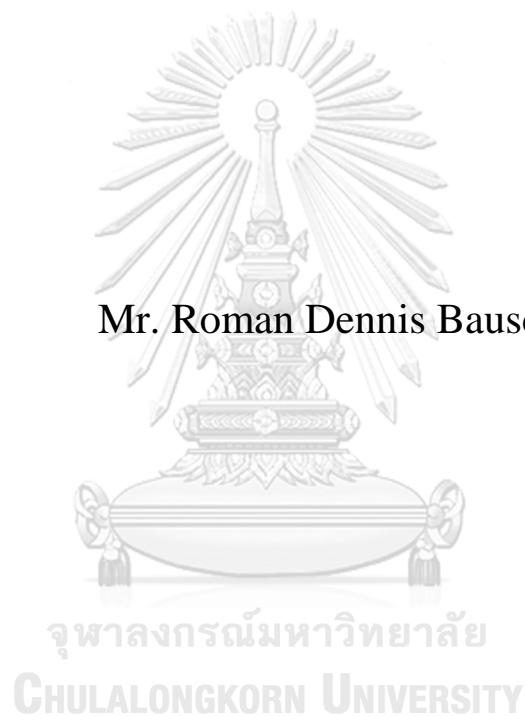*Economic Effects of Social Capital*

Mr. Roman Dennis Bausch

A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy (Economics) in Economics
Field of Study of Economics
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อ.ที่ปรึกษาหลัก : อธิภัทร มุทิตาเจริญ, อ.ที่ปรึกษาร่วม : ธานี ชัยวัฒน์

วิทยานิพนธ์ฉบับนี้ศึกษาถึงผลกระทบทางเศรษฐกิจของทุนทางสังคม ซึ่งทำการศึกษา 3 เรื่อง การศึกษาในสองเรื่องแรก
เป็นการศึกษาผลกระทบของทุนทางสังคมต่อสองปัจจัยที่นำไปสู่ความตึงเครียดทางการคลัง ความไม่เป็นทางการ และวัฏจักรการคลัง
ขณะที่กิจกรรมซ่อนเร้นทางเศรษฐกิจในรูปแบบของการหลีกเลี่ยงภาษีส่งผลให้รายรับของการคลังสาธารณะน้อยลง พฤติกรรมการใช้
นโยบายการคลังตามวัฏจักรของนโยบายการคลังมักมาพร้อมกับการขยายข้อจำกัดทางการเงินในช่วงเศรษฐกิจขาขึ้น ส่งผลให้งบประมาณ
สาธารณะมีความเสี่ยงและเปราะบางในช่วงที่เศรษฐกิจขาลงในช่วงเวลาถัดไป สำหรับการศึกษาในเรื่องที่สามจะมุ่งเน้นไปที่การเกิดขึ้นของ
ความตึงเครียดทางการคลัง ซึ่งเป็นอีกหนึ่งเป้าหมายของการศึกษาสำหรับการวิเคราะห์ผลกระทบในภาพรวมของทุนทางสังคมในงานวิจัย
ฉบับนี้ ผลการศึกษาพบความสัมพันธ์แบบสองทาง (ไปและกลับ) ซึ่งเป็นความสัมพันธ์เชิงลบระหว่าง 1.) ความน่าเชื่อถือของสถาบัน
และขนาดของกิจกรรมทางเศรษฐกิจแบบแอบแฝง (เศรษฐกิจในเงามืด) โดยสถานการณ์ในอดีตคล้ายว่าจะเป็นเงื่อนไขที่ส่งผลต่อความ
น่าเชื่อถือของสถาบัน 2.) ทุนทางสังคม (โดยรวม) และ วัฏจักรทางการคลัง ซึ่งตัวแปรทั้งสองขึ้นอยู่กับการใช้กฎเกณฑ์ทางการคลังและ
ขอบเขตของการทุจริต 3.) แม้ว่าจะมีการเชื่อมโยงระหว่างเวลาและความเครียดทางการคลังให้เป็นช่วงเวลาเดียวกัน งานวิจัยฉบับนี้ยังพบว่า
ความน่าเชื่อถือทั่วไป มีความสัมพันธ์แบบสองทาง (ไปและกลับ) และความสัมพันธ์เชิงลบกับ ความตึงเครียดทางการคลัง

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5785902129 : MAJOR ECONOMICS
KEYWORD: SOCIAL CAPITAL, TIME PREFERENCE, SHADOW ECONOMY,
                FISCAL CYCLICALITY, FISCAL STRESS
    Roman Dennis Bausch : *Economic Effects of Social Capital* . Advisor: Asst. Prof.
    Athiphat Muthitacharoen, Ph.D. Co-advisor: Asst. Prof. THANEE CHAIWAT,
    Ph.D.

    This thesis investigates economic effects of social capital in three separate
studies. The first two studies deal with the effect of social capital on two factors that pave
the way for fiscal stress, informality and fiscal cyclicality. While the shadow economy as a
form of tax evasion deteriorates public revenues, a cyclical behavior of fiscal policy often
goes along with an extension of lasting financial obligations in economic good times which
makes public budgets vulnerable in following downturns. The third study focusses on the
occurrence of fiscal stress which lends itself as research object for the analysis of the
overall effect of social capital in this context. The main results indicate that there is a causal
and negative relationship between: 1.) Institutional trust and the size of the shadow
economy, whereby the effect of the former seems conditional on generalized trust; 2.)
Social capital (as a whole) and fiscal procyclicality, which partially runs through the
adoption of fiscal rules and the extent of corruption; 3.) Generalized trust and the
occurrence of fiscal stress, though the link between time preference and fiscal stress
appears equally pronounced.

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Field of Study: Economics   Student's Signature ....
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Roman Dennis Bausch

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ABBREVIATIONS

BMI	Body Mass Index
BOC-BOE	Bank of Canada and Bank of England
CIA	Central Intelligence Agency
CE	Civic Engagement
CN	Civic Norms
DPI	Database of Political Institutions
EU	European Union
ESS	European Social Survey
EVS	European Values Study
GDP	Gross Domestic Product
GPS	Global Preference Survey
GT	Generalized Trust
GPST	GPS Generalized Trust
ID	Identification
IMF	International Monetary Fund
IT	Institutional Trust
IV	Instrumental Variable
INSCR	Integrated Network for Societal Conflict Research
INTRA	International Test of Risk Attitudes
ISWGNA	Intersecretariat Working Group on National Accounts
LIML	Limited-Information Maximum Likelihood
LM	Lagrange Multiplier
LTO	Long-Term Orientation

MIMIC	Multiple Indicators Multiple Causes
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
OR	Old-Age Dependency Ratio
PCA	Principal Component Analysis
TFR	Total Fertility Rate
2SLS	Two-Stage Least Squares
US	United States of America
USD	United States Dollar
WEO	World Economic Outlook
WGI	Worldwide Governance Indicators
WVS	World Values Survey

NON-TECHNICAL SUMMARY

The main theme of this thesis is that social capital is a fundamental determinant of fiscal stability. Some of the characteristics, which are commonly subsumed under the note of social capital, shape and constrain the functioning of institutions and the room for political maneuver and thereby also the economic constraints of fiscal policy. If the basic idea is correct, such characteristics should help to explain why some countries have problems to collect taxes, to conduct anticyclical fiscal policies, and finally slide into fiscal stress.

Section 1 introduces the note of social capital and discusses how its components help to overcome collective action problems in general. Further, it gives insights into the measurement of social capital and the data that is employed by the three studies.

Section 2 is envisaged to investigate in a multivariate cross-sectional analysis whether confidence in public institutions affects the size of the shadow economy. Accounting for the multifaceted nature of institutional trust, estimates of the size of the shadow economy in 99 industrialized and developing countries are regressed on seven distinct survey based institutional trust items. The items enter the regressions separately and in aggregate form as an index. Beside additional social capital measures in regard to generalized trust and tax morale, the regressions include also a number of covariates that reflect the incentive environment of entrepreneurs and laborers. The results confirm a causal and significant negative relationship between confidence in public institutions and the size of the shadow economy. Whereby the effect of institutional trust seems conditional on the simultaneous existence of a minimum level of generalized trust.

Section 3 sets out to examine whether social capital as a whole determines fiscal cyclicality. Recent work identified as a leading cause for procyclicality institutional shortcomings. Following the idea that the functioning of institutions is strongly affected by social capital, the cyclicality of fiscal policy - measured as the correlation between cyclical components of real government expenditure and real gross domestic product (GDP) - is under control for standard determinants of fiscal cyclicality regressed on four compound survey based social capital measures and an index thereof. The multivariate cross-sectional analysis, which uses data from 104 industrialized and developing countries, confirms a causal and robust negative relationship between social capital and fiscal procyclicality. The results indicate that this relationship partially runs through the adoption of fiscal rules, and the extent of corruption.

Section 4 focusses on the question why some countries are evidently more often struck by fiscal stress than others. Following a strand of literature that classifies public debt primarily as an intertemporal collective action problem which can be alleviated by trust in unknown others, and aggravated by a lack of intergenerational ties and strong time discounting, the study tries to ascertain whether the old-age dependency ratio, the total fertility rate, survey measured generalized trust, and survey measured time preference have an effect on the occurrence of fiscal stress. Newly available data on patience in 76 countries, from the Global Preference Survey allows to shed light on the effect of the willingness to wait in this context. The covariates account beside for economic also for institutional, political and socio economic factors that are frequently employed in the analysis of fiscal stability. The occurrence of fiscal stress is acknowledged whenever one of the following criteria is

met: Explicit default; implicit default; high levels of government debt accompanied by immoderate government expenditure; financing constraints; financial aid. The multivariate cross-sectional analysis finds that generalized trust and time preference have a causal negative effect on the occurrence fiscal stress.

Section 5 provides a comprehensive summary and discussion of the main findings and their implications. The remainder of the thesis encompasses the references and the Appendix.

1. INTRODUCTION

1.1 Background

Purpose of this thesis is to examine the economic effects of social capital in three areas associated with the fiscal performance of states. To this end, the thesis first sheds light on the association between social capital and two factors that for obvious reasons pose a threat to the stability of fiscal budgets, the size of the shadow economy and the cyclicality of government expenditure. While informality obstructs the governmental revenue collection, fiscal procyclicality often goes along with a lack of fiscal moderation in economic good times, i.e. an expansion of financial obligations and insufficient saving of revenue for bad times. Finally, the thesis investigates whether demographics, generalized trust, and time preference of a population determine the occurrence of fiscal stress. Before the three topics are addressed, sections 1.2 and 1.3 present the note of social capital and the employed data. Section 1.2 includes a brief introduction of varying social capital definitions, a discussion on how its components can be related to different economic outcomes, and an overview of its measurement. Section 1.3 introduces the characteristics of the survey data, discusses resulting limitations in regard to the study design, and gives a detailed insight into to the creation and the structure of the employed datasets.

1.2 Social Capital

1.2.1 Definition

The elusive nature of the social capital notion led to various conceptual delimitations and confusion for what it actually stands. A definition that is often cited in the literature is the one by Putnam (1995, p. 67), who describes social capital as *"features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit"*. Although this functionalistic definition points to an aptitude for cooperation, it does not exclude features of social capital that e.g. in small groups might lead to negative external effects for the rest of society. The definition of social capital as *"civic capital"* i.e. *"persistent and shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities"* proposed by Guiso *et al.* (2011, p. 3) addresses this shortcoming.[1] Beside the exclusion of features that might have socially adverse effects, this definition distinguishes itself also from the one by Putnam (1995) in that it does not include social networks. Guiso *et al.* (2011) point out that networks are

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[1] To the same end, a very similar concept is proposed by Ritzen (2001, p. 8), social cohesion. Which he terms as "a state of affairs in which a group of people (delineated by a geographical region, like a country) demonstrates an aptitude for collaboration that […] in the longer run, benefits all". Easterly *et al.* (2006, p. 105) identify social cohesion also as the absence of socio-economic divisions. These divisions "whether by income, ethnicity, political party, caste, language, or other demographic variable" represent fractures around which distrust and eventually social disintegration may arise which undermines the capacity for collective action. Albeit, deemed as indirect indicators of social cohesion, socioeconomic divisions are straightforward and therefore outright measureable. Essential direct indicators of social cohesion are according to Easterly *et al.* (2006) measures of trust, membership rates of organizations, and civic participation. Related to (positive) social capital is also the communitarian approach in the political culture school which distinguishes itself through *"voluntary activity in associations, interpersonal trust and norm obedience"* (Inglehart and Welzel, 2005, p. 5). The political culture school accounts in total for three different approaches in regard to their conduciveness for democratization.

only of value if its members share the same social norms. Moreover, following a critique of Robert M. Solow on Fukuyama (1995) they criticize that Putnam's usage of civic engagement as an indicator for the existence of social networks doesn't allow to measure the stock of social capital separately from the outcome.[2]

A non-functionalistic view on social capital is taken by Stone (2001, p. 6), who conceptualizes *"social capital as networks characterized by norms of trust and reciprocity"*. While according to her taxonomy networks make up the formal (civic, group, work, and state based relations) and informal (family, friends, and the neighborhood) structural elements of social capital, the *"norms of trust and reciprocity", "which operate within these structures" (pp. 6, 7)* represent its relational components.[3] Although, she acknowledges social networks, she also highlights that the existence of networks can only serve as a measure of social capital in conjunction with *"the norms governing social relations" (p. 25).*

1.2.2 Components

Trust, which Fafchamps (2004, p. 5) understands *"as an optimistic expectation or belief regarding other agents' behaviour"*, attracts of all social capital components by far the most attention in the theoretical and empirical literature (Petrou and Daskalopoulou, 2014). Forms of trust are generally distinguished by dimensions of

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[2] A number of papers measures social capital in terms of outcomes that are regarded as unlikely to be steered by economic or legal incentives. Among these are referendum (Putnam, 1993) and electoral turnout, per capita blood donation (Guiso et al., 2004), diplomatic parking violations (Fisman and Miguel, 2006), and number of non-profit organizations per capita (Nannicini et al., 2013).

[3] Stone (2001) recognizes three types of trust, personal, generalized, and institutional trust. The survey items for civic norms that are introduced below, are described by her as measures for the lack of reciprocal norms.

source and distance. While dimensions of the former can refer to interpersonal, institutional or political trust, the latter are used to distinguish e.g. between particularized and generalized interpersonal trust. Interpersonal trust concerns the disposition to believe in the good intentions of others, institutional trust describes in contrast the confidence placed in the administration of norms and the enforcement of rules. The last category in this dimension refers to trust in political protagonists (Hwang, 2015). Particularized trust arises from repeated interpersonal interactions (Platteau, 1994 in Fafchamps, 2004) and does for this reason not play a decisive role in economic transactions with unknown individuals. Generalized trust stems from the general knowledge about counterparts, the prevailing incentives that are driving them as well as their moral imprint and is thus the most prominent kind of trust from an economic perspective (Hwang, 2015).

Tabellini (2008, p. 261) stresses that the earlier literature interpreted the standard (generalized) trust question of the World Values Survey (WVS) and European Values Study (EVS) either *"as a belief about the behavior of others"*, or *"as an indicator for moral values and trustworthiness"*, whereby the two interpretations are not mutually exclusive, since *"beliefs are likely to be formed also extrapolating to others normative conceptions of how one ought to be have"*. Knack and Keefer (1997) emphasize that civic norms are mirror images of generalized trust. They argue that the standard generalized trust question measures the expectation whether others will behave opportunistically - or rather cooperatively, while the WVS questions for civic norms measure the individual's own trustworthiness.

Civic engagement came mainly to prominence through the work of Putnam (1993, 1995, 2000). Putnam uses the term civic engagement to describe a broad range

of social activities based or related to social networks that encompass e.g. voting, reading newspapers, associational membership, or just meeting other people at picnics and parties. As Berger (2009, p. 335) criticizes civic engagement has been used as *"a catch-all-term for almost anything that citizens might happen to do together or alone",* which has created confusion about what civic engagement actually is. Encouraged by the obvious need for clarification, Ekman and Amnå (2012) divide what Putnam subsumes under civic engagement into two main categories, manifest political participation and latent political participation. Whereby they count formal political participation (e.g. membership in parties) and activism (e.g. demonstrations) under the former category and involvement (e.g. wearing identity clothes), and typical civic engagement (e.g. voluntary work) under the latter.

These delineations give an overall impression of social capital, but they leave open why it relates to favorable economic outcomes. The next section fills this gap by putting successively item for item the presumed mechanisms of action forward.

1.2.3 Modes of Action

Petrou and Daskalopoulou (2014) emphasize that factors of the informal institutional environment as social capital are in terms of a country's economic performance of the same vital importance as formal institutions.

A direct channel through which social capital facilitates positive economic outcomes is highlighted by Fafchamps (2004). He argues that a high level of trust, which is not limited to some kind of sub-population, makes transactions more efficient, since it allows e.g. the invoicing of delivered goods. Referring to the fact that in commercial transactions one of the trading parties is likely to have more

knowledge about the quality of the commodity and its price in alternative markets, Arrow (1972) highlights the necessity of trust. Tabellini (2008), who measures generalized morality in terms of generalized trust and generalized respect, emphasizes that individuals who practice generalized morality will be less inclined to free ride on their fellow citizens. Further, he argues that this pattern not only affects mere economic behavior like evading taxes or shirking duties, but also political action as that *"voters expect and demand higher standards of behavior from political representatives and are more inclined to vote based on general social welfare rather than personal benefit criteria" (p. 261).* Correspondingly, he finds that Italian voters in regions with more generalized morality give fewer votes to politicians that are subject of criminal investigations than voters in regions with less generalized morality. Knack and Keefer (1997) argue that in countries where people trust each other, promises and guarantees by public authorities (e.g. in respect to exchange rates and tax levels) are perceived as more credible, which allows citizens to choose the most appropriate time horizon for investments. Consequently, incentives for long-term planning and the accumulation of physical capital are larger. Furthermore, they claim that civic norms *"can be linked with economic outcomes in some of the same ways as trust"*, and that they offer solutions to various kinds of collective action problems that *"resolve prisoner's dilemmas without imposing substantial external costs on other parties" (p. 1254).* Referring to Coleman (1990, p. 311), who sees in the norm *"that one should forgo self-interests to act in the interests of the collectivity"* a very important form of social capital, they also emphasize the restraining effect of civic norms on narrow self-interest and opportunism, which leads

individuals to contribute to public goods and helps to reduce the costs that accrue under asymmetric information from contract monitoring and contract enforcement.

Putnam (1995), who assumes civic engagement to be crucial for the functioning of societies argues that it fosters solid norms of generalized reciprocity and helps to create social trust, which consequently through coordination, communication, and amplification of reputation solves collective action problems. But most importantly, he is convinced that dense networks of civic engagement broaden the sense from the self to the collective, and thus create the desire for joint benefits. One of the papers that aroused interest in civic engagement is the one by Helliwell and Putnam (1995). They provide evidence that the regions of the (poor) Italian south that had more civic participation in the 1960s and 1970s, had also higher GDP per capita levels, respectively that GDP per capita in these regions was faster converging towards northern Italian levels than in regions with less civic participation. Fafchamps (2004) brings furthermore into focus that if formal institutions are missing, public goods can be provided instead through the mobilization of organizational members. Accordingly, social networks might be especially at lower levels of development downright helpful. A fact that should be kept in mind, when the effect of civic engagement is analyzed across industrialized and developing countries.

While social capital has acquired a widespread reputation of being economically beneficial, some of the items that are often indiscriminately subsumed under this term must be assumed to engender negative economic outcomes (Easterly *et al.*, 2006). Inglehart and Welzel (2005, p. 7) point e.g. out that *"intimate interpersonal trust [...] is limited to closely-knit groups that can exist in isolation*

from each other with no bridging ties at all". And that for this reason *"intimate interpersonal trust does not produce the sorts of social capital that are needed to process the diverse interactions of complex societies"*. Knack and Keefer (1997) emphasize correspondingly that the reference population of trust is very important. They find that generalized trust has a low correlation with specific trust e.g. in family members, and that both forms of trust have different implications, when it comes to prisoner's dilemma situations with individuals apart from e.g. kinship, ethnic affiliation or special interests. Moreover, they point out that *"cooperation and trust among [...] limited groups may facilitate their organization for rent-seeking purposes or even for violent conflict" (p. 1258)*, which undoubtedly has a negative potential.

As for interpersonal trust, there is also a controversy about adverse effects of civic engagement in the literature. Keefer and Knack (2003), who distinguish between a network and a norms dimension of social capital, emphasize e.g. in contrast to the findings of Helliwell and Putnam (1995) that there are several studies that have not been able to verify the existence of a positive network effect. Here, it has to be mentioned that diverging results for civic engagement could theoretically be attributed to the usage of different civic engagement items. Plausibly, if people have differing motives for joining different organizations, membership in these organizations will be associated with different economic outcomes. Some organizations might for example act as mere interest groups that hurt economic development through rent seeking (Olson, 2008 in Knack and Keefer, 1997). However, Knack and Keefer (1997), who distinguish between membership in organizations with redistributional motives (unions, political parties and professional associations) and organizations that have non-pecuniary agendas, do not find evidence

that one of both groups has an impact on economic performance. They reason that the effects of these groups might be polysemous. In this logic, a high membership rate in sport clubs could inter alia be an expression for a strong leisure preference, and trade unions could as a byeffect establish necessary standards. Moreover, they put forward that associational activity is more likely to invoke collective action and solidarity on the level of small groups. Similarly Keefer and Knack (2003) argue that at different levels of aggregation, civic engagement can have different effects. A positive effect of a specific form of civic engagement on the community level, doesn't have to translate necessarily into a positive effect on the national level. A reason is that some forms of organizational activity generate negative externalities for other groups, that can't be accounted for on lower levels of aggregation.

In acknowledgment of the described ambiguity, the employed measures capture only components of social capital of which more is assumed to be better for the society as a whole.

1.2.4 Measurement

Owing to the wide country coverage of the World Values Survey (WVS) and European Values Study (EVS) most empirical cross-country analyses resort for social capital measures to the data inventories of these two large scale international surveys. Following the literature, the thesis makes use of attitudinal survey items from the Integrated Values Surveys 1981-2014 dataset which consists of the combined inventories of both surveys. The employed items encompass beside generalized trust (non-intimate interpersonal trust), institutional trust (confidence in public

institutions), civic norms (justifiability of non-cooperative behavior), and civic engagement (membership in typical voluntary organizations).[4]

In regard to the validity of attitudinal WVS/EVS survey measures, Knack and Keefer (1997) refer to an experiment by the Reader's Digest in which wallets containing cash and contact details of their owners were "accidentally" lost in fourteen European countries. They state that the return rates were (highly*) correlated with responses to survey questions in respect to generalized trust* and to the justifiability of non-cooperative behavior (civic norms).[5] In the same vein, Fehr *et al.* (2003) validate experimentally that survey based trust measures can predict actual trusting behavior. Corroborating the reliability of surveyed membership rates in organizations, Knack and Keefer (1997) point to the fact that for trade unions surveyed membership rates are highly correlated with actual membership rates.

1.3 Data and Design

1.3.1 Survey Data Characteristics

Since the WVS/EVS surveys are conducted in intermittent waves with varying country coverage, the Integrated Values Surveys 1981-2014 dataset is severely

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[4] The respective survey questions for the employed social capital items are listed in Appendix - A1.

[5] Inglehart and Welzel (2005) emphasize that the standard WVS/EVS trust question *"Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?"* (WVS, 2012, p. 3), since it does not contain further specifications, should be considered solely as referring to people in general, i.e. as a measure of generalized, and not of particularized trust. The above mentioned finding of Knack and Keefer (1997) that the WVS standard trust item bears only low correlation with the WVS item concerning trust in family members is in line with this argument.

unbalanced. While some of the 105 countries have been covered in 34 years only once (e.g. Tunisia) or twice (e.g. Thailand), other countries have been included up to 9 times (e.g. Spain).[6] The country-year coverage can be examined in Table 13 which displays the single survey waves (Appendix - A1). One way to deal with unbalanced survey data is to interpolate, or to impute the data points between the available waves as done by Heinemann *et al.* (2014) and Dahlum and Knutsen (2016).[7] Problematic is in this regard that when the original survey data is very unbalanced, many missing data points have to be replaced, which might lead the analysis to become more of a simulation than an empirical study (Welzel *et al.*, 2016).

Another salient feature of the Integrated Values Surveys 1981-2014 dataset is that the encompassed social capital items show a comparatively larger variation across entities (countries) than over time. Table 14 in Appendix - A1 displays for selected social capital items their source of variation. In case of generalized trust, the variation between countries in terms of the standard deviation (SD = 0.144) is for instance about three times larger than the variation within countries (SD = 0.054).[8] The persistence of social values in general, but especially of generalized trust, is addressed by numerous studies.[9] Amongst them Tabellini (2008), who finds that the trust level of third-generation migrants in the U.S. strongly depends on whether the political institutions in their ancestral countries had been in the distant past despotic.

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[6] The Integrated Values Surveys 1981-2014 dataset encompasses in total 112 entities. But for seven of these, namely Andorra, West-Germany, Kosovo, Northern Cyprus, Northern Ireland, Palestine, Serbia and Montenegro, the data availability of covariates is quite limited.

[7] Dahlum and Knutsen (2016) use for years that are not covered by the WVS multiple imputation.

[8] The variation of confidence in the justice system, tax morale, and membership in sport organizations is between countries two or three times larger than within countries.

[9] For a brief overview of this literature see Tabellini (2008) and, or Algan and Cahuc (2010).

Which indicates that generalized trust changes only very slowly over time because otherwise, trust levels would have been altered to the point where the political conditions in the spatially and timely distant environment of their ancestral countries would be less determinative.

1.3.2 Study Design

Since the persistence of social capital is very likely to obstruct a proper identification of parameters in a fixed effects model and might thereby lead to the rejection of existing effects (Welzel *et al.*, 2016), but also because a panel regression seems due to the unbalancedness of the Integrated Values Surveys 1981-2014 data in general inappropriate, study 1 and study 2 resort to cross-sectional Ordinary Least Squares (OLS) analyses as it is the standard in the literature dealing with social values. Study 3 employs variables from the Integrated Values Surveys 1981-2014 dataset, but is largely built around the data from the Global Preference Survey (GPS). The GPS is based on the infrastructure of the Gallup World Poll 2012. One part of the key variables in study 3 stems thereby from only one survey wave, which limits all regressions that rely on these variables already to a cross-sectional setting. However, following the methodology of Bützer *et al.* (2013) who aggregate the patchy annual WVS/EVS survey data to the decade level in order to retrieve additional observations, the Appendix displays for each study - where applicable - supplementary pooled OLS regressions.[10]

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[10] Bützer *et al.* (2013) emphasize that they treat their data as cross-sectional since it spans over three decades and 65 countries. In order to control for serial correlation and unobserved heterogeneity standard errors are clustered at the country level. They also control for time-fixed effects by including dummy variables for each decade. Their sample shows much more variation between than

1.3.3 Data Structure

For study 1 and study 2, the Integrated Values Surveys 1981-2014 dataset was merged with the data on the other variables in a way that only matching observations were retained. Thereby the resulting data samples are also severely unbalanced.

The data of the dependent variable in study 1 (shadow economy) spans without gaps over 99 countries and 25 years (1991-2015), resulting in a sample that provides in total 279 observations, of which 278 are covered by generalized trust and 273 to 231 by the other employed social capital measures. The covariates cover with one exception - tax revenue in % of GDP - between 279 and 268 observations. The latter is only available for 84 countries, which allows for 227 observations.

The dataset in study 2 spans over 104 countries and the full time range of the Integrated Values Surveys 1981-2014 dataset (351 observations). The dependent variable (fiscal cyclicality) was created from two sources and has in total 300 observations. The variables associated with trust and civic norms cover between 350 and 306 observations, the civic engagement variables 171 to 165 observations (T-Bar 1.92 - 1.85), and the covariates between 331 and 211 observations (T-Bar 3.57 - 2.11). Thereof, the fiscal rules measure provides for only 61 countries information.

In both studies, the missing data points are to the largest part spread in an erratic fashion over the full time range. Subsequent to the data merging, country mean values for all variables are calculated.[11] The social capital indexes employed in study

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within entities so that they abstain from including country-fixed effects. Since the data of the three studies shows similar features (comparatively large N, small T, and low within variation), this methodology is also applied to the supplementary pooled OLS regressions in the Appendix.

[11] Similar approaches have been adopted by Knack and Keefer (1997), Torgler and Schneider (2009), and Elkhuizen *et al.* (2018).

1 (IT Naive & IT Synt) and study 2 (SC I) are based on the resulting social capital (mean) variables. Consequently, the indexes depend in the same way as the single social capital variables only on the time range for which data on the respective dependent variable is available, i.e. the IT Naive index and the IT Synt index in study 1 depend on the given data points that fall in the time range between 1991 and 2015, and the SC I index in study 2 depends on the available data points from 1981 to 2014.

Since in study 3 the variables for generalized trust and time preference from the GPS are only available for 76 countries, of which in turn only 63 took part in the WVS and EVS, the sample includes also episodes that are not matched by observations in the Integrated Values Surveys 1981-2014 dataset.[12] The data covers in consequence 2,736 episodes stemming from 76 countries and 36 years (1980-2015). In total 2,022 observations are given for the dependent variable (occurrence of fiscal stress). Between 247 and 241 observations are available for the WVS/EVS key variables (T-Bar 3.92 - 3.82), 2,726 to 2,720 for the demographics (T-Bar 35.86 - 35.78), and 2,588 to 2,068 for the covariates (T-Bar 34.51 - 27.21) - with exception of the 1st principal component of the six Worldwide Governance Indicators (WGI) and the Gini coefficient. The data for the latter is limited to 1,292 and 723 observations (T-Bar 17 - 10.49).[13] After the datasets are merged country mean values for all variables are calculated.

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[12] Regressions based only on the episodes that are matched by the Integrated Values Surveys 1981-2014 dataset were limited to 40 observations under inclusion of controls. In these regressions the coefficient of generalized trust showed a slightly improved performance, but all other variables - exempt patience - were rendered insignificant.

[13] The variance between countries is for the PC WGI index and the Gini coefficient about six times, respectively 3 times larger than the variance within countries.

The gaps in the data are in study 3 larger than in study 1 and study 2. This applies in particular to the variables from the WVS/EVS and GPS which mean values are accordingly only based on 1 to 9 survey waves.

For social capital, the course of conduct is based on the conjecture that due to its exemplified persistence, averages created from the available data points provide acceptable proxies for its level in the period under review. Elkhuizen *et al.* (2018) who choose a similar approach justify this as follows: *"In cases where the same country was included in multiple waves, we calculate the average level of trust over time and assume that this average describes a country's level of trust in the period 1973-2008. This assumption is based on the claim made elsewhere in the literature that social capital is changing only very slowly over time (Algan and Cahuc, 2010). It is also corroborated by the data we use: the average correlation between different WVS waves of answers to the trust question is higher than 0.8. The fact that social capital appears to be relatively unchanged over time does lead us to the conclusion that it can be treated as an exogenous variable in the analysis"* (p. 1273).

For time preference, the approach likewise requires a high persistence. Galor and Özak (2016, p. 3100) find e.g. that long-term orientation (LTO)[14] of second generation migrants in Europe can be traced back to *"geographical variations in the natural return to agricultural investment"* in ancestral countries since the Neolithic Revolution. This suggests that time preference is also changing quite slowly, which is especially relevant in regard to the employment of the cross-sectional time preference variables taken from the GPS and from Hofstede *et al.* (2010).

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[14] Galor and Özak (2016) use the LTO time preference measure of Hofstede *et al.* (2010).

One should be aware of the possible limitations due to the chosen methodological approach. The creation of country mean values allows to extract cross-sectional observations from longitudinal data, even though single data points are missing. For study 1 and study 2 this applies only to a comparatively limited number of observations. In study 3, however, especially the data of the key variables is partly based on only one episode in 36 years. Consequently, a larger variability of generalized trust and time preference than assumed, would cast doubt on the ability to approximate the level of both factors in the period under review and would consequently also put the significance of the results into question.

A possible remedy in regard to the limited data availability would be to rely on harmonized data inventories of several surveys. The so called Data Harmonization Project[15] (Slomczynski, 2017) offers e.g. data for trust. However, in attempts to exploit these larger and richer data source for study 1, the relationship between the size of the shadow economy and the harmonized trust variables was considerably weaker than for the WVS/EVS trust measures.

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[15] Democratic Values and Protest Behavior: Data Harmonization, Measurement Comparability, and Multi-Level Modeling in Cross-National Perspective (Data Harmonization Project)

2. SHADOW ECONOMY

2.1 Motivation

Tax evasion severely limits the capacity of states to carry out their essential functions which reduces in turn incentives for citizens to pay taxes (Hug and Spörri, 2011). The tax compliance literature (cf. D'Hernoncourt and Méon, 2012; Lee, 2013) suggests that this vicious circle may be broken by factors that are often subsumed under 'social capital', namely the trust people put into each other (generalized trust), the confidence people have in public institutions (institutional trust), and their intrinsic motivation to pay taxes (tax morale). While a state might find it difficult to manipulate generalized trust and tax morale directly, it has influence on the demeanor of its officials and thereby likely also on the confidence citizens develop in public institutions (Levi, 1998; Mishler and Rose, 2001).[16]

This study sets out to investigate the effects of institutional trust on tax compliance behavior which is measured in terms of the size of the shadow economy in 99 different countries. In distinction to earlier studies, the analysis accounts thereby for potential multidimensionality of institutional trust.

The study employs a new set of shadow economy estimates together with survey based social capital measures. Usage of country mean values created from all WVS/EVS survey waves allows thereby to widen the data availability beyond the limited scope of observations (typically 30 to 60) in most of the related studies.

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[16] Weatherley (1993, p. 38), who investigates how the perception of fairness of the social security system affects claimants' attitudes towards compliance, concludes for example that fair treatment of beneficiaries *"can engender a sense of obligation"*.

The empirical results suggest that there is a causal and significant negative relationship between institutional trust and the size of the shadow economy. Moreover, the results support the note of 'contingent consent', i.e. that tax compliance is larger when people have confidence in public institutions and trust each other, whereby the effect of institutional trust seems to depend on the existence of a minimum of generalized trust.

Section 2.2 starts with an overview of the fiscal impact of the shadow economy. Section 2.3 provides a review of the literature on the joint role that institutional trust and generalized trust might play for tax compliance. Subsequently, the section focusses on the available evidence on the effects of institutional trust on tax morale and tax evasion. Section 2.4 provides insights into the conceptualization of the underground economy and the dimensionality of institutional trust. Furthermore, the section introduces all employed variables in detail. It closes with a presentation of the methodological framework. Section 2.5 reports and discusses the empirical results. Section 2.6 draws an intermediate conclusion.

2.2 Informality and Tax Losses

Tax evasion in form of informality affects the state budget not only through the tax base, but also indirectly through withheld social security contributions. If there is a statutory consensus on a sacrosanct subsistence level, informal sector workers might, due to the lack of registered income, even become eligible to various kinds of social benefits. Given that internal revenues diminish under pervasive informality, a fiscally conservative government might also feel obliged to cut non-pivotal public services or

increase taxes to fund social aid. Insofar the recipients are informal sector workers, this will necessarily erode trust in the fairness of the system and increase the resistance to taxation, but at least strengthen the attractiveness of the informal sector.

But to what degree does informality indeed affect public budgets? Assuming that in the absence of the shadow economy all informal activities would be formal, Schneider (2016) calculates resulting tax losses - including lost social security contributions - based on a data sample over 33 OECD[17] countries. In order to do so he deducts consecutively from the initial shadow economy estimate for all countries in 2013[18] for double counting activities and already taxed material beforehand 33%, and for illegal transactions 10%, so that mainly the part that represents added value remains (informal labor).[19] The tax and social security contribution loss is then derived by multiplying the remaining shadow economy value with the tax and social security burden ratio. In consideration of the tax and social security burden, which is on average 36%, he calculates that the average tax losses for the 33 OECD countries sum up to 2.3% of GDP.[20] If the total figure is translated into percent of the tax and social security contribution receipts, it equates to 6.4%. An example for a country with a comparatively large shadow economy and an accordingly large tax loss in the sample is Croatia. The country has in uncorrected figures a shadow economy worth 28.4% of GDP - and a tax and social security burden of 36.5% - the total tax loss corresponds to 17.1% of all tax receipts.

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[17] Organisation for Economic Co-operation and Development (OECD)

[18] Equates to EUR 3,285,902m or 17.8% of overall GDP.

[19] The first two steps provide a shadow economy worth EUR 1,981,399m.

[20] Equals to EUR 713,056m.

Medina and Schneider (2018) provide estimates for the size of the shadow economy in 158 industrialized and developing countries. They calculate for the sample that the average size of the shadow economy between 1991 and 2015 for all entities was equal to 31.77% of official GDP. Whereas the size varied widely from country to country, as can be seen at the extreme examples of Switzerland with 7.24% and Bolivia with 62.28%. Applying Schneider's above approach to the larger set of estimates and to data on current GDP and tax revenues from the World Bank allows to calculate also for other countries the impact of informality in orders of magnitude. Sticking for comparability first of all to the example of Croatia in 2013 with a shadow economy worth of 25.28% of GDP in uncorrected numbers,[21] and a tax burden of 19.1%,[22] the actual tax loss - irrespective of social security contributions - equals 2.9% of GDP,[23] or 15.2% of the actual tax revenue.[24] Thailand had in the years under review with 50.63% on average one of the largest shadow economies. In the year 2013 its shadow economy was equal to 46.74% of GDP in uncorrected numbers.[25] The tax burden of 17.3% incurred according to the above approach a tax loss in corrected numbers equal to 5.3% of GDP,[26] which equals 30.5% of the actual tax revenue.[27]

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[21] Croatia in 2013: GDP of USD 57,770,884,729; Shadow Economy of USD 14,604,479,660

[22] Tax revenue as a percentage of GDP, this definition is e.g. used by the Heritage Foundation.

[23] Corrected size of the shadow economy in USD: 14,604,479,660 – (14,604,479,660*0.33) – (9,785,001,372 *0.10) = 8,806,501,235; Tax loss in USD: 8,806,501,235*0.191 = 1,682,041,736

[24] Tax revenue in 2013: HRK 63,044,946,300 = USD 11,049,113,047; Exchange rate (mid-rate) in 2013 according to the Croatian National Bank USD 1 = HRK 5.705883.

[25] Thailand in 2013: GDP of USD 419,888,628,523 / Shadow Economy of USD 212,589,612,621

[26] Corrected size of the shadow economy in USD: 212,589,612,621 – (212,589,612,621*0.33) – (142,435,040,456*0.10) = 128,191,536,411; Tax loss in USD: 128,191,536,411*0.173 = 22,177,135,799

[27] Tax revenue in 2013: THB 2,234,672,960,446 = USD 72,729,055,538; Exchange rate (mid-rate) in 2013 according to the Bank of Thailand USD 1 = THB 30.7260.

2.3 Literature Review

Compliance behavior is more eclectic than might be intuitively expected. Levi (1998) argues for instance that people are 'contingent consenters', i.e. that they are in most cases willing to accept policies that do not correspond directly to their preferences as long as they deem the process fair and legitimate. Whereby only governments that give commitments credibility can ensure fair procedures. But as she argues, trustworthiness of the authorities is only a necessary, not a sufficient condition for contingent consent, since people follow the *"norm of contributing one's fair share as long as others are also doing their part" (p. 9),* meaning that compliance will be significantly enforced by ethical reciprocity (Figure 1).

Figure 1: Model of Contingent Consent
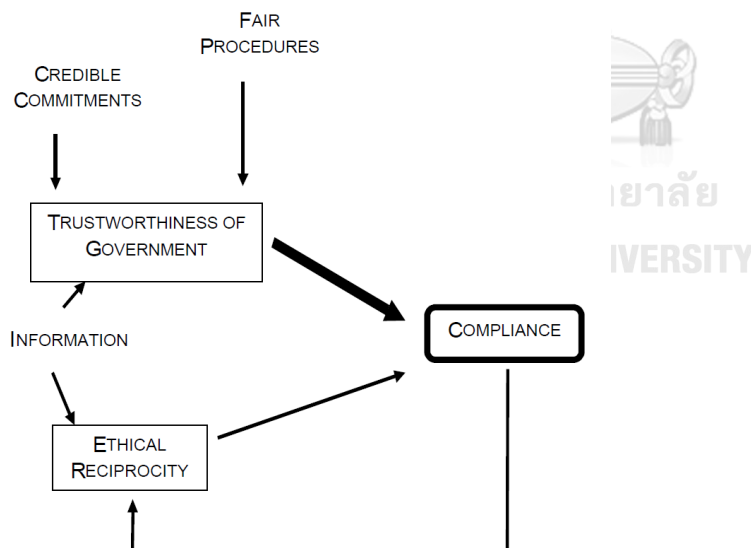
Note: Reprinted from Levi (1998).

Following these arguments, Fjeldstad (2004) identifies three kinds of trust that are important for voluntary compliance: Confidence that the authorities use their revenues

to provide public goods as promised, confidence that authorities *"secure the compliance of the otherwise non-compliant" (p. 10),* and trust in other citizens to contribute their fair share.

In a similar vein as Levi (1998), Frey and Torgler (2007) speak of 'conditional cooperation'. They find a significant correlation between the perceived tax compliance of compatriots and voluntary tax compliance, measured in terms of tax morale.[28] When they introduce generalized trust into the regression the variable shows no significance, which might be interpreted as that generalized trust affects tax morale through the perceived tax compliance of others. Following the original argument of Levi (1998) and Fjeldstad (2004) one might expect mutually increasing effects of generalized trust and institutional trust on tax compliance behavior. D'Hernoncourt and Méon (2012) find likewise Lee (2013) a negative and causal relationship between generalized trust and the size of the shadow economy. They argue that the effect of generalized trust might be driven by institutional trust, but conclude that both forms of trust have separate effects on the shadow economy.

Motivated by evidence that tax morale has a (causal*) negative relationship with the size of the shadow economy (see e.g. Alm *et al.*, 2006; Alm and Torgler, 2006; Barone and Mocetti, 2011; Halla, 2012*; Lee, 2013*; Lisi, 2012; Torgler, 2005; Torgler and Schneider, 2009*), literature has tried to identify determinants of tax morale. The reviewed empirical papers that control for institutional trust, rely in a pragmatical fashion on different institutional trust 'items' largely from the WVS/EVS data inventories (Table 1). They focus on determinants of tax morale across countries

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[28] Voluntary tax compliance is often proxied with surveyed attitudes towards tax compliance. Tax morale, respectively *"the moral obligation to pay taxes"* (Frey and Torgler, 2007, p. 140) is probably the most prominent of these attitudes.

(Alm and Torgler, 2006; Torgler and Schneider, 2006), amid political transitions (Alm *et al.*, 2006; Frey and Torgler, 2007; Torgler, 2007), under different scenarios of political participation (Hug and Spörri, 2011; Torgler *et al.*, 2010), or in the context of enforced and voluntary tax compliance (Fischer and Schneider, 2009; Lisi, 2012; Muehlbacher *et al.*, 2011).[29]

Although, one might expect that confidence in institutions with quite disparate fields of duty might have also very different effects on tax evasion, the findings suggest unambiguously a positive relationship between institutional trust and tax morale, respectively tax compliance.

Table 1: Institutional Trust in the Tax Compliance Literature

Institutional Trust and Tax Morale	**Institutional Trust Items / Confidence in:**
Fischer and Schneider (2009) Hug and Spörri (2011) Torgler (2007) Torgler and Schneider (2006)	Justice System, Government, Parliament
Alm *et al.* (2006)	Justice System, Government (composite measure)
Alm and Torgler (2006) Frey and Torgler (2007)	Justice System, Parliament
Torgler *et al.* (2010)	Justice System
Muehlbacher *et al.* (2011)	Tax Authorities
Institutional Trust and Tax Evasion	**Institutional Trust Items / Confidence in:**
D'Hernoncourt and Méon (2012)	Civil Service, Government
Lisi (2012)	Government

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[29] Following the slippery slope approach by Kirchler *et al.* (2008), this strand of literature interprets institutional trust as a persuasive power of tax authorities affecting voluntary tax compliance measured either by tax morale, or surveyed tax honesty.

While there is a comparatively large body of empirical research on the link between institutional trust and tax morale, hardly any study analyses the relationship between institutional trust and actual tax compliance behavior. Exceptional is in this regard the work by D'Hernoncourt and Méon (2012), respectively Lisi (2012). The papers, which measure institutional trust in slightly different ways (see Table 1), find both an unambiguous negative relationship between institutional trust and the size of the shadow economy. However, neither of them establishes causality. An explanation for the prioritization of attitudes towards tax evasion over actual tax evasion by the research on institutional trust could be the assumption that its effect runs through this attitudes. Strangely, none of the reviewed papers looks into a potential mediator function of tax morale for the effect of institutional trust on tax evasion.[30]

In sum, the theoretical literature assumes that people are 'contingent consenters' whose compliance rests on the belief of fair play, i.e. confidence in authorities to provide public goods as promised, the readiness of authorities to deter free riders, and last but not least, confidence that other citizens contribute also their fair share. The empirical tax compliance literature provides ample evidence for a positive association between confidence in public institutions and the disapproval of tax evasion, whereas evidence for a negative link between the former and actual tax evasion is very scarce. Potential reverse causality between institutional trust and tax evasion is an issue that remains to be addressed. Moreover, research has focused on different institutional trust items, making results - though they point all in the same direction - to a certain extent incomparable. Last but not least, although the strong

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[30] Lisi (2012) regresses the size of the shadow economy also on tax morale, but does not address the interrelationship with institutional trust explicitly.

focus of the literature on tax morale might be interpreted as that the effect of institutional trust on tax evasion is assumed to run through tax morale, none of the papers looks into the relationship between the three factors in detail. Given that there is a negative effect of institutional trust on tax evasion, these elaborations culminate in four research questions: 1) Does confidence in different public institutions have indeed similar effects on the size of the shadow economy?; 2) In the sense that tax compliance depends on both, institutional trust and generalized trust - Is the former a necessary but insufficient condition for 'contingent consent'?; 3) Does the effect of institutional trust on tax evasion run through tax morale?; 4) Is the effect of institutional trust on tax evasion causal?

2.4 Data and Design

2.4.1 Delineation of the Underground Economy

The reviewed tax compliance literature classifies unofficial economic activity unanimously as a form of tax evasion or even as an imperfect measure of its extent (see e.g. Torgler and Schneider, 2009). Following the relevant literature, this section of the thesis employs country estimates of the size of the shadow economy in percent of official GDP. The estimates, which have been derived by Medina and Schneider (2018) via the Multiple Indicators Multiple Causes (MIMIC) method, cover the time between 1991 and 2015. The MIMIC method treats the size of the shadow economy as a latent variable and accounts based on a structural model and a measurement model for various causes and indicators. Medina and Schneider (2018, p. 4) define the shadow economy as including "*all economic activities which are hidden from official*

authorities for monetary, regulatory, and institutional reasons," while *"monetary reasons include avoiding paying taxes and all social security contributions, regulatory reasons include avoiding governmental bureaucracy or the burden of regulatory framework. [...] Institutional reasons include corruption law, the quality of political institutions and weak rule of law. [...] The shadow economy reflects mostly legal economic and productive activities that, if recorded, would contribute to national GDP, therefore the definition of the shadow economy [...] tries to avoid illegal or criminal activities, do-it-yourself, or other household activities".* In acknowledgement of the diverse methodological positions on the underground economy, it has to be noted that institutions as the ISWGNA (1993)[31], and the OECD (2002) draw an additional line between underground and informal sector production. The reasoning is that in many developing countries the state is largely absent in everyday life and *"informal sector activities"* are thus *"not necessarily performed with the deliberate intention of evading the payment of taxes or social security contributions, or infringing labour legislation or other regulations"* (OECD, 2002, p. 161). However, amid the difficulty to distinguish between different and undeniably overlapping intentions that motivate non-observed economic activities, the attribute informal is used in this thesis without any dissociation from the underground, or shadow economy.

2.4.2 Institutional Trust and Social Capital

While the reviewed tax compliance literature does not bother to distinguish between different kinds of institutional trust, the social capital literature provides evidence that

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[31] Intersecretariat Working Group on National Accounts (ISWGNA)

in some cases different groups or dimensions are justifiable (Thomas *et al.*, 2015). However, if a concept is not unidimensional, failure to conceptualize its different dimensions makes it likely to mix-up empirical questions, respectively limits the understanding of the interaction between it and other factors (Stone, 2001). In this regard, factor models might help to distinguish between different groups or dimensions of institutional trust (Thomas *et al.*, 2015). To this end, a factor analysis of confidence in seven distinct public institutions is conducted. The correlation of the underlying WVS/EVS survey items is displayed in Table 17 in Appendix - A2. All items have been frequently employed in empirical economic analyses (see e.g. Knack and Keefer, 1997).

Factor 1 (panel a, Table 2) has an eigenvalue of approximately 5.05 and accounts for around 72% of total variance. The eigenvalues of the other factors are in comparison very small, the largest still below 0.78. The fact that the analysis produces only one factor with an eigenvalue larger than 1 suggests that the survey respondents have a generalized sense of public institutions. The factor loadings for factor1 (panel b, Table 2) are quite large, varying between than 0.68 and 0.94, whereby the loadings are by far the smallest for confidence in institutions that are associated with providing security (army and police - below 0.72).

Mishler and Rose (1997, p. 430) offer the following explanation for the holistic perception of public institutions: Even though citizens tend to trust some institutions more than others, it might well be *"that citizens perceive particular institutions as integral parts of an encompassing social network in which they have a basic trust over and above their evaluations of specific institutions"*.

Table 2: Factor Analysis - Institutional Trust

a) Method: Principal-component factors · · · · · · · · · · · · · · · Number of obs = 96
   Rotation: (unrotated) · Retained factors = 1

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	5.04689	4.27343	0.7210	0.7210
Factor2	0.77347	0.18405	0.1105	0.8315
Factor3	0.58942	0.35047	0.0842	0.9157
Factor4	0.23894	0.06240	0.0341	0.9498
Factor5	0.17654	0.05290	0.0252	0.9750
Factor6	0.12364	0.07255	0.0177	0.9927
Factor7	0.05110	- - -	0.0073	1.0000

LR test: independent vs. saturated: chi2 (21) = 686.67 Prob>chi2 = 0.0000

b) Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Uniqueness
IT Armed Forces	0.6830	0.5335
IT Police	0.7159	0.4875
IT Justice System	0.8788	0.2277
IT Civil Services	0.9088	0.1741
IT Parliament	0.9378	0.1206
IT Government	0.8980	0.1936
IT Political Parties	0.8854	0.2160

c) Scoring coefficients

Variable	Factor1
IT Armed Forces	0.13533
IT Police	0.14185
IT Justice System	0.17413
IT Civil Services	0.18007
IT Parliament	0.18581
IT Government	0.17793
IT Political Parties	0.17544

Source: Author's calculations based on data from WVS (2015); EVS (2011)

Beside institutional trust this section relies on two additional social capital components that have been found to have a significant effect on the size of the shadow economy, these are generalized trust, and tax morale. In line with the empirical literature, the study resorts for measures of these social capital components also to the (WVS/EVS) Integrated Values Surveys 1981-2014 dataset.

All single survey items have been scaled at the individual level in a way that higher values indicate more social capital, i.e. more confidence in public institutions (armed forces, police, justice system, civil service, government, parliament, political parties), more (generalized) trust in other people, and more tax morale measured by the perceived justifiability of cheating on taxes. Subsequently, the longitudinal dataset

was collapsed on the country variable so that the resulting measures represent national averages. Further on, in order to account for the respondents' holistic view of public institutions two indexes were created, one synthetic index that is based on the 1st factor of all seven institutional trust items (scoring coefficients in panel c, Table 2) and a 'naive' composite index which is based on their average values. While the latter represents the mean confidence in (respectively across) the 7 public institutions (4 point scale), the tax morale variable expresses the average extent of disapproval of tax evasion (10 point scale). The generalized trust measure reflects the national percentage of respondents who stated trust in other persons.

2.4.3 Control Variables

Torgler and Schneider (2009) find a negative relationship between economic development and the size of the shadow economy and reason that in developing countries constraints for entrepreneurial activities are higher, while exemption levels for taxes are lower. An additional explanation for this direction of the relationship is given by Maloney (2004), who emphasizes that with increased labour productivity and larger salaries in the formal sector, being informal has higher opportunity costs. Thus, the informal sector, which is characterized by low capital and technology intensity, is all the more attractive when productivity in the formal sector is low. The level of economic development is proxied throughout all specifications by the log of GDP per capita in constant 2010 USD[32] (retrieved from: World Bank, 2016a).

Johnson *et al.* (1997) indicate that informality can be seen foremost as a vehicle to escape exuberant taxation, regulation, and corruption. They assume that the

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[32] United States dollar (USD)

burden of the former two aspects extents the leeway for corrupt officials - *"the higher the level of taxation and regulation* […]*, the greater are the bribes that politicians can extract from entrepreneurs in return for excusing them from paying taxes or following regulations" (p. 170).* Lassen (2007) indicates in turn that pervasive corruption hampers the efficient transformation of taxes into public goods, and thus may cause lower tax compliance. Friedman *et al.* (2000) point in regard to the burden of regulation and corruption in the same direction as Johnson *et al.* (1997), but find in contrast that higher taxation is not associated with a larger shadow economy, which they attribute to a potential connection with a better legal environment. Moreover, they find that weak protection of property rights goes along with more unofficial economic activity. The empirical framework accounts for the impact of taxation by tax revenue in percentage of GDP (retrieved from: World Bank, 2016).

In order to control for institutional quality, three indices are employed: Freedom from corruption, business freedom, and protection of property rights (scaled 0 to 100/strong, retrieved from: Heritage Foundation, 2016).

While a deficient institutional environment has been found to make formality less desirable, unconditional social security benefits should intuitively increase the appeal of the shadow economy. Maloney (2004, p. 15) emphasizes in this regard that *"universal basic medical care not linked to other dimensions of formality is implicitly a subsidy to those contemplating leaving formal protections for informal entrepreneurship".* Incentives inherent to public healthcare are represented by a dummy variable that is equal to 1 when primary health care is publicly funded (retrieved from: STC, 2017)[33].

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[33] Stephane Tajick Consulting and Best Development Group Ltd (STC)

2.4.4 Empirical Strategy

Merging of the longitudinal data from the different sources results in a panel that spans over 24 years (1991-2014) and 99 industrialized and developing countries from all over the world. Since the panel is due to the wave pattern of the WVS and EVS very unbalanced and social capital is very persistent over time, the empirical framework relies on a cross-sectional OLS analysis (see section 1.3). The full model specification is as follows:

$$Size\ of\ the\ Shadow\ Economy_i = \alpha + \beta_1\ IT_i + \beta_2\ SC_i + \emptyset'X_i + \epsilon_i$$

Where IT_i is institutional trust (either the synthetic index or the naive composite index), SC_i (social capital) is either generalized trust or tax morale, and X_i is a vector of the determinants of the size of the shadow economy from the earlier literature that have been introduced above. Descriptive statistics for all variables can be found in Appendix - A2 (Table 15). The sources of the variables are listed in Table 3.

Since a lack of due tax enforcement might lead to less confidence in public institutions, institutional trust could be endogenous to the size of the shadow economy. Accounting for this fact, the subsequent paragraphs introduce three instruments for institutional trust that are employed in subsequent Two-Stage Least Squares (2SLS) regressions.

Several empirical studies emphasize that Muslims in European countries report a significantly higher confidence in public institutions when surveyed, as adherents of other religious denominations including the native population. Commonly, this is explained with their migrant status, either by the argument that individuals who have left their homeland are predisposed to see institutions in their destination country more positively (Maxwell, 2010), or more specifically by the

origin from repressive autocratic states, which makes migrants more appreciative for democratic principles and thereby leads to positive attitudes towards institutions as the judiciary (Doerschler and Jackson, 2012). However, analysis of the data at hand, indicates that the phenomena of higher confidence is not limited to Muslim minorities in European countries. The naive composite indexes for confidence in public institutions has of all recorded major religious denominations (namely Buddhism, Christianity, Islam and Hinduism) only a significant positive correlation (1% level) with the share of Muslims in the respective population. The work of Guiso et al. (2003) gives a different explanation for this phenomena. They find that active participation in religion relates to more confidence in government institutions, whereas this kind of relationship is the strongest for Hindus and Muslims. Analysis of the employed survey data in regard to affiliation in one of the four major world religions and self-assessed religiosity (as well as service attendance) indicates that only the Islamic Community has a significant positive correlation with both criteria [Buddhists -0.3584*** (0.0037); Christians 0.1062 (0.1118); Hindus 0.0653 (0.1103); Muslims 0.3332*** (0.2608***)]. Although across all religions both measures of religiosity seem to be unrelated to institutional trust (naive index)[34] [-0.0791 (0.0468)], a replication of this analysis with interaction terms for the single religions and self-assessed religiosity (service attendance) shows only for the Islamic Community a significant and positive correlation for both measures of religiosity [Buddhists 0.1508 (0.1210); Christians -0.1954* (-0.1565); Hindus 0.1154 (0.1217); Muslims 0.2751*** (0.2767***)]. By generalizing the argument by Putnam (1993) that the Catholic Church often in close liaison with the state established hierarchical

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[34] The results are similar for the synthetic institutional trust index.

structures in societies to any strong hierarchical religion, La Porta et al. (1996) collaterally point to a rationale for this result. If a church establishes in symbiosis with the state vertical allegiances, its adherents might be more amenable to public institutions than they would be in a secular environment. In line with this theory, the share of respondents that reported in the WVS/EVS to be of Islamic faith is employed as instrument for institutional trust.

The second instrument is intended to capture whether nations have been faced in history with pervasive social disruptions originating from the transition to the current state system or its predecessors that might have led to an alienation from public institutions. The binary variable accounts for two possible causes, either the transition from a communist to a market economy or extractive colonialization. Accounting for the fact that the political transition in many formerly communist countries led initially to pervasively corrupt and inefficient new state systems (Alm *et al.*, 2006; Mishler and Rose, 2001), the binominal variable was coded 1 if such institutional discontinuities were listed in 'The World Factbook' of the CIA (2017)[35]. Data on extractive colonization was retrieved from Acemoglu et al. (2001) and Hensel (2014). Following Acemoglu *et al.* (2001), (2002), who argue that European settlers introduced extractive institutions where the disease environment forbade large European settlements, extractive colonialization for a former colony was acknowledged whenever Acemoglu et al. (2001) stated - according to the criteria of Gutierrez (1986) - a 'high mortality rate of European settlers' (more than 23 per

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[35] Central Intelligence Agency (CIA)

1000). The mortality rates are for illustrative purposes displayed in Table 18 in Appendix - A2.[36]

The third instrument is the polity2 index, which accounts for the effect 'of having a say' on policies. While the findings of Hug and Spörri (2011) suggest that political institutions that allow for (direct) political participation might increase institutional trust, Van der Meer and Thompson (2017) point to the fact that institutional trust is often comparatively lower in liberal democracies than in illiberal and non-democratic regimes. Dalton and Welzel (2014) explain this as follows. Democracies allow for debates and dissent, while autocratic states suppress both, which might lead to more critical citizens in democratic regimes. Following Dalton and Welzel (2014), more democratization should then result in less institutional trust. The instrument which was retrieved from INSCR (2016) is scaled from -10 (strongly autocratic) to +10 (strongly democratic).[37]

The four research questions are hereafter approached as follows: (1) To analyze the effect of confidence in different public institutions on the size of the shadow economy, all seven institutional trust items as well as both indexes are sequentially included in the regressions; (2 & 3) To see whether the effect of institutional trust on the size of the shadow economy depends on the presence of generalized trust, respectively to investigate whether tax morale functions as a vehicle

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[36] The categorization of countries was conducted according to the fourth estimate. The following countries were neither communist nor covered by Acemoglu *et al.* (2001). Coding was conducted according to the bracketed information: Korea and Taiwan (Japanese settlers and naturalization); Lebanon (under French rule, in the vicinity of Egypt); Jordan, Kuwait, and Qatar (not colonies: British Protectorates); Philippines (mostly under Spanish rule, high mortality); Vietnam (former French colony, but currently a socialist single-party state); Zambia and Zimbabwe (under British rule, in the vicinity of Angola / former Zaire).

[37] Integrated Network for Societal Conflict Research (INSCR)

for the effect of institutional trust, the full model specification which includes the synthetic institutional trust index is sequentially augmented with generalized trust and tax morale; (4) In order to establish causality in the relationship between institutional trust and the size of the shadow economy, both institutional trust indexes are instrumented in 2SLS regressions with the three above introduced variables.

First-stage specifications:

$$Institutional\ Trust_i = \alpha + \beta_1\ Mus_i + \beta_2\ Dis_i + \beta_3\ Pol_i + \emptyset'X_i + \epsilon_i$$

Where $Institutional\ Trust_i$ is either the synthetic or the naive index. Mus_i is the share of Muslims in the population, Dis_i stands for social disruptions, Pol_i is democratization (polity2), and $\emptyset'X_i$ is a vector of the determinants of the size of the shadow economy from the earlier literature.

Table 3: Data Sources: Shadow Economy

Dependent Variable	
Size of the Shadow Economy	Estimates of the size of the shadow economy (1991 - 2015) derived by Medina and Schneider (2018) via the Multiple Indicators Multiple Causes (MIMIC) method.
Key Variables	
Institutional Trust • Confidence in: Armed Forces • Confidence in: Police • Confidence in: Justice System • Confidence in: Civil Services • Confidence in: Government	The attitudinal social capital data was retrieved from the 'Integrated Values Surveys 1981-2014 dataset' which consists of the merged longitudinal data inventories of the World Values Survey (WVS, 2015) and the European Values Study (EVS, 2011). All WVS/EVS survey questions are depicted in Appendix - A1. • Confidence in: Parliament • Confidence in: Political Parties
Generalized Trust	
Civic Norms: Justifiability of Cheating on Taxes (Tax Morale)	

Table 3 (cont'd): Data Sources: Shadow Economy

Control Variables	Retrieved from:
Log of GDP pc	Open Data - World Bank (2016a) / Constant 2010 USD
Tax Revenue in % of GDP	World Development Indicators - World Bank (2016)
Freedom from Corruption	Heritage Foundation (2016)
Property Rights	Scaled 0 (weak) to 100 (strong)
Business Freedom	
Free Primary Healthcare	2018 STC Health Index - STC (2017)
Instruments for Institutional Trust	
Muslim	Share of respondents who reported in the WVS (2015) and EVS (2011) to be of Islamic faith.
Disrupted	
• Extractive colonization	Created from: Acemoglu et al. (2001) and Hensel (2014)
• Transition from a communist to a market economy	Created from: CIA (2017)
Polity2 Index	Democratization Index - INSCR (2016)
	Scaled -10 (weak) to +10 (strong)

2.5 Results and Discussion

Specifications (1) to (11) in Table 5 report results of Ordinary Least Squares regressions, in which the size of the shadow economy is under control for the institutional environment regressed on seven institutional trust items (separately and in index form), generalized trust, and tax morale.[38] The coefficients indicate unequivocally that institutional trust has a negative effect, whereby the relationship seems more pronounced (significant) for confidence in institutions that are typically associated with security (police; armed forces), respectively with political

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[38] Since Breusch-Pagan / Cook-Weisberg tests indicated heteroskedasticity all results in Table 5 rely on robust White-Huber standard errors.

participation (parliament; political parties) than for confidence in institutions which might be identified with the enforcement of property rights (justice system), or the provision of public goods (civil services; government). The t-statistics of the synthetic and the naive index fall broadly into the same range as the t-statistics of confidence in institutions associated with security and political participation. Moreover, generalized trust and tax morale, which are included to proxy the belief that others also contribute their fair share as well as the moral obligation to pay taxes, display as expected a negative sign and significance at conventional levels. Consequently, it can be concluded that more social capital is throughout associated with a smaller shadow economy (see in this regard also Table 16 in Appendix - A2).[39] It is noteworthy however, that the institutional trust items, which are associated with security and political participation, are more significant than tax morale. The results of Lisi (2012) corroborate also a subordinate significance of tax morale. She even finds that the effect of confidence in the government on the shadow economy is more significant

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[39] Table 16 contains for a better overview of the effect of social capital on the shadow economy beside specifications that include the social capital measures of this study, also specifications with the social capital measures from study 2, whereby all regressions rely on the same set of controls. The composite measures of study 2 are based on the mean of the following survey items: Institutional trust (confidence in the police, justice system, and parliament); civic norms (justifiability of avoiding a fare on public transport, cheating on taxes, and accepting a bribe); civic engagement (member in sport/ recreation, art/ music/ education, and charity/ humanitarian - organization). The social capital index is based on the 1st principal component of all 10 survey items, including generalized trust. The coefficient of the social capital index (SC I) indicates a negative and highly significant relationship between social capital and the size of the shadow economy. Furthermore, Table 16 contains three pooled OLS regressions (based on decade level data) which include either generalized trust, or one of the two institutional trust indexes. The coefficients of all three trust variables show a smaller magnitude and lower t-statistics than under OLS.

than the effect of tax morale. A reason might be that the underlying survey item suffers from extensive overstating as experiments suggest (see Andreoni *et al.*, 1998). Economic development is in all specifications negative and significant at the 1% level, which solidifies the theory that economically advanced countries provide more conducive environments for entrepreneurial activity, respectively that - from a laborer's perspective - opportunity costs of informality increase with higher productivity in the formal sector. The coefficient of taxation is positive and under control for the synthetic institutional trust index significant at the 10% level, which can be interpreted in favor of the idea that informality is a vehicle to escape taxation. Freedom from corruption seems to make informality less attractive, its coefficient is only insignificant at conventional levels when it is controlled for generalized trust or confidence in the police. Lee (2013), who is faced with a significant coefficient of corruption and an insignificant coefficient of generalized trust, concludes that social capital (or more precisely generalized trust) affects the size of the shadow economy through its impact on corruption. However, the insignificant coefficient of freedom from corruption suggest that the link between generalized trust and corruption runs the other way around. The coefficients of the measures for business freedom, the protection of property rights and free primary healthcare have through all specifications low t-statistics and partly also an unexpected sign.

Specification (12) encompasses beside the synthetic institutional trust index also generalized trust. Compared with specifications (1) and (11) the coefficients of both variables show only modest changes. D'Hernoncourt and Méon (2012), who also regress the size of the shadow economy on both variables, observe changes of similar size. Amid this result and the fact that their institutional trust items (government; civil

service) show no significant correlation with generalized trust, they conclude that both types of trust measure different sentiments and thereby logically have separate effects on the size shadow economy. A correlation analysis in Table 17 (Appendix - A2), supports the alterity of both forms of trust. Of all institutional trust items only confidence in the police, courts, and political parties (the latter only to a minor extent) are significantly correlated with generalized trust.

Following the claim of Levi (1998) that institutional trust is only a necessary but not a sufficient condition for compliance, an interaction term for the product of institutional trust and generalized trust in their undemeaned form is added in specification (13).[40] As a result, the t-statistics of institutional trust become very small and the significance of generalized trust falls to the 10% level. This indicates that both factors need a minimum of the other to develop their full clout. Replacement of both undemeaned variables in the interaction term with their demeaned versions in specification (14), increases the t-statistics of institutional trust drastically, respectively leaves both variables marginally significant.[41] The negative sign of the interaction terms indicates also that both factors increase each other's effect, though the coefficient is far from being significant at conventional levels.

Specification (15) includes the synthetic index and tax morale. In case that the effect of institutional trust on tax compliance runs indeed mainly through tax morale, the former should lose most of its effect on the shadow economy, but the change in

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[40] Adding an interaction term of two variables in their undemeaned form makes the main effect of each variable the effect of the respective variable for a value of zero of the other. For a brief summary on the interpretation of interaction terms see Williams (2015).

[41] Adding an interaction term of two variables in their demeaned form makes the main effect of each variable the effect of the respective variable for an average value of the other.

the coefficient of institutional trust is only marginal. The results indicate thereby that tax morale has no mediator function for institutional trust.

Specifications (16) and (17) report 2SLS regressions in which both institutional trust indexes are instrumented by: 1) The share of the population that stated in the WVS/EVS surveys to be Muslim; 2) A dummy measuring whether a country has a national history of pervasive social disruptions; 3) A democratization index. The coefficient of the naive index is more than one-third larger than the corresponding coefficient in specification (10), but relates very closely in terms of the t-statistics. The coefficient of the synthetic index (based on the 1st factor of institutional trust) in specification (17), is a bit larger in magnitude, but has slightly smaller t-statistics than the coefficient in specification (11). In the first-stage regressions all instruments show the expected sign and significance at conventional levels. Overidentification tests (Hansen's J statistic) do not reject the null that the instruments are uncorrelated with the error term, and underidentification tests (Kleibergen-Paap rk LM statistic)[42] indicate that the instruments are correlated with both institutional trust indexes. Accordingly, the instruments can be deemed valid and relevant (Baum et al., 2007). In regard to nonzero but small correlation between the endogenous variable and the multiple instruments both first-stage F-statistics[43] (weak identification test) are larger than 10, and thereby pass the rule of thumb by Staiger and Stock (1994). Comparison with the more specific critical values of Stock and Yogo (2005) in Table 4 reveals for both specifications that the maximal instrumental

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[42] "The LM [Lagrange multiplier] version of the Kleibergen–Paap rk statistic can be considered as a generalization of the Anderson canonical correlation rank statistic to the non-i.i.d. (independently and identically distributed] case" (Baum et al., 2007, p. 487).

[43] Kleibergen-Paap rk Wald F-statistic

variable (IV) bias in comparison to OLS is under 5% and the size distortion of the Wald test based on IV statistics is slightly above 10%.[44] Endogeneity test (based on the difference of two Sargan-Hansen statistics in which the regressor is treated once as endogenous and once as exogenous) fail for both specifications to reject the null that institutional trust can be treated as exogenous, which indicates that OLS should be preferred to 2SLS and that reverse causality is not an issue.

Table 4: Critical values for the weak instrument test (significance level 5%)

5% maximal IV relative bias	13.91
10% maximal IV relative bias	9.08
20% maximal IV relative bias	6.46
30% maximal IV relative bias	5.39
10% maximal IV size	22.30
15% maximal IV size	12.83
20% maximal IV size	9.54
25% maximal IV size	7.80

Source: Reproduced from Stock and Yogo (2005).

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[44] While Baum *et al.* (2010, p. 8) state in the help file of the unofficial Stata command 'ivreg2' that *"the critical values reported by ivreg2 for the Kleibergen-Paap statistic are the Stock-Yogo critical values for the Cragg-Donald i.i.d. case"*, a more recent strand of the literature offers also specific critical values for robust first stage F-statistics (see: Andrews and Stock (2018); Olea and Pflueger, 2013; Pflueger and Wang, 2015).

Table 5: Determinants of the Shadow Economy

Dependent Variable: Size of Shadow Economy in % of GDP (statistics robust to heteroskedasticity)

	(1)	(2)	(3) Armed F	(4) Police	(5) Justice	(6) Civ Serv	(7) Parl	(8) Gov	(9) Parties	(10) IT Naive	(11) IT Synt	(12) IT Synt	(13) IT Synt	(14) IT Synt	(15) IT Synt	(16) IT Naive	(17) IT Synt
						OLS										2SLS	
Institutional Trust			-7.543** (-2.24)	-9.668*** (-2.67)	-5.203 (-1.45)	-6.490 (-1.60)	-7.456** (-2.50)	-5.010 (-1.58)	-10.08*** (-3.18)	-8.852** (-2.33)	-2.970** (-2.26)	-2.078* (-1.86)	-0.177 (-0.07)	-2.005* (-1.88)	-2.751** (-2.09)	-13.652** (-2.28)	-3.691* (-1.99)
Tax Morale		-2.578* (-1.87)													-2.019 (-1.51)		
D-Interact IT*GT														-6.949 (-0.85)			
Interact IT*GT													-6.949 (-0.85)				
Generalized Trust	-25.581*** (-2.90)											-18.802* (-2.43)	-15.282* (-1.73)	-15.282* (-1.73)			
Log GDP per Capita	-4.180*** (-3.18)	-4.556*** (-3.26)	-4.389*** (-2.83)	-4.011*** (-2.68)	-4.279*** (-2.89)	-4.298*** (-2.74)	-4.487*** (-3.01)	-4.353*** (-2.86)	-5.561*** (-3.33)	-4.369*** (-2.86)	-5.021*** (-2.76)	-4.674*** (-2.78)	-4.635*** (-2.70)	-4.635*** (-2.70)	-5.176*** (-3.05)	-5.602*** (-2.86)	-5.107** (-2.62)
Tax Rev in % of GDP	0.145 (1.16)	0.187 (1.34)	0.205 (1.50)	0.234 (1.66)	0.182 (1.28)	0.210 (1.46)	0.193 (1.38)	0.156 (1.10)	0.220 (1.40)	0.174 (1.23)	0.291* (1.88)	0.244* (1.72)	0.260* (1.76)	0.260* (1.76)	0.292* (1.84)	0.262 (1.45)	0.294 (1.65)
Free. from Corruption	-0.139 (-1.18)	-0.297*** (-2.64)	-0.292*** (-2.77)	-0.149 (-1.32)	-0.246** (-2.19)	-0.257** (-2.37)	-0.225** (-2.09)	-0.262** (-2.40)	-0.211** (-2.02)	-0.221** (-2.04)	-0.215* (-1.95)	-0.120 (-1.00)	-0.112 (-0.96)	-0.112 (-0.96)	-0.214* (-1.90)	-0.168 (-1.28)	-0.187 (-1.42)
Property Rights	-0.049 (-0.44)	0.036 (0.28)	0.008 (0.07)	-0.052 (-0.45)	0.014 (0.12)	-0.002 (-0.02)	-0.020 (-0.18)	-0.017 (-0.15)	-0.027 (-0.24)	-0.023 (-0.20)	-0.026 (-0.24)	-0.071 (-0.68)	-0.094 (-0.87)	-0.094 (-0.87)	-0.018 (-0.16)	-0.041 (-0.33)	-0.050 (-0.41)
Business Freedom	0.141 (0.91)	0.162 (1.00)	0.148 (0.92)	0.0987 (0.63)	0.117 (0.75)	0.120 (0.73)	0.113 (0.73)	0.139 (0.88)	0.176 (1.07)	0.110 (0.70)	0.166 (1.02)	0.160 (0.99)	0.160 (0.98)	0.160 (0.98)	0.172 (1.05)	0.144 (0.87)	0.153 (0.93)
Primary Care	0.672 (0.16)	0.270 (0.06)	0.168 (0.04)	1.883 (0.42)	0.606 (0.13)	0.545 (0.11)	0.637 (0.15)	1.480 (0.32)	-0.0911 (-0.02)	1.120 (0.25)	-0.584 (-0.13)	-0.568 (-0.14)	-0.524 (-0.13)	-0.524 (-0.13)	-1.045 (-0.24)	0.367 (0.09)	-0.314 (-0.07)
Constant	69.12*** (6.46)	89.05*** (5.83)	87.91*** (5.33)	86.71*** (5.91)	78.76*** (5.17)	82.24*** (5.03)	85.83*** (5.75)	79.05*** (5.15)	94.55*** (6.34)	89.176*** (5.49)	68.458*** (5.54)	69.601*** (6.13)	69.235*** (6.07)	69.235*** (6.07)	86.863*** (6.14)	106.975*** (4.66)	69.816*** (5.40)
N	84	82	83	83	82	81	83	83	81	83	79	79	79	79	79	78	76
adj. R²	0.599	0.549	0.579	0.588	0.560	0.564	0.586	0.560	0.594	0.582	0.587	0.611	0.610	0.610	0.590	0.587	0.579
F	28.21	34.11	32.41	32.75	33.24	32.02	30.66	29.35	27.68	31.193	31.326	28.877	24.461	24.461	31.696	26.736	26.079

First-Stage Regressions (control variables and constant term not reported)

	(16)	(17)
Muslim	0.194* (2.03)	0.597* (1.88)
Disrupted	-0.372*** (-4.54)	-1.241*** (-4.58)
Polity2	-0.024*** (-3.51)	-0.077*** (-3.35)
Underid. Test (Kleibergen-Paap rk LM-statistic)	0.0001	0.0001
Weak Id Test (Kleibergen-Paap rk Wald F-statistic)	21.295	20.599
Overid. Test	0.4347	0.4612
Endog. Test	0.6583	0.5448

Notes: t-statistics in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01.   For definitions and sources of variables see section 2.4 and Table 3.   F test of excluded instruments (spec.16; 17): Prob > F = 0.0000.

2.6 Intermediate Conclusion

The results of this study suggest that institutional trust has a significant and negative relationship with the size of the shadow economy. The result is not driven by endogeneity, which substantiates causality.

The results of the factor analysis suggest that people have a holistic perception of public institutions. Correspondingly, all seven institutional trust items display a negative and significant relationship with the shadow economy.

Regressions with interaction terms for institutional trust and generalized trust do not underpin a standalone effect of institutional trust on the shadow economy. The relationship between confidence in public institutions and the size of the shadow economy is insignificant when both variables enter the regressions in their demeaned form, i.e. institutional trust is insignificant when the value of generalized trust is set equal to zero. But it becomes significant when generalized trust is set at its average value. Consequently, it can be concluded that confidence in public institutions (e.g. to spend tax money as promised, or to deter tax evaders) alone is not a sufficient condition for tax compliance. Presumably, it needs for institutional trust to become effective also a minimum of trust that others contribute their fair share.

The correlation between tax morale and the size of the shadow economy is negative but only marginally significant at conventional levels, which indicates a weaker link between both factors than found by earlier work. Simultaneous control for institutional trust and tax morale shows correspondingly that the effect of the latter is not mediated by the former.

3. FISCAL CYCLICALITY

3.1 Motivation

The fact that fiscal policy in developing countries predominantly follows the business cycle, though procyclicality implies spending cuts during downturns that further exacerbate economic contraction, is a persistent thematic anchor in the literature (Frankel *et al.*, 2013). Figure 2 gives an overview of the differences in the cyclicality of fiscal policy in 104 industrialized and developing countries.

While earlier work identified as cause for the phenomena particularly a lack of access to credit markets (cf. Riascos and Vegh, 2003), more recent work found evidence that effects of the institutional environment are the dominant cause (cf. Calderón and Schmidt-Hebbel, 2008). Two institutional factors that received particular attention because they are assumed to affect the societal consensus on fiscal moderation in economic good times - the natural premise for countercyclical spending in bad times - are fiscal rules and corruption. This study argues that lacking social capital is a hitherto neglected cause of fiscal procyclicality by its own means, but also since it affects the adoption of fiscal rules and the extent of corruption.

The remainder of this section is organized as follows. Section 3.2 reviews the literature on fiscal cyclicality, fiscal rules, corruption, and social capital. Section 3.3 presents the data and outlines the empirical framework. Section 3.4 discusses the results. Section 3.5 contains intermediate concluding remarks.

Figure 2: Fiscal Cyclicality (1981 - 2014)
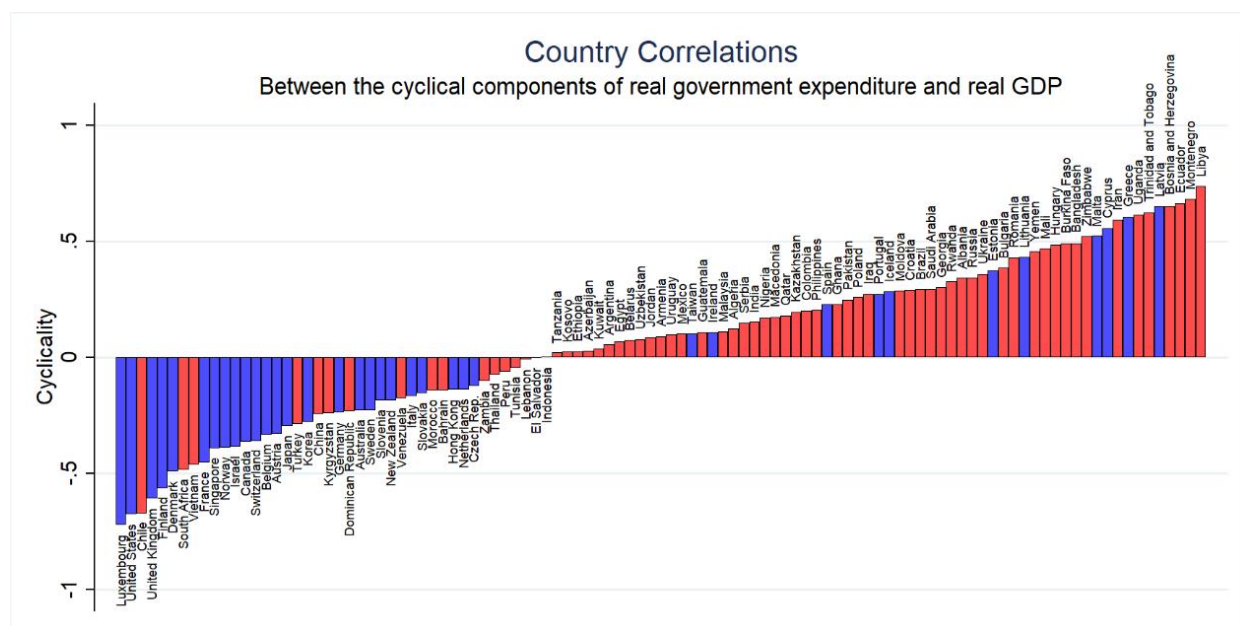
Notes: Adapted from Frankel *et al.* (2013). Blue = industrialized countries, red = developing countries.
Source: Author's calculations based on data from IMF (2017).[45]

3.2 Literature Review

Frankel *et al.* (2013) find that many of the emerging economies that 'graduated' in the last 25 years from procyclical to countercyclical fiscal policy achieved this due to increased institutional quality. Alas, they do not explain in detail in which ways institutional quality affects the choice of fiscal policy.

By explaining how corruption might lead to the political distortions described by Talvi and Vegh (2005), Alesina *et al.* (2008) shed partially light on this relationship. They find that corruption is negatively associated with fiscal countercyclicality in democracies and reason that although voters can replace corrupt

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[45] International Monetary Fund (IMF)

politicians, they are not able to prevent the creation of political rents. This fuels the demands for more public goods when it is evident that the economy is expanding. Consequently, the state embarks on a procyclical fiscal policy path initiated by excessive overborrowing in good times instead of reserve accumulation. The expenditure increasing effect of corruption is also shown by Sironi and Tornari (2013), whose work indicates that corruption plays a decisive role in the rise of government spending. Petrarca and Ricciuti (2013) claim that the extend of corruption is determined by social capital. In line with this assertion, literature has focused on links between both factors that run through the supply and demand for certain kinds of policymakers and bureaucrats. Nannicini *et al.* (2013) propose e.g. foremost that more civic minded voters keep politicians accountable and thereby disincentivize clientelism and corruption. Bjørnskov (2010, p. 325), however, who empirically analyses for social trust explicitly both transmission mechanisms, concludes that social trust diminishes corruption rather through *"the supply of honest economic and political agents"* than through the normative expectations of trusting voters.

Stanova (2012) points out that opportunistic behavior in the context of fiscal policy can be mitigated by the implementation of fiscal rules. One reason could be that in face of public pressure to increase government spending, fiscal frameworks provide the necessary political cover for prudent fiscal policies (Lavigne, 2011). Accordingly, Manasse (2006) finds evidence that fiscal rules tend to reduce deficits and enhance countercyclicality. However, he also draws attention to the possibility that the effects of fiscal frameworks might not be independent, since under control for measures of social, institutional, economic, and financial vulnerability, fiscal rules appear to be insignificant. This result coincides with the findings of Heinemann *et al.*

(2014), who claim that fiscal rules are negatively related to sovereign risk premia, but that the measurable impact is dampened when it is controlled for generalized trust. They assume that fiscal rules mirror fiscal preferences, respectively that positive effects of institutionalized fiscal constraints *"can almost entirely be explained by the fact that mainly countries with a more pronounced stability culture adopt [...] fiscal rules" (p. 123)*, or as Alesina and Passalacqua (2016, p. 54) note *"the adoption of certain budget institutions may be endogenous to certain cultural traits"*.

In this regard social capital indicates a certain culture that facilitates fiscal stability. Heinemann *et al.* (2014) point out that the faith in other citizens' good intentions determines to which extent people are able to overcome typical societal coordination failures as unsustainable public debt and are willing to accept policies that entail short-term losses, which is explained in reference to evidence for a facilitating effect of generalized trust on policy reforms (Heinemann and Tanz, 2008), as well in reference to evidence for a positive effect on the inclination to accept costs of consolidations (Heinemann and Hennighausen, 2012). Beside generalized trust, the fiscal literature focusses also on institutional trust, which is assumed to be a premise to overcome reform resistance, since it increases the credibility of state experts and politicians in situations of limited information and makes compensation promises more credible to potential reform losers (Heinemann and Grigoriadis, 2016). Bursian *et al.* (2015) find for instance that even though fiscal adjustments are more palatable in economically good times, mainly high-trust governments are able to conduct these at that times. The work of Schaltegger and Torgler (2005) might be interpreted as further evidence for the role of institutional trust. They use electoral support of government proposals in Swiss cantonal ballots as a measure for trust and find that it

is an important determinant of fiscal discipline. While the above mentioned work indicates that forms of trust and civic mindedness (measured by Nannicini *et al.* (2013) with characteristics similar to the ones of civic engagement) might facilitate the consensus to moderate expenditure in economic good times, civic norms and actual forms of civic engagement as they are typically employed in the analysis of collective action (cf. Knack and Keefer, 1997) play no explicit role in the reviewed literature on fiscal cyclicality. Nevertheless, since the distributional issues that come along with economic reforms concern specific societal groups that cannot be sure to have repeated encounters, the situation is akin to an one-shot ultimatum game, in which the notion of fairness (Camerer and Thaler, 1995) and its institutionalization in rules of good conduct or civic norms might affect the trust one group is willing to put into the propriety of the other. Following Putnam (1995) in that networks of civic engagement create a feeling of community, civic engagement should also be relevant in reform situations, especially when short-time losses have to be weighed up with long-term benefits whereof the future distribution is uncertain.

3.3 Data and Design

3.3.1 Cyclicality of Government Expenditure

While fiscal cyclicality can in principle be examined from two different directions - government spending and taxes, most research focusses on spending for the reason that the development of tax revenues is endogenous to the business cycle (Frankel *et al.*, 2013). In line with earlier work (cf. Frankel *et al.*, 2013; Kaminsky *et al.*, 2004), the dependent variable is created from country correlations between cyclical

components of real government expenditure (deflated by the GDP deflator) and real GDP, which are retrieved through a Hodrick-Prescott Filter with $\lambda = 6.25$ (cf. Ravn and Uhlig, 2002).[46] Both data series are taken from the IMF (2017).

3.3.2 Social Capital

The key variables depend on ten survey items (see italics in Table 6) from the Integrated Values Surveys dataset of the World Values Survey (WVS, 2015) and European Values Study (EVS, 2011) which typify in the literature constituents of social capital (cf. Knack and Keefer, 1997).[47]

After the scaling of the single characteristics such that higher values indicate more social capital, country mean values were created. Then, for an insight into the relationship between different dimensions of social capital and cyclicality the characteristics have been compounded into four indicators which are displayed in panel b) of Table 6. These represent the percentage of respondents who trust strangers (generalized trust: GT) and the mean values of each three survey items in regard to institutional trust (IT), civic norms (CN), and civic engagement (CE). Furthermore, the features of the single characteristics have been condensed by a principal component analysis (PCA) into three social capital indexes (see Heinemann *et al.*, 2014; Tabellini, 2010) which are based on the 1st, the 2nd, and the 3rd principal component, respectively.[48] The 1st component explains 33.8% of the total variability - panel a). The eigenvectors in panel b explain how the variables contribute to the

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[46] The resulting values are multiplied by a factor of 10.

[47] The pairwise correlation between all social capital survey items is displayed in Table 20.

[48] According to the Kaiser criterion (eigenvalue larger than 1) three components have been retained.

indexes. Figure 2 gives a first insight into the relationship between social capital - measured by the 1st PC index - and fiscal cyclicality.

Table 6: Principal Components Analysis - Social Capital

Panel a)

Component	Eigenvalue	Difference	Proportion	Cumulative
1	3.37535	0.76558	0.3375	0.3375
2	2.60976	0.82440	0.2610	0.5985
3	1.78537	0.89378	0.1785	0.7770
4	0.89158	0.43494	0.0892	0.8662
5	0.45664	0.18460	0.0457	0.9119
6	0.27204	0.045215	0.0272	0.9391
7	0.22682	0.043082	0.0227	0.9618
8	0.18374	0.047315	0.0184	0.9801
9	0.13643	0.074158	0.0136	0.9938
10	0.62268	….	0.0062	1.0000

Panel b)

Variable	Eigenvectors:	Comp 1	Comp 2	Comp 3
GT: *Generalized Trust*		0.3063	-0.0032	0.0458
IT: *Confidence in the police*		0.3879	0.1438	-0.3356
IT: *Confidence in the parliament*		0.3363	0.1221	-0.4244
IT: *Confidence in the justice system*		0.3805	0.1539	-0.4329
CN: *Justifiability of avoiding a fare on public transport*		0.3458	0.3185	0.2851
CN: *Justifiability of cheating on taxes*		0.2442	0.3435	0.3875
CN: *Justifiability of accepting a bribe*		0.1760	0.3577	0.4527
CE: *Member in sport/ recreation organization*		0.3182	-0.4417	0.1571
CE: *Member in art/ music/ education organization*		0.2852	-0.4656	0.1904
CE: *Member in charity/ humanitarian organization*		0.3241	-0.4260	0.1431

Source: Author's calculations based on data from WVS (2015) and EVS (2011).

Figure 3: Social Capital vs. Fiscal Cyclicality
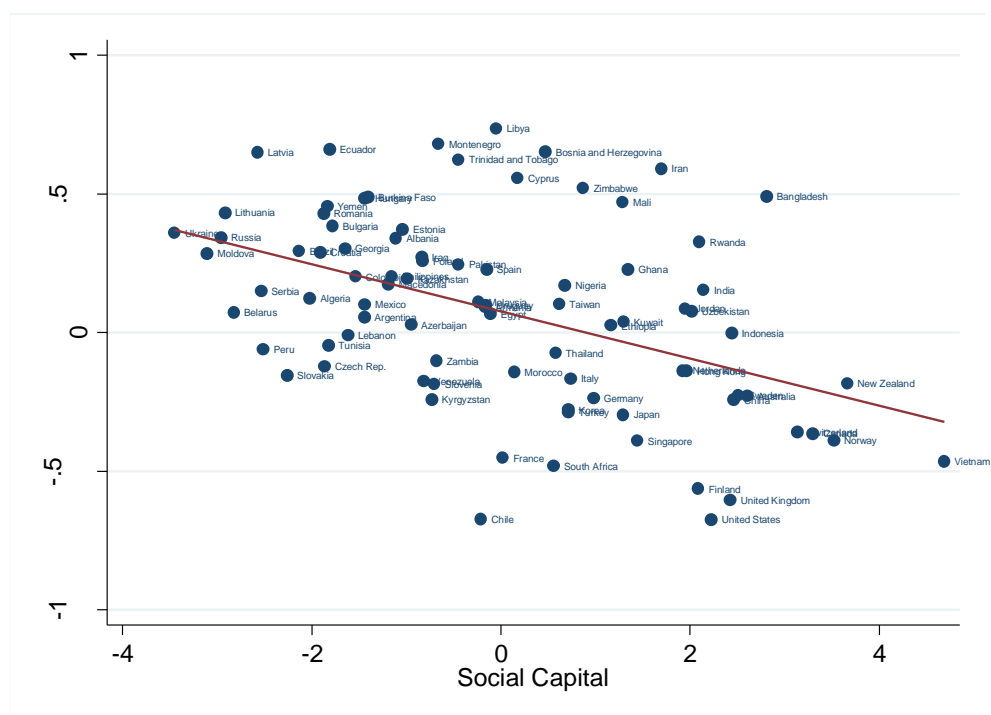
Source: Author's calculations based on data from WVS (2015), EVS (2011), and IMF (2017).

3.3.3 Control Variables

Accounting for the established links between cyclicality and fiscal rules, respectively corruption (cf. Manasse, 2006; Alesina *et al.*, 2008), the empirical framework controls for the adoption of fiscal rules and for control of corruption. A dummy variable reflecting institutionalized fiscal constraints either in form of budget balance rules, debt rules, expenditure rules, or revenue rules and a measure for control of corruption (scaled -2.5 to 2.5/strong) were retrieved from the IMF Fiscal Rules Dataset (2016) and from the World Development Indicator dataset by the World Bank (2018b).

The selection of the further variables follows largely Frankel *et al.* (2013), who control for standard determinants of fiscal cyclicality from the earlier literature. In line with the increased attention political factors receive in recent empirical studies

on debt crises, the results of Frankel *et al.* (2013) indicate that stronger checks and balances are related to less procyclical fiscal policy which is inter alia explained with lower expected returns to rent-seeking in more democratic regimes. The measure that captures checks and balances (scaled 1 to 7/strong) is taken from the Database of Political Institutions (DPI) by Cruz *et al.* (2016). Moreover, the variable selection acknowledges the existence of borrowing constrains which might lead countries to pursue procyclical fiscal policies (Riascos and Vegh, 2003). For this purpose, the Kaopen index - which measures the extensity of capital controls - of Chinn and Ito (2008) is employed. In order to control for solvency perceptions as done by Manasse (2006) the amount of cumulated government reserves as well as the debt-to-GDP ratio enter the regressions. Data on the total reserves, and government debt has been retrieved from the IMF (2017) (2018). Last, following the idea of Talvi and Vegh (2005) that a government, which faces large anticipated fluctuations in its tax receipts, will in good times under pressure from political distortions all the more increase government spending and in bad times vice versa, the empirical framework accounts for the variability of tax revenues by the proxy proposed by Frankel *et al.* (2013) - output volatility, i.e. the square of the cyclical components of real GDP.[49]

3.3.4 Empirical Strategy

The available data allows to compile a panel that spans over 34 years (1981-2014) and 104 industrialized and developing countries. Since the sample is due to the wave pattern of the WVS and EVS largely unbalanced and the variation of social capital

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[49] Divided by a factor of 1000.

within countries is much lower than the variation between countries - as exemplified in section 1.3 - the study resorts to a cross-sectional OLS analysis.

The model specification is:

$$Cyclicality_i = \alpha + \beta_1 \, SC_i + \beta_2 \, F_i + \emptyset'X_i + \epsilon_i$$

Where SC_i is social capital, F_i is either fiscal rules or freedom from corruption and X_i is a vector of the standard determinants of fiscal cyclicality from the earlier literature (all variables are listed with sources in Table 7). Table 19 in Appendix - A3 contains the descriptive statistics. Since the data on fiscal rules is very scarce, the analysis contents itself with separate regressions for the latter and control of corruption. Objective is to analyze the effect of social capital on fiscal cyclicality, and to shed light on the interplay between social capital and fiscal rules, respectively corruption in this area.

Insofar fiscal procyclicality leads to an unsustainable accumulation of debt, and eventually to a full grown debt crisis with severe social upheavals, a reverse link between cyclicality and social capital is conceivable. Beside the aggravation of allocation conflicts, which might consolidate social divisions with consequences for trust, the justifiability of non-cooperative behavior, and civic engagement - a lack of public resources is likely to deteriorate the quality of government services and as a byproduct weaken confidence in the system. In order to control for such endogeneity, in a final step a 2SLS regression is conducted.

The first instrument for social capital is a dummy variable measuring whether the majority-language allows for a drop of the pronoun. Inspired by the result of Kashima and Kashima (1998) (2005) that the usage of personal pronouns relates to differences between linguistic groups in the conception of the person, Tabellini (2008)

analyzes the relationship between the respective language-rule and cultural traits. He finds that the obligatory usage of personal pronouns is positively correlated with generalized trust and respect. Information on whether the majority language in a country requires the usage of a pronoun was collected from Cook (1997).

The second instrument builds on the finding of Bjørnskov (2006) that countries with a monarchy have considerably more trusting citizens. He points out that a royal house can be a uniting element for people of different social segments and thus can be an instrument to found and maintain social cohesion. Moreover, the permanence of some ruling houses can be interpreted as a symbol of social stability and a peaceful political history. Information about current monarchies was gathered from the World Factbook of the CIA (2017).

The third instrument is based on self-assessed religiosity as surveyed by the WVS (2015) and EVS (2011). Evidence on the direction of the effect of religiosity on social capital is mixed. Berggren and Bjørnskov (2011) report for instance that religiosity correlates negatively with social trust. In contrast, Guiso *et al.* (2003) emphasize that active participation in religion relates to more trust in other people, more confidence in government institutions and higher moral standards. However, the results of Guiso *et al.* (2003) change, when the religion is dominant in the country. Accounting for these instruments, the first-stage specification is as follows:

$$Social\ Capital_i = \alpha + \beta_1\ PD_i + \beta_2\ Mon_i + \beta_3\ Rel_i + \beta_4\ I_i + \emptyset'X_i + \epsilon_i$$

Where PD_i is pronoun drop, Mon_i is existence of a monarchy, Rel_i is self assed religiosity, I_i are institutional factors: either fiscal rules or control of corruption, and X_i is as before a vector of standard determinants of fiscal cyclicality.

Table 7: Data Sources: Fiscal Cyclicality

Dependent Variable	
Fiscal Cyclicality	The Cyclical behavior of government expenditure is derived through a Hodrick-Prescott Filter with $\lambda = 6.25$ (cf. Ravn and Uhlig, 2002) from country correlations between cyclical components of real government expenditure (deflated by the GDP deflator) and real GDP. Both data series are taken from the IMF (2017).
Key Variables (Social Capital)	
Generalized Trust Institutional Trust • Confidence in: Police • Confidence in: Justice System • Confidence in: Parliament	The attitudinal social capital data was retrieved from the 'Integrated Values Surveys 1981-2014 dataset' which consists of the merged longitudinal data inventories of the World Values Survey (WVS, 2015) and the European Values Study (EVS, 2011). All survey questions of the WVS and EVS are depicted in Appendix - A1.
Civic Norms / Justifiability of: • Avoid a Public Transport Fare • Cheat on Taxes (Tax Morale) • Accept a Bribe	Civic Engagement / Member in: • Sport/ recreation organization • Art/ music/ education organization • Charity/ humanitarian organization

Control Variables	**Retrieved from:**
Fiscal Rules (strictly national)	IMF Fiscal Rules Dataset (2016)
Control of Corruption	World Bank (2018b) / Scaled -2.5 (weak) to 2.5 (strong)
Standard Determinants	
Checks and Balances	Cruz *et al.* (2016) / Scaled 1 (weak) to 7 (strong)
Kaopen Index	Chinn and Ito (2008) / Extensity of capital controls
Total Reserves	IMF (2017) / US Dollars (Gold at Market Price)
Government Debt-to-GDP	IMF (2018) / Gross Debt
Output Volatility	IMF (2017) / Square of the cyclical components of real GDP

Instruments for Social Capital	
Language Allows Drop of Pronoun	Created from Cook (1997)
Monarchy	Created from: CIA (2017)
Self-Assessed Religiosity	WVS (2015) and EVS (2011)

3.4 Results and Discussion

Specifications (1) to (7) in Table 9 display Ordinary Least Squares regressions of fiscal cyclicality on its above presented standard determinants, fiscal rules, control of corruption, and ten social capital characteristics. The latter enter the regressions in form of four composite indicators and as social capital index based on the 1st component of the principal component analysis. While the social capital variables have the expected sign and a significant effect, of the standard determinants, only the debt-to-GDP ratio shows notable significance in most specifications. Among the social capital variables the index has the largest t-statistics, which can be interpreted in favor of the social capital notion and its usefulness to describe the aptitude to overcome social coordination failures, i.e. the consistent features of the indicators are the ones that seem to have the most significant effect on the cyclicality of fiscal policy.[50] Specifications (8) and (9) encompass beside the standard determinants and the social capital index, fiscal rules, respectively control of corruption. In line with the proposed relationship between cultural traits and institutionalized fiscal constraints by Heinemann *et al.* (2014), the respective coefficient loses roughly two thirds in size and significance, while the coefficient of social capital shows comparatively small changes. Conversely, when control of corruption is added both coefficients lose in terms of their t-statistics almost half in significance and around a third in magnitude,

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[50] Table 21 in Appendix - A3 contains (inter alia) regressions that include either one of the three social capital indexes of study 2 or one of the institutional trust indexes of study 1. The social capital index which is based on the 1st principal component is part of OLS and pooled OLS regressions. As the institutional trust indexes of study 1, it is negative and significant at conventional levels, whereby it shows considerably larger t-statistics under pooled OLS than under OLS. The social capital indexes that are based on the 2nd and 3rd principal component do not show a significant effect on the cyclicality of fiscal policy.

which might indicate a reciprocal relationship between social capital and control of corruption.[51] Experiments in which bribe demanding authorities led to a loss in vertical trust (Rothstein and Eek, 2009) substantiate a link between corruption and institutional trust that runs opposite to the direction proposed above for corruption and social capital. While the experiments also indicated that the demand for bribes led to a loss in horizontal trust - which is assumed to happen since people draw inference from authorities to the whole society, empirical work by Bjørnskov (2003) suggests that the direction of causality runs from generalized trust to corruption and not the other way around. Bjørnskov (2010) argues also that for trust and governance - which he measures inter alia in terms of corruption - a reverse causality is rather unlikely, since governance has improved in the last decades while trust has been very stable over time. However, when in specifications (10) to (13) the social capital index is substituted with the single indicators, corruption stays highly significant, but the indicators lose considerably in size and significance. Given that people regard authorities as generic members of society, it might well be that a corrupt administration does not only affect trust but also the perceived justifiability of non-cooperative behavior and the readiness for civic engagement.

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[51] In addition to the aforementioned specifications, Table 21 (Appendix - A3) contains all the OLS specifications of Table 9 that include social capital and control of corruption. Further, the table displays specifications which include interaction terms for both factors. The interaction terms show throughout very low t-statistics. This suggests that social capital and control of corruption do not have a mutually increasing effect on the cyclicality of fiscal policy, which might indicate a saturation effect, insofar that the effects of social capital and control of corruption are interchangeable. While the main effects of both variables are in case of the regressions with generalized trust and civic norms rendered insignificant, they show only minor changes in the specifications that contain the social capital index and civic engagement.

In specifications (14) to (16) the social capital index is instrumented by three different variables. The coefficients of social capital relate roughly in magnitude to their counterparts in specifications (7), (8) and (9), but lose in significance. Since overidentification tests (Sargan statistic) for all three specifications do not reject the null that the instruments are uncorrelated with the error term, and underidentification tests (Anderson canon. corr. LM statistic) suggest that the instruments are correlated with the endogenous variable, the instruments seem to be valid and relevant (Baum *et al.*, 2007). In respect to weak identification problems, i.e. nonzero but small correlation between regressor and instrument, specification (16) does not pass the rule of thumb by Staiger and Stock (1994) that the first-stage F-statistic[52] (weak id. test) should be larger than 10. Comparison of the first-stage F-statistics with the critical values of Stock and Yogo (2005) in Table 8 indicates that the maximal IV bias in comparison to OLS is for specifications (14) and (15) under 5% and 10%, and for specifications (16) under 20%. The size distortion of the (α-level) Wald test based on IV statistics is in specifications (14) and (15) under 15% and 20%, and in specification (16) only slightly above 25%.[53] Moreover, endogeneity tests (based on the difference of two Sargan-Hansen statistics in which the regressor is treated as

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[52] Cragg-Donald Wald F-statistic

[53] In the forthcoming paper that is based on this study, the institutional trust and civic engagement measures are scaled in a way that they either represent the percentage of respondents that stated to have confidence in one of the three public institutions (see Knack and Keefer, 1997), or to be a member in one of the three voluntary organization types. In the IV regressions, the maximal IV bias in comparison to OLS was for specifications (15) and (16) under 10% and the size distortion of the (α-level) Wald test based on IV statistics under 15% and 20%, respectively. For a better comparability of all single measures in this thesis, the scaling of both variables has been adapted to the approach in study 1 and study 3. In consequence, the scaling of all social capital variables is limited to a rescaling which assures that higher values represent more social capital.

endogenous and exogenous) fail in all three specifications to reject the null that social capital can be treated as exogenous. This indicates on the one hand that OLS should be preferred over 2SLS, and on the other that reverse causality is most likely not a problem.

Table 8: Critical values for the weak instrument test (significance level 5%)

5% maximal IV relative bias	13.91
10% maximal IV relative bias	9.08
20% maximal IV relative bias	6.46
30% maximal IV relative bias	5.39
10% maximal IV size	22.30
15% maximal IV size	12.83
20% maximal IV size	9.54
25% maximal IV size	7.80

Source: Reproduced from Stock and Yogo (2005).

Table 9: Determinants of Fiscal Cyclicality

Dependent Variable: Fiscal Cyclicality	OLS													2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
			GT	IT	CN	CE	SC1	SC1	SC1	GT	IT	CN	CE	SC1	SC1	SC1
Social Capital	-1.301** (-2.05)		-9.109*** (-3.77)	-3.938*** (-3.52)	-1.644** (-2.26)	-7.437*** (-3.38)	-0.898*** (-4.86)	-0.851*** (-3.72)	-0.557*** (-2.71)	-4.055 (-1.51)	-2.365* (-1.88)	-0.510 (-0.72)	-4.744** (-2.31)	-1.084*** (-3.42)	-0.829** (-2.19)	-0.560 (-1.26)
Control of Corr.		-1.797*** (-5.02)							-1.373*** (-3.08)	-1.467*** (-3.51)	-1.360*** (-3.24)	-1.726*** (-4.63)	-1.738*** (-4.34)			-1.413** (-2.07)
Fiscal Rules								-0.540 (-0.95)							-0.106 (-0.14)	
Checks and Bal.	-0.845** (-2.29)	0.340 (1.29)	-0.069 (-0.26)	-0.275 (-1.01)	-0.220 (-0.80)	0.437 (1.47)	0.178 (0.64)	-0.111 (-0.31)	0.378 (1.41)	0.313 (1.19)	0.259 (0.94)	0.313 (1.17)	0.587** (2.20)	-0.109 (-0.36)	-0.059 (-0.15)	0.091 (0.31)
Kaopen	-0.647* (-1.82)	0.223 (0.86)	-0.109 (-0.45)	-0.344 (-1.44)	-0.314 (-1.26)	-0.287 (-1.10)	-0.214 (-0.88)	-0.713** (-2.06)	0.232 (0.86)	0.218 (0.84)	0.046 (0.17)	0.210 (0.80)	0.349 (1.28)	-0.083 (-0.28)	-0.818* (-1.78)	0.286 (0.97)
Total Reserves	-0.006 (-1.05)	-0.004 (-1.63)	-0.002 (-0.77)	-0.003 (-1.17)	-0.004 (-1.58)	-0.005* (-1.85)	-0.002 (-0.74)	-0.004 (-0.92)	-0.002 (-0.89)	-0.003 (-1.14)	-0.003 (-1.11)	-0.004 (-1.52)	-0.004 (-1.62)	-0.001 (-0.46)	-0.003 (-0.62)	-0.002 (-0.92)
Debt to GDP	0.511* (1.71)	0.579*** (2.90)	0.459** (2.15)	0.628*** (2.92)	0.657*** (2.89)	0.516* (1.70)	0.710*** (2.59)	1.805*** (2.54)	0.567** (2.17)	0.534*** (2.67)	0.657*** (3.29)	0.609*** (2.98)	0.403 (1.47)	0.389 (1.32)	1.899** (2.27)	0.334 (1.21)
Output Volatility	0.000 (0.10)	-0.000 (-0.74)	0.000 (0.77)	0.000 (0.09)	0.000 (0.51)	0.000 (0.58)	0.000 (1.02)	0.000 (1.04)	0.000 (0.00)	-0.000 (-0.27)	-0.000 (-0.49)	-0.000 (-0.55)	-0.000 (-0.46)	0.000 (1.16)	0.000 (0.99)	-0.000 (-0.09)
Constant	5.137*** (3.29)	-0.539 (-0.55)	2.891*** (2.67)	11.066*** (3.64)	15.526** (2.42)	0.973 (0.80)	-0.561 (-0.54)	1.549 (0.97)	-1.079 (-1.09)	0.523 (0.44)	5.409 (1.57)	3.971 (0.63)	-0.236 (-0.21)	0.204 (0.17)	0.772 (0.43)	-0.085 (-0.08)
N	53	80	84	82	84	71	70	42	70	80	79	80	70	60	37	60
adj. R^2	0.284	0.325	0.225	0.210	0.139	0.227	0.337	0.533	0.416	0.336	0.351	0.320	0.399	0.320	0.487	0.401
F	4.438	7.328	5.025	4.594	3.242	4.421	6.854	7.676	8.018	6.715	7.021	6.315	7.535	4.413	5.184	6.399
First-Stage Regressions (control variables and constant term are not reported)																
Pronoun Drop														-1.848*** (-4.54)	-2.419*** (-4.43)	-1.154*** (-2.78)
Monarchy														1.531*** (3.45)	1.369** (2.43)	1.162*** (2.82)
Religious Person														0.440 (0.52)	0.995 (0.76)	1.830** (2.13)
Underid. Test														0.0000	0.0002	0.0003
Weak Id. Test														14.228	10.086	7.678
Overid. Test														0.2953	0.1218	0.5590
Endog. Test														0.5188	0.9082	0.8613

Notes: t-statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. For definitions and sources of variables see section 3.3 and Table 7. F test of excluded instruments (spec. 14; 15; 16): Prob > F = 0.0000; 0.0001; 0.0003.

3.5 Intermediate Conclusion

The empirical results of this study show that the four dimensions of social capital have a significant and negative effect on the cyclicality of government expenditure that is robust to control for standard determinants of fiscal cyclicality. Moreover, the effect of social capital as a whole is not biased by endogeneity and remains significant when the set of control variables is augmented with two additional factors that have been shown to be associated with fiscal cyclicality, fiscal rules and the control of corruption. The study corroborates also that the adoption of fiscal constraints is rooted in social capital, respectively that the effects of social capital and corruption are entangled.

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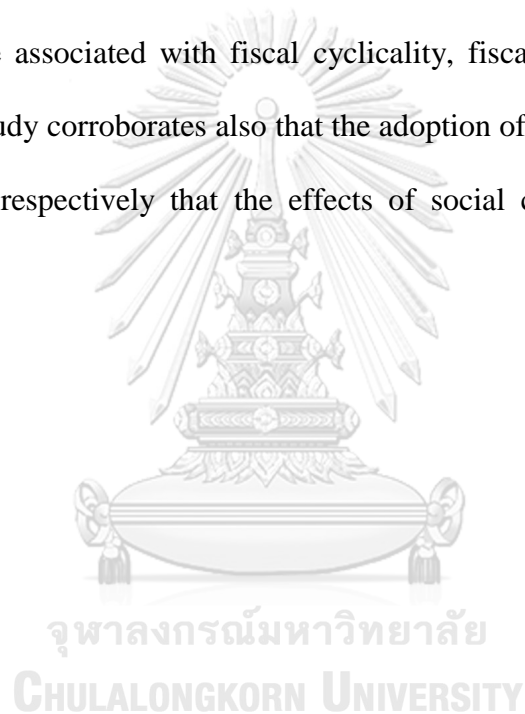
4. FISCAL STRESS

4.1 Motivation

Amid looming debt crises e.g. in Mediterranean Europe, it is of interest to know why some countries are evidently more often struck by fiscal stress than others. In the used data 43 of the in total 76 countries have been permanently under some sort of fiscal stress, while 21 countries were able to avoid such problems at least in more than half of all years.[54] The earlier literature proxied the severeness of fiscal situations predominantly by debt-to-GDP benchmarks (Callen *et al.*, 2003; Lavigne, 2011). Drawing from the recent literature, this study augments debt benchmarks with other indicators to articulate more comprehensive and thereby also less arbitrary fiscal stress criteria.

Since earlier work found that the variation in many of the purely economic factors that have been suspected to bring about debt crises is rather a symptom than a fundamental cause of fiscal stress, the empirical literature has turned increasingly to political and socio-economic factors (cf. Berg and Sachs, 1988), and more recently also to the formal and informal institutional environment (cf. Lavigne, 2011). Following a strand of this literature that classifies public debt as an intertemporal collective action problem (cf. Bützer *et al.*, 2013), this study tries to ascertain whether specific factors that have been assumed to be pivotal from an intertemporal angle - namely generalized trust, age structure, intergenerational ties, and time preference have an effect on the occurrence of fiscal stress.

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[54] It is apparent that in the period under review (1980-2015) some countries in Africa and South America have been permanently faced with some form of fiscal stress.

The study finds that generalized trust and time preference have a causal and negative effect on the occurrence fiscal stress. The relationship is in both cases robust to the inclusion of numerous covariates. The age structure which is proxied by the old-age dependency ratio is also significantly associated with fiscal stress, though the relationship is less robust and the variable displays instead of the expected positive relation a negative one.

The remainder of this section proceeds as follows. Section 4.2 gives an overview of the literature that relates to the issue of public debt as an intertemporal collective action problem. Section 4.3 introduces all employed variables and the empirical framework. Section 4.4 reports the results and section 4.5 contains an intermediate conclusion.

4.2 Literature Review

Insofar households act as if they have an infinite time horizon, which implies that current and future generations are linked through intergenerational transfers, there is no marginal net-wealth effect of taking on public debt (Barro, 1974). However, the study of Poterba and Summers (1987) shows that citizens not necessarily react with increased saving to larger fiscal deficits, i.e. changes in government debt are not matched by the amount of future bequests. In the absence of Ricardian equivalence, going into debt can then constitute a form of intergenerational redistribution, which raises the question why some countries rely more heavily on this kind of resourcing for current consumption than others.

A reason could be that as societies due to changes in life expectancy and fertility turn into 'gerontocracies' (Sinn and Uebelmesser, 2003), the electorate has an increasingly limited time horizon and stabilizing the welfare state at the expense of immediate losses is just not in its self-interest. This would then in turn raise the question why intergenerational altruism does not guide these societies to conduct a more 'responsible' budget management (Alesina and Perotti, 1995). Heinemann and Grigoriadis (2016) argue that in ageing societies a lack of intergenerational ties - due to the fact that an increasing number of people have no children of their own - leads to stronger time discounting. The findings of Heinemann (2004) corroborate this argument, his results indicate that with an ageing population the likelihood of reforms decreases. Bützer *et al.* (2013) find that generalized trust has a strong and negative effect on macroeconomic imbalances (measured in terms of the current account balance, fiscal balance, and inflation) which they explain in that generalized trust increases current generation's care for future generations, respectively helps to internalize future costs of action. Accordingly, Heinemann *et al.* (2014) find that sovereign risk premia are smaller for countries with higher levels of generalized trust than for countries with lower generalized trust, which reflects in their view the ability of trusting societies to overcome societal coordination failures as unsustainable public debt. They reason that generalized trust helps people to accept long-term policies that come together with short-term losses, since it makes it easier to believe in the honesty and probity of all parties involved. The results of Heinemann and Hennighausen (2012) and Heinemann and Tanz (2008) underpin this claim, they find that generalized trust makes people more inclined to support consolidation efforts, respectively that it facilitates policy reforms in general. Without distinguishing

explicitly between generalized and institutional trust, the authors put forward that trust lowers costs in situations of limited information by increasing the credibility of experts, making compensation promises more credible to potential reform losers, mitigating wars of attrition between interest groups that are afraid to be the only one to forsake privileges,[55] and probably most importantly by reducing resistance when short-term losses of reforms have to be weighted up with long-term benefits whereof the future distribution is uncertain.

Apart from questions of intergenerational welfare redistribution, time preference could provide an answer to the question why some countries conduct more myopic fiscal policies than others. Guiso *et al.* (2006) observe that thrift, measured by the World Values Survey in terms of a quality that parents might see as important to instill into their children, positively affects the national savings rate. Bützer *et al.* (2013), who focus on macroeconomic imbalances include in their regressions also the aforementioned thrift measure, but do not find a significant effect. However, Falk *et al.* (2018) point out that the measure might be first of all about childrearing than about something else. Wang *et al.* (2016) surveyed within the framework of the International Test of Risk Attitudes (INTRA) time preferences in 53 countries. Their binary 'wait-or-not' question is based on the decision between a payment in the same month and a higher payment that was delayed for one month. Regression of sovereign

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[55] Bützer *et al.* (2013) point in this regard to an essay by Eichengreen (2012), in which he illustrates the impeding role that a lack of interpersonal trust can have as follows: "*There is lack of trust among the social groups called on to make sacrifices. Italian taxi drivers would be prepared to allow more competition if they were sure that Italian pharmacy owners were willing to do likewise. But if issuing more taxi medallions reduces cab drivers' earnings, while pharmacists succeed in vetoing pro-competition measures to lower the cost of their services, the taxi drivers will end up worse and the pharmacists will be enriched, which hardly seems fair.*"

bond credit ratings on their 'waiting' measure indicates that both factors are significantly correlated. Although, evidence on fiscal decision making and time preference seems to be still very limited, a number of articles analyze the effects of time preferences on individual decisions in regard to saving and borrowing. Falk *et al.* (2016) (2018) introduce the Global Preference Survey dataset, which captures beside other economic preferences, time preference. Their patience measure, is based on a qualitative and a quantitative survey item (see Appendix - A1 for details). They find a highly significant and positive relationship between patience and self-reported accumulation decisions (saving and education) of survey respondents. Breuer *et al.* (2015) create from two INTRA questions, in which survey participants were asked to name the amount of a delayed payment which would make them indifferent to an instant payment, a long-term discount factor. Counterintuitively, the discount factor, of which higher values reflect more patience, shows a weak positive relationship with longer household debt maturities. But, their results indicate also that two cultural time preference measures, long-term orientation by Hofstede (2001) and future orientation by House *et al.* (2004) have a strong and significant negative effect on household debt maturity, i.e. with long-term or future orientation a higher repayment rate and thereby shorter debt maturities are considered optimal. Further evidence on individual debt decisions and time preferences is provided by Meier and Sprenger (2010), who make use of incentivized choice experiments to create individual discount factors and present bias indicators. Although they find that present biased individuals have substantially higher credit card balances, individual discount factors seem not to have a significant effect on credit card levels. Inspired by earlier findings that Hofstede's measure for long-term orientation is positively correlated with various saving

measures (Hofstede *et al.*, 2010), Galor and Özak (2016) use individual data from the European Social Survey (ESS) to analyze for second generation migrants in Europe the relationship between long-term orientation, respectively crop yield of different time periods in the parental country and saving behavior. They observe that long-term orientation has a highly significant effect on the propensity to save and a mediating effect on the otherwise highly significant coefficient for crop yield before the Columbian Exchange,[56] which suggests that time preference might be instrumented with factors that are associated with agricultural conditions.

This overview demonstrates that the age structure, generalized trust, and the time preference of a nation can be suspected to shape the political constraints governments face in the process of budget formulation and in typical reform situations. The following empirical analysis will therefore focus on the effects of these three factors under control of standard determinants of fiscal crises from the earlier literature.[57]

4.3 Data and Design

4.3.1 Fiscal Stress Criteria

If a balanced budget can't be maintained and debt is permanently growing, it becomes more and more difficult for a country to service its debt. Either the country conducts at some point a fiscal adjustment or the debt level gets out of hand and a prohibitively high interest has to be paid for the growing default risk (Ghosh *et al.*, 2013; Ostry *et*

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[56] Extensive exchange of crops between the 'new' and the 'old' world.

[57] For further research on outcomes of long-term orientation see Falk *et al.* (2018).

al., 2010; Zandi *et al.*, 2011). In the same vein, it might be expected that with rising debt levels, economic agents will expect a looming fiscal crisis which eventually will have contractionary effects (Callen *et al.*, 2003).

Since screening for debt thresholds suffers always from a certain arbitrariness, Callen *et al.* (2003) justify the choice of their debt-to-GDP benchmark for emerging market economies with the fact that adjustment efforts - expressed through the primary balance - generally abate at a debt-to-GDP ratio of 50%. For industrialized countries they do not provide an upper debt-to-GDP limit, but their graphical illustration of the primary balance reaction function indicates that above a ratio of 80% the fiscal response gets increasingly resolute up to the largest graphically depicted ratio of 120%. In reference to Callen *et al.* (2003), Lavigne (2011) acknowledges fiscal distress, respectively an adjustment need in industrialized countries, whenever the debt-to-GDP ratio is above 80% in 5 consecutive years.[58] Further benchmarks are proposed by Ostry *et al.* (2010), who conclude based on the primary balance reaction function and historical interest growth rate differentials in 23 industrialized countries that reasonable debt limits might range between debt-to-GDP ratios of 150% and 260%. Taking these results into account, a sensitive benchmark for industrialized countries could lie above 120% and below 150% of debt-to-GDP. However, it is questionable if a pure debt-to-GDP criterion is sufficient. First of all, it has to be assumed that only a fraction of the actual domestic debt is covered by the data available from international organizations. Bruns and Poghosyan (2016, p. 10) also emphasize that debt-to-GDP is *"more of an ex post indicator of fiscal distress*

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[58] Article 109j.1 of the Maastricht Treaty (European Union, 1992) outlines in terms of fiscal responsibility a 60% debt-to-GDP level convergence criterion.

rather than a leading indicator". They find that debt-to-GDP ratios in trouble free times are not very different from the levels before crises, but that they increase in the aftermath. Thus, debt-to-GDP ratios alone offer seemingly only insufficient information about whether a crisis is about to come. A way to address this shortcoming would be to augment debt benchmarks in a way that the resulting criteria convey more comprehensive information about the remaining fiscal leeway.

The findings of the tax compliance literature offer in this regard valuable insights. Several empirical studies found e.g. that higher tax rates generally go along with lower tax compliance (Alm, 2012). Countries with already high tax rates should thus face more resistance if a tax increase is inevitable than countries with low tax levels. Accordingly, debt-to-GDP benchmarks could be augmented with criteria that indicate in this regard a limited room for maneuver. Although, the literature doesn't seems to have identified so far a certain tax burden at which tax resistance increases exuberantly, there is much evidence that excessive government expenditure is detrimental to GDP growth, which should translate into a diminishing effect on the development of future state revenues. Forte and Magazzino (2011), who describe the relationship simplified as that exorbitant government growth implies a contraction of the free market economy, cite various studies which emphasize discouraging effects through high taxation, and interference by infringement of public authorities in inappropriate sectors. The general relation between government size and GDP growth is often expressed in terms of the inverted U-shaped Armey curve, whereby the spire of the curve represents the optimal government size for GDP growth. The optimum seems generally to be the lower the more a country is developed which can be explained as that developing countries spend a larger part of their budget on the

extension of infrastructure, while industrialized countries spend more on redistribution. An extensive review of the literature in this field by Facchini and Melki (2011) suggests that the optimal government size varies depending on the targeted country group somewhere between 20% and 40%, whereby certain studies arrive irrespectively of each other at the conclusion that for industrialized and developing countries a benchmark of government expenditure of 40% of GDP is optimal.

Various criteria for fiscal crises episodes are put forward by Baldacci *et al.* (2011). They account for defaults on public debt and debt restructurings, which include distressed debt exchanges. Further, they acknowledge implicit domestic defaults in form of inflation for industrialized countries (greater than 35 percent per annum) and for emerging economies (greater than 500 percent per annum). Their third and fourth criteria are, large financing by the International Monetary Fund (IMF) with an access to 100 percent of quota or more, and extreme financing constraints in form of sovereign yield pressure, which translates into spreads greater than 1,000 basis points or 2 standard deviations from the country average.[59]

Adapting the discussed benchmarks and thresholds, this study acknowledges fiscal stress episodes based on the following four criteria:

1. Explicit and implicit default (inflation of more than 20% per annum).[60]

2. Government expenditure of over 40% of GDP in interplay with a Debt-to-GDP ratio of more than 130% in industrialized countries and more than 50% in developing countries.

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[59] De Grauwe and Ji (2013) find that bond spreads in the Eurozone have due to self-fulfilling market sentiments disconnected from underlying fiscal space indicators as debt-to-GDP ratios.

[60] Even after World War II and the oil crisis in the 1970s, yearly and monthly U.S. inflation rates never exceeded 20% (U.S. Bureau of Labor Statistics, 2019; US Inflation Calculator, 2019).

3. Financing constraints: Sovereign yield pressure expressed by bond spreads of more than 1,000 basis points (bps) or 2 standard deviations from the country average.[61]

4. Ongoing financial aid programs by the IMF.

To make the distinction between fiscal stress and soundness more pronounced, an episode is only recognized as sound when fiscal stress is absent and spreads are below 400 bps, by which deliberately episodes are ignored that are either characterized by mediocre fiscal performance, or by missing bond-yield data.[62]

An additional criterion for fiscally alarming situations that is not applied yet could be derived from data on explicit default and debt to GDP ratios. Scrutiny of the sovereign default database of the Bank of Canada and the Bank of England (BOC-BOE) reveals that since the year 1980 nearly 48% of all defaults took place at gross debt-to-GDP levels below 50%, which is in line with the findings of Reinhart and Rogoff (2009) that most of the debt restructurings in middle income countries between 1970 and 2008 happened at external debt levels below 60%.[63] Since Qian *et al.* (2011) found that most recidivisms occur within a timeframe of 20 years after a

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[61] Benchmark securities are 10-year U.S. bonds (10-year bonds are the most important refinancing proxies for the United States of America and Germany). Credit default swaps cannot be used as an indicator due to their recency.

[62] Since data on bond spreads is neither available for Saudi Arabia nor for the United Arab Emirates, and none of them met one of the other three crisis criteria, the procedure led to missing values in the dependent variable. Assuming that the lack of data results from the fact that both countries are major oil exporters, and thus do not have to rely on the issuance of bonds to finance their households, missing values in the fiscal crisis variable for both countries were coded as sound.

[63] Reinhart and Rogoff (2009) insist that a lot of this anomaly disappears, when also domestic debt is taken into account. The BoC-BoE Sovereign Default Database contains also defaults on local currency debt, but the data set excludes in its current version still *"domestic fiscal arrears - such as overdue payments to suppliers, civil servants, and pensioners"* (Beers and Mavalwalla, 2018, p. 19).

preceding default, an additional criterion could consist of debt-to-GDP thresholds derived from countries' default debt levels in the last 20 years.[64]

Following the above methodology, the data - which covers 36 years (1980-2015) and 76 industrialized and developing countries - contains in total 1,697 fiscal stress episodes, which stem from 1,364 explicit defaults, 389 implicit defaults, 120 episodes with government expenditure of more than 40% of GDP and debt-to-GDP levels of above 50% or 130%, 39 episodes with financing constraints, and 866 episodes with ongoing IMF programs, whereby most stress episodes fulfil more than one of the above criteria. In total 435 episode are acknowledged as fiscally sound.

A current and comprehensive database on sovereign defaults is provided by the BOC-BOE (Beers and Mavalwalla, 2018).[65] Public debt-to-GDP ratios, the government expenditure in percentage of GDP and the inflation (based on annual changes in average consumer prices) are available through the World Economic Outlook (WEO) of the International Monetary Fund (IMF, 2016b). Data on fiscal bond spreads was taken from Bloomberg's financial data system (Bloomberg L.P., 2016). Information about ongoing fiscal aid programs respectively IMF-arrangements was retrieved via the query form on the IMF webpage (IMF, 2016a).

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[64] Potential criterion: Debt-to-GDP ratio higher as in explicit defaults that occurred within the last 20 years (this backward reaching criterion could also be applied to implicit defaults).

[65] Put simply, the BOC-BOE acknowledge defaults whenever a change in the stream of current and future payments occurs that lessens the value of debt to the creditor. A detailed account of the complex criteria is given by Beers and Mavalwalla (2018).

4.3.2 Demography, Generalized Trust, and Time Preference

In order to control for the incentives that might arise from the lack of intergenerational ties in ageing societies, two variables are employed, the old-age dependency ratio (OR) and the total fertility rate (TFR).[66] The former reports the proportion of dependents over 64 years to the working age population (15-64), and provides thereby information about the relative strength of the population part that does not provide for itself, is disproportionately affected by austerity measures, and whose time horizon is from a biological perspective probably already too limited to reap future benefits from current spending cuts. The total fertility rate reflects the number of children who would be born to a woman in her reproductive life years if she would give birth to children according to the age-specific fertility rates of the period. Both measures are taken from the World Development Indicators dataset of the World Bank (2018a).

For generalized trust, the study turns first of all to the Integrated Values Surveys 1981-2014 dataset which consists of the full data inventories of the World Values Survey (WVS, 2015) and the European Values Study (EVS, 2011). A further generalized trust measure is taken from the Global Preference Survey (GPS), which was recently introduced by Falk *et al.* (2018). The WVS/EVS generalized trust variable is based on survey responses to the binary choice question whether *'most people can be trusted'*. At the individual level the scaling of the variable has been reversed so that higher values symbolize more trust in other people. In order to be able to use the variable on the country level, national averages have been calculated,

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[66] The fertility rate in births per woman could also give account on the eventuality of lacking intergenerational ties in regard to having no children or grandchildren.

representing the fraction of respondents who stated trust in other persons. The GPS item for generalized trust relies on the survey question whether *'other people only have the best intentions'* and is based on a Likert scale (0-10). In order to avoid confusion, it is referred to the novel variable from here on only as GPS trust.

The study employs in total four time preference related variables. Different versions of the long-term orientation (LTO) measure by Hofstede et al. (2010) have been used frequently in the empirical literature. The employed LTO measure relies on three WVS survey items, in regard to thrift as a desirable trait for children, national pride, and the importance of service to others. Since the constituting items of the LTO measure seem partly distant to long-term orientation (see also Falk *et al.*, 2018), the second measure relies only on the one of the three WVS/EVS items that seems most closely related to time preference, namely thrift. Moreover, the WVS/EVS item for perseverance as a desirable trait for children, which also seems connected to time preference, is included. The fourth variable, patience is taken from the Global Preference Survey (GPS) dataset. The selection procedure of the underlying survey items included multiple incentivized choice experiments, carried out as part of an initial survey validation study (Falk et al., 2016). The GPS items were selected, combined, and weighted in regard to their ability to predict behavior of participants in experiments. Patience consists of a combination of a qualitative and a quantitative survey item. The qualitative item is based on the self-assessed willingness to wait on an 11-point Likert scale. The quantitative item was retrieved by a staircase procedure, involving five interdependent binary choices between a smaller payment today and a larger payment in 12 months, whereby the immediate payment remained the same for all 5 choices, and the delayed payment was varied in order to approach the point

where the respondent was indifferent between both payments. The quantitative and the qualitative survey items entered the combined patience measure with a weight of 71%, and 29%.[67]

4.3.3 Control Variables

In order to reduce the omitted variable bias, respectively to test the robustness of the results, the set of covariates comprises beside economic also a number of institutional, political and socio economic factors that have been found to be important in regard to fiscal consolidation and fiscal stability.

All estimations control in their baseline for the level of economic development, which is proxied by the log of GDP per capita in constant 2010 USD (retrieved from: World Bank, 2016a) and for the oil trade balance, measured as oil trade in percentage of GDP (retrieved from: IMF, 2013). Bützer *et al.* (2013) elaborate that oil exporters are likely to have large fiscal surpluses due to additional revenues even in the absence of prudent fiscal policy.

In order to account for political collective action problems stemming from the polarization of the electorate into 'rich' and 'poor', the framework controls for income inequality measured via the Gini index (retrieved from: World Bank, 2018a). Berg and Sachs (1988, p. 282) emphasize that income inequality undermines the ability to manage debt by impeding *"the development of a social consensus around policies that promote development in the long-term, but which may impose costs on*

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[67] The measure is standardized at the individual level, giving it a mean of zero and a standard deviation of one. A country-level correlation analysis conducted by Falk et al. (2018) between patience and an older version of long-term orientation from Hofstede (2001), respectively thrift from the WVS, reveals that patience is significantly correlated to the former, but not to the latter.

some social groups in the short-term". Income inequality might also be of interest from an intertemporal perspective because wealth constrained individuals might want to borrow from future generations (Cukierman and Meltzer, 1989).

The recent empirical literature on fiscal imbalances and adjustments relied on manifold measures of institutional quality. The empirical framework takes in this regard a holistic approach and employs the 1st principal component of the six Worldwide Governance Indicators (WGI) of the World Bank (2018b), namely: 1. Voice and accountability; 2. Political stability and absence of violence / terrorism; 3. Government effectiveness; 4. Regulatory quality; 5. Rule of law; 6. Control of corruption. All governance indicators are normalized, ranging between -2.5 and +2.5. A detailed account on these factors can be found in Kaufmann *et al.* (2010).[68] The quality of governance can affect fiscal stability in manifold ways. Government effectiveness, which is a measure of public service quality, impartiality, and capability to formulate, and implement policies, can e.g. be conceived to increase the confidence in authorities, which might translate into less reform resistance and higher tax compliance. The prevalence of corruption might also play a role. If the system is corrupt and cannot be trusted it is a rationale choice for voters to seize benefits as long as they are within reach, although this may have consequences for the long-term economic prospects. Insights acquired by research on delayed gratification correspond to this kind of voter behavior. A modified version of the Stanford Marshmallow Experiment at the University of Rochester (2012), in which one proband group experienced reliable interactions and the other broken promises, showed that the latter group tended clearly towards more instant gratification. In this regard, an unreliable

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[68] The WGI account mainly for views of survey respondents and sector experts.

environment can be a reason why benefits are discounted. According to the behavioral taxonomy of Stephens (2002), the voters' situation is subject to 'collection risk', i.e. there is no assurance that economically good times last, as well as that financial means are not embezzled by another group. Győrffy (2007) emphasizes accordingly that in a political environment which is characterized by distrust in the deliverance of long-term benefits, support can only be bought with short-term material promises. If instead consensus on long-term policies is reached that come with short-term losses, such consensus might be interpreted by the voter as a form of betrayal. Moreover, Arin *et al.* (2011) find that corrupt countries are less successful in their attempts to consolidate their budgets than other countries. Their results indicate also that corrupt countries rely for fiscal consolidation less on expenditure cuts, which they explain as that vested interests might prevent such policies during consolidations. However, cutting government expenditure has been shown to the best tool at hand when it comes to fiscal adjustments. Von Hagen and Strauch (2001) and Heylen and Everaert (2000) find for instance that successful consolidations rely on average to a lesser extent on revenue as unsuccessful ones.

In regard to fiscal consolidations that can help avert fiscal stress, the results of Baldacci *et al.* (2004) indicate that proximity of executive elections can impede fiscal adjustments. In order to control for the influence of the electoral cycle a variable provided by Cruz *et al.* (2016) in the Database of Political Institutions (DPI) which indicates whether an executive election took place in a given year is included. Moreover, Lavigne (2011) finds that countries that get into fiscal stress have higher executive constraints, which he traces back to a lower ability to enact needed policy changes. The included measure from the DPI captures institutionalized constraints of

the political arrangement, namely whether the political system is parliamentary or presidential (scaling: Presidential 0; Assembly-elected President 1; Parliamentary 2).

4.3.4 Empirical Strategy

The data at hand spans over 36 years and 20 industrialized, as well as 56 developing countries. Based on the prevailing fiscal situation the binary dependent variable captured episodes either as stressful (= 1) or as sound (= 0).

Several reasons speak against a panel analysis. First of all, the data provided by the GPS and by Hofstede et al. (2010) is of cross-sectional nature. Second, the WVS and EVS follow a wave pattern, i.e. every panel containing such survey data must necessarily be unbalanced. Third, social capital shows considerably less variation within than between countries.[69] And last but not least, since there is no variation on the dependent variable for 46 countries - i.e. all covered episodes are either fiscally sound or stressful - a fixed-effects panel analysis would probably exclude exactly the entities that can contribute the most to the explanation of differences in fiscal performance (Wenzelburger, 2008).[70] Accordingly, the empirical framework relies on a cross-sectional OLS analysis.

To test whether the ratio of the old to the young, the average fertility, generalized trust, and or time preference lead to fiscal stress, variations of the following full specification are estimated:

$$Fiscal\ Crisis_i = \alpha + \beta_1 Dem_i + \beta_2 GTrust_i + \beta_3 Time_i + \emptyset'X_i + \epsilon_i$$

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[69] Points two and three are addressed in detail in section 1.3.

[70] Wenzelburger (2008, p. 25) emphasizes in this regard that *"even if unit heterogeneity cannot be excluded, the estimation of a conditional logit model is not appropriate"*.

Where Dem_i is one of the two demographic indicators, $GTrust_i$ is generalized trust, $Time_i$ is time preference, and X_i is a vector of the fiscal stress determinants drawn from the earlier literature, namely: Economic development, significance of oil trade, income inequality, political system, temporal proximity of executive elections, and institutional quality. Descriptive statistics for all variables are provided in Table 22 (Appendix - A4). The sources of the variables can be found in Table 10.

Since severe fiscal crises could cause economic hardships that intensify existing societal conflicts and thereby affect the disposition of people to believe in the good intentions of unknown others, reverse causality might be a problem. Furthermore, the fiscal stress criteria is intended to express a situation in which the capacity of governments to act is seriously constrained by lacking financial means. Critical financing needs could according to Frankel *et al.* (2013, p. 39) *"lead to expropriation, repudiation of contracts, and/or intervention in independent branches of governments such as the judiciary system or the central bank"*. Buiter and Rahbari (2013) emphasize in this regard that when the sanctity of a contract is broken by the state, by the very one that should actually oversee and enforce the compliance with regulations, not only the rule of law is eroded, but also trust. Insofar, people make inferences from the demeanor of government institutions and public officials to other citizens as claimed by Rothstein and Stolle (2008) such state behavior could also negatively affect generalized trust. In the same vein, deprivations and 'collection risk' (cf. Stephens, 2002) arising from turmoil in fiscal crises could lead to a decline in the ability to delay gratification. In order to establish causality, the empirical framework instruments each of the potentially endogenous measures in 2SLS regressions with three different variables.

Drawing from the argument by Putnam (1993) that the Catholic Church often in close liaison with the state established hierarchic structures in society, which has hindered the development of trust, La Porta *et al.* (1996) find that the percentage of the population belonging to strong hierarchical religions (Catholicism, Islam, Orthodoxy - but most notably Catholicism) negatively correlates with generalized trust. In recognition of this insight, the percentage of respondents that stated in the WVS (2015) and EVS (2011) to be of Roman-Catholic faith is employed as an instrument for generalized trust.

Bjørnskov and Méon (2015) argue that survival through winters in cold climates historically depended to a much larger extent on help from strangers and that therefore the extension of trust to distant and also unknown people was an evolutionary survival strategy. In the same vein, climates which are in so far inhospitable as that they impede agriculture could lead to a higher mutual dependence and cooperation and in consequence to higher trust. As second instrument, the empirical framework uses a classification of the climate in each country in regard to its conduciveness to agriculture (retrieved from Olsson and Hibbs, 2005). The scaling is as follows: 3 = best climate e.g. in the Mediterranean or West Coast and 0 = worst climate, e.g. tropical dry.

Since alien domination often had the imposition of authoritarian rule as a consequence, the third instrument for generalized trust accounts for whether countries had been colonized. Putnam (1993) emphasizes in this regard that current discrepancies in social capital between the northern and the southern parts of the Italian peninsula can be traced back to the medieval Norman dominion in the south. While the society in the self-governed North Italian towns at this time was determined

by horizontal allegiances, the Norman reign entailed a steep social hierarchy. Data on the colonial history of countries was retrieved from Acemoglu et al. (2001) and Hensel (2014). As in study 1, only extractive colonialization was acknowledged.[71]

The first instrument for patience is the share of Protestants in the population from the WVS/EVS. The paper follows thereby Guiso *et al.* (2003), (2006), who refer to the claim by Weber (1905) that Protestantism has a strong emphasis on hard work, tenacity and thriftiness that promoted the later success of capitalism in many countries in the world.

Galor and Özak (2016, p. 3065) argue that whenever a population experienced a high crop yield *"the rewarding experience in agricultural investment triggered selection, adaptation, and learning processes which have gradually increased the representation of traits for higher long-term orientation in the population."* However, the variable for crop yield in ancestral countries doesn't show a significant correlation with the GPS patience measure. Accordingly, it seems legit to consider also the possibility that the relationship between patience and agriculture is somewhat different. In this vein, the abundance of food could also give way to a stronger present orientation, especially when the supply with consumable crops is easily secured and has no large variations since there are plenty cultivatable plants to diversify agriculture. Accordingly the *"number of annual or perennial wild grasses with a mean kernel weight exceeding 10 mg known to exist in prehistory in various parts of the world"* (Olsson and Hibbs, 2005, p. 930) is employed as second instrument.

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[71] The following countries were neither covered by Acemoglu *et al.* (2001) nor by study1. The coding was conducted according to the bracketed information: Cambodia (under French rule, in the vicinity of Vietnam), Nicaragua (under Spanish rule, in the vicinity of Costa Rica), Malawi, and the United Arab Emirates (not colonies: British Protectorates).

Following the idea that provident actions like building up stocks for winter is a necessity for survival in cold climate zones, the distance from the equator in absolute latitude (degrees) is used as third instrument for patience (retrieved from Olsson and Hibbs, 2005). Accordingly, the first-stage specifications can be outlined as follows:

$$Generalized\ Trust_i = \alpha + \beta_1 Col_i + \beta_2 Cat_i + \beta_3 Clim_i + \emptyset' X_i + \epsilon_i$$

$$Patience_i = \alpha + \beta_1 Prot_i + \beta_2 Plant_i + \beta_3 Lat_i + \emptyset' X_i + \epsilon_i$$

Where Col_i is colonized, Cat_i is the share of Catholics in the population, $Clim_i$ is climate, $Prot_i$ is the share of Protestants in the population, $Plant_i$ is the number of cultivatable wild grasses, Lat_i is absolute latitude, and X_i is as in the above specification a vector of the fiscal stress determinants.

Table 10: Data Sources: Fiscal Stress

Dependent Variable	
Fiscal Stress	
• Explicit Defaults	BOC-BOE Sovereign Default Data Base - (Beers and Mavalwalla, 2018) / The BOC-BOE acknowledge defaults whenever a change in the stream of current and future payments occurs that lessens the value of debt to the creditor.
• Implicit Defaults	World Economic Outlook - (IMF, 2016b) / Inflation > 20% per annum (annual changes in average consumer prices)
• Immoderate Gov. Expendit. & High Gov. Debt-to-GDP	World Economic Outlook - (IMF, 2016b) Government expenditure > 40% of GDP & debt-to-GDP ratio > 130% in industrial. countries, or > 50% in devel. countries
• Financing Constraints	Bloomberg's Financial Data System - Bloomberg L.P. (2016) Sovereign yield pressure (10yr Government Bond yields): Bond spreads > 1,000 bps, or 2 stdv. from country average
• Financial Aid by IMF	Query Form on IMF Webpage - IMF (2016a) / IMF Programs

Table 10 (cont'd I): Data Sources: Study 3 - Fiscal Stress

Key Variables	
Old-Age Dependency Ratio	World Development Indicators - World Bank (2018a) Dependents (>64) to working age population (15-64 years)
Total Fertility Rate	World Development Indicators - World Bank (2018a) Number of children who would be born to a woman in her reproductive life years if she would give birth to children according to the age-specific fertility rates of the period.
WVS/EVS Generalized Trust WVS/EVS Time Preference • Thrift (desirable trait for children) • Perseverance (desirable trait for children)	The attitudinal data was retrieved from the 'Integrated Values Surveys 1981-2014 dataset' which consists of the merged longitudinal data inventories of the World Values Survey (WVS, 2015) and the European Values Study (EVS, 2011).
LTO (Hofstede / WVS)	Hofstede et al. (2010) / Long-term orientation The LTO measures is based on the WVS items: Thrift, national pride, and the importance of service to others.
Patience (GPS)	Global Preference Survey (GPS) - Falk *et al.* (2018)
Generalized Trust (GPS)	Global Preference Survey (GPS) - Falk *et al.* (2018)
	Further information about the WVS/EVS and GPS survey items is depicted in Appendix - A1.
Control Variables	**Retrieved from:**
Log of GDP pc	Open Data - World Bank (2016a) / Constant 2010 USD
Oil Trade Balance	World Economic Outlook - IMF (2013) / % of GDP
Gini Index	Development Indicators - World Bank (2018a) Income inequality (deviation from an equal income distribution): Index of 0 represents perfect equality, index of 100 implies perfect inequality (World Bank, 2016).
PC WGI • Voice and Accountability • Political Stability… • Government Effectiveness • Regulatory Quality • Rule of law • Control of corruption	Worldwide Governance Indicators - World Bank (2018b) Scaled -2.5 (weak) to +2.5 (strong)
Executive Elections	Database of Political Institutions - Cruz *et al.* (2016) Election in the same year
Political System	Database of Political Institutions - Cruz *et al.* (2016) Scaling: Parliamentary (2), Assembly-elected President (1), Presidential (0)).

Table 10 (cont'd II): Data Sources: Study 3 - Fiscal Stress

Instruments	
Colonized	Extractive col. - Acemoglu et al. (2001) and Hensel (2014)
Catholic	Integrated Values Surveys 1981-2014 Dataset - WVS (2015) and EVS (2011)
Climate	Climate classification in regard to conduciveness for agriculture: 3 = best (Mediterranean & West Coast) and 0 = worst (tropical dry) - Olsson and Hibbs (2005).
Protestant	Integrated Values Surveys 1981-2014 Dataset - WVS (2015) and EVS (2011)
Plants	*"Number of annual or perennial wild grasses with a mean kernel weight exceeding 10 mg known to exist in prehistory in various parts of the world"* - Olsson and Hibbs (2005, p. 930)
Latitude	Absolute distance from the equator - Olsson and Hibbs (2005)

4.4 Results and Discussion

Following the line of argument at the outset that public debt is a temporal collective action problem which might get more intense with an adverse demographic structure, less propensity to trust, and stronger time discounting. The dependent variable 'fiscal stress' is regressed in Table 12 sequentially on the old-age dependency ratio, the total fertility rate, on proxies for generalized trust, and on measures of time preference.

The old-age dependency ratio (OR) shows in the baseline estimation in specification 1 a highly significant coefficient, but a negative sign. Meaning that with more old people in the population fiscal stress doesn't become as expected more frequent. Consequently, it has to be noted that the effects of higher transfers due to more dependents, and potentially lacking intergenerational ties must be overshadowed by other factors. A possible explanation is that the lower adaptability of older people and a thereof resulting preference for stability leads them to vote for a sustainable budget management and due consolidations, irrespective of incentives arising from their biologically limited time horizon and fewer bonds to following generations.

However, the coefficient of the old-age dependency ratio becomes insignificant when in specification 3 the controls for institutional quality, income inequality, proximity of executive elections, and type of the political system are added. In order to see whether intergenerational ties through the existence of children have a negative effect on the occurrence of fiscal crises, the total fertility rate (TFR) is included in specification 2. The coefficient of the TFR displays also an unexpected sign. The birthrate per woman seems to have a weak positive association with the occurrence of fiscal stress events. Specifications 4 and 5 of Table 12 display baseline estimations with the generalized trust measures from the WVS/EVS and the GPS. Both measures show the expected negative sign and significance at conventional levels, whereby the WVS/EVS trust variable (GT) is comparatively more significant than the one from the GPS (GPST). The former remains significant at the 5% level when in specification 6 the baseline estimation is augmented with controls, and changes only marginally when in specification 7 the old age dependency (OR) is included on top.[72]

Although, the coefficients of the time preference measures show in specifications 8 to 11 (baseline estimations) with exception of thrift as expected negative coefficients, only GPS patience displays high significance. While Hofstede's LTO measure is significant at the 10% level, both single WVS items, thrift and

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[72] Table 23 in the Appendix - A4 contains further OLS and pooled OLS regressions in which fiscal stress is beside generalized trust also regressed on the social capital measures of study 1 and study 2. All the social capital measures display a negative sign. While in the baseline OLS estimations - except for civic norms - the coefficients of all measures show significance at conventional levels, in the augmented OLS specifications, civic engagement and the social capital index are the only measures that remain significant, beside generalized trust. The pooled OLS regressions encompass one baseline and one augmented specification, both including the generalized trust measure which shows only minor changes in comparison to its counterparts under OLS.

perseverance are insignificant at standard levels. Thrift has very low t-statistics which might be due to the fact that the survey question for thrift aims according to its wording primarily at qualities that are perceived desirable for children and not at individual time preference (Falk *et al.*, 2018). Augmentation of the baseline estimation in specification 12 with controls leaves patience significant at the 1% level. Specification 13 displays a 'horserace' between all controls, old age-dependency ratio, generalized trust, and patience. The latter clearly outdoes all other variables, which is particularly interesting because time preference seems to receive not as much attention as the other factors in the fiscal crises literature.

The last four specifications in Table 12 account for potential reverse causality problems between fiscal stress and the two most significant key variables, generalized trust and patience. The coefficients of both variables change in magnitude, whereby the change for generalized trust is considerably larger than for patience. While over- and underidentification tests (lower part of the table) suggest that the instruments in all four specifications are valid and relevant (Baum, 2007), weak identification tests indicate for both sets of instruments in the 2SLS regressions weak identification (comparison of the Cragg-Donald Wald F-statistics with the critical values of Stock and Yogo (2005) in Table 11: max IV relative bias > 30%; max IV size > 25%).

This finding is worrisome, first of all, because when the correlation between the excluded and potentially endogenous variable is *"sufficiently small, conventional approximations to the distribution of IV estimators, such as two-stage least squares, are generally unreliable"* (Andrews *et al.*, 2018, p. 2), and second, because the selected instruments have shown to be the most suitable among the numerous variables proposed by the reviewed literature. However, (chi-squared) Anderson-

Rubin Wald tests which are robust in the presence of weak instruments (cf. Andrews *et al.*, 2018; Mikusheva and Poi, 2006) suggests that the coefficients of both variables are not zero, respectively that they are statistically significant. One way to deal with such 'weakness' is to turn to partially robust estimators that are less sensitive to weak correlation. The limited-information maximum likelihood (LIML) method (cf. Imbens and Wooldridge, 2007; Mayoral, 2015) is one of the methods suggested by the literature in such cases. Application of the LIML method leads to small changes in the coefficients of both variables, but reduces the maximal size distortion of the Wald test (Table 11) for both specifications below 20%. Tests for endogeneity (Sargan-Hansen statistics) fail to reject the possibility that generalized trust and patience are exogenous, i.e. indicate in both cases a causal relationship with fiscal stress. [73]

Table 11: Critical values for the weak instrument test (significance level 5%)

5% maximal IV relative bias	13.91
10% maximal IV relative bias	9.08
20% maximal IV relative bias	6.46
30% maximal IV relative bias	5.39
10% maximal IV size	22.30
15% maximal IV size	12.83
20% maximal IV size	9.54
25% maximal IV size	7.80
10% maximal LIML size	*6.46*
15% maximal LIML size	*4.36*
20% maximal LIML size	*3.69*
25% maximal LIML size	*3.32*

Source: Reproduced from Stock and Yogo (2005).

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[73] Demko (2012) and Hahn *et al.* (2011) find that with weak instruments the Hausman test statistic might be biased. Accordingly, the results of the endogeneity tests (which under homoscedasticity are equal to Hausman tests) have to be taken with a grain of salt. But nevertheless, the extracted exogenous variation in generalized trust and patience seems to have a genuine effect on the occurrence of fiscal stress.

Table 12: Determinants of Fiscal Stress

Dependent Variable: Fiscal Stress

	OLS													2SLS		LIML	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	OR	TFR	OR	GT	GPST	GT	OR/GT	LTO	Thrift	Pers	Pat	Pat	OR/GT/Pa	GT	Pat	GT	Pat
Demography	-0.019*** (-2.92)		-0.007 (-0.94)				-0.002 (-0.27)						-0.006 (-0.97)				
Generalized Trust				-1.541*** (-6.21)	-0.265* (-1.96)	-0.625** (-2.66)	-0.628** (-2.64)						-0.286 (-1.25)	-1.066* (-1.84)		-1.258* (-1.82)	
Time Preference								-0.003* (-1.75)	0.008 (0.02)	-0.355 (-0.81)	-0.650*** (-7.35)	-0.341*** (-3.90)	-0.349*** (-3.84)		-0.491*** (-2.95)		-0.552*** (-2.74)
PC WGI			-0.099*** (-4.48)			-0.097*** (-4.94)	-0.095*** (-4.34)					-0.066*** (-3.13)	-0.055** (-2.51)	-0.089*** (-3.37)	-0.070** (-2.42)	-0.083*** (-2.90)	-0.062* (-1.86)
Executive Election			1.030*** (2.73)			0.748** (2.12)	0.771** (2.10)					0.744** (2.24)	0.772** (2.38)	0.536 (1.20)	0.130 (0.35)	0.448 (0.92)	0.105 (0.28)
System			-0.028 (-0.53)			-0.084* (-1.70)	-0.080 (-1.58)					-0.039 (-0.85)	-0.077* (-1.71)	-0.088 (-1.60)	-0.141*** (-2.77)	-0.087 (-1.52)	-0.142*** (-2.70)
Gini Index			0.002 (0.51)			-0.006 (-1.45)	-0.006 (-1.39)					0.003 (1.08)	-0.008* (-1.93)	-0.008 (-1.62)	-0.004 (-1.23)	-0.008 (-1.65)	-0.005 (-1.26)
Oil Trade	-0.002 (-0.47)	0.001 (0.17)	-0.003 (-0.92)	0.009*** (2.71)	0.005 (1.15)	-0.002 (-0.58)	-0.002 (-0.59)	0.003 (0.65)	0.005 (1.16)	0.005 (1.03)	-0.002 (-0.55)	-0.001 (-0.37)	-0.002 (-0.56)	-0.001 (-0.11)	-0.004 (-1.18)	0.000 (0.08)	-0.003 (-0.98)
Log GDP per Capita	-0.099*** (-3.24)	-0.127*** (-3.99)	0.002 (0.06)	-0.111*** (-4.16)	-0.148*** (-6.01)	-0.007 (-0.26)	-0.005 (-0.16)	-0.164*** (-5.15)	-0.175*** (-5.46)	-0.172*** (-5.45)	-0.074*** (-3.40)	-0.009 (-0.34)	-0.002 (-0.07)	-0.002 (-0.06)	0.037 (1.25)	-0.003 (-0.08)	0.037 (1.20)
Constant	1.851*** (8.19)	1.717*** (4.94)	0.648** (2.40)	2.072*** (9.05)	2.007*** (9.08)	1.163*** (4.19)	1.184*** (4.08)	2.299*** (7.84)	2.248*** (6.58)	2.361*** (7.37)	1.389*** (7.17)	0.636*** (2.78)	1.166*** (4.53)	1.333*** (3.58)	0.651** (2.57)	1.414*** (3.43)	0.665** (2.52)
N	76	76	69	63	76	59	59	61	63	63	76	69	59	56	50	56	50
adj. R^2	0.397	0.343	0.719	0.590	0.360	0.787	0.783	0.349	0.323	0.330	0.615	0.772	0.830	0.765	0.858	0.749	0.849
F	17.476	14.069	25.914	30.785	15.058	31.529	27.096	11.716	10.842	11.179	40.873	33.945	32.354	26.695	42.165	25.008	39.324
First Stage Regressions (control variables and constant term not reported)																	
Colonized																	
Protestant														-0.049 (-1.05)	0.527** (2.10)	-0.049 (-1.05)	0.527** (2.10)
Catholic														-0.108* (-1.96)		-0.108* (-1.96)	
Plants															-0.010** (-2.41)		-0.010** (-2.41)
Climate														-0.050** (-2.47)		-0.050** (-2.47)	
Latitude															0.005* (1.98)		0.005* (1.98)
Underid. Test														0.0125	0.0078	0.0125	0.0078
Weak Id. Test														3.692	4.151	3.692	4.151
Overid. Test (2SLS - Sargan Statistic / LIML - Anderson-Rubin Statistic)														0.1923	0.1348	0.1919	0.1314
Endog. Test														0.3234	0.3306	0.3234	0.3306
Anderson-Rubin Wald Test														0.0489	0.0055	0.0489	0.0055

Notes: t-statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. For definitions and sources of variables see section 4.3 and Table 10. F test of excluded instruments: Prob > F = (spec. 14; 16): 0.0183 & (spec. 15; 17): 0.0119.

4.5 Intermediate Conclusion

While between 1980 and 2015 only about one fourth of the countries in the data managed to avert fiscal stress in at least half of the time, almost 60% were permanently faced with fiscal problems.

Starting from the hypothesis that the age structure, the fertility rate, the propensity to trust strangers, and the time preference of a nation are essential for the intertemporal aspect of public debt, respectively the inclination of governments to conduct sustainable fiscal policies and necessary consolidations, this section of the thesis provides evidence for a causal, robust, and negative relationship of generalized trust and patience with fiscal stress. Obvious explanations are that trust increases the sense of responsibility for future generations, while a stronger willingness to wait leads people simultaneously to place more value on future economic prospects, facilitating thereby a climate conducive to prudent fiscal policies.

While the total fertility rate seems to be of minor importance in this context, the age structure is significantly associated with fiscal stress. Though the relationship does not run in the expected direction, and becomes insignificant as soon as controls are included in the regression.

5. FINDINGS AND IMPLICATIONS

Although a large body of literature emphasizes that social capital shapes and constrains the functioning of institutions and the room for political maneuver (cf. Tabellini, 2008, 2010; Exadaktylos and Zahariadis, 2012; Heinemann and Grigoriadis, 2016) earlier empirical work often neglected values and beliefs in the search for determinants of sovereign debt crises. This thesis adds to the literature by showing that the factors which are commonly subsumed under the note of social capital are very decisive for fiscal performance. The three studies investigate to this end the effects of typical social capital indicators on tax evasion, the cyclical behavior of fiscal policy, and fiscal stability.

5.1 Findings

The factor analysis of the seven distinct survey based institutional trust items in the first study indicates that public institutions are generally perceived as constitutes of a larger entity (the state). Correspondingly, all single forms of institutional trust seem to have a significant negative effect on the size of the shadow economy. More importantly, the results suggest that the effect of institutional trust (measured in terms of its 1st factor) is not biased by endogeneity. An additional finding is that the effect of institutional trust is conditional on the existence of a minimum of generalized trust. This conditionality can be interpreted as that the confidence in public institutions, e.g. to spend tax revenues in the promised way, is not sufficient to instill tax compliance, it also needs the belief that others can be trusted to contribute their fair share.

Probably conjecturing that the effect of institutional trust on tax evasion runs through tax morale, a large part of the related tax compliance literature prioritizes as outcome variable in empirical analyses attitudes towards tax evasion over actual tax evasion. Although this study finds a negative link between tax morale and the size of the shadow economy, this link is only modestly significant, which indicates a weaker relationship between both factors than stated by earlier work. Moreover, there are no indications that the effect of institutional trust is mediated by tax morale. One of the reasons why the tax morale measure performs so badly might be that it suffers from severe overstatement which puts its use as proxy for tax evasion into question.

The results of the second study show that the four dimensions of social capital, namely generalized trust, institutional trust, civic norms and civic engagement have a significant negative effect on the cyclicality of government expenditure. For social capital as a whole - represented by the 1st principal component of the ten characteristics that underlie the indicators representing the four social capital dimensions - the findings indicate a causal negative effect on fiscal cyclicality that is robust to the control for corruption and the adoption of fiscal rules. The findings corroborate the claim by Heinemann *et al.* (2014) that the adoption of fiscal constraints is rooted in social capital, but also that the effects of corruption and social capital are entangled.

Starting point of the third study is that while an older population might be in general a strain to public budgets, increasingly more people in an ageing society have a biologically limited time horizon, which might make them less inclined to accept fiscal consolidations that should prevent a country from running into fiscal stress in the (probably) distant future. Given that the adverse age structure originates largely in

a low fertility rate, a lot of people might also lack intergenerational ties, since they have no children of their own. Lacking bonds to the next generation could then make the old feel less responsible for the wellbeing of the young. Generalized trust is said to have in this context a counteracting effect, since it is assumed to make people more inclined to care about others. Another factor that might affect the frequency with which a country faces fiscal stress is the willingness to wait, if citizens put comparatively more value on the future, they might e.g. also be more inclined to accept austerity measures to ensure good economic prospects. Of these factors generalized trust and patience have the most pronounced effect on the occurrence of fiscal stress. Moreover, their effects seems to be unbiased by endogeneity. The result that patience has a negative effect on the occurrence of fiscal stress corresponds to the finding of Marcheggiano and Miles (2013) that government expenditure in more patient nations has a smaller multiplying effect on private consumption and output than in their less patient counterparts. Accordingly, it could be easier for the former group of countries to agree on harsh austerity measures if necessary than for the latter (see also Breuer *et al.*, 2015). While the total fertility rate seems to be insignificant in this context, an older population appears to make fiscal stress less frequent. The negative sign of the old-age dependency ratio, stands to some extent in contradiction to the general reform resistance of the older population found by Heinemann and Grigoriadis (2016). A possible explanation is that a larger stability preference leads older people to vote for sustainable budget management and due consolidation efforts, even though such a behavior might seem opposed to the incentives arising from their biologically limited time horizon.

5.2 Policy Implications

The results of the first study have three notable implications. First of all, if governments want to tackle informality they can start by safeguarding that public institutions live up to their entrusted tasks. Second, although confidence in each of the 7 public institutions seemingly attenuates the inclination to be active in the shadow economy, efforts to improve confidence in a specific one would probably not show the expected results. Insofar people see public institutions indeed rather as a smaller part of a larger entity (the state), improved performance of a single institution will not necessarily lead to more confidence in this institution. Positive experiences with one institution could be superseded by bad experiences with other institutions. Committed reformers should therefore probably rather try to promote the overall performance in state-citizen interactions, e.g. by interventions that enhance the perceived procedural fairness of public institutions as a whole (cf. Heinemann and Grigoriadis, 2016; Mishler and Rose, 1997). Third, the fact that institutional trust needs a minimum of generalized trust for having a significant effect on the size of the shadow economy constitutes a natural limitation in regard to the capabilities of states to exert direct influence. The finding of Brehm and Rahn (1997) and Sønderskov and Dinesen (2016) that institutional trust exerts a causal impact on generalized trust, which can be explained as that people make inferences from the demeanor of government institutions and public officials to other citizens (Rothstein and Stolle, 2008) relativizes this limitation. However, the work by Tabellini (2008) suggests that generalized trust could only be increased very slowly over time.

The finding of the second study that the effects of social capital and corruption are entangled, is ambivalent. Following the two conflicting stand points in the

literature on the relationship between both factors, a high level social capital (and especially generalized trust) could curb corruption, whereas severe corruption might reduce social capital (especially institutional trust). Since social capital has been shown to be a precious resource in this context, the latter possibility should be a reason for concern, especially for countries with low levels of institutional trust. Measures to reduce corruption could thus payoff twofold in terms of the political pressure that policymakers have to overcome for fiscal moderation in economic good times. Practical policy recommendations for countries with a lack of social capital are to constitutionalize fiscal constraints (Alesina and Passalacqua, 2016), or as revived by Talvi and Vegh (2005) to create an autonomous national fiscal council that decides on the extent of borrowing over the business cycle.

The results of the third study challenge the concern that countries which turn into 'gerontocracies' will necessarily develop reform backlogs in areas were the old are affected (cf. Sinn and Uebelmesser, 2003). If the ageing of society leads indeed to a stronger stability preference of the average voter, this development could - beside the costs for higher transfers - open the doors for more prudent fiscal policies. Attempts to strengthen generalized trust and patience might be regarded not the most auspicious approaches to tackle reform resistance. As noted above, empirical evidence suggests that the levels of generalized trust and patience have been developed under the institutional and evolutionary environment hundreds and even thousands of years ago (cf. Tabellini, 2008; Algan and Cahuc, 2010; Galor and Özak, 2016). If this is the case, both factors are probably difficult to manipulate ad hoc, since otherwise they would have been already subject to substantial change.

5.3 Avenues for Future Research

Standard & Poor's considers the cohesiveness of societies in sovereign credit ratings (Standard & Poor's, 2017), a concept related to the note of social capital. Since the three studies provide clear evidence for the significance of the latter in regard to fiscal outcomes, it should be worthwhile to investigate whether social capital as whole or its components could play a role in the assessment of sovereigns' creditworthiness. Amid the strong effect of patience on the occurrence of fiscal stress, time preference is another candidate that should be tested in regard to its usefulness in this context.

Future work could place emphases on related questions in regard to fiscal effects of both factors, e.g. whether social capital and patience facilitate fiscal discipline in terms of balanced budgets, but also whether these factors help to take action, respectively help to avert fiscal procrastination when fiscal adjustments are inevitable. Since inconsistencies in time preference (e.g. present biasedness/ hyperbolic discounting) offer opportunities for policymakers to implement unpleasant, but necessary reforms (cf. Heinemann and Grigoriadis, 2016) these aspects of time preference should also be put into focus.

REFERENCES

Acemoglu, D., Johnson, S. & Robinson, J.A., 2001. The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review,* 91**,** 1369-1401.

Acemoglu, D., Johnson, S. & Robinson, J.A., 2002. Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution. *The Quarterly Journal of Economics,* 117**,** 1231-1294.

Alesina, A., Campante, F.R. & Tabellini, G., 2008. Why Is Fiscal Policy Often Procyclical? *Journal of the European Economic Association,* 6**,** 1006-1036.

Alesina, A. & Passalacqua, A., 2016. The Political Economy of Government Debt. *Handbook of Macroeconomics,* 2**,** 2599-2651.

Alesina, A. & Perotti, R., 1995. The Political Economy of Budget Deficits. *Staff Papers,* 42**,** 1-31.

Algan, Y. & Cahuc, P., 2010. Inherited Trust and Growth. *American Economic Review,* 100**,** 2060-92.

Alm, J., 2012. Measuring, Explaining, and Controlling Tax Evasion: Lessons from Theory, Experiments, and Field Studies. *International Tax and Public Finance,* 19**,** 54-77.

Alm, J., Martinez-Vazque, J. & Torgler, B., 2006. Russian Attitudes Toward Paying Taxes–Before, During, and After the Transition. *International Journal of Social Economics,* 33**,** 832-857.

Alm, J. & Torgler, B., 2006. Culture Differences and Tax Morale in the United States and in Europe. *Journal of Economic Psychology,* 27**,** 224-246.

Andreoni, J., Erard, B. & Feinstein, J., 1998. Tax Compliance. *Journal of Economic Literature,* Vol. 36**,** 818-860.

Andrews, I., Stock, J. & Sun, L., 2018. *Weak Instruments in IV Regression: Theory and Practice*.

Andrews, I. & Stock, J.H., 2018. Weak Instruments and What To Do About Them. NBER Summer Institute 2018, Methods Lectures.

Arin, K.P., Chmelarova, V., Feess, E. & Wohlschlegel, A., 2011. Why Are Corrupt Countries Less Successful in Consolidating their Budgets? *Journal of Public Economics,* 95**,** 521-530.

Arrow, K.J., 1972. Gifts and Exchanges. *Philosophy & Public Affairs***,** 343-362.

Baldacci, E., Clements, B.J., Gupta, S. & Mulas-Granados, C., 2004. *Front-Loaded or*

Back-Loaded Fiscal Adjustments: What Works in Emerging Market Economies?: International Monetary Fund.

Baldacci, E., Petrova, I.K., Belhocine, N., Dobrescu, G. & Mazraani, S., 2011. Assessing Fiscal Stress. *IMF Working Paper.* International Monetary Fund.

Barone, G. & Mocetti, S., 2011. Tax Morale and Public Spending Inefficiency. *International Tax and Public Finance,* 18**,** 724-749.

Barro, R.J., 1974. Are Government Bonds Net Wealth? *Journal of Political Economy,* 82**,** 1095-1117.

Baum, C.F., Schaffer, M.E. & Stillman, S., 2007. Enhanced Routines for Instrumental Variables/GMM Estimation and Testing. *Stata Journal,* 7**,** 465-506.

Baum, C.F., Schaffer, M.E. & Stillman, S., 2010. ivreg2: Stata Module for Extended Instrumental Variables/2SLS, GMM and AC/HAC, LIML, and k-class Regression, Statistical Software Components, Boston College Department of Economics.

Baum, C.F., Schaffer, M.E., Stillman, S. , 2007. Ivreg2: Stata Module for Extended Instrumental Variables/2SLS, GMM and AC/HAC, LIML and K-Class Regression.

Beers, D. & Mavalwalla, J., 2018. The BoC-BoE Sovereign Default Database Revisited: What's New in 2018? *Bank of England Working Paper.*

Berg, A. & Sachs, J., 1988. The Debt Crisis Structural Explanations of Country Performance. *Journal of Development Economics,* 29**,** 271-306.

Berger, B., 2009. Political Theory, Political Science and the End of Civic Engagement. *Perspectives on Politics,* 7**,** 335-350.

Berggren, N. & Bjørnskov, C., 2011. Is the importance of religion in daily life related to social trust? Cross-country and cross-state comparisons. *Journal of Economic Behavior & Organization,* 80**,** 459-480.

Bjørnskov, C., 2003. Corruption and Social Capital.

Bjørnskov, C., 2006. Determinants of Generalized Trust: A Cross-Country Comparison. *Public Choice,* 130**,** 1-21.

Bjørnskov, C., 2010. How Does Social Trust Lead to Better Governance? An Attempt to Separate Electoral and Bureaucratic Mechanisms. *Public Choice,* 144**,** 323-346.

Bjørnskov, C. & Méon, P.-G., 2015. The Productivity of Trust. *World Development,* 70**,** 317-331.

Bloomberg L.P., 2016. *Bloomberg's Financial Data System - Bloomberg Terminal*

Brehm, J. & Rahn, W., 1997. Individual-Level Evidence for the Causes and Consequences of Social Capital. *American Journal of Political Science,* 41**,** 999–1023.

Breuer, W., Hens, T., Salzmann, A.J. & Wang, M., 2015. On the Determinants of Household Debt Maturity Choice. *Applied Economics,* 47**,** 449-465.

Bruns, M. & Poghosyan, T., 2016. Leading Indicators of Fiscal Distress; Evidence from the Extreme Bound Analysis. *IMF Working Paper.* International Monetary Fund.

Buiter, W.H. & Rahbari, E., 2013. Why Do Governments Default, and Why Don't They Default More Often? : CEPR Discussion Papers.

Bursian, D., Weichenrieder, A.J. & Zimmer, J., 2015. Trust in Government and Fiscal Adjustments. *International Tax and Public Finance,* 22**,** 663-682.

Bützer, S., Jordan, C. & Stracca, L., 2013. Macroeconomic Imbalances: A Question of Trust? *ECB Working Paper.* European Central Bank.

Calderón, C. & Schmidt-Hebbel, K., 2008. Business Cycles and Fiscal Policies: The Role of Institutions and Financial Markets. *Documentos de Trabajo***,** 1.

Callen, T., Terrones, M., Debrun, X., Daniel, J. & Allard, C., 2003. Public Debt in Emerging Markets: Is It Too High? *World Economic Outlook.* International Monetary Fund 113-152.

Camerer, C.F. & Thaler, R.H., 1995. Anomalies: Ultimatums, Dictators and Manners. *Journal of Economic perspectives,* 9**,** 209-219.

Chinn, M.D. & Ito, H., 2008. A New Measure of Financial Openness. *Journal of Comparative Policy Analysis,* 10**,** 309-322.

CIA, 2017. *Central Intelligence Agency, The World Factbook.*

Coleman, J.S., 1990. *Foundations of Social Theory* Cambridge, MA: Harvard University Press.

Cook, V.J., 1997. *Inside Language* London: Arnold.

Cruz, C., Keefer, P. & Scartascini, C., 2016. *Database of Political Institutions Codebook, 2015 update*.

Cukierman, A. & Meltzer, A.H., 1989. A Political Theory of Government Debt and Deficits in a Neo-Ricardian Framework. *The American Economic Review,* 79**,** 713-732.

D'Hernoncourt, J. & Méon, P.-G., 2012. The Not So Dark Side of Trust: Does Trust

Increase the Size of the Shadow Economy? *Journal of Economic Behavior & Organization,* 81**,** 97-121.

Dahlum, S. & Knutsen, C.H., 2016. Democracy by Demand? Reinvestigating the Effect of Self-Expression Values on Political Regime Type. *British Journal of Political Science***,** 1-25.

Dalton, R.J. & Welzel, C., 2014. *The Civic Culture Transformed: From Allegiant to Assertive Citizens*: Cambridge University Press.

De Grauwe, P. & Ji, Y., 2013. Self-Fulfilling Crises in the Eurozone: An Empirical Test. *Journal of International Money and Finance,* 34**,** 15-36.

Demko, A., 2012. Validity and Power of the Hausman Test Under Weak Instruments. Department of Economics, Reed College, Portland, Mimeo.

Doerschler, P. & Jackson, P.I., 2012. Do Muslims in Germany Really Fail to Integrate? Muslim Integration and Trust in Public Institutions. *Journal of International Migration and Integration,* 13**,** 503-523.

Easterly, W., Ritzen, J. & Woolcock, M., 2006. Social Cohesion, Institutions, and Growth. *Economics and Politics,* 18**,** 103-120.

Eichengreen, B., 2012. Europe's Trust Deficit. *Project Syndicate.*

Ekman, J. & Amnå, E., 2012. Political Participation and Civic Engagement: Towards a New Typology. *Human Affairs,* 22.

Elkhuizen, L., Hermes, N., Jacobs, J. & Meesters, A., 2018. Financial development, financial liberalization and social capital. *Applied Economics,* 50**,** 1268-1288.

European Union, 1992. Treaty on European Union, Treaty of Maastricht , 7 February 1992. *In* E. Union (ed.) Maastricht.

EVS, 2011. *European Values Study 1981-2008, Longitudinal Data File, ZA4804 Data File Version 2.0.0 (2011-12-30), Cologne, Germany, GESIS Data Archive.*

Exadaktylos, T. & Zahariadis, N., 2012. Policy Implementation and Political Trust: Greece in the Age of Austerity. *GreeSE Paper 65* London: Hellenic Observatory, LSE.

Facchini, F. & Melki, M., 2011. Optimal Government Size and Economic Growth in France (1871-2008): An Explanation by the State and Market Failures.

Fafchamps, M., 2004. Social Capital and Development. Department of Economics, University of Oxford.

Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D. & Sunde, U., 2018. Global Evidence on Economic Preferences. *The Quarterly Journal of Economics,* 133**,**

1645-1692.

Falk, A., Becker, A., Dohmen, T., Huffman, D.B. & Sunde, U., 2016. The Preference Survey Module: A Validated Instrument for Measuring Risk, Time, and Social Preferences. IZA Discussion Papers.

Fehr, E., Fischbacher, U., Schupp, J., von Rosenbladt, B. & Wagner, G.G., 2003. A Nationwide Laboratory Examining Trust and Trustworthiness by Integrating Behavioural Experiments into Representative Surveys. *IZA Discussion Paper.*

Fischer, J. & Schneider, F., 2009. The Puzzle of Tax Compliance Revisited: Testing the „Slippery Slope "Hypothesis for Trust and Power Against Field Data. *SGVS 2009.*

Fjeldstad, O.-H., 2004. What's Trust Got to Do with It? Non-Payment of Service Charges in Local Authorities in South Africa. *The Journal of Modern African Studies,* 42**,** 539-562.

Forte, F. & Magazzino, C., 2011. Optimal Size Government and Economic Growth in EU Countries. *Economia Politica,* 28**,** 295-322.

Frankel, J.A., Vegh, C.A. & Vuletin, G., 2013. On Graduation from Fiscal Procyclicality. *Journal of Development Economics,* 100**,** 32-47.

Frey, B.S. & Torgler, B., 2007. Tax Morale and Conditional Cooperation. *Journal of Comparative Economics,* 35**,** 136-159.

Friedman, E., Johnson, S., Kaufmann, D. & Zoido-Lobaton, P., 2000. Dodging the Grabbing Hand: The Determinants of Unofficial Activity in 69 Countries. *Journal of Public Economics,* 76**,** 459-493.

Fukuyama, F., 1995. *Trust: The Social Virtues and the Creation of Prosperity* New York: Free Press.

Galor, O. & Özak, Ö., 2016. The Agricultural Origins of Time Preference. *American Economic Review,* 106**,** 3064-3103.

GESIS Data Archive for the Social Sciences, 2019. *Integrated Values Surveys 1981-2014.*

Ghosh, A.R., Kim, J.I., Mendoza, E.G., Ostry, J.D. & Qureshi, M.S., 2013. Fiscal Fatigue, Fiscal Space and Debt Sustainability in Advanced Economies. *The Economic Journal,* 123**,** F4-F30.

Guiso, L., Sapienza, P. & Zingales, L., 2003. People's Opium? Religion and Economic Attitudes. *Journal of Monetary Economics,* 50**,** 225-282.

Guiso, L., Sapienza, P. & Zingales, L., 2006. Does Culture Affect Economic Outcomes?

Journal of Economic Perspectives, 20**,** 23-48.

Guiso, L., Sapienza, P. & Zingales, L., 2011. Civic Capital as the Missing Link. *Handbook of social economics.* Elsevier, 417-480.

Gutierrez, H., Year. LA MORTALITE DES EVEQUES LATINO-AMERICAINS AUX XVII e ET XVIII e SIECLESed.^eds. *Annales de Démographie Historique*JSTOR, 29-39.

Győrffy, D., 2007. Political Trust and the Success of Fiscal Consolidations. TIGER Working Paper Series.

Hahn, J., Ham, J.C. & Moon, H.R., 2011. The Hausman Test and Weak Instruments. *Journal of Econometrics,* 160**,** 289-299.

Halla, M., 2012. Tax Morale and Compliance Behavior: First Evidence on a Causal Link. *The BE Journal of Economic Analysis & Policy,* 12.

Heinemann, F., 2004. *Explaining Reform Deadlocks*.

Heinemann, F. & Grigoriadis, T., 2016. Origins of Reform Resistance and the Southern European Regime. *Empirica,* 43**,** 661-691.

Heinemann, F. & Hennighausen, T., 2012. Understanding Public Debt Preferences. *FinanzArchiv: Public Finance Analysis,* 68**,** 406-430.

Heinemann, F., Osterloh, S. & Kalb, A., 2014. Sovereign Risk Premia: The Link between Fiscal Rules and Stability Culture. *Journal of International Money and Finance,* 41**,** 110-127.

Heinemann, F. & Tanz, B., 2008. The Impact of Trust on Reforms. *Journal of Economic Policy Reform,* 11**,** 173-185.

Helliwell, J.F. & Putnam, R.D., 1995. Economic Growth and Social Capital in Italy. *Eastern Economic Journal,* 21**,** 295-307.

Hensel, P.R., 2014. *Issue Correlates of War Project, Colonial History Data Set, version 1.0.*

Heritage Foundation, 2016. *2016 Index of Economic Freedom.*

Heylen, F. & Everaert, G., 2000. Success and Failure of Fiscal Consolidation in the OECD: A Multivariate Analysis. *Public Choice,* 105**,** 103-124.

Hofstede, G., 2001. *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*: Sage publications.

Hofstede, G.H., Hofstede, G.J. & Minkov, M., 2010. *Cultures and Organizations: Software of the Mind: Intercultural Cooperation and Its Importance for*

Survival, 3rd ed. New York: McGraw-Hill.

House, R.J., Hanges, P.J., Javidan, M., Dorfman, P.W. & Gupta, V., 2004. *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies*: Sage publications.

Hug, S. & Spörri, F., 2011. Referendums, Trust, and Tax Evasion. *European Journal of Political Economy,* 27**,** 120-131.

Hwang, I.D., Year. Which Type of Trust Matters? Interpersonal vs. Institutional vs. Political Trusted.^eds. *Asian Law & Economics Association XIth Annual Conference*, Bangkok, Thailand, 348-406.

Imbens, G. & Wooldridge, J., 2007. Weak Instruments and Many Instruments. *"What's New in Econometrics" Summer 2007 Lecture 13.* NBER.

IMF, 2013. *International Monetary Fund, World Economic Outlook, April 2013.*

IMF, 2016a. *IMF Financial Data Query Tool.*

IMF, 2016b. *International Monetary Fund, World Economic Outlook, April 2016.*

IMF, 2017. *International Monetary Fund, World Economic Outlook, April 2017.*

IMF, 2018. *International Monetary Fund, International Financial Statistics, April 2018.*

IMF Fiscal Rules Dataset, 2016. *Accompanying Paper: Schaechter, A., T. Kinda, N. Budina and A. Weber (2012) Fiscal Rules in Response to the Crisis – Toward the 'Next-Generation' Rules, A New Dataset, IMF Working Paper WP/12/187.*

Inglehart, R. & Welzel, C., 2005. *Modernization, Cultural Change, and Democracy*: Cambridge University Press.

INSCR, 2016. *Integrated Network for Societal Conflict Research, Center for Systemic Peace, Polity IV Project, Political Regime Characteristics and Transitions, 1800-2016.*

ISWGNA, 1993. *System of National Accounts 1993* New York: Inter-Secretariat Working Group on National Accounts.

Johnson, S., Kaufmann, D., Shleifer, A., Goldman, M.I. & Weitzman, M.L., 1997. The Unofficial Economy in Transition. *Brookings Papers on Economic Activity,* 1997**,** 159.

Kaminsky, G.L., Reinhart, C.M. & Végh, C.A., 2004. When It Rains, It Pours: Procyclical Capital Flows and Macroeconomic Policies. *NBER Macroeconomics Annual,* 19**,** 11-53.

Kashima, E.S. & Kashima, Y., 1998. Culture and language: the case of cultural

dimensions and personal pronoun use. *Journal of Cross-Cultural Psychology,* 29**,** 461+.

Kashima, E.S. & Kashima, Y., 2005. Erratum to Kashima and Kashima (1998) and Reiteration. *Journal of Cross-Cultural Psychology,* 36**,** 396-400.

Kaufmann, D., Kraay, A. & Mastruzzi, M., 2010. The Worldwide Governance Indicators: Methodology and Analytical Issues. *Policy Research Working Papers.* The World Bank.

Keefer, P. & Knack, S., 2003. Social Capital, Social Norms and the New Institutional Economics. *MPRA Paper*

Kirchler, E., Hoelzl, E. & Wahl, I., 2008. Enforced versus Voluntary Tax Compliance: The "Slippery Slope" Framework. *Journal of Economic Psychology,* 29**,** 210-225.

Knack, S. & Keefer, P., 1997. Does Social Capital Have an Economic Payoff? A Cross-Country Investigation. *The Quarterly Journal of Economics,* 112**,** 1251-1288.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. & Vishny, R.W., 1996. Trust in Large Organizations. *Working Paper 5864.* Cambridge: National Bureau of Economic Research, 333-338.

Lassen, D.D., 2007. Ethnic Divisions, Trust, and the Size of the Informal Sector. *Journal of Economic Behavior & Organization.*

Lavigne, R., 2011. The Political and Institutional Determinants of Fiscal Adjustment: Entering and Exiting Fiscal Distress. *European Journal of Political Economy,* 27**,** 17-35.

Lee, D., 2013. How Does Social Capital Reduce the Size of the Shadow Economy? *Global Economic Review,* 42**,** 251-268.

Levi, M., 1998. A state of trust. *Trust and governance,* 1**,** 77-101.

Lisi, G., 2012. Testing the Slippery Slope Framework. *Economics Bulletin,* 32**,** 1369-1377.

Maloney, W.F., 2004. Informality Revisited. *World Development,* 32**,** 1159-1178.

Manasse, P., 2006. Procyclical Fiscal Policy: Shocks, Rules, and Institutions: A View from MARS.

Marcheggiano, G. & Miles, D., 2013. Fiscal Multipliers and Time Preference. *Monetary Policy Committee Unit Discussion Paper.* Bank of England.

Maxwell, R., 2010. Trust in Government Among British Muslims: The Importance of

Migration Status. *Political Behavior,* 32**,** 89-109.

Mayoral, L., 2015. IV Estimation and its Limitations: Weak Instruments and Weakly Endogenous Regressors. *Lecture Notes.* University of Gothenburg.

Medina, L. & Schneider, F., 2018. Shadow Economies Around the World: What Did We Learn Over the Last 20 Years? *IMF Working Paper WP/18/17*

Meier, S. & Sprenger, C., 2010. Present-Biased Preferences and Credit Card Borrowing. *American Economic Journal: Applied Economics,* 2**,** 193-210.

Mikusheva, A. & Poi, B.P., 2006. Tests and Confidence Sets with Correct Size When Instruments Are Potentially Weak. *The Stata Journal,* 6**,** 335-347.

Mishler, W. & Rose, R., 1997. Trust, Distrust and Skepticism: Popular Evaluations of Civil and Political Institutions in Post-Communist Societies. *The journal of politics,* 59**,** 418-451.

Mishler, W. & Rose, R., 2001. What Are the Origins of Political Trust? Testing Institutional and Cultural Theories in Post-Communist Societies. *Comparative political studies,* 34**,** 30-62.

Muehlbacher, S., Kirchler, E. & Schwarzenberger, H., 2011. Voluntary Versus Enforced Tax Compliance: Empirical Evidence for the "Slippery Slope" Framework. *European Journal of Law and Economics,* 32**,** 89-97.

Nannicini, T., Stella, A., Tabellini, G. & Troiano, U., 2013. Social Capital and Political Accountability. *American Economic Journal: Economic Policy,* 5**,** 222-50.

OECD, 2002. *Measuring the Non-Observed Economy: A Handbook* Paris OECD Publications.

Olea, J.L.M. & Pflueger, C., 2013. A Robust Test for Weak Instruments. *Journal of Business & Economic Statistics,* 31**,** 358-369.

Olson, M., 2008. *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*: Yale University Press.

Olsson, O. & Hibbs, D.A.J., 2005. Biogeography and Long-run Economic Development. *European Economic Review,* 49**,** 909-938.

Ostry, J., Ghosh, A., Kim, J. & Qureshi, M.S., 2010. *Fiscal Space*, 2072-3202.

Petrarca, I. & Ricciuti, R., 2013. The Historical Economics of Corruption and Development within Italy. *International Journal of Monetary Economics and Finance,* 6**,** 186-202.

Petrou, A. & Daskalopoulou, I., 2014. Is Greece a Rent Seeking Society? A Research on the Relationship Between Entrepreneurship, Trust and Institutions. *Social*

Indicators Research, 119**,** 1495-1515.

Pflueger, C.E. & Wang, S., 2015. A Robust Test for Weak Instruments in Stata. *The Stata Journal,* 15**,** 216-225.

Platteau, J.P., 1994. Behind the Market Stage Where Real Societies Exist - Part II: The Role of Moral Norms. *Journal of Development Studies,* 30**,** 753-817.

Poterba, J.M. & Summers, L.H., 1987. Finite Lifetimes and the Effects of Budget Deficits on National Saving. *Journal of Monetary Economics,* 20**,** 369-391.

Putnam, R.D., 1993. *Making Democracy Work. Civic Traditions in Modern Italy* Princeton: NJ: Princeton University Press.

Putnam, R.D., 1995. Bowling Alone: America's Declining Social Capital. *Journal of Democracy,* 6**,** 65-78.

Putnam, R.D., 2000. *Bowling Alone: The Collapse and Revival of American Community*: Simon and Schuster.

Qian, R., Reinhart, C.M. & Rogoff, K., 2011. On Graduation from Default, Inflation, and Banking Crises: Elusive or Illusion? *NBER Macroeconomics Annual 2010.* University of Chicago Press, 1-36.

Ravn, M.O. & Uhlig, H., 2002. On Adjusting the Hodrick-Prescott Filter for the Frequency of Observations. *Review of Economics and Statistics,* 84**,** 371-376.

Reinhart, C.M. & Rogoff, K., 2009. *This Time is Different, Eight Centuries of Financial Folly*: Princeton University.

Riascos, A. & Vegh, C.A., 2003. Procyclical Government Spending in Developing Countries: The Role of Capital Market Imperfections.

Ritzen, J., Year. Social Cohesion, Public Policy and Economic Growth: Implications for OECD Countries *In*: J.F. Helliwell, ed.^eds. *International Symposium: The Contribution of Human and Social Capital to Sustained Economic Growth and Well-Being*, Canada: Organisation de Coopération et de Développement Économiques (Paris), Canada. Ministère du Développement des Ressources Humaines.

Rothstein, B. & Eek, D., 2009. Political Corruption and Social Trust: An Experimental Approach. *Rationality and Society,* 21**,** 81-112.

Rothstein, B. & Stolle, D., 2008. The State and Social Capital: An Institutional Theory of Generalized Trust. *Comparative politics,* 40**,** 441-459.

Schaltegger, C.A. & Torgler, B., 2005. *Trust and Fiscal Performance: A Panel Analysis with Swiss Data*: Swiss Federal Tax Administration.

Schneider, F., 2016. Tax Losses Due to Shadow Economy Activities in OECD Countries from 2011 to 2013: A Preliminary Calculation. *Turkish Economic Review,* 3**,** 1-15.

Sinn, H.-W. & Uebelmesser, S., 2003. Pensions and the Path to Gerontocracy in Germany. *European Journal of Political Economy,* 19**,** 153-158.

Sironi, E. & Tornari, M., 2013. Corruption, Political Instability and Public Finance in Europe. *International Journal of Monetary Economics and Finance,* 6**,** 203-212.

Slomczynski, K.M., Jenkins, J.C., Tomescu-Dubrow, I., Kołczyńska, M., Wysmułek, I, Oleksiyenko, O., Powałko, P. and Zieliński, M.W. , 2017. *Democratic Values and Protest Behaviour: Data Harmonization, Measurement Comparability, and Multi-Level Modelling, SDR Master Box, Harvard Dataverse, V1*.

Sønderskov, K.M. & Dinesen, P.T., 2016. Trusting the State, Trusting Each Other? The Effect of Institutional Trust on Social Trust. *Political Behavior,* 38**,** 179-202.

Staiger, D.O. & Stock, J.H., 1994. Instrumental Variables Regression with Weak Instruments. National Bureau of Economic Research Cambridge, Mass., USA.

Standard & Poor's, 2017. *Sovereign Rating Methodology*.

Stanova, N., 2012. Democratic Learning and Fiscal Rules in the Political Budget Cycles of the CEE countries. *International Journal of Economic Policy in Emerging Economies,* 5**,** 168-182.

STC, 2017. *Stephane Tajick Consulting and Best Development Group Ltd, The 2018 STC Health Index*.

Stephens, D.W., 2002. Discrimination, Discounting and Impulsivity: A Role for an Informational Constraint. *Philosophical Transactions of the Royal Society of London B: Biological Sciences,* 357**,** 1527-1537.

Stock, J.H. & Yogo, M., 2005. Testing for Weak Instruments in Linear IV Regression. *In* A. Dwk (ed.) *Identification and Inference for Econometric Models.* New York: Cambridge University Press, 80-108.

Stone, W., 2001. Measuring Social Capital. *Australian Institute of Family Studies* Research Paper 24

Tabellini, G., 2008. Presidential Address: Institutions and Culture. *Journal of the European Economic Association,* 6**,** 255-294.

Tabellini, G., 2010. Culture and Institutions: Economic Development in the Regions of Europe. *Journal of the European Economic Association,* 8**,** 677-716.

Talvi, E. & Vegh, C.A., 2005. Tax Base Variability and Procyclical Fiscal Policy in

Developing Countries. *Journal of Development Economics,* 78**,** 156-190.

Thomas, T.D., Abts, K., Stroeken, K. & Vander Weyden, P., 2015. Measuring Institutional Trust: Evidence from Guyana. *Journal of Politics in Latin America,* 7**,** 85-115.

Torgler, B., 2005. Tax Morale in Latin America. *Public Choice,* 122**,** 133-157.

Torgler, B., 2007. Tax Morale in Central and Eastern European Countries. *In* S. Hug (ed.) *Tax Evasion, Trust and State Capacities: How Good Is Tax Morale in Central and Eastern Europe.* 155-186.

Torgler, B. & Schneider, F., 2006. What Shapes Attitudes Toward Paying Taxes? Evidence from Multicultural European Countries. *Social Science Quarterly,* 88**,** 443-470.

Torgler, B. & Schneider, F., 2009. The Impact of Tax Morale and Institutional Quality on the Shadow Economy. *Journal of Economic Psychology,* 30**,** 228-245.

Torgler, B., Schneider, F. & Schaltegger, C.A., 2010. Local Autonomy, Tax Morale, and the Shadow Economy. *Public Choice,* 144**,** 293-321.

U.S. Bureau of Labor Statistics, 2019. *Consumer Price Index (CPI) Databases*.

University of Rochester, 2012. The Marshmallow Study Revisited.

US Inflation Calculator, 2019. *Historical Inflation Rates: 1914-2018*.

Van der Meer, T.W. & Thompson, W., 2017. Political Trust and the" Crisis of Democracy". *Oxford Research Encyclopedias*.

Von Hagen, J. & Strauch, R.R., 2001. Fiscal Consolidations: Quality, Economic Conditions, and Success. *Public Choice,* 109**,** 327-346.

Wang, M., Rieger, M.O. & Hens, T., 2016. How Time Preferences Differ: Evidence from 53 Countries. *Journal of Economic Psychology,* 52**,** 115-135.

Weatherley, R., 1993. Doing the Right Thing: How Social Security Claimants View Compliance. *The Australian and New Zealand Journal of Sociology,* 29**,** 21-39.

Weber, M., 1905. *The Protestant Ethic and the Spirit of Capitalism* London: Routledge Classic.

Welzel, C., Inglehart, R. & Kruse, S., 2016. Pitfalls in the Study of Democratization: Testing the Emancipatory Theory of Democracy. *British Journal of Political Science,* 47**,** 463-472.

Wenzelburger, G., 2008. The Analysis of Budget Consolidations: Concepts, Research Designs and Measurement. *ECPR Joint Sessions 2008, Workshop 5*

"Sustainable Public Finance: The Politics of Budget Consolidation, Tax Reform and Expenditure Control". Rennes, France.

Williams, R., 2015. Interaction Effects Between Continuous Variables *Department of Sociology, University of Notre Dame*.

World Bank, 2016. *World Development Indicators*.

World Bank, 2016a. *Open Data*.

World Bank, 2018a. *World Development Indicators*.

World Bank, 2018b. *Worldwide Governance Indicators (WGI) Project*.

WVS, 2012. *World Values Survey, WV6 Official Questionnaire, v4, June 2012*.

WVS, 2015. *World Values Survey 1981-2015, Official Aggregate v.20150418, 2015, World Values Survey Association*.

Zandi, M., Cheng, X. & Packard, T., 2011. Special Report: Fiscal Space. *Moody's Economic & Consumer Credit Analytics*. Moody's Investors Service.

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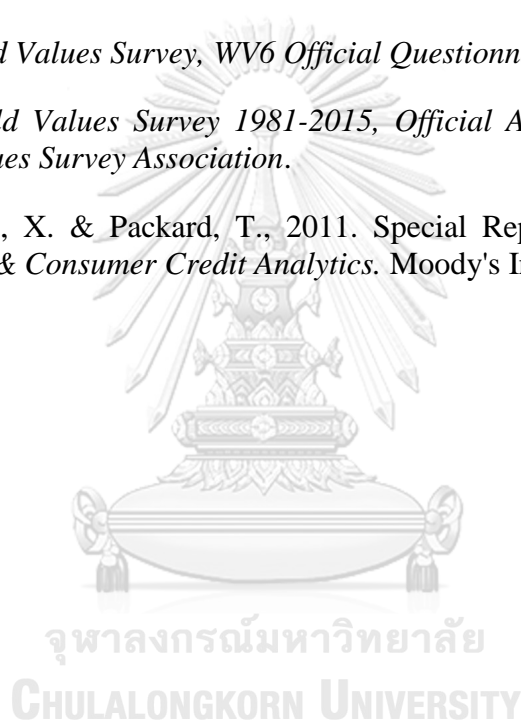
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APPENDIX

A1: Surveys

Table 13: Countries Participating in EVS 1981-2008 and WVS 1981-2014

Country / Region	1981 - 1984		1989 - 1993		1994 - 1998	1999 - 2004		2005 - 2009	2008 - 2010	2010-2014
	EVS	WVS	EVS	WVS	WVS	EVS	WVS	WVS	EVS	WVS
Albania					1998		2002		2008	
Algeria							2002			2013
Andorra								2005		
Argentina		1984		1991	1995		1999	2006		2013
Armenia					1997				2008	2011
Australia		1981			1995			2005		2012
Austria			1990			1999			2008	
Azerbaijan					1997				2008	2011
Bahrain										2014
Bangladesh					1996		2002			
Belarus				1990	1996	2000			2008	2011
Belgium	1981		1990			1999			2009	
Bosnia and Herzegovina					1998	2001			2008	
Brazil				1991				2006		2014
Bulgaria			1991		1997	1999		2005	2008	
Burkina Faso								2007		
Canada	1982		1990				2000	2006		
Chile				1990	1996		2000	2006		2011
China				1990	1995	2001		2007		2012
Colombia					1997/1998			2005		2012
Croatia					1996	1999			2008	
Cyprus								2006	2008	2011
Czech Republic			1991	1991	1998	1999			2008	
Denmark	1981		1990			1999			2008	
Dominican Republic					1996					
Ecuador										2013
Egypt							2001	2008		2013
El Salvador					1999					
Estonia			1990		1996	1999			2008	2011
Ethiopia								2007		
Finland		1981	1990		1996	2000		2005	2009	
France	1981		1990			1999		2006	2008	
Georgia					1996			2009	2008	2014
Germany			1990		1997	1999		2006	2008/2009	2013
Germany West	1981									
Great Britain	1981		1990		1998	1999		2005	2009/2010	

Table 13 (cont'd I): Countries Participating in EVS 1981-2008 and WVS 1981-2014

Country / Region	1981 - 1984		1989 - 1993		1994 - 1998	1999 - 2004		2005 - 2009	2008 - 2010	2010-2014
	EVS	WVS	EVS	WVS	WVS	EVS	WVS	WVS	EVS	WVS
Greece						1999			2008	
Ghana								2007		2012
Guatemala							2004			
Hong Kong								2005		2013
Hungary		1982	1991		1998	1999		2009	2008/2009	
Iceland	1984		1990			1999			2009/2010	
India				1990	1995		2001	2006		2014
Indonesia							2001	2006		
Iran							2000	2007		
Iraq							2004	2006		2012
Ireland	1981		1990			1999			2008	
Israel							2001			
Italy	1981		1990			1999		2005	2009	
Japan		1981		1990	1995		2000	2005		2010
Jordan							2001	2007		2014
Kazakhstan										2011
Korea (South)		1982		1990	1996		2001	2005		2010
Kosovo									2008	
Kuwait										2014
Kyrgyzstan							2003			2011
Latvia			1990		1996	1999			2008	
Lebanon										2013
Libya										2014
Lithuania			1990		1997	1999			2008	
Luxembourg						1999			2008	
Macedonia					1998		2001		2008	
Malaysia								2006		2012
Mali								2007		
Malta	1983		1991			1999			2008	
Mexico		1981		1990	1995/1996		2000	2005		2012
Moldova					1996		2002	2006	2008	
Montenegro					1996		2001		2008	
Morocco							2001	2007		2011
Netherlands	1981		1990			1999		2006	2008	2012
New Zealand					1998			2004		2011
Nigeria				1990	1995		2000			2011
Northern Cyprus									2008	
Northern Ireland	1981		1990			1999			2008	
Norway	1982		1990		1996			2007	2008	
Pakistan					1997		2001			2012

Table 13 (cont'd II): Countries Participating in EVS 1981-2008 and WVS 1981-2014

Country /	1981 - 1984		1989 - 1993		1994 - 1998	1999 - 2004		2005 - 2009	2008 - 2010	2010-2014
Region	EVS	WVS	EVS	WVS	WVS	EVS	WVS	WVS	EVS	WVS
Palestine										2013
Peru					1996		2001	2006		2012
Philippines					1996		2001			2012
Poland			1990	1989	1997	1999		2005	2008	2012
Portugal			1990			1999			2008	
Puerto Rico					1995		2001			
Qatar										2010
Romania			1993		1998	1999		2005	2008	2012
Russian Federation				1990	1995	1999		2006	2008	2011
Rwanda								2007		2012
Saudi Arabia						2003				
Serbia					1996		2001		2008	
Serbia and Montenegro								2005		
Singapore						2002				2012
Slovakia			1991	1990	1998	1999			2008	
Slovenia			1992		1995	1999		2005	2008	2011
South Africa		1982		1990	1996		2001	2006		2013
Spain	1981		1990	1990	1995	1999	2000	2007	2008	2011
Sweden	1982		1990		1996	1999		2006	2009/2010	2011
Switzerland				1989	1996			2007	2008	
Thailand								2007		2013
Taiwan Province of					1994			2006		2012
Tanzania						2001				
Trinidad and Tobago								2006		2011
Tunisia										2013
Turkey				1990	1996	2001	2001	2007	2008/2009	2011
Uganda						2001				
Ukraine					1996	1999		2006	2008	2011
United States	1982		1990		1995		1999	2006		2011
Uruguay					1996			2006		2011
Uzbekistan										2011
Venezuela					1996		2000			
Viet Nam						2001		2006		
Yemen										2014
Zambia								2007		
Zimbabwe						2001				2012

Source: Adapted from GESIS Data Archive for the Social Sciences (2019)

Table 14: Source of Variation for Selected Social Capital Items

Variable		Mean	Std. Dev.	Min	Max	Observations
Generalized Trust	overall	0.289489	0.156332	0.031671	0.761227	351
	between		0.143575	0.035240	0.679145	105
	within		0.053753	0.015825	0.563153	T-bar = 3.34286
Institutional Trust: Justice System	overall	2.522641	0.331917	1.628757	3.587411	307
	between		0.346731	1.785668	3.587411	100
	within		0.144523	2.157574	3.209842	T-bar = 3.07
Civic Norms: Cheating on Taxes	overall	8.655141	0.658546	6.257805	10	339
	between		0.570772	7.336376	9.923769	101
	within		0.385909	6.710288	9.71466	T-bar = 3.35644
Civic Engagement: Sport Organization	overall	0.128469	0.095020	0.00255	0.419151	166
	between		0.087381	0.005879	0.393917	90
	within		0.024393	0.036255	0.260154	T-bar = 1.84444

Source: Author's calculations based on data from WVS (2015); EVS (2011)

World Values Survey and European Values Study:

Social capital and time preference are measured in terms of responses to attitudinal survey questions from the World Values Survey (WVS, 2015) and the European Values Study (EVS, 2011). In order to exploit all the available data from both surveys, a comprehensive data inventory, the 'Integrated Values Surveys 1981-2014 dataset' has been created from all single WVS/EVS waves.

The employed survey based items and their underlying questions are listed below. Each variable identifier from the Integrated WVS Dictionary is preceded with the name of the variable - in brackets - under which it enters the regressions in the three studies. The depicted wording stems from the 6th WVS wave (see WVS, 2012). Furthermore, for each variable information about the scaling is depicted.

WVS/EVS: Social Capital

Question: Generalized Trust

(Generalized Trust): *A165.*[74] *Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*

> *1 Most people can be trusted*   *2 Need to be very careful*

Following Inglehart and Welzel (2005),[75] at the individual-level a dummy variable was created that is coded 1 for respondents opting for "most people can be trusted" and 0 for respondents opting for "need to be careful". At the country level, the

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[74] Additional WVS/EVS interpersonal trust items: **1.** (Generalized trust): A168. Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair? Would try to take advantage of you (1) / Would try to be fair (2); **2.** (Intimate interpersonal and Generalized trust): I'd like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group completely, somewhat, not very much or not at all? G007_33_B. People you know personally / G007_34_B. People you meet for the first time: Trust completely (1) / Trust somewhat (2) / Do not trust very much (3) / Do not trust at all (4)

[75] Knack and Keefer (1997) follow a similar approach.

variable can be interpreted in terms of the percentage of respondents reporting "most people can be trusted".

Questions: Institutional Trust

I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all?

	A great deal	Quite a lot	Not very much	None at all
	1	2	3	4

(Institutional Trust / Armed Forces): *E069_02. Armed Forces*
(Institutional Trust / Police): *E069_06. Police*
(Institutional Trust / Justice System): *E069_17. Justice System / Courts*
(Institutional Trust / Civil Services): *E069_08. Civil Services*
(Institutional Trust / Parliament): *E069_07. Parliament*
(Institutional Trust / Government): *E069_11. Government*
(Institutional Trust / Political Parties): *E069_12. Political Parties*

At the individual level, the single items were scaled in a way that higher values indicate more social capital, i.e. more confidence in public institutions (armed forces, police, justice system, civil service, government, parliament, political parties).

Questions: Civic Norms

Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between:

Never justifiable 2 3 4 5 6 7 8 9 Always justifiable

(Social Capital / Civic Norms): *F115. Avoiding a fare on public transport*
(Social Capital / Civic Norms): *F116. Cheating on taxes*
(Social Capital / Civic Norms): *F117. Someone accepting a bribe*

At the individual level, the single items were scaled in a way that higher values indicate more social capital.

Questions: Civic Engagement

Now I am going to read off a list of voluntary organizations. For each organization, could you tell me whether you are an active member, an inactive member or not a member of that type of organization?

	Active member	Inactive member	Don't belong
	2	*1*	*0*

(Social Capital / Civic Engagement): *A099. Sport or recreational organization*
(Social Capital / Civic Engagement): *A100. Art, music or educational organization*
(Social Capital / Civic Engagement): *A105. Humanitarian or charitable organization*

WVS/EVS: Time Preference

Questions: Time Preference

Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?

(Time Preference): *A038. Thrift saving money and things*
(Time Preference): *A039. Determination perseverance*

Global Preference Survey:

Further measures for generalized trust 'GPS trust' and time preference 'patience' were retrieved from the Global Preference Survey (GPS) dataset, which was recently introduced by Falk *et al.* (2018).The selection procedure of the underlying survey items included multiple incentivized choice experiments, carried out as part of an initial survey validation study (Falk et al., 2016). The GPS items were selected, combined and weighted in regard to their ability to predict behavior of participants in experiments.

GPS: Social Capital

The GPS item for generalized trust relies on the survey question whether:

'Other people only have the best intentions'

Answers were recorded based on a Likert scale 0 (low trust) – 10 (high trust).

GPS: Time Preference

Patience consists of a combination of a qualitative and a quantitative survey item.

- The qualitative item is based on the self-assessed willingness to wait on an 11-point Likert scale.

- The quantitative item was retrieved by a staircase procedure, involving five interdependent binary choices between a smaller payment today and a larger payment in 12 months, whereby the immediate payment remained the same for all 5 choices, and the delayed payment was varied in order to approach the point where the respondent was indifferent between both payments. The quantitative and the qualitative survey items entered the combined patience measure with a weight of 71%, and 29%.

The measure is standardized at the individual level with a mean of zero and a standard deviation of one.

A2: Shadow Economy

Table 15: Data Summary: Shadow Economy

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Dependent Variable					
Shadow Economy Size in % of GDP	99	27.99131	12.97061	6.85	65.455
Key Variables					
Institutional Trust: Synt Index	96	2.45e-09	1	-1.88397	3.807567
Institutional Trust: Naive Index	104	2.461700	0.329417	1.873659	3.574566
Institutional Trust: Political Parties	100	2.056678	0.361262	1.387008	3.516066
Institutional Trust: Government	103	2.419508	0.403852	1.776280	3.761504
Institutional Trust: Parliament	103	2.321738	0.421432	1.421933	3.751662
Institutional Trust: Civil Services	102	2.428714	0.331828	1.654704	3.497218
Institutional Trust: Justice System	100	2.549174	0.354091	1.785668	3.587411
Institutional Trust: Police	103	2.619489	0.363403	1.849490	3.713525
Institutional Trust: Armed Forces	102	2.767484	0.345781	2.065961	3.728825
Tax Morale	101	8.697797	0.571171	7.336376	9.923769
Generalized Trust	105	0.263053	0.147280	0.035240	.7132707
Control Variables					
Log GDP pc	104	8.891015	1.430884	5.607239	11.4874
Tax Revenue in % of GDP	87	17.42962	7.36356	0.890139	38.92633
Freedom from Corruption	101	46.48837	23.72846	15.33333	97
Property Rights	101	53.68482	24.36056	10	91.66666
Business Freedom	101	68.62114	13.06457	38.10	99.45
Free Primary Healthcare	104	0.884615	0.321033	0	1
Instruments for Institutional Trust					
Muslim	102	0.23378	0.365048	0	1
Colonized	105	0.619048	0.487950	0	1
Polity2 Index	101	4.842244	5.914844	-10	10

Table 16: Determinants of the Shadow Economy (miscellaneous)

Dependent Variable: Size of Shadow Economy in % of GDP (statistics robust to heteroskedasticity)

					OLS				Pooled OLS	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	GT	IT	CN	CE	SC1	IT Naive	IT Synt	GT	IT Naive	IT Synt
Social Capital	-25.581*** (-2.90)	-9.103** (-2.49)	-2.623 (-1.58)	-6.449 (-0.94)	-2.138*** (-3.18)	-8.852** (-2.33)	-2.970** (-2.26)	-16.111** (-2.28)	-6.694* (-1.92)	-2.044 (-1.61)
Log GDP per Capita	-4.180*** (-3.18)	-4.286*** (-2.85)	-4.319*** (-3.17)	-4.432*** (-2.99)	-4.550*** (-3.34)	-4.369*** (-2.86)	-5.021*** (-2.76)	-5.054*** (-4.23)	-5.648*** (-4.45)	-5.876*** (-3.67)
Tax Rev in % of GDP	0.145 (1.16)	0.194 (1.38)	0.200 (1.47)	0.220 (1.45)	0.213 (1.31)	0.174 (1.23)	0.291* (1.88)	0.178* (1.71)	0.222** (2.03)	0.342** (2.40)
Free. from Corruption	-0.139 (-1.18)	-0.186 (-1.65)	-0.286** (-2.61)	-0.294** (-2.01)	-0.126 (-0.95)	-0.221** (-2.04)	-0.215* (-1.95)	-0.108* (-1.66)	-0.155** (-2.90)	-0.163** (-2.53)
Property Rights	-0.049 (-0.44)	-0.030 (-0.26)	0.028 (0.22)	0.072 (0.52)	-0.010 (-0.08)	-0.023 (-0.20)	-0.026 (-0.24)	-0.051 (-0.72)	-0.021 (-0.29)	-0.011 (-0.13)
Business Freedom	0.141 (0.91)	0.092 (0.59)	0.143 (0.88)	0.133 (0.82)	0.076 (0.46)	0.110 (0.70)	0.166 (1.02)	0.047 (0.51)	0.037 (0.39)	0.058 (0.57)
Primary Care	0.672 (0.16)	1.275 (0.29)	0.420 (0.09)	-0.848 (-0.16)	-1.652 (-0.38)	1.120 (0.25)	-0.584 (-0.13)	4.103 (1.37)	4.198 (1.38)	2.282 (0.65)
Constant	69.117*** (6.46)	88.843*** (5.67)	88.386*** (5.28)	67.612*** (5.20)	67.899*** (6.18)	89.176*** (5.49)	68.458*** (5.54)	77.748*** (8.99)	95.031*** (7.24)	79.605*** (6.85)
N	84	83	84	73	71	83	79	170	168	144
adj. R^2	0.599	0.586	0.553	0.499	0.561	0.582	0.587	0.635	0.629	0.608
F	28.213	32.639	34.865	27.762	43.376	31.193	31.326	30.786	30.341	25.420

Notes: t-statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 17: Pairwise Correlation between Forms of Trust: Shadow Economy

	GT	IT: Armed	IT: Police	IT: Justice	IT: Civil	IT: Parliament	IT	IT: Pol.
Generalized Trust	1.000							
Institutional Trust: Armed Forces	-0.056	1.000						
Institutional Trust: Police	0.335***	0.520***	1.000					
Institutional Trust: Justice System	0.284***	0.597***	0.794***	1.000				
Institutional Trust: Civil Services	0.134	0.606***	0.611***	0.789***	1.000			
Institutional Trust: Parliament	0.157	0.599***	0.621***	0.767***	0.850***	1.000		
Institutional Trust: Government	0.034	0.639***	0.541***	0.733***	0.772***	0.885***	1.000	
Institutional Trust: Political Parties	0.174*	0.518***	0.456***	0.657***	0.806***	0.927***	0.846***	1.000

Source: Author's calculations based on data from WVS (2015); EVS (2011)

Table 18: Mortality: Shadow Economy

| | | | Appendix Table A2 | | | | | | |
| | | | Data on Mortality | | | | | | |
Former Colonies	Abbreviated name used in graphs	Log GDP per capita (PPP) in 1995	Average Protection Against Expropriation Risk 1985-95	First mortality estimate	Second mortality estimate	Third mortality estimate	Fourth mortality estimate (used in main analysis)	Fifth mortality estimate	Alternative version of Curtin data on Africa
Angola	AGO	7.77	5.36			280	280	280	280
Argentina	ARG	9.13	6.39				68.9	71	68.9
Australia	AUS	9.90	9.32				8.55	8.55	8.55
Burkina Faso	BFA	6.85	4.45		280	280	280	280	280
Bangladesh	BGD	6.88	5.14	71.41	71.41	71.41	71.41	71.41	71.41
Bahamas	BHS	9.29	7.50				85	85	85
Bolivia	BOL	7.93	5.64				71	71	71
Brazil	BRA	8.73	7.91				71	71	71
Barbados	BRB	9.27		85	85	85	85	85	85
Central African Fed.	CAF	7.19			280	280	280	280	280
Canada	CAN	9.99	9.73	16.1	16.1	16.1	16.1	16.1	16.1
Chile	CHL	9.34	7.82				68.9	71	68.9
Cote d'Ivoire	CIV	7.44	7.00			668	668	668	483
Cameroon	CMR	7.50	6.45			280	280	280	280
Congo (French)	COG	7.42	4.68		240	240	240	240	280
Colombia	COL	8.81	7.32				71	71	71
Costa Rica	CRI	8.79	7.05				78.1	78.1	78.1
Dominican Re	DOM	8.36	6.18			130	130	130	130
Algeria	DZA	8.39	6.50	78.2	78.2	78.2	78.2	78.2	78.2
Ecuador	ECU	8.47	6.55				71	71	71
Egypt	EGY	7.95	6.77		67.8	67.8	67.8	67.8	67.8
Ethiopia	ETH	6.11	5.73		26	26	26	26	26
Ghana	GHA	7.37	6.27			668	668	668	483
Guinea	GIN	7.49	6.55			483	483	483	483
Gambia	GMB	7.27	8.27		1470	1470	1470	1470	164.66
Guatemala	GTM	8.29	5.14				71	71	71
Guyana	GUY	7.90	5.89	32.18	32.18	32.18	32.18	32.18	32.18
Hong Kong	HKG	10.05	8.14			14.9	14.9	14.9	14.9
Honduras	HND	7.69	5.32				78.1	78.1	78.1
Haiti	HTI	7.15	3.73				130	130	130
India	DNI	7.33	8.27	48.63	48.63	48.63	48.63	48.63	48.63
Indonesia	IND	7.33	7.59	170	170	170	170	170	170
Jamaica	JAM	8.19	7.09	130	130	130	130	130	130
Kenya	KEN	7.06	6.05			145	145	145	280
Sri Lanka	LKA	7.73	6.05	69.8	69.8	69.8	69.8	69.8	69.8
Morocco	MAR	8.04	7.09			78.2	78.2	78.2	78.2
Madagascar	MDG	6.84	4.45		536.04	536.04	536.04	536.04	302
Mexico	MEX	8.94	7.50		71	71	71	71	71
Mali	MLI	6.57	4.00		2940	2940	2940	2940	280
Malta	MLT	9.43	7.23	16.3	16.3	16.3	16.3	16.3	16.3
Myanmar	MMR		5.77	34.6	34.6	34.6	34.6	34.6	34.6
Mauritania	MRT	7.41			280	280	280	280	280
Mauritius	MUS	9.05		30.5	30.5	30.5	30.5	30.5	30.5
Malaysia	MYS	8.89	7.95	17.7	17.7	17.7	17.7	17.7	17.7
Niger	NER	6.73	5.00		400	400	400	400	280
Nigeria	NGA	6.81	5.55			2004	2004	2004	483
Nicaragua	NIC	7.54	5.23				163.3	163.3	163.3
New Zealand	NZL	9.76	9.73	8.55	8.55	8.55	8.55	8.55	8.55
Pakistan	PAK	7.35	6.05			36.99	36.99	36.99	36.99
Panama	PAN	8.84	5.91				163.3	163.3	163.3
Peru	PER	8.40	5.77				71	71	71
Paraguay	PRY	8.21	6.95				78.1	78.1	78.1
Rwanda	RWA	6.48				280	280	280	280
Sudan	SDN	7.31	4.00		88.2	88.2	88.2	88.2	36.4
Senegal	SEN	7.40	6.00	164.66	164.66	164.66	164.66	164.66	164.66

Table 17: Mortality (cont'd): Shadow Economy

	Abbreviated name used in graphs	Log GDP per capita (PPP) in 1995	Average Protection Against Expropriation Risk 1985-95	First mortality estimate	Second mortality estimate	Third mortality estimate	Fourth mortality estimate (used in main analysis)	Fifth mortality estimate	Alternative version of Curtin data on Africa
Sierra Leone	SLE	6.25	5.82	483	483	483	483	483	483
El Salvador	SLV	7.95	5.00				78.1	78.1	78.1
Singapore	SGP	10.15	9.32	17.7	17.7	17.7	17.7	17.7	17.7
Surinam	SUR		4.68			32.12	32.18	32.18	32.12
Chad	TCD	6.84				280	280	280	280
Togo	TGO	7.22	6.91			668	668	668	483
Trinidad and Tobago	TTO	8.77	7.45	85	85	85	85	85	85
Tunisia	TUN	8.48	6.45		63	63	63	63	61
Tanzania	TZA	6.25	6.64			145	145	145	280
Uganda	UGA	6.97	4.45			280	280	280	280
Uruguary	URY	9.03	7.00				71	71	71
USA	USA	10.22	10.00	15	15	15	15	15	15
Venezuela	VEN	9.07	7.14				78.1	78.1	78.1
Vietnam	VNM	7.28	6.41		140	140	140	140	140
South Africa	ZAF	8.89	6.86	15.5	15.5	15.5	15.5	15.5	15.5
Zaire	ZAR	6.87	3.50			240	240	240	280
European Colonizers									
France				20.17	20.17	20.17	20.17	20.17	20.17
Britain				15.3	15.3	15.3	15.3	15.3	15.3

A blank indicates missing data. When mortality varies across different cities for a country, we use the lowest rate. Countries in italics have reasonable mortality estimates, but they cannot be included in our basic sample as other data are missing. Gutierrez shows that the ratio of mortality for bishops aged 40-49 is, by disease environment: low mortality 10 per 1000; medium mortality, 11 per 1000; high mortality, 23 per 1000. We use these proportions and the death rate in Mexico from Curtin to infer mortality in Latin America. The results would be essentially the same if we used Curtin (1989)'s Jamaica estimate as the base case for calculating Latin American settler mortality using the Gutierrez estimates.

Curtin (1964) reports average annual mortality from disease in the anti-slavery blockade (West Africa) as 5.44%, and mortality from disease in the South American Naval Stations as 0.77%. Mortality at other naval stations is consistent with the Curtin and Gutierrez estimates (comparing the ratios with West Africa): Mediterranean (0.93%), East Indian (1.51%), West Indian (1.81%), Home Station (0.98%).

The alternative mortality estimates are calculated as follows. First mortality estimate: data from Curtin (1989), "Death by Migration" only. Second mortality estimate: data from "Death by Migration" plus earliest data for each country from Curtin (1998), "Disease and Empire". Third mortality estimate: including neighbours with same disease environments and African mortality for Kenya and Congo, from other Curtin sources discussed in the appendix. Fourth mortality estimate: using Gutierrez (1986) data on bishops to estimate mortality in South America and the full set of Curtin estimates of mortality. Fifth mortality estimate: using Curtin (1964) data from naval stations for Chile and Argentina. Alternative version of Curtin data: using long sample periods from Curtin (1989) and (1998) and data on bishops to estimate mortality in South America.

Note: Reprinted from Acemoglu *et al.* (2001)

A3: Fiscal Cyclicality

Table 19: Data Summary: Fiscal Cyclicality

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Dependent Variable					
Cyclicality	104	0.695082	3.467116	-7.21489	7.359561
Key Variables					
Social Capital: PC Index	87	4.37e-09	1.863398	-3.18140	4.194246
Generalized Trust	105	0.264074	0.143575	0.035240	0.679145
Institutional Trust	103	2.505123	0.341800	1.820332	3.591971
Civic Norms	105	8.795343	0.491067	7.475483	9.913510
Civic Engagement	90	0.278232	0.1717595	0.258620	0.730055
Control Variables					
Control of Corruption	101	0.204984	1.089652	-1.564978	2.393064
National Fiscal Rules	61	0.754411	0.752816	0	3
Checks and Balances	100	3.199036	1.387965	1	7.2
Kaopen Index	90	0.647547	1.457938	-1.564582	2.500014
Total Reserves	100	49.44697	122.4090	0.248788	1053.74
Debt-to-GDP Ratio	102	0.747056	1.827689	0.000011	10.39532
Output Volatility	105	8.12e+07	7.82e+08	0.000022	8.00e+09
Instruments for Social Capital					
Pronoun Drop	92	0.728261	0.447294	0	1
Monarchy	105	0.190476	0.394560	0	1
Religious Person	104	2.670536	0.228583	1.854554	2.992823

Table 20: PW Correlation of Social Capital Survey Items: Fiscal Cyclicality

	GT	IT: Police	IT: Parliam.	IT: Justice S.	CN: Av. Fare	CN: Tax M.	CN: A. Bribe	CE: Sport	CE: Art	CE: H.
Generalized Trust	1.000									
Institutional Trust: Police	0.337***	1.000								
Institutional Trust: Parliam.	0.157	0.622***	1.000							
Institutional Trust: Just. S.	0.283***	0.796***	0.771***	1.000						
Civic Norms: Avoid. Fare	0.238**	0.425***	0.373***	0.356***	1.000					
Civic Norms: Tax Morale	0.030	0.167*	0.144	0.193*	0.712***	1.000				
Civic Norms: Accept Bribe	0.281***	0.232**	0.029	0.075	0.631***	0.640***	1.000			
Civic Engagement: Sport	0.341***	0.170	0.085	0.097	0.063	-0.012	-0.102	1.000		
Civic Engagement: Art	0.177*	0.030	0.118	0.054	0.066	0.012	-0.143	0.873***	1.000	
Civic Engagement: Human.	0.277***	0.223**	0.122	0.178*	0.123	-0.019	-0.078	0.790***	0.849***	1.000

Author's calculations based on data from WVS (2015); EVS (2011)

Table 21: Determinants of Fiscal Cyclicality (miscellaneous)

Dependent Variable: Fiscal Cyclicality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	OLS (8)	(9)	(10)	(11)	(12)	(13)	(14)	Pooled OLS (15)	(16)
	SC I	SC II	SC III	SC I	GT	IT	CN	CE	SC I	GT	IT	CN	CE	IT Naive	IT Synt	SC I
Inter. SC & CoC									-0.053 (-0.30)	-0.782 (-0.35)	-0.287 (-0.22)	-0.292 (-0.30)	-0.701 (-0.42)			
Social Capital	-0.898*** (-4.86)	0.244 (0.91)	0.169 (0.52)	-0.557*** (-2.71)	-4.055 (-1.51)	-2.365* (-1.88)	-0.510 (-0.72)	-4.744** (-2.31)	-0.551*** (-2.65)	-3.389 (-1.03)	-2.400* (-1.88)	-0.571 (-0.77)	-4.572** (-2.17)	-2.682** (-2.03)	-0.943** (-2.32)	-1.058*** (-6.56)
Control of Corr.				-1.373*** (-3.08)	-1.467*** (-3.51)	-1.360*** (-3.24)	-1.726*** (-4.63)	-1.738*** (-4.34)	-1.316*** (-2.69)	-1.225 (-1.53)	-0.613 (-0.18)	0.865 (0.10)	-1.476* (-1.98)	-1.508*** (-3.98)	-1.493*** (-3.90)	
Checks and Bal.	0.178 (0.64)	0.377 (1.14)	0.287 (0.89)	0.378 (1.41)	0.313 (1.19)	0.259 (0.94)	0.313 (1.17)	0.587** (2.20)	0.376 (1.39)	0.332 (1.23)	0.261 (0.94)	0.318 (1.18)	0.573** (2.11)	0.161 (0.59)	0.214 (0.78)	0.168 (0.59)
Kaopen	-0.214 (-0.88)	-0.499* (-1.81)	-0.560** (-2.00)	0.232 (0.86)	0.218 (0.84)	0.046 (0.17)	0.210 (0.80)	0.349 (1.28)	0.239 (0.87)	0.220 (0.84)	0.048 (0.18)	0.213 (0.81)	0.347 (1.26)	0.066 (0.25)	0.043 (0.16)	-0.046 (-0.18)
Total Reserves	-0.002 (-0.74)	-0.005 (-1.65)	-0.004 (-1.41)	-0.002 (-0.89)	-0.003 (-1.14)	-0.003 (-1.11)	-0.004 (-1.52)	-0.004 (-1.62)	-0.002 (-0.91)	-0.003 (-1.18)	-0.003 (-1.11)	-0.004 (-1.46)	-0.004 (-1.62)	-0.003 (-1.04)	-0.002 (-0.87)	-0.002 (-1.13)
Debt to GDP	0.710** (2.59)	0.752** (2.27)	0.867*** (2.67)	0.567** (2.17)	0.534** (2.67)	0.657*** (3.29)	0.609*** (2.98)	0.403 (1.47)	0.561** (2.12)	0.528** (2.61)	0.655*** (3.26)	0.626*** (2.94)	0.397 (1.44)	0.633*** (3.21)	0.659*** (3.32)	0.261* (1.86)
Output Volatility	0.000 (1.02)	0.000 (0.29)	0.000 (0.23)	0.000 (0.00)	-0.000 (-0.27)	-0.000 (-0.49)	-0.000 (-0.55)	-0.000 (-0.46)	-0.000 (-0.04)	-0.000 (-0.36)	-0.000 (-0.48)	-0.000 (-0.57)	-0.000 (-0.49)	-0.000 (-0.52)	-0.000 (-0.46)	0.000* (1.89)
Constant	-0.561 (-0.54)	-0.890 (-0.73)	-0.666 (-0.55)	-1.079 (-1.09)	0.523 (0.44)	5.409 (1.57)	3.971 (0.63)	-0.236 (-0.21)	-1.025 (-1.01)	0.356 (0.27)	5.510 (1.58)	4.489 (0.68)	-0.185 (-0.16)	6.479* (1.80)	-0.299 (-0.30)	-0.726 (-0.70)
N	70	70	70	70	80	79	80	70	70	80	79	80	70	80	78	78
adj. R^2	0.337	0.101	0.093	0.416	0.336	0.351	0.320	0.399	0.407	0.328	0.342	0.311	0.391	0.352	0.367	0.364
F	6.854	2.286	2.173	8.018	6.715	7.021	6.315	7.535	6.924	5.820	6.067	5.467	6.527	7.136	7.384	10.813

Notes: t-statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A4: Fiscal Stress

Table 22: Data Summary: Fiscal Stress

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Dependent Variable					
Fiscal Crisis	76	0.72642	0.389241	0	1
Key Variables					
Old-Age Dependency Ratio	76	12.66713	7.209393	1.441826	27.40190
Total Fertility Rate	76	3.056990	1.559539	1.356389	6.956250
Generalized Trust	63	0.273542	0.143495	0.056958	0.640917
GPS Trust	76	-0.022146	0.277795	-0.70644	0.609021
WVS LTO	61	44.77425	24.01952	3.526448	100
Thrift	63	0.363768	0.117332	0.106524	0.596968
Perseverance	63	0.365338	0.095987	0.162964	0.581339
Patience	76	-0.003421	0.369663	-0.612520	1.071452
Control Variables					
WGI: PC Index	76	-5.68e-09	2.319933	-4.419485	4.605972
Executive Election	75	0.114669	0.095022	0	0.263158
Political System	75	0.813505	0.861125	0	2
Gini Index	69	39.26152	8.785111	26.38571	61.71429
Oil Trade Balance	76	4.335494	9.232041	0	42.37770
Log GDP PC	76	8.852481	1.488608	4.645298	11.77565
Instruments for Generalized Trust					
Colonized	76	0.434211	0.498946	0	1
Catholic	63	0.284974	0.310569	0	0.936654
Climate	71	1.901408	1.016365	0	3
Instruments for Patience					
Protestant	63	0.104949	0.158483	0	0.573691
Plants	65	17.01538	14.49945	2	33
Latitude	64	20.27942	25.30423	-36.67600	60.21200

Table 23: Determinants of Fiscal Stress (miscellaneous)

Dependent Variable: Fiscal Stress	OLS														Pooled OLS	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	GT	IT	CN	CE	SC 1	IT Naive 1	IT Synt 1	GT	IT	CN	CE	SC 1	IT Naive	IT Synt	GT	GT
Social Capital	-1.541***	-0.334***	-0.071	-1.061***	-0.084***	-0.316**	-0.086**	-0.625**	-0.052	-0.023	-0.632***	-0.032*	-0.060	-0.020	-1.439***	-0.741**
	(-6.21)	(-2.75)	(-0.85)	(-4.48)	(-4.33)	(-2.30)	(-1.96)	(-2.66)	(-0.57)	(-0.39)	(-3.29)	(-1.89)	(-0.63)	(-0.65)	(-5.53)	(-2.64)
PC WGI								-0.097***	-0.111***	-0.113***	-0.081***	-0.104***	-0.112***	-0.111***		-0.085***
								(-4.94)	(-5.41)	(-5.53)	(-3.79)	(-4.87)	(-5.47)	(-5.29)		(-4.78)
Executive Election								0.748**	0.970**	0.997***	1.046***	0.836**	0.973**	1.018**		0.670**
								(2.12)	(2.56)	(2.69)	(2.95)	(2.07)	(2.60)	(2.60)		(2.41)
System								-0.084*	-0.082	-0.082	-0.046	-0.070	-0.084	-0.080		-0.062
								(-1.70)	(-1.56)	(-1.57)	(-0.86)	(-1.26)	(-1.58)	(-1.46)		(-1.05)
Gini Index								-0.006	-0.003	-0.003	0.003	-0.002	-0.003	-0.003		-0.011**
								(-1.45)	(-0.79)	(-0.79)	(0.77)	(-0.44)	(-0.81)	(-0.62)		(-2.46)
Oil Trade	0.009***	0.009*	0.005	0.009**	0.008*	0.005	0.010**	-0.002	-0.005	-0.005	-0.002	-0.005	-0.005	-0.005	0.010***	0.002
	(2.71)	(1.95)	(1.11)	(2.18)	(1.92)	(1.26)	(2.10)	(-0.58)	(-1.33)	(-1.39)	(-0.43)	(-1.20)	(-1.36)	(-1.34)	(3.71)	(0.67)
Log GDP per Capita	-0.111***	-0.181***	-0.175***	-0.122***	-0.150***	-0.199***	-0.185***	-0.007	-0.014	-0.009	-0.030	-0.022	-0.015	-0.019	-0.097***	-0.057**
	(-4.16)	(-6.11)	(-5.56)	(-4.13)	(-5.17)	(-6.15)	(-5.53)	(-0.26)	(-0.45)	(-0.29)	(-0.95)	(-0.65)	(-0.47)	(-0.58)	(-3.08)	(-2.16)
Constant	2.072***	3.136***	2.880***	2.064***	2.023***	3.241***	2.327***	1.163***	1.083**	1.102*	0.962***	0.978***	1.111***	0.976***	2.199***	1.966***
	(9.05)	(7.16)	(3.63)	(7.83)	(7.59)	(6.38)	(7.49)	(4.19)	(2.61)	(1.86)	(3.47)	(3.28)	(2.61)	(3.19)	(7.89)	(7.01)
N	63	61	63	55	55	62	58	59	58	59	52	52	58	55	145	104
adj. R^2	0.590	0.431	0.331	0.510	0.501	0.379	0.385	0.787	0.757	0.758	0.784	0.751	0.758	0.750	0.453	0.702
F	30.785	16.174	11.216	19.758	19.049	13.406	12.874	31.529	26.412	26.916	27.406	22.954	26.460	24.162	47.461	39.203

Notes: t-statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$