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Abstract

Apprenticeship systems are essentially based on the voluntary participation of firms that provide (and usually also finance) training positions, often incurring considerable net training costs. One potential, yet under-researched explanation for this behavior is that firms act in accordance with the norms and expectations they face with in the local labor market in which they operate. In this paper, we focus on the Swiss apprenticeship system and ask whether local norms towards the private, rather than the public, provision of training influence firms' decisions to offer apprenticeship positions. In line with this hypothesis, we find that the training incidence is higher in communities characterized by a stronger norm towards the private provision of training, which we measure using local results from two national-level plebiscites that explicitly dealt with the role of the state in the context of the apprenticeship system. This finding turns out to be robust to a series of alternative specifications and robustness checks, as well as to an instrumental-variable strategy that tackles the issue of potential endogeneity of normative attitudes.

JEL-Codes: D220, D630, H410, I220, J240.

Keywords: public goods, private provision of training, social norms, normative attitudes towards the role of the state, vocational education and training, apprenticeship training.

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1 Introduction

> *"No matter how cleverly designed (...), incentives alone cannot provide the foundations of good governance."* Bowles (2016, p.2)

It has since long been argued that social norms may have the power to enforce and sustain the private provision of public goods. And indeed, ample experimental evidence has accumulated to date that appears to be broadly consistent with this idea.[1] Nonetheless, it has proven notoriously difficult to come up with relevant real-world examples of privately provided public goods, let alone examples where social norms have been decisive in setting up and/or sustaining such a private solution.[2]

In this paper, we argue that apprenticeship systems, primarily in place in several European countries, provide an interesting and compelling real-world case for studying the impact of social norms on the private provision of education and training, an issue of considerable academic and practical relevance.[3] The key feature of these systems is that mostly privately run companies provide, and usually also finance, these training positions on a fully voluntary basis. While empirical research on the subject has shown that the training firms not only incur costs, but also reap various benefits associated with training apprentices, thereby explaining part of the appeal to them, we believe that these conventional explanations are not sufficient to fully comprehend these often complex and historically grown systems.

Among the countries where these systems are prevalent, Switzerland is particularly well suited for studying the effect of social norms on firms' provision of apprenticeship positions (additional information on the institutional setup is given in section 2 below). First, Switzerland has an exceptionally high share of youth participating in firm-based apprenticeships. About sixty percent of the most recent cohorts of adolescents enter firm-based apprenticeship training

[1] The experimental literature on this issue is too voluminous to give it due credit here (cf. Chaudhuri, 2011; Ledyard, 1995). Nonetheless, two results from this literature are worth mentioning. First, contributions to the public good tend to be larger in environments where the same individuals interact repeatedly with one another, as is the case in many real-world situations. Second, the possibility of punishing defectors increases average contributions (e.g. Fehr and Fischbacher, 2004) and, perhaps more importantly to us, internalized norms may have similar "power" in sustaining cooperation in public-good situations (Choi and Ahn, 2013; Dugar, 2010; Rege, 2004; Samek and Sheremeta, 2014).

[2] Cowen (1992) provides some real-world examples of privately provided public goods, and social norms have been shown to be relevant in the context of charitable giving (e.g. Shang and Croson, 2009) or energy consumption (e.g. Allcott, 2011). Another example that has received considerable attention from economic historians are turnpike road systems (e.g. Klein, 1990).

[3] Sadowski (2001) uses a similar conceptualization of vocational education and training which is, moreover, close to descriptions often used in comparative political science (e.g. Busemeyer *et al.*, 2011). The notion of "community governance" (Bowles and Gintis, 2002) is another potentially useful conception of these systems.

at the upper-secondary level, rendering apprenticeship training indeed a key pillar of the Swiss educational system. A second, not well-known feature calling for explanation is that, even within Switzerland, firms' training incidence differs substantially between regions. Training incidence increases from the western to the eastern part of the country, and the lowest share of training firms is found in the French language region located in western Switzerland, but the regional variation is high even within the French and German language regions (this variation in the regional training incidence is documented empirically in section 5.1 below). This feature is very hard to explain referring only to arguments based on the costs and benefits of apprenticeship training because both the Swiss system of vocational education and training and the labor market in general are primarily regulated at the national level. Moreover, wage levels have an ambiguous effect on firms' training incidence because they affect both costs and benefits from training apprentices, and thus the corresponding variation in wage levels probably cannot explain the regional pattern in the training probability.

Against this background, we hypothesize that a stronger local norm favoring the private – rather than the public – provision of public goods increases firms' training incidence in Switzerland.[4] Employers might internalize such a norm, or consumers who favor training firms might enforce it by sanctioning non-training firms.[5] Anecdotal evidence appears to be in line with this argument (though we are aware that other explanations may be consistent with this behavior as well). For example, many Swiss firms actively communicate their training efforts, e.g. by placing newspaper and online ads in which they congratulate their apprentices for successfully passing their final exams, obviously being proud of their successful apprentices, or by placing a vignette signaling their training status on their entrance door or their shop window (the vignette is shown in appendix figure A.1).

To identify the effect of social norms on firms' training behavior, we further take advantage from the fact that Swiss citizens' are regularly asked to express their preferences on federal laws and amendments to the Swiss constitution in the voting booth. Specifically, two popular

[4]The concept of "civic virtue" (e.g. Algan and Cahuc, 2009) is very close to what we have in mind here. We prefer the conceptualization as a local social norm because it explicitly refers to the underlying mechanisms and because it fits neatly with our measurement based on local voting results (see section 3 below).

[5]Subtle mechanisms of expressing (dis)approval are presumably much more likely than explicit statements. Indeed, behavioral research shows that simply reminding people that there is a norm related to some behavior suffices; this indicates that social norms may work at a very subliminal level (see, for example, Agerström *et al.*, 2016; Pruckner and Sausgruber, 2013; Riyanto and Zhang, 2013)

plebiscites in 1986 and 2003 asked for an amendment to the constitution stipulating a stronger involvement of the state in the provision of training positions. These votes provide us with unique regional measures of people's preferences on the public or private provision of training and thus their expectations towards state and firms to provide training positions. We merge the voting results with firm-level information on the provision of apprenticeship positions. The data on firms' willingness to provide apprenticeships comes from three national surveys on firms' training costs and benefits that were carried out in 2000, 2004, and 2009, respectively. These data contain detailed information about firms' training behavior along with some important firm-level characteristics.

The main result of our analysis is that regional norms on the private provision of public goods are strongly associated with firms' training incidence and that this correlation is robust to different specifications. Controlling for firm and regional characteristics does not change the results. However, a major concern is that the social norm for the private provision of training might be stronger in regions where firms' training incidence is already high. This would result in a simultaneous causality problem where social norms themselves are influenced by firm behavior, interfering with the hypothesized influence of social norms on firm behavior. Therefore, we instrument voting outcomes on new training laws with other voting outcomes that also deal with the public or private provision of public goods, but not with apprenticeship training. Using such votes, e.g. on the public or private provision of health insurance, as instruments for the social norm confirms our findings and results in a significant and sizeable effect of the norm on firms' training incidence. Some ancillary analyses also corroborate the hypothesis that both the local employers and the local population have internalized the norm towards the private provision of training.

Our study also contributes to a growing body of evidence documenting the various effects of social norms on individual and corporate behavior, above and beyond their potential impact on the private provision of public goods. At the individual level, for example, social norms have been shown to influence such diverse individual behavior as fertility (Fernández and Fogli, 2006) and female labor supply (Fernández *et al.*, 2004), tipping (Azar, 2004), investments into "sin stocks" (Hong and Kacperczyk, 2009), or political participation (Alesina and Giuliano, 2011).[6] Several studies using Swiss data have used voting results to measure attitudes or

[6]Several studies have explored the reverse channel as well, i.e. the impact of the economic environment on

norms, documenting the effect of work attitudes on job search behavior (Eugster *et al.*, 2011; Stutzer and Lalive, 2004) or from local gender norms on female well-being (Lalive and Stutzer, 2010). Evidence on the importance of social norms on corporate behavior is considerably rarer and focusses mainly on corporate social responsibility (e.g. Schmitz and Schrader, 2015). One exception is a paper by Bassanini *et al.* (2017), who investigate the effects of local social pressure and show that firms dismiss fewer workers in secondary establishments that are closer to the headquarters. Another is the analysis by Janssen *et al.* (2016), who argue that the gender pay gap within firms is larger when local norms towards gender equality are weaker.

The remainder of this paper is organized as follows. The next section presents some important background information on the institutional setting, focusing on the key features of the Swiss apprenticeship system. Section 3 discusses the different data sources used in our empirical analysis, primarily focusing on the data containing information about firms' training behavior and on the measurement of the norm towards the private provision of public goods and, more generally, the role of the state. Our estimation framework is discussed in section 4, and the resulting estimates are presented and discussed in section 5. In that section, we also provide a series of robustness checks and we test several ancillary hypotheses to strengthen the credibility of our main estimates. Section 6 concludes.

2 The Swiss apprenticeship system

This section provides some background information on the Swiss educational system and the institutional setting of the Swiss apprenticeship system.[7]

2.1 General education and vocational education and training at the upper-secondary level

The Swiss educational system is first and foremost characterized by its exceptionally strong emphasis on vocational education and training (VET, henceforth) at both the upper-secondary

one's attitudes or preferences (e.g. Giuliano and Spilimbergo, 2014; La Ferrara *et al.*, 2012), suggesting that reverse causality may be a relevant issue (an issue we will therefore take up again in section 4).

[7]More information about the Swiss VET system, its historical roots, and how it fits into Switzerland's educational system as a whole, is available in Wettstein *et al.* (2017). See also Wolter and Ryan (2011) for a more general discussion of apprenticeship training beyond the Swiss case.

and tertiary level. After completion of mandatory schooling, about 64% of the most recent cohorts of adolescents eventually enter some kind of apprenticeship training (SERI, 2014). The remainder mainly chooses further general education (taught at a "Gymnasium") that prepares for, and grants access to, university studies. VET is thus by far the most often chosen educational track at the upper secondary level in Switzerland. It is fully integrated into Switzerland's formal educational system, and there are several possibilities for entering into tertiary education with a completed apprenticeship (see appendix figure A.2).

Among those entering some kind of apprenticeship training, the most frequent choice by far is to enter a firm-based apprenticeship program lasting from two to four years, depending on the occupation learned.[8] During their training, apprentices spend most of their time in their training firms, where they are involved in both practical exercises and actual work from the start of their apprenticeship. In addition, apprentices spend one or two days per week in vocational school, where they acquire both occupation-specific knowledge as well as general human capital (such as native and foreign languages). The employer pays the apprentices' wages, but their wages are considerably lower than those of fully trained workers in the same occupation, even taking their lower productivity into account, which implies that apprentices share the costs of training with their employers.

2.2 Key features of the Swiss apprenticeship system

Voluntary participation of both employers and apprentices

The most obvious feature of the Swiss apprenticeship system is that it is based on the voluntary participation not only of apprentices but also of employers. Indeed, there is no direct regulation of the number of apprenticeship positions; except perhaps that some public employers are, at least implicitly, expected to train apprentices (e.g. hospitals training nurses). Furthermore, there is no explicit regulation of wages paid to apprentices. Thus, a market for apprentices essentially exists, regulated largely by their supply and demand.

Moreover, various formal associations and informal cooperation agreements among (training) firms within the same occupation or industry (e.g. Agell, 1999; Busemeyer and Trampusch,

[8] Among these, about 91% enter a dual apprenticeship which combines practical training in a firm with vocational school. The remainder attends full-time school-based VET program (which is possible for selected occupations only).

2011) play a key role in the Swiss apprenticeship system. Indeed, employers and their associations ("Organisationen der Arbeitswelt [organizations of the world of work]") are not only responsible for the (further) development of the training curricula, they also prepare and implement the final practical examinations, which are decisive for completing the programs, on behalf of the cantons. Moreover, they can even call for a change in the duration of an apprenticeship or the introduction of a new learnable occupation (e.g. because technological innovations change the demand for skills on the labor market). Training activity by Swiss firms is thus embedded in a system of community governance that arguably supports adherence to established norms (Bowles and Gintis, 2002).

The financing of firm-based vocational education and training

Another distinguishing feature of the Swiss apprenticeship system, and one closely related to the voluntary participation of both employers and apprentices, is that the costs accruing from apprenticeship training (within the firm) are almost fully borne by the firms actually providing the training positions and by the apprentices. Estimations based on survey data suggest that employers incur some CHF 2.7 billion of direct training costs per year and spend almost as much on apprentices' wages. In total, firms spend yearly nearly 1% of GDP on apprenticeship training.[9] In contrast, however, vocational schooling is almost fully funded publicly (by both the federal government and the cantons). The costs of vocational schooling amount to about 2.5 billion per year, according to official statistics (SERI, 2014).

Specificity of firm-based vocational training, external certification of training, and poaching

One might argue that the setting just described should imply that the training provided must be specific to the training firm to a significant degree. However, quite in contrast, empirical evidence suggests that a substantial part of the human capital acquired through apprenticeship training is Switzerland is transferable across firms – and often even across different occupations (e.g. Mueller and Schweri, 2015). Moreover, Switzerland's labor market is comparatively unregulated and flexible, undermining the argument that imperfections in the labor market may

[9]These estimates are based on the same firm-level survey data that we use in this paper (see section 3 below for details.

explain the high fraction of training firms in Switzerland.[10]

Further, indirect evidence on the transferability of the competencies acquired through apprenticeship is given by the observation that other employers poach apprentices once they have completed their training (e.g. Muehlemann and Wolter, 2011). If the competencies acquired during apprenticeship training were fully or mainly firm specific, however, we would not observe such behavior on the labor market.

In addition, there are several institutional features in place that explicitly aim to ensure that mobility across employers is possible for apprentices after the completion of their training (for example, there are centralized examinations at the end of the apprenticeship and the federal administration provides an external certification of the competencies acquired during the apprenticeship; cf. Acemoglu and Pischke (2000)).

Short-run benefits of apprenticeship training to the training firm

A final key feature of the Swiss apprenticeship system is that there are not only considerable short-run costs from apprenticeship training, but also often substantial monetarized gains to the training firm, as discussed in considerable detail in, for example, Strupler and Wolter (2012). Employers may benefit from training apprentices because apprentices, at least towards the end of their training, are able to perform skilled work (i.e. work that otherwise needs to be done by a trained worker) to a lower cost than when performed by a fully trained worker.

Indeed, one of the main results of the empirical literature on the costs and benefits of apprenticeship training in Switzerland is that a large fraction of the training firms (about two-thirds in the year 2009) is able to realize a net benefit from training apprentices within the training period, the sometimes high costs of training notwithstanding (in the year 2009, for example, training costs per apprenticeship averaged almost 90,000 Swiss francs; which is considerably higher than the annual wage of an average worker in that year).[11]

At the same time, however, many training firms incur substantial net costs from training

[10]Consistent with this, comparisons between Switzerland and Germany (e.g. Muehlemann *et al.*, 2010) and between Switzerland and Austria (Moretti *et al.*, 2018) argue that corresponding differences in labor market regulation partially explain the observed differences in the net benefits to employers.

[11]It has further been shown that training firms may save recruiting costs that they would otherwise have to spend if they (are able to) retain apprentices who have completed their training (e.g. Blatter *et al.*, 2012, 2016). Similarly, apprenticeship training may also serve as a (costly) screening device for employers (Mohrenweiser *et al.*, 2017) or a (costly as well) signaling device (Backes-Gellner and Tuor, 2010).

apprentices.[12] Moreover, even if a training firm covers its costs by the end of training, it has no guarantee of this when it hires a new apprentice because there is considerable uncertainty in both the costs and benefits of training from an ex-ante point of view. This can be inferred from the large variation of net benefits observed within the same training occupation.

3 Data and key variables

3.1 Firm-level survey data

Our first data source are three consecutive surveys that were specifically designed to elicit detailed information about the costs and benefits of apprenticeship training from the point of view of the employers. The surveys were administered in the years 2000, 2004, and 2009, respectively (see Strupler and Wolter, 2012, for details and additional references). Taken together, the three surveys cover more than 21,000 firm-level observations, containing both training and non-training firms. Moreover, the sample of firms is representative of almost the entire population of firms in Switzerland.[13] While it is possible for the same firm to appear more than once in the combined data because it might have been sampled in more than one wave of the survey, it is not possible for us to follow the firms across time for reasons of data protection. Because we will use clustered standard errors throughout, however, we take this feature of the data into account with regard to statistical inference.

Because all three surveys cover both training and non-training firms, and because we know whether a specific firm currently trains apprentices or not, the data can be used to model the incidence of apprenticeship training – which is our variable of main substantive interest. Moreover, the data cover not only detailed additional variables related to the costs and benefits of apprenticeship training, but also employers' assessment of their motives for offering apprenticeship positions (see Muehlemann and Wolter, 2014, for an overview). The richness of information available in the data allows us to test a whole series of ancillary hypotheses, such

[12]Net benefits are typically negative for the more technical and the more demanding apprenticeships (e.g. a polymechanic ("Polymechaniker"), a highly-skilled mechanic involved in the manufacturing of machinery, tools, and prototypes, among other things.

[13]In all three years of the survey, each cross-section of firms is representative of the universe of all firms in the year of the corresponding survey, excluding the very smallest firms and employers from the primary sector (which were excluded from the sampling frame in all three surveys). Additional details on the sampling procedure, for the most recent wave of the survey, are given in Potterat (2011).

as implementing an empirical test on norm internalization by the employers (see section 5.7 below).

Finally, another key feature of the survey data is that they contain the postal code indicating the physical address of the firms, which allows us to merge data from other sources, such as community-level voting results or additional variables from the census or the business census (see section 3.4 for details).

3.2 Community-level voting results

As one of the main pillars of the direct-democratic political system of Switzerland, citizens are regularly asked to cast their votes on various policy topics, such as environmental policy, gender issues or, of course, educational policy. Votes take place both at the national and the subnational level (i.e. at the cantonal and the communal level), depending on the level(s) at which the corresponding legislation takes place. As mentioned in section 2 above, the VET system is regulated at the national level in Switzerland – in contrast to most other educational domains, which are regulated at either the cantonal and/or the communal level. This opens up the possibility for using national-level voting results related to VET policy to measure individuals' normative attitudes towards the role of the state in this domain in a consistent way across all of Switzerland.

Using disaggregated voting results to measure regional norms towards the role of the state

Voting results are, first of all, a direct measure of voters' attitudes towards specific policy issues, and we believe that the use of the voting results has some distinct advantages compared to the use of attitudinal survey data. One important advantage of the use of voting results is that the outcome of a given vote has real consequences, and thus voters have a strong incentive to reveal their true preferences. In contrast, corresponding survey questions necessarily remain hypothetical, providing less incentive for respondents to reveal their true attitudes. Moreover, because voting is strictly anonymous, there is no pressure towards expressing socially desirable opinions (e.g. Bertrand and Mullainathan, 2001). Therefore, by focusing on those votes that dealt specifically with the question of whether the state or private actors should take responsibility, we believe that we are able to measure public attitudes towards the role of the state in

a convincing yet very straightforward way.

Moreover, we will interpret differences in the voting results across communities as reflecting spatial differences in the local norm towards the private – rather than public – provision of training in the context of our study.[14] Indeed, aggregate-level voting results fulfill the two conditions noted by Brennan *et al.* (2013) for the existence of a (social) norm.[15] First, a significant fraction of individuals within a given community must hold a certain normative attitude towards a given subject. Second, people within a community must be aware that a shared norm exists in the community in which they live. The voting data that we use in our empirical analysis fit this definition almost perfectly – they directly measure the fraction of people sharing a given normative attitude on a specific subject. After the vote has taken place, the result of the vote is public knowledge because the results are discussed in the media and published in national and/or local newspapers, implying that the strength of the norm within a given community becomes evident to the members of a community, as well as to everyone else.

Implicitly, we also have to assume that we use data that are aggregated at the "correct" spatial level, i.e. the level at which the voting data are aggregated should reflect the level at which social norms are expected to have an effect on individual behavior. We believe that the spatial units used in our empirical analysis are small enough that we can plausibly expect social norms to be effective within these units (cf. section 3.4 below).

A final advantage of the voting data is that they are virtually complete, i.e. votes represent kind of a full census of attitudes on a specific subject among voters, which allows us to measure mean attitudes even for scarcely populated communities; something that would not be possible with usual attitudinal survey data.[16]

[14]Community-level voting results have been used before in various contexts to measure cultural and/or social norms. For example, Stutzer and Lalive (2004) and Eugster *et al.* (2017) use regional voting results to measure work attitudes, while Lalive and Stutzer (2010) and Janssen *et al.* (2016) use them to measure the local norm towards gender equality.

[15]Different definitions of social norms are abundant but are, for the most part, close or identical to the definition of Brennan *et al.* (2013) that we use in this paper. For example, Fehr and Fischbacher (2004) define social norms as "(...) standards of behavior that are based on widely shared beliefs how individual group members ought to behave in a given situation".

[16]At the same time, however, voting results do not necessarily represent attitudes among the whole local population. First, participation rates are usually far below 100% (cf. table 1), potentially inducing a bias due to selective participation (though one may argue that those not willing to participate do not care about the outcome of the vote). Perhaps more importantly, however, many individuals are excluded from voting because they lack Swiss citizenship. To take these two issues into account, we will include the mean turnout across the two votes as well as the fraction of foreigners within a community as control variables in most of the regressions

Votes about the allocation of responsibilities within the VET system

Based on the above considerations, we therefore use municipality-level results from several national-level votes in our empirical analysis. Most importantly, there were two votes that directly touched the issue of private versus public provision of vocational education and training and that were temporally close to the collection of the survey data. The first vote was a popular initiative ("Initiative für ein ausreichendes Berufsbildungsangebot" ["Plebiscite for an adequate provision of vocational training"]), held on May 18, 2003; the second vote was also a popular initiative ("Initiative für eine gesicherte Berufsbildung und Umschulung" ["Plebiscite for a guaranteed vocational training and retraining"]), held on September 28, 1986. Both initiatives aimed to increase the public involvement regarding the provision of vocational education and training, and both initiatives were rejected by a majority of the votes. From a substantive point of view, note that both initiatives demanded a shift away from private towards more public responsibility in the Swiss apprenticeship system.

Table 1

Panel (a) of table 1 lists a few key figures for the two votes. Both initiatives were ultimately clearly rejected, with only a minority of all valid votes in support of the respective initiative: the 1986 vote gained only 18.3% of all valid votes for its support, the 2003 vote captured about 31.6% of all votes cast.

Figure 1

As illustrated in figure 1, however, there was considerable variation in the share of votes in favor of each of the two initiatives across different municipalities. Municipality-level vote shares from the 1986 vote (the 2003 vote) vary between 0% and about 95% (between 0% and 79%). Not surprisingly, mean vote shares are somewhat less spread out, but there is still a large amount of variation, with mean vote shares varying between a low of about 6.5% to a maximum of about 64% (appendix figure A.3 shows the close correlation between the two voting results).

Panel (b) in the middle of table 1 lists three additional plebiscites on educational policy; two of these also dealt directly with the regulation of VET, while the third one covered higher

presented below (we also checked that the interaction term between our measure of the norm towards the role of the state and voter turnout is insignificant; results not shown).

education at the university level.[17] Note that these three plebiscites took place in the more distant past than those from panel (a), thus they present kind of a "historical" measure of attitudes towards the role of the state within the context of VET and educational policy. In the empirical analysis below, we will use the mean vote share among these three votes as an instrument for current attitudes towards public responsibility in VET. As above, there is considerable variation in the voting results, both for the single votes and the mean share across the three votes. Specifically, the mean share of supporting votes across the three votes varies between about 28% and 76% (cf. appendix figure A.4).

Votes about the role of the state beyond educational policy

Finally, panel (c) of table 1 lists three additional plebiscites that dealt with the provision of public goods or the role of the state more generally (i.e. these votes were concerned with issues outside the realm of educational policy). Specifically, the table includes the results from two votes on public health insurance and one vote which asked for the introduction of a female quota within the federal administration. While two of these votes were clearly rejected, the vote on the introduction of a mandatory health insurance was accepted with a close majority of the votes (51.8%) in its favor. Each of the three votes demanded more responsibilities for the state. Consequently, we will use the results from these additional votes to construct a measure of attitudes towards the role of the state in the non-educational context (we will use this measure as an instrument for norms towards the role of the state in VET as well; see section 4.2 below). Again, there is considerable variation in the mean vote share across municipalities, with values ranging from a minimum of about 6% to a maximum of 66% (cf. appendix figure A.4).

3.3 Community characteristics from the Swiss census and the Swiss business census

In addition, we use selected data from the Swiss census ("Volkszählung") and the Swiss business census ("Betriebszählung") to construct some regional-level characteristics. These variables will be used as control variables in the empirical analysis below, at different levels of regional aggregation (either at the municipality level or at the level of local labor markets). More specifically,

[17] We also include the third vote because it was more contentious than the other two votes, thereby inducing additional variation in the mean vote share.

we use data (mainly) from the 2000 Swiss census to construct a variety of control variables that describe the composition of the population living within a given municipality. We further use data from the Swiss business census, mainly from the year 2008, to construct complementary measures describing the structure of economic activity. Additional details regarding these variables are given in section 5 below.

3.4 Spatial structure of the data

In the main part of the empirical analysis, our basic unit of observation is always the individual firm. For each firm i in the pooled survey data, we know its postal code, extracted from the information used to contact the firms in the course of the survey, and we can use this information to identify the community j where a specific firm i is located.[18]

This regional information with regard to the physical location of a firm in turn is key for our empirical analysis because it allows us to merge the firm-level survey data with aggregate-level information derived from the voting results and with variables constructed from either the census data or the business census data.[19] Further, given that we know the political community where a firm is located, it is easy to derive additional spatial information. For example, in the context of apprenticeship training, it is relevant to control for institutional differences across the cantons because educational policy is, to a large extent, under the supervision of the cantons, as discussed in section 2 above.

As a final remark, it is worth pointing out that Switzerland is a small country. Subnational entities, such as municipalities, are therefore small as well, both with regard to area and number of inhabitants (cf. appendix table A.1). This makes us confident that the spatial units which we observe variation in the voting results are actually small enough such that local norms can plausibly take effect on individual behavior (to be sure that the aggregation level has no impact on our results we estimate our baseline specification using different aggregation levels for the

[18]Postal codes can be mapped to community numbers, even though there is no one-to-one correspondence between postal codes and municipalities (there is a table of correspondence provided by the Federal Statistical Office). We map postal codes to municipal numbers because most additional data, such as the voting results, are only available at the municipal level (e.g. our key regressor). As shown in appendix table A.1, there are somewhat more postal codes than distinct municipalities (mainly because there are several postal codes within the larger cities).

[19]An important issue that we have to take into account is that the structure of the municipalities constantly changes over time (most importantly, the total number of municipalities has significantly decreased over time as there has been an increasing tendency for them to merge together).

key regressor; see section 5.2 below).

4 Econometric framework

Our empirical analysis will proceed in three consecutive steps. In a first step, we start with OLS regressions in which social norms are treated as exogenous, but where we try to control for as many potential confounders as possible. In a second step, we try to tackle the imminent issue of simultaneity between firms' training behavior and public attitudes towards the role of the state using various instruments. In a third and final step, we will provide a series of ancillary analyses with the aim of further strengthening the robustness and credibility of our main estimates.

4.1 Baseline OLS estimates

Our baseline OLS regression models take the following form:

$$T_i = \alpha + \beta N_{j[i]}^{\text{VET}} + \gamma F_i + \delta C_{j[i]} + \psi_{r[i]} + \phi_{t[i]} + \epsilon_i, \tag{1}$$

with the dependent variable T_i being a binary variable indicating whether firm i offers apprenticeship training or not (i.e. T_i equals 1 if firm i trains any apprentices, and 0 otherwise).[20] For the most part of the empirical analysis, T_i will be the dependent variable, but we will also have a look at some alternative outcomes (such as the number of apprentices) in section 5.5 below. The regressor of primary interest is given by $N_{j[i]}^{\text{VET}}$, which denotes to the local share of votes supporting the private provision of training in community j in which firm i is located, and thus reflects normative attitudes towards the private provision of vocational education and training (as discussed in detail in section 3 above). Parameter β is the main target of our empirical analysis because it quantifies the impact of social norms on individual firms' training behavior, at least under appropriate conditions. Because we hypothesize that stronger norms towards the private provision of training are associated with firms being more likely to be involved in

[20] One may object that a nonlinear probability model would be more suitable for the data at hand (because of the binary nature of the dependent variable). We prefer using the linear probability model because of its straightforward interpretation and because the comparison across OLS and instrumental-variable estimates is much easier. Nonetheless, we show average marginal effects from a probit model in column 10 of table 5 below.

the training of apprentices, and because lower values on $N^{\text{VET}}_{j[i]}$ indicate a stronger norm towards the private provision of training, we expect β to be negative.

Given that the dependent variable is measured at the firm level and the main regressor at the municipal level, the most obvious confounding variables are either at the firm level or at the regional level. For example, there may be regional differences in the number or structure of firms across communities, and these regional features could be predictive of whether an individual employer trains apprentices or not, independent of any regional differences in normative attitudes towards the role of the state. All additional variables are therefore used as controls for potential confounders when estimating β, and are thus of no (or only minor) direct interest. Equation (1) distinguishes between F_i and $C_{j[i]}$ which denote, respectively, the inclusion of additional firm- and community-level controls. In most of our regression specifications, we will also include regional fixed-effects and survey-year fixed effects, denoted by $\psi_{r[i]}$ and $\phi_{t[i]}$, respectively. The regional fixed effects are potentially important because regional subentities in Switzerland have considerable impact on educational policy and thus potentially also on the probability that a given employer provides apprenticeship positions. Survey-year fixed effects in turn could be important if there are differences in the sampling frame and/or response behavior across the three different years of the survey.[21]

Finally note that our main regressor, $N^{\text{VET}}_{j[i]}$, varies at a higher level of regional variation than the dependent variable, potentially biasing conventional standard errors that ignore this specific feature of the data (e.g. Cameron and Miller, 2015). We therefore report standard errors that are clustered at the community-level throughout the empirical analysis. Clustering at the community level also takes into account that we may observe the same firm in more than one wave of the survey (as discussed in section 3 above).

4.2 Tackling potential simultaneity bias

One remaining issue with the estimates based on equation (1) is that they do not take the potential simultaneity of local norms and employers' training behavior into account. That is, one might argue that there may not only be an effect of the local norm towards the private

[21] We basically treat our data as one large cross-section of firms, and we only use the survey-year fixed effects to allow for differences in the baseline probability of training across survey years. For that reason, we do not index the whole equation (1) against t, but only the survey-year fixed effects $\phi_{t[i]}$.

provision of training on the probability of training, but a reverse effect as well (i.e. one might argue that, say, a high training probability strengthens individuals' belief that training is best provided privately). In the second step of our empirical analysis, we thus try to correct for potential simultaneity bias using different instrumental variables.

Our main idea is to use additional voting results as instrument(s) for the local norm towards the private provision of training. More specifically, voting results that have no direct relation to VET, but that also relate to the issue of how responsibilities should be split between private and public actors, are likely to be correlated with corresponding attitudes in the context of VET and may therefore be used as an instrument. Examples of these votes are plebiscites that dealt with the role of the state within the domain of health insurance (cf. panel (c) of table 1). It is worth noting that it is, ex-ante, not at all obvious whether normative attitudes towards the role of the state outside the educational context are associated with preferences towards the private provision of training (i.e. there are various countries with very strong beliefs towards the private provision of public goods yet with virtually no firm-based training).

Another idea to mute the reverse channel is to use results from past votes on the distribution of responsibilities between private actors and the state within VET and the educational context more generally as an instrument for current attitudes towards the role of the state. A variation of this idea is to use historical election results, also available at the community level, but much farther back in time – we use community-level results from the 1947 elections of the national parliament – as instruments for contemporary attitudes towards the role of the state (appendix figure A.6 shows the spatial distribution of the electoral percentages for the four largest parties). The idea here is that the strength of the different political parties also reflects regional norms towards the role of the state, since one of the main differences across political parties is in fact how they judge the role of the state vis-à-vis private actors, across various policy domains.

5 Results

5.1 Descriptive evidence

Starting with some descriptive evidence, figure 2 first illustrates how the training incidence among firms varies across regions within Switzerland. The figure documents that there is con-

siderable spatial variation in the training incidence across the different regions within Switzerland (note that, for the purpose of illustration, the figure plots data aggregated up to the level of districts). It is even more remarkable that there appears to be systematic variation in the training incidence across regions. Specifically, the training incidence is considerably higher in the German language region of Switzerland than in both the French and Italian language regions (which are, respectively, located in the western and the southern parts of the country). It further appears that the regional training incidence among employers is higher in the more rural than in the more urban areas.

Figure 2

Analogously, figure 3 shows how the norm towards the private, rather than the public, provision of vocational education and training varies across the different districts. This figure shows that there is pronounced spatial variation in normative attitudes towards the role of the state as well, and that the variation in attitudes also follows a systematic spatial pattern. Specifically, the support for more public involvement in the provision of apprenticeship training is much stronger in the both the French and Italian language areas of Switzerland than in the German language area, consistent with the findings of Eugster *et al.* (2011), for example. Further, it appears that voters in the more urban regions have more favorable attitudes towards the role of state than those in the more rural areas. Overall, it thus appears that the pattern in figure 3 mirrors that from figure 2 (with reverse sign, however).

Figure 3

Combined, the two figures therefore imply that we should find a pronounced association between the local norm towards the public provision of vocational education and training and the observed training incidence among firms. This is confirmed by figure 4, which plots the regional incidence of apprenticeship training (shown on the y-axis) and public attitudes towards the role of the state (shown on the x–axis). The figure shows that there is an obvious negative correlation between the local incidence of training and the mean vote share in favor of more public involvement in the provision of apprenticeship training. Thus, as expected, the probability of a firm offering apprenticeship positions is higher in those communities characterized by a stronger norm towards the private provision of training. Moreover, the association between

the two variables turns out to be unambiguous, virtually linear and surprisingly strong, with an estimated correlation coefficient of about -0.61, based on data weighted by the number of firms within a region in the pooled sample.

Figure 4

Thus, in line with our main hypothesis, the raw data indeed suggest that part of the observed variation in the training incidence across regions can be explained by corresponding variation in public attitudes towards the role of the state. In the following section, we will test whether this association is also robust to the inclusion of additional control variables.

5.2 Main estimates

Baseline estimates

Table 2 presents our first set of estimates of the effect of public attitudes towards the role of the state on the training incidence at the firm level.

Table 2

The point estimate of β in the first column of panel (a) is from a simple regression of T_i on the communal vote share in favor of private provision of vocational education and training, $N^{\text{VET}}_{j[i]}$, as described in section 3 above. This simple specification yields a point estimate of $\widehat{\beta} = -0.497$, confirming the pattern from figure 4 that there is a strong negative association between the local norm towards the public provision of training and the observed incidence of apprenticeship training among firms. Further note that the point estimate is statistically highly significant, with a large robust t-value of about 5.1. Moreover, the point estimate implies quite a large elasticity of -0.389 (approximate elasticities, evaluated at mean values of the involved variables, are given in brackets in this and the following tables).

The inclusion of survey-year dummies picks up a lot of variation in firms' training behavior, as shown in column 2 (i.e. there is quite a large increase in the R-squared), but at the same time it does not heavily influence the point estimate of β. This is because the sampling frame included a different fraction of non-training firms in the different waves of the survey. The resulting point estimate is thus only slightly smaller, and it remains large and statistically significant ($\widehat{\beta} = -0.438$, with a robust standard error of about 0.085).

We next add, in the third column, the size of firm, its sector of activity, and ownership (private versus public and nonprofit employers).[22] This specification yields a point estimate that is somewhat stronger, i.e. more negative, than the estimates from the preceding two columns, and it remains highly significant ($\widehat{\beta} = -0.551$, with a robust standard error of about 0.059). The comparison with the preceding columns shows that the firm-level variables, taken together, are highly predictive of a firm's training behavior (as indicated by the large increase in the R-squared, from 0.127 to 0.326). Yet it appears that firms located in communities with a weaker norm towards the private provision of training have characteristics that make them, a-priori, more likely to train apprentices than those in regions with a stronger norm. For that reason, the inclusion of these controls makes the effect of the local norm towards the private provision of training even stronger.

Next, column 4 further adds a full set of cantonal fixed effects, yielding a point estimate of $\widehat{\beta} = -0.280$. As expected, the inclusion of the fixed effects lowers the point estimates substantively – by about 50%, compared to the preceding column. This confirms our expectation that there is large variation in the training incidence across cantons that is potentially due to institutional factors (e.g. regulations of general education at the upper-secondary level). Nonetheless, even in this demanding specification, the point estimate of β remains substantively large as well as statistically significant, with a robust t–value of about 5.49.

Finally, in the fifth and final columns of table 2, we further add some community-level controls (e.g. the size and the type of the community, i.e. whether a community is an agglomeration or rural community, or the age distribution in a given region), yielding an estimate of $\widehat{\beta} = -0.393$ with an associated robust standard error of about 0.087.[23] Similar to the inclusion of the firm-level controls, adding community-level controls makes the estimated point estimate associated with the local norm stronger, i.e. more negative, suggesting that those communities with a weaker norm towards the private provision of VET have features that make it more likely for employers to provide apprenticeship positions.[24]

[22] To save space, we do not show the full regression results but these are, of course, available upon request.

[23] The full list of controls is as follows: log population size of the community in the year 2000, the change in log population size (i.e. growth) between 1970 and 2000, the share of foreigners (i.e. inhabitants without Swiss citizenship), the change in the share of foreigner between 1970 and 2000, the mean age in the year 2000 in the local population, the share of individuals aged below 18 (above 65), the type of community, the area of a community, and the mean turnout in the two votes (i.e. vote nr. 340 and 503). See appendix table A.2.

[24] Appendix table A.3 further shows that the negative effect of public attitudes towards the role of the state on employers' training behavior exists for different aggregation levels with regard to the local norm.

Our first set of estimates thus shows that firms which are located in regions characterized by a stronger norm towards the private provision of training are significantly and substantively (see section 5.4 below for an illustration of the size of the estimated effect) more likely to provide apprenticeship positions than comparable firms in locations with a weaker norm. We next provide several additional checks to further probe the robustness of this result.

Robustness checks

Treating the specification from column of table 2 as our benchmark, table 3 presents some robustness checks.

Table 3

A first check is to include additional or more detailed controls at the regional level. Thus, the specification in column 1 includes some additional, regional-level controls (such as the log number of firms within a local labor market or the average size of a firm in a local labor market). This yields an estimate of β that is only marginally smaller (i.e. less negative) than our baseline estimate ($\widehat{\beta} = -0.342$, with a robust standard error of about 0.089). A similar check is to include regional fixed effects at a finer level of aggregation. This is done in columns 2 and 3 which, respectively, include a full set of fixed effects at the level of districts and local labor markets (instead of cantonal fixed effects).[25] Similar to column 1, these two specifications yield estimates of β that are considerably smaller (in absolute terms) than our baseline estimate – yet they remain large, both statistically and substantively. Controlling for fixed effects at the level of districts (local labor markets) yields an estimate of $\widehat{\beta} = -0.227$ ($\widehat{\beta} = -0.230$), with a robust standard error of 0.089 (0.092).

A next check is to see whether the result is simply driven by the obvious difference in the training incidence between the different language regions within Switzerland (cf. figures 2 and 3). We thus restrict the estimation sample, in column 4, to those communities from the German language region of Switzerland (which reduces the sample size to 15,706 observations). The resulting point estimate of $\widehat{\beta} = -0.322$ is very close to our baseline estimate, however.

[25]There are 148 (106) distinct districts (local labor markets), but only 26 cantons; see appendix table A.1. Obviously, the more disaggregated fixed effects will not only pick up much of the variation in employers' training behavior due to unobserved regional characteristics, but a substantial fraction of the variation in the local norm as well.

Our result is thus not simply driven by simultaneous differences in both training behavior and normative attitudes towards the role of the state between the different language regions within Switzerland.[26] Another potential issue is that we have only few firm-level observations is some communities, while having full information regarding the main regressor. However, using only observations from regions with at least ten different employers per region also yields a point estimate of similar size as our baseline estimate, suggesting that this is not an important issue in our context. At the same time, it is somewhat less clear whether social norms can be effective in larger communities. We thus focus on observations located in the larger regions (i.e. regions with more than 10,000 inhabitants) only in column 6, again finding that the resulting point estimate, $\widehat{\beta} = -0.449$, is not very different from our baseline estimate. Reassuringly, column 7 further shows that the point estimate hardly changes when we focus on private employers only ($\widehat{\beta} = -0.381$, with a robust standard error of 0.089). Next, column 8 shows that the point estimate remains negative and significant when we focus on smaller employers (employers with less than 50 employees).

The final two columns present robustness checks with respect to more technical issues. The first check, shown in column 9, uses the sampling weights provided along with the survey data; the final column estimates the model by probit. Again, our result is robust against these checks, as we find a very similar point estimate when we use the sampling weights that come along with the survey data. Finally, the average marginal effect from a probit model (equal to -0.344) is also very close to the marginal effect from our baseline OLS estimate.

5.3 Instrumental-variable estimates

Next, table 4 presents a set of instrumental-variable estimates. For the ease of comparison, the first column of table 4 simply replicates the OLS estimates from column 5 of table 2 above. The remaining columns present instrumental-variables estimates using our different instruments.[27]

[26]Similarly, using only the French language regions yields a point estimate of $\widehat{\beta} = -0.383$ (not shown in table 3). With a robust t-value of about -2.4, this estimate is statistically significantly different from zero. At the same time, the point estimate is not statistically different from that derived in the German language regions. Using only the Italian language regions, however, yields an insignificant, but even positive point estimate of β. Thus, consequently, excluding the Italian language regions yields an even higher estimate of $\widehat{\beta} = -0.412$ (with a robust standard error of 0.093).

[27]First-stage F-values are shown at the bottom of table 4, first-stage and reduced form estimates are shown in appendix tables A.4 and A.5, respectively. Moreover, appendix table A.6 shows additional estimates that use voting results from "placebo votes" (i.e. votes that we expect to be unrelated to firms' training behavior). These additional estimates show that both OLS and 2SLS estimates turn out to be statistically insignificant

Table 4

The second column shows 2SLS estimates of our baseline specification, instrumenting our main regressor $N_{j[i]}^{\text{VET}}$ using $N_{j[i]}^{\text{STATE}}$, the mean share of supporting votes from the three votes on the division of responsibilities between private and public actors outside the realm of educational policy (as discussed in section 4). This yields an 2SLS estimate of $\widehat{\beta} = -0.503$, which is close in size to our baseline OLS estimate (as expected, however, it also turns out to be estimated with less precision; blurring the difference to the corresponding OLS estimate). In fact, the 2SLS estimate from column 2 is not statistically different from our baseline OLS estimate, which is indicated by a formal test on the equivalence between OLS and 2SLS estimates (the p-value associated with the corresponding regression test proposed by Wooldridge (2010) is shown at the bottom of table 4). In column 3, we use $N_{j[i]}^{\text{HIST}}$ as instrument for $N_{j[i]}^{\text{VET}}$, which yields an estimate of $\widehat{\beta} = -0.427$. While this estimate is no longer statistically significant, note that this is mainly due to the large increase in the associated standard error (the estimate is very close to being significant, however, with a robust t–value of about -1.61). At the same time, the confidence interval associated with this point estimate overlaps with that from column 2, suggesting that the two instruments yield point estimates of the effect of normative attitudes on firms' training behavior which are broadly consistent with each other. This is also confirmed by the large p-value (about 0.893) associated with the corresponding formal test of the equivalence between the 2SLS and the OLS estimate. A similar, though again statistically significant, estimate results when we use the historical elections results $E_{j[i]}^{HIST}$ as instruments for $N_{j[i]}^{\text{VET}}$, as shown in column 4 ($\widehat{\beta} = -0.823$).

In column 5, we use the historical voting results and the historical election results as instruments at the same time, yielding again a statistically significant and negative point estimate of $\widehat{\beta} = -0.567$ (with a robust standard error of 0.208). Once again, the resulting point estimate is close to our baseline OLS estimate and a formal test on the equivalence between the two estimates does not reject the null hypothesis (the p-value associated with the test is 0.376). The final column of table 4 shows the estimate resulting from using the full set of instruments simultaneously. Again, this yields a statistically significant point estimate of $\widehat{\beta} = -0.503$, with a robust standard error of about 0.132. Moreover, this estimate is close in size to the estimate

when using the placebo votes either directly as regressor instead of $N_{j[i]}^{\text{VET}}$, or as an instrument for $N_{j[i]}^{\text{VET}}$.

from column 2, and it is not statistically different from the baseline OLS estimate shown in the first column.[28]

Taken together, the different instrumental-variable estimates yield a consistent pattern of estimates suggesting a negative effect of normative attitudes towards the role of the state on the likelihood of offering apprenticeship positions. Moreover, almost all instrumental-variable estimates are quantitatively very close to our baseline OLS estimates, and we thus stick with OLS for the remainder of our empirical analysis. If anything, the comparison between with the instrumental-variable estimates shows that OLS will tend to underestimate the effect of the local norm towards the private provision of training – which implies that the reported estimates are perhaps slightly conservative.

5.4 Quantitative implications

Our main estimates from tables 2 and 4 are not only statistically significant, they also imply a sizeable economic impact of local norms towards the private provision of training on firms' training behavior.[29] This is probably best illustrated by some simple back-of-the-envelope calculations. One natural starting point are the raw differences in training incidence across larger regions within Switzerland, such as across cantons. This is illustrated graphically in panel (a) of figure 5 (which essentially reproduces the pattern from figure 4 above; using fewer regional units mainly makes the figure easier to read).

Figure 5

To illustrate the quantitative implications of the estimate of β from our baseline specification, we simply predict T_i using the estimated coefficients from our baseline specification of equation (1) but replacing the actual value of $N_{j[i]}$ with the maximum value observed from the distribution of $N_{j[i]}$ across all communities. We then aggregate these predictions within each canton and plot, as is done in panel (b) of figure 5, the hypothetical change the training probability against the effectively observed incidence of training.

[28] Because we use clustered standard errors, we have also estimated the two specifications from columns 5 and 6 of table 4 using GMM instead of 2SLS. This yields point estimates very close to those reported in table 4, however. They are therefore not reported in the table.

[29] Muehlemann *et al.* (2007) report a semi-elasticity of firms' training incidence with respect to the net benefits of training (i.e. the difference between the benefits from training and the training costs to the firm) of about 0.45. Thus, the effect of the norm is comparable in size to the effect of the monetary return from training to the firm.

Figure 5 shows that the estimated effect of $N_{j[i]}$ on the regional training probability is quantitatively important. For example, the canton of Geneva is the canton with both the lowest average training incidence across its communities as well as the weakest norm towards the private provision of VET (in panel (a), Geneva is thus located below right, indicated by "GE"). Shifting attitudes towards the role of the state to the level most critical of the state observed in the data would imply a huge increase in the incidence of training. In the case of Geneva, the training incidence would increase by about 12 percentage points (starting from a low observed training incidence of 15 percent, this implies a relative increase in the training incidence of about 80%). In contrast, there is not much of an effect for the canton of Glarus (labeled "GL" in figure 5), which already has the highest training incidence and a very strong norm towards the private provision of training.

5.5 Additional results

Regional differences in the supply of apprentices

A first set of additional results, shown in columns 1 to 3, shows that our baseline estimates are robust to the inclusion of additional variables that explicitly aim to control for regional differences in the supply of apprentices.[30]

Table 5

In the first column of table 5, we add three variables measuring the distance to the nearest high school ("Gymnasium"), to the nearest vocational school, and the nearest full-time vocational school as additional controls for the supply of apprentices. In the second column, we add, on top of these three variables, a set of variables representing the share of individuals with a given level of educational attainment. These variables may serve as additional supply controls because parents tend to pass on their educational preferences to their children.[31] We further add the fraction of adolescents choosing general education at the upper-secondary level (i.e.

[30] We use a wording here that is consistent with the existence of a market for apprenticeship positions, where there is a demand for apprentices by firms and a corresponding supply by adolescents.

[31] Note that the variables are constructed using the census data from the year 2000, and thus these variables do not simply mirror the information already contained in the regional variation of training probabilities. Still, these variables presumably also reflect differences in firms' demand for VET. In that case, it would be better not to include these variables as controls (e.g. Angrist and Pischke, 2008). We therefore prefer the specifications that do not include these additional controls, and thus our baseline estimates do not control for these variables.

going to a "Gymnasium") at the cantonal level as an additional supply control in this specification (in part reflecting the degree of selectivity in the access to further general education at the upper-secondary level). These two additional specifications yield an estimate of β close to the specification without the supply-side controls ($\widehat{\beta} = -0.379$ and $\widehat{\beta} = -0.322$, respectively). This suggests that our main estimates are not driven by differences in the supply of apprentices, conditional on the other controls.

Alternative data

The next two columns of table 5 show estimates with a similar set of controls as our baseline specification, but that are based on an alternative source of data. The main advantage of the survey data vis-à-vis the business census is that the survey data allows a variety of additional analyses, such as using alternative outcomes (see following paragraph) or testing ancillary hypotheses (see sections 5.6 and 5.7 below). Instead of using the pooled survey data, we here merge firm-level data from the Swiss business census from the year 2008 to the set of regional variables. We basically select the same subset of firms sampled in the survey data (i.e. only employers from the non-agricultural sector and excluding micro enterprises), and we show both estimates with and without the inclusion of control variables.[32] As expected, the resulting estimates are consistent with our baseline estimate using the firm-level survey data. While not surprising, given that the survey data were originally drawn from the business census (tough not exactly from the data we use here), it is nonetheless a reassuring finding that the resulting estimates are comparable in size.

Alternative outcomes

The richness of the survey data further allows us to construct a variety of alternative outcome variables. Therefore, in the remaining columns of table 5 we show estimates for several alternative outcomes (in most cases, however, alternative outcomes are available for training firms only). First, column 5 uses the absolute number of apprentices (including zero apprentices) as dependent variable, yielding an insignificant point estimate ($\widehat{\beta} = 0.321$, with a robust standard

[32]In the survey, there was an additional step that excluded firms from the sampling frame if they stated that they were unable to train apprentices, for example, because they need highly specialized workers (see Potterat, 2011, for details). Because we cannot reproduce this specific step here, the two populations are not exactly identical.

error of 1.854). Consistent with this, using only the subset of training firms also yields an insignificant estimate for the number of apprentices (cf. column 6 of table 5). We think that this finding tends to confirm our main result because it implies that the social norm affects whether an employer trains or not – given that decision, the number of apprentices is then primarily influenced by other factors, such as the size the of the employer, for example.

Moreover, the remaining two columns of table 5 show that the local norm neither has a significant effect on the overall training costs nor on the net benefits from training apprentices accruing to the training firm.[33] Again, it is reassuring to find that there is no effect of normative attitudes towards the role of the state on either the overall training costs or on the net benefits from training. Finding no effect of the local norm on either costs or on net benefits is consistent with the fact that employers from different regions within Switzerland are essentially faced with the same institutional context regarding VET (as discussed in section 2 above). The zero effect on costs and net benefits in turn also suggests that our main result cannot be explained away by regional differences in either of these factors.

5.6 Testing subsidiary hypotheses

Interaction with the expected short-run benefits of an apprenticeship

A first subsidiary test is based on the observation that some apprenticeships yield a positive average net benefit in the short-run, i.e. until the end of the training period, while others are associated with considerable net costs. Based on this, an ancillary hypothesis postulates that the local norm towards the private provision of training has a weaker partial effect on the incidence of training if there is an expected net benefit from training. That is, we would expect a more important role of the social norm if the costs of training are higher.

Table 6

The first column of table 6 thus includes the interaction term between $N_{j[i]}^{\text{VET}}$ and a dummy variable indicating whether an employer is active in a sector where training apprentices is, on average, associated with positive net benefits.[34] We find that the interaction term yields a

[33]Using the log of training costs or the log of net benefits yields the same qualitative finding (i.e. a positive but insignificant estimate for log costs, and a negative and insignificant estimate for log net benefits).

[34]More specifically, we determine the net benefits from training (i.e. the benefits from training minus the

positive and significant coefficient estimate of about 0.127, implying that the marginal effect of $N_{j[i]}^{\text{VET}}$ on the probability of training is higher for those employers who train apprentices that are more costly from an ex-ante point of view. We show estimates that use a slightly different construction of the expected net benefit from training in column 2 of table 6 (using a finer level of aggregation with regard to the net benefits from training). This alternative specification yields also a positive, as well as statistically significant, coefficient estimate of about 0.228.

Interactions with employer characteristics

We further expect that some employers are more likely to be influenced in their decisions by local norms than others. Specifically, we speculate that large(r) employers are presumably more sensitive to local attitudes towards the role of the state within the context of VET because they are more visible and because they are faced with more elevated expectations than are the smaller employers. As shown in columns 3 and 4 of table 6, we indeed find that larger employers react more strongly to changes in the local norm than smaller firms (i.e. the estimated coefficient on the interaction term is large and statistically significant in both cases).[35]

Another dimension that could be relevant is foreign ownership of an enterprise or if a firm mainly serves foreign demand. A priori, we expect to find that employers in foreign ownership and firms that mainly serve foreign demand to be less sensitive to local norms than other employers. We thus include the interaction between $N_{j[i]}^{\text{VET}}$ and a dummy indicating that an employer is in foreign ownership in column 5 of table 6, and the interaction term between $N_{j[i]}^{\text{VET}}$ and a dummy indicating that a given firm mainly supplies foreign demand in column 6. In these two cases, however, the point estimate associated with the interaction term is insignificant (even though the main effect has the expected sign in both specifications).

5.7 Evidence on norm internalization

A final issue worth exploring is whether local norms towards the role of the state affect employers' self-perception regarding the motives for (not) providing apprenticeship positions. In fact, we believe that one can argue that these variables in part reflect the internalization of

costs of training) within a given economic sector and then assume that firms active within the same sector can expect to realize the same net benefits.

[35]We define employers with more than 10 (more than 50) employees as large firms in column 3 (column 4) of table 6, while noting that about 84% of all firms had less than 10 employees in the year 2008.

the norm by employers. Specifically, training firms were directly asked in the survey about the importance of various motives for providing apprenticeship positions from their own point of view, some of them reflecting economic considerations (i.e. they may state that "training apprentices is important to remain competitive" or that "training apprentices is essential for keeping innovative"), others being of less or no obvious economic significance (for example, employers may state that "training apprentices is a community task" or that "training is part of the corporate identity"). We expect that employers are more likely to state that they care about noneconomic motives if they are located in a region with a strong norm towards the private provision of training, whereas we expect to find no corresponding effect in the case of economic motives.[36]

Table 7

Table 7 reports the corresponding estimates, using both the minimal and the full specification that we already used above. In the first four columns, the dependent variable reflects the importance of noneconomic and economic motives, respectively.[37] The first two columns look at the importance of noneconomic motives for employers' training decision. There is a statistically significant effect of the local norm towards the private provision of training on the likelihood that an employer states that noneconomic motives are important in his/her decision to train apprentices. Remarkably, the effect is robust to the inclusion of the full set of control variables used in the baseline regressions above. Thus, employers located in regions with a stronger norm towards the private provision of training are more likely than similar employers in regions with a weak(er) norm to state that apparently noneconomic motives are relevant for their decision to train apprentices. This evidence is certainly consistent with awareness of the norm on the part of the employers, and it is also consistent with norm internalization (see appendix table A.8 for further evidence on norm internalization).

Column 3 shows that there is also a negative and significant effect of normative attitudes on the likelihood that employers state that economic motives are important for their decision

[36]A related idea is to look at the number of years an employer has been training apprentices. Again, the likelihood that a given firm has been training apprentices for a longer time is higher in those regions where the norm towards the private provision of training is stronger (see appendix table A.7).

[37]In a first step, we constructed a dummy variable indicating consent with any single survey item. The dependent variable in columns 1 and 2 (3 and 4) simply measures the fraction of items an employer has classified as important for his/her training decision within the set of noneconomic (economic) motives.

to train apprentices. However, and in contrast to the importance of noneconomic motives, this effect completely vanishes once we include additional control variables, as shown in column 4. Note that this result is not driven by an excessive increase in the associated standard error (the increase is similar to the one observed in the first two columns), but rather by the shrinkage in the corresponding point estimate.

Columns 5 and 6 also look at the effect of the local norm on the importance of economic motives but, in contrast to the two preceding columns, the underlying survey items were answered by both training and non-training firms (using a slightly different set of questions, however). The resulting estimates mirror the result from the two preceding columns: there is a negative association between the local norm and the self-assessed importance of economic motives for training, but this effect is driven towards zero when additional controls are included in the regression.

6 Conclusions

In this paper, we use a unique combination of different data sources to estimate the impact of social norms towards the role of the state on the private provision of training – a topic not only of academic but also of considerable public interest. Specifically, we combine firm-level survey data with municipality-level voting results from different plebiscites that dealt with the issue of public versus private involvement in the provision of public goods. We use the voting results to measure local public attitudes towards the role of the state in general and towards the private – rather than the public – provision of vocational education and training in particular.

In line with the vast, though mainly experimental, evidence on the effect of social norms on the private provision of public goods, we hypothesize that firms which are located in regions with a stronger norm towards the private provision of public goods are, ceteris-paribus, more likely to provide training positions; either because they have internalized the norm and/or because the norm is enforced in their community. In line with our hypothesis, we find that there is a significant and surprisingly strong correlation between normative attitudes towards the role of the state and the incidence of training among employers within a given region. Employers located in regions with a strong norm towards the private provision of training are much more likely to provide apprenticeship positions than similar employers located in regions

where the corresponding norm is weaker.

The negative association between firms' provision of training positions and the local norm towards the private provision of training turns out to be very robust to a wide variety of robustness checks and alternative model specifications. The negative association between the local norm and the regional training incidence is robust to the inclusion of a wide variety of firm- and regional-level controls. Moreover, we find a quantitatively similar-sized effect of the norm on employers' training behavior when correcting for simultaneity bias using different instrumental variables. Taken together, the resulting estimates are robust and consistent across a wide range of different specifications. Finally, the finding that social norms have a significantly higher impact on the training incidence of firms which train in occupations where the training firm has to expect net-costs of training rather than net-benefits, corroborates our interpretation of the association between norms and training incidence. We thus conclude that our findings point to the importance of norms describing the role of the state as an important explanatory factor with regard to firms' training decisions. At a very general level, these findings suggest that the successful, yet also highly complex, Swiss apprenticeship system is deeply rooted in its broader social environment (cf. Alesina *et al.*, 2015; Algan and Cahuc, 2009). Our analysis of firm-based VET in Switzerland illustrates that social norms, by influencing firms' behavior, can help maintain local equilibria in which public goods are provided privately.

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Table 1: List of votes used to measure norms towards the role of the state

Nr.	Date	Title/description	Result	Share of supporting votes	Turnout
(a) Votes about vocational education and training					
503	18.05.2003	Popular initiative for a "sufficient supply of vocational education and training"	Rejected	31.6%	49.6%
340	28.09.1986	Popular initiative for a "secured vocational education and training and retraining"	Rejected	18.4%	34.8%
(b) "Historical" votes about vocational education and training and other educational policies					
292	03.12.1978	Federal law on vocational education and training	Accepted	56.0%	43.2%
286	07.10.1977	Federal law on funding universities and research	Rejected	43.3%	48.9%
207	24.05.1964	Federal law on vocational education and training	Accepted	68.8%	37.0%
(c) Other votes on the provision of public goods or demanding more public intervention					
528	11.03.2007	Popular initiative for a "unitary public health insurance"	Rejected	28.8%	45.9%
461	12.03.2000	Popular initiative for a "fair representation of women in the Federal Administration"	Rejected	18.0%	42.2%
415	04.12.1994	Federal law concerning health insurance	Accepted	51.8%	44.0%

Notes: The vote number corresponds to the official numbering of the votes used by the Swiss Federal Administation. The share of supporting votes equals the fraction of all valid votes cast that were in favor of the vote, while turnout describes the fraction of eligible voters taking part in the vote.

Table 2: Baseline estimates (OLS estimates)

	Training firm (yes = 1), T_i				
Mean	0.335	0.335	0.335	0.335	0.335
Standard deviation	0.472	0.472	0.472	0.472	0.472
$N_{j[i]}^{\text{VET}}$	-0.498^{***}	-0.438^{***}	-0.551^{***}	-0.280^{***}	-0.393^{***}
	(0.098)	(0.085)	(0.059)	(0.051)	(0.087)
	[−0.389]	[−0.343]	[−0.431]	[−0.219]	[−0.307]
Survey-year dummies	No	Yes	Yes	Yes	Yes
Firm-level controls	No	No	Yes	Yes	Yes
Cantonal dummies	No	No	No	Yes	Yes
Community-level controls	No	No	No	No	Yes
Number of observations	21,339	21,339	21,339	21,339	21,339
R-Squared	0.007	0.127	0.316	0.323	0.326

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities. Approxmiate elasticities, evaluated at mean values, are given in brackets.

Table 3: Robustness checks (OLS estimates)

	Training firm (yes = 1), T_i									
Mean	0.335	0.335	0.335	0.367	0.345	0.331	0.302	0.225	0.276	0.335
Standard deviation	0.472	0.472	0.472	0.482	0.475	0.471	0.459	0.418	0.447	0.472
$N_{j[i]}^{\text{VET}}$	-0.342^{***}	-0.227^{**}	-0.230^{**}	-0.322^{***}	-0.503^{***}	-0.449^{**}	-0.381^{***}	-0.275^{***}	-0.309^{**}	-1.344^{***}
	(0.089)	(0.089)	(0.092)	(0.123)	(0.115)	(0.174)	(0.089)	(0.084)	(0.122)	(0.334)
	[−0.267]	[−0.178]	[−0.180]	[−0.213]	[−0.397]	[−0.407]	[−0.330]	[−0.317]	[−0.289]	[−0.344]
Robustness check	Regional controls			Subsample of regions			Subsample of firms		Statistical issues	
	LLM controls	District FEs	LLM FEs	German	$n_j \geq 10$	Large	Private	Smaller	Weights	Probit
Survey-year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cantonal dummies	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Community-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	21,339	21,339	21,339	15,706	17,260	11,432	17,930	16,279	21,339	21,339
(Pseudo) R-Squared	0.327	0.330	0.331	0.334	0.334	0.351	0.328	0.196	0.138	0.283

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities. Approxmiate elasticities, evaluated at mean values, are given in brackets.

Table 4: Instrumental-variable estimates (2SLS estimates)

	Training firm (yes = 1), T_i					
Mean	0.335	0.335	0.335	0.335	0.335	0.335
Standard deviation	0.472	0.472	0.472	0.472	0.472	0.472
$N_{j[i]}^{\text{VET}}$	$-0.393^{\star\star\star}$	$-0.503^{\star\star\star}$	-0.427	$-0.823^{\star\star\star}$	$-0.567^{\star\star\star}$	$-0.503^{\star\star\star}$
	(0.087)	(0.138)	(0.265)	(0.294)	(0.208)	(0.132)
	[−0.307]	[−0.393]	[−0.334]	[−0.644]	[−0.443]	[−0.393]
Estimation method	OLS	2SLS	2SLS	2SLS	2SLS	2SLS
Instrument(s)	–	$N_{j[i]}^{\text{STATE}}$	$N_{j[i]}^{\text{HIST}}$	$E_{j[i]}^{\text{HIST}}$	$N_{j[i]}^{\text{HIST}} + E_{j[i]}^{\text{HIST}}$	All together
Survey-year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Cantonal dummies	Yes	Yes	Yes	Yes	Yes	Yes
Community-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	21,339	21,339	21,331	21,279	21272	21,272
R-Squared	0.326	0.326	0.326	0.325	0.326	0.326
F-value (first-stage)	–	425.964	89.348	12.833	29.109	88.503
p-value (endogeneity)	–	0.300	0.893	0.136	0.376	0.281

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities. Approxmiate elasticities, evaluated at mean values, are given in brackets. The p-value shown in the last row is associated with a formal test on the equivalence between the OLS estimate from column 1 and the corresponding instrumental-variable estimate.

Table 5: Additional results (OLS estimates)

	All firms				Training firms only			
	Training firm (yes = 1), T_i				#apprentices		costs	net benefits
Mean	0.335	0.335	0.311	0.311	1.741	5.198	98.582	6.322
Standard deviation	0.472	0.472	0.463	0.463	19.032	32.612	32.777	39.748
$N_{j[i]}^{\text{VET}}$	-0.379^{***}	-0.322^{***}	-0.573^{***}	-0.205^{***}	0.321	4.546	5.530	-19.988
	(0.087)	(0.084)	(0.071)	(0.036)	(1.854)	(5.325)	(9.784)	(12.792)
	[−0.296]	[−0.252]	[−0.486]	[−0.174]	[0.048]	[0.221]	[0.014]	[−0.797]
Additional feature	Supply-side controls		Alternative data		Alternative outcomes			
Survey-year dummies	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Cantonal dummies	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Community-level controls	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Number of observations	21,339	21,339	208,857	208,857	21,339	7,147	7,147	7,147
p-value (F-statistic)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-Squared	0.326	0.327	0.010	0.207	0.028	0.041	0.186	0.086

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities. Approxmiate elasticities, evaluated at mean values, are given in brackets.

Table 6: Heterogeneous effects (OLS estimates)

	Training firm (yes = 1)					
Mean	0.335	0.335	0.335	0.335	0.302	0.304
Standard deviation	0.472	0.472	0.472	0.472	0.459	0.460
$N_{j[i]}^{\text{VET}}$	-0.487^{***}	-0.585^{***}	-0.318^{***}	-0.258^{***}	-0.262^{***}	-0.272^{***}
	(0.105)	(0.110)	(0.088)	(0.094)	(0.082)	(0.084)
$N_{j[i]}^{\text{VET}} \times 1$(net benefits > 0)	0.127^{*}	0.228^{***}				
	(0.074)	(0.078)				
$N_{j[i]}^{\text{VET}} \times 1$(large firm)			-0.385^{**}	-0.301^{***}		
			(0.151)	(0.102)		
$N_{j[i]}^{\text{VET}} \times 1$(foreign ownership)					-0.082	
					(0.107)	
$N_{j[i]}^{\text{VET}} \times 1$(foreign demand)						-0.041
						(0.162)
Survey-year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Cantonal dummies	Yes	Yes	Yes	Yes	Yes	Yes
Community-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	21,339	21,337	21,339	21,339	15,619	15,488
R-Squared	0.326	0.327	0.327	0.327	0.379	0.378

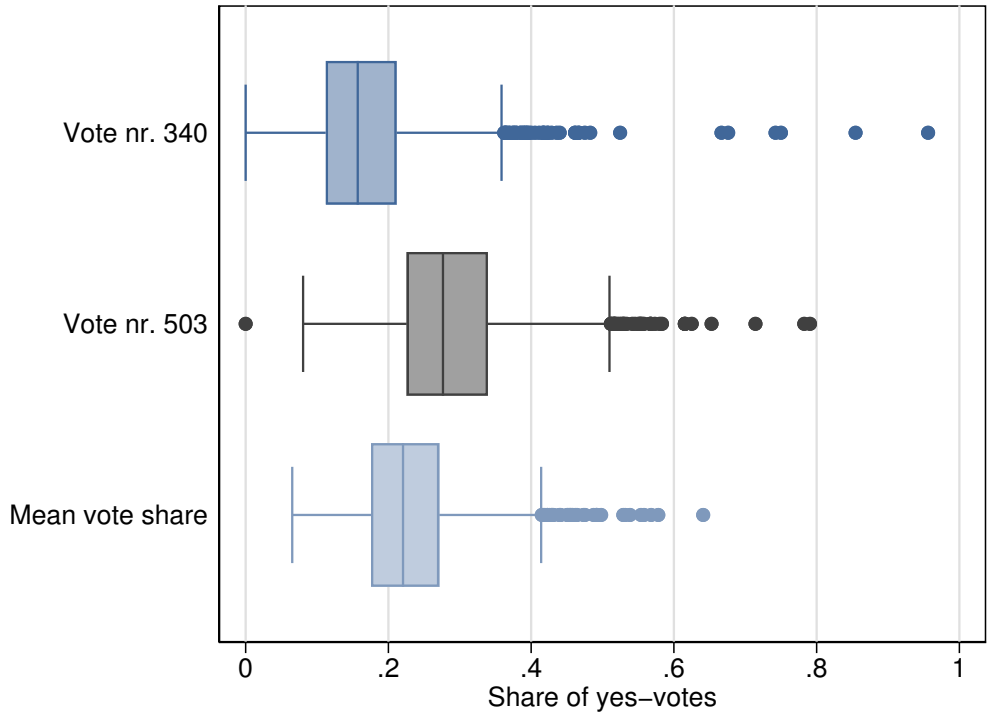
Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities.

Table 7: Employers' self-perception of their motives for training apprentices (OLS estimates)

	Noneconomic motives		Economic motives		Economic motives (all firms)	
Mean	0.720	0.720	0.459	0.459	0.409	0.409
Standard deviation	0.242	0.242	0.289	0.289	0.289	0.289
$N_{j[i]}^{\text{VET}}$	-0.245^{***}	-0.191^{*}	-0.198^{***}	-0.064	-0.305^{***}	-0.055
	(0.067)	(0.102)	(0.045)	(0.108)	(0.035)	(0.060)
	[−0.086]	[−0.067]	[−0.109]	[−0.035]	[−0.195]	[−0.035]
Survey-year dummies	No	Yes	No	Yes	No	Yes
Firm-level controls	No	Yes	No	Yes	No	Yes
Cantonal dummies	No	Yes	No	Yes	No	Yes
Community-level controls	No	Yes	No	Yes	No	Yes
Number of observations	7147	7147	7147	7147	18,322	18,322
R-Squared	0.006	0.065	0.003	0.060	0.007	0.049

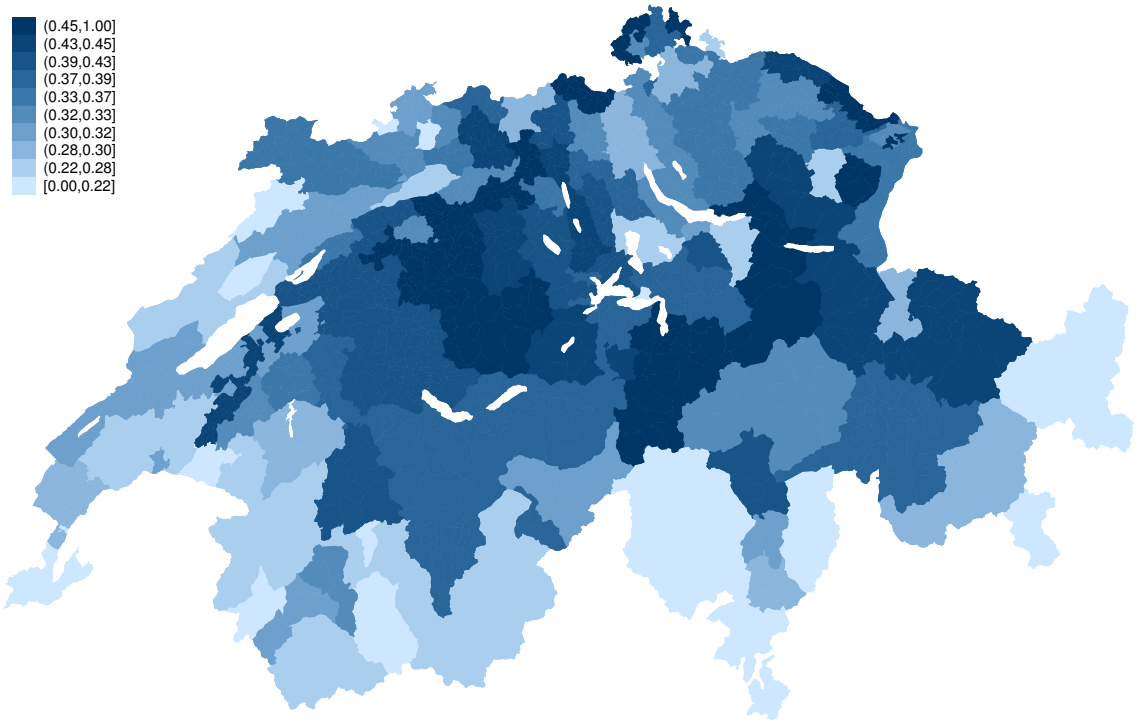
Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities. Approxmiate elasticities, evaluated at mean values, are given in brackets.

Figure 1: Variation in the share of supporting votes, votes nr. 340 and nr. 503



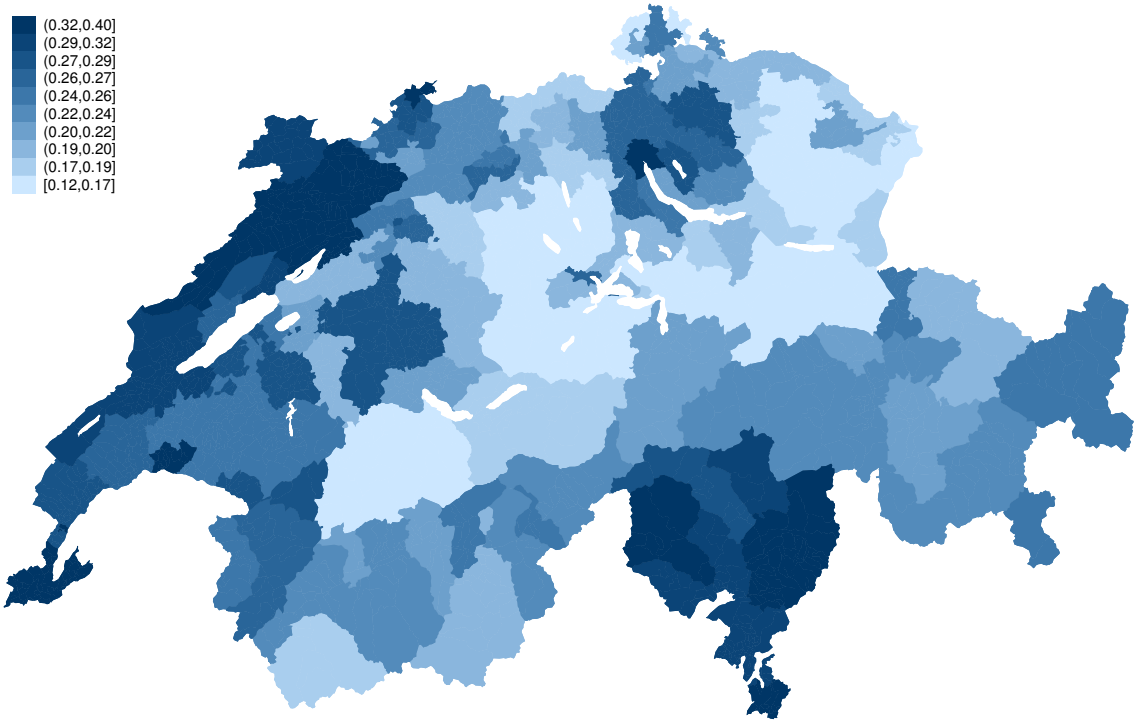
Notes: The figure shows the distribution of the share of supporting votes for vote nr. 340 and vote nr. 503, as well as the mean across the two votes (see table 1 for details).

Figure 2: Spatial variation in the incidence of training



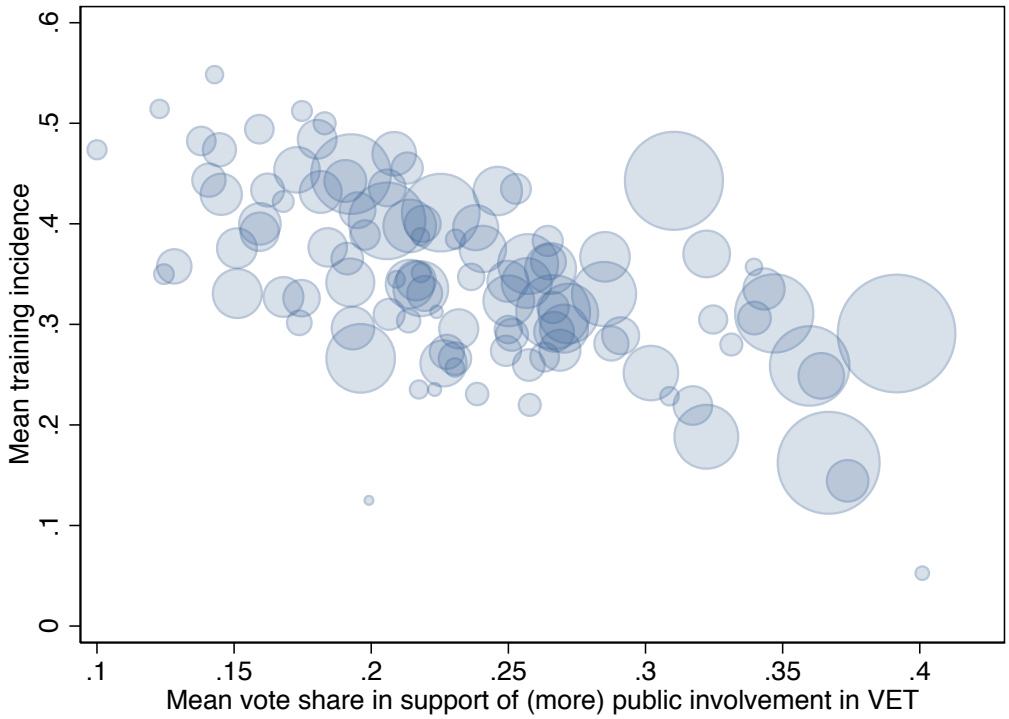
Notes: The figure shows the spatial distribution of training incidence (i.e. the local mean of T_i) across the 148 distinct districts of Switzerland. Darker shaded areas have a higher fraction of training firms.

Figure 3: Spatial variation in public attitudes towards the role of the state in VET



Notes: The figure shows the spatial distribution of district-level voting results (i.e. the mean share of supporting votes from vote nr. 340 and vote nr. 503); see table 1 for additional information concerning the three votes. Darker shaded areas are characterized by a weaker norm towards the private provision of training.

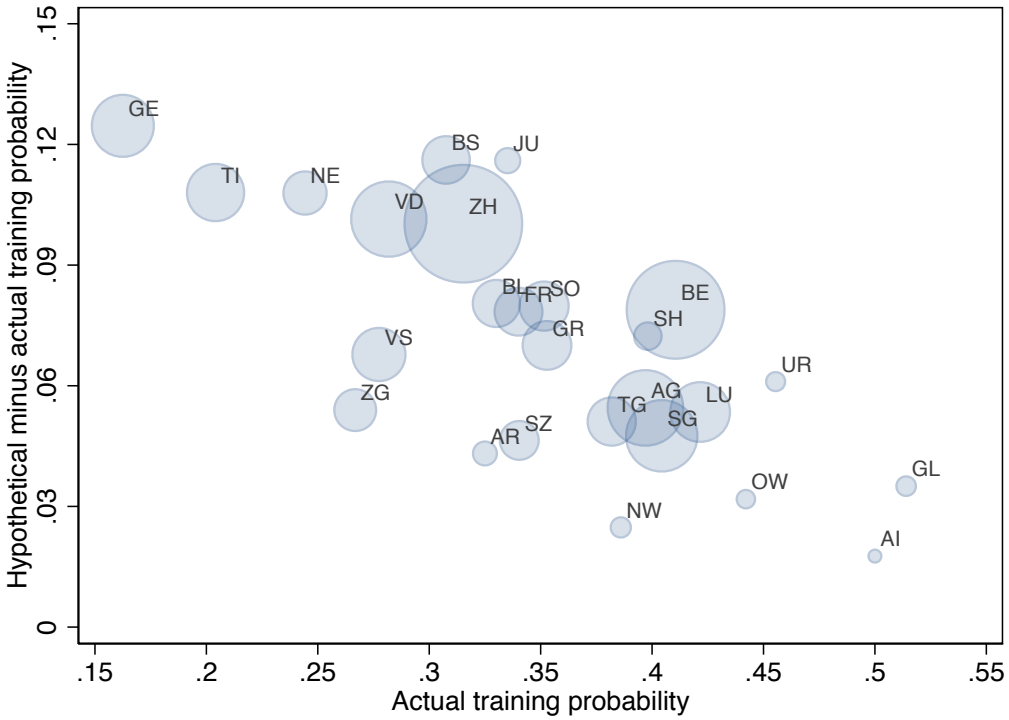
Figure 4: The association between training incidence and public attitudes towards the role of the state



Notes: The figure plots the association between the local training incidence (on the y–axis) and public attitudes towards the role of the state within the VET system (on the x–axis). Both variables are aggregated up to the level of local labor markets, guaranteeing that the local training incidence is strictly larger than 0 and stricly smaller than 1 for each region. The size of the circles is proportional to the size of (i.e. the number of firms in) the local labor markets in the pooled sample of firms.

Figure 5: Illustrating the quantitative effect of the local norm towards the private/public provision of training on the regional incidence of training among employers

(a)



(b)

Notes: Panel (a) plots actual cantonal-level training probabilities against mean attitudes towards the role of the state in VET. Panel (b) illustrates the quantitative implications of the estimate of β from column 5 of table 2. In this figure, the y–axis shows the predicted increase in the cantonal training probability from a hypothetical shift of $N_{j[i]}^{\text{VET}}$ to the maximum value observed in each community. The size of the circles is proportional to the number of firms in the sample in a given canton (see also appendix table A.2 for a list of the cantonal abbreviations used in the figure).

A Additional tables and figures (online publication only)

Table A.1: Spatial structure of the sample data

Spatial unit	Unique units	# of inhabitants	# of firms	Area, in km^2
Postal code	3,102	2,656	146	13.31
Community	2,352	3,502	192	17.55
District	148	55,660	3,052	278.95
Local labor market	106	77,714	4,261	389.48
Canton	26	316,833	17,372	1,587.89
Sum		8,237,666	451,663	41,285.00

Notes: The table shows the number of unique units (as of the year 2014) for different levels of regional aggregation, along with the average number of inhabitants, the average number of firms (as of 2008), and the mean area (in hectares) per spatial unit.

Table A.2: Descriptives, baseline control variables

Variable	Mean	Sd
(a) Year of survey		
Year = 2000	0.211	0.408
Year = 2004	0.197	0.398
Year = 2009	0.592	0.492
(b) Firm-level controls		
Firm size:		
1-9 employees	0.524	0.499
10-49 employees	0.239	0.427
50-99 employees	0.112	0.316
100 or more employees	0.125	0.330
Main sector of activity:		
Industry	0.169	0.375
Construction	0.118	0.323
Services	0.553	0.497
Government and nonprofit	0.160	0.366
Industry:		
Mining and quarrying; energy and watersupply, construction	0.125	0.330
Food products, beverages and tobacco products	0.016	0.124
Textiles and apparel	0.006	0.078
Wood and paper products, and printing	0.020	0.140
Chemicals and chemical products, rubber and plastics	0.025	0.156
Metail products	0.027	0.163
Machinery and equipment n.e.c. and transport equipment	0.026	0.158
Electrical equipment, electronic/optical products, watches and clocks	0.026	0.160
Other manufacturing	0.017	0.131
Trade and repair	0.164	0.370
Food and beverage service activities, accomodation	0.065	0.246
Transport, telecommunications	0.032	0.177
Financial service activities and insurance	0.031	0.173
Real estate activities	0.032	0.176
IT, publishing, audiovisual/broadcasting activities, R&D	0.156	0.363
Education	0.035	0.183
Human health activities, social work activities	0.104	0.305
Public administration	0.040	0.196
Other service activities	0.053	0.223
(c) Regional-level controls		
ln(population size)	9.511	1.666
Δ ln(population size)	0.144	0.278
Fraction foreign	0.220	0.098
Δ fraction foreign	0.043	0.057
Mean age	39.362	2.268
Fraction aged below 18	0.199	0.038
Fraction aged above 65	0.147	0.033
Fraction female	0.511	0.015
Area	2995.248	3751.857
Mean voter turnout	0.419	0.070
Type of community:		
Major centers	0.170	0.376
Medium centers	0.149	0.356
Small centers	0.092	0.289

Table A.2: Continued

Variable	Mean	Sd
Peripheral centers	0.016	0.127
High income communities	0.031	0.173
Tourist communities	0.026	0.160
Semitouristic communities	0.012	0.107
Communities with homes and institutions	0.003	0.057
Workplace municipalities in metropolitan regions	0.156	0.363
Suburban municipalities of metropolitan regions	0.036	0.185
Periurban municipalities of metropolitan regions	0.036	0.186
Workplace communities in non-metropolitan regions	0.062	0.241
Suburban communities of non-metropolitan regions	0.022	0.148
Periurban communities of non-metropolitan regions	0.026	0.159
Commuter communities with high levels of immigration	0.022	0.147
Low immigration commuter communities	0.013	0.111
Industrial-tertiary communities	0.045	0.207
Industrial Communities	0.031	0.174
Agricultural-industrial communities	0.028	0.164
Agricultural-tertiary communities	0.020	0.139
Agricultural communities	0.004	0.061
Municipalities with a sharp decline in population	0.000	0.022
Canton:		
Aargau (AG)	0.075	0.264
Appenzell Innerrhoden (AI)	0.002	0.046
Appenzell Ausserrhoden (AR)	0.007	0.086
Bern (BE)	0.126	0.332
Basel-Land (BL)	0.029	0.168
Basel-Stadt (BS)	0.030	0.170
Fribourg (FR)	0.030	0.171
Geneve (GE)	0.051	0.219
Glarus (GL)	0.005	0.071
Graubünden (GR)	0.031	0.174
Jura (JU)	0.008	0.090
Luzern (LU)	0.047	0.211
Neuchatel (NE)	0.025	0.155
Nidwalden (NW)	0.005	0.073
Obwalden (OW)	0.004	0.067
St.Gallen (SG)	0.067	0.250
Schaffhausen (SH)	0.010	0.099
Solothurn (SO)	0.032	0.175
Schwyz (SZ)	0.020	0.139
Thurgau (TG)	0.031	0.172
Ticino (TI)	0.043	0.202
Uri (UR)	0.005	0.069
Vaud (VD)	0.075	0.263
Valais (VS)	0.037	0.189
Zug (ZG)	0.023	0.150
Zürich (ZH)	0.182	0.386

Notes: The table shows descriptives (mean and standard deviation) for all the controls used in the baseline specification (shown in column 5 of table 2).

Table A.3: Attitudes towards the role of the state measured at different aggregation levels (OLS estimates)

	Training firm (yes = 1)					
Mean	0.335	0.335	0.335	0.335	0.335	0.335
Standard deviation	0.472	0.472	0.472	0.472	0.472	0.472
$N_{r[i]}^{\text{VET}}$	-0.498^{***}	-0.393^{***}	-0.742^{***}	-0.551^{***}	-0.750^{***}	-0.565^{***}
	(0.098)	(0.087)	(0.147)	(0.097)	(0.152)	(0.102)
	[−0.389]	[−0.307]	[−0.572]	[−0.425]	[−0.578]	[−0.436]
Aggregation level of $N_{r[i]}^{\text{VET}}$	Postal codes ($R = 1,984$)		Districts ($R = 148$)		Local labor markets ($R = 106$)	
Survey-year dummies	No	Yes	No	Yes	No	Yes
Firm-level controls	No	Yes	No	Yes	No	Yes
Cantonal dummies	No	Yes	No	Yes	No	Yes
Community-level controls	No	Yes	No	Yes	No	Yes
Number of observations	21,339	21,339	21,339	21,339	21,339	21,339
R-Squared	0.007	0.326	0.013	0.326	0.013	0.326

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors, clustered by r, are given in parentheses. $N_{r[i]}^{\text{VET}}$ denotes public attitudes towards the role of the state in region r, where the level of spatial aggregation varies across columns.

Table A.4: First-stage estimates

	$N_{j[i]}^{\text{VET}}$				
Mean	0.262	0.262	0.262	0.262	0.262
Standard deviation	0.081	0.081	0.081	0.081	0.081
$N_{j[i]}^{\text{STATE}}$	0.678***				0.619***
	(0.033)				(0.031)
$N_{j[i]}^{\text{HIST}}$		0.368***		0.341***	0.135***
		(0.039)		(0.037)	(0.030)
FDP^{1947}			0.001*	0.001**	0.000
			(0.000)	(0.000)	(0.000)
CVP^{1947}			0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)
SP^{1947}			0.001**	0.001*	0.001*
			(0.000)	(0.000)	(0.000)
SVP^{1947}			−0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)
LPS^{1947}			−0.002***	−0.001***	−0.001***
			(0.001)	(0.000)	(0.000)
Mitte^{1947}			0.000	−0.001	−0.000
			(0.001)	(0.001)	(0.000)
PDA^{1947}			0.003***	0.002***	0.001***
			(0.001)	(0.001)	(0.000)
Survey-year dummies	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Cantonal dummies	Yes	Yes	Yes	Yes	Yes
Community-level controls	Yes	Yes	Yes	Yes	Yes
Number of observations	21,339	21,331	21,279	21,272	21,272
R-Squared	0.888	0.834	0.832	0.844	0.894
F-value (instruments)	425.964	89.348	12.833	29.109	88.503

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities.

Table A.5: Reduced-form estimates

	Training firm (yes = 1)				
Mean	0.335	0.335	0.335	0.335	0.335
Standard deviation	0.472	0.472	0.472	0.472	0.472
$N_{j[i]}^{\text{STATE}}$	−0.341***				−0.290***
	(0.097)				(0.103)
$N_{j[i]}^{\text{HIST}}$		−0.157		−0.102	−0.006
		(0.101)		(0.109)	(0.111)
FDP^{1947}			0.000	0.000	0.001
			(0.001)	(0.001)	(0.001)
CVP^{1947}			0.001	0.001	0.001
			(0.001)	(0.001)	(0.001)
SP^{1947}			0.000	0.000	0.000
			(0.001)	(0.001)	(0.001)
SVP^{1947}			0.002*	0.002*	0.002
			(0.001)	(0.001)	(0.001)
LPS^{1947}			0.001	0.001	0.001
			(0.002)	(0.002)	(0.002)
Mitte^{1947}			0.000	0.000	0.000
			(0.002)	(0.002)	(0.002)
PDA^{1947}			−0.001	−0.001	0.000
			(0.002)	(0.002)	(0.002)
Survey-year dummies	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Cantonal dummies	Yes	Yes	Yes	Yes	Yes
Community-level controls	Yes	Yes	Yes	Yes	Yes
Number of observations	21,339	21,331	21,279	21,272	21,272
R-Squared	0.326	0.325	0.326	0.326	0.326
F-value (instruments)	12.252	2.410	1.945	1.952	2.844
p-value (F-test)	0.001	0.121	0.059	0.049	0.003

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities.

Table A.6: Placebo votes

	Training firm (yes = 1)			
Mean	0.335	0.335	0.335	0.335
Standard deviation	0.472	0.472	0.472	0.472
$N_{j[i]}^{\text{VET}}$	-0.393^{***}	-0.503^{***}		0.328
	(0.087)	(0.138)		(0.298)
	[−0.307]	[−0.393]		[0.257]
$N_{j[i]}^{\text{Placebo}}$			−0.110	
			(0.097)	
			[−0.194]	
Estimation method	OLS	2SLS	OLS	2SLS
Instrument	–	$N_{j[i]}^{\text{STATE}}$	–	$N_{j[i]}^{\text{Placebo}}$
Survey-year dummies	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Cantonal dummies	Yes	Yes	Yes	Yes
Community-level controls	Yes	Yes	Yes	Yes
Number of observations	21,339	21,339	21,339	21,339
p-value (F-statistic)	0.000	0.000	0.000	0.000
R-Squared	0.326	0.326	0.325	0.323

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities. Approxmiate elasticities, evaluated at mean values, are given in brackets. $N_{j[i]}^{\text{Placebo}}$ is the mean share of supporting votes from two votes on different subjects: the first on the rehabilitation of the Gotthard road tunnel (vote from February 28, 2016), the second on the protection of children from paedophiles (vote from May 18, 2014). We use these two specific votes because they are arguably unrelated to the question of private/public accountability.

Table A.7: Employers' long-term engagement in training (ordered probit estimates)

	Number of years	
Mean	6.788	6.788
Standard deviation	2.071	2.071
$N_{j[i]}^{\text{VET}}$	$-0.663^{\star\star\star}$	$-0.861^{\star}$
	(0.180)	(0.432)
Survey-year dummies	Yes	Yes
Firm-level controls	Yes	Yes
Cantonal dummies	Yes	Yes
Community-level controls	Yes	Yes
Number of observations	7,075	7,075
Pseudo R-Squared	0.001	0.030

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by communities. The dependent variable is a ordinal measure of the number of years a given firm has been training apprentices.

Table A.8: Further evidence on norm internalization using survey-data on voluntary work

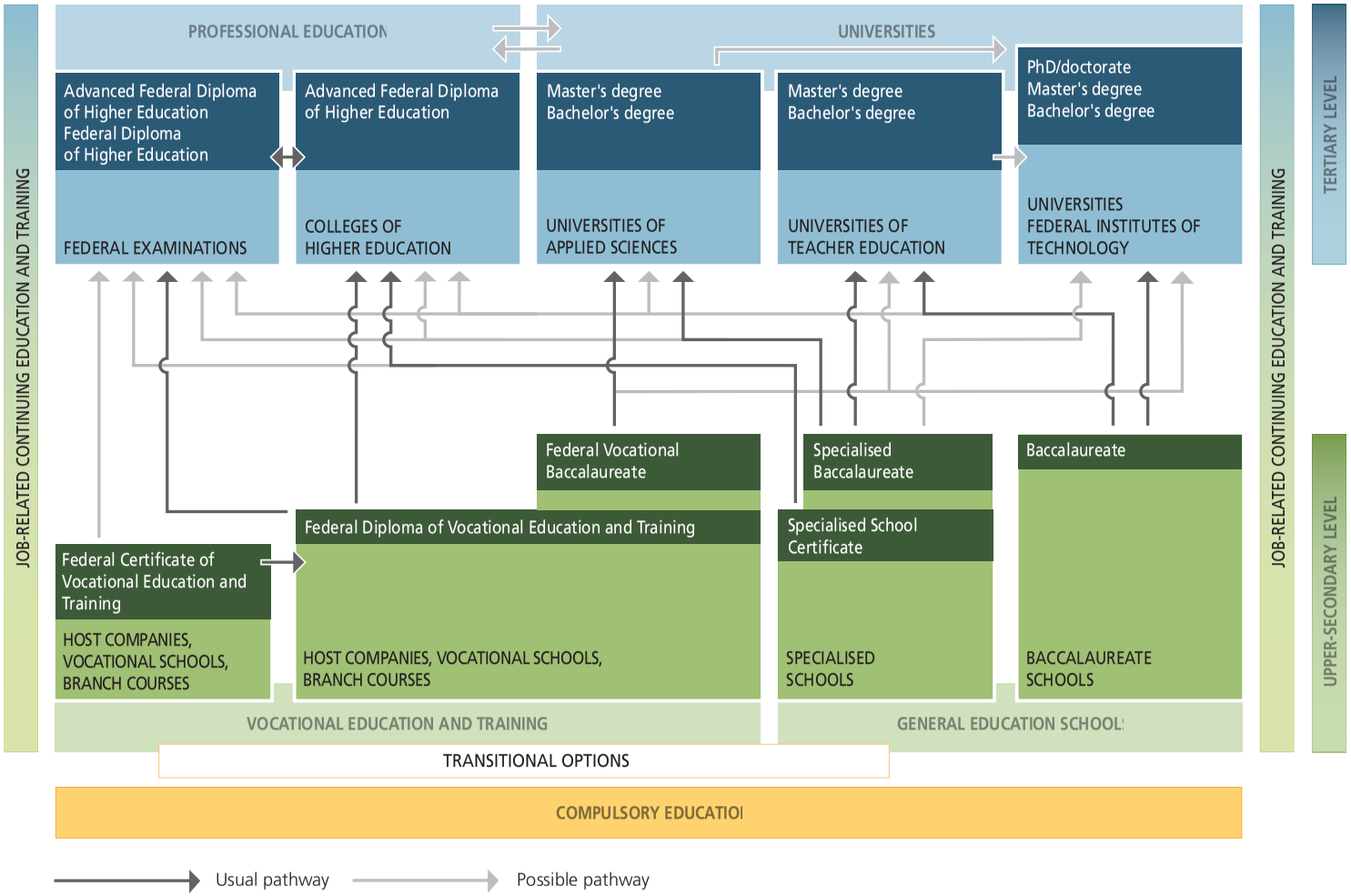
	"Being active"		"Being a member"		"Making donations"	
Mean	1.099	1.099	2.026	2.026	2.282	2.282
Standard deviation	1.290	1.290	1.668	1.668	1.935	1.935
$N_{j[i]}^{\text{STATE}}$	-0.769^{***}	-1.395^{***}	-2.396^{***}	-1.866^{***}	-2.745^{***}	-1.915^{***}
	(0.170)	(0.362)	(0.232)	(0.418)	(0.323)	(0.494)
	[−0.226]	[−0.409]	[−0.381]	[−0.297]	[−0.388]	[−0.271]
Survey-year dummies	No	Yes	No	Yes	No	Yes
District-level FEs	No	Yes	No	Yes	No	Yes
Individual-level controls	No	Yes	No	Yes	No	Yes
Number of observations	13,051	13,051	13,051	13,051	13,051	13,051
R-Squared	0.004	0.066	0.023	0.124	0.022	0.137

Notes: ***, **, and * denote statistical significance on the 1%, 5%, and 10% level, respectively. Robust standard errors are given in parentheses and are clustered by community. Approxmiate elasticities, evaluated at mean values, are given in brackets. The dependent variables are taken from a survey on voluntary work and trust (Freitag, 2014). This survey has been administered two times (2007 and 2012), thus covering essentially the same time period as the firm-level data. The dependent variable in columns 1 and 2 is a variable indicating whether respondent i is active in one ore more domains (such as, for example, a sports club or a political party). Similarly, the dependent variable 3 and 4 denotes whether individual i is a member (i.e. either active or passive) in any club or association. In the final two columns, the dependent variable is whether a person has made one or several donations to any charitable association.

Figure A.1: Official vignette to be used by training firms

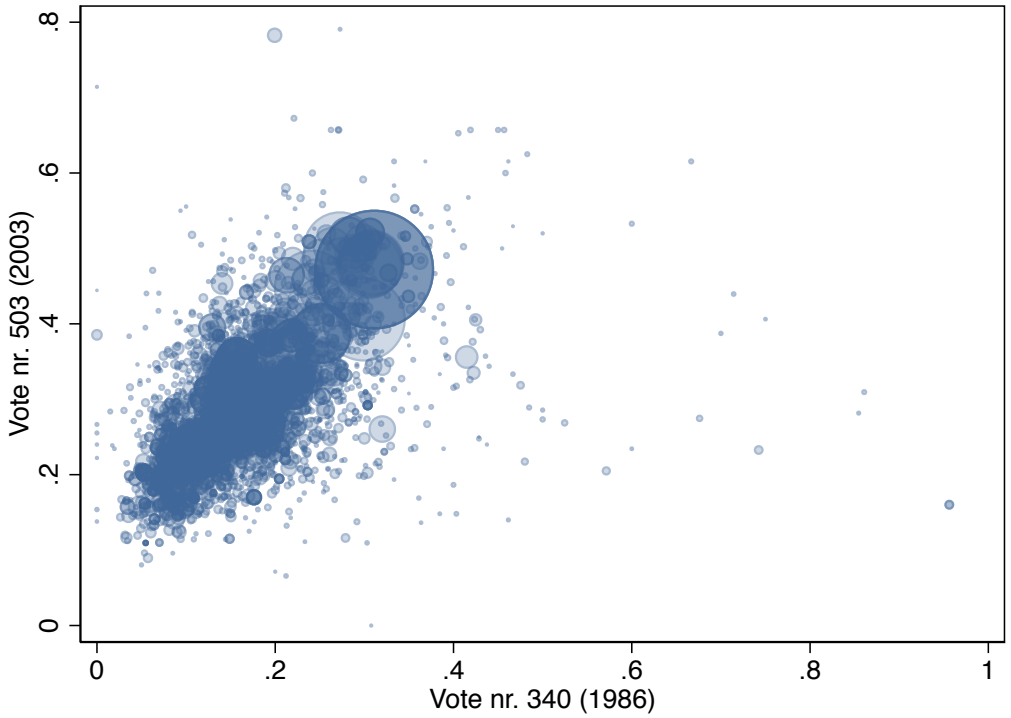
Notes: This is the officiel vignette (in German) that training firms can, for example, stick on their entrance door and/or put on their website (which many employers do).
Source: http://www.berufsbildungplus.ch.

Figure A.2: The Swiss educational system



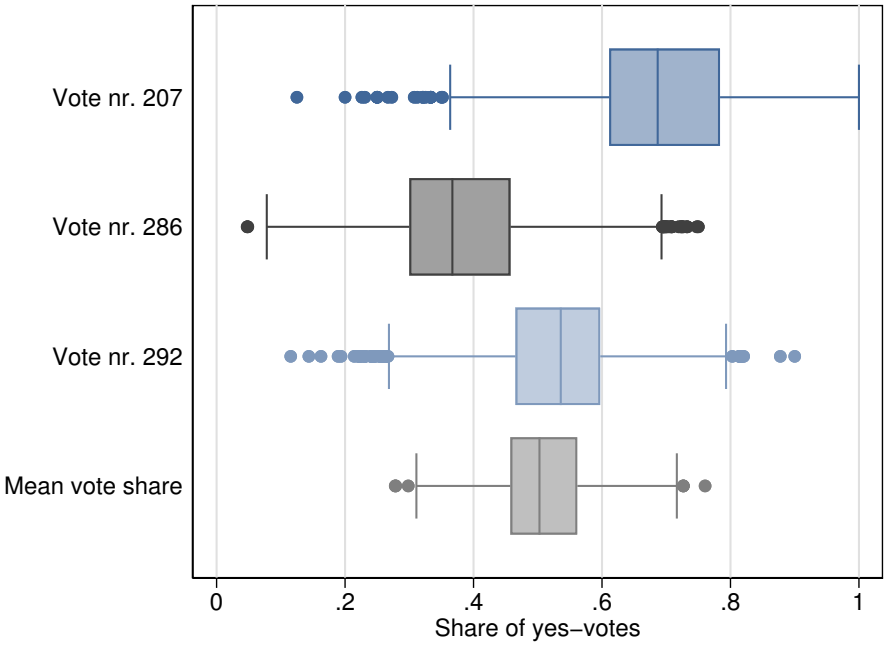
Source: State Secretary for Education, Research and Innovation (SERI).

Figure A.3: Correlation in the voting results across the two votes from 1986 and 2003

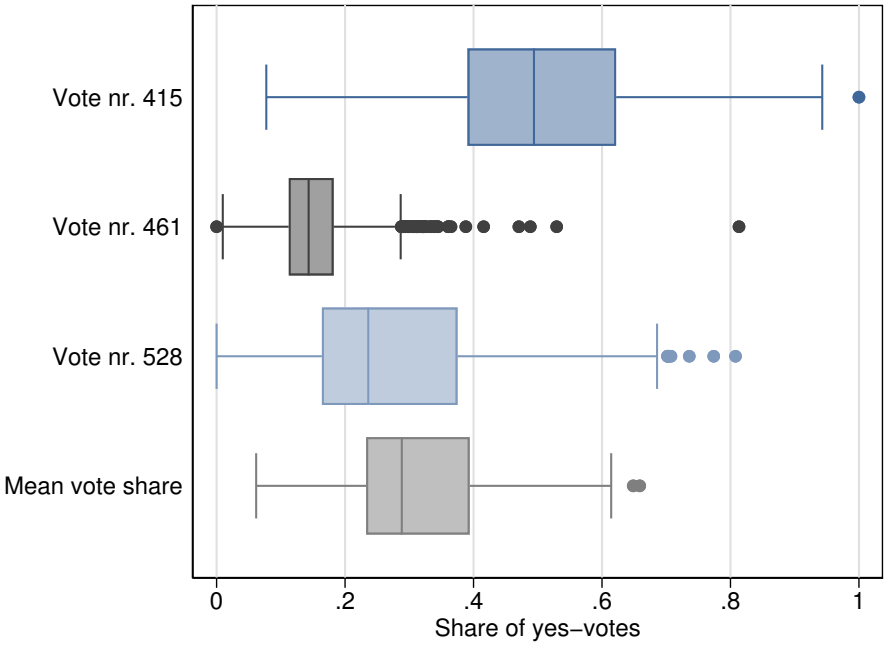


Notes: The figure shows the share of supporting votes from vote nr. 503 (on the y–axis) against the corresponding share of supporting votes from vote nr. 340 (on the x–axis). Each circle represents a communnity, and the size of the circles is proportional to the average number of valid votes from the two votes (which is about proportional to the number of inhabitants).

Figure A.4: Variation in the voting results across communities



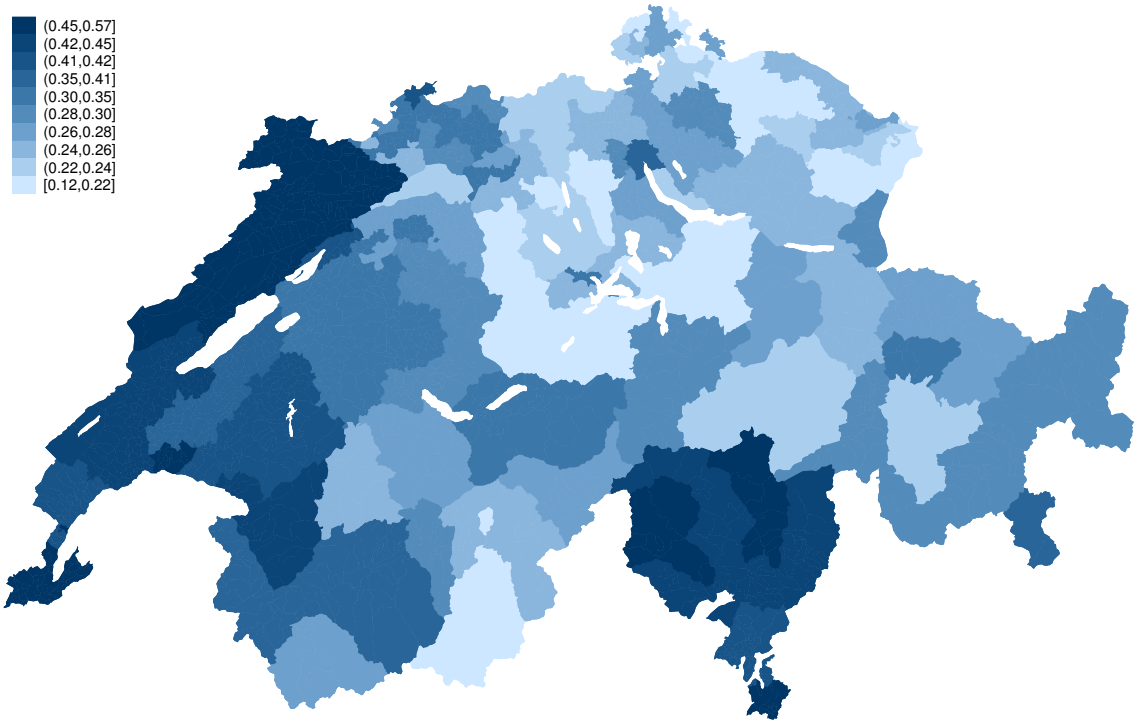
(a) Past votes on the role of the state in the provision/financing of VET



(b) Votes on the more general role of the state

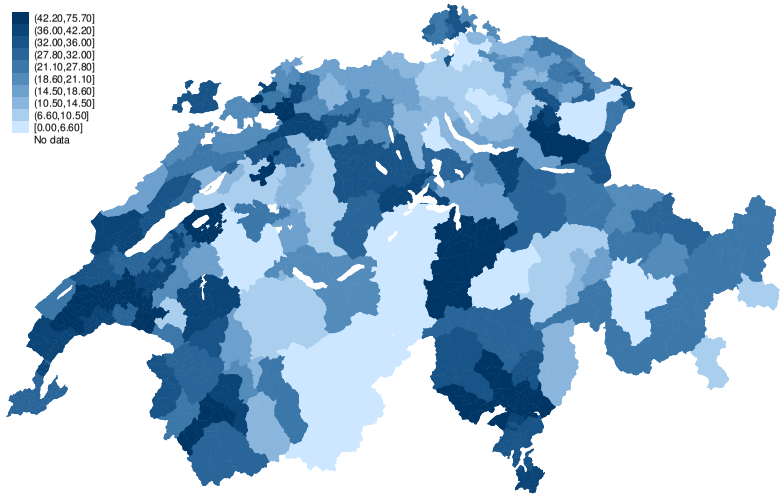
Notes: The figure shows the amount of cross-sectional variation across communities in the voting results, for each vote separately as well as for the corresponding mean vote shares. See table 1 for additional details concerning the votes.

Figure A.5: Spatial variation in public attitudes towards the role of the state outside the educational context

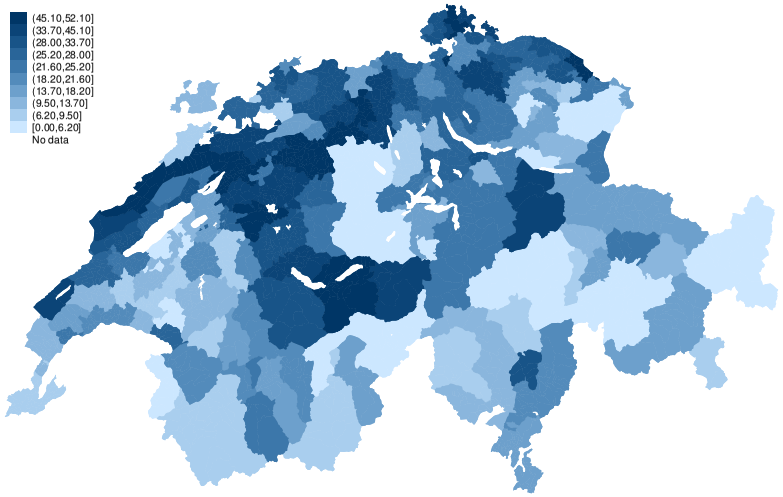


Notes: The figure shows the spatial distribution of district-level voting results that measure attitudes towards the role of the state (mean share of supporting votes across votes nr. 415, 461, and 528). See table 1 for additional details concerning the votes.

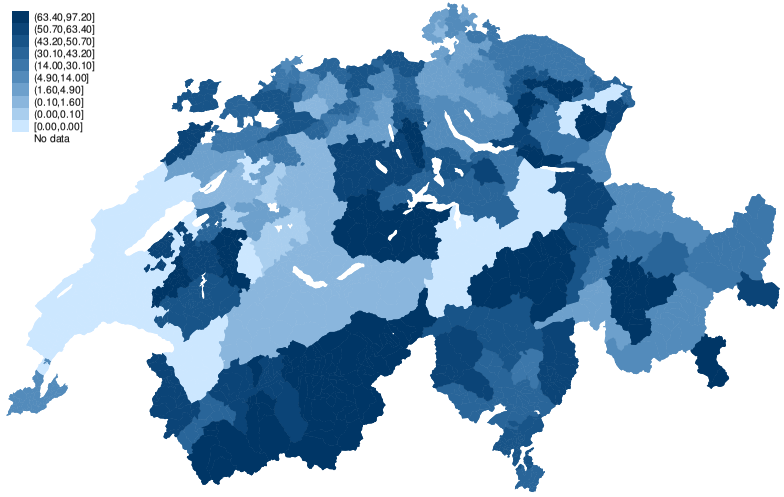
Figure A.6: Spatial variation in results from the 1947 elections of the national parliament



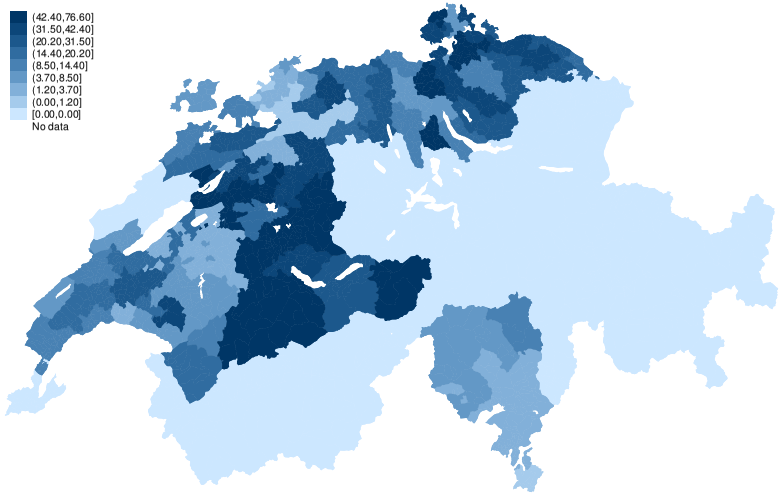
(a) FDP



(b) SP



(c) CVP



(d) SVP

Notes: The figure shows the spatial distribution of 1947 elections of the national parliament (for the four largest parties only).