SHADOW ECONOMY, TAX MORALE, GOVERNANCE AND INSTITUTIONAL QUALITY: A PANEL ANALYSIS

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Abstract

This paper analyses how governance or institutional quality and tax morale affect the shadow economy, using an international country panel and also within country data. The literature strongly emphasizes the quantitative importance of these factors to understand the level and changes of shadow economy. However, the limited number of investigations use cross-sectional country data with a relatively small number of observations, and hardly any paper has investigated tax morale and provides evidence using within country data. Using more than 25 proxies that measure governance and institutional quality we find strong support that its increase leads to a smaller shadow economy. Moreover, an increase in tax morale reduces the size of the shadow economy.

JEL Code: D73, D78, H2, H26, O17, O5.

Keywords: shadow economy, tax morale, governance quality, government intervention, corruption.

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1. INTRODUCTION

The interest in determining the causes of the shadow economy and other illegal activities has strongly increased in more recent years. However, investigating the causes is still an undeveloped area of research. The transformation of the socialist economies was one of the main reasons for the interest of governance quality as institutional weaknesses and corruption surfaced as major obstacles to market reforms (Abed and Gupta, 2002). However, the informal sector plays an important role not only in transition countries, but also in developing countries. Employment in the informal sector seems to be a relevant income source for many people. An increased interest and new datasets contributed to a rapidly growing empirical literature on illegal activities such as shadow economy or corruption (see Schneider and Enste, 2000, 2002; Treisman, 2000, and Lambsdorff, 1999 for reviews). Moreover, the relevance of investigating not only institutional or governance quality, but also social norms or tax morale - the intrinsic motivation to pay taxes - has emerged, as empirical and experimental findings indicate that deterrence models predict far too little compliance and far too much tax evasion (for an overview, see Alm, 1999; Torgler, 2002). Such findings cannot be explained by the degree of risk aversion as some studies report a large gap between the effectively reported degree of risk aversion and the amount required to guarantee compliance (Graetz and Wilde, 1985, Alm, McClelland, and Schulze, 1992, Frey and Feld, 2002).

Our paper investigates to which extent governance and institutional quality and tax morale affect the shadow economy. To check the robustness, we will use three different data sources covering more than 25 variables that measure governance and institutional quality. Although there are more and more studies that investigate the causes of shadow economic activities, there is a tendency to control illegal activities through measures such as punishment, prosecution, economic growth or education (Schneider and Enste, 2002). However, there are further instruments that merit more attention. It is highly relevant to

investigate not only the importance of objective variables such as tax burden, the sectoral composition, the richness of a country or the labor market conditions, but also institutional and governance quality and subjective perceptions, expectations, attitudes and motivations such as tax morale which we define as societal institutions. Recently developed data sources provide the basis to investigate the importance of more sophisticated theories at the micro and the macro level. Hence, our basic working hypothesis suggests that if citizens perceive that their interests (preferences) are properly represented in political institutions and consider government to be rather helpful than wasteful, their willingness to opt for staying in the official sector and comply with their obligations will increase. Moreover, in such a situation the violation of social norms when being active in the informal sector is connected with higher moral costs. In order to explain international and within country differences and changes over time in the size of shadow economies it is useful to investigate to which extent social norms and the quality of the governance matter.

An important contribution of this paper is thus to extend the previous models by establishing the extent to which societal institutions matter. In addition, in contrast to the limited number of previous studies using cross-sectional data, we provide a panel analysis, encompassing a period of 10 years, which allows to exploit the time variation in governance quality and to increase the number of observations. Finally, the literature often uses cross-country data. However, drawing conclusions from cross-cultural comparisons is difficult because institutional and cultural frameworks that typify specific countries might influence the size of the shadow economy: such features cannot always be controlled in a satisfactory manner. Our study, on the other hand, focuses also on *within* country data at the state (cantonal) level in Switzerland and thus allows to better isolate the impact of societal institutions.

In section 2 we present our theoretical approach and develop our hypotheses. Section 3 describes the data set and section 4 contains the empirical results using the international panel

and section 5 the within country panel data. Finally, section 6 concludes with a summary and discussion of the main results.

2. THEORETICAL CONSIDERATIONS

2.1 Governance and Institutional Quality

Not only the economic, but also the political system affects formal and informal economic activities. The outcome in many countries may be explainable by underlying political conditions. Bird et al. (2006) stress that "Countries may tend to achieve an equilibrium position with respect to the size and nature of their fiscal systems that largely reflects the balance of political forces and institutions, and stay at this position until 'shocked' to a new equilibrium" (p. 289). It is worthwhile to investigate whether the recent political economy literature on the importance of governance and institutions allow to understand the level and the changes of the shadow economy. If citizens perceive that their interests (preferences) are properly represented in political institutions and they receive an adequate supply of public goods, their identification with the state increases, their willingness to contribute increases. On the other hand, in an inefficient state where corruption is rampant the citizens will have little trust in authority and thus a low incentive to cooperate. A more encompassing and legitimate state increases citizens' willingness to contribute. If the government and the administration have a great discretionary power over the allocation of resources corruption is enhanced. A sustainable tax system is based on a fair tax system and responsive government, achieved with a strong connection between tax payments and the supply of public goods (Bird et al. (2006). Friedman et al. (2000) show empirically that countries with more corruption have a higher share of unofficial economy. Dreher and Schneider (2006) have also

investigated the correlation between shadow economy and corruption. They observe the tendency that shadow economy and corruption are substitutes in high-income countries, but complements in low-income countries. Agents as the political elite, administration staff, and legislators have a discretionary power if institutions are neither credible nor working well. This has the negative consequence that citizens lose their trust in the authority. In countries where corruption is systemic and the government budget lacks transparency and accountability the obligation of paying taxes cannot be assumed to be an accepted social norm. Institutional instability, lack of transparency and rule of law undermine the willingness of frustrated citizens to be active in the formal economy. Furthermore, there might be a crowding-out effect of morality among the tax administrators when there are a great number of corrupt colleagues. Moreover, regulatory restraints and bureaucratic procedures not only limit competition and the operation of markets, but also provide a better fundament for corrupt activities. If individuals and businesses believe that neither contracts will be enforced nor productive efforts protected, their incentive to be active in the shadow economy increases. Citizens will feel cheated if they believe that corruption is widespread, their tax burden is not spent well, their government lacks accountability, and that they are not protected by the rules of law. This increases the incentive to enter the informal sector.

Thus our first core hypothesis reads:

Core hypothesis 1: An increase in governance and institutional quality reduces ceteris paribus the size of shadow economies.

In the within country investigation we are going to focus on the impact of direct democracy on the size of the shadow economy. If the government is not benevolent, direct voter participation has the potential to control politicians' discretionary power. Not only can voter control help limit the abuse of political power by selfish politicians, when citizens cannot completely foresee incumbents' preferences elements of direct democracy also empower them

with an instrument for controlling the government. Such control has an ex ante effect on policy formulation by elected incumbents in that they must always take into account possible voter intervention. Levi (1988) points out that a possibility to create or maintain compliance is to provide reassurance by the government. A government that precommits itself with direct democratic rules imposes itself restraints on its own power and thus sends a signal that taxpayers are seen as responsible persons. Furthermore, direct democratic rules signalize that citizens are not ignorant or uncomprehending voters, which might create or maintain a certain social capital stock. The government signalizes thus that taxpayers' preferences are taken into account in the political process. Voting possibilities also provide utility in themselves. Citizens value the right to participate, because it produces a kind of procedural utility as the opportunity set increases. It leads to a more favorable outcome compared to the situation where no such voting possibility exists. If taxpayers can vote on the way taxes will be spent, they may feel less inclined to be active in the shadow economy. The more taxpayers are able to participate in the political decision making process by popular rights, the more this contract is based on trust, and this trust in turn will foster the moral costs of behaving illegally. If participation possibilities are lacking, citizens might feel less satisfied with the system and powerless, and thus might be less inclined to comply (Alm, Jackson and McKee, 1993). Rules attained through an active involvement of people enhance rule obedience and the willingness to cooperate and to act in line with the decided rules. The more people are involved in establishing rules, the stronger is their sense of obligation (Kidder and McEwen, 1989; Cialdini, 1989; McEwen and Maiman, 1986; Lempert, 1972). Tyler's research (1990a, 1990b, 1997) also provides support for the importance of legitimacy and allegiance to authority in compliance decisions. The way people are treated by the authorities affects their evaluation of these authorities and their willingness to co-operate (see, e.g., Tyler, Casper and Fisher, 1989). Tyler (1997) argues that understanding what people want in a legal procedure helps to

explain public dissatisfaction with the law and points towards directions for building public support for the law in the future.

Using Swiss data, Pommerehne and Weck-Hannemann (1996) found that in cantons with a high degree of direct political control tax evasion is – ceteris paribus – about SFr 1500 lower than the average in the cantons without such direct influence. Feld and Frey (2002) analyzed how tax authorities treat taxpayers in Switzerland and found that tax authorities of cantons with more direct participation rights, compared to cantons with less direct democracy, treat taxpayers more respectfully and are less suspicious if taxpayers report too low incomes. On the other hand, not submitted tax declarations are more heavily fined. The experimental evidence of Alm, McClelland and Schulze (1999), Feld and Tyran (2002) and Torgler and Schaltegger (2005) shows that voting on tax issues has a positive effect on tax compliance, and according to Torgler (2005a) on tax morale as well. The more taxpayers can participate in political decision making by popular rights, the more the tax contract is based on trust and the higher is tax morale. Taxpayers are treated as "citizens" with extensive rights *and* obligations (Frey, 2003). They are in the position to better monitor and control politicians via referenda. Furthermore, they can set rules via initiative and are thus able to renegotiate the tax contract with the government influencing, e.g., the tax laws and the tax rates, which enhances civic virtue. Thus, the possibility for citizens to vote on fiscal issues negatively influences the size of the shadow economy. Being involved in the political decision process enhances citizens' sense of civic duty (Feld and Frey, 2002). The instrument of direct democracy helps spend taxes according to their preferences, the motivation to contribute to the society increases. Thus, the following hypothesis can be developed:

> *Core hypothesis 2: The more extensive the citizens' direct political participation possibilities, the lower ceteris paribus the size of the shadow economy.*

2.2 Tax Morale

The tax compliance literature has shown the relevance of going beyond a neoclassical approach when trying to understand why citizens pay taxes. Allingham and Sandmo's (1972) groundbreaking model which assumes that the extent of tax evasion is negatively correlated with the probability of detection and the degree of punishment has been widely criticized (e.g., Graetz and Wilde, 1985; Alm, McClelland, and Schulze, 1992; Frey and Feld, 2002). As mentioned, in many countries, the level of deterrence is too low to explain the high degree of tax compliance. To resolve this puzzle of tax compliance, many researchers have argued that tax morale can help explain the high degree of tax compliance (for an overview see Torgler, 2007). Tax morale, unlike tax evasion, measures not individual *behavior* but individual *attitude*. Tax morale—which is not a new notion but has received surprisingly little attention in the tax compliance literature—can be defined as a moral obligation to pay taxes, a belief in contributing to society by paying taxes.[1] Tax morale is also closely linked to what have been termed as *taxpayer ethics*, "the norms of behaviour governing citizens as taxpayers in their relationship with the government" (Song and Yarbrough, 1978, p. 443). Values and attitudes can affect individual behavior (Ajzen and Fishbein 1980 and Lewis 1982). Spicer and Lundstedt (1974) argued that the choice between tax compliance and evasion does not result only from sanctions but also from a set of attitudes and norms. Lewis (1982) points out that

> "it could be that tax evasion is the only channel through which taxpayers can express their antipathy … we can be confident in our general prediction that if tax attitudes become worse, tax evasion will increase" (p. 165, 177).

[1] Preliminary tax morale research in the 1960s (Schmölders, 1970; Strümpel, 1969) tried to bridge economics and social psychology by emphasizing that economic phenomena should be analyzed from a perspective larger than the traditional neoclassical point of view (e.g., Lewis, 1979, 1982).

A reduction of tax morale reduces the moral costs of behaving illegally and increases the incentives to work in the underground economy. It is a relevant issue to investigate whether differences in tax morale across countries are reflected in any differences in real, or observed, behaviors in these countries. Thus, we expect that tax morale has such real effects on the size of the shadow economy. Moreover, Alm, Martinez-Vazquez, and Schneider (2004) argue that the size of the underground economy can serve as a useful, if somewhat imperfect, measure of the extent of tax evasion, so that a negative correlation between the size of the shadow economy and tax morale indicates the extent to which individuals' revealed actions are related to their attitudes about paying taxes.

Thus, we put forward our third core hypothesis:

Core hypothesis 3: *A higher degree of tax morale, defined as the intrinsic motivation to pay taxes, reduces the size of the shadow economy in a country, ceteris paribus.*

A number of previous studies have investigated the simple correlation between tax morale and the size of shadow economy. Alm and Torgler (2006) focus on Europe and the United States. They find a strong negative correlation (Pearson r=-0.460) significant at the 0.05 level. Analyzing the linear relationship in a simple regression indicates that the variable tax morale can explain more than 20 percent of the total variance of the size of shadow economy. Thus, the degree of tax morale has consequences for real behavior, and might be responsible for the size of shadow economy: if tax morale is declining, then the shadow economy is likely to increase. A similar approach has been used by Alm, Martinez-Vazquez and Torgler (2006) focusing on transition countries. The results indicate a strong negative correlation between both variables (-0.657), significant at the 0.01 level when working with the World Values

Survey data 1999-2000. After including the WVS 1995-1997 and therefore increasing the number of observations, the correlation still remains strong and negative (Pearson r = -0.551), significant at the 0.01 level. Thus, here too countries with low tax morale show a clear tendency to have a large shadow economy. A simple linear regression suggests that a decrease of tax morale by 1 unit would lead to an increase of the shadow economy of roughly 20 percentage points, and the variable tax morale can explain more than 30 percent of the total variance of the size of shadow economy Torgler (2005b) investigates the correlation between the size of shadow economy and tax morale in Latin America using the Latinobarómetro, an annual public opinion survey carried out in 17 Latin American countries (data from 1998), as a data set to measure tax morale. It reports the opinions, attitudes, and behaviors of the around 400 million inhabitants of the region, covering most of Latin America with the exception of Cuba, the Dominican Republic, and Puerto Rico. A strong negative correlation between both variables (-0.511), significant at the 0.05 level (sign. 2-tailed: 0.043) has been found. However, these studies give information about the raw and not the partial effects. The observed correlation might be explained in terms of factors that affect the size of shadow economy. It is important to investigate the causes as a whole with their interdependencies. An investigation that focuses on a simple correlation has a somewhat limited validity. Thus, multiple regressions help us to disentangle the effects of other factors from a possible tax morale effect.

3. DATA

3.1 Shadow Economy

The shadow economy includes all market-based legal production of goods and services that are deliberately concealed from public authorities for the following reasons (Schneider 2005a):

(1) to avoid payment of income, value added or other taxes,
(2) to avoid payment of social security contributions,
(3) to avoid having to meet certain legal labor market standards, such as minimum wages, maximum working hours, safety standards, etc., and
(4) to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms.

Hence, in this paper, we will not deal with typical underground economic activities, which are all illegal actions with the characteristics of classical crimes like burglary, robbery, drug dealing, etc. We also do not include the informal household economy which consists of all household services and production. To measure the shadow economy as a percentage of the official GDP we will use the DYMIMIC-method to estimate the parameters for determining the size of the shadow economy and with the help of the Currency Demand Method to calibrate the estimated coefficients of the DYMIMIC procedure into absolute ones. We build a panel with values for the years 1990, 1995, and 2000. The fundament of the database has been elaborated in previous studies and is therefore not further discussed in this paper (see Schneider, 2005a, 2005b).

3.2 Governance and Institutional Quality

Several data sources are used to investigate the relationship between governance or institutional quality and the shadow economy.

1) International Country Risk Guide (ICRG) (see also Knack 1999)

The ICRG has a special emphasis on aspects affecting private foreign investment decisions. The rating comprises 22 variables in three subcategories of risk: political, financial, and economic. We will mainly focus on the political risk component. However, in several cases we are also going to include the COMPOSITE RISK RATING. The POLITICAL RISK RATING is provided to assess the political stability on a comparable basis using 12 different measurements that cover both political and social attributes. We will investigate the POLITICAL RISK RATING, but also 8 key sub-components that measure governance and institutional quality, namely[2]: BUREAUCRATIC QUALITY[3], CORRUPTION[4], DEMOCRATIC ACCOUNTABILITY[5], GOVERNMENT STABILITY[6], LAW & ORDER[7],

[2] See http://www.icrgonline.com/page.aspx?page=icrgmethods#Background_of_the_ICRG_Rating_System.

[3] Institutional strength and quality of the bureaucracy: "High points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training. Countries that lack the cushioning effect of a strong bureaucracy receive low points".

[4] Assessment of corruption within the political system. Lower scores indicate "high government officials are likely to demand special payments" and that "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and export licenses, exchange controls, tax assessment, police protection, or loans. "

[5] Measures how responsive the government is with its people.

[6] Assessment of the government's ability to carry out its declared program(s), and its ability to stay in office. (subcomponents: government unity, legislative strength and popular support).

INTERNAL CONFLICT[8] and MILITARY IN POLITICS[9]. A higher number of points indicates a lower potential risk and therefore higher scores are in line with a higher institutional and governance quality.

2) Aggregate Governance Indicators

We use the Quality of Governance Index as a key proxy for governance and institutional quality (see Kaufmann, Kraay, and Mastruzzi, 2003). The disadvantage is that no data is available for the year 1990. Thus, for these variables only two time periods are available. The variables are based on several hundred variables measuring perceptions of governance and derived from 25 different data sources. Kaufmann et al. (2003) classify the six governance indicators into three groups as follows:

1) Process by which governments are selected, monitored and replaced
    - VOICE AND ACCOUNTABILITY: measures the political process, civil liberties, and political rights, and
    - POLITICAL STABILITY AND ABSENCE OF VIOLENCE: measures perceptions of the likelihood that the government will be destabilized/overthrown).
2) Capacity of the government to effectively formulate and implement sound policies

[7] The 'law' sub-component measures the strength and impartiality of the legal system, while the 'order' sub-component is an assessment of popular observance of the law.

[8] Assessment of the political violence in a country and its actual or potential impact on governance (sub-groups: civil war/coup threat, terrorism/political violence, civil disorder).

[9] This variable measures military's involvement in politics. ICRG stresses that "its involvement in politics, even at a peripheral level, is a diminution of democratic accountability".

- GOVERNMENT EFFECTIVENESS (inputs required for the government to be able to produce and implement good policies and deliver public goods), and
- REGULATORY QUALITY (focuses more on policies, such as incidence of market/unfriendly policies, perceptions of the burdens imposed by excessive regulation).

3) Respect of citizens and the state for the institutions that govern economic and social interactions
   - RULE OF LAW (several indicators measuring the degree of agents' confidence in and compliance with the rules of society). According to Kaufmann et al. (2003, p.4) these indicators "measure the success of a society in developing an environment in which fair and predictable rules form the basis of economic and social interactions", and
   - CONTROL OF CORRUPTION: measures the perceived corruption (exercise of public power for private gain).

All scores estimated by Kaufmann et al. (2003) lie between –2.5 and 2.5, with higher scores corresponding to better institutions (governance outcomes). We check the robustness of the statistical results using all single sub-indexes independently.

The variables of the data sets ICRG and *Aggregate Governance Indicators* are highly correlated. For example, the correlation between the POLITICAL RISK RATING and the average of all six variables in the *Aggregate Governance* Indicators is 0.88. We will use these two sets of variables in alternative estimations to check the robustness of our first two core hypotheses.

3) Economic Freedom of the World (EFW)

The objective of the index is to measure the economic freedom in an accurate and comprehensive manner (see Gwarney et al., 2006). The data is derived from third-party international sources such as the IMF, World Bank, World Economic Forum etc. The index covers a large number of countries over a certain period of time. Some data is available for all three time periods others for two or only one period. We investigate many variables that measure the legal structure, the security of property rights and the regulation of businesses (LEGAL SYSTEM[10], LAW AND ORDER, JUDICIAL INDEPENDENCE[11], IMPARTIAL COURTS[12], PROPERTY RIGHTS[13], MILITARY INTERFERENCE[14], ADMINISTRATIVE CONDITIONS[15]). The variables in the first group measure the integrity of the legal system, the protection of intellectual property, judicial independence, impartial courts, and military interference in rule of law and the political process. The second one measures regulations that restrict businesses' entry into the market. Stricter regulations increase the incentive to be active in the shadow economy. The variables used are designed to identify the extent to which regulatory restraints and bureaucratic procedures limit competition and the operation of markets (BUREAUCRACY (TIME)[16], STARTING BUSINESS[17], IRREGULAR

[10] Integrity of the legal system and property rights (index covering JUDICIAL INDEPENDENCE, IMPARTIAL COURTS and PROPERTY RIGHTS.

[11] The judiciary is independent and not subject to interference by the government or parties in disputes.

[12] A trusted legal framework exists for private businesses to challenge the legality of government actions or regulations.

[13] Protection of intellectual property.

[14] Military interference in rule of law and political process.

[15] Administrative procedures are an important obstacle to starting a new business.

[16] Time invested in government bureaucracy – senior management spends a substantial amount of time dealing with government bureaucracy.

[17] Starting a new business – starting a new business is generally easy.

PAYMENTS[18], BUSINESS REGULATIONS[19]). Higher values are in line with a higher level of freedom.

3.3 Tax Morale

We define tax morale as the intrinsic motivation to pay taxes. It measures an individual's willingness to pay taxes, in other words, the moral obligation to pay taxes or the belief that paying taxes contributes to society. Data for the tax morale variable are extracted from the World Values Survey (WVS) 1990-1993, 1995-1997 and 1999-2001 (see Inglehart et al., 2000). The surveys investigate socio-cultural and political change and collect comparative data on values and belief systems. They are based on representative national samples of at least 1000 individuals. The World Values Survey (WVS) is worldwide and covers quite a huge number of countries. The general question to assess the level of tax morale is:

> *(i) World Values Survey/European Values Survey:*
>
> "*Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between: (…) Cheating on tax if you have the chance (% "never justified" – code 1 from a ten-point scale where 1=never and 10=always).*"

The tax morale variable is developed by recoding the ten-point scale into a four-point scale (0 to 3), with the value 3 standing for "never justifiable". The value of 0 is an aggregation of the last 7 scale points, which were rarely chosen.

[18] Irregular, additional payments connected with import and export permits, business licenses, exchange controls, tax assessments, police protection, or loan applications.

[19] Composite index measuring including all four indexes including also PRICE controls (extent to which businesses are free to set their own prices).

Of course, the measurement of tax morale is not free of bias. First, because the available data are based on self-reports in which subjects tend to overstate their degree of compliance (Andreoni, Erard, and Feinstein 1998), and no objective or observable measure of tax morale is available. Nonetheless, because the way we define tax morale is less sensitive than asking whether a person has evaded taxes, we expect the degree of honesty to be higher. Moreover, the dataset is based on broad surveys; respondents are therefore less liable to react with suspicion and/or to be influenced by other questions touching the tax context. It can still be argued, however, that a taxpayer who has evaded in the past will tend to excuse this kind of behavior and report a higher tax morale in the survey. In general, the use of such a single question has the advantage of reducing problems of index construction complexity, especially as regards the measurement procedure or low correlation between items. It can also be argued though that tax morale is a multidimensional concept requiring a multi-item measurement tool and that the reduced likelihood of a multi-item index to be adversely affected by random errors will produce more reliable measures. However, several previous studies have found consistent results using single-item survey measurements and laboratory experiments (e.g., Cummings et al., 2005; Alm and Torgler, 2006). Despite these possible objections our approach to measuring tax morale is consistent with the previous studies in this area (for an overview see Torgler, 2007).

4. EMPIRICAL RESULTS

4.1 Specification of the Test Equation

To test whether improvements in governance/institutional quality and tax morale foster a lower level of shadow economy, we propose the following baseline equation:

$$SHADOW_{it} = \alpha + \beta_1 CTRL_{it} + \beta_2 GOVINST_{it} + \beta_3 TAXMORALE_{it} + TD_t + REGION_i + \varepsilon_{it} \quad (1)$$

where *i* indexes the countries in the sample, $SHADOW_{it}$ denotes countries' size of the shadow economy as a percentage of the official GDP over the periods 1990, 1995 and 2000. $GOVINST_{it}$ are our indicators for governance and institutional quality as described in the previous section and $TAXM_{it}$ the level of tax morale. The regressions also contain several control variables, $CTRL_i$, including factors such as GDP per capita, the share of agriculture in GDP, the share of urban population, the size of the population, the labor force, the marginal tax rate, price controls and labor market regulations. To control for time as well as regional invariant factors, we include fixed time, TD_t, and fixed regional effects, $REGION_i$[20]. ε_{it} denotes the error term[21].

In order to fulfill the ceteris paribus conditions, we have to control for a number of other important factors, what will be discussed in turn:

(i) Richness of a Country

Per capita GDP is a proxy for the level of development of a country. A higher level of development goes together with a greater capacity to pay and collect taxes, as well as a higher relative demand for income elastic public goods and services (Chelliah, 1971; Bahl, 1971). In general, we would expect a negative relation between the level of per capita income and the level of the shadow economy. Our fourth hypothesis is:

(4) The higher the per capita income of a country is, the lower is the shadow economy, ceteris paribus.

[20] We differentiate between developed, Asian, and developing or transition countries.

[21] For summary statistics and an overview of the countries see Appendix *Table A1* and *Table A3*.

(ii) Fiscal Burden

The fiscal burden is also expected to influence the shadow economy positively. It can be argued that a higher burden increases the attractiveness of behaving illegally. As a proxy we use the top marginal tax rate (and income threshold at which it applies) provided by the Economic Freedom of the World data base. We expect a positive correlation between the fiscal burden and the size of shadow economy. However, using the marginal tax rates has some limitations. It can be argued that it is not so much the statutory tax rates that are relevant in the decision to behave illegally, but rather their application, offering tax exceptions or concessions that affect individual decisions (Friedman et al., 2000). The authors couldn't find evidence that higher direct or indirect tax rates are associated with a larger unofficial economy. On the contrary, they find some evidence that higher direct tax rates are associated with a smaller shadow economy. Such results are also supported by Dreher and Schneider (2006). In spite of the so far mixed empirical evidence we still formulate the following hypothesis:

(5) The higher the fiscal burden, the higher the shadow economy, ceteris paribus.

(iii) Demographic and labor characteristics

Demographic and labor characteristics such as population size or the labor force may also affect the shadow economy. As Bahl (2003, p. 13) points out, in countries with faster growing populations tax systems may lag behind in the ability to capture new taxpayers. This may increase the incentive to be active in the underground economy. Moreover the higher density of population in urban areas may further anonymity and thus reduce loyalty towards the state; this may lead to a higher level of shadow economy. As many sectors are city-based, it is expected that there the incentives to act in the underground economy are higher, especially

when government activities and services are below individuals' expectations and preferences. Thus, we formulate the following hypothesis:

(6) The higher the urbanization and the population size, the higher ceteris paribus the shadow economy.

The labor force variable measures the potential pool that has the best preconditions to work in the shadow economy. On the other hand, individuals with an occupation have less leisure time at their disposal. Thus, time acts as a restriction to being active in the shadow economy. Unemployed people have an incentive not to report their additional work hours as otherwise they would lose their financial support. If the wage of illicit work and the financial aid together yield more income than regular and overtime work, taking also into account the costs of detection and punishment and assuming risk neutrality, full-time illicit work as an unemployed person yields ceteris paribus a higher utility. In such a situation, the danger that a person remains in the shadow economy and turns down job offers increases (Schneider and Enste, 2002)[22]. In sum, we predict the following hypothesis:

(7) The higher the labor force, the lower ceteris paribus the shadow economy.

(iv) Sectoral Composition of a Country

The sectoral composition of the domestic product may also affect the size of shadow economy. A traditional measure signaling the difficulty to tax domestic output is the share of agriculture in GDP. Moreover, the tax compliance literature shows the tendency that self-

[22] We have investigated the impact of unemployment without reporting the results in the empirical part. The variable has a relatively high amount of missing values. We were not able to find a statistically significant correlation between unemployment and the size of the shadow economy.

employed people such as farmers are more inclined to evade taxes than other professions (see, e.g., Torgler 2007). We formulate the following hypothesis:

(8) The higher the agricultural sector is, the higher is the shadow economy, ceteris paribus.

(v) Openness

We also measure openness focusing on trade. Trade is transparent and easier to tax and therefore more difficult to hide in the underground economy. Thus, a higher trade volume in relation to countries' GDP may lead ceteris paribus to a lower shadow economy. Thus, the next hypothesis reads:

(9) The higher the trade is, the higher is ceteris paribus the shadow economy.

(vi) Regulations

Finally, regulations can also affect the shadow economy, especially labor regulations. Stronger restrictions are a strong incentive to choose the exit option, as they reduce the freedom of action (Schneider and Enste, 2002). We are going to investigate labor regulations (impact of minimum wage, hiring and firing practices[23], share of labor forces whose wages are set by centralized collective bargaining, unemployment benefits[24], use of conscripts to obtain military personnel). Moreover, we include a variable that measures the extent to which businesses are free to set their own prices. In addition, business regulations are investigated when dealing with governance and institutional quality. The Economic Freedom of the World allows to include these variables. Higher values are connected with lower restraints. Hence, our last hypothesis is:

(10) The more government interventions in the economy take place, the higher is the shadow economy, ceteris paribus.

[23] Hiring and firing practices of companies are determined by private contract.

[24] The unemployment benefit system preserves the incentive to work.

4.2 Empirical Results

In a first step we focus on the impact of governance/institutional quality on the size of the shadow economy working with the ICRG data. To maximize the number of observations we include in *Table 1* only the control variables provided by the World Development Indicator (WDI). In *Table 2* we add TAX MORALE to the specifications. *Table 1* and *Table 2* present two different types of empirical methodology: pooling and fixed effect regressions. In the pooled estimations, the *beta* or *standardized* regression coefficients compare magnitude, which reveals the relative importance of which variables are used. To obtain robust standard errors in these estimations, we use the Huber/White/Sandwich estimators of standard errors. At first only the POLITICAL RISK RATING index has been included. In a next step, 8 sub-factors are investigated. This allows to check in detail the robustness of the political factors. *Table 1* and *2* show that our first hypothesis cannot be rejected. In 17 out of 18 regressions, the coefficients are highly statistically significant. The strongest impact can be found for the variables BUREAUCRATIC QUALITY, CORRUPTION, and LAW & ORDER. *Table 2* also shows that hypothesis 3 - a higher tax morale leads to a smaller shadow economy – cannot be rejected. The beta coefficients also show that its quantitative impact is comparable to other determinants. Thus, tax morale clearly matters, being highly statistically significant in all 18 estimations.

Moreover, in line with our expectations *Tables 1* and *2* show that a higher GDP per capita is associated with a smaller shadow economy which is in line with hypothesis 4. In most of the cases the coefficient is statistical significant. The coefficient AGRICULTURE/GDP is only statistically significant in the specifications (11), (16) and (18) with a positive correlation between the strength of the agriculture sector and the size of the shadow economy (partly confirming our hypothesis 8). Population size and labor force affect the size of the shadow economy when using the broader sample, but after including tax

morale these factors are not statistically significant anymore. On the other hand, a positive correlation between URBANIZATION and the size of the shadow economy is only observable in *Table 2* (no support for hypothesis 6 and 7). Similarly, the coefficient of TRADE is only statistically significant with an expected negative relationship in the specifications (13) and (14).

Table 3 also investigates ICRG's COMPOSITE RISK RATING. The coefficient is also statistically significant. Moreover, to check the robustness of the previous results we add additional factors, namely TOP MARGINAL TAX RATE, PRICE CONTROLS AND LABOR MARKET REGULATIONS in the previous specifications. For simplicity, in *Table 3* we only report the results relative to the POLITICAL RISK RATING index rather than all the sub-factors. However, it should be noted that the results remain robust when using the previous sub-factors. It is useful to include the further control factors sequentially as the number of observations decreases. In line with the previous findings we can observe that our core hypotheses cannot be rejected. The coefficients POLITICAL RISK RATING and TAX MORALE are always statistically significant. We find the tendency that an increase in the TOP MARGINAL TAX RATE reduces the size of the shadow economy. In line with hypothesis 5, a strong and statistically significant impact is observable in the specifications (20) and (21), but not after controlling for tax morale and labor market regulations leading to the conclusions that our prediction is only partly confirmed. Previous studies such as Friedman et al. (2000) and Dreher and Schneider (2006) were not able to find a robust positive correlation between the fiscal burden and the size of the shadow economy. Friedman et al. (2000) stress such proxies do not measure *how* the tax system is administrated. *Table 3* also shows that price controls and labor market regulations are no reasons for firms to move into the unofficial economy although it should be noted that for the variable LABOR MARKET REGULATIONS many values are missing. To check the robustness, we have also investigated the sub-factors (impact of minimum wage, hiring and firing practices, share of

labor forces whose wages are set by centralized collective bargaining, unemployment benefits, use of conscripts to obtain military personnel). In none of the cases the coefficients were statistically significant.

4.3 Robustness Checks

In *Table 4* we provide additional robustness checks using alternative sources that measure governance and institutional quality, namely the 6 *Aggregate Governance Indicators* together with the average of all six factors, and 11 *Economic Freedom* (EFW) variables. The EFW data also covers several variables that measure business regulations. For simplicity, we only report in *Table 4* the coefficients of our core variables, but controlling for other factors in the regression. The left hand side in *Table 4* presents 18 regression results without including tax morale. Control variables are in line with specification (20) that includes also the marginal tax rate. The right hand side provides the results when adding tax morale in the specifications. The previous results are confirmed. In all 18 specifications, TAX MORALE is statistically significant. Similarly, we can conclude that governance and institutions matter. In most of the cases the coefficients are statistically significant. Less robust results are observable when investigating some business regulation variables. The strongest effects are observable for the two variables ADMINISTRATIVE CONDITIONS and IRREGULAR PAYMENTS. Moreover, the overall index BUSINESS REGULATIONS shows also a strong negative correlation which shows that a higher level of freedom is correlated with a lower shadow economy. GOVERNMENT EFFECTIVENESS, CONTROL OF CORRUPTION, and RULE OF LAW provide the strongest impact among the *Aggregate Governance Indicators* factors. The findings using the EFW variables also show the strength of the legal structure and the security of property rights.

In a next step we provide further robustness test. Previously, we have 1) included additional variables in the baseline equation, 2) presented estimations with a broad amount of sub-factors that measure governance and institutional quality, and 3) used three alternative data sources. In a further step, we are going to investigate in all the previous cases whether outliers are important. We run specifications that resist the pull of outliers, and make them more efficient using iteratively re-weighted least squares with Huber and bi-weight functions tuned for 95% Gaussian efficiency (Hamilton, 2004). As a consequence more extreme outliers are less heavily weighted in the regression calculations. The results are not reported, but they strongly support the previous findings. The coefficient TAX MORALE is always statistically significant showing even higher t-values (mostly statistically significant at the 1% level), as are in most of the cases the variables that measure governance or institutional quality.

4.4 Causality

The causality direction of our two main hypotheses can be criticized. Do a higher tax morale or a better governance and better institutions cause a lower level of shadow economy, or do higher levels of underground activities undermine tax morale or governance and institutional quality? A substantial increase of the shadow economy can lead to a significant decrease in tax revenues and therefore to a lower quantity and quality of public goods and services. The more taxpayers believe that others work in the shadow economy, the lower their moral costs to behave dishonestly and evade taxes by transferring their own activities into the shadow economy. In this way the potential intrinsic motivation to comply and contribute to public sector activities gets crowded out. Evaluating the direct effect of tax morale or governance and institutional quality on the size of the shadow economy requires an investigation of any potential causality problems and therefore an instrumental variable technique. To check the robustness we are going to present 2SLS estimations with a variety of different instruments. In general, the choice of adequate instruments for institutions is not extensively addressed in

the literature (for corruption see, e.g., Kaufmann, Kraay and Zoido-Lobatón, 1999; Bai and Wei, 2000; Kaufmann, Mehrez and Gurgur, 2002). Recent studies have also stress the relevance of considering historical and geographic features of the countries as instrumental variables as they influence the outcome through their impact on the institutional and political environment [25]. Studies such as those by Alesina et al. (2003) or La Porta et al. (1999) offer a broad data set to consider factors such as latitude, fractionalization (ethnic, language, and religion), religious affiliations or legal origin as instruments. Easterly and Levine (1997) find a negative correlation between per capita GDP growth and ethnolinguistic fractionalization. Alesina et al. (2003) provide support for theses results using a broader data set for fractionalization. Thus, in line with this literature we are going to consider linguistic FRACTIONALIZATION as an instrument for governance and institutional quality. As a further instrument we take religion. La Porta et al. (1999), Weber (1958), Putnam (1993) and Landes (1998) argue that religion can affect governance and government's performance. La Porta et al. (1997) find that "hierarchical religions" (p. 233) such as Catholicism, Islam, and Greek Orthodox – exhibit inferior government performance to that of largely Protestant countries. Referring to the cultural theories the authors argue that Muslim and Catholic countries provide inferior public goods and that these countries can be viewed as more interventionist and less efficient as a consequence of excessive power and the development of bureaucracies from religious ranks. Thus, following La Porta et al. (1999) we use the SHARE OF PROTESTANTS as an instrument for governance and institutional quality.

There is an increasing number of studies that stress that climatic conditions have an impact on countries' or regions' institutions and their development and individuals' attitudes and their behavior (see, e.g., Engerman and Sokoloff, 1997; Landes, 1998; La Porta et al. 1999; Diamond, 1999; Sachs, 2000; Hirshleifer and Shumway, 2003; Coyle, 2004). Such

[25] See e.g., Hall and Jones (1999), and Acemoglu, Johnson and Robinson, (2001).

external situations may affect the character of inhabitants and hence their culture and institutional arrangements. According to Diamond (1999) geography and climate helps to explain different nations' economic destinies. Porta et al. (1999) investigate latitude arguing in line with Landes (1998) that temperature zones have more productive agriculture and healthier climate which helped to develop their economies and institutions. Hall and Jones (1999) argue that latitude is a proxy for the penetration of European institutions in various regions of the world. Thus, we will also consider LATITUDE as an instrument of governance and institutional quality. However, Sachs (2000) criticizes that "when latitude is tested for explanatory power against various direct climate or ecological measures, we find that latitude per se adds little if anything to the explanation of patterns of cross-country development" (pp. 4-5). The studies of Engerman and Sokoloff (1997), Landes (1998) and Sachs (2000) investigate the connection between climate and economic development. Sachs (2000), for example, presents evidence that production technology in the tropics has lagged behind temperate zone technology in the areas of agriculture and health which opened a considerable income gap between climate zones. Roll (1992) stresses that the unambiguously observable weather is a genuinely exogenous identifying variable. Schaltegger and Torgler (2007), for example, have shown that weather conditions are valid instruments for government accountability. Temperature has also the advantage that we observe a certain variety over time and can therefore be considered in a panel analysis. Coyle (2004) stresses that a higher temperature is related to a lower performance and productivity. Still many countries, even in Europe for example, don't have air-conditioning. Thus, we are going to investigate in detail the relevance of nation's yearly mean TEMPERATURE in Celsius[26] as an instrument for governance and institutional quality.

[26] See Mitchell et al. (2003).

Weather may also be relevant as instrument for tax morale. The psychology literature has found that sunshine is connected with a better feeling and a lack of sunshine is related to depression and suicide (see, e.g., Eagles, 1994 and Tietjan and Kripke, 1994). Several studies report that sunshine influences markets. Cloudiness is correlated with a negative stock exchange (Saunders 1993 and Hirshleifer and Shumway 2003). Thus, CLOUDINESS (cloud coverage in percentage)[27] may be a good instrument for tax morale. To check the robustness of our results we are going to explore a second instrument. We develop an index that measures moral values using data from the World Values Survey[28] (INDEX MORAL VALUES). In addition, we also use the SOCIOECONOMIC CONDITIONS as a second instrument of governance and institutional quality. It measures general public satisfaction or dissatisfaction covering also a broad spectrum of factors ranging from infant mortality and medical provision to housing and interest rates. The data is provided by the EFW.

Table 5 and 6 show 25 2SLS estimations with several diagnostic tests. In all the specifications the coefficients of GOVERNANCE/INSTITUTIONAL QUALITY and TAX MORALE are statistically significant, which supports our previous results. For simplicity we only focus on a selection of variables, namely the POLITICAL RISK RATING, the ICRG CORRUPTION, and two variables of the Aggregate Governance Indicators, namely INDEX GOVERNANCE (average value of all sub-factors) and CONTROL OF CORRUPTION. However, it should be noted that the results are also robustness when using other factors.

Table 5 presents 2SLS estimations without considering TAX MORALE. To check the robustness we will present pooled and FE regressions. In a first step we are going to consider the instruments TEMPERATURE and SOCIOECONOMIC CONDITIONS (specifications 63 to 72). Instead of TEMPERATURE we are going to include LATITUDE as instrument in

[27] See Mitchell et al. (2003).

[28] We use the following questions to develop an index for moral values (mean values): justifiability of claiming government benefits to which you are not entitled, justifiability of avoiding a fare on public transport, and buying something you knew was stolen (1=never justifiable, 0=all other scales).

specification (73). Specification (74) adds in addition further instruments, namely LINGUISTIC FRACTIONALIZATION and SHARE OF PROTESTANTS. Due to the lack of variance over time we use only pooled 2SLS estimations. For simplicity we only use the POLITICAL RISK RATING as a proxy for governance/institutional quality. However, the results are also robust when using other factors.

In *Table 6* we include TAX MORALE in the specifications. In a first step we use CLOUDINESS as an instrument of TAX MORALE (see specifications 75 to 79, and 85 to 86). In a second step we take the INDEX MORAL VALUES as an instrument (specifications 83 AND 87). Also here we vary the instruments for governance/institutional quality. In a first step we use TEMPERATURE AND SOCIOECONOMIC CONDITIONS, in a second step we investigate LATITUDE instead of TEMPERATURE and in a final step we consider also LINGUISTIC FRACTIONALIZATION and SHARE OF PROTESTANTS. In specification (63) and (66) we only use TEMPERATURE as an instrument for governance and institutional quality. In a further step, the SOCIOECONOMIC CONDITIONS is added as an instrument. The results show that in all the cases the coefficients of TAX MORALE and the quality of governance and institutions are statistically significant, which supports the previous findings. In specifications (84) to (87) we present only 2SLS estimations with the POLITICAL RISK RATING as a proxy for governance/institutional quality. However, also here the results are robust when using other proxies for institutional and governance quality.

Overall, the used instruments are effective in explaining tax morale and governance/institutional quality. In the governance/quality first stage regressions TEMPERATURE, LATITUDE, SOCIOECONOMIC CONDITIONS, and LINGUISTIC FRACTIONALIZATION and SHARE OF PROTESTANTS are always statistically significant (except SHARE OF PROTESTANTS in *Table 6*). Similarly, CLOUDINESS and the INDEX OF MORAL VALUES are always statistically significant in the tax morale first stage regression. The *F*-tests for the instrument exclusion set in the first-stage regressions are

also in all the cases statistically significant (mostly at the 1% level). In addition, *Table* 5 and 6 also report a test for instrument relevance using the Anderson canonical correlations LR for whether the equation is identified. The test shows that the null hypothesis can be rejected in all the cases indicating that the model is identified and the instruments are relevant (see Hall, Rudebusch and Wilcox, 1996). The Anderson-Rubin test suggests that the endogenous variables are jointly statistically significant. Such a test is robust to the presence of weak instruments. We also present the Sargan's (1958) test for over-identification for those 2SLS regressions in which we have more than two instruments to examine the validity of the exclusion restrictions. In most of the cases, this test fails to reject the null hypothesis that our instruments are valid, which supports their validity.

In sum, the empirical results provided in this section suggest that our key hypotheses cannot be rejected. Tax morale and governance and institutional quality play a significant role in the determination of the size of the shadow economy. Moreover, sub-factors also indicate the importance of the political process, political or democratic rights and civil liberties which indicates that our second hypothesis cannot be rejected. However, in the next section the second hypothesis will be tested using within country data.

5. WITHIN COUNTRY PANEL EVIDENCE

In general, drawing conclusions from cross-cultural comparisons is difficult because not all features specific to a country can always be controlled in a satisfactory manner. Thus, we extend our study, focusing on *within* country data from Switzerland at the state (cantonal) level to investigate the impact of tax morale and institutional quality. Analyses of Swiss data are interesting because Switzerland's institutions are not homogeneous. The degree of institutionalized political participation rights varies strongly between the 26 Swiss cantons

(see Kobach, 1994). Thus, this study uses a 6-point scale index established by Frey and Stutzer (2000) that reflects the extent of direct democratic participation (1 = lowest and 6 = highest degree of participation).[29] In line with the previous regressions, we are going to investigate a sample period that covers the years 1990, 1995 and 2000. To control for cantonal invariant factors, we include cantonal fixed effects. The tax morale variable is derived from the World Values Survey (WVS) data 1995-1997 and the International Social Survey Programme (ISSP) data set "Religion II" (data year 1999). The question in the ISSP (year 1999) was: *Do you feel it is wrong or not wrong if a taxpayer does not report all of his or her income in order to pay less income taxes? (1= not wrong, 2= a bit wrong, 3= wrong, 4=seriously wrong).* The similarity of this question with the one of the WVS allows to include both data sets in the specification[30].

Using Swiss data allows to include also a deterrence measurement. As an approximation for the PROBABILITY OF DETECTION, we use the number of tax auditors per taxpayer (in ‰) in each canton *c*. This might be an indicator for the cantons willingness to search for illegal activities, although we are not able to directly investigate the number of

[29] The index includes four legal instruments: the popular initiative to change the canton's constitution, the popular initiative to change the canton's law, the compulsory and optional referendum to prevent a new law or change a law, and the compulsory or optional referendum to prevent new state expenditure (for a detailed discussion, see Stutzer, 1999).

[30] It was not possible to consider more than one wave for both data sets for Switzerland. Only the WVS 1995-97 and the ISSP RELIGION II provide Swiss cantonal data. Moreover, it should be noted that the Swiss World Values Survey was not random-random but quota-random, based on a random sample of communes and then on quotas in terms of sex, age, etc. in the selected communes. Thus, the smallest cantons are not necessarily represented (not represented are: Appenzell a. Rh., Glarus, Jura, Nidwalden, Uri, and Zug). On the other hand, the ISSP data set contains all 26 cantons.

inspectors dealing with the shadow economy[31]. In addition to other control variables such as LABOR FORCE ratio (share of employment of the cantonal population) URBANIZATION, or the TAX BURDEN we also consider the share of REGISTERED CANTONAL HOUSE PROPRIETORS on the cantonal population[32]. The commitment made by house proprietors to their jurisdiction by voluntarily increasing their opportunity costs for the exit option to migrate to another jurisdiction may support the willingness to remain honest. On the other hand, house proprietors have a strong demand for those economic sectors that have the highest rates of illicit work. Schneider and Enste (2002) report that building, renovating, repairing provide the largest share of illicit work (44% of the total illicit work) in Germany. Such results are also applicable to Switzerland. Thus, home proprietors may have a stronger incentive to take advantage of such services which increases the shadow economy.

Table 7 presents the results. The first two specifications include TAX MORALE. These results should be treated with caution as only few degrees of freedom are available, and as tax morale has been measured with two different data sources. Nevertheless, in line with the previous results we find a negative correlation between tax morale and the size of the shadow economy. A higher level of direct democratic participation rights leads to a lower size shadow economy as well. The coefficient is statistically significant in all 9 regressions. In specification (80) and (83) we present 2SLS estimations. As can be seen the coefficient DEMOCRATIC PARTICIPATION RIGHTS is statistically significant at the 1% level. In line with the cross-country regression we use religion as an instrument for direct democracy building the share of Protestant population on the total cantonal population. A certain religion diversity in Switzerland allows such an approach. *Table 7* shows that the instrument is

[31] The information about the probability of detection and the fine for tax evasion has been collected by Lars P. Feld and Bruno S. Frey with a questionnaire. The following contributions are based upon this data set: Feld and Frey (2002) and Frey and Feld (2002).

[32] For summary statistics see *Table A2* in the Appendix.

effective in explaining political accountability. The coefficient SHARE OF PROTESTANTS is highly statistically significant in both first stage regressions. Similarly, the F-tests for the instrument exclusion set the first-stage regressions are statistically significant at the 1% level. In addition, *Table 7* also reports a test for instrument relevance using the Anderson canonical correlations LR for whether the equation is identified. The test shows that the null hypothesis can be rejected in both cases indicating that the model is identified and the instruments are relevant.

In *Table 7* we also report a pooled estimation that shows the *beta* or *standardized* regression coefficients compare magnitude, which reveals the relative importance of which variables are used. To obtain robust standard errors in these estimations, we use the Huber/White/Sandwich estimators of standard errors. The results in specification (82) show that the coefficients of DIRECT DEMOCRATIC PARTICIPATION RIGHTS are highly relevant in explaining the shadow economy.

Looking at the control variables we find in line with Friedman et al. (2000) evidence of the tendency that the tax burden is negatively correlated with the shadow economy. Interestingly, we also find that a higher probability of detection is correlated with a higher rather than a lower size of shadow economy, although the result is not robust in specification (83). It should be noted that other studies that focused on tax evasion, tax compliance and tax morale in Switzerland also find that deterrence does not perform as expected (see Pommerehne and Weck-Hannemann 1996, Frey and Feld, 2002; Torgler, 2005a, Torgler and Schaltegger, 2005). A higher SHARE OF REGISTERED HOUSE PROPRIETORS is correlated with a higher shadow economy. The coefficient is statistically significant in all five regressions. We also observe the tendency that URBANIZATION is correlated with a higher shadow economy, a result that supports our prediction in the theoretical section. On the other hand, a higher share of employment of the cantonal population (LABOR FORCE) is

correlated with a smaller shadow economy. It seems that time acts as a restriction of being active in the shadow economy. Thus, these results are consistent with hypothesis 6 and 7.

6. CONCLUSIONS

The paper shows that improving governance and institutional quality and tax morale helps lessen a possible incentive to go underground. The results are quite robust using more than 25 proxies of governance and institutional quality, testing for endogeneity and running a broad variety of specifications. The paper has extended the previous empirical models of the shadow economy by showing that tax morale and a broad variety of governance/institutional factors matter quite significantly in the determination of the size of the shadow economy providing strong robustness tests using international and within country panel data[33]. Moreover, we go beyond previous studies that mainly use a cross-sectional analysis working not only with an international data panel, but also with within country data.

It is important to consider the moral dimension of complying with societies' rules and the underlying legal structure and countries' security of property rights. A failure of a country's legal system undermines the official economy driving individuals and businesses to the shadow economy. Also regulatory restraints and bureaucratic procedures limit the operation of markets and enhance the incentives to act in the shadow economy. A more legitimate and responsive state appears to be an essential precondition to influence the shadow economy. If individual and business contracts are not enforced and productive efforts not protected, the incentive to be active in the shadow economy increases. Citizens feel cheated if corruption is widespread, their tax burden is not spent well, and that they are not protected by the rules of law. Such a situation increases the incentive to be in the shadow economy.

[33] The results are summarized in *Table A1* and *Table A2*.

Social norms or social capital are key factors to understand why people comply. Moreover, social capital seems to be an important determinant of economic phenomena like macroeconomic performance. For example, Knack and Keefer (1997) find, in a cross-sectional analysis, a strong and significantly positive relationship between social capital variables (civic duty) and economic growth. Schaltegger and Torgler (2007), using data for a synthetic panel of Swiss cantons over the 1981–2001 period, show that accountability enhances fiscal performance. As Slemrod (1998) argues that social capital – measured as the willingness to pay taxes voluntarily – lowers the cost of government operations and of equitably assigning such cost to citizens.

Such research justifies a closer look at social capital and societal institutions. A high level of governance and institutional quality allows to express one's own preferences and involvement and participation in the political process enhances identification with a state's institutions; this counteracts the inclination to be active in the shadow economy. Participation and identification reduce therefore free-rider problems. If citizens and authorities interact with a sense of collective responsibility thanks to the institutional structures, the system may be better governed and the policies more effective, as accountability promotes effectiveness through its impact on government behavior (Schaltegger and Torgler, 2007). On the other hand, if citizens feel cheated, if they believe that corruption is widespread, that their tax burden is not spent well and that they are not well protected by the rules of law, the incentive for them to get involved in the informal sector grows. The institutional architecture and governance quality seem to be a key component in the understanding of the shadow economy.

7. TABLES AND APPENDIX

Table 1: Governance and Institutional Quality and the Size of Shadow Economy

Dependent Variable: Shadow Economy	OLS (1)[a]	FE (2)	FE (3)	FE (4)	FE (5)	FE (6)	FE (7)	FE (8)	FE (9)
A) GOVERN. & INSTIT.QUALITY									
POLITICAL RISK RATING	-0.386***	-0.380***							
	(-5.16)	(-5.15)							
BUREAUCRATIC QUALITY			-3.699***						
			(-4.92)						
CORRUPTION				-3.018***					
				(-4.82)					
DEMOCRATIC ACCOUNTABILITY					-0.622				
					(-1.17)				
GOVERNMENT STABILITY						-0.894**			
						(-1.99)			
LAW & ORDER							-3.346***		
							(-5.95)		
INTERNAL CONFLICT								-1.525***	
								(-5.25)	
MILITARY INTERFERENCE									-1.620***
									(-3.40)
B) CONTROL VARIABLES									
LOG (GDP PER CAPITA)	-0.503***	-4.113***	-4.550***	-5.032***	-5.649***	-5.469***	-4.343***	-4.707***	-4.938***
	(-3.54)	(-3.69)	(-4.13)	(-4.63)	(-5.03)	(-4.87)	(-4.02)	(-4.33)	(-4.40)
AGRICULTURE (% OF GDP)	-0.232**	-0.235**	-0.275***	-0.196**	-0.217**	-0.194*	-0.171*	-0.181*	-0.214**
	(-2.42)	(-2.48)	-(2.86)	(-2.07)	(-2.15)	(-1.97)	(-1.84)	(-1.92)	(-2.20)
URBANIZATION	0.006	0.004	-0.009	0.029	0.029	0.029	0.022	0.039	0.021
	(0.06)	(0.07)	(-0.18)	(0.58)	(0.57)	(0.58)	(0.45)	(0.80)	(0.42)
LOG (POPULATION)	-1.376***	-13.695***	-9.090**	-12.255***	-8.399**	-7.061*	-12.774***	-11.625***	-10.950***
	(-3.21)	(-3.47)	(-2.39)	(-3.13)	(-2.11)	(-1.78)	(-3.35)	(-3.03)	(-2.75)
LOG (LABOR FORCE)	1.232***	12.081***	8.340**	10.507***	7.067*	5.908	11.512***	10.203**	9.400**
	(2.81)	(3.08)	(2.19)	(2.71)	(1.78)	(1.50)	(3.02)	(2.67)	(2.37)
TRADE (% GDP)	-0.021	-0.007	0.001	-0.011	-0.012	-0.007	0.0004	0.001	-0.002
	(-0.33)	(-0.39)	(0.06)	(-0.64)	(-0.62)	(-0.37)	(0.02)	(0.06)	(-0.12)
Regional Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	274	274	274	274	274	274	274	274	274
R-squared	0.554	0.530	0.526	0.524	0.485	0.490	0.544	0.531	0.504
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: *t*-statistics in parentheses. Significance levels: * 0.05 < p < 0.10, ** 0.01< p < 0.05, *** p < 0.01. [a] Regressions with robust standard errors, beta coefficients reported.

Table 2: Tax Morale and the Size of Shadow Economy

Dependent Variable: Shadow Economy	OLS (10)[a]	FE (11)	FE (12)	FE (13)	FE (14)	FE (15)	FE (16)	FE (17)	FE (18)
A) GOVERN. & INSTIT. QUALITY									
POLITICAL RISK RATING	-0.366***	-0.369***							
	(-3.18)	(-3.42)							
BUREAUCRATIC QUALITY			-3.293***						
			(-3.31)						
CORRUPTION				-2.102**					
				(-2.45)					
DEMOCRATIC ACCOUNTABILITY					-2.046***				
					(-3.47)				
GOVERNMENT STABILITY						-0.201			
						(-0.33)			
LAW & ORDER							-1.844**		
							(-2.42)		
INTERNAL CONFLICT								-1.000*	
								(-1.93)	
MILITARY INTERFERENCE									-1.209*
									(-1.92)
B) WILLINGNESS TO PAY									
TAX MORALE	-0.176***	-5.984***	-5.242**	-5.627**	-6.121***	-5.582**	-5.063**	-4.899**	-6.852***
	(-2.73)	(-2.67)	(-2.33)	(-2.45)	(-2.73)	(-2.35)	(-2.19)	(-2.09)	(-2.83)
C) CONTROL VARIABLES									
LOG (GDP PER CAPITA)	-0.256	-2.309	-3.848***	-4.957***	-4.578***	-5.462***	-4.361**	-3.961**	-4.514**
	(-1.15)	(-1.25)	(-2.30)	(-3.01)	(-2.85)	(-3.23)	(-2.56)	(-2.16)	(-2.61)
AGRICULTURE (% OF GDP)	0.270	0.393**	0.251	0.251	0.303	0.317	0.394**	0.406**	0.323*
	(1.51)	(2.07)	(1.32)	(1.28)	(1.61)	(1.59)	(2.01)	(2.02)	(1.65)
URBANIZATION	0.171*	0.125*	0.103	0.151**	0.151**	0.177**	0.181***	0.162**	0.144**
	(1.88)	(1.91)	(1.52)	(2.28)	(2.36)	(2.62)	(2.77)	(2.43)	(2.11)
LOG (POPULATION)	0.235	2.101	7.981	2.612	5.452	7.896	2.970	4.136	5.110
	(0.35)	(0.35)	(1.38)	(0.42)	(0.94)	(1.28)	(0.48)	(0.66)	(0.83)
LOG (LABOR FORCE)	-0.416	-3.732	-9.093	-4.680	-7.490	-9.636	-4.679	-5.857	-6.838
	(-0.62)	(-0.62)	(-1.56)	(-0.74)	(-1.28)	(-1.56)	(-0.74)	(-0.93)	(-1.10)
TRADE (% GDP)	-0.092	-0.036	-0.032	-0.051*	-0.053*	-0.050	-0.036	-0.029	-0.047
	(-1.22)	(-1.22)	(-1.07)	(-1.71)	(-1.83)	(-1.63)	(-1.17)	(-0.89)	(-1.56)
Regional Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	109	109	109	109	109	109	109	109	109
R-squared	0.769	0.725	0.724	0.710	0.726	0.692	0.710	0.703	0.703
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: *t*-statistics in parentheses. Significance levels: * 0.05 < p < 0.10, ** 0.01< p < 0.05, *** p < 0.01. [a] Regressions with robust standard errors, beta coefficients reported.

Table 3: Robustness Check Including Further Variables

Dependent Variable: Shadow Economy	FE (19)	FE (20)	FE (21)	FE (22)	FE (23)	FE (24)	FE (25)	FE (26)
A) GOVERN. & INSTIT.QUALITY								
POLITICAL RISK RATING		-0.343***	-0.338***	-0.337***	-0.334***	-0.465***	-0.407***	-0.509***
		(-4.07)	(-3.82)	(-2.94)	(-3.22)	(-4.15)	(-3.56)	(-4.22)
COMPOSITE RISK RATING	-0.340***							
	(-4.00)							
B) WILLINGNESS TO PAY								
TAX MORALE					-5.935***	-7.759***	-6.238***	-8.767***
					(-2.63)	(-3.29)	(-2.64)	(-3.50)
C) CONTROL VARIABLES								
LOG (GDP PER CAPITA)	-3.997***	-4.165***	-4.222***	-2.750	-3.554**	-0.551	-1.293	-1.371
	(-3.41)	(-3.11)	(-3.04)	(-1.25)	(-2.08)	(-0.29)	(-0.68)	(-0.57)
AGRICULTURE (% OF GDP)	-0.252**	-0.150	-0.171	0.173	0.266	0.648***	0.612***	0.338
	(-2.59)	(-1.24)	(-1.39)	(0.57)	(1.40)	(3.16)	(2.94)	(1.02)
URBANIZATION	-0.014	-0.007	-0.010	-0.038	0.106	0.111*	0.139**	0.073
	(-0.28)	(-0.12)	(-0.16)	(-0.55)	(1.56)	(1.69)	(2.07)	(1.07)
LOG (POPULATION)	-10.661***	-7.359	-8.095	-7.650	5.032	-2.887	-4.900	0.140
	(-2.72)	(-1.49)	(-1.60)	(-1.15)	(0.86)	(-0.47)	(-0.79)	(0.02)
LOG (LABOR FORCE)	9.401**	5.395	6.399	5.553	-6.608	0.762	2.801	-2.408
	(2.41)	(1.10)	(1.27)	(0.83)	(-1.12)	(0.12)	(0.45)	(-0.36)
TRADE (% GDP)	-0.001	-0.013	-0.011	-0.016	-0.043	-0.046	-0.044	-0.056*
	(-0.07)	(-0.70)	(-0.57)	(-0.72)	(-1.47)	(-1.55)	(-1.53)	(-1.81)
TOP MARGINAL TAX RATE		0.673***	0.677**	0.530		0.093	0.019	-0.051
		(2.62)	(2.48)	(1.34)		(0.27)	(0.06)	(-0.13)
PRICE CONTROLS			-0.091				-0.412	
			(-0.27)				(-1.10)	
LABOR MARKET REGULATIONS				-0.639				0.448
				(-0.96)				(0.69)
Regional Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	274	222	213	148	109	102	97	92
R-squared	0.512	0.585	0.592	0.571	0.722	0.749	0.779	0.717
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: *t*-statistics in parentheses. Significance levels: * 0.05 < p < 0.10, ** 0.01< p < 0.05, *** p < 0.01.

Table 4: Robustness Check Including Further Governance and Institutional Variables

FE SPECIFICATIONS (27) TO (44) [a]	Coeff. t-stat.	Observ. R^2	FE SPECIFICATIONS (45) TO (62) [b]	Coeff. t-stat.	FE SPECIFICATIONS (45) to (62) [b]	Coeff. t-stat.	Observ. R^2
AGGR. GOVERNANCE INDIC.			**AGGR. GOVERNANCE INDIC.**				
INDEX GOVERNANCE	-9.417***	152	INDEX GOVERNANCE	-10.783***	TAX MORALE	-6.860**	76
	(-4.26)	0.603		(-4.86)		(-2.64)	0.798
CONTROL OF CORRUP.	-7.361***	152	CONTROL OF CORRUP.	-5.994***	TAX MORALE	-5.159*	76
	(-4.56)	0.609		(-3.34)		(-1.84)	0.765
POLITICAL STABILITY	-5.971***	152	POLITICAL STABILITY	-7.916***	TAX MORALE	-8.414***	76
	(-4.22)	0.602		(-4.50)		(-3.11)	0.790
GOVERNMENT EFFECTIV.	-9.503***	152	GOVERNMENT EFFECTIV.	-9.028***	TAX MORALE	-5.698**	76
	(-5.35)	0.627		(-4.60)		(-2.17)	0.792
VOICE AND ACCOUNT.	-0.824	152	VOICE AND ACCOUNT.	-5.505***	TAX MORALE	-8.299***	76
	(-0.46)	0.552		(-2.76)		(-2.76)	0.753
RULE OF LAW	-7.291***	152	RULE OF LAW	-8.497***	TAX MORALE	-5.270*	76
	(-3.88)	0.595		(-4.11)		(-1.95)	0.781
REGULATORY QUALITY	-1.819	152	REGULATORY QUALITY	-6.451***	TAX MORALE	-5.639**	76
	(-0.94)	0.554		(-3.36)		(-2.02)	0.765
ECONOMIC FREEDOM			**ECONOMIC FREEDOM**				
LEGAL SYSTEM	-3.011***	224	LEGAL SYSTEM	-3.168***	TAX MORALE	-6.385***	104
	(-5.06)	0.600		(-4.15)		(-2.78)	0.740
LAW AND ORDER	-0.971**	153	LAW AND ORDER	-0.904*	TAX MORALE	-5.961*	73
	(-2.21)	0.568		(-1.70)		(-1.93)	0.743
JUD. INDEPENDENCE	-2.398***	102	JUD. INDEPENDENCE	-2.206***	TAX MORALE	-9.839***	60
	(-3.85)	0.577		(-2.99)		(-2.85)	0.738
IMPARTIAL COURTS	-1.882***	156	IMPARTIAL COURTS	-1.670**	TAX MORALE	-6.158**	76
	(-2.93)	0.578		(-2.30)		(-2.11)	0.745
PROPERTY RIGHTS	-3.326***	116	PROPERTY RIGHTS	-2.143**	TAX MORALE	-7.080**	66
	(-3.87)	0.582		(-2.07)		(-2.11)	0.713
MILIT. INTERFERENCE	-1.526***	156	MILIT. INTERFERENCE	-1.310*	TAX MORALE	-6.665**	76
	(-3.14)	0.581		(-1.91)		(-2.23)	0.738
ADMINISTR. CONDITIONS[c]	-6.169***	65	ADMINISTR. CONDITIONS[c]	-7.330***	TAX MORALE	-7.644**	0.794
	(-2.98)	0.653		(-3.79)		(-2.09)	43
BUREAUCRACY (TIME)	-1.416*	110	BUREAUCRACY (TIME)	-0.777	TAX MORALE	-7.338**	66
	(-1.66)	0.571		-0.77		(-2.09)	0.694
STARTING BUSINESS	-1.329*	110	STARTING BUSINESS	-1.172	TAX MORALE	-6.381*	66
	(-1.86)	0.574		-1.50		(-1.86)	0.703
IRREGULAR PAYMENTS	-1.932***	110	IRREGULAR PAYMENTS	-1.981**	TAX MORALE	-7.512**	66
	(-2.70)	0.590		(-2.52)		(-2.27)	0.723
BUSINESS REGULATIONS	-2.457**	110	BUSINESS REGULATIONS	-2.801**	TAX MORALE	-7.478**	66
	(-2.52)	0.586		(-2.60)		(-2.27)	0.725

Notes: Time and regional fixed effects. Significance levels: * $0.05 < p < 0.10$, ** $0.01 < p < 0.05$, *** $p < 0.01$. [a] Control variables in line with specification (20). [b] Control variables in line with specification (24). [C] Cross-sectional analysis.

Table 5: 2SLS Estimations Focusing on Governance/Institutional Quality

Dependent Variable: Shadow Economy	POOLED (63)	POOLED (64)	FE (65)	FE (66)	POOLED (67)	FE (68)	POOLED (69)	FE (70)	POOLED (71)	FE (72)	POOLED (73)	POOLED (74)
A) GOVERN./INSTIT. QUALITY												
ICRG												
POLITICAL RISK RATING	-0.782**	-0.640***	-1.358**	-0.481***							-0.590***	-0.529***
	(-2.02)	(-3.43)	(-2.23)	(-3.13)							(-3.08)	(-3.06)
CORRUPTION					-8.971***	-9.540***						
					(-3.34)	(-3.13)						
AGGR. GOVERNANCE INDIC.												
INDEX GOVERNANCE							-19.830***	-16.842***				
							(-3.40)	(-3.08)				
CONTR. OF CORRUPTION									-14.848***	-12.245***		
									(-3.45)	(-3.19)		
B) CONTROL VARIABLES	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.
FIRST STAGE REGRESSIONS												
INSTR. INST./GOV. Q.												
TEMPERATURE	-0.336***	-0.394***	-0.240**	-0.295***	-0.037***	-0.037***	-0.013***	-0.013***	-0.021***	-0.021***		
	(-3.30)	(-4.17)	(-2.57)	(-3.63)	(-3.36)	(-3.44)	(-2.87)	(-2.88)	(-3.27)	(-3.32)		
SOCIOECON. CONDITIONS		2.054***		2.481***	0.122***	0.091**	0.075***	0.080***	0.094***	0.107***	2.089***	2.098***
		(6.09)		(8.35)	(3.14)	(2.31)	(4.46)	(-4.59)	(4.15)	(-4.58)	(6.15)	(6.05)
LATITUDE											11.356***	8.412**
											(3.00)	(2.14)
LINGUISTIC FRACTION.												-4.000*
												(-1.77)
SHARE OF PROTESTANTS												0.068**
												(2.41)
Test of excluded instruments	10.86***	24.93***	15.07***	39.24***	9.59***	7.99***	13.28***	13.88***	13.13***	15.07***	21.19***	13.01***
Regional Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	NO	NO	YES	YES	NO	YES	NO	YES	NO	YES	NO	NO
Anderson canon. corr. LR statistic	11.095***	47.054***	6.760***	69.720***	19.321***	16.130***	26.223***	27.120***	25.961***	29.240***	40.612***	49.305***
Anderson Rubin test	5.15***	7.12***	8.25***	6.71***	7.12***	6.71***	6.03***	4.78***	6.03***	4.78***	5.43***	3.00**
Sargan statistic		0.200		4.096**	0.144	0.017	0.690	0.567	0.002	0.295	0.463	2.016
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	219	219	219	219	219	219	150	150	150	150	219	218

Notes: *t*-statistics in parentheses. Significance levels: * 0.05 < p < 0.10, ** 0.01< p < 0.05, *** p < 0.01. Control variables in line with specifications (20).

Table 6: 2SLS Estimations Including Tax Morale

Dependent Variable: Shadow Economy	POOLED (75)	FE (76)	FE (77)	FE (78)	FE (79)	FE (80)	FE (81)	FE (82)	FE (83)	POOLED (84)	POOLED (85)	POOLED (86)	POOLED (87)
A) GOVERN./INSTIT. QUALITY													
ICRG													
POLITICAL RISK RATING	-0.887***	-0.686**				-0.822***				-0.729***	-0.773***	-0.623***	-0.571***
	(-2.94)	(-2.58)				(-3.32)				(-3.33)	(-3.01)	(-2.95)	(-3.03)
CORRUPTION			-8.476**				-8.413***						
			(-2.28)				(-3.26)						
AGGR. GOVERNANCE INDIC.													
INDEX GOVERNANCE				-12.496***				-14.834***					
				(-3.01)				(-3.25)					
CONTR. OF CORRUPTION					-8.805**				-9.808***				
					(-2.62)				(-3.10)				
B) WILLINGNESS TO PAY													
Tax Morale	-20.410**	-29.897***	-29.003**	-20.496**	-22.820**	-11.139***	-9.699**	-14.762***	-13.312***	-10.489**	-15.959*	-13.842*	-10.273**
	(-2.26)	(-3.00)	(-2.57)	(-2.28)	(-2.19)	(-2.54)	(-2.16)	(-3.36)	(-2.97)	(-2.53)	(-1.87)	(-1.79)	(-2.53)
C) CONTROL VARIABLES	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.	INCL.
FIRST STAGE REGRESSIONS													
INSTR. INST./GOV. Q.													
TEMPERATURE	-0.199**	-0.197**	-0.030**	-0.020***	-0.026***	-0.250***	-0.030**	-0.017***	-0.024***				
	(-2.15)	(-2.19)	(-2.19)	(-3.29)	(-3.40)	(-2.61)	(-2.00)	(-2.75)	(-2.94)				
SOCIOECON. COND.	2.006***	2.134***	0.141**	0.107***	0.159***	1.985***	0.184***	0.094***	0.142***	2.193***	2.224***	2.390***	2.312***
	(5.61)	(6.04)	(2.63)	(4.85)	(5.73)	(5.46)	(3.21)	(4.24)	(5.00)	(6.24)	(6.46)	(6.91)	(6.63)
LATITUDE										13.460***	11.627**	8.497*	9.916**
										(2.85)	(2.62)	(1.85)	(2.04)
LINGUISTIC FRACTION.												-6.543***	-7.032***
												(-2.70)	(-2.95)
SHARE OF PROTESTANTS												0.034	0.043
												(1.31)	1.59
Test of excluded instruments	11.73***	13.59***	3.92**	9.90***	12.87***	11.46***	4.46***	7.96***	10.34***	14.59***	15.43***	11.48***	11.64***
INSTR. TAX MORALE													
Cloudiness	-0.010***	-0.009***	-0.009***	-0.008**	-0.008**						-0.010***	-0.010***	
	(-3.55)	(-3.14)	(-3.14)	(-2.44)	(-2.44)						(-3.27)	(-3.24)	
Index moral values						0.016***	0.016***	0.016***	0.016***	0.016***			0.016***
						(7.40)	(7.40)	(6.20)	(6.20)	(7.45)			(7.24)
Test of excluded instruments	4.88***	3.58**	3.58**	2.35*	2.35*	19.72***	19.72***	14.07***	14.07***	19.63***	4.52***	2.68***	11.24***
Regional Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO
Anderson canon. corr. LR statistic	12.487***	10.328***	8.890***	7.839***	7.473***	32.225***	14.142***	18.808***	22.616***	35.81***	10.86***	12.641***	45.405***
Anderson Rubin test	5.57***	7.12***	7.12***	4.06**	4.06**	6.67***	6.67***	4.60***	4.60***	5.63***	4.39***	2.53**	3.31**
Sargan statistic	0.321	0.396	0.133	0.000	0.026	0.229	0.015	0.118	0.023	0.700	1.368	2.863	3.321
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	102	102	102	74	74	95	95	69	69	94	101	100	93

Notes: *t*-statistics in parentheses. Significance levels: * 0.05 < p < 0.10, ** 0.01< p < 0.05, *** p < 0.01. Control variables in line with specifications (24).

Table 7: Evidence from Switzerland

Dependent variable: shadow economy	FE (88)	FE (89)	FE (90)	FE (91)	FE (92)	2SLS (FE) (93)	First stage regr.	FE (94)	OLS[a] (95)	2SLS (FE) (96)	First stage regr.
Independent variables											
a) WILL. TO PAY TAXES											
TAX MORALE	-0.013*	-0.011*									
	(-1.92)	(-1.79)									
b) INSTITITUTION											
DEMOCRATIC PARTIC.	-0.019*	-0.018*	-0.017**	-0.021***	-0.015**	-0.060***		-0.011**	-0.305**	-0.056**	
RIGHTS	(-1.89)	(-1.85)	(-2.36)	(-2.80)	(-2.56)	(-2.87)		(-2.00)	(-2.18)	(-2.32)	
INSTRUMENTS											
Share of Protestants							5.873***				5.276***
							(2.97)				(2.43)
Test of excluded instr.							8.85***				
c) GOVERMENT											
TAX BURDEN		-0.001	-0.001**	-0.001**	-0.001***	-0.001***	-0.001	-0.001**	-0.161	-0.001***	-0.3E-03
		(-1.63)	(-2.21)	(-2.25)	(-4.39)	(-2.66)	(-0.16)	(-4.76)	(-1.34)	(-2.81)	(-0.07)
PROBABILITY OF								0.0002**	0.267**	0.4E-04	-0.001
DETECTION								(2.60)	(2.33)	(0.36)	(-0.68)
d) CONTROL VARIABLES											
LABOR FORCE				-0.159*	-0.233***	-0.328***	-6.437***	-0.151**	-0.106	-0.303**	-6.502***
				(-1.78)	(-3.34)	(-3.03)	(-3.00)	(-2.07)	(-0.84)	(-2.31)	(-3.01)
URBANIZATION				0.130	0.160*	0.218*	0.897	0.155*	0.430**	0.213*	0.940
				1.19	(1.91)	(1.76)	(0.46)	(1.95)	(2.07)	(1.79)	(0.48)
SHARE OF REGISTERED					0.688***	0.528***	6.022	0.634**	0.398*	0.525***	5.505
HOUSE PROPRIETORS					(5.90)	(2.91)	(1.45)	(5.66)	(1.81)	(3.05)	(1.29)
Anderson canon. corr. LR statistic						8.968***				6.270***	
Anderson Rubin test						21.93***				13.54***	
State (canton) effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Observations	46	46	78	78	78	78	78	78	78	78	78
R-squared	0.274	0.372	0.175	0.241	0.564			0.620	0.146		

Notes: *t*-statistics in parentheses. Significance levels: * 0.05 < p < 0.10, ** 0.01< p < 0.05, *** p < 0.01. [a] beta coefficients.

Table A1: Descriptive Statistics and a Summary of the Results (International Investigation)

VARIABLES	Mean	Std. Dev.	Min	Max	Source	Results
DEPENDENT VARIABLE						
SHADOW ECONOMY	29.594	13.193	6.90	67.30	Schneider (2005a, b)	
GOVERNANCE/INSTITUTIONAL Q.						
ICRG						
COMPOSITE RISK RATING	66.276	12.987	24.83	92.50	ICRG	-
POLITICAL RISK RATING	65.088	13.785	11.33	95.25	ICRG	-
BUREAUCRATIC QUALITY	2.319	1.167	0.00	4.00	ICRG	-
CORRUPTION	3.473	1.273	0.08	6.00	ICRG	-
DEMOCRATIC ACCOUNT.	3.932	1.471	0.00	6.00	ICRG	(-)
GOVERNMENT STABILITY	7.388	2.288	1.00	12.00	ICRG	(-)
LAW AND ORDER	3.938	1.501	0.00	6.00	ICRG	-
INTERNAL CONFLICT	9.092	2.629	0.00	12.00	ICRG	-
MILITARY INTERFERENCE	4.014	1.694	0.00	6.00	ICRG	-
AGGR. GOVERNANCE INDICATORS						
INDEX GOVERNANCE	0.193	0.866	-1.27	1.95	Kaufmann et al. (2003)	-
CONTROL OF CORRUP.	0.156	1.040	-1.98	2.56	Kaufmann et al. (2003)	-
POLITICAL STABILITY	0.149	0.866	-2.78	1.73	Kaufmann et al. (2003)	-
GOVERNMENT EFFECTIV.	0.222	0.971	-1.22	2.51	Kaufmann et al. (2003)	-
VOICE AND ACCOUNT.	0.161	0.891	-1.64	1.76	Kaufmann et al. (2003)	(-)
RULE OF LAW	0.194	0.989	-1.25	2.20	Kaufmann et al. (2003)	-
REGULATORY QUALITY	0.287	0.868	-2.70	2.31	Kaufmann et al. (2003)	(-)
ECONOMIC FREEDOM						
LEGAL SYSTEM	5.888	1.849	2.20	9.60	The Fraser Institute	-
LAW AND ORDER	6.862	2.448	0.00	10.00	The Fraser Institute	-
JUD. INDEPENDENCE	6.491	2.187	1.50	9.80	The Fraser Institute	-
IMPARTIAL COURTS	5.930	1.795	2.50	9.70	The Fraser Institute	-
PROPERTY RIGHTS	5.336	2.021	1.20	9.40	The Fraser Institute	-
MILITARY INTERFERENCE	6.985	2.355	0.00	10.00	The Fraser Institute	-
ADMINISTR. CONDITIONS	7.099	0.716	5.10	8.50	The Fraser Institute	-
BUREAUCRACY (TIME)	6.618	1.488	2.20	9.70	The Fraser Institute	(-)
STARTING BUSINESS	5.770	1.567	2.50	9.10	The Fraser Institute	(-)
IRREGULAR PAYMENTS	6.071	2.280	0.60	10.00	The Fraser Institute	-
BUSINESS REGULATIONS	6.214	1.478	2.60	9.40	The Fraser Institute	-
WILLIGNESS TO PAY TAXES					World Values Survey	
TAX MORALE	2.085	0.396	1.11	2.96		-
CONTROL VARIABLES						
LOG (GDP PER CAPITA)	7.654	1.586	4.71	10.53	World Development Indicators	(-)
AGRICULTURE (% of GDP)	16.640	13.442	0.07	57.65	World Development Indicators	(+)
URBANIZATION	55.715	22.131	8.90	100.00	World Development Indicators	(+)
LOG (POPULATION)	16.550	1.306	14.17	20.95	World Development Indicators	(-)
LOG (LABOR FORCE)	15.705	1.315	13.15	20.42	World Development Indicators	(+)
TRADE (% GDP)	71.811	39.133	14.41	290.85	World Development Indicators	((-))
TOP MARGINAL TAX RATE	4.794	2.727	0.00	10.00	The Fraser Institute	(+)
PRICE CONTROLS	4.592	2.853	0.00	10.00	The Fraser Institute	((-))
LABOR MARKET REGULATIONS	5.145	1.375	1.80	8.90	The Fraser Institute	((+))
INSTRUMENTS						
ANNUAL TEMPERATURE	16.789	8.194	-5.50	29.00	Mitchell et al. (2003)	
CLOUDINESS (%)	54.621	14.302	18.90	77.50	Mitchell et al. (2003)	
SOCIO ECONOMIC CONDITIONS	5.693	1.943	1.00	11.00	ICRG	
INDEX MORAL VALUES	62.535	13.166	28.100	94.250	World Values Survey	
LATITUDE	0.343	0.195	0.011	0.711	La Porta et al. (1999)	
LINGUISTIC FRACTIONALIZATION	0.372	0.288	0.002	0.923	Alesina et al. (2003)	
SHARE OF PROTESTANTS	10.543	19.700	0.000	97.800	La Porta et al. (1999)	

Notes: Tendencies: - Reduction of the shadow economy, always statistically significant.. (+) and (-) mostly or sometimes statistically significant ((+)), ((-)), (almost) never statistically significant.

Table A2: Descriptive Statistics and a Summary of the Results (Within Country Investigation)

VARIABLES	Mean	Std. Dev.	Min	Max	Source	Results
DEPENDENT VARIABLE						
SHADOW ECONOMY	0.073	0.013	0.05	0.10	Own calculations	
INSTITUTIONS						
DEMOCRATIC PARTICIPATION RIGHTS	4.256	1.200	1.58	5.83	Own calculation based on Stutzer (1999)	-
WILLIGNESS TO PAY TAXES						
TAX MORALE	1.894	0.353	1.03	3.00	WVS, ISSP	-
CONTROL VARIABLES						
TAX BURDEN	103.328	17.522	56.90	143.00	Swiss Federal Statistical Office	(-)
PROBABILITY OF DETECTION	63.188	41.433	3.14	188.98	Frey and Feld (2002)	(+)
LABOR FORCE	0.502	0.027	0.44	0.56	Swiss Federal Statistical Office	-
URBANIZATION	0.324	0.250	0.00	0.99	Swiss Federal Statistical Office	(+)
SHARE OF REGISTERED HOUSE PROPRIETORS	0.412	0.111	0.13	0.61	Swiss Federal Statistical Office	+
INSTRUMENT (RELIGION)						
SHARE OF PROTESTANTS	0.297	0.188	0.06	0.75	Swiss Federal Statistical Office	

Notes: Tendencies: - Reduction of the shadow economy, always statistically significant.. (+) and (-) mostly or sometimes statistically significant.

Table A3: Overview of the Countries

1990		1995		2000	
countries	countries	countries	countries	countries	countries
Albania	Madagascar	Albania	Malawi	Albania	Lebanon
Algeria	Malawi	Algeria	Malaysia	Algeria	Lithuania
Argentina	Malaysia	Argentina	Mali	Argentina	Madagascar
Australia	Mali	Australia	Mexico	Armenia	Malawi
Austria	Mexico	Austria	Mongolia	Australia	Malaysia
Bangladesh	Mongolia	Bangladesh	Morocco	Austria	Mali
Belgium	Morocco	Belgium	Mozambique	Azerbaijan	Mexico
Bolivia	Mozambique	Bolivia	Netherlands	Bangladesh	Moldova
Botswana	Netherlands	Botswana	New Zealand	Belarus	Mongolia
Brazil	New Zealand	Brazil	Nicaragua	Belgium	Morocco
Bulgaria	Nicaragua	Burkina Faso	Niger	Bolivia	Mozambique
Burkina Faso	Niger	Cameroon	Nigeria	Botswana	Netherlands
Cameroon	Nigeria	Canada	Norway	Brazil	New Zealand
Canada	Norway	Chile	Pakistan	Bulgaria	Nicaragua
Chile	Pakistan	China	Panama	Burkina Faso	Niger
China	Panama	Colombia	Peru	Cameroon	Nigeria
Colombia	Peru	Costa Rica	Philippines	Canada	Norway
Costa Rica	Philippines	Cote d'Ivoire	Poland	Chile	Pakistan
Cote d'Ivoire	Poland	Czech Republic	Portugal	China	Panama
Denmark	Portugal	Denmark	Romania	Colombia	Peru
Dominican Republic	Romania	Dominican Republic	Russian Federation	Costa Rica	Philippines
Ecuador	Saudi Arabia	Ecuador	Saudi Arabia	Cote d'Ivoire	Poland
Egypt, Arab Rep.	Senegal	Egypt, Arab Rep.	Senegal	Croatia	Portugal
Ethiopia	South Africa	Ethiopia	Slovak Republic	Czech Republic	Romania
Finland	Spain	Finland	South Africa	Denmark	Russian Federation
France	Sri Lanka	France	Spain	Dominican Republic	Saudi Arabia
Germany	Sweden	Germany	Sri Lanka	Ecuador	Senegal
Ghana	Switzerland	Ghana	Sweden	Egypt, Arab Rep.	Slovak Republic
Greece	Syrian Arab Republic	Greece	Switzerland	Ethiopia	Slovenia
Guatemala	Tanzania	Guatemala	Syrian Arab Republic	Finland	South Africa
Honduras	Thailand	Honduras	Tanzania	France	Spain
Hong Kong, China	Tunisia	Hong Kong, China	Thailand	Germany	Sri Lanka
Hungary	Turkey	Hungary	Tunisia	Ghana	Sweden
India	Uganda	India	Turkey	Greece	Switzerland
Indonesia	United Arab Emirates	Indonesia	Uganda	Guatemala	Syrian Arab Republic
Iran, Islamic Rep.	United Kingdom	Iran, Islamic Rep.	United Arab Emirates	Honduras	Tanzania
Ireland	United States	Ireland	United Kingdom	Hong Kong, China	Thailand
Italy	Uruguay	Italy	United States	Hungary	Tunisia
Jamaica	Venezuela, RB	Jamaica	Uruguay	India	Turkey
Japan	Vietnam	Japan	Venezuela, RB	Indonesia	Uganda
Jordan	Yemen, Rep.	Jordan	Vietnam	Iran, Islamic Rep.	Ukraine
Kenya	Zambia	Korea, Rep.	Yemen, Rep.	Ireland	United Arab Emirates
Korea, Rep.	Zimbabwe	Lebanon	Zambia	Italy	United Kingdom
		Madagascar	Zimbabwe	Jamaica	United States
				Japan	Uruguay
				Jordan	Venezuela, RB
				Kazakhstan	Vietnam
				Kenya	Yemen, Rep.
				Korea, Rep.	Zambia
				Latvia	Zimbabwe
TOTAL	86		88		100

Note: Countries in *Table 1*(highest number of observations).

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