, three are bilingual (French / German) cantons (Berne, Valais, and Fribourg), one canton – *Graubünden* – is officially trilingual (German, Rhaeto-Romansh, and Italian) and the remaining seventeen are German-speaking cantons.⁵ The ruling constitution gives cantons a lot of discretion in political decision making (i.e. in taxation, education, etc.). While federalism leads to a situation where legal rules differ strongly across cantons, this is not the case with respect to labor legislation in general and unemployment insurance in particular which are determined at the federal level.

Switzerland has four official languages. The North East of Switzerland speaks Swiss German, the West speaks French, the South East speaks Italian, and some parts of the East speak Romansh. According to the population census 2000, 72.5 percent of Swiss citizens speak German, 21.0 percent speak French, 4.3 percent speak Italian, 0.6 percent speak Romansh and 1.6 percent speak other languages (Lüdi and Werlen, 2005).⁶ The empirical analysis contrasts the regions speaking languages derived from Latin – French, Italian, Romansh – with the regions speaking German. Figure 1 displays a map of Switzerland shaded according to the language spoken by

⁵Multilingual cantons exist for historical reasons. The current border of the canton of Valais traces the ancient border of the Roman catholic diocese of Sion. The current border of the cantons Fribourg and Berne traces the lands acquired by their capitals Fribourg and Berne. The border of the canton of *Graubünden* traces the borders of the ancient Roman province of *Rhaetia*.

⁶The numbers in the text refer to the Swiss citizens. Roughly 20 percent of residents are immigrants of which 62.3 percent speak either German, French, Italian or Romansh and 37.7 percent have some other first language. Romansh is one of the Rhaeto-Romance languages, believed to have descended from the Vulgar Latin variety spoken by Roman era occupiers of the region, and, as such, is closely related to French, Occitan and North Italian.

a majority of each region’s residents. Areas with light shading are areas with majority German speaking populations. Areas with dark shading are those with a majority speaking either French, Italian, or Romansh. Note that dark lines separate the 26 Swiss cantons, i.e. states. The Swiss multilingual situation is supported by its education system. Children learn to speak another “Swiss” language as their second language.⁷

Figure 2: Language regions in Switzerland



Notes: Dark shading means majority of a community’s resident population speak either French (West), Italian (South), or Romansh (East). Light shading means majority of a community’s residents speak German. Figures as of census 2000. Dark lines indicate canton borders.
 Source: data from Federal Statistical Office (FSO), Neuchâtel.

There are two key features of this language barrier. First, important parts of the language border are neither a geographical barrier nor an institutional border. In terms of geography, note that the most important segment of the language border runs from North to South (the border between French-speaking and German-speaking regions) whereas the main geographical barrier, the Alps, are in East-West direction. This fact, together with an efficient (public) transportation system implies that transport costs within language regions are similar to transport costs across language regions (conditional on distance). Second, important segments of the language border do not coincide with borders between cantons (dark lines). This means that people living within these four cantons but on different sides of the language border face the same regional set of policies and institutions.

The key argument of this paper is that linguistic groups in Switzerland have adopted different attitudes towards working. Language is central to this idea for at least three reasons. *First,*

⁷This translates into good command of the languages spoken in other parts of the country. Around 73 % of the inhabitants of the French speaking regions of Switzerland are able to speak one additional language of the country. The corresponding number is 92 % for the inhabitants of the Italian speaking regions, and 85 % for the inhabitants of the German speaking regions (see Werlen, 2008).

language is a key source of identity (Aspachs-Bracons et al. 2008) and language is central to mixing – genetic markers differ more strongly between people living in Latin Swiss area and the German Swiss area than within those regions (Novembre et al. 2008). *Second*, the Latin Swiss identity is different from the German Swiss identity. Large parts of French-speaking Switzerland have been dominated by the German Swiss oppressors from Berne during 250 years creating a desire for the French Swiss to distinguish themselves from the ruling German elites and their cultural heritage. *Third*, the French Swiss live in a climate that has always been very forthcoming. In contrast, the German Swiss nourish the founding myth of the mountain peasant working hard to survive in remote areas of the Alps. The Latin Swiss lean towards their large neighbors whereas the German Swiss emphasize neutrality and independence.⁸

Is there any evidence of cultural differences in attitudes towards work? The Swiss module of the International Social Survey Programme provides information on the importance of work (ISSP 1997 and 2005). ISSP data contains information on the extent to which survey respondents agree with the statement "I would enjoy a paid job even if I did not need the money". Breaking responses down by interview language, Table 1 shows that German speaking respondents indicate much stronger support for the statement than respondents speaking French, Italian or Romansh. Moreover, support for this statement is stronger in the German speaking region both during a recession (1997 unemployment rate 5.1 %) as well as in a period of economic upswing (2005 unemployment rate 3.8 %).

Table 1: Importance of Work across Language Groups

	Year	Latin	German	Difference
Enjoy a paid job even if I did not need the money ^a	1997	3.26	2.60	0.65***
Enjoy a paid job even if I did not need the money ^a	2005	2.58	2.26	0.32***

Notes: ^a 1=strongly agree, 2="agree", 3="indifferent", 4="disagree", 5="strongly disagree". This table reports the average disagreement with the statement "I would enjoy a paid job even if I did not need the money" by interview language.

Source: ISSP 1997 and 2005, own calculations.

These differences in attitudes towards work as measured in the ISSP data translate into actual voting behavior. The Swiss direct democratic system provides us with the possibility to test the hypothesis that in Latin-speaking parts of the country individuals have different attitudes towards work time regulations than in the German-speaking parts of the country. Voter initiatives are a crucial part of the political system and have a long tradition in Switzerland. Basically, anyone who collects more than 100,000 signatures can force the parliament to subject her or his change to the constitution to the popular vote.

Since 1980, the year when voting outcomes started to be registered electronically, various voter initiatives – related to working time regulations (the "intensive" margin) – were held at the national level. In 1985, all Swiss nationals aged 18 years or older – the voting age population – were asked to vote on whether to increase paid vacations to a minimum of 4 weeks; in 1988

⁸This pattern is clearly evident in the voting decisions in a referendum on joining the European Economic Area (1992). Whereas the Latin Swiss overwhelmingly supported integration, the German Swiss did not.

whether to reduce regular weekly working time to 40 hours; and in 2002 whether to reduce weekly working time to 36 hours. Moreover, there were three referenda related to lifetime work regulations (the "extensive" margin): in 1988 the population had to vote whether to reduce the statutory retirement age from 65 to 62 for men and from 62 to 60 for women; in 2000 whether to make early retirement more attractive to all workers; and in another vote in 2000 whether to leave the statutory retirement age for women at age 62 (rather than increasing it to 65 years). Table 1 displays the voting results of these six votes, separately for German-speaking and for Latin-speaking cantons.

Table 2: Voting results by language region of six votes on working time regulations

	% Yes in Latin Region	% Yes in German Region	% Yes Total
Panel A, "intensive margin"			
Longer vacations (1985)	0.444	0.314	0.348
Less working hours (1988)	0.436	0.311	0.343
Less working time (2002)	0.354	0.226	0.259
Panel B, "extensive margin"			
Reduce retirement age (1988)	0.463	0.310	0.350
Downward flexible retirement age (2000)	0.625	0.402	0.460
No increase of retirement age for women (2000)	0.562	0.336	0.394

Notes: This table shows mean approval for a series of national voter initiatives regarding the duration of work differentiated by the language spoken by the majority of residents in the community. German = cantons with a German speaking majority, Latin = cantons with a French or Italian speaking majority. Voter turnout has been 34.97% for vote 1, 52.86% for vote 2, 58.26% for vote 3, 42.04% for vote 4, 41.71% for vote 5, 41.66% for vote 6. There are no differences in turnout across language regions.

Source: Community level data from Federal Statistical Office (FSO), CH-2010 Neuchâtel.

Table 2 shows that there are strong differences in voting results between the two language regions and that the Latin-speaking cantons are consistently much more in favor of regulations that allow workers to enjoy more leisure. For instance, in the 1985 referendum, 44.4 percent of the population in Latin-speaking cantons voted in favor of longer vacations whereas only 31.4 percent were in favor of such a regulation in the German speaking cantons. The 1988 and 2002 votes on weekly working time reductions show very similar differences. The same picture emerges when we look at differences in voting behavior on issues related to (early) retirement rules. Over all six referenda, the percentage yes-votes is between 1.4 and 1.7 times as large in the Latin-speaking regions as opposed to the German-speaking regions. We consider this as first evidence consistent with a higher prevalence of a "leisure culture" in Latin-speaking regions as opposed to "workaholic" attitudes in German-speaking regions.

Local unemployment may clearly also affect support for work time reductions – through the "lump of work fallacy", for instance. How important is this reverse channel of causation? We discuss this by contrasting the votes that took place in the late 1980s where the unemployment rate stood below 1 % and with the three votes that took place in 2000 (unemployment rate 2 %)

and 2002 (unemployment rate 2.5 %), respectively. The language region differential in support for weekly work time reductions amounts to roughly 12 - 13 % regardless of the aggregate unemployment rate. In contrast, support for proposals to reduce the retirement age is much higher in early 2000 than in 1988 suggesting that voting on early retirement is sensitive to unemployment. Nevertheless, the strong differences in voting on work time reductions are also likely to reflect strong differences in cultural attitudes towards working across Swiss language regions.

3 Data and Identification

3.1 Data

Data on unemployment duration and level is drawn from two sources. We use *unemployment register* data from the years 1998-2003 collected by the local public employment service. Once a job seeker files a claim for unemployment benefits, the case worker enters this claim into the so-called AVAM/ASAL system of the ministry of labor. This system registers the date the claim starts as well as a wealth of information on the individual. Job seekers then see the caseworker on a regular basis and any new information is updated in the system. A job seeker leaves the database either when he or she finds a new job or for "unknown reasons" (does not show up any more; has moved to a different region; or has exhausted unemployment benefits). A nice feature of the AVAM/ASAL database is information on the way a job seeker found a new job: (i) by own initiative or (ii) by placement via the local labor office. This information will be of particular importance in the empirical analysis below. We use 2000 *census* data to construct a survey based measure of labor force participation and full vs part time employment. In the decennial census, respondents are asked to provide information on their employment status. We can therefore re-construct a snapshot of the Swiss labor force in December 2000 – the (biblical) reference date for the census. Moreover, census data allows discussing whether the unemployment data from administrative sources agree with survey data on labor supply.

Our unemployment inflow analysis is based on Swiss men aged 25 - 60 because female labor supply may be affected by both differences in work culture and family culture. The lower age bound is set to ensure that the unemployed in our sample have (mostly) finished their education. The upper bound is set to avoid any unemployment spells that directly allow for early retirement. We also restrict attention to people in our sample who are registered as full-time unemployed who are entitled to unemployment benefits. This selection does not critically lower the number of unemployment spells in our sample but it does ensure a homogeneous sample. The census analysis is based on Swiss men aged 15-64 years in the census. We also focus on younger and older age groups to discuss labor market entry and exit.

Both data sources contain information on the socio-economic background of job seekers and census respondents as well as information on the place of residence. Whereas the census data contains information on place of work, the unemployment register data neither informs

on where job seekers worked before entering unemployment nor where they work after leaving unemployment. We supplement these data sources with important information characterizing the socio-demographic structure of the community of residence, information on labor demand, and on the implementation of labor market policy. *Individual controls* include socio-economic characteristics as reported in the AVAM/ASAL data base as well as information on previous employment: age, marital status, number of dependent family members, willingness to commute or move, education, qualification, the sector of previous employment (agriculture, manufacturing, construction, services, tourism, other), previous insured earnings, and the assessment of the caseworker w.r.t. the ease of finding a suitable job. *Community controls* are taken from the Swiss population census 2000 and consist of: structure of population/employment by 5-year age groups, 5 education groups, and three sectors as well as the percentage of men and immigrants living in the respective community, the total number of inhabitants, and if the community belongs to an agglomeration area or not. *Labor demand controls* are measured at the community level and include the number of vacancies posted from January to June 2000 per employed resident in the working age population, the 1998 number of jobs, the 1998-2001 changes in both the number of jobs and the number of firms, and the median wage of each community. This information is based on the Swiss firm censuses 1998 and 2001. Finally, *ALMP controls* include monthly time varying entry rates into four types of active labor market programs (basic course, training programs, employment programs, subsidized jobs) and the benefit sanction rates drawn from the AVAM/ASAL database.

3.2 Identification

Comparing unemployment rates in Latin-speaking versus German-speaking cantons as in Figure 1 is suggestive for a potential role of culture for unemployment, but we can not interpret this evidence as causal. Attitudes towards work appear to differ between ethnic groups delineated by language in Switzerland (Tables 1 and 2) but a simple comparison of these groups is unlikely to be informative on the effects of culture on unemployment. Regional differences in industry structure, education, or shocks to labor demand are clear confounders.

To discuss the identification problem and discuss our approach to solve the problem, let Y_{ic} be the duration of unemployment experienced by individual i living in community c – a geographically contiguous and politically independent area with a varying number of inhabitants. We discuss identification and provide main results contrasting "Latin" (i.e. French, Italian or Romansh) speaking individuals or areas with German speaking individuals or areas. The key cultural rift is between German and Latin rather than within the Latin area. We also discuss separate results by language area in a sensitivity analysis. So, let $L_i = 1$ if job seeker i is a native French or Italian or Romansh speaker, and $L_i = 0$ if job seeker i is a native German speaker. Let $PL_c \equiv E_c(L_i)$ denote the fraction of Latin speakers in the community of residence c of individual i . The following model captures both the effect of individual values on unemployment, and the effects of cultural values in the group on the individual (i.e. the community).

$$Y_{ic} = \alpha + \beta L_i + \gamma PL_c + \nu_{ic} \quad (1)$$

The parameter β captures the role of individual culture for unemployment. The idea is that individuals who have been raised in different cultural environments may have different attitudes towards work which in turn shape their job search behavior when unemployed. Thus β measures the role of work values that are transmitted from parents to their children – the vertical channel of cultural transmission. In contrast, the parameter γ captures the role of work culture prevailing in the community of residence of the individual. Why may community culture be important? There are at least three reasons for why a horizontal channel of transmission may be important. First, social interactions between job seekers and other job seekers may lead to spillovers.⁹ These interactions may be endogenous – job seekers are unemployed longer because other’s are seeking for work longer – or contextual – job seekers are directly affected by cultural (language) composition of their community. Second, culturally shaped attitudes towards working give rise to work norms which are enforced via social sanctions. Third, the extent to which information on job openings is shared between workers and job seekers may vary across cultural groups.

Clearly, simple least squares identification of the parameters will fail since language skills are important in job finding, and language groups tend to be located in different geographical regions with different markets and institutions.¹⁰ How can we identify the role of work culture on unemployment?

We address the key identification problem by analyzing labor market behavior on either side of the language border. The key idea of spatial regression discontinuity is that geographic proximity preserves differences in culture but lets differences in employment opportunities and institutions vanish. In other words, observed differences in unemployment at the *Röstigraben* reflect differences in behavior generated by differences in norms and values rather than by differences in labor markets and/or institutions. Local contrasts at the language border identify the effect of culture on unemployment if this assumption is satisfied.

Specifically, to apply the spatial regression discontinuity design, we calculate S_c , the driving distance in kilometers to get from community c to the closest community on the other side of the language border. To reflect both distance and language region, we code the distance measure negatively for communities in the German-speaking regions and positively for the Latin-speaking regions, so $S_c > 0$ identifies a community in the Latin speaking part and $S_c < 0$ is a community

⁹Note that the reduced form model 1 may be derived from a standard linear-in-means model of social interactions where group unemployment and group language structure affects individual unemployment, i.e. $Y_i = \alpha' + \beta' L_i + \gamma' E_c(Y_i) + \delta' PL_c + \nu'_{ic}$, where $E_c(Y_i)$ is the peer group average unemployment outcome. The parameters in model (1) then represent the reduced form parameters obtained by replacing $E_c(Y_i)$ in the linear-in-means model and solving for the underlying determinants. In particular $\alpha = \alpha'/(1 - \gamma')$, $\beta = \beta'$, $\gamma = (\delta' + \gamma'\beta')/(1 - \gamma')$, and $\nu_{ic} = \nu'_{ic} + \gamma'/(1 - \gamma')E_c(\nu'_{ic})$.

¹⁰Note that specification (1) imposes a homogeneity assumption on the treatment effect. Relaxing this assumption does not lead to fundamentally different conclusions regarding the conditions needed for identification but it does change the interpretation of the identified effects (Hahn et al 2001).

on the German speaking side of the language border.¹¹ Let $E_+(Y)$ denote the limit of the expectation of Y on the Latin side of the language border, i.e. $E_+(Y) \equiv \lim_{\epsilon \rightarrow 0} E(Y|S_c = \epsilon)$, with $E_-(Y)$ denoting the corresponding expectation when approaching the language border from the German side. Contrasting unemployment outcomes as defined in equation (1) at the border, we find that the border contrast is composed of three components

$$E_+(Y_i) - E_-(Y_i) = \beta[E_+(L_i) - E_-(L_i)] + \gamma[E_+(PL_c) - E_-(PL_c)] + [E_+(\nu_{ic}) - E_-(\nu_{ic})] \quad (2)$$

This analysis shows two key results. The first result is that we can identify whether culture plays any role or not by investigating whether labor market outcomes are discontinuous at the language border. The key idea in this result is that a language barrier separates culture (giving rise to discontinuities in own culture and other's culture) without separating markets. Thus, the key underlying identifying assumption for (2) to provide valid causal evidence on any role of culture is that the error term ν_{ic} is mean independent of the language region at the language border. In other words, the identifying assumption is that there are no unobserved differences in regional labor market development at the language border. There are three important concerns with this assumption: unemployment differences could simply reflect (i) regional differences in labor market opportunities; (ii) regional differences in how unemployment insurance is implemented; and/or (iii) sorting across the language border. Section 4 below discusses the validity of these concerns in detail.

Lee and Lemieux (2009) discuss that the estimand (2) can be measured in the context of a spatial regression discontinuity regression. Let $L_c = 1$ if more than 50 % of Swiss residents of community c speak French, Italian, or Romansh, and $L_c = 0$ if the majority's language is German. Consider the following linear regression

$$Y_i = \pi_0 + \pi_1 L_c + \pi_2 S_c + \pi_3 L_c S_c + X'_{ic} \delta + \nu_{ic} \quad (3)$$

where X_{ic} is a vector of variables that capture differences between individuals, communities, markets, and local labor market policies. Furthermore, the vector X_{ic} contains a full set of canton and time dummies to account for unobserved differences between states and over time. The terms in S_c and $L_c S_c$ capture a two sided linear trend between unemployment duration and distance to language border. The parameter estimate for π_1 is a consistent estimate of (2), provided that our specification appropriately captures differences in unemployment outcomes across regions.

¹¹For instance, Geneva – the Westernmost city – is located +150 km away from the barrier, St. Gallen, the largest city in the East is –170 km away from the border. Zurich is –100 km away and Lausanne is +65 km away from the language barrier. The city of Fribourg (capital of the bilingual canton Fribourg) is located exactly on the language barrier. In the job seeker data, the average distance to the language border is 69.3 kilometers for job seekers in French or Italian or Romansh speaking areas, and 80.6 kilometers for job seekers who live in German speaking areas. Focusing on job seekers who live in bilingual cantons (Berne, Fribourg and Valais) reduces mean distance to border to 28.8 kilometers on the French, Italian or Romansh speaking side, and to 32.7 kilometers on the German speaking side.

The second result of the analysis (2) is that contrasting unemployment outcomes does not allow differentiating between vertical and horizontal transmission of culture. Because both individual language and the community’s language change discontinuously at the language border, the parameter π_1 measures the overall effect of culture on unemployment. How can we disentangle the effects of one’s own cultural values from the effect of one’s neighbors culture? Understanding the role of vertical cultural transmission requires shutting down the channel of horizontal cultural transmission, i.e. contrasting individuals with different native languages L_i in the same language region L_c – as is common in the epidemiological approach to identifying culture (Fernández 2007). In principle, this is possible because there is within region variation in native language. About 6 % of all job seekers who live in the Latin speaking region are native German speakers, and about 3 % of all job seekers in the German speaking region are native French, Italian or Romansh speakers. This means that we can augment regression (3) with information on job seeker i ’s native language and separate horizontal transmission of culture from vertical transmission of culture.

The key problem with this identification strategy is that it requires comparing people who do not live in the region speaking their native language (movers) with job seekers who live in a region that speaks their language (stayers). There are at least two reasons why these two groups might differ. First, not speaking the region’s language may harm labor market success. Second, movers tend to be a selected sub-group of the overall population.

How relevant are these concerns? First, note that we can measure the role of vertical transmission of values both in the Latin speaking and the German speaking region. If there is a region independent disadvantage to one’s first language not being the local language, we would detect this in terms of an asymmetric estimate of the role of vertical transmission β .¹² Second, note that self-selection is common to all studies adopting the epidemiological approach. Culture-based selective migration will tend to decrease the importance of vertical cultural transmission. By consequence, our analysis provides a *lower* bound on the importance of the vertical channel of cultural transmission. Moreover, the presence of a large bilingual city – the city of Fribourg – allows us to go one step further. Fribourg is a setting with two cultural groups residing in the same geographic location in a non-segregated fashion. This suggests that residents of Fribourg are similarly affected by horizontal transmission of culture allowing us to study the role of vertical transmission without adaptation and selection.

Our empirical identification strategy to separate vertical and horizontal transmission proceeds as follows. We control for language skills by adding the information on one’s native

¹²To see this, note that comparing Latin to German speaking job seekers in the Latin region provides information on $E(Y_i|L_i = 1, L_c = 1) - E(Y_i|L_i = 0, L_c = 1) = \beta + E(\nu_{ic}|L_i = 1, L_c = 1) - E(\nu_{ic}|L_i = 0, L_c = 1)$ whereas comparing Latin to German speaking job seekers in the German speaking region of Switzerland measures $E(Y_i|L_i = 1, L_c = 0) - E(Y_i|L_i = 0, L_c = 0) = \beta + E(\nu_{ic}|L_i = 1, L_c = 0) - E(\nu_{ic}|L_i = 0, L_c = 0)$. These contrasts only measure the same parameter if there is no stayer mover difference in labor market skills, or if there is a stayer advantage in the Latin region but a stayer disadvantage in the German region – or vice versa. Asymmetric stayer advantage in labor market success is not plausible because language skills are likely to favor stayers in both language regions.

language not being equal to the language spoken by the majority in the community, i.e. $N_{ic} \equiv L_i \neq L_c$. This variable captures the extent to which individuals whose native language is not identical to the local language experience differential unemployment durations than individuals who are able to speak the local language perfectly. Specifically, we modify equation (3) as follows

$$Y_i = \alpha + \beta L_i + \pi_1 L_c + \delta N_{ic} + \pi_2 S_c + \pi_3 L_c S_c + X'_{ic} \delta + \nu_{ic} \quad (4)$$

the parameter β measures vertical transmission, the parameter π measures horizontal transmission generated by the change in the percentage latin speakers at the language border, and the parameter δ measures the pure effect of not speaking the local language. Note that L_c can be used as an instrument for PL_c (conditional on the spatial trends) to identify the parameter γ (Lee and Lemieux, 2009).

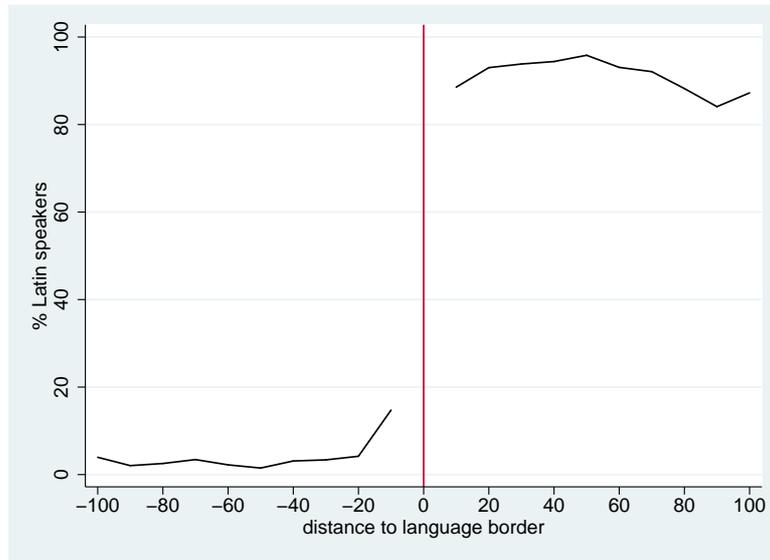
4 Assessing discontinuities at the *Röstigraben*

In this section we assess whether there exist significant discontinuities in unemployment durations at the *Röstigraben*. We start by documenting the significance of the *Röstigraben* as a language barrier and show that one key element – support for work regulations – changes across different language regions. We then assess the extent to which unemployment durations change at the language border. Under the assumption that geographic proximity to this language barrier preserves differences in culture but does not imply a segmentation of labor markets and the institutional environment, observed differences in unemployment outcomes can be interpreted as the causal effect of culture on unemployment. To check the plausibility of this identifying assumption we proceed as follows. We address in detail the key concern that the *Röstigraben* is a barrier that segments labor markets. We then go one step further and provide detailed regression analyzes that check to which extent observed language-border differences can be attributed to standard explanations commonly associated with differences in unemployment outcomes.

4.1 Assessing discontinuities in language, voting, and unemployment

We start by exploring how sharply the dominant native language changes at the *Röstigraben*. Figure 3 shows the percentage unemployed with Latin (i.e. French or Italian) native language by distance to the language border. The figure clearly demonstrates that the *Röstigraben* is a sharp language barrier. In the German-speaking parts of the country (negative distance measure) the percentage of Latin native speakers is very small, considerably less than 10 percent. More importantly, the percentage native Latin speakers does not show a clear trend when we approach the *Röstigraben*. At the language border, there is a sudden jump from about 20 percent Latin-speakers on the side of the German language area to more than 80 percent on the Latin-dominated side. Notice that this change occurs within a distance of 10 km, the grid adopted in the Figure. Hence we conclude that the language border delineates quite sharply the two language regions.

Figure 3: Percentage Latin-speakers (French, Italian or Romansh), by distance to language border



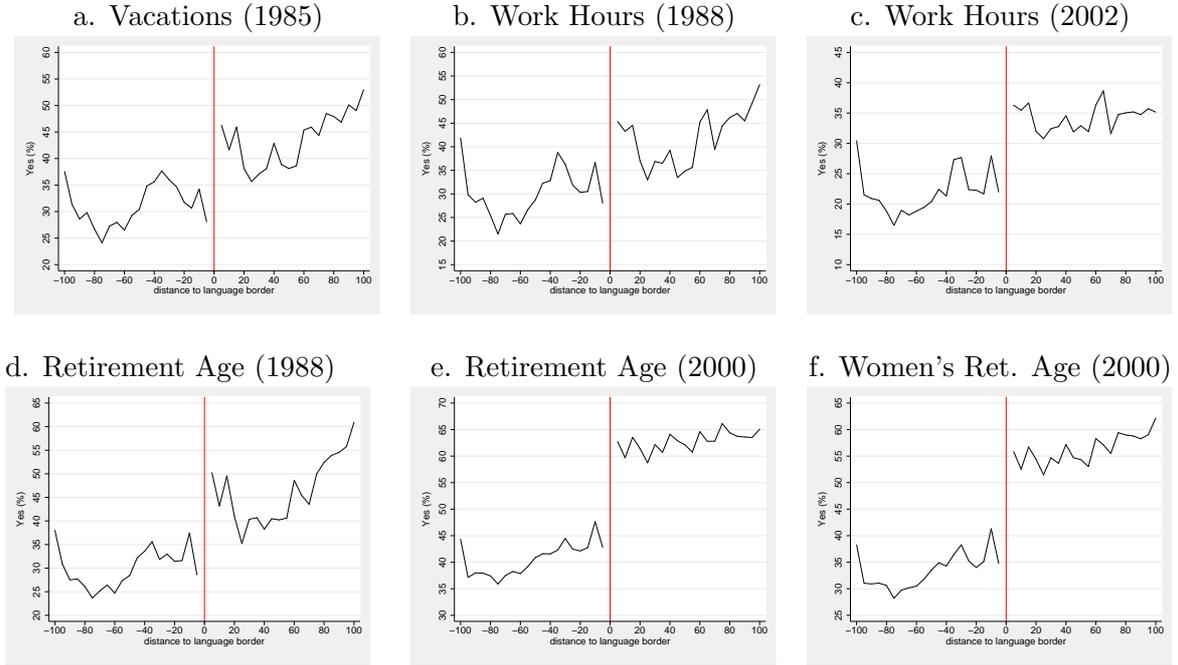
Notes: negative=German-speaking part; positive=French-/Italian-speaking part.
 Source: Swiss Census 2000, Federal Statistical Office (FSO), Neuchâtel.

Recall that Table 2 showed much stronger support for work time regulations in the Latin speaking areas of Switzerland than in the German speaking areas of Switzerland. If there is a cultural break at the language border, then there should also be a gap in support for work time regulations exactly at the language border. Figure 4 draws these voting results, using disaggregated information at the community level by distance to the language border.

Panel a)-c) show average (weighted) community votes for the referenda on working-time regulations (“intensive margin”), respectively for the 1985 vote whether to increase vacation weeks (panel a); and the 1988 and 2002 votes on a reduction of regular weekly working hours (panels b and c). These graphs tell a consistent story. In particular, there exists a large discontinuity in voting behavior at the language border. The voting population with residence on the Latin-speaking side of the language border votes also in favor of more work time regulations as compared to the German-speaking side. The situation is very similar when we look at voting results concerning lifetime-work regulations. In panels d)-e) we see the results of the community votes on the 1988 vote on the reduction of the statutory retirement age, the 2000 vote on easier access to early retirement and the 2000 vote on leaving the retirement age for women at the current level (rather than increasing it). Overall, these results indicate that there is a clear break in one important element of culture – support for work time regulations – at the language border.¹³

¹³Voting is endogenous reflecting not only work attitudes but also the large differences in regional unemployment. Note, however, that in the late 1980s Switzerland was characterized by unemployment rates below the 1 percent level. Thus, even though there were regional differences in unemployment in the 1980s, voters are likely to

Figure 4: Voting results on 6 referenda, by distance to language border, Panels a)-f)

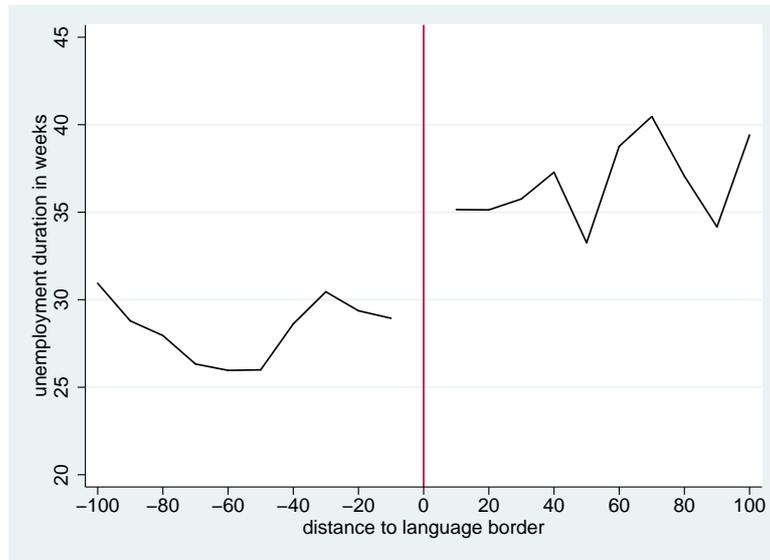


Notes: negative=German-speaking part; positive=French-/Italian-speaking part. This figure reports percentage of yes votes in national referenda or voter initiatives on work time regulations. Source: data from Federal Statistical Office (FSO), Neuchâtel.

In Section 2 above we have already documented the striking differences in unemployment outcomes between German-speaking and the Latin-speaking cantons. If culture is a first-order determinant of these differences we should see a discontinuous change in unemployment not only between entire language areas, but also at the *Röstigraben*. In Figure 5, we draw the average duration of unemployment experienced by residents located at different distances from this border. This graph clearly shows a strong discontinuity of average unemployment durations at the language border. On the German-speaking side the average duration of unemployment is about 29 weeks. On the Latin-speaking side the corresponding value is about 35 weeks. In either direction, we do not observe a strong trend (with respect to distance from the border) in unemployment outcomes.

Table 3 presents unemployment durations for the two language regions together with two estimates for the differential at the language border. Row 1 suggests that the difference in unemployment duration between language regions is very high (10 weeks), but probably driven to some extent by different economic structures (column 4). Using model (3) without controls, we estimate the corresponding difference directly at the language border (column 5). This estimate may be biased if the relationship between unemployment duration and distance to language have been less concerned by the motive to generate employment for the unemployed when voting on work time reductions. Nevertheless, we still find striking differences in voting on work time regulations for the 1980s votes. This suggests that there is a clear cultural break at the language border.

Figure 5: Average durations of unemployment, by distance to language border



Notes: negative=German-speaking part; positive=French-/Italian-speaking part.
 Source: Unemployment Register 1998-2003, Federal Statistical Office (FSO), Neuchâtel.

border is misspecified. Addressing this important issue, we therefore report estimates of model (3) that only use information from three bilingual German/French cantons (Fribourg / Valais / Berne). Findings in column (6) show that the language border difference in unemployment duration remains at a level of 6 weeks. Row 2 in Table 3 also presents estimates for log unemployment duration which should be less affected by outliers. Results indicate that log unemployment duration increases by .19 points using information on all Switzerland or by .21 points using bilingual cantons. These estimates translate into changes of unemployment duration that are of similar order of magnitude as the duration estimates.

Table 3: Summary statistics: Dependent variables

	(1)	(2)	(3)	(4)	(5)	(6)
	All	Latin	German	Difference	Difference at border	
					All	Bilingual cantons
Unemployment duration (weeks)	32.12	39.12	29.07	10.05***	6.34***	6.18***
Log unemployment duration	4.89	5.16	4.77	.38***	.19***	.21***
No. of observations	173072	52317	120755		173072	34528

Notes: Latin = majority in community speaks French, Italian or Romansh. Difference at the border is estimated using linear specifications. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

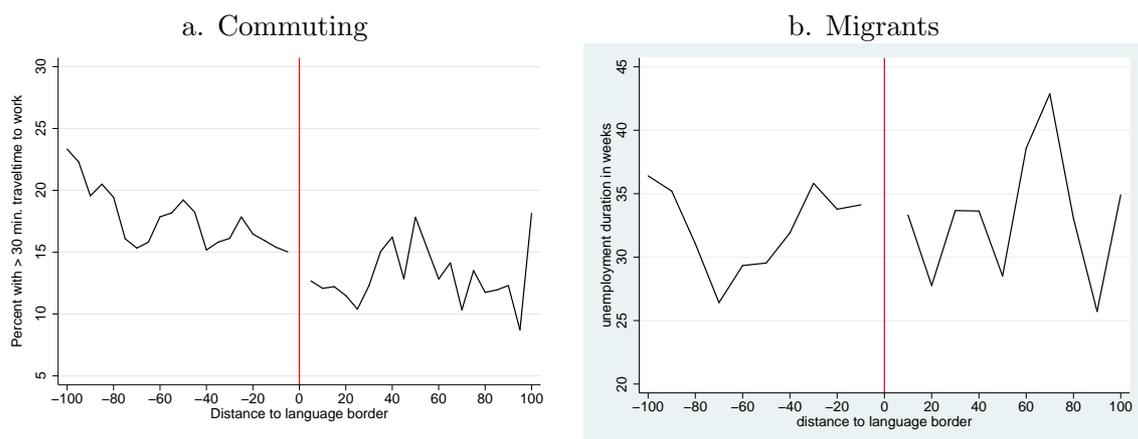
Notice that a 6 weeks difference in unemployment durations is quantitatively significant. To see recall the effects of unemployment insurance parameters as estimated e.g. by Katz and Meyer (1990). Their analysis indicates that an increase in maximum benefit duration by 10 weeks increases actual durations of unemployment by one week. Extrapolating this effect linearly, a six-week difference in unemployment duration arises from increasing the maximum benefit duration of unemployment benefits by more than a whole year! We therefore conclude that the difference in unemployment durations at the *Röstigraben* is strikingly large. To what extent is this difference driven by differences in labor demand and labor market integration?

4.2 Assessing discontinuities in labor markets

An obvious concern against the cultural interpretation of language-border effects in unemployment outcomes is that these differences may reflect labor market conditions. We address this central issue in two different ways.

First, commuting times allow studying the extent of labor market integration. If the language barrier separates markets, workers living close to the border will be forced to search further away from their place of residence. This suggests that commuting times will tend to be higher in communities that are close to the language border than in communities that are further away from the border. The empirical evidence is exactly in contrast to this idea (Figure 6a). Both in the Latin speaking area and in the German speaking area, commuting times tend to be lower closer to the border than further away. What is more, there is no discontinuity in the fraction commuting more than 30 minutes to their workplace at the language border. This evidence suggests both that the language border does not constrain job search radius in a one sided fashion.

Figure 6: Are Labor Markets Integrated?



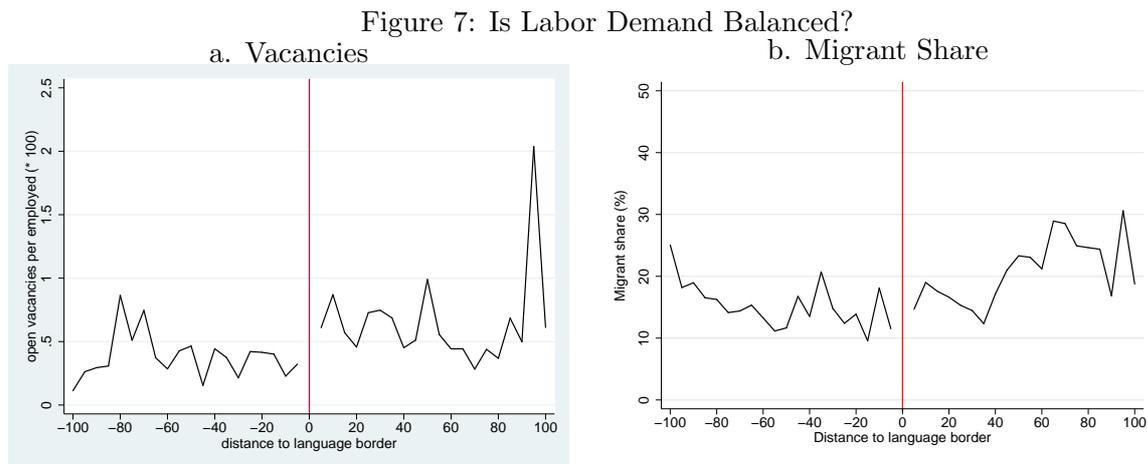
Notes: negative=German-speaking part; positive=French-/Italian-speaking part. Figure a shows the share of workers commuting for more than 30 minutes to reach their place of work. Figure b shows average log unemployment duration for job seekers for non Swiss citizens whose native language is neither of the languages spoken in Switzerland.

Source: Swiss Census 2000, Federal Statistical Office (FSO), Neuchâtel.

Moreover, we also provide descriptive evidence on immigrants who are neither German native

speakers nor Latin native speakers (whereof 29% immigrants from former Yugoslavia, 12% from Portugal, and 11% Turkish immigrants). Arguably, this group does not share the cultural background of Latin- or German-Swiss so they are neither affected by horizontal (due to language differences) nor by vertical (due to differences in country of origin) transmission of preferences and values. Yet immigrant job seekers are looking for jobs in similar labor markets as the native job seekers. Figure 6b reports unemployment duration of this group of migrants. Clearly, the figure shows that there are no salient differences in unemployment durations for immigrants with a non-German and non-Latin cultural background, i.e. a group of job seekers who do not share norms and views expressed by Swiss residents.¹⁴ This is a second piece of evidence suggesting that labor markets are similar on both sides of the *Röstigraben*.

The *second* question is whether labor market success would be identical in the absence of cultural differences. A direct measure of labor demand is the number of vacancies in each community per employed person (Figure 7a). The Swiss firm census provides information on all vacancies that were created by firms between January and June 2000. Interestingly, the figure suggests that the vacancy to employment rate is slightly higher on the Latin speaking side of the language border. This suggests that labor market chances are slightly better on the Latin side of the language border than on the German speaking side of the language border.



Notes: negative=German-speaking part; positive=French-/Italian-speaking part. Figure a shows the vacancies posted by firms between January and June 2000 in each community per number of employed individuals in the working age population (16-64 years) living in that community. Figure b shows the share non-Swiss residents.

Source: Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), Neuchâtel.

The ultimate question refers to job competition among Swiss natives and non-Swiss immigrants. The Latin speaking area of Switzerland is characterized by a substantially higher share of non-Swiss population than the German speaking area. Thus, competition for jobs is stronger in the Latin-speaking area than in the German speaking area. Yet does this also hold for communities located close to the language border? Figure 7b shows that the migrant share

¹⁴Table 7 confirms that there is no significant difference in log unemployment duration in a regression setting that controls for canton dummies, individual characteristics, community characteristics, and labor market policy controls.

is balanced right at the language border. Both German speaking border communities and Latin speaking communities are characterized by a migrant share on the order of 18 %. This evidence is consistent with symmetric job competition across the language border within Switzerland.¹⁵ Moreover, Figure 7 also suggests that regional sorting by immigrants is not relevant. First, the migrant share is balanced at the language border, and second there are no differences in unemployment duration at the language border.¹⁶

Taken together, ex ante evidence suggests that the language border does not separate labor markets, that labor market chances are similar across the border, and that there is not differential job competition between Swiss and non-Swiss migrants.

5 The Effect of Culture on Unemployment

This section provides the main result on the effects of culture on unemployment. We *first* discuss regression analyzes of the border gap in unemployment duration that account in detail for regional differences in the economic and institutional environment. In a *second* step, we discuss why unemployment duration differs at the border and provide additional evidence on alternative labor supply measures.

5.1 Effects on Unemployment Duration

The above descriptive graphical analysis did not control for socio-economic characteristics of individual job-seekers, so the specific reason for the observed border-discontinuity in unemployment remains unclear. Therefore we investigate whether the barrier effect survives once we introduce, sequentially, four groups of variables: (i) the composition of the unemployment pool with respect to human capital and other socio-economic characteristics; (ii) labor demand conditions (availability of jobs, vacancies, changes in jobs and firms); (iii) community characteristics (age structure, average education levels, and urbanization/agglomeration); and (iv) implementation of labor market policies (treatment intensities with active labor market policies and sanction rates).

Table 4 shows the estimated effect at the language border based on equation (3). All regressions in Table 4 control for inflow year and quarter, for canton (=state) dummies, and a set of dummies for large cities. Introducing canton dummies is of particular importance in the present context because cantonal borders are also institutional borders and because cantonal dummies account for persistent regional differences in labor market conditions. We also use dummy variables to control for large urban centers because they may be driving the distance

¹⁵One might argue that there is asymmetric competition for jobs due to workers crossing the national border. Note, however, that identification is due to bilingual cantons. Two of these three cantons (Fribourg and Berne) do not share a border with France. Moreover, the third canton (Valais) who borders France and Italy does so in a rugged terrain that does not lend itself to daily commuting. Asymmetric international job competition is therefore unlikely to be an important issue.

¹⁶Note that the share of non-Swiss who do not speak a language spoken in Switzerland is also balanced across the language border reaching a level of about 6 %.

to border effects in the regressions. All estimates account for clustering at the level of each community.¹⁷

Table 4: The language barrier effect in unemployment durations

	(1)	(2)	(3)	(4)
	Indur	Indur	Indur	Indur
Latin	0.237*** (0.039)	0.241*** (0.032)	0.244*** (0.032)	0.215*** (0.031)
Distance	-0.0317 (0.031)	-0.0987*** (0.029)	-0.0979*** (0.029)	-0.0948*** (0.028)
Distance·Latin	-0.0596*** (0.013)	0.0143 (0.013)	0.00926 (0.014)	0.00205 (0.014)
Constant	2.583*** (0.077)	2.493*** (0.208)	2.345*** (0.222)	2.363*** (0.224)
Individual controls	Yes	Yes	Yes	Yes
Community characteristics	No	Yes	Yes	Yes
Labor demand	No	No	Yes	Yes
ALMP controls	No	No	No	Yes
Observations	173072	173072	173072	173072
R^2	0.123	0.126	0.126	0.126

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Latin = majority in community speaks French, Italian or Romansh. Distance = distance to language border (in 100 kilometers road distance). All designs include control dummies for year, quarter, canton (state) and for large cities. Other controls are individual characteristics (age, marital status, no. of dependents, qualification, employability, previous earnings, previous industry and mobility). Community characteristics are education, sector, age and % of people that speak another than the official languages. Labor demand controls are number of firms, % change in no. of firms and available jobs from 1998 to 2001 and vacancies per working age population. Labor market policy controls are a community average of sanction rates, ALMP assignment rates for training course, employment programs, and subsidized jobs. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

Column 1 includes a large set of individual characteristics in the regression (skills, sector of last job, employment prospects assessed by the caseworker, previous earnings, family background, willingness to move to another region). Controlling for the above set of variables, we

¹⁷Card and Lee (2008) argue that errors need to be clustered with respect to the running variable if the running variable is not measured on a continuous scale. Note that this type of clustering is not needed in our context since distance to border is measured on a continuous scale.

find a language border differential in log unemployment durations of .237 log points. Evaluated at the sample mean, roughly 32 weeks, this is equivalent to a 7.5 weeks difference in average durations of unemployment at the language border. This means that, after controlling for a detailed set of characteristics, the estimated language barrier effect does even become somewhat larger than the raw differential observed at the language border in figure 5 above. The language barrier effect is estimated using linear distance-to-language border trends, separately for the Latin-speaking and the German-speaking side of the language border. The parameter estimates for the distance to the language border indicate that unemployment duration decreases when approaching the language border on the German speaking side of the language border, and it increases when approaching the language border from the French/Italian/Romansh speaking side of the language border. Apart from the estimates in column 1, results indicate that distance matters for unemployment to a similar extent on either side of the language border. We investigate below to what extent non-linear specifications and specifications that attach more weight to communities located closer to the language border affect the main results.

To check the robustness of this effect, the remaining 3 columns of Table 4 introduce additional controls. Column 2 controls for community characteristics (community education levels, demographic structure, community size, and a dummy that indicates whether the community belongs to suburbs of an urban center (agglomeration)). Although most of these variables (in particular, age structure, education levels, and community size) have a statistically significant impact on unemployment durations, introducing these additional controls does not change the magnitude of the language barrier effect. In contrast, the point estimate even increases slightly to .241. Column 3 checks for labor demand conditions within cantons (i.e. in addition to persistent differences in labor market conditions across canton that are captured by the cantonal dummies). We introduce detailed community indicators to capture local differences in labor demand. The number of available jobs in the community (in the base year 2001); the increase in the number of jobs and the increase in the number of firms at the community level between the years 1998-2001; and the number of vacancies opened in a community between January and June 2000 per employed resident in the working age 16-64 years. Introducing these detailed labor market indicators neither has a strong impact on the overall performance of the estimated equations nor does it have an impact on the estimated language barrier effect on unemployment durations. It appears that differences in labor market conditions are well captured by the cantonal dummies. Column 4 includes indicators for differences in regional ALMP treatment intensities (sanction rates, ALMP assignment rates for training courses, employment programs, and subsidized jobs). These variables contribute to explaining unemployment durations. However, controlling for regional differences in ALMPs does not contribute very much to an explanation of the observed difference in unemployment durations at the language barrier. The coefficient of the Latin-dummy decreases only slightly to .215.

Why is the unemployment duration differential at the language border so stable? Intuitively, this must be due to the fact that the characteristics we include in columns 1-4 are either balanced on both sides of the language border, or that imbalances are quantitatively unimportant.

Detailed summary statistics in the appendix show that contrasting individuals just across the language border reduces the imbalances across language regions considerably. Nevertheless, a number of background characteristics remain imbalanced at the language border in ways that are favoring job seekers on the Latin speaking side of the language border.¹⁸ Do the differences in observed characteristics contribute to enlarging the difference in unemployment duration? To shed further light on this issue we regress individual, community, labor demand, and ALMP characteristics on log unemployment duration of individuals living on the German speaking side of the language border. We then combine the German parameter estimates with the background characteristics of the Latin speaking job seekers to predict unemployment duration of residents of the Latin speaking side of the border – and vice versa for the German speaking side of the language border. This allows assessing the overall contribution of imbalances in background characteristics to the language border unemployment differential.

Figure 8 shows average actual log unemployment duration (solid lines) as well as average predicted log unemployment duration (dashed lines) for both language regions using the procedure outlined above. Results indicate that there is no noteworthy discontinuity at the language border, neither in a regression based on German-Swiss observations to predict Latin-Swiss unemployment duration nor vice versa. Moreover, both exercises suggest that the observed gap in log unemployment is smaller than the one predicted using background characteristics. This explains why results that do control for background characteristics identify a slightly larger language border differential than those that do not account for background characteristics.

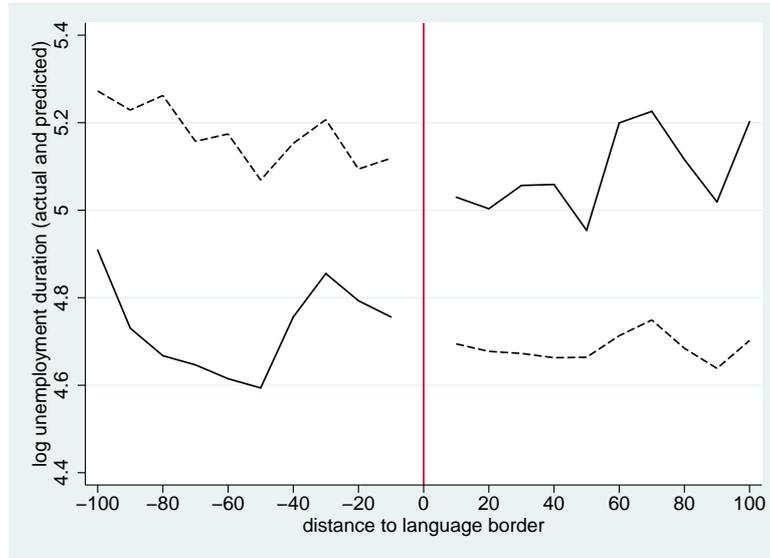
We next look at the robustness of the estimated effect. Table 5 looks at the unemployment differential at different segments of the language border. Column 1 repeats the estimate of column 4 in Table 4 for ease of comparison. In columns 2 and 3 we restrict the sample to observations along the German-French language border and the German-Italian language border, respectively. That is, in column 2 we use only observation that (i) live in a French-speaking community or that (ii) live in a German-speaking community that has a French-speaking community as nearest neighbor on the other side of the language border. In column 3 we use therefore only unemployed from (i) Italian-speaking communities, or (ii) German-speaking communities that have an Italian-speaking community as nearest language border neighbor.

It is interesting to see that the estimated coefficient for the French-German comparison is almost exactly the same as the one for the whole sample. This is support for the robustness of our specification as the French-German language border accounts for the vast majority of the overall language border. (In fact, the term "Röstigraben" originally refers to French-German language border only). Column 3 shows that also for the Italian-German language border the point estimate is very close to the baseline estimate of column 1, but is not statistically significant. Notice, however, that the high standard error is due to the low within canton variance that can be used to identify the effect. Identification is based on a few communities with a majority of the Italian-speaking residents in the canton Graubünden.¹⁹

¹⁸For instance, job seekers on the Latin side are slightly better qualified, easier to place, and more mobile.

¹⁹The only cantons where there are Italian-speaking communities are the canton Ticino and the canton

Figure 8: Predicted and actual log unemployment duration, by distance to language border



Notes: negative=German-speaking part; positive=French-/Italian-speaking part. Solid lines show actual log unemployment duration. Dashed lines show predicted unemployment duration using data from the German speaking part of Switzerland to predict duration in the Latin speaking part and vice versa. Linear prediction. Source: Swiss Census 2000, Federal Statistical Office (FSO), Neuchâtel.

Existing estimates are based on a linear distance to border specification. Column 4 in Table 4 introduces squared terms in distance to language border (along with an interaction term $\text{Latin} \cdot \text{distance}^2$) to assess the validity of the linear specification. Estimates indicate that the Latin border effect is 0.166 which is lower than in the baseline estimate. We also assess sensitivity to functional form using a second approach – local linear regression (column 5). Local linear regression attaches more weight to observations that are closer to the language border.²⁰ Local linear regression yields a Latin-border effect that is lower than the one of our baseline specification (column 5 in Table 4). Column 6 shows the Latin-effect when focusing on job seekers who live in one of the three bilingual cantons: Berne, Fribourg, and Valais. That is, we are measuring the effect even closer to the language border. The Latin-border effect is almost exactly equal to the one estimated using local linear regression. The final robustness check, conducted in column 6 of Table 4 analyzes whether our results remain stable when we focus on bilingual public employment offices and include public employment office fixed effects.²¹ This is Graubünden, located in the South and the South-East, respectively. The canton Ticino consists entirely of Italian speaking communities. In Graubünden, some communities are Italian, but the vast majority speaks Swiss German.

²⁰We adopt a normal kernel with bandwidth of 15 kilometers (or 9.3 miles). This implies that the job seeker who lives, for instance, 30 kilometers from the language border only contributes 0.135 as much to identification as a job seeker living exactly on the language border (because the weight of the latter is 0.135 of the weight of the former job seeker).

²¹We do not control for distance to language border because all of these offices are located on the language

Table 5: Culture and Unemployment: Sensitivity Analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Base line	French border	Italian border	Squared Distance	Local Linear.	Bilingual cantons	Bilingual PES (FE)
Latin	0.215*** (0.031)	0.218*** (0.033)	0.191 (0.165)	0.166*** (0.040)	0.189*** (0.043)	0.207*** (0.044)	0.176* (0.091)
Distance	-0.0948*** (0.028)	-0.0830*** (0.031)	0.0777* (0.045)	0.0201 (0.064)	0.001 (0.146)	-0.0884 (0.078)	
Distance·Latin	0.00205 (0.014)	-0.00432 (0.016)	0.221* (0.127)	0.001 (0.014)	0.0822 (0.196)	-0.0353 (0.140)	
Distance sq.				0.0804** (0.035)			
Distance sq.·Latin				0.0102 (0.041)			
Constant	2.363*** (0.224)	2.474*** (0.249)	3.125*** (0.947)	2.364*** (0.222)	1.936*** (0.520)	1.598*** (0.456)	-0.378 (1.708)
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	173072	121367	28886	173072	173072	34528	3012
R^2	0.126	0.133	0.110	0.126	0.107	0.100	0.097

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Latin = majority in community speaks French, Italian or Romansh. Distance = distance to language border (in 100 kilometers road distance). Squared Distance = regression includes a squared term in distance and an interaction term Latin · distance squared. Local linear Reg.: Observations are weighted with respect to distance to language border (normal kernel weights with bandwidth $h = 15km$). Bilingual cantons = canton of Berne, Valais, Fribourg (German / French cantons). Bilingual PES = public employment service offices with both Latin and German speaking job seekers. All controls as in table 4.

Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

potentially relevant as regional labor offices have some discretion about implementation of active labor market policies. Including labor office fixed effects still allows us to identify the Latin-effect as there are some bilingual districts. It turns out that the point estimate is lower than our baseline estimates of Table 4. Summing up we find that while our baseline analysis measures an upper bound the the language border gap in unemployment duration, all sensitivity analyzes (except for the Italian German contrast) identify a statistically and economically important unemployment duration gap at the language border of similar order of magnitude.

border.

5.2 Exit Channels and Alternative Measures of Labor Supply

Above we have documented a very large difference in unemployment durations across language regions. We have argued that standard explanations for regional unemployment differences are unlikely to account for the Latin-border effect. In this subsection we go one step further and ask whether the estimated Latin-effect can plausibly be interpreted as an effect of cultural differences in attitudes towards work in general and job search behavior in particular. To make the case for the culture explanation we proceed in two steps. *First*, we look at the particular channel by which unemployed individuals find new jobs. Exploiting information available in the AVAM data base we ask whether unemployed individuals in the German-speaking region are more likely to find a new job by own initiative rather than by mediation of caseworkers in the regional labor offices. This provides direct evidence on the extent to which search effort exerted by the unemployed may account for regional unemployment differences. *Second*, if culturally transmitted work norms are a first-order determinant of unemployment outcomes, we should see similar regional differences with respect to other dimensions of labor supply: labor force participation and full-time vs part time employment.

Our *first* step exploits information available in the AVAM database on how a new job was started: (i) whether this job was found by the unemployed worker him- or herself; or (ii) whether the new job was mediated by the caseworker at the local labor office. Studying the issue of how unemployed individuals find a new job sheds direct light on the job search effort of unemployed individuals.

Moreover, this analysis sheds further light on the issue whether differences in labor demand may explain the estimated Latin-effect. The idea is this: if unemployment differences are due to lower labor demand on the Latin side (because of job competition between migrants and natives or discrimination of Latin speaking Swiss-residents by all employers), this should show up in both exit channels. Firms are central both to jobs that job seekers locate themselves; and to jobs that caseworkers at the employment office mediate. In contrast, job seekers are clearly central in locating jobs themselves, but their search effort is less crucial for jobs mediated by the public employment office. These jobs are assigned by caseworkers and job seekers who refuse to apply for such a job run into the risk that their benefits might be withheld. Hence strong regional differences in the relative importance of exits to own-initiative jobs and exits to caseworker-mediated jobs make us more confident that cultural differences in work norms drive observed differences in unemployment durations.

Table 6 presents the results of our Cox proportional hazard rate analyses. Note that the dependent variable is no longer the duration of unemployment but the exit rate from unemployment. Hence the coefficients of Table 6 have a different interpretation than those in Table 4. All models estimated in Table 6 control for the full set of variables (as in Table 4, column 4). Column 1 reports the estimates of the single-risk model, Columns 2 to 4, report the estimates of a competing risk model with three exit states (own-initiative job, caseworker-mediated job;

Table 6: The importance of various exit channels at the language barrier

	(1)	(2)	(3)	(4)
	All	Self	Empl. Serv.	Other
	96.21%	48.30%	14.47%	33.44%
Latin	-0.322*** (0.032)	-0.497*** (0.047)	0.217*** (0.074)	-0.257*** (0.042)
Distance (100km)	0.0742*** (0.026)	0.157*** (0.040)	-0.101 (0.067)	0.0548 (0.040)
Distance·Latin	0.0105 (0.015)	-0.0285 (0.027)	0.0263 (0.045)	0.0402* (0.022)
All controls	Yes	Yes	Yes	Yes
Observations	173072	173072	173072	173072

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Latin = majority in community speaks French, Italian or Romansh. Distance = distance to language border (in 100 kilometers road distance). All: all exits from unemployment. Self: exits to jobs found by the job seeker. Empl. Serv.: exit to job found by the public employment service. Other: destination unknown (job or non-employment). All controls as in table 4. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

other exit).²² The estimate of the single-risk model in column 1 indicates that the overall exit rate is .322 log points lower on the Latin-speaking side than on the German-speaking side of the language border, consistent with our basic findings in Table 4. The estimates of the competing risk model yields a particularly interesting result. The barrier effect is extremely strong for job finding rates on the unemployed worker's own initiative. The exit hazard rate is .497 log points (roughly 40 percent) lower on the Latin-speaking side compared to the German-speaking side. In contrast, the exit rate for jobs located by a local labor office is .217 log points (roughly 24 percent) higher on the Latin-speaking side compared to the German-speaking side of the language border. This could be due to the fact that there are more open vacancies on the Latin speaking side of the border compared to the German speaking side of the border (see Figure 7). The barrier effect for other exits is negative though only half as big as on exits to own-initiative jobs. This result is intuitive as other exits do not only include exits from the labor force, but also exits to own-initiative jobs that are not communicated to the local labor office. This lets us conclude that the Latin-effect for other exits might be a mixture between a negative effect

²²This model assumes that the three competing exit hazards are independent conditional on information observed in the dataset. This allows separate estimation of the three hazard rates. We do not expect results on the Latin effect to be sensitive to the assumption of independence since these are identified from language border contrasts.

for those that find a job themselves, and an insignificant effect for withdrawing from the labor force. Taken together we find that the relative importance of the way by which unemployed individuals find a new job changes strongly at the language border. This result is consistent with the hypothesis that observed unemployment differences are driven by cultural differences in job search behavior but are inconsistent with an explanation based on labor demand differences.

The *second* step to make a case for the importance of cultural differences in work attitudes is a look at other dimensions of labor supply. The idea is this: When cultural differences in attitudes towards work are a first-order explanatory factor behind observed differences in unemployment duration, we should see differences at the language border also with respect to other dimensions of labor supply. We use the Swiss population census of the year 2000 providing results on both Swiss men whose native language is a Swiss language and immigrants whose native language is not one of the four official Swiss languages. Public use files of this data set are unique as they provide information on the *universe* of the resident population in Switzerland. The large number of observations makes it an ideal data set to explore the issue. Our focus is labor force participation or, more precisely, a dummy indicating whether or not an individual is employed or unemployed (dummy takes value 1) or out of labor force (value 0).²³

Table 7 provides results on unemployment duration, labor force participation, and full vs part-time employment for Swiss men who speak a Swiss language, and results for migrant men who do not speak a Swiss language, in the age bracket 16-64. Results consistently indicate that labor supply is lower on the Latin side of the language border compared to the German speaking side. Unemployment duration is 24 percent higher, labor force participation is 3 percentage points lower, and the rate of full time employment is 1 percentage point lower among residents of Latin border communities compared to what one would expect from German border communities.²⁴ In contrast, labor supply of migrant men who do not speak a Swiss language does not differ in a statistically significant manner at the language border.

6 Vertical versus horizontal cultural transmission

The estimated Latin-effects in tables 4 to 5 are consistent with a large impact of culture on unemployment. In general any effects of culture are a mixture between an individual's culture inherited from the own family (vertical transmission) and the dominant culture of the individual's peers transmitted through social interaction, social networks, or social norms (horizontal

²³Using employment (rather than labor force participation) as a dependent variable does not change the results in Table 7. We also experimented with unemployment (both unconditional and conditional on being in the labor force) as the dependent variable. Also in the unemployment regressions results indicate significantly higher unemployment probabilities in the Latin region.

²⁴Focusing on bilingual cantons reproduces the same result. Further results (not shown) for labor market entrants (15-24 years), prime-age workers (25-49 years), and labor market leavers (50-64 years) indicate that labor force participation is more strongly reduced among entrants and leavers whereas the reduction of full-time employment occurs among prime-age workers. Unemployment results also indicate a stronger effect among younger age groups (25-49 years) than for older cohorts (50-59 years).

Table 7: Unemployment Duration and Labor Force Participation

Dependent variable	Swiss men (Swiss native language)			Migrant men (non-Swiss native language)		
	(1)	(2)	(3)	(4)	(5)	(6)
	log duration	in labor force	full-time employed	log duration	in labor force	full-time employed
Latin	0.215*** (0.031)	-0.0311*** (0.00333)	-0.0115*** (0.00353)	0.0674 (0.052)	-0.0123 (0.0112)	-0.00543 (0.00597)
Distance (100km)	-0.0948*** (0.028)	-0.00364 (0.00370)	-0.00153 (0.00423)	-0.0138 (0.047)	0.000363 (0.00806)	-0.00908* (0.00529)
Distance·Latin	0.00205 (0.014)	0.0201*** (0.00647)	0.0146** (0.00725)	-0.00653 (0.021)	0.000660 (0.0139)	0.00571 (0.00975)
Constant	2.363*** (0.224)	0.946*** (0.0206)	0.833*** (0.0302)	2.942*** (0.467)	0.765*** (0.127)	0.927*** (0.0506)
All controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	173072	1718501	1445747	99093	198150	150331
R^2	0.126	0.212	0.061	0.098	0.083	0.023

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Latin = majority in community speaks French, Italian or Romansh. Distance = distance to language border (in 100 kilometers road distance). Source: Data from Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

transmission). That is, culture can be transmitted vertically from the parents to their children, but also horizontally from relevant peer groups.

This section disentangles the role of these two transmission mechanisms. We decompose these two channels using variation in native language within language regions. More precisely, there is a small (but non-negligible) fraction of individuals in the Latin region whose native language is German, and vice versa. Therefore we can separate the effect of being a Latin native speaker (vertical transmission) from the effect of living in a Latin community (horizontal transmission).

Table 8 shows the relative importance of vertical and horizontal transmission for unemployment duration. Column 1 of table 8 repeats the baseline estimation from table 4, column 4. Including a dummy for Latin native language into this regression (column 2) reduces the measured effect on the language border markedly. However, adding together the effect of vertical transmission (MT Latin) and horizontal transmission (Latin) yields an overall effect of culture quite similar to the one estimated in column 1. The coefficients of column 2 do not account for the fact that it could be harder to find a job in a region where you do not speak the dominant

local language. Columns 3 and 4 repeat the analysis of columns 1 and 2 including a dummy indicating whether the individual's native language differs from the dominant local language. The estimated culture-effects do not change at all. Having a native language that differs from the local language decreases unemployment duration. One way to rationalize this finding is in terms of second language skills. While movers have a native skill disadvantage, they are likely to compensate for that in terms of second languages. A second way to rationalize this finding is that movers could be positively selected in terms of job search skills or employability.

Column 5 of table 8 takes into account that the percentage of Latin speakers does not increase from 0% to 100% at the language border. That is, we deal with a fuzzy regression discontinuity design. In this context, we can use information on residence in the Latin region as an instrument for the percentage with native language French, Italian, or Romansh *conditional on distance to the border* (Lee and Lemieux, 2009). This allows extrapolating the effect on unemployment duration that would arise when changing the percentage Latin speakers from 0% to 100%. The results suggest that increasing the percentage of Latin speakers by 100 % prolongs unemployment duration by 17 %. In contrast, interacting with Latin speaking parents increases unemployment duration 10 %. Recall that self-selection based on work ethic tends to decrease the importance of vertical transmission. This suggests that vertical transmission of culture is at least half as important as horizontal transmission of culture in explaining unemployment duration.

To check the robustness of our estimates further, table 9 takes a closer look at the effect of vertical transmission of culture. Column 1 of table 9 repeats column 4 of table 8. Columns 2 of table 9 looks more closely on the isolated effect of vertical transmission (own native language) using a design where horizontal transmission is captured by community fixed effects. It turns out that the estimate of vertically transmitted culture does not differ from our estimate of column 1. Column 3 estimates the same model using only data from the three bilingual cantons (Berne, Valais, and Fribourg). This yields results very similar to the baseline specification of column 1, though within bilingual cantons the vertical transmission effect at the language border becomes somewhat more important. In column 4 we confine the analysis to job seekers who live in Fribourg only. Fribourg is an interesting case because it is a bilingual city (with some more Latin-speaking than German-speaking individuals). People living in Fribourg share the same environment and the same labor market, independently of their native language and as a result of bilinguality there is no obvious disadvantage to speaking a Latin or the German language. Estimates of the role of the vertical transmission within the city of Fribourg are not affected by self-selection. It turns out that the vertical transmission within the city of Fribourg is on the same order of magnitude than the corresponding effect estimated using data from whole Switzerland. Provided vertical transmission of culture is equally important in Fribourg as in the rest of Switzerland, this evidence suggests that self-selection does not bias baseline estimates of the vertical channel of cultural transmission strongly. Finally, in columns 5 and 6 of table 9 we look at the Latin and the German region separately. The vertical transmission effect is identified contrasting natives and non-natives in the Latin region (presumably leading

Table 8: Separating Horizontal and Vertical Transmission of Culture

	(1)	(2)	(3)	(4)	(5)
	Indur	Indur	Indur	Indur	Indur
	OLS	OLS	OLS	OLS	IV
% Latin					0.173*** (0.046)
Latin	0.215*** (0.031)	0.131*** (0.033)	0.214*** (0.031)	0.127*** (0.033)	
MT Latin		0.104*** (0.015)		0.108*** (0.015)	0.0981*** (0.016)
Distance (100km)	-0.0948*** (0.028)	-0.105*** (0.028)	-0.0968*** (0.028)	-0.108*** (0.028)	-0.119*** (0.030)
Distance·Latin	0.00205 (0.014)	0.00271 (0.014)	0.00251 (0.014)	0.00335 (0.014)	0.00278 (0.014)
MT \neq LL			-0.0225 (0.014)	-0.0301** (0.013)	-0.0309** (0.013)
Constant	2.363*** (0.224)	2.338*** (0.223)	2.368*** (0.223)	2.343*** (0.222)	2.327*** (0.219)
All controls	Yes	Yes	Yes	Yes	Yes
Observations	173072	173072	173072	173072	173072
R^2	0.126	0.126	0.126	0.127	0.127

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Latin = majority in community speaks French, Italian or Romansh. Distance = distance to language border (in 100 kilometers road distance). MT Latin = native language is French, Italian, or Romansh. MT \neq LL = native language is different from community majority language. All controls as in table 4.

Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

to a downward bias if there is a native advantage), and the native language effect is identified contrasting non-native Latin speakers with German natives (leading to an upward bias). Thus, strong asymmetries in the native language effect (being Latin native-speaker causes a labor market disadvantage) would indicate failure of identification. It turns out that the estimated effect of being Latin native speaker is not statistically significantly different and quantitatively very similar in both language regions. This is consistent with the key identifying assumption that there are no unobserved differences between movers and stayers (see section 3).

To learn more about the relative importance of horizontal versus vertical transmission of culture we look in more detail at the exit process from unemployment to a regular job. Using

Table 9: Sensitivity Analysis on Vertical vs Horizontal Transmission

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	Community FE	Bilingual cantons	Fribourg	Latin region	German region
Latin	0.127*** (0.033)		0.114** (0.046)			
MT Latin	0.108*** (0.015)	0.106*** (0.017)	0.147*** (0.034)	0.107** (0.008)	0.101*** (0.021)	0.0852*** (0.022)
Distance (100km)	-0.108*** (0.028)		-0.125 (0.081)			
Distance·Latin	0.00335 (0.014)		-0.0447 (0.139)			
MT \neq LL	-0.0301** (0.013)	-0.0180 (0.013)	0.00795 (0.022)			
Constant	2.343*** (0.222)	3.337*** (0.546)	1.475*** (0.456)	5.248** (0.086)	3.251*** (0.307)	2.237*** (0.416)
All controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	173072	173072	34528	684	52317	120755
R^2	0.127	0.086	0.101	0.125	0.120	0.105

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Latin = majority in community speaks French, Italian or Romansh. Distance = distance to language border (in 100 kilometers road distance). MT Latin = native language is French, Italian, or Romansh. MT \neq LL = native language is different from community majority language. All controls as in table 4. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

exit-channel information available in the AVAM data, we now extend our analysis of table 6 above. In particular, we study whether an individual's own native language affects exit channels (own-initiative jobs versus caseworker-mediated jobs) in a different way than the dominant language of the resident community. Column 1 of Table 10 shows the result of the single-risk analysis adding a Latin native-speaker dummy as a proxy for vertical transmission of culture. Columns 2 to 4 show the results from the competing risk analysis with exit channel own-initiative job (column 2), caseworker-mediated job (column 3) and other exits (column 4). (Notice that coefficients indicate the estimated effect on the exit rate, hence signs are different from previous tables using unemployment durations as the dependent variable). The estimated effects confirm our previous results. The single-risk analysis of column 1 shows that both horizontal and vertical transmissions effects are (statistically and quantitatively) highly significant with the horizontal channel being somewhat more important. More interestingly, we find that the effect is driven

by exits to own-initiative jobs. Both Latin-effects, own language and language region, are significantly negative. Interestingly, being Latin-native speaker also reduces the probability of leaving the unemployment register via "other exits". This is since other exits are mainly exits to own-initiative jobs rather than labor force withdrawals.²⁵

Table 10: Exit channels and Horizontal vs Vertical Transmission of Culture

	(1)	(2)	(3)	(4)
	All	Self	Empl. Serv.	Other
	96.21%	48.30%	14.47%	33.44%
Latin	-0.229*** (0.033)	-0.390*** (0.048)	0.173** (0.079)	-0.129*** (0.047)
MT Latin	-0.118*** (0.013)	-0.135*** (0.021)	0.0579 (0.035)	-0.162*** (0.023)
Distance (100km)	0.0877*** (0.026)	0.171*** (0.040)	-0.107 (0.067)	0.0758* (0.040)
Distance·Latin	0.0100 (0.015)	-0.0294 (0.027)	0.0258 (0.045)	0.0388* (0.022)
MT \neq LL	0.0226** (0.011)	0.0115 (0.016)	-0.000654 (0.028)	0.0626*** (0.017)
All controls	Yes	Yes	Yes	Yes
Observations	173072	173072	173072	173072

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Latin = majority in community speaks French, Italian or Romansh. Distance = distance to language border (in 100 kilometers road distance). MT Latin = native language is French, Italian, or Romansh. MT \neq LL = native language is different from community majority language. All: all exits from unemployment. Self: exits to jobs found by the job seeker. Empl. Serv.: exit to job found by the public employment service. Other: destination unknown (job or non-employment). Stratification at the community level. All controls as in table 4. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

Do the baseline estimates of the Latin region and Latin mother tongue merely reflect past experiences of unemployment? To check whether this concern is important we use information on the individual's past unemployment history available in the AVAM data. In particular, Table 11 splits the sample into individuals who are experiencing their first unemployment spell in the

²⁵We also estimated Cox regressions that are stratified at the community level. These compare with the fixed effects regression from table 9 in that they allow for differences in the baseline hazard by communities. Comparing the stratified estimates to columns 1-4 in Table 10 we find no noteworthy differences in the estimated effect of vertical transmission of culture on exit rates.

last 5 years and individuals who have experienced one or more spells in the last 5 years before their current unemployment spell.²⁶

Table 11: The Role of Prior Unemployment Experience

	(1)	(2)	(3)	(4)	(5)	(6)
	lndur	lndur	lndur	lndur	lndur	lndur
	All	1 st spell	not 1 st spell			
Latin	0.127*** (0.033)	0.183*** (0.041)	0.104** (0.041)	0.0984** (0.040)	0.0894** (0.041)	0.0842** (0.040)
MT Latin	0.108*** (0.015)	0.110*** (0.021)	0.107*** (0.021)	0.108*** (0.021)	0.0955*** (0.021)	0.0964*** (0.021)
Distance (100km)	-0.108*** (0.028)	-0.109*** (0.031)	-0.103*** (0.037)	-0.0959*** (0.037)	-0.0959*** (0.037)	-0.0890** (0.036)
Distance-Latin	0.00335 (0.014)	0.0109 (0.019)	-0.000242 (0.020)	-0.000456 (0.020)	-0.00269 (0.020)	-0.00290 (0.020)
MT ≠ LL	-0.0301** (0.013)	-0.0213 (0.016)	-0.0327* (0.018)	-0.0315* (0.017)	-0.0311* (0.018)	-0.0298* (0.017)
No. of spells last 5 years				-0.0587*** (0.003)		-0.0588*** (0.003)
Avg. log dur last 5 years					0.0693*** (0.004)	0.0693*** (0.004)
Constant	2.343*** (0.222)	2.871*** (0.316)	2.294*** (0.290)	2.569*** (0.282)	1.905*** (0.288)	2.180*** (0.280)
All controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	173072	72034	101038	101038	101038	101038
R^2	0.127	0.174	0.107	0.111	0.110	0.114

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Latin = majority in community speaks French, Italian or Romansh. Distance = distance to language border (in 100 kilometers road distance). MT Latin = native language is French, Italian, or Romansh. MT ≠ LL = native language is different from community majority language. No. of spells last 5 years: Number of unemployment spells in the 5 years prior to this spell. Avg. log dur last 5 years: Average log duration of unemployment spells in the 5 years prior to this unemployment spell. All controls as in table 4. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

Column 1 of table 11 repeats the baseline result of table 8 (column 4). Columns 2 and 3 repeat this same regression when the sample is confined to individuals without a previous unemployment spell in the recent past (column 2) and individuals with one or more previous spells (column 3). It turns out that the Latin-region effect is even stronger among individuals experiencing their first unemployment spell and lower for individuals with previous unemployment experience. We do not see a significant difference of Latin native-language effect between groups with a

²⁶Notice that we have data on unemployment history back to 1993, therefore we can identify the exact number of spells in the last five years for every unemployment spell in the data set.

different unemployment background. This means that vertical transmission of culture is not driven by past unemployment history. In contrast, the horizontal cultural channel is sensitive to the experience of unemployment.

Columns 4 to 6 of table 11 elaborate further on the role of previous employment history for repeatedly unemployed job seekers. Column 4 adds information on the number of unemployment spells. Both the native language and Latin region effect remain unaffected by adding controls for unemployment recurrence suggesting that there are no important differences in terms of past unemployment recurrence between both Latin region and German region residents, and Latin speakers compared to German speakers. Column 4 adds average duration of unemployment spells in the past. Estimates of the strength of the vertical and the horizontal channel are slightly lower compared to the baseline in column 3 that does not control for past duration. This suggests that there are indeed differences in past unemployment duration. Importantly, these differences do in no way account for the salient and strong differences in unemployment duration between Latin speakers and German speakers, and Latin region residents compared to their German region counterparts. Column 6 adds both past unemployment recurrence and mean duration to the main regression model. Results indicate that both vertical and horizontal transmission of culture remain statistically highly significant and quantitatively important.²⁷ We conclude that the Latin-effects (regional and own language) are quantitatively important and not driven by differential unemployment histories between Latin and German native speakers and Latin and German language regions.

7 Conclusions

This paper analyzes the role of culture in explaining unemployment duration along the Swiss *Röstigraben* – the language barrier separating the German-speaking from the Latin-speaking (i.e. French- and Italian-speaking) regions of Switzerland. Our strategy to identify an effect of culture on unemployment relies on the idea that, while the *Röstigraben* separates cultural groups, it neither separates labor markets nor political jurisdictions. This idea is tested in three steps. We *first* collect data on national votes in Switzerland that are associated with limiting work time (weekly hours, duration of vacancies, and early retirement). We argue that voting in favor of work time regulations reflects preferences and norms associated with work. Indeed, the data indicate a strikingly higher support for work limits on the Latin-side of the *Röstigraben*. (The percentage of votes in 6 national referenda on work-time limits was between 13 to 23 percentage points higher – or 1.4 to 1.7 times as large – in Latin-speaking regions as compared to German-speaking regions.). More importantly, support for work time differs strongly on either side of the language border.

Second, the *Röstigraben* lends itself to studying culture because important segments of that

²⁷Consistent with the previous literature, we find that longer durations in the past are associated with longer current unemployment; and more spells in the past go hand in hand with shorter spells in the present (indicating instable employment, i.e. frequent moves between employment and unemployment).

border do not coincide with the borders of Swiss states. Hence, with such quasi-experimental variation in tastes for leisure at the language barrier we can identify the role of culture in explaining unemployment. We discuss in detail how alternative explanations might contribute to the unemployment-gap at the Röstigraben and find that this gap is unlikely generated by differences in labor market conditions and/or changes in political jurisdictions. We also find that differences in labor market policies cannot account for the discontinuous change in unemployment at the Röstigraben.

As a *third* way to test for potential importance of different tastes for leisure we exploit information in Swiss unemployment register data about the way unemployed individuals find a new job (by own initiative versus by mediation through local labor offices). Results indicate that the bulk of the difference is driven by a lower exit rate to own-initiative jobs on the Latin-speaking side. Finally, we document that individuals on the Latin-side do not only have higher unemployment durations but there is also a gap in other dimensions of labor supply. In particular, our findings indicate a substantial *Röstigraben*-gap in labor force participation rates, which is particularly large for younger and older individuals.

Our analysis also sheds light on the relative importance of horizontal versus vertical transmission of culture. In this dimension we go beyond the epidemiological literature that has concentrated on the vertical transmission mechanism (Fernández and Fogli, 2006, Fernández, 2007). As we observe individuals in the Latin region whose native language is German, and vice versa, we can separate the effect of being a Latin native speaker (vertical transmission) from the effect of living in a Latin community (horizontal transmission). We find that both channels are of substantial importance, with the horizontal effect being roughly twice as large as the vertical effect.

In quantitative terms, our analysis suggests that culture is an important predictor of unemployment. Our horizontal estimate suggests that a change in the cultural environment from a 0 percent to a 100 percent Latin neighborhood increases unemployment durations by .173 log points; and our vertical transmission estimate suggests that being Latin (rather than German) native speaker increases the duration of unemployment by .098 log points. Evaluated at the sample mean, the overall effect of culture is on the order of a 7 weeks difference in the average duration of unemployment. Quantitatively, this is a very large effect. Taking as a benchmark the estimate of Katz and Meyer (1990) – according to which a 10 weeks increase in maximum benefit duration increases the average duration of unemployment by 1 week – our estimates suggest that our estimated culture-effect is as large as the effect of a 1.3 years (!) increase in maximum benefit duration.

Clearly, the "change culture" policy cannot be mandated whereas the "change unemployment benefit generosity" policy can be. Does this mean that our results are irrelevant to economic policy? We believe that the answer is no, for at least three reasons. First, our research sheds light on the reasons for the tremendous differences in regional unemployment rates that have puzzled policy makers and researchers for a long time. Second, having identified the role of cultural differences in explaining unemployment we can now start thinking about how economic

policy interacts with culture. Third, cultural differences may also give rise to different policies. Understanding the reverse arrow of causation is an interesting topic of future research.

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Appendix

This appendix provides descriptive statistics on all variables used in estimating model 3. All tables follow the same template. Columns 1-3 show means for all, job seekers in Latin regions, and job seekers in German speaking regions. Columns 4-6 show the language region difference in means, the language border difference in means, and the language border difference within bilingual regions. Columns 4-6 therefore allow assessing to what extent background characteristics are balanced.

Table 12 shows background information for individual characteristics (qualification, sector of last job, difficulty of placement, mobility, age, earnings, family characteristics and native language).

Table 12: Summary statistics: Individual characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
	All	Latin	German	Difference	Difference at border	
					All	Bilingual cantons
Qualification						
% low qualification	.08	.09	.08	.01***	.01	.00
% medium qualification	.10	.10	.10	.00**	-.03**	-.03**
% high qualification	.82	.81	.82	-.01***	.02	.02
Sector of last job						
% agrar	.03	.03	.02	.01***	.02***	.02**
% construction	.11	.11	.10	.00***	-.04*	-.05*
% manufacturing	.17	.15	.18	-.03***	.05***	.05**
% services	.49	.48	.50	-.03***	.01	.03
% tourism	.06	.07	.06	.01***	-.01	.03**
% other sector	.08	.11	.07	.04***	.02**	.01
Difficulty of placement (caseworker assessment)						
% easy to place	.20	.23	.19	.05***	.13***	.07***
% medium to place	.64	.64	.63	.00	-.10***	.02
% hard to place	.15	.11	.17	-.05***	-.04***	-.09***
Mobility						
% no mobility	.03	.11	.00	.11***	.00*	.00
% daily mobility	.89	.76	.94	-.18***	-.05***	-.08***
% mobility: parts of CH	.04	.06	.02	.04***	.04***	.05***
% mobility: whole CH	.03	.04	.02	.02***	.00	.02*
% mobility: abroad	.02	.03	.01	.02***	.00	.01
Age and Earnings						
Age	38.49	37.66	38.70	-1.04***	.10	-.11
Log insured earnings	8.49	8.42	8.51	-.09***	-.08***	-.08***

Family characteristics						
No. of dependents	.96	1.01	.94	.07***	.12**	.07
% single	.51	.50	.52	-.02***	-.04**	-.02
% married	.37	.40	.36	.03***	.03	.01
% divorced	.11	.10	.11	-.01***	.01	.01
% widowed	.00	.00	.00	.00	-.00	.00
Mother tongue						
% German native language	.69	.05	.97	-.92***	-.83***	-.72***
% Latin native language	.31	.95	.03	.92***	.83***	.72***

Notes: Latin = majority in community speaks French, Italian or Romansh. Difference at the border is estimated using linear specifications. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

The results suggest that individual qualification levels do not differ significantly at the language border. It seems however, that on the Latin side of the border significantly more people work in the construction and manufacturing sector and less in the services sector than on the German side. This difference in sectoral composition of the unemployment pool could explain parts of the persistently higher unemployment duration. Note also, that people seem to be slightly more mobile, that is willing to travel to other parts in Switzerland, on the Latin speaking side. This enforces the conclusion that we would rather expect shorter than longer unemployment durations on the Latin side of the language border. Contrasting individuals within bilingual cantons reduces the pre-existing differences considerably.

Tables 13 and 14 summarize differences in community characteristics (educational, sectoral and religious structure as well as dimension and agglomeration status) and labor demand characteristics (growth in jobs and firms, vacancies), respectively.

Table 13 shows minor but statistically significant differences in sectoral structure at the language border. These can be explanatory for the different sectoral structure in the unemployment pool. Religious structure and dimension of communities do also differ to a large extent at the language border. Again, going closer to the language border reduces the pre-existing differences in means considerably. Communities are also slightly smaller on the Latin side of the language border.

Looking at table 14 yields that especially the number of work places differ somewhat at the language border. Arguably, this reflects the fact that communities are smaller rather than weaker labor demand. Indeed, a more direct measure of labor demand – vacancies per employed person– does not show any significant differences at the language border. Moreover, the median wage paid to employed workers is somewhat lower on the Latin side than on the German side of the language border. This could, again, reflect the fact that communities are smaller on the Latin side of the border (absence of city wage premium). In sum, labor demand appears to be quite balanced at the language border.

Table 13: Summary statistics: Community characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
	All	Latin	German	Difference	Difference at border	
					All	Bilingual cantons
% primary education	.18	.19	.18	.01***	-.01	.01
% secondary education	.73	.70	.74	-.03***	-.02	-.03**
% other education	.02	.02	.02	-.00***	-.00*	-.00
% sector 1	.02	.02	.02	-.00**	.01***	.01
% sector 2	.12	.09	.13	-.04***	-.01	-.01
% sector 3	.39	.38	.40	-.02***	-.04***	-.02
% age 25-29	.08	.08	.07	.00***	-.01***	-.01**
% age 30-34	.09	.09	.09	-.01***	-.01***	-.01***
% age 35-39	.10	.09	.10	-.01***	-.01***	-.01***
% age 40-44	.09	.09	.09	-.01***	-.00**	-.00
% age 45-49	.09	.08	.09	-.00***	.00	.00
% age 50-54	.09	.09	.09	.00***	.00	.00
% age 55-59	.08	.08	.08	.00***	.00**	.01***
% men	.46	.45	.47	-.02***	-.00	-.01
% catholics	.41	.49	.37	.12***	.04	.03
% protestants	.39	.29	.44	-.15***	-.05*	-.05
% other language	.01	.01	.01	-.00***	-.00	-.00
Log no. of inhabitants	8.91	8.58	9.05	-.47***	-.46	-.67*
% agglomeration	.54	.51	.55	-.05***	-.09	-.39***

Notes: Latin = majority in community speaks French, Italian or Romansh. Difference at the border is estimated using linear specifications. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

A final candidate for explanation of differences in labor market performance between language regions is *differing labor market policies*.

There is some indication that sanction rates are higher in the German-speaking regions and that they discontinuously fall at the language border. Similarly, assignment rates to employment programs and subsidized jobs are somewhat higher on the German-speaking side as compared to the Latin-speaking side of the language border. In contrast, training programs are more heavily used on the Latin-speaking side. In sum, differences in ALMP-treatment intensities between language regions and at the language border could have some explanatory power in explaining the language barrier effect in unemployment durations.

Table 14: Summary statistics: Labor demand

	(1)	(2)	(3)	(4)	(5)	(6)
	All	Latin	German	Difference	Difference at border	
					All	Bilingual cantons
Log no. of work places	6.42	6.16	6.53	-.37***	-.51	-.69
% new jobs	.06	.07	.06	.01***	.01	-.00
% new firms	.01	.00	.02	-.02***	-.02**	-.02*
Vacancies per employed	.13	.14	.12	.02***	.01	-.01
Log median wage	3.55	3.51	3.57	-.05***	-.08***	-.09***

Notes: Latin = majority in community speaks French, Italian or Romansh. Difference at the border is estimated using linear specifications. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.

Table 15: Summary statistics: Active labor market policies

	(1)	(2)	(3)	(4)	(5)	(6)
	All	Latin	German	Difference	Difference at border	
					All	Bilingual cantons
% days in sanction	.06	.04	.07	-.03***	-.01***	.00
% days in course	.12	.12	.12	-.00***	.03***	.05***
% days in employment program	.01	.01	.01	-.00***	-.00*	-.00
% days in subsidized employment	.11	.11	.10	.01***	-.00	-.01

Notes: Latin = majority in community speaks French, Italian or Romansh. Difference at the border is estimated using linear specifications. Source: Data from Unemployment Register 1998-2003, Swiss Census 2000, Federal Statistical Office (FSO), CH-2010 Neuchatel.