

# **EMPIRICAL ANALYSIS OF INFORMAL INSTITUTIONS**

Sang-Min Park

Dissertation

# **EMPIRICAL ANALYSIS OF INFORMAL INSTITUTIONS**

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Philipps-Universität Marburg

Eingereicht von: Dipl.-Vw. Sang-Min Park (Ge-  
burtsort: Albstadt)

Erstgutachter: Prof. Dr. Stefan Voigt

Zweitgutachter: Prof. Dr. Bernd Hayo

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# Inhaltliche Zusammenführung

## 1 Introduction

The New Institutional Economics has established itself as widely accepted extension to the standard neoclassical paradigm. Here, institutions are defined as commonly known rules that structure recurring interaction situations and the corresponding sanctioning mechanism. Formal institutions describe rules with a sanction mechanism that is organized by the state. Informal institutions describe rules with a sanction mechanism that is *not* organized by the state but by other societal members. Most studies providing empirical evidence that “institutions matter” focus solely on formal institutions. This is in stark contrast to the theoretical acknowledgement that human decisions are shaped by *both* formal *and* informal institutions.

This dissertation brings together five contributions in the empirical analysis of informal institutions. The first contribution provides a conceptual framework for the measurement of informal institutions. The second and third contribution analyze the impact of informal institutions on economic outcomes. The fourth contribution is concerned with the trade-off between formal and informal contract enforcement, while the fifth contribution is concerned with the effect of individual level religiosity on acceptance of corruption.

## 2 How to measure informal institutions

The aim of this work is to provide a methodological basis for the empirical study of informal institutions. Concerning the pragmatic measurement of informal institutions, it is argued that (1) a clear conceptual definition of an informal institution is essential to ensure validity, especially given that informal institutions are usually not codified. (2) In general, the measurement of factual behavior should be preferred if feasible. The observed behavior should provide enough variation to enable causal inference. (3) Because subjective measures are often faced with the problem of reverse causality in the measurement process, it is argued that objective measurement is generally to be preferred. If this is not feasible, the methodology used in the analysis of the data has to account for this problem. (4) In order to ensure reliability, transparency in the measurement process is required.

Given these proposals, some existing measures for informal institutions are critically surveyed. Objective measures include proximate measures and experimental measures. The ad-

vantage of proximate measures – like newspaper readership, the number of non-governmental organizations in a country or information on which religion is dominant in a region – is that it avoids the Heisenberg problem, namely that mere measurement of a phenomenon affects said phenomenon. However, there are concerns with regard to the validity of such measures. Experimental measurement of informal institutions – like the trust or public goods game – seems to be very well suited at first glance: It measures factually observed behavior and the use of randomization ensures causal inference. However, generalization beyond the (typically small-group) framing of the experiment and the sample used is usually not possible. In addition, analysis of institutional change is inherently difficult in the experimental methodology.

Subjective measurements of informal institutions include representative survey projects like the World Values Survey and non-representative survey measures, which are subjective expert assessments concerning some social aspect, like the state of civil society. The biggest caveat with these measures stems from the fact that subjective measures do not directly measure factual behavior. Potential advantages include measurement over rather long periods of time and exploratory use of numerous items of a survey. Furthermore, representative survey data are inherently well-suited for multi-level analysis, which would explicitly account for the basic notion that enforcement of institutions can occur at different levels of societal aggregation. A third category of subjective measures is represented by historical narratives. Here, historical records are utilized in order to arrive at qualitative assessments of the impact of an informal institution, usually focusing on times when centralized state enforcement of contracts was not yet available. Although these measures can prove valuable as the only feasible source for measurement in the very long-run, it is argued that this approach is characterized by several problems, all rooted in the subjectivity of qualitative historical interpretation.

The general conclusion to this work is that none of the surveyed approaches to measuring informal institutions is first-best: Each is characterized by advantages as well as disadvantages. The implication for empirical work is that objective and subjective measures of informal institutions should be seen as complements, rather than substitutes in assessing the impact of informal institutions.

### **3 Values, norms and the rule of law in long-run economic development**

There is some consensus in the literature that institutions can account fundamentally for long-run differences in economic development. However, the most influential works in this line neglect the role of informal institutions (like values and norms) in the development process. The aim of this work is to assess (in an exploratory manner) whether and how values and

norms impact long-run development. It is conjectured that (1) rule of law and social capital are fundamental determinants of economic development, (2) values and norms prevalent in a society influence the effectiveness of rule of law and social capital and (3) values and norms could directly impact development outcomes.

Because there is no general theory as to which values and norms are relevant here, a list of values and norms that could potentially be significant is considered. (1) *Individual responsibility and choice*: If actors follow the norm that it is the individual that is responsible for decision making and achieving goals, this should not only lead to actors striving to be better off economically, it should also increase the chance of establishing a functioning system of private property rights. (2) *Inequality acceptance*: Competition is inherently associated with inequalities, as there will be many enterprises that fail. If actors accept legally attained inequalities in economic outcomes, this should facilitate development through competition. However, this norm could also lead to a weakening of the rule of law, as institutions that promote equal treatment are not favored. (3) *Individuals are not militantly averse against the unknown*: If actors follow this norm, this should be associated with more innovative behavior and tinkering, both with regard to technology and political institutions, which would then be associated with economic and political development. (4) *Unequal treatment*: When societal values and norms support unequal treatment according to arbitrary lines such as men/women, believers/infidels, it is more likely that there are distortions in the allocation of human capital. (5) *Hierarchy acceptance*: When actors accept without question instructions given to them within a hierarchy, it is expected that the operation of firms – which are inherently hierarchical organizations – should be easier due to lower organizational costs. On the other hand, too strong an acceptance of hierarchies might weaken democratic institutions. (6) *Future orientation*: The more actors follow norms that support caring for future outcomes, the more likely they will save and invest optimally.

In order to test for the impact of these values and norms on economic development, representative survey data from the World Values Survey (and as a control non-representative survey data from the GLOBE project) are employed. For each of the proposed value dimensions, items that might be suitable are identified in the survey and combined using factor analysis. The dependent variable is per capita income. The estimation approach, three stage least squares, allows to explicitly endogenize rule of law and social capital. With the exception of *Inequality acceptance*, none of the value dimensions is found to have a direct impact on economic development. Without exception, all value dimensions are found to have an indirect

impact via rule of law and social capital. This indirect effect is not always positive: *Inequality acceptance* and *Hierarchy acceptance* are found to negatively affect the effectiveness of social capital. These results confirm the theoretical conjecture that the effectiveness of formal institutions in a country is constrained by its existing informal institutions.

#### **4 Informal institutions and bilateral trade**

International trade involves transaction between actors of two distinct sets of institutions, both formal and informal. Nevertheless, most of the literature concentrates on a pure gravitational model to explain the extent of trade between countries: The larger the respective market sizes and the lower the geographic distance, the higher bilateral trade is expected to be. The aim of this work is to extend the pure gravity approach with indicators of formal and informal institutions to assess their respective role in facilitating or impeding cross-border trade. The general conjecture regarding formal institutions is that the stronger institutions of contract enforcement are, the higher should bilateral trade be.

Again, several informal institutions are identified that might play a role. (1) *Uncertainty avoidance*: The more potential trading partners from two countries are characterized by uncertainty avoidance, the less likely it is that they will venture in to cross-border transactions, which are inherently more uncertain than domestic transactions. (2) *Universalism*: If potential trading partners in two countries follow the rule that everyone should be treated equally, regardless of group affiliation, it is more likely that they will consider cross-border trade, i.e. trade with a foreign person. (3) *Patriotism*: If potential trading partners from two countries follow the rule that domestic goods and services should be preferred, it is less likely that cross-border transactions will be realized. For all of these informal institutions, interactions are also expected with the effect of contract enforcement.

In order to test these conjectures, representative survey data from the World Values Survey are utilized. As above, for each of the informal institution, suitable items from the survey are aggregated using factor analysis. The dependent variable is the volume of exports from country  $i$  to country  $j$ . Exporting country uncertainty avoidance is positively, but not significantly associated with trade. Importing country uncertainty avoidance is negatively and significantly associated with trade. This effect is stronger the better contract enforcement is. A possible explanation is that, in the presence of both high uncertainty avoidance and strong contract enforcement, cross-border trade is replaced by domestic trade. The effect of exporting country universalism is significantly positive only for very high values of universalism. Importing country universalism is associated with a very small negative and insignificant effect on trade.

There is some evidence that universalism and formal contract enforcement are substitutive, as the effect of exporter universalism on trade is strictly positive (negative) and significant for low (high) values of contract enforcement quality. For both importing and exporting country patriotism, higher levels are significantly associated with less trade. The effect of importer patriotism is stronger for higher levels of importer contract enforcement quality. Again, this could be interpreted as a replacement of cross-border trade by domestic trade when patriotism is high and contract enforcement is strong.

The broad conclusion from this work is that informal institutions do matter for bilateral trade. A possible policy implication is that, when bilateral trade is hampered by patriotism or uncertainty avoidance, the use of trade intermediaries might be useful.

## **5 Does arbitration blossom when state courts are bad?**

While the previous work concentrated on the uncertainties involved in contract enforcement across borders, here, the relationship between formal and informal contract enforcement within a given country is considered. In particular, the trade-off between state dispute resolution (SDR, formal) and non-state dispute resolution (informal) is analyzed.

From a simple cost-benefit perspective, non-SDR will be preferred over SDR if the expected utility associated with it is higher. For a given quality of non-SDR, it is conjectured that the higher the (perceived) quality of SDR, the less frequently non-SDR will be used. A second conjecture is that, the higher the degree of procedural formalism, the more likely non-SDR will be used, as the use of SDR becomes more cumbersome. The third conjecture is that, the more international conventions that facilitate arbitration have been ratified, the more likely non-SDR will be used.

For the testing of these hypotheses, firm-level survey data taken from the World Bank World Business Environment Survey are used. To proxy for the use of non-SDR, a binary variable that indicates whether a firm has settled any payment disputes out of court is constructed. For the quality of SDR, two variables are employed. One is subjective and contains the firm's perceived confidence in the judicial system. The other is a (quasi) objective variable taken from the *Lex Mundi* project and provides information on the estimated number of days it takes in a country to collect on a bounced check. Estimation is implemented using pooled Probit regression. The results suggest that both indicators of SDR quality are positively associated with the probability of using non-SDR. This implies that the relationship between SDR and non-SDR is complementary rather than substitutive: Firms evidently turn to non-SDR not to



escape bad SDR, but rather to fill gaps in their dispute resolution portfolio. The second hypothesis is tested using a dummy variable for common law, as common law countries are characterized by less procedural formalism than civil law countries. However, the hypothesis is rejected as the probability of using non-SDR is actually higher in common law countries. Concerning the third hypothesis, there is no evidence that firms' use of non-SDR is influenced by conventions ratified. The main conclusion is that non-SDR and SDR seem to be complements rather than substitutes. These results thus imply that support of non-SDR as response to lacking quality of SDR is not a feasible policy option.

## **6 Religious loyalty and acceptance of corruption**

In this work, the impact of a specific informal institution – religiosity – on another informal institution – acceptance of corruption – is analyzed. Religiosity describes the degree to which religious values and norms are binding at the individual level, while acceptance of corruption describes the degree to which individual values and norms support corruption. It is conjectured that, as religious values and norms typically oppose corruption, religiosity should be negatively associated with acceptance of corruption. Furthermore, it is conjectured that individual acceptance of corruption should be positively affected by either aggregated, country level acceptance of corruption or country level perceived corruption.

These conjectures are tested using subjective representative survey data from the World Values Survey. As opposed to the aggregate analysis in the previous works, here, individual level variation is exploited. Acceptance of corruption is measured using an item that asks whether accepting bribes in the course of one's duties is justified. Religiosity is measured as common factor of four distinct items. Estimation is implemented with Probit. The results indicate a significantly negative marginal effect of religiosity on acceptance of corruption for values of religiosity above the 30-percentile. This implies that, for religiosity to actually have the conjectured negative effect on acceptance of corruption, some threshold level of religiosity is required. This result does not differ systematically between individuals of different religious denominations. The estimated effect of religiosity on acceptance of corruption is rather small in magnitude. A possible explanation for this is that religiosity might actually lead to more acceptance of corruption through the promotion of intra-group trust, a transmission channel not accounted for here. In line with the second hypothesis, a 1% higher country level acceptance is significantly associated with a 1.4% higher individual level acceptance of corruption.

# How to Measure Informal Institutions

Matthias Dauner (Institute of Law & Economics, University of Hamburg)

Sang-Min Park (University of Kassel & Philipps-University Marburg)

Stefan Voigt (Institute of Law & Economics, University of Hamburg and CESifo\*)

Abstract:

Although the relevance of informal institutions for economic outcomes has been acknowledged theoretically, the empirical work is lacking behind. We propose that the impact of either formal or informal institutions can usually not be assessed independent of the other. We argue that pragmatic measurement of informal institutions requires (1) clear definitions, (2) measurement of observed behavior, (3) acknowledgement of potential reverse causality in the measurement process and (4) transparency. We survey different objective and subjective measure of informal institutions and conclude that each approach is characterized by strengths and weaknesses. The general recommendation is then to utilize objective and subjective measurements as complements, rather than substitutes.

Key words: Institutions, Measurement, Formal vs. Informal Institutions.

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\* Prof. Dr. Stefan Voigt, Institute of Law & Economics, University of Hamburg, Rothenbaumchaussee 36, D-20146 Hamburg, Germany. Telephone: +49-40- 42838 \*\*\*, Telefax: +49-40-42839 \*\*\*, e-mail: [voigt@wiwi.uni-hamburg.de](mailto:voigt@wiwi.uni-hamburg.de). The authors thank participants of the MAGKS Forschungskolloquium and, in particular, Anne van Aaken, Nora El-Bialy, Phil Keefer, Marcus Kurtz, Katharina Pistor, Janina Satzer, Katharina Stepping, and Kim Eun-Young for helpful comments.

*“It is difficult to measure informal constraints [...].” (Aron 2000)*

*“[...] it is much easier to describe and be precise about the formal rules that societies devise than to describe and be precise about the informal ways by which human beings have structured human interaction. But although they defy, for the most part, neat specification and it is extremely difficult to develop unambiguous tests of their significance, they are important.” (North 1990)*

## **1 Introduction**

The New Institutional Economics (NIE) has been a huge success. Its representatives are united in the assumption that institutions determine – or at least substantially influence – economic outcomes. Although under attack from a number of directions<sup>1</sup>, the NIE has had a huge impact on the way economics is carried out. In a way, we are all institutional economists now: *“The battle to persuade the economics profession that institutions matter was won many years ago.”* (Binmore 2010)

Measurement of institutions – and as an implication the empirical testing of institutional theory – has been lagging behind the success of the more theoretical insights. This gap appears to be particularly severe regarding the measurement of informal institutions. This is noteworthy as many institutional economists argue that the informal institutions shared by large proportions of a society have decisive influence on their choice of more formal institutions. In general, informal institutions – as opposed to formal institutions – are assumed to be more stable over time, less amenable to intentional modification and could even be conceived of as the most fundamental layer of institutions in a society’s institutional system<sup>2</sup>.

Testing any assertion with regard to informal institutions presupposes that measures of informal institutions are available. Here, we set out to provide a survey of various approaches that provide measurable information on informal institutions. By evaluating the advantages and disadvantages of these various approaches to measure informal institutions, we try to extract some more general lessons concerning measurability of institutions. This work complements an earlier contribution on the chances and pitfalls of measuring institutions more generally (Voigt 2009a) and the rule of law specifically (Voigt 2009b). There, it was concluded general-

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<sup>1</sup> Some argue that it is really “geography” that determines all the rest (McArthur and Sachs 2001; Sachs 2003), others that representatives of the NIE have really been measuring policies rather than institutions (Henry and Miller 2008; Glaeser et al. 2004).

<sup>2</sup> Oliver Williamson refers to this as “embeddedness” (2000).

ly that “*measures of institutions should be precise, objective, and take into account de jure as well as de facto elements.*” (2009b, p. 23). With regard to the rule of law, it was argued that the use of aggregated indicators is associated with a significant loss in information as far as the effects of specific institutions are concerned (Voigt 2009b).

We will begin with introducing the main theoretical assumptions and implications for measurement that are behind these conclusions and assess the extent to which they apply when considering informal institutions in particular. Building on Voigt (2009a), we will then derive a few criteria for pragmatic measurement of informal institutions and survey existing measures based on these criteria. In the last section, we provide conclusions for empirical research on informal institutions.

## **2 The crucial importance of informal institutions: the main theoretical arguments**

### **2.1 A definition of informal institutions**

*“What is it about informal constraints that gives them such a pervasive influence upon the long-run character of economies?” (North 1991)*

In this section, we will pick up on the main theoretical arguments and implications for the measurement of institutions in general form Voigt (2009a). We will simultaneously work out differences when we are concerned with the measurement of informal institutions in particular.

Before we show some of the main arguments why informal institutions matter, we have to define institutions in general and more specifically the difference between formal and informal institutions. We define institutions as commonly known rules (endowed with a sanction mechanism) used to structure recurrent interactions. This definition allows for differences between formal and informal institutions, while also differentiating between rules and their enforcement (Ostrom 1986). North delineates formal and informal along the lines of the rule itself, while we propose a distinction with regard to who sanctions non-compliant behavior (Kiwit and Voigt 1995): If enforcement of a rule is organized by the state, the institution is formal (or external). This most obviously encompasses legal institutions. If rule-breaking is sanctioned by other members of society, be they organized or not, the institution is informal

(or internal)<sup>3</sup>. This includes moral values, social norms, traditions and the like. In line with this, Elster (1989) defines social norms as “*the propensity to feel shame and to anticipate sanction by others at the thought of behaving in a certain, forbidden way. This propensity becomes a social norm when and to the extent that it is shared with other people*”.

Thus far, we have established that informal institutions (1) are commonly known rules that provide structure to recurring interaction situations, (2) are usually not codified and (3) are not enforced by the state. We will now shortly present analogies to related concepts.

One concept that is very close but usually treated separately is social capital, which includes civic participation, trust, density of social networks and more (Fidrmuc and Gerxhani 2008). Interestingly, one can see social capital as a type of informal institutions (Casson et al. 2010) or informal institutions as a type of social capital (Ostrom and Ahn 2009), while some simply equate the two concepts (Stiglitz 2000). This conceptual difference seems mainly rooted in the focus of the respective research, so that for our purpose, it will suffice to see social capital as a type of informal institution. If – following Ostrom & Ahn (2009) and Putnam (1993, 1995) – social capital describes the capacity of a social group to solve collective action problems, we can simply refer to social capital as those informal institutions that are geared towards tackling collective action problems. In particular the dimension trust or trustworthiness seems relevant here. Although trust is for the most part treated as a concept apart from but highly related to institutions (Møllering 2006), one could interpret trust as an institution, the rule being e.g. that members of one’s own group can be trusted to fulfill contracts even in the presence of potential hold-up. Naturally, sanctioning in case of non-compliance (i.e. breach of trust/contract) is realized through the relevant social group (Dixit 2009). Trust can also be applied to imply a more aggregate level institution beyond the boundaries of a particular social group. We would then refer to generalized (or vertical) trust (Ostrom and Ahn 2009)<sup>4</sup>. Further related concepts include fairness (Binmore 2008) and altruism (Simon 1993).

Another related concept (and one that is sometimes hard to distinguish from institutions in general) is that of governance. In the context of the theory of the firm, governance mainly de-

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<sup>3</sup> A more fine-grained taxonomy of different types of informal institutions is proposed in Kiwit & Voigt (1995). This study also provides one of the first attempts in the social science literature at a taxonomy regarding the interplay between informal and formal institutions, which is later picked up by Lauth (2000) and Helmke & Levitsky (2004).

<sup>4</sup> A related dimension of social capital which is however harder to map into an institutional interpretation is that of horizontal networks and their density. A network per se or its density is hard to interpret as a rule instead of simply a characteristic of a social group.

scribes contractual mechanisms that help overcome firms commitment problems in business relationships with specific investments (Williamson 1979). A broader definition encompasses all legal and social institutions that govern economic activity (Dixit 2009). With both definitions, informal institutions can play a role. Even though Williamson is mainly concerned with contractual solutions to commitment problems, such as vertical integration, thus matters related to formal institutions, there is also scope for informal mechanisms, e.g. hostages as an informal commitment device (Werner and Keren 1993; Williamson 1983). In a more development-oriented context, rotating savings and credit associations (ROSCA) have been interpreted as informal commitment device (Gugerty 2007). As can be seen with the essay of Dixit (2009), when we define governance very broadly, it becomes nearly indistinguishable from the term institution. The more important contribution of his work is that informal institutions are not necessarily always associated with positive effects. Some informal institutions can straight out have negative effects, while others might be used to solve some collective action problem but turn out to have negative effects when they outlive their original purpose, such as the Mafia. More generally speaking, informal institutions can help actors settle on a Nash equilibrium, but this Nash equilibrium is not necessarily socially optimal.

We can see that the concepts of social capital and governance are largely compatible with our notion of informal institution. Alas, this does not mean that there is a general consensus on what informal institutions are. A look at the literature reveals that there is quite the variety of conceptual works on informal institutions, often providing their own taxonomy of institutions<sup>5</sup>. Instead of arguing that our definition is in some way superior to others, we will simply take this variety as given and point to differences when they appear relevant with respect to measurement.

## **2.2 Assumptions and implications**

Let us now turn to more substantial theoretical arguments and what they imply for the measurement of informal institutions. In Voigt (2009a), it was argued that the effect of an institution can be ascribed to both its substantial content and its factual implementation. This implies that any measure of institutions should distinguish between *de jure* and *de facto* institutions, as otherwise there is no way to separate the effect of the rule and the effect of its enforcement. How relevant is this implication for the measurement of informal institutions in particular?

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<sup>5</sup> See e.g. Helmke & Levitsky (2004), Greif (2008b), Dequech (2006), Stacey & Rittberger (2003), Raiser (1997), Scott (2001), Boettke et al. (2008), Davis (2006), Nee (1998), Binmore (2010).

Remember that by definition, it is nigh impossible to distinguish de jure and de facto concerning informal institutions: A rule that is (1) not codified and (2) enforced by societal members is inherently a de facto institution, but because it is not codified, it is at the same time de jure. However, our definition of informal institutions allows for informal rules to be codified, they are just not enforced by the state. Think for example of biblical norms, procedural rules of private courts of arbitration or simply the constitution of a local bowling association. Logically, a divergence of de jure and de facto informal institutions is possible in such instances. However, such a divergence cannot represent an equilibrium outcome, as a continued dissonance between a social group's rules and their implementation would ultimately lead to an adjustment in either the rule itself or the enforcement until de jure and de facto institutions are indistinguishable. This in turn brings us to the conclusion that, even when it might not be possible to measure de facto and de jure informal institutions separately, the researcher should try to measure informal institutions over a sufficiently long period of time that controls for the possibility of measurement out of equilibrium (*Implication 1*).

Another proposed assumption is that, in order to capture the constraining effect of any institution, its factual implementation has to be explicitly accounted for, as it represents the main way in which a rule actually constrains behavior. This implies that measures of institutions should take actual behavior into account (*Implication 2*). Naturally this implication is equally applicable when considering "only" informal institution, especially given that most of the time, the rule is not codified.

The next assumption is particularly relevant here: In most situations, more than one single institution is likely relevant for actual behavior; informal institutions can undermine or strengthen the effect of formal institutions. This implies that when analyzing the effect of an institution on some behavior, one should consider all institutions relevant for this behavior (separately, not in aggregate), be they formal or informal (*Implication 3*). What is more, one needs to control for the possibility that one of the relevant informal institutions is complementary or conflicting with another relevant formal institution (Kiwit and Voigt 1995).

The final assumption is that informal institutions are, for the most part, constant in the short term. The prevailing standpoint is that informal institutions change very slowly (Williamson 2000; Roland 2004). Furthermore, because the state is not involved in the enforcement of informal institutions, the state usually has no leverage to change the substantial content of informal rules (though it obviously has incentives to do so). If informal institutions are indeed in the short run stable and exempt from intentional modification and crucial for the factual

implementation of formal institutions, then the set of existing informal institutions provides natural bounds to the potential effectiveness of newly installed formal institutions. A new formal institution that is in some way conflicting with existing informal institutions will be hampered in its effectiveness by this very conflictary relationship. One of the most prominent examples is the failure of the (text of the) U.S. constitution to achieve political and economic stability in Latin American states (North et al. 2000).

The assertion that informal institutions are constant in the short run and thus not subject to political influence could be taken to imply that we need not worry about measuring specific informal institutions as opposed to bundles of institutions. This has been one of the main critiques of existing rule of law indicators (Voigt 2009b). After all, there is no scope for specific policy recommendations anyway. For two reasons, we nevertheless prefer the measurement of specific institutions over bundled measurement.

(1) Whether or not informal institutions are indeed stable in the short run is ultimately an empirical question. In order to answer it, we do need measures of informal institutions that are specific and available for several points in time. Because informal institutions are inherently less formalized and codified than formal institutions, measurement over long periods of time is disproportionately more difficult in this context. While Inglehart (2008) indeed finds that, since 1970 values have changed significantly, this evidence cannot tell us anything about long run changes in informal institutions, in particular whether these observed changes are also significant in the long run.

(2) Even if we can establish short run stability as stylized fact, different informal institutions can impact economic outcomes in very diverse ways, both directly and indirectly (Park and Voigt 2008). If we do not measure informal institutions in a differentiated manner, there is no way for us to account for these effects.

Tentatively, we could conclude from this section that measuring informal institutions is not strictly harder than measuring formal institutions. On the one hand, it might be easier as the distinction between content and enforcement, thus between *de jure* and *de facto*, is less relevant with informal institutions. On the other hand, valid measurement of informal institutions requires measurements over rather long periods of time.

### **3 Pragmatic proposals to measure informal institutions**

In this section, we will pick up on the proposals in Voigt (2009a) concerning the pragmatic measurement of institutions with special reference to informal institutions.



(1) Before we can measure specific institutions, we need a clear conceptual definition of what institution we are interested in. Logically, this is a necessary condition to ensure that we are indeed measuring the impact of a specific institution on some outcome. In particular, the conceptual definition (which feeds into the operationalization and ultimately the measurement) needs to address the following questions (Helmke and Levitsky 2004): What is the relevant group that is constrained by the institution? How is non-compliant behavior sanctioned? A clear definition also includes details on what exactly constitutes compliant and non-compliant behavior: When does the observed behavior constitute a violation of a rule? Do we need to distinguish different degrees of non-compliance? On a more concrete note, sometimes, the concept that we are interested in cannot be narrowed down to a single, specific institution, but rather represents some broader notion. This is particularly relevant in the analysis of informal institutions, where institutions are much harder to narrow down conceptually due to the general lack of codification. If this is the case, factor analysis can be a powerful tool to extract information of several measures into one substantiated latent variable<sup>6</sup>.

(2) If feasible, the measurement of factually observable behavior should be preferred. For the sake of causal inference, this must include behavior both in case of compliance and in case of non-compliance. Measurement at only one point in time is suboptimal, even if we acknowledge informal institutions to be stable in the short run: Because the effect of informal institutions potentially works both directly and indirectly through formal institutions, the period of measurement should be long enough to include variation in the relevant formal institutions. Otherwise, no inference concerning the impact of informal institutions via formal institutions is possible.

(3) We should ensure that potential reverse causality from  $y$  to  $x$  does not influence the measurement of  $x$ . Voigt (2009a) argues that this problem can be avoided by relying on objective, rather than subjective data, as this would ensure that the measurement is not contaminated by subjective evaluations of the respondent that are related to  $y$ . Where objective measurement is not feasible, the empirical method applied to the data needs to somehow account for reverse causalities.

(4) Objectivity implies reliability: Repetition of the measurement by others should yield the same data. One crucial requirement for this is transparency, i.e. the complete disclosure of the measurement process to the scientific public. This is all the more important in the context of informal institutions as measurement here potentially involves more subjective parts.

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<sup>6</sup> See Leschke (2000) for an application in constitutional economics.

To sum up, measures of informal institutions should (1) be based on a clear-cut conceptual definition, (2) measure actually observed behavior, (3) account for reverse causality e.g. by objectivity and (4) be transparent.

#### **4 A survey of approaches to measuring informal institutions**

Equipped with a set of criteria, we now proceed to survey different attempts at measuring informal institutions. Note that the study of informal institutions is by far not restricted to economics, nor is it restricted to studies that explicitly mention the term informal institution. Naturally, we cannot claim to have surveyed all of the relevant literature in all social sciences, especially since many of the studies that we survey do not mention the term informal institutions explicitly. As such, the studies we discuss here represent a (hopefully representative) sample of the relevant population.

Let us first review objective data sources, as we have argued that, conceptually, objective data should be preferred over subjective data. Objective measurement of informal institutions usually means looking for proximate objective causes or consequences of informal institutions. As a prime example, Putnam (1993, 1995) measures different aspects of social capital partly using objective scales like newspaper readership, referenda turnout and density of sports clubs. On a more aggregate level, Paxton (2002) uses the number of international non-governmental organizations (INGOs) in a country as proximate measurement for the strength of civil society. These numbers, dating back to 1910, can be found in the International Yearbook of Organizations provided by the Union of International Associations.

Though these measurements are objective, the question remains as to how validly they measure specific aspects of an informal institution. Surely, differences in newspaper readership between social groups do not solely reflect differences in informal institutions. Given this uncertainty, the use of factor analysis is recommended in order to clarify whether these measurements indeed share a common latent concept that is the informal institution. If we take these worries about validity as given, how do these measure fare with the respect to the criteria that we set up above? (1) Bjørnskov (2006) argues that, although Putnam provides a clear definition of social capital, the meshing of trust, norms and networks into one unitary concept of social capital is too much of an aggregation. (2) On the one hand, these measures are based on some factual behavior, which is good. However, because we are dealing with proximate measures of institutions, the behavior that influences the measurement might or might not be actually related to the institution. (3) The work of Putnam has been criticized for not dealing

with the issue of reverse causality in his measurements (Sobel 2002). This shows that objectivity by itself is not a sure fire way to avoid these problems. (4) Transparency and thus replicability is given, as we would expect that measurement by someone else would lead to very similar results.

Another approach to objectively measure informal institutions through proximate variables comes from the economics of religion literature. Religious norms, though more strongly codified than other informal institutions, are mostly not enforced by the state, so that we can count them as informal institutions. Lewer & Van den Berg (2007) incorporate religion dummy variables into a gravity equation of bilateral trade flows. These dummies – created using information from the CIA Factbook – indicate whether one of the major world religions is dominant in one of the trading countries, thus indirectly measuring the strength of the respective religion’s trade-related norms. This approach is not only interesting for its emphasis on religious norms, but also for its unit of analysis, the country-dyad. However, the question of validity has to be raised again: An indicator variable for a dominant religion does not allow inference as to which specific norm of that religion facilitates or hinders trade, nor can it account for situations in which different norms of the same religion have opposing effects on the outcome variable.

Despite these potential misgivings regarding validity, measurement through objective proximate variables is characterized by one big advantage: It avoids the Heisenberg problem, namely that mere observation of something might significantly disturb that something (Hofstede 1980). This is because proximate measures are measures that are already existing and not carried out with the purpose of measuring something specific.

Another way to obtain objective measures of informal institutions is experiments (Jakiela 2011). The great advantage of the experimental approach in general is that randomized controlled trials are very well suited to enable causal inference (Nichols 2007). This is because, for sufficiently large sample sizes, the only systematic difference between two individuals, one from the control group, one from the treatment group, is the treatment. Any difference in the outcome variable that we observe can then be causally attributed to the treatment (Angrist and Pischke 2010). Many of the common experiments in this context (dictator, ultimatum, trust, public goods game) measure the extent of cooperative behavior, thus allowing for some inference regarding fairness norms (Jakiela 2011).

With regard to the above postulated criteria, experiments fare quite well: (1) A clear conceptual definition of the institutions involved is almost a given in all design-based studies. (2)

Furthermore, by their very nature, experiments measure institutions via factually observed behavior, which is not the case (or much less so) for all other measures we examine. (3) For sufficiently large samples, randomization will ensure that reverse causality does not affect the measurement. (4) Transparency (and reliability) is also given: Documentation of design and implementation is usually very extensive in the experimental literature.

Nevertheless, the experimental approach is also characterized by a few problems. One problem of pure laboratory experiments is that the very exact set of institutions laid out by the experimenter is in stark contrast to the reality of social relations (Levitt and List 2007). This implies that in the context of informal institutions, field experiments are probably more appropriate than lab experiments. For instance, Barr & Genicot (2008) analyze the institution of risk pooling. Another example is the study of Goldberg (2010), which analyzes the role of social norms that support informal insurance networks in the trade-off between consumption and saving. In Jakiela & Ozier (2011), the effect of sharing norms on income hiding is analyzed.

But there is another problem that is hard to tackle even with the use of field experiments: The experimenter imposes his consciously chosen experimental design on the subjects. This includes which informal institutions are present, typically in the treatment group. Though such a design allows comparing situations with the institution and without the institution, it cannot account for the fact that informal institutions actually evolve over long periods of time. Note that this problem persists even (1) when the experimental design endogenizes the institution in question or (2) measurement is repeated over long periods of time, as the experimenter still defines the parameters within which an informal institution might be adopted or not. In this regard, the approach of RCTs might actually be too narrow.

There is another reliability problem which, though not inherent to the experimental approach, appears in the implementation of experiments: Experiments in this context are exclusively framed to reflect small-group situations. Any inference drawn from this small-group framing cannot be simply transferred to societal institutions, which are inherently large-group (Rose 2011). This feeds directly into our next point: Carrying out large scale experiments in multiple cultural contexts, i.e. in many different countries, is very expensive. Though the same argument might apply to all other methods for measuring informal institutions, it is especially true for experiments.

Let us now turn to subjective data sources. For several reasons, data produced from representative survey projects are the most widely used measures of informal institutions. Firstly,

the survey approach allows the researcher to ask the respondent about a wide range of values, norms, beliefs and preferences. Second, the survey approach is the most feasible approach to cross-cultural data collection and thus most widely available for a large sample of countries. This leads into a third advantage: Survey data that is available across countries allows for the simultaneous analysis of disaggregated level variation and aggregate level variation in informal institutions. This is especially neat as our taxonomy of institutions implies that the sanctioning of non-compliant behavior does not always occur at the same level of aggregation. Contrary to the measures discussed so far, survey data are inherently subjective, as the questions usually ask the respondent to provide a subjective evaluation of some statement or situation. Note that even within a survey, we can have differing degrees of subjectivity. For instance, asking the subject how often she attends church (Glaeser and Sacerdote 2008) will produce a more objective measure than asking the subject how important God is in her life (Gouda and Park 2011).

The most widely used data in this context is certainly the World Values Survey (WVS), which has since 1981 measured in five waves items regarding social trust, civil society and a host of other social, religious and ethical issues for representative samples of up to 90 countries. Other commonly used representative surveys include the Hofstede data (Hofstede 1980, 1997), the GLOBE study (House et al. 2004) and the Gallup World Poll. One of the most commonly used single survey variables is based on the WVS question “*Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?*”. Among the earliest works in economics to employ the trust variable is Knack & Keefer (1997), who use the country average of people replying “most people can be trusted”. Alternatively, one can focus on respondent level variation in this binary variable, such as in Guiso, Sapienza & Zingales (2009).

Another way to employ survey methodology is to conduct non-representative surveys. These usually include subjective assessments of informal institutions by some form of expert. For instance, the International Country Risk Guide (ICRG), more well known for its subjective ratings of formal institutional quality of countries, also produces ratings that can allow for inference with regard to informal institutions. For instance, the item *Civil Disorder* assesses the risk of mass protests, the item *Ethnic Tensions* measures the degree of tensions that can be attributed to ethnic division, an according item *Religious Tension*. Another interesting project is the CIVICUS Civil Society Index (CSI) which collects assessments of the state of civil society (by civil society organizations and stakeholders) along four dimensions (structure, environment, values, impact) in 50 countries around the world (Heinrich 2007). Other survey pro-

jects assess – inter alia – informal barriers to conducting business. For instance, the World Business Environment Survey (WBES), which covers 10,000 firms in 80 countries (Batra et al. 2003), includes companies' perceptions of informal constraints to their business.

How do survey based measurements of informal institutions fare with respect to the criteria that we proposed above? (1) Clarity of definitions might be an issue here. In particular surveys that are rather open and exploratory (like the WVS) naturally do not measure values and norms with some specific theory in mind. However, as the concept of an informal institution can usually not be pinpointed to one question anyway, factor analysis is a feasible solution, in particular given the great number of items available in representative surveys. For instance, Bertrand & Schoar (2006) use five family-related WVS questions to compute an index for the strength of family ties. Mishler & Rose (2001) use several questions from the New Democracies Barometer (Rose and Haerpfer 1996) to compute two indices for trust in public organizations: one for trust in state-based organizations, such as parliament or the military; one for trust in civil, non-state-based organization, such as the press or electronic media. Unfortunately, this practice can also be overdone: Several studies (e.g. Klasing (2011), Tabellini (2010), Williamson & Kerekes (2008)) aggregate single variables in order to arrive at so-called “culture” variables. The resulting compound variables are then over-aggregated and unable to provide any information about the effect of specific informal institutions (Voigt 2009b).

(2) By their very nature, surveys do not measure factually observed behavior, but rather statements about behavior and normative assessments. For the trust item, it has been argued that there is some divergence between survey responses and experimental trust when both survey and experiment are combined in one study (Glaeser et al. 2000), though this result is disputed (Baran et al. 2010). One potentially mitigating factor, at least for some surveys, is that survey data from the WVS or ICRG provide measurements for multiple points in time.

(3) Reverse causality in the measurement process is likely to be a problem with survey-based measurement. The critique of Voigt (2009a), namely that subjective evaluations of a country's institutional quality by experts is inherently biased by the experts' knowledge (or beliefs) with regard to the outcome of that country, also applies here. Even if we wanted to tackle this during measurement, consider this: Because survey based data are usually rather exploratory, they can potentially be applied to a great number of research topics and thus outcome variables. Thus, for measurement that precludes reverse causality, we would have to account for all possible applications and outcome variables, which is clearly not feasible. The pragmatic solution is then to account for reverse causality in the actual analysis of the data.

(4) Transparency very much depends on the specific measure. For instance, transparency – and thus replicability – is high with most representative survey, because they usually provide the raw items to the researcher, as well as the questionnaire that was used for the responses. For surveys that use experts' subjective evaluations, transparency is more likely to be a problem, as the original items that go into the rating are usually not provided. This is the case for ICRG and CIVIKUS measures.

Another issue beyond these criteria appears noteworthy in the use of survey data on informal institutions: Survey measures are inherently micro-level in that they provide information at very disaggregated levels. Many secondary studies, in particular in economics, tend to use only aggregated information from these surveys like country averages for specific items. Such a procedure wastes valuable information, especially with regard to informal institutions, where enforcement not only occurs at the societal level, but also at the individual or group level. However, an explicit acknowledgement of the disaggregated levels requires (1) specific theories and hypotheses regarding the individual or group level and (2) the interaction of these disaggregated transmission channels with the aggregate transmission channels. However, this is not always feasible.

Finally, let us mention another category of subjective measurement<sup>7</sup> of informal institutions: historical narratives. This strand of literature uses historical records to find informal institutional arrangements that enabled transactions without working formal institutions in medieval times (see Greif (1998) for an overview). Greif (1993) describes the so-called coalition as an informal institution (more likely a set of institutions) that governed agency relations between Maghribi traders. Milgrom et al. (1990) describe the role of the *Lex Mercatoria* or *Law Merchant* in enforcing contracts between merchants of different regions using private judges.

What about the criteria that we postulated above? (1) Clear definitions are usually given in this line of research. This is not surprising, given the very exploratory nature of historical institutional research. (2) On the one hand, one could argue that, yes, historical analysis is based on factually observed behavior. On the other hand, we have to consider that all historical records represent subjective interpretations of reality through the eyes of the respective historian, which is then again subjectively interpreted by the researcher. For instance, Edwards & Ogilvie (2008) offer a completely opposite interpretation of the Maghribi traders' records. (3) Reverse causality in measurement is probably the most serious problems of historical meas-

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<sup>7</sup> Naturally, "measurement" here does not imply quantitative, but rather qualitative measures. On the use of quantitative historical measures, see Greif (1997).

urements. This is very closely related to the problems of silent evidence and confirmation bias described in Taleb (2011). For instance, we will have a very hard time finding historical records describing social groups that were characterized by some informal institution like the coalition or the *Law Merchant*, but did not achieve cooperation. However, this kind of variation in the independent variable is strictly required to achieve causal inference with respect to the impact of an informal institution (King et al. 1994). (4) Although transparency is usually given with historical studies, the debate about the correct interpretation of the Maghribi traders' history in Edwards & Ogilvie (2008) and Greif (2008a) shows that replicability is not automatically implied.

In spite of these shortcomings and a lack of generalizability beyond the analyzed case, the use of historical records is the only way to provide measures of informal institutions in the very long run.

## 5 Conclusions

The broad conclusion that we can draw from our survey is that no single approach to measuring informal institutions is first-best. Proximate measures avoid the Heisenberg problem but might run into validity problems. Prima facie, experimental measures fulfill all our requirements for pragmatic measurement. However, beyond the mere effect of an informal institution, experiments have a hard time capturing institutional change. What is more, generalization beyond the framed situation is usually not possible. This is exacerbated by the fact that most existing experimental approaches use small-group situations, the results of which cannot logically be transferred to societal, i.e. large-group situations. Representative surveys are particularly well-equipped to measure informal institutions across cultures and over time. However, these measures, along with non-representative surveys suffer from various problems, most of which are rooted in their subjective nature of measurement. Potentially, representative surveys allow for the simultaneous analysis of micro-level and macro-level effects of informal institutions. Qualitative historical measures of informal institutions suffer all the more from problems of subjectivity, but might be the only to measure informal institutions in the very long run.

As we can see, the measures we discuss are all characterized by strengths and weaknesses. This implies that objective and subjective measures should not be seen as substitutes, but rather as complements in the empirical study of informal institutions. Especially given the wide availability of representative survey measures such as the WVS, it would be a waste of infor-



mation not to use the societal and micro-level information conveyed by them. These analyses should then be complemented by more objective measures, such as proximate and experimental measures in order to counter-act any potential biases stemming from subjective measurement. In the best of worlds, one would thus combine (1) large field experiments that use RCTs with (2) surveys of the subjects, (3) other objective proximate measures concerning the social groups studied and (4) historical records regarding the social context of the group studied. Much more so than for the case of formal institutions, the analysis of informal institutions brings together scholars of different disciplines, both within economics and beyond (political science, sociology, psychology and many more). This is potentially associated with great complementarities and advances, but also requires that scholars of different disciplines are able to find some common ground (Ostrom 2007; Svendsen and Svendsen 2009). Given the costs of large-scale, cross-cultural experiments and surveys, we agree with Voigt (2009a) that large international organizations are best suited for the collection and dissemination of such data.

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# Values, Norms and the Rule of Law in Long-Run Economic Development<sup>\*</sup>

Stefan Voigt, Institute of Law & Economics (University of Hamburg) and CESifo<sup>\*\*</sup>

Sang-Min Park, University of Kassel<sup>†</sup>

## *Abstract*

*Over the last couple of decades, it has become a commonplace to claim that “institutions matter” for economic development. Yet, institutions are not exogenous but the result of human action. It is argued here that the values and norms held by substantial parts of society’s members are an important determinant of its institutions. It is further argued that values and norms have both a direct and an indirect effect on economic development: the direct effect materializes because the values and norms also contain the work ethic which, if transformed into behavior, should have direct consequences on economic development. The indirect effect is conjectured to work via the relevant institutions: if institutions are important for economic development and institutions are influenced by the values and norms, then this is a more indirect channel through which values and norms can display their impact. We find that the impact of values and norms is mainly mediated through rule of law and social capital.*

*JEL classification: O43, E19, E66, O11, O12, O17, Z13.*

*Key Words: Institutions, Values and Norms, Democracy, Rule of Law, Culture, Informal Institutions, Economic Development, Civil Society, Social Capital*

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<sup>\*\*</sup> Prof. Dr. Stefan Voigt, Institute of Law & Economics, University of Hamburg, Rothenbaumchaussee 36, 20148 Hamburg, Germany. Telephone: +49-40-42838 5782, Telefax: +49-40-42838 6794, e-mail: [stefan.voigt@uni-hamburg.de](mailto:stefan.voigt@uni-hamburg.de).

<sup>†</sup> Sang-Min Park, E-mail: [park@uni-kassel.de](mailto:park@uni-kassel.de).

*“If a society is to maximize general prosperity and it can choose its own moral beliefs, what kinds of moral beliefs would it choose?” (Rose 2011)*

## **1 Introduction**

The question that David Rose poses is at the core of our research. Just a couple of decades ago, most economists took pride in not resorting to factors like culture or institutions when trying to explain economic growth. This has dramatically changed. Rodrik et al. (2004) for instance claim that “institutions rule” and argue that institutions dominate alternative explanations for long-run economic performance such as geography or economic integration. With regard to constitutions (often interpreted as the most basic layer of formal institutions), Persson and Tabellini (2003) show that a number of constitutional rules (e.g. referring to the voting system) have far-reaching consequences on various economic variables, including total factor productivity.

Representatives of related research programs have made similar claims: Putnam (1993) claims that the degree of civil society is an important long-run determinant for a number of outcome variables. Social capital researchers usually claim that the level of trust as well as the degree to which citizens participate in voluntary associations are important determinants of economic development.

These developments are important for understanding the causes of the wealth and poverty of nations. Yet, we need to dig deeper into these causes. After all, institutions are not exogenously given but rather the outcome of (collective) choice. We thus need to explain why some societies choose welfare-enhancing institutions, whereas others seem to be stuck with inefficient ones. In this paper, we argue that the values and norms held by substantial parts of a society’s members are an important determinant of its institutions. We further conjecture that values and norms exert both a direct and an indirect effect on economic development: the direct effect materializes e.g. because values and norms also contain the work ethic which, if transformed into behavior, should have direct consequences on economic development. The indirect effect is conjectured to work via the relevant institutions: If institutions are important for economic development and institutions are influenced by the values and norms, then this is a more indirect channel through which values and norms can display their impact. Using a system of simultaneous equations, we find evidence that values and norms indirectly affect per capita income via rule of law and social capital, but mostly not directly.

The paper is organized as follows: the next section contains our theoretical conjectures. Sec-

tion three serves to discuss possibilities to put the theoretical conjectures to an empirical test. Section four presents the estimation approach – as well as the data – used. Section five is a discussion of the results and in section six some open questions are shortly mentioned.

## 2 Theory

It is the aim of this paper to go beyond the current wisdom of institutional economics. The New Institutional Economics has been a huge success and we simply assume that “institutions matter”. Although there is lots of evidence in favor of this assumption, it is by no means universally accepted<sup>1</sup>. For lack of space, we simply go with the assumption that institutions do matter.

We define institutions as commonly known rules used to structure recurrent interaction situations that are endowed with a sanctioning mechanism whose application is threatened in case the rule part is not complied with. Both the rule of law as well as constitutional democracy (our two proxies for institutions) are, strictly speaking, not institutions because they are made up of dozens or even hundreds of different institutions. In order to keep things simple, we propose to call them institutional systems assuming that there is a minimum amount of internal consistency among the many single institutions.

The most important trait of the rule of law is that the law is to be applied equally to all persons (*isonomia*), government leaders included. It is therefore also called *government under the law*. No power used by government is arbitrary, all power is limited. Drawing on Kant (1797/1995), laws should normatively fulfill the criterion of universalizability, which has been interpreted to mean that the law should be (1) general, i.e., applicable to an unforeseeable number of persons and circumstances, (2) abstract, i.e., not prescribing a certain behavior but simply proscribing a finite number of actions, (3) certain, (anyone interested in discovering whether a certain behavior will be legal can do so with a fairly high chance of being correct and can furthermore expect that today’s rules will also be tomorrow’s rules) and (4) justifiable in rational discourse between any persons<sup>2</sup>.

Hayek (1960) has argued that the rule of law would necessarily imply a market economy (i.e. secure private property rights and the freedom of contract), since decisions by the government about who is to produce what in what quantities cannot be subsumed under general rules but

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<sup>1</sup> See, e.g., McArthur & Sachs (2001) responding to Acemoglu (2001).

<sup>2</sup> A number of institutional provisions typically support the rule of law. Among the most important ones are the separation of powers, the prohibition of retroactive legislation, the prohibition of expropriation without just compensation, habeas corpus, and other procedural devices such as protection of confidence, the principle of the least disruptive intervention, the principle of proportionality, and the like.

imply the arbitrary discrimination between persons. Individual liberty is exempt from arbitrary interference by government – or other powerful groups – only if it is secured by an effectively enforced rule of law. Logically, a rule-of-law constitution does not imply that the political system will be democratic. That is why we deal separately with constitutional democracy.

The concept of constitutionalism was developed primarily by settlers in the British colonies of North America. It links the rule of law with the notion of a written constitution in which the basic procedures that government is to use are laid down. Constitutionalism is thus a normative concept not to be confused with the *de facto* constitution used by any society, which has achieved a minimum amount of order to produce and finance public goods.

A constitution can be defined as the rules based on which a society makes its decisions concerning the provision and financing of public goods. Democracies are called constitutional if the domains to which majoritarian procedures may be applied are limited. A democratic constitution contains specific procedures concerning the choice (and the substitution) of those who are to make decisions concerning the provision of public goods and who have the power to tax even those who are not in favor of a specific bundle of public goods to be provided.

Market economies are based on a specific concept concerning the role of the individual: the individual is the only “unit” that can think and act responsibly and that is capable of pursuing goals responsibly. This position is often subsumed under the heading of ‘methodological individualism’. Market economies are further based on the presumption of (individual) freedom in the sense of “*a condition ... in which all are allowed to use their knowledge for their purposes, restrained only by rules of just conduct of universal application ...*” ((Hayek 1973). These concepts form the basis for guaranteeing private autonomy, which in the economic sphere translates into the freedom to contract. The freedom to contract only makes sense if private property is secure and widely respected. The freedom to contract can furthermore only enhance overall welfare if contracts voluntarily entered into are subsequently adhered to. We have thus arrived at Hume’s three fundamental laws of culture: “*the stability of possession, of its transference by consent, and the performance of promises*” (Hume 1740/1990). Functionally, the provisions hitherto mentioned could be said to solve the problem of who has the competence to decide the use of factors and goods in a market economy.

The coordination of individual decisions that will most likely not be compatible with each other *ex ante*, is brought about by competition and the price system. If the questions concerning competence are answered in the way just outlined, competition cannot be used as an in-



strument to achieve specific goals defined by a central authority, but must be modeled as an open process whose specific results are systematically unpredictable. This trait is best captured by the title of Hayek's seminal paper, "*Competition as a discovery procedure*"<sup>3</sup>. This understanding of competition also points to the fact that competition helps market actors to discover new knowledge, e.g. in the form of technical progress. If innovations are successful, they will most likely draw some demand away from competing suppliers, which may lead to a certain devaluation of their property rights. The existence – and acceptance – of such pecuniary externalities is a necessary condition for sustained economic growth.

But the functions of competition do not stop here. If a similar product is offered by more than one supplier or if there is even the possibility of new entrants into the market, the probability of substitution gives buyers more power over suppliers. The permanent threat of suppliers to be negatively sanctioned by the other market-side, including the threat of being forced out of the market entirely, produces positive incentives for suppliers. When property rights enable entrepreneurs to appropriate the profits from their economic activities, entrepreneurs have every reason to behave innovatively.

Empirically, there is little doubt that a rule of law is correlated with high income levels. The relationship from democracy to income and growth is less clear. In fact, a debate concerning the more plausible direction of causality (from democracy to growth or from growth to democracy) was kicked off by Lipset (1959) and has not been settled until today<sup>4</sup>. What is clear, however, is that different countries realize vastly different levels of both the rule of law as well as of constitutional democracy.

Representatives of political economy have recently proposed a number of explanations based on the power of the ruling elite<sup>5</sup>. According to these approaches, both institutional systems are the consequence of the (relative) power that the ruling class enjoys. Various versions of this approach exist: Barzel (1997) has, e.g., argued that strong elites will more readily enter into institutional arrangements that constrain governments if they are strong. Only strong regimes are able to reap the additional benefits accruing from the increased levels of credibility that follow from these institutional systems. Voigt (1999) has argued that government strength as well as the number of veto players is crucial for institutional development: if some groups have the capacity to prevent a cooperation rent from being produced, then these groups will

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<sup>3</sup> Hayek (1978).

<sup>4</sup> Sunde (2006) is a survey of the main arguments, while Acemoglu et al. (2007) represents the most recent argument against a causal effect from growth to democracy.

<sup>5</sup> See for example Acemoglu & Robinson (2006).

become part of a “factual social contract”. The higher the number of these groups, the more general will the rules be – in other words: the higher the likelihood to observe the rule of law.

Bargaining for fundamental institutional change with the current ruling elite presupposes the ability of groups to act collectively. It seems plausible to suppose that it is easier for organized groups than for unorganized individuals to act collectively because organized groups have already solved the problem of collective action. Olson (1965) has shown that many potential interest groups never manage to become effective interest groups because they are unable to solve the problem of collective action, which is basically a free rider problem<sup>6</sup>. Robert Putnam (1993) argues that the performance of democratic institutions does not only hinge upon their formal set-up but also upon civic traditions. His argument could be read as being in direct opposition to Olson's: the larger the number of voluntary associations, the higher the degree of civiness and thus the performance of democratic institutions<sup>7</sup>.

We hypothesize the capacity to act collectively (which is called *social capital* or *civil society* there) to have an impact on the institutional systems realized. But social capital (or civil society) is for its part the (collective) result of individual behavior. We conjecture that the quality as well as the quantity of social capital that can be found anywhere is determined, or at least heavily influenced, by the values and norms prevalent in a society.

The political economy approach of endogenizing institutional systems can also be thought of as a “top down” approach. This can be complemented by a “bottom up” approach which draws directly on values and norms held by individuals. Since this approach is rather novel, we describe it in a little more detail here.

Values have been defined as “... *conceptions of the desirable, influencing selective behavior*” (Darity 2007). A cluster of values will also be called a value-system. Norms for conduct can be distinguished from values:

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<sup>6</sup> In his *Rise and Decline of Nations*, he argues that within stable regimes, ever more latent interest groups will manage to become manifest interest groups (Olson 1982). Ever more interest groups will be successful in their rent seeking endeavors which will lead to stagflation, rigidities and reduced economic growth. Olson is not directly concerned with the rule of law but his analysis bears direct implications on our topic: the larger the number of organized interest groups, the higher the probability that the rule of law will suffer due to privileges granted to specific groups. As long as interest groups are not inclusive of the interests of all citizens (or “super-encompassing” as Olson later (McGuire and Olson 1996) wrote), their existence has to be evaluated negatively. By focusing on the intended consequences of collective action, Olson arrives at the conclusion that interest groups are a threat to the rule of law.

<sup>7</sup> Not every organization will have such beneficial effects, however: only horizontally organized associations will foster cooperation and trust. Putnam's argument is based on the concept of Civil Society which can be traced back to Ferguson (1988) and Tocqueville (1840/1945). Its adherents claim that a balance of power between government on the one side and a number of voluntary associations on the other would be possible (for an overview, see Gellner (1994). Although Putnam does not deal with the consequences of civil associations' activities on the possibility to sustain a rule of law-constitution, a causal relationship can easily be established: the larger the number of associations, the higher the chance that a relevant number will protest if government tries to renege upon the constitution.

*“Values are not the same as norms for conduct. ... Values are standards of desirability that are more independent of specific situations. The same value may be a point of reference for a great many specific norms; a particular norm may represent the simultaneous application of several separable values” (Darity 2007)*

The values and norms prevalent in a society are an important determinant of the running cost of institutional systems. Remember that institutions are endowed with the threat of sanction in case of non-compliance with the rule component. If sanctioning relies exclusively on the state (the police, prosecutors etc.) and is not complemented by enforcement from within society, running institutional systems is a lot more costly than if most (or even all) enforcement is done without having to rely on the visible hand of the state. The cost of running institutional systems will, in turn, be crucial for their sustainability over time.

Formulated in terms of a hypothesis:

*Institutional systems largely compatible with the prevalent values and norms of a society are more likely to survive than institutional systems largely incompatible with the prevalent values and norms.*

This implies that – at least in the long run – there would be a close correspondence between values and norms on the one hand and institutional systems on the other (since institutional systems incompatible with the prevalent values and norms are likely to disappear).

Yet, it would be naïve to attribute prevalent institutional systems exclusively to values and norms. Actors commanding power can incur heavy costs to keep institutional systems alive although they are incompatible with the prevalent values and norms. The conjecture is, hence, that the political economy approach and the values and norms approach are not mutually exclusive but that they both play a role. Economic development depends both on values and norms conducive to it (both directly and indirectly) and on those preconditions usually considered within political economy approaches.

There is a plethora of potentially relevant political economy factors and instruments to suppress individual freedom and, hence, to prevent values and norms held by individuals to translate into behavior: the military, the police, the capacity to restrict access to necessary resources and so on. To keep the theory simple, we propose to follow Hayek (1973) and argue that economic development will be faster in situations “... *in which all are allowed to use their knowledge for their purposes, restrained only by rules of just conduct of universal application* ...”. Economic development depends on the degree of freedom that individual actors experience. Formulated as a hypothesis:

*Economic development is conjectured to be fastest when favorable values and norms are complemented by a high degree of freedom secured via the institutional system.*

It would, of course, be interesting to inquire more deeply into the functional relationship between these two causes. This will, however, not be pursued here. Instead, we propose to dig a bit deeper into the question of which values and norms have positive effects on economic development (both directly and indirectly).

The fundamental hypothesis underlying our “list of favorable values and norms” is that economic systems that are based on individual liberty have proven to provide the greatest chance to enhance individual wealth. The list names some of the attitudes that seem to be either necessary for or favorable to growth in an economic system based on individual liberty. These attitudes would have to be backed by a value-system and its corresponding norms:<sup>8</sup>

*(1) It is the individual actor who is responsible for decision-making, for carrying out the decisions and for reaching – or not reaching – his goals.*

If success in life is, however, perceived of as being largely out of the individual's control and seen as being determined by God, destiny or some organic entity, we would not expect a market economy that is based on private autonomy and that depends on entrepreneurial spirit to develop. The view of the individual who is responsible for the actions committed is a necessary prerequisite for the establishment of private property rights because conceptually, it is them that grant the individual actor the chance to incorporate the benefits arising as a consequence of her actions as well as attribute to her the responsibility to bear the costs.<sup>9</sup> It is conjectured that the view of the individual as being largely responsible for his own fate displays a direct as well as an indirect effect: individuals with such norms will try to be better off economically (direct effect) but will also be actively involved in establishing institutions granting them the individual freedom that they strive for. In a similar manner, Casson (1993) points out the importance of an “atomistic morality” for long-run economic development, emphasizing individual rights rather than social obligations.

*(2) Individuals who are doing exceptionally well economically are perceived as role models rather than being looked at enviously.*

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<sup>8</sup> In a slightly different form, the following list first appeared in Voigt (1993). Some theory on this can also be found in Casson (1993).

<sup>9</sup> Hofstede (1997) describes individualistic societies as “societies in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family.”

This implies that the perceived inequality of economic outcomes is accepted as long as it is legally attained. This is not to imply that inequality either of property or of income is necessarily a prerequisite for a market economy and economic growth<sup>10</sup>. It is conjectured that such norms display a positive direct effect whereas the indirect effect appears more uncertain: accepting large inequality could mean that individuals do not actively try to establish rules treating everybody equally, in other words, this norm could be a hindrance for the establishment of the rule of law.

*(3) Individuals are geographically and socially mobile.*

Geographic mobility is a favorable attitude because it enables the mobile factors to combine their inputs with other – immobile – factors. High geographical mobility ensures the possibility of putting the factors to their most valued use. In order to enhance market systems, this attitude must also be shared by those who are immobile, i.e. those at the ‘recipient end’. If they share a militant aversion against strangers – for example because they constitute a source of competition on the labor-market possibly leading to lower wages – potential economic growth will not be realized.

Social mobility includes upward as well as downward mobility. It is favorable to market systems if people moving up the social ladder are not looked at enviously but are rather perceived as role models. Downward social mobility should ideally not be accompanied by stigmatizing those who have moved down the social ladder.

*(4) Individuals do not share a militant aversion against anything unknown.*

Market economies thrive on the basis of competition and competition means that innovative behavior is rewarded. But innovations can also occur with regard to political institutions. It is, hence, argued that values and norms trying to conserve the status quo are not conducive to economic development. It is conjectured that there is a direct effect as well as an indirect effect<sup>11</sup>. The direct effect is, e.g., expected to work via the propensity to act as a “consumption pioneer” whereas the indirect effect materializes because such societies are not only likely to experiment with political institutions but also to find those that are more conducive to aggregate welfare.

*(5) Equal treatment of all persons.*

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<sup>10</sup> Hofstede (1997) introduces the dimension “Confucian dynamism” that bears resemblance with these norms. What he has in mind is the degree to which a society encourages (and rewards) group members for good performance.

<sup>11</sup> Hofstede (1997) introduces a dimension that he calls “uncertainty avoidance” which depicts the extent to which individuals follow norms that reduce uncertainty. This dimension is very similar to what we have in mind.

Traditionally, many societies have made important distinctions between natives and foreigners, between believers and infidels, between men and women. The higher the degree to which such unequal treatment is backed up by corresponding values and norms, the lower the chances for economic development as this unequal treatment implies that human capital is misallocated or not used at all. Again, we would expect both a direct and an indirect effect: the direct effect will work through the more efficient allocation of talent whereas the indirect effect is conjectured to work via better political institutions making the efficient allocation of human capital easier.

*(6) Refusal to accept hierarchies*

This norm is conjectured to be important for the way people interact in society. It can relate to all sorts of hierarchies, including firms but also the state. If hierarchies – and the orders issued by them – are accepted without discussion, this would seem to make survival for autocrats easier. It is, hence, conjectured that a high propensity will most likely be connected with undemocratic political institutions. The direct effect is not as clear-cut: on the one hand, a certain degree of accepting superiors' decisions is necessary for firms to function effectively. On the other hand, hierarchies require new ideas and proposals for their development. At the extreme, one could think of values and norms not accepting any hierarchies whatsoever. This could imply that firms would be far below optimum size and would, hence, have a negative direct effect<sup>12</sup>.

*(8) Individuals share some 'lesser virtues' such as being honest, being on time, not cheating on each other etc.*

If a person can reasonably expect that another person unknown to her will e.g. stick to his promises, this will greatly decrease the costs of transacting thus making exchange less complicated and less costly<sup>13</sup>. Other values and norms conducive to economic development include thriftiness, diligence and tidiness. All these virtues should display a direct effect. A certain degree of thriftiness is a necessary condition for economic development, without it, no investment is possible. A high degree of thriftiness can therefore also be interpreted as a forward-looking attitude or future-orientation.

Of course, some of the attitudes described as favorable to an economic system based on decentralized co-ordination are not backed up by corresponding norms in societies that have

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<sup>12</sup> Hofstede (1997) introduces the dimension "power distance" closely resembling the aspects discussed here.

<sup>13</sup> See e.g. Casson (1993).

long been coordinated in this way. It seems to be essential, however, that the people who do share the above-mentioned attitudes are not hindered actively by those parts of the population who do not share them. In other words: it might not be necessary that the listed attitudes are actively backed up by corresponding norms (and values) but that there are no norms that punish those who share them. Thus, if there are umbrella-norms which secure that people who do behave according to some of the above-mentioned attitudes will be sanctioned because they break some traditional norm, prospects for economic growth are predicted to be pretty slim.

### **3 Possibilities to Put the Theory to an Empirical Test**

We are interested in the determinants of long-run economic development. Our conjecture is that it is not primarily elites that determine development but that the values and norms held by substantial groups of society also play an important role. In order to test this hypothesis, it would be ideal to have indicators for the values and norms held in various countries a long time ago, say around 1900. In this section, we discuss possibilities to put the theory to an empirical test. Due to lack of available data, only a fraction of the possibilities discussed can be pursued in this work.

Since the value-system offers the individual a reference-system that helps her to determine the things she does and helps her to order things in an otherwise unordered world, it is unlikely that a person will frequently change parts of her value-system or even the entire system. In other words: values are assumed to be relatively time-invariant. They should be primarily determined during a person's childhood<sup>14</sup>. Indicators for the prevalent values in a society would therefore have to be found in the values that children are taught. We think that a society's fairy-tales that have often endured over decades or even centuries would be the most reliable indicator because they have come to reflect the shared value-system of a society. Different from fairy-tales, newly released children's books might also reflect the aspirations and dispositions of their authors and might therefore, especially in totalitarian states, reflect more the values of the nomenclature than those of the people. Unfortunately, we will not be able to draw extensively on fairy-tales as an indicator in this paper as comparative research into fairy-tales has not compared the values and norms emphasized by various fairy-tales.

A second indicator reflecting the values shared in a society might be found by analyzing its religion. This approach can be traced back to Max Weber who analyzed many religions with regard to their 'economic ethics' which he understood as "...not the ethical theory of theologi-

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<sup>14</sup> For evidence on this, see Goodnow (1997) and Knafo & Schwartz (2004).

*cal compendia ... but the practical impulses for action that are based on the psychological and pragmatic connections of the religion*”<sup>15</sup>. It might be argued that the economic ethics of the respective religions had become largely irrelevant because people had long ceased to be religious. Yet, economic ethics can continue to influence the behavior of people long after they have ceased to view themselves as religious.

A mapping between the economic ethics of religions and values and norms would be ideal. Additionally, a number of issues ought to be reflected in any indicator: the intensity of religious beliefs could be important. People never attending any religious ceremonies might be less guided by values and norms than people regularly doing so. This could well be reflected in their behavior. We are here not only interested in the effect of religions on individual behavior but also on collective outcomes. This implies that the ratio of people following a certain religion should be controlled for. It would, hence, be ideal to use information on the intensity of religious beliefs from some 100 years ago. Unfortunately, we did not find any such data for a large number of countries<sup>16</sup>.

A third possible indicator relies on public opinion polls that contain questions concerning the prevalent values. One problem with such surveys is that they might reflect the attitudes and dispositions that the interviewees think they should have or that they think the group of people that they most identify with would have. Yet, highly professional survey organizations know how to deal with these issues and the responses can tell us quite a lot about the values and norms that real people hold. Previous work by Granato et al. (1996) has used this approach, though with an emphasis on (short-term) growth rather than (long-term) levels of development. In a recent work closer to this one, Licht et al. (2007) use survey data collected by Schwartz (2004)<sup>17</sup> to correlate cultural dimensions with “*the rule of law, corruption and democratic accountability*” (p. 659). We expand the framework of Licht et al. (2007) by (1) using a greater diversity of value dimensions and (2) employing a more general estimation approach.

#### **4 The Estimation Approach**

The main focus of this paper is on long-term development – and not on short-term growth. This is why we are interested in explaining income levels rather than growth rates. After all, income levels are aggregate growth rates over a very long time. As our assumption is that in-

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<sup>15</sup> Weber (1921/1980).

<sup>16</sup> A number of recent studies have found various effects attributed to religions. For an overview, see McCleary & Barro (2006) and Barro & McCleary (2003).

<sup>17</sup> We do not employ the Schwartz data in this study. Evidence by Pryor (2007, 2008) suggests that the World Values Survey data and the Schwartz data are similar.



stitutions matter, we are interested in isolating their effects from the effects of the other factors contributing to growth – and income<sup>18</sup>.

Hall and Jones (1999) conjecture that “social infrastructure” is crucial to explaining variation in total factor productivity (TFP) across countries. Their proxies for social infrastructure include law and order, bureaucratic quality, risk of government repudiation of contracts, the degree of (perceived) corruption but also the openness of an economy to international trade. They are, of course, aware of the possibility that beneficial social infrastructure might for its part be the result of high incomes, i.e. of reverse causality. To control for that possibility, they rely on an instrumental variables approach using a country’s Latitude as well as the degree to which European languages as spoken as native languages as instruments.

Building on this research, Acemoglu et al. (2001) set out to explain cross-country differences in income levels by differences in institutional quality. They too tackle the problem of reverse causality with an instrumental variables approach, arguing that settler mortality rates in the colonies of the 17<sup>th</sup> to 19<sup>th</sup> centuries explain differences in institution observed today. This approach enables them to isolate a statistically significant and meaningful effect of institutional quality on income levels.

Our analysis adapts the central idea of these two central works, but with several modifications. Firstly, we explicitly allow both Social Capital (CIVIL) and Values and Norms (VN) to influence per capita income (GDP). This implies that we are now dealing with four instead of Hall and Jones’ two simultaneous structural equations: the first determines GDP, the second determines institutional quality, the third determines Social Capital, the fourth determines Values and Norms. Considering any of the three equations separately would lead to serious endogeneity problems, which is why we estimate them simultaneously<sup>19</sup>. The system of equations we consider is then:

$$\log(GDP_{it}) = \alpha_0 + \alpha_1 INST_{it} + \alpha_2 CIVIL_{it} + \alpha_3 VN_{it} + \alpha_4 I_i + u_{1,it} \quad (1)$$

$$INST_{it} = \beta_0 + \beta_1 CIVIL_{it} + \beta_2 VN_{it} + \beta_3 I_i + u_{2,it} \quad (2)$$

$$CIVIL_{it} = \gamma_0 + \gamma_1 INST_{it} + \gamma_2 VN_{it} + \gamma_3 I_i + u_{3,it} \quad (3)$$

$$VN_{it} = \delta_0 + \delta_1 INST_{it} + \delta_2 CIVIL_{it} + \delta_3 I_i + u_{4,it} \quad (4)$$

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<sup>18</sup> Alternatively, we could use the Solow residual as explained variable. The Solow residual is the fraction of output that cannot be explained by the endowment with capital and labor. The advantage of such an approach would be that we can better isolate the effects of institutions given more “shallow” predictors such as capital and labor. We nevertheless decide not to proceed with the Solow residual as (1) it imposes rather strong assumptions on cross-country depreciation rates and (2) is not readily available for multiple years.

<sup>19</sup> This is in contrast to an approach with separate estimations (Andonova et al. 2007).

where  $i$  indexes countries,  $t$  indexes years,  $\log(\text{GDP}_{it})$  is the logarithm of per capita income,  $\text{INST}_{it}$  is an indicator of the strength of the rule of law and democracy  $\text{CIVIL}_{it}$ , is an indicator for social capital,  $\text{VN}_{it}$  is a proxy for values and norms,. Although we differentiate between different years, this is strictly speaking not a panel analysis, as our proxies for Values and Norms are measured through a new sample at each point in time (i.e. wave).

Three stage least squares estimation allows us to control for the endogeneity inherent in this system of equations. In the first stage, instrumented values for all endogenous variables are predicted using the vector of exogenous variables  $I_i$ . In the second stage, a consistent covariance matrix of the respective equation disturbances is retrieved. In the third stage, a generalized least squares (GLS) estimation is performed for the whole system using the instrumented values from stage one and the covariance matrix from stage 2. Identification requires that the number of instruments be at least as large as the number of endogenous variables. The instrument vector  $I_i$  includes regional and time dummies to account for unobserved heterogeneity. Furthermore, we consider including a set of variables that have been suggested in the institutions and growth literature as instruments, all of which have in common that they represents some geographic or deep-rooted cultural trait of a country that is assumed to be exogenous and not related to the error term in the above equation. Providing concrete theories regarding the transmission channels from these instruments to the endogenous variables might allow us to identify distinct sets of instruments for each equation. This is however beyond the scope of this work. Thus, we choose to exploratively look for the set of instruments that maximizes the Bayesian model selection criterion, which has been argued to be superior to other conventional model selection criteria (Raftery 1995). Note that this multi-equation approach allows us to differentiate between direct effects of  $\text{VN}_{it}$  ( $\alpha_3$ ) and indirect effects mediated either by  $\text{INST}_{it}$  ( $\alpha_1\beta_2$ ) or  $L_{it}$  ( $\alpha_2\gamma_2$ ).

Our estimation Approach (including the exploratory search for an instrument set) will be run separately for various indicators proxying the dimensions of values and norms mentioned in section 2.

## 5 Data and Estimation Results

We now turn to describe the data used. The dependent variable is GDP per capita. As a measure for the strength of rule of law and the quality of democracy, we propose to use an indicator which combines Freedom House's political rights index and civil liberties index. Given the theoretical discussion above, we conjecture that countries that are characterized by both a strong rule of law and a high quality of democratic institutions should be countries with high

per capita income. Thus, it seems fitting to measure institutional quality via this composite variable<sup>20</sup>. The civil liberties index measures the extent to which freedoms of expression and belief, associational and organizational rights, rule of law and personal autonomy are given in a country without interference from the state. The political rights index measures the extent to which people can participate freely in the political process. For missing values, this variable is additionally complemented by the PolityIV indicator for constitutional democracy. Hadenius & Teorell (2005a) show that this combined index performs better in terms of reliability and validity than the respective component variables.

The potential instruments that we identified from the existing literature include indices for ethnic, religious and linguistic fractionalization (Mauro 1995), a dummy that indicates whether in the predominant language of a country, it is allowed to drop the pronoun (Licht et al. 2007), a dummy for common law legal origin (La Porta et al. 1999), the malaria transmission index (McArthur and Sachs 2001), the 20 year lagged value of GDP per capita. See [Table 1](#) for detailed descriptions and sources for these variables.

Our primary source for proxies for value and norms is the World Values Survey (WVS) that has been carried out in five waves to date since 1980. Face-to-face interviews have been conducted with representative samples of up to 82 countries and each interview covers up to 350 questions<sup>21</sup>. The WVS collects responses regarding individual beliefs and attitudes towards matters of politics, economy, society, religion and ethics (Inglehart et al. 2005).

The WV does not cover our list of favorable values and norms in its entirety. This is why we choose to draw on the GLOBE study on culture, leadership and organization<sup>22</sup> to cover the missing parts of the list. GLOBE is an acronym derived from “Global Leadership and Organizational Behavior Effectiveness Research Program”. As the name indicates, the participants of the research project are interested in the consequences of different values and norms for firm behavior, in particular different leadership models. But some of the nine dimensions that they work with mirror our list of favorable values and norms rather closely, so that their data might be meaningfully applied to the central question of this paper. The GLOBE data are based on questionnaire responses of 17,300 middle managers in 951 firms and 62 societies.

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<sup>20</sup> Composite indicators of institutional quality and rule of law indicators in particular have recently come under heavy attack recently, see, e.g., Arndt & Oman (2006), Kurtz & Schrank (2007b, 2007a) or Thomas (2007)). Voigt (2008) discusses some of the issues involved in the attempts to make institutions measurable. For lack of a better measure, we continue to use this one, despite its various shortcomings.

<sup>21</sup> For details, see World Values Study Group (1999).

<sup>22</sup> House et al. (2004).

The GLOBE data systematically distinguish societal practice (“as is”) and societal values (“should be”) in all nine dimensions covered by the survey, on a scale from 1 to 7. Interestingly, the “as is” and the “should be” dimensions are negatively correlated respectively. Hofstede (2006) argues that this is basically due to a measurement problem in the GLOBE survey questionnaire. “As is” value are inherently hard to assess for individuals, and furthermore, the survey questions for the “as is” dimensions were overly abstract. This leads Hofstede to conclude that the “as is” dimension actually reflects “should be” assessments, mostly by criticizing the respective society (hence the negative correlation). To circumvent this problem, we utilize only the “should be” variable.

Potentially, the focus on the middle-management of only three branches constitutes a problem since these persons might not be representative of their societies, resulting in sample selection bias. However, correlations with both objective data as well as with other surveys (such as the World Values Survey) indicate that this is not a serious problem<sup>23</sup>.

For each of the seven categories of Values and Norms<sup>24</sup>, we identify multiple potentially suitable variables from the WVS and GLOBE and perform factor analysis to calculate weighted averages<sup>25</sup>. This approach puts emphasis on the exploratory nature of our analysis<sup>26</sup>.

We now present the operationalizations of the seven groups of Values and Norms identified in Section 2, reporting the respective estimation results in parallel. Note that WVS data is available for five waves since 1980, a fact that we exploit to estimate with pooled cross-sections in order to increase sample size. For the estimations that include GLOBE variables, we estimate with data for 2005 with regard to the time-variant variables. Unfortunately, the restricted sample size for the GLOBE (54 countries) data does not provide sufficient degrees of freedom for 3SLS estimation so that we can only present equation by equation OLS estimations. Thus, we will focus our interpretations mainly on the WVS results.

For each value dimension, we present one 3SLS specification and the corresponding OLS estimation. The first broad result to notice is that in most specifications, we find evidence for a positive and significant association between our *Rule of law* variable and per capita income. Second, higher *Social Capital* is also positively and significantly associated with higher per capita income in virtually all specifications.

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<sup>23</sup> See Gupta et al. (2004).

<sup>24</sup> True, in section 2, more attitudes were discussed. Unfortunately, we were not able to find any variables proxying for geographic and/or social mobility such that the number of empirically tested attitudes is reduced.

<sup>25</sup> For a different approach, see Granato et al. (1996).

<sup>26</sup> Andonova (2007) also use factor analysis, but in their work, its purpose is to identify a common factor underlying the different dimensions of cultural values.

### (1) Individual responsible for achieving goals

The World Values Survey (WVS)<sup>27</sup> contains two variables indicating to which degree populations in various countries share this norm. The first one (question V95) asks respondents to assess on a scale “*how much freedom of choice and control you feel you have over the way your life turns out*”. The second one (question V252) asks to assess one’s position on a scale between “*Individuals should take more responsibility for providing for themselves*” and “*The state should take more responsibility to ensure that everyone is provided for*”. Factor analysis yields a weighted average of the two, which we call *Individual responsibility and choice (WVS)*.

The GLOBE project contains a dimension entitled *Performance Orientation* which refers to the extent to which society encourages and rewards individual group members for performance improvement, innovation and excellence.

Our estimation results show that, although a simple OLS analysis suggests a positive and significant direct effect of the variable *Individual responsibility and choice* (Table 3, column 1, equation 1), this effect vanishes when we account for the endogeneity in the system (column 2) or when we use the GLOBE variable *Performance orientation* (Table 3, column 1). We do, however, find that *Individual responsibility and choice* significantly impacts per capita income indirectly via both rule of law and social capital (Table 4, column 1). This is in line with our conjecture that, for an effective rule of law, individuals need to acknowledge responsibility for their fate and that individuals believing in individual responsibility will strive to establish according institutions.

We find that *Individual responsibility and choice* significantly and positively impacts both the rule of law (column 2, equation 2) and social capital (column 2, equation 3). In particular the former effect is sizable: A one standard deviation increase in *Individual responsibility and choice* is associated with a rise in rule of law by almost 2 (rule of law ranges from 0 to 10). Furthermore, we find evidence for a positive feedback loop: Both rule of law and social capital for their part positively influence *Individual responsibility and choice* (column 2, equation 4).

### (2) Inequality Accepted

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<sup>27</sup> We aggregate the WVS individual level data over each country.

Here, we rely exclusively on two variables drawn from the WVS, namely V125 (*Secretary Fairness*<sup>28</sup>) and V250 (*Incomes should be made more equal*<sup>29</sup>). Using factor analysis, we combine these variables in a common factor *Inequality acceptance*.

We find that *Inequality acceptance* exhibits a significant and positive direct impact on per capita income once we control for endogeneity (Table 3, column 4, equation 1): A one standard deviation increase in *Inequality acceptance* is associated with rise in per capita income of almost 1%. This is in line with our conjecture that some acceptance of justifiable inequalities is necessary for a market economy to flourish.

We also conjectured that there might be a negative indirect effect in that individuals who accept large inequalities might also favor institutions that cultivate inefficient inequalities such as those implied by rent-seeking. Indeed, we find that *Inequality acceptance* indirectly negatively affects per capita income via social capital (Table 4, column 2): Higher *Inequality acceptance* leads to lower social capital, ultimately also lowering per capita income. There is also a positive and significant indirect effect via rule of law, indicating that higher *Inequality acceptance* actually increases the effectiveness of the rule of law. We conclude that, if there are any negative indirect effects of *Inequality acceptance*, they are rather mediated by social capital than by the rule of law.

### (3) No Aversion Against Unknown

GLOBE defines uncertainty avoidance as “*the extent to which members of collectives seek orderliness, consistency, structure, formalized procedures, and laws to cover situations in their daily lives*” (Sully de Luque and Javidan 2004). The dimension *Uncertainty Avoidance (GLOBE)* was inspired by similar constructs, e.g. Hofstede’s Uncertainty Avoidance Index.

The conjecture is that lower aversion against anything unknown fosters innovation, which would then be conducive to economic development. The indirect effects of uncertainty avoidance are somewhat more difficult to grasp: if societies are more willing to accept uncertainty, the number of laws and regulations could be lower than in societies having a harder time to tolerate uncertainty. *Ex ante*, the effect of this is, however, unpredictable: on the one hand, this could mean that there are less laws and regulations constraining entrepreneurial behavior and innovation. On the other, if laws and regulations make the environment less uncertain und

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<sup>28</sup> “Imagine two secretaries, of the same age, doing practically the same job. One finds out that the other earns \$50 a week more than she does. The better paid secretary, however, is quicker, more efficient and more reliable at her job. In your opinion, is it fair or not fair that one secretary is paid more than the other?” (World Values Study Group 1999).

<sup>29</sup> Here, respondents were asked to choose on a scale between “*Incomes should be made more equal*” and “*There should be greater incentives for individual effort.*” (World Values Study Group 1999).

more predictable, this could also spur additional entrepreneurial activity. A first look at the bivariate scatterplot surely suggests that lower uncertainty avoidance is associated with higher per capita income (Figure 7).

In the WVS, questions V69 to V82 ask respondents to choose from a list any group of people that they would not like to have as their neighbor. Those groups include “People with a criminal record”, “Heavy drinkers”, “Muslims”, “People who have AIDS” and so on. Our variable *Uncertainty Avoidance (WVS)* counts the number of groups that each respondent mentions: The more groups are mentioned, the higher that respondent’s uncertainty avoidance. Note that both the WVS and the GLOBE variable inversely measure the concept that we are interested in. A first bivariate look at the data indicates a negative correlation between this variable and per capita income (Figure 3).

For the WVS variable *Uncertainty Avoidance*, the equation by equation OLS estimation suggests a significant and negative effect on per capita income (Table 3, column 5, equation 1). However, the significance vanishes once we account for the inter-relationships suggested in our statistical model (column 6, equation 1). This indicates that there is no direct effect of this value dimension on per capita income. Again, we find a significant indirect impact via the rule of law and social capital. More uncertainty avoidance is associated with weaker rule of law (column 6, equation 2), which also manifests in a significantly negative indirect effect on per capita income (Table 4, column 3). This implies that more uncertainty leads to a weaker effectiveness of the rule of law with regard to economic development, which is in line with our conjecture that uncertainty avoidance should lead to less institutional innovation and more inefficient regulations. The second finding is a little more puzzling: One might expect that more *Uncertainty Avoidance* leads to more social capital, with individuals utilizing the implied social networks as devices to reduce uncertainty. This is a transmission channel that has been suggested in the trade literature (Rauch 2001) and that is somewhat at odds with our findings here. All of these findings are also compatible with the pure correlational evidence provided by the GLOBE indicator (Table 5, column 3).

#### (4) Equality of Treatment

Equality of treatment refers to the equality before the law *tout court*. Encompassing (objective) indicators for this do not seem to be available.

The WVS contains two corresponding variables. The first (V130) asks respondents whether they agree to the statement “*When jobs are scarce, men have more right to a job than women*”. The second one states “*Men make better political leaders than women do*” (V118).

Again, we produce a weighted average of these responses using factor analysis (with higher values corresponding to less egalitarianism).

The GLOBE project contains the dimension *Gender Egalitarianism* that proxies for one important, if not the most important, dimension with regard to the equality of treatment. (Emrich et al. 2004) define it as reflecting “*societies’ beliefs about whether members’ biological sex should determine the roles that they play in their homes, business organizations, and communities.*”

Again, we find that a pure equation by equation OLS analysis (Table 3, column 8, column 7, equation 1) would mistakenly suggest a significant and positive<sup>30</sup> impact of this values dimension, as the significance of this effect vanishes when controlling for endogeneity (column 9, equation 1). Yet again, we find evidence for a significant indirect effect: *Gender Egalitarianism* positively influences per capita income via both the rule of law and social capital (Table 4, column 4). This finding conforms to our conjecture that more *Gender Egalitarianism* should result in more egalitarian political institutions, ultimately improving the rule of law. This is partly corroborated by our estimations with the GLOBE indicator (Table 5, column 7), which find a positive association between *Gender Egalitarianism* and per capita income (equation 1) and the rule of law (equation 2) respectively.

#### (5) Propensity to Accept Hierarchies

The propensity to accept hierarchies has been conjectured to be detrimental to economic development, primarily due to its expected indirect effect of a higher willingness to accept institutions not conducive to development. As a proxy for this, we rely on the dimension *Power Distance* found in the GLOBE project and defined as “*the degree to which members of an organization or society expect and agree that power should be shared unequally*” (Carl et al. 2004).

Question V127 from the WVS asks respondents whether “*one should follow instructions of one’s superiors (at work) even when one does not fully agree with them*”, we call this one *Hierarchy acceptance (WVS)*.

For the WVS variable, we find that, regardless of estimating our system of equations with OLS or 3SLS, there is no evidence for a direct effect of *Hierarchy acceptance* on per capita income (Table 3, columns 9-10, equation 1). We do observe evidence for an indirect effect, one that furthermore diverges between rule of law and social capital. On the one hand, *Hier-*

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<sup>30</sup> For the WVS variable, *Gender egalitarianism* is measured inversely.



*archy acceptance* positively affects per capita income via the rule of law (Table 4, column 5), implying that, instead of weakening democratic political institutions, *Hierarchy acceptance* rather strengthens the functioning of the rule of law, maybe through better effectiveness of government bureaucracies. On the other hand, *Hierarchy acceptance* negatively affects per capita income via social capital (Table 4, column 5), which we could take to mean that the functioning of civil society organizations is rather weakened by strong *Hierarchy acceptance*. These findings are not corroborated when using the GLOBE variable (Table 5, column 6), where we do not find any significant effects of *Hierarchy acceptance*, but neither are our findings contradicted.

#### (7) Shared Lesser Virtues

Virtues such as honesty and thriftiness are conjectured to keep transaction costs low which should have positive effects on economic development. Unfortunately, it is not easy to find indicators that cover these secondary virtues in their entirety. Among the nine dimensions contained in the GLOBE project, one dimension does, however, reflect part of the conjecture that we have in mind. This is *Future orientation*, which is defined as “*the extent to which members of a society or an organization believe that their current actions will influence their future, focus on investment in their future, believe that they will have a future that matters, believe in planning for developing their future, and look far into the future for assessing the effects of their current actions*” (Ashkanasy et al. 2004). Without future orientation, savings and thus investment might be inefficiently low in an uncertain world. Since investments are one key to economic development, we argue that high values of future orientation should have an impact on the economic development of a society.

Because there is only a GLOBE indicator for this value dimension, we can only (tentatively) interpret equation by equation OLS in this case. We find no evidence that *Future orientation* is directly associated with per capita income (equation 1) or rule of law (equation 2), but a significant negative correlation with social capital (equation 3). A sweeping interpretation of such a finding would be that for the functioning of civil society, actions with a focus on the present are more important and that when individuals care more about the future, they care less about present-oriented civil society matters.

## **6 Conclusions and Outlook**

It has become somewhat of a commonplace to claim that institutions matter for economic development. The endogeneity of institutions is often mentioned but not explicitly inquired into. In this paper, we develop a number of hypotheses how values and norms could impact upon

some of the institutions conjectured to be relevant for economic development. Drawing on a simultaneous equations approach, we examine the causal influence of various values and norms on economic performance.

When we control for the various feedbacks implied by a system of equations in which rule of law, civil society and value dimensions can be endogenous, we find that, for the most part, values and norms do not affect economic development directly (with the exception of *Inequality acceptance*). Simultaneously, we find for all value dimensions a significant impact on per capita income via both rule of law and social capital. We can thus broadly conclude that the functioning of the rule of law and civil society hinge upon the prevailing values and norms in a country. This finding is consistent with the theoretical conjecture that the effect of formal institutions always depends on the prevailing informal institutions (Voigt 2009). It is also in line with the observation that mere transplantation of legal institutions into low-income countries produces varying results (Berkowitz et al. 2003).

Importantly, we find that the indirect effect of values on per capita income is positive throughout: *Inequality acceptance* and *Hierarchy acceptance*, though exhibiting a positive impact via rule of law, negatively affect the impact of civil society on per capita income.

Are there any policy conclusions we can draw from these results? One definite policy implication is that policy makers engaging in legal transplantation need to be very wary about existing informal institutions, as they will shape the performance of the rule of law. While we do not propose that values and norms can be molded in the short term by policymakers to achieve desired results, it would be interesting to delve deeper into the medium- to long-term determinants of value development and change and investigate which values are more endogenous than others.

Finally, some outlook. What we have not looked at here are interactions between different value dimensions: Are there any inter-relationships in the way they affect the impact of rule of law and social capital on per capita income? Additional theoretical underpinning but also more analysis on the transmission channels is desirable, as this will allow us to test more specific hypotheses. We simply do not know enough about the specific transmission channels (and possibly interactions) to arrive at any final conclusion, especially with regard to policy implications. Note also that we have not exploited any individual level variation in the survey data, which might reveal patterns that are not visible at the aggregate level. Such an approach would also potentially allow us to differentiate between individual and societal levels of sanctions against rule-breaking behavior.

## 7 Tables

**Table 1: Variables used (with descriptive statistics)**

<i>Name</i>	<i>Source and Description</i>	Obs.	Mean	S.D.	Min	Max
GDP	Log GDP per capita	215	1.509	1.446	-1.900	3.859
Rule of law (Freedom House/Imputed Polity)	Index of rule of law and democratic quality, composed of indices by Freedom House and Polity (Hadenius and Teorell 2005b; Marshall and Jaggers 2004; House 2005).	215	7.754	2.708	0	10
Individual responsibility and choice (WVS)	See 5 for detailed description.	177	0	1	-2.273	2.000
Inequality acceptance (WVS)	See 5 for detailed description.	119	0	1	-2.540	2.474
Uncertainty avoidance (WVS)	See 5 for detailed description.	151	0	1	-2.095	2.963
Gender egalitarianism (WVS)	See 5 for detailed description.	122	0	1	-1.678	2.676
Hierarchy acceptance (WVS)	See 5 for detailed description.	111	0	1	-2.297	2.391
Performance orientation (GLOBE)	See 5 for detailed description.	54	0	1	-2.436	1.977
Uncertainty avoidance (GLOBE)	See 5 for detailed description.	54	0	1	-2.390	1.621
Gender egalitarianism (GLOBE)	See 5 for detailed description.	54	0	1	-3.026	1.405
Power distance (GLOBE)	See 5 for detailed description.	54	0	1	-2.084	2.496
Future orientation (GLOBE)	See 5 for detailed description.	54	0	1	-2.920	1.772
Absolute Distance from equator	Distance from equator, normalized to a scale from 0 to 1.	148	0.433	0.173	0.014	0.711
Ethnic fractionalization	Index of ethnic fractionalization. Probability that two randomly selected people from a given society will not belong to the same ethnolinguistic group (Alesina et al. 2003).	148	0.293	0.228	0.002	0.850
Linguistic fractionalization	Index of linguistic fractionalization. Probability that two randomly selected people from a given society will not belong to the same linguistic group (Alesina et al. 2003).	147	0.268	0.263	0.002	0.865
Religious fractionalization	Index of religious fractionalization. Probability that two randomly selected people from a given society will not belong to the same religious group (Alesina et al. 2003).	148	0.446	0.246	0.003	0.860
Pronoun drop	Indicates whether in the dominant language of a country, it is allowed to drop the pronoun (Licht et al. 2007).	137	0.533	0.501	0	1
Legal origin (common law)	Dummy variable equal to 1 if the country belongs to the common-law tradition, 0 otherwise (La Porta et al. 1999).	148	0.250	0.434	0	1
Malaria transmission index	Malaria Transmission Index in 1994 (McArthur and Sachs 2001).	148	0.057	0.180	0	1

**Table 2: Pairwise correlations of value dimensions**

	Performance orientation (GLOBE)	Uncertainty avoidance (GLOBE)	Gender egalitarianism (GLOBE)	Hierarchy acceptance (GLOBE)	Future orientation (GLOBE)
Individual responsibility and choice (WVS)	0.3063*	-0.4740*	0.4896*	-0.1567	-0.3859*
Inequality acceptance (WVS)	-0.1053	0.2324*	-0.3646*	0.3935*	-0.0273
Uncertainty avoidance (WVS)	-0.1419	0.5708*	-0.5834*	0.2745*	0.4167*
Gender egalitarianism (WVS)	-0.1316	0.6620*	-0.7388*	0.3036*	0.4384*
Contribution to public good (WVS)	-0.0414	-0.4010*	0.1404	0.2084	-0.2551
Political action for public good (WVS)	-0.3198*	-0.2660	0.2113	0.0130	-0.4180*
Hierarchy acceptance (WVS)	0.0640	0.2388*	-0.2352*	-0.2348*	0.0884

\*indicates 5% significance.

**Table 3: Estimations for World Values Survey variables**

	Individual responsibility and choice		Inequality acceptance		Uncertainty avoidance		Gender egalitarianism		Hierarchy acceptance	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	OLS	3SLS	OLS	3SLS	OLS	3SLS	OLS	3SLS	OLS	3SLS
$\log(GDP_{it})$ (1)										
$INST_{it}$	0.246*** (0.0308)	0.437*** (0.0476)	0.248*** (0.0466)	0.0545 (0.0967)	0.206*** (0.0387)	0.676*** (0.127)	0.127*** (0.0422)	0.391*** (0.0945)	0.274*** (0.0420)	0.203*** (0.0763)
$VN_{it}$	0.234*** (0.0858)	-0.170 (0.180)	0.0342 (0.0939)	0.964*** (0.172)	-0.451*** (0.0863)	-0.0251 (0.228)	-0.579*** (0.121)	0.168 (0.236)	-0.0630 (0.0970)	-0.451 (0.260)
$CIVIL_{it}$	0.470*** (0.0930)	0.740*** (0.166)	1.152*** (0.204)	2.629*** (0.365)	0.512*** (0.144)	-0.551** (0.254)	0.398*** (0.0925)	0.740*** (0.120)	1.017*** (0.176)	1.752*** (0.370)
$INST_{it}$ (2)										
$CIVIL_{it}$	1.231*** (0.209)	-0.171 (0.368)	2.657*** (0.323)	3.888*** (0.250)	1.816*** (0.267)	2.409*** (0.143)	0.475** (0.196)	-0.509** (0.223)	2.351*** (0.334)	4.282*** (0.312)
$VN_{it}$	0.375 (0.209)	1.932*** (0.337)	-0.656*** (0.177)	1.182*** (0.310)	-0.965*** (0.165)	-1.824*** (0.102)	-1.642*** (0.216)	-2.468*** (0.127)	-0.370* (0.220)	1.419*** (0.542)
$CIVIL_{it}$ (3)										
$INST_{it}$	0.135*** (0.0229)	-0.0336 (0.0356)	0.138*** (0.0168)	0.246*** (0.0161)	0.131*** (0.0193)	0.404*** (0.0281)	0.0990** (0.0408)	-0.107 (0.0895)	0.134*** (0.0190)	0.222*** (0.0152)
$VN_{it}$	0.411*** (0.0627)	0.895*** (0.0706)	0.0335 (0.0426)	-0.371*** (0.0678)	-0.00580 (0.0493)	0.706*** (0.0777)	-0.358*** (0.116)	-0.826*** (0.207)	0.00136 (0.0531)	-0.451*** (0.107)
$VN_{it}$ (4)										
$INST_{it}$	0.0483 (0.0270)	0.177*** (0.0300)	-0.162*** (0.0436)	0.301*** (0.0809)	-0.194*** (0.0332)	-0.535*** (0.0314)	-0.199*** (0.0262)	-0.370*** (0.0195)	-0.0693 (0.0411)	0.198*** (0.0613)
$CIVIL_{it}$	0.482*** (0.0735)	0.819*** (0.0650)	0.158 (0.201)	-1.491*** (0.277)	-0.0161 (0.137)	1.242*** (0.122)	-0.208*** (0.0673)	-0.333*** (0.0803)	0.00448 (0.174)	-1.116*** (0.250)
Instruments		Malaria transmission index Absolute Distance from equator		Linguistic fractionalization Pronoun drop Legal origin (common law)		Religious fractionalization Pronoun drop		Ling. Fract., Rel. fract., Malaria transm. index, Legal origin (common law), Absolute Distance from equator		Religious fractionalization, Legal origin (common law), Absolute Distance from equator, 20year lag of GDP per capita
Observations	177	177	119	119	151	151	122	122	111	111

Standard errors in parentheses, \*\* significant at 5%; \*\*\* significant at 1%. All estimations include regional dummies and year dummies as additional controls and a constant (not reported).

**Table 4: Indirect effects for World Values Survey variables**

	Indirect effect of...				
	(1)	(2)	(3)	(4)	(5)
	Individual responsibility and choice	Inequality acceptance	Uncertainty avoidance	Gender egalitarianism	Hierarchy acceptance
Via...	based on estimation (2)	based on estimation (4)	based on estimation (6)	based on estimation (8)	based on estimation (10)
$INST_{it} (\alpha_1\beta_2)$	0.843***	0.064***	-1.232***	-0.964***	0.288***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
$CIVIL_{it} (\alpha_2\gamma_2)$	0.662***	-0.974***	-0.389***	-0.611***	-0.789***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

P-values in parentheses refer to an F test for joint significance of the two relevant coefficients, \*\* significant at 5%; \*\*\* significant at 1%.

**Table 5: Estimations for GLOBE variables**

	Performance orientation		Uncertainty avoidance		Gender egalitarianism		Hierarchy acceptance		Future orientation	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	OLS	3SLS	OLS	3SLS	OLS	3SLS	OLS	3SLS	OLS	3SLS
$\log(GDP_{it})$ (1)										
$INST_{it}$	0.118**		0.104**		0.0944		0.123**		0.133**	
	(0.0555)		(0.0481)		(0.0541)		(0.0560)		(0.0548)	
$VN_{it}$	-0.130		-0.516***		0.342**		0.00525		-0.217	
	(0.128)		(0.130)		(0.146)		(0.112)		(0.138)	
$CIVIL_{it}$	0.605**		0.488**		0.475		0.610**		0.540**	
	(0.253)		(0.221)		(0.247)		(0.264)		(0.253)	
$INST_{it}$ (2)										
$CIVIL_{it}$	2.417***		1.852***		1.570***		2.222***		2.359***	
	(0.428)		(0.545)		(0.435)		(0.440)		(0.505)	
$VN_{it}$	0.279		-0.504		1.037***		-0.291		0.0137	
	(0.277)		(0.356)		(0.284)		(0.287)		(0.328)	
$CIVIL_{it}$ (3)										
$INST_{it}$	0.159***		0.0997***		0.130***		0.150***		0.127***	
	(0.0282)		(0.0293)		(0.0359)		(0.0297)		(0.0272)	
$VN_{it}$	-0.109		-0.291***		0.120		-0.0783		-0.245***	
	(0.0702)		(0.0736)		(0.0901)		(0.0746)		(0.0678)	
$VN_{it}$ (4)										
$INST_{it}$	0.0698		-0.0751		0.200***		-0.0678		0.00251	
	(0.0694)		(0.0530)		(0.0548)		(0.0669)		(0.0599)	
$CIVIL_{it}$	-0.413		-0.806***		0.280		-0.270		-0.832***	
	(0.267)		(0.204)		(0.210)		(0.257)		(0.230)	
Observations	54		54		54		54		54	

Standard errors in parentheses, \*\* significant at 5%; \*\*\* significant at 1%. All estimations include regional dummies as additional controls and a constant (not reported).

## 8 Figures

Figure 1: Individual responsibility and choice (WVS)

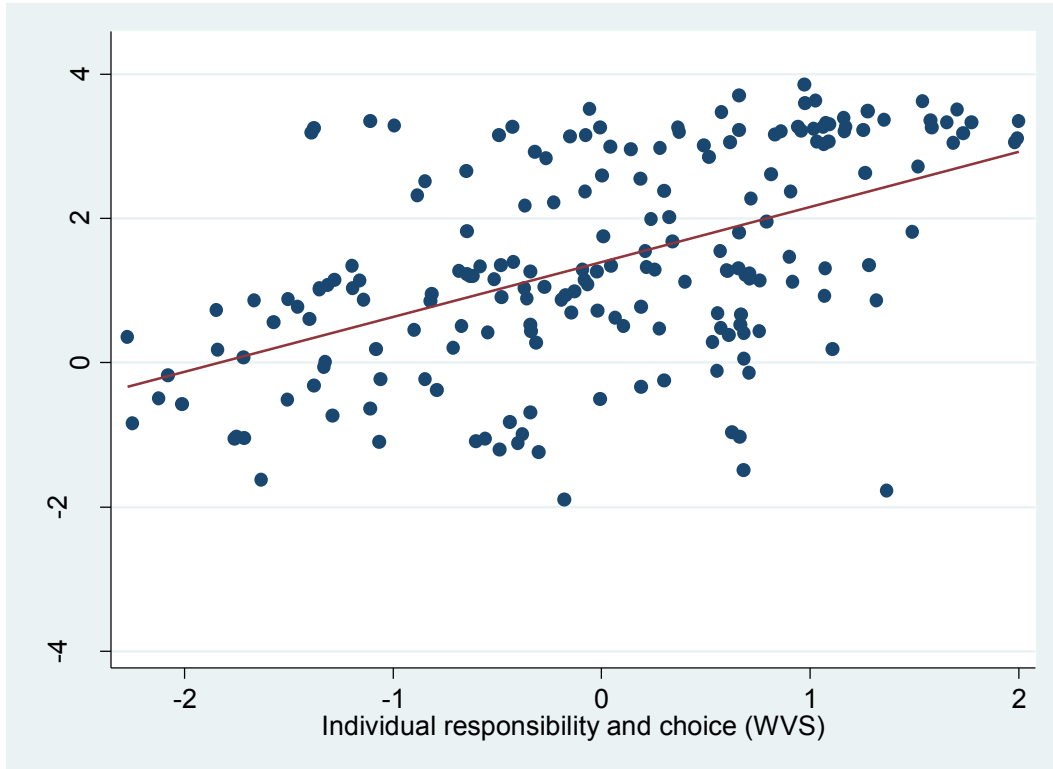


Figure 2: Inequality acceptance (WVS)

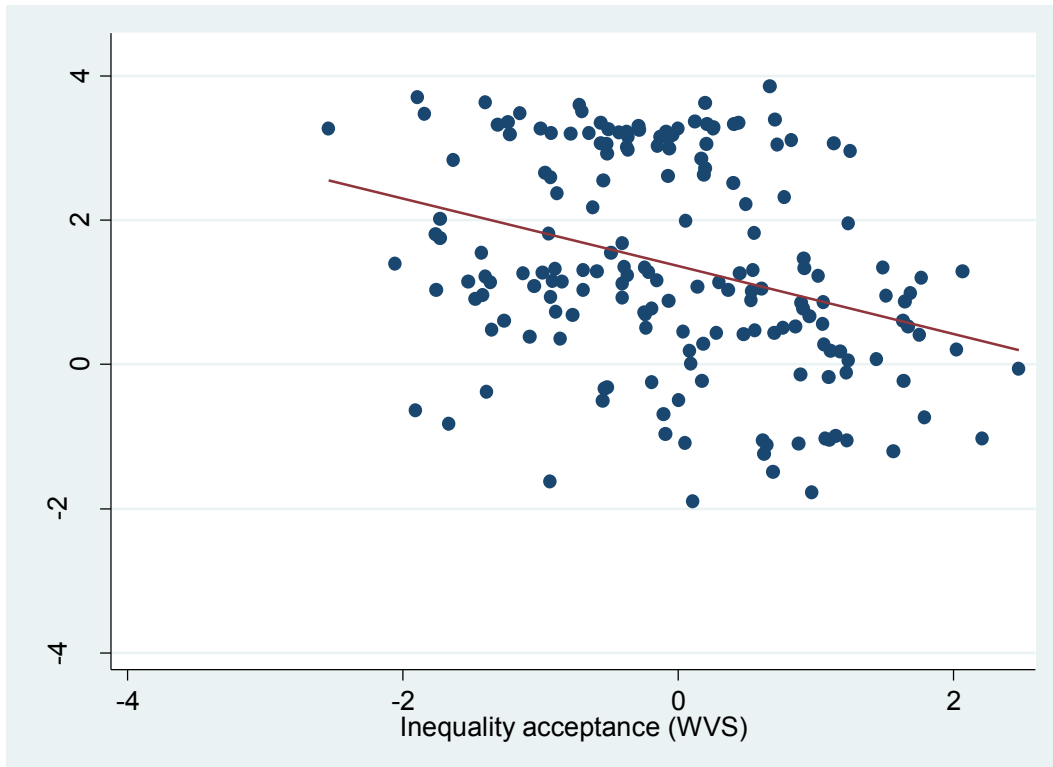




Figure 3: Uncertainty avoidance (WVS)

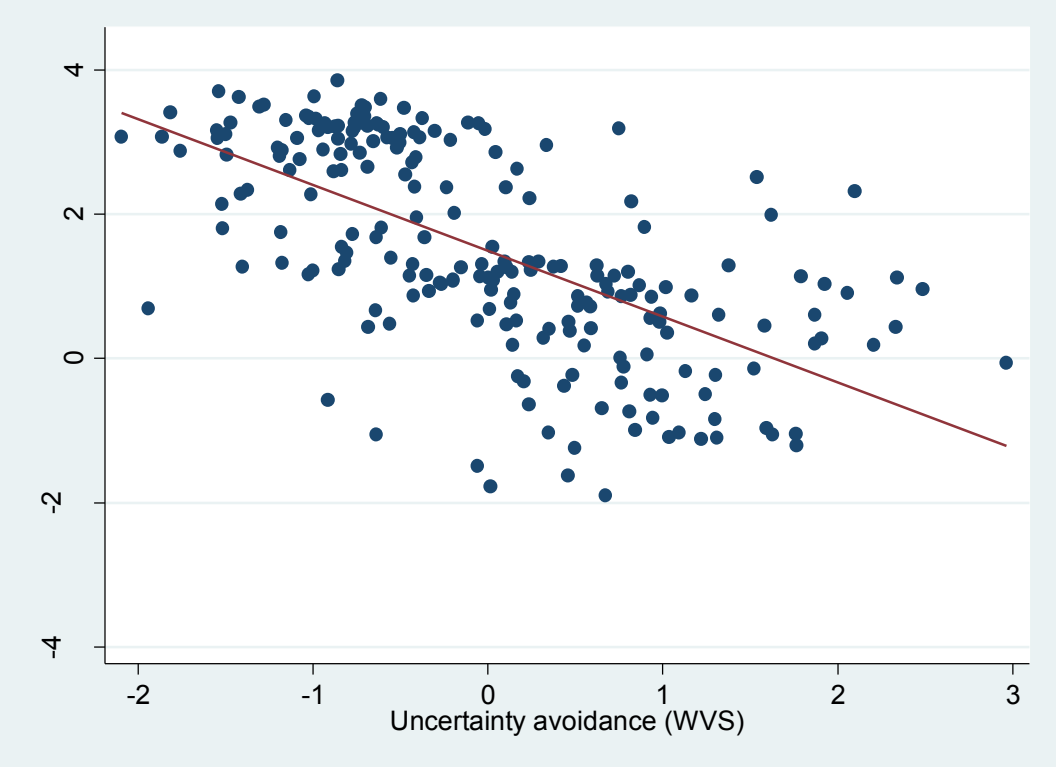


Figure 4: Gender egalitarianism (WVS)

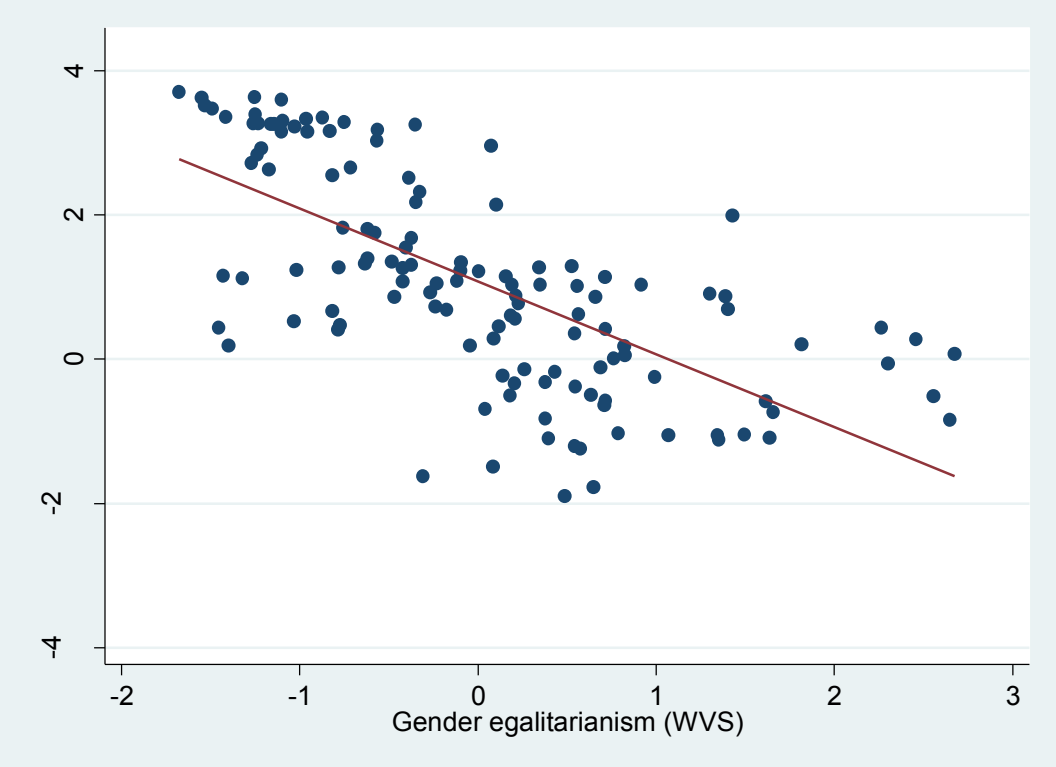


Figure 5: Hierarchy acceptance (WVS)

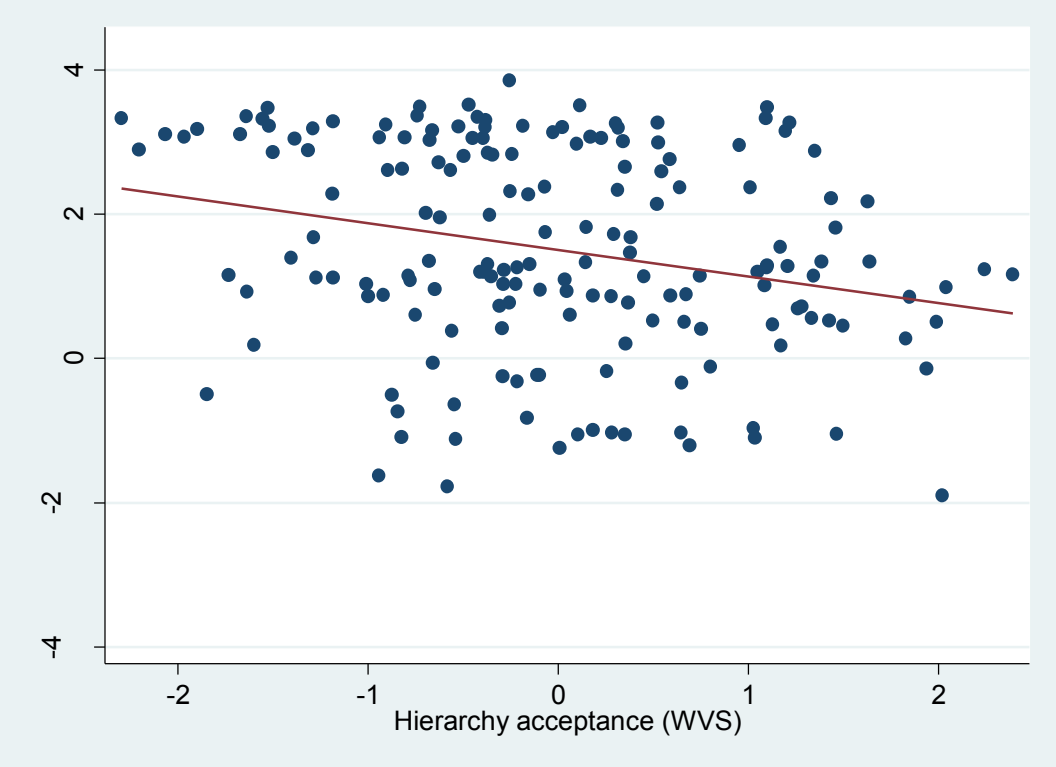


Figure 6: Performance orientation (GLOBE)



Figure 7: Uncertainty avoidance (GLOBE)

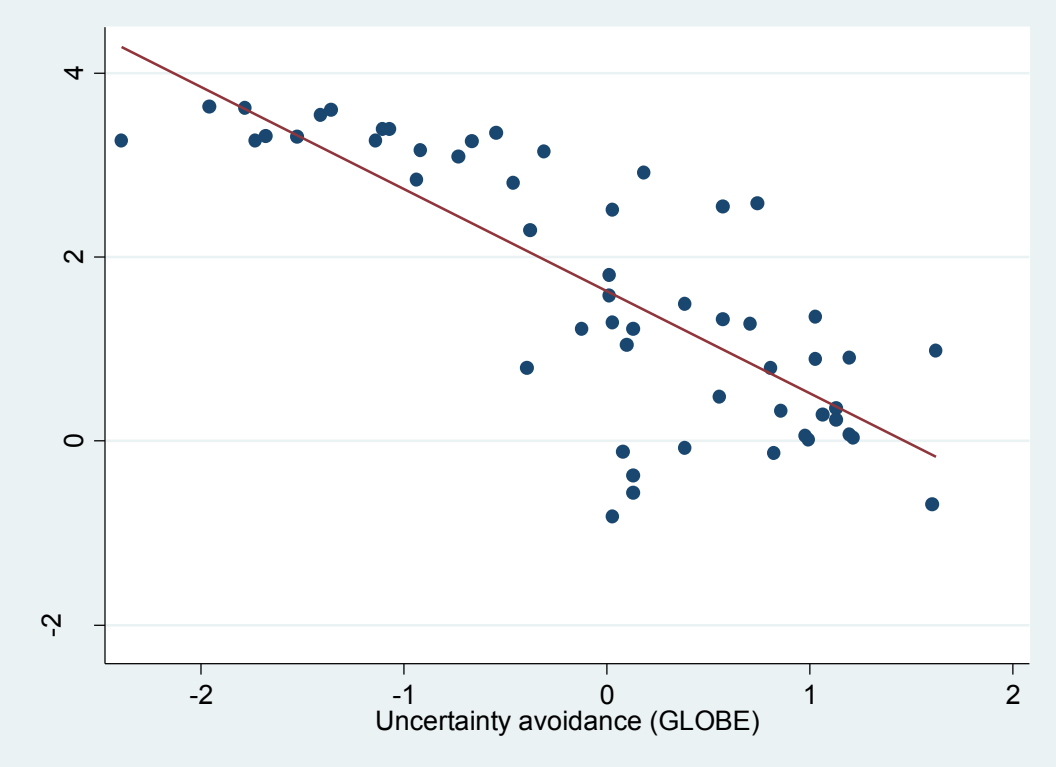


Figure 8: Gender egalitarianism (GLOBE)

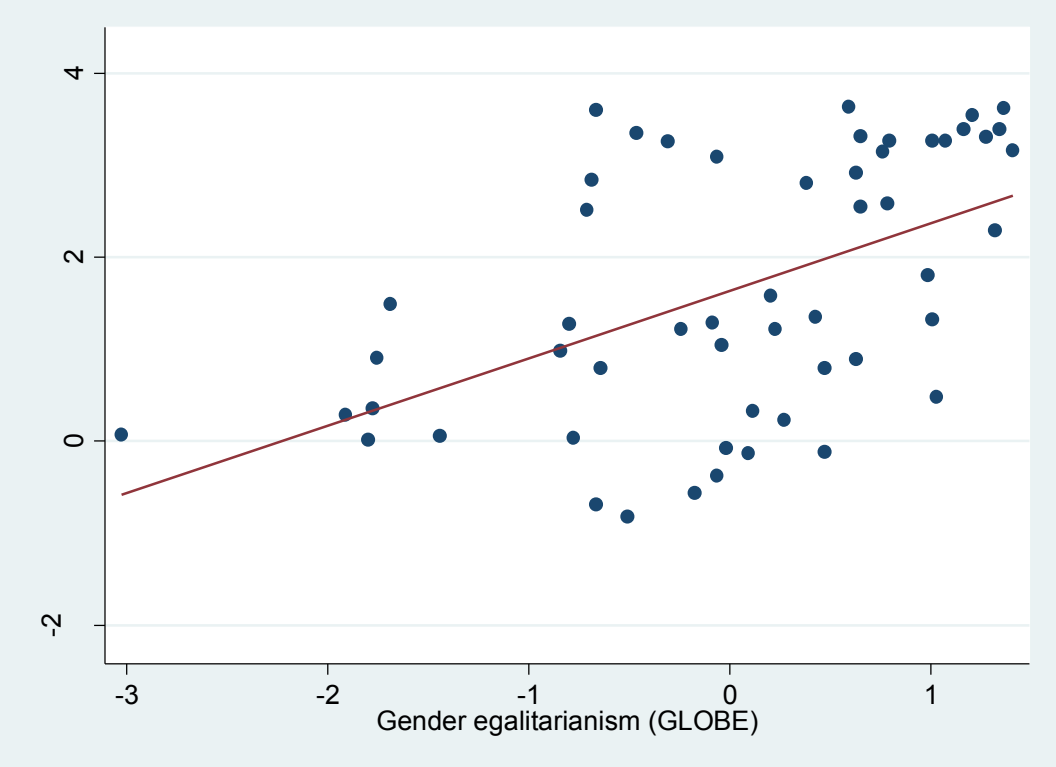


Figure 9: Hierarchy acceptance (GLOBE)

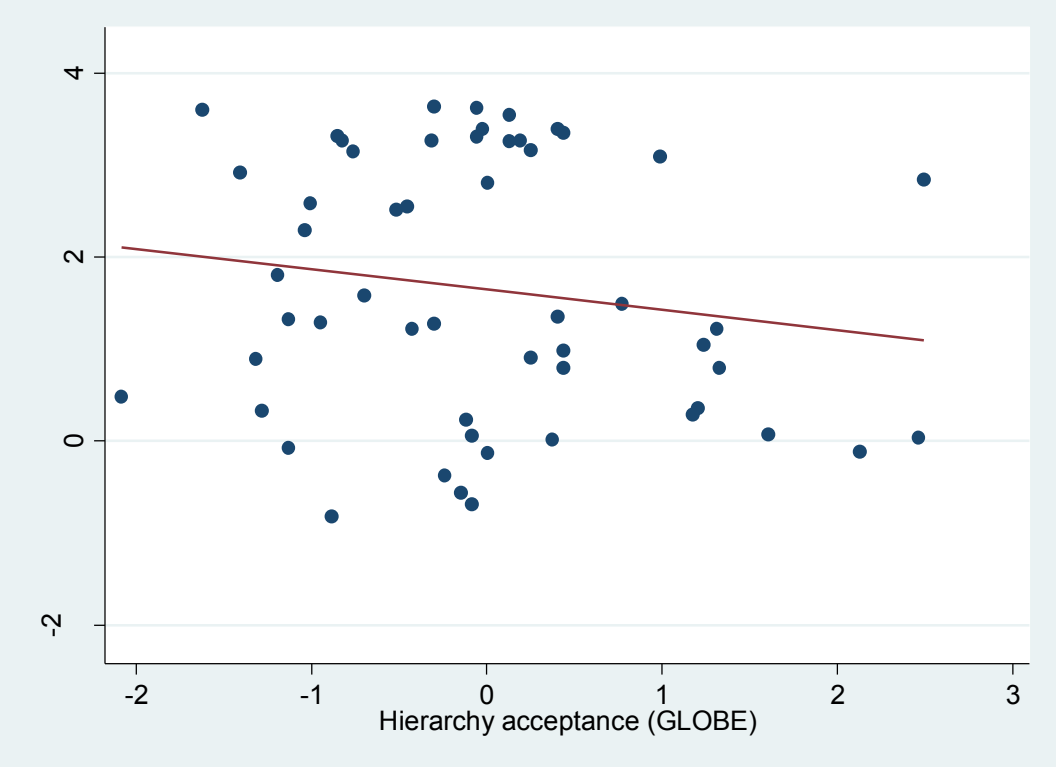
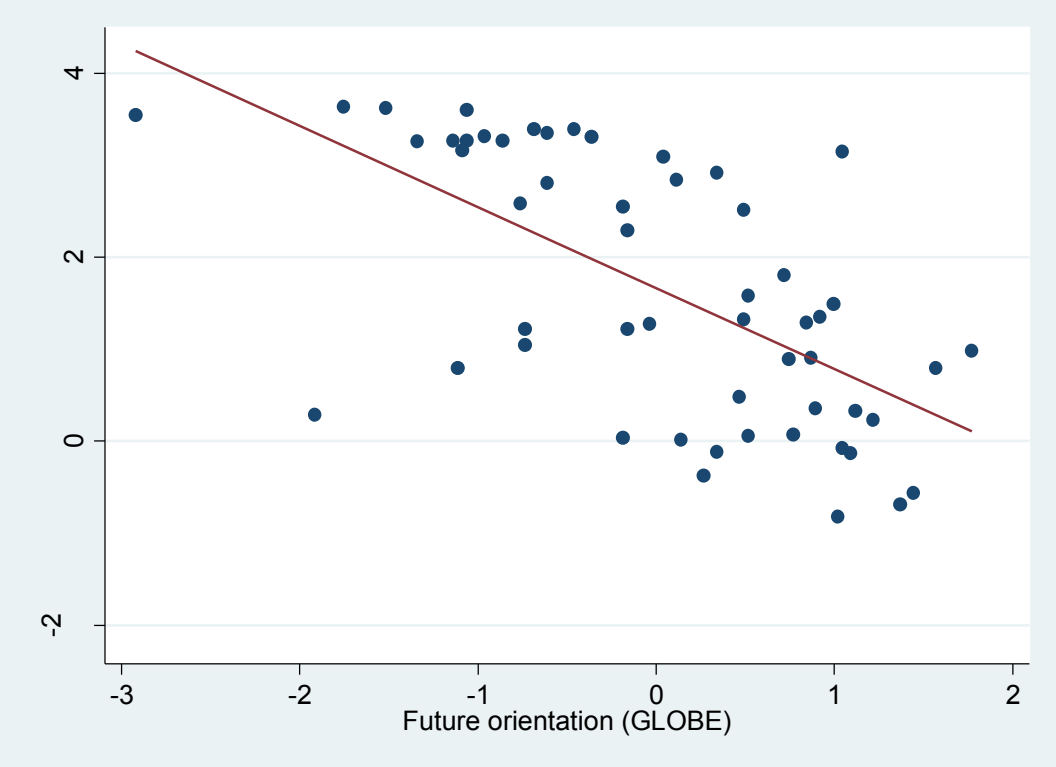


Figure 10: Future orientation (GLOBE)



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# Informal institutions and bilateral trade<sup>\*</sup>

Sang-Min Park, University of Kassel<sup>\*</sup>

(This version: February 1, 2012)

## *Abstract*

*Gravity models of international trade try to explain (bilateral) trade as a function of the trading partners' respective market size and their geographical distance. Recently, institutional variables have been included into such models, aiming to add institutional differences as explanatory factors. In this paper, we follow up on this literature by adding specific informal institutions – uncertainty avoidance, universalism, patriotism – to the analysis. We find evidence that specific informal institutions matter for bilateral trade, but the effect of exporting country and importing country informal institutions are not symmetrical. Furthermore, we find evidence that, simultaneously high levels of uncertainty avoidance (or patriotism) and formal contract enforcement quality, are associated with lower bilateral trade, implying that in such instances, cross-border exchange is replaced with domestic exchange.*

*JEL classification: O43, E19, E66, O11, O12, O17, Z13.*

*Key Words: Institutions, Informal Institutions, Values and Norms, Culture, International Trade, International Private Law, Transaction Costs*

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<sup>\*</sup> Sang-Min Park, Department of Economics, University of Kassel, e-mail: [park@uni-kassel.de](mailto:park@uni-kassel.de).



## 1 Introduction

The New Institutional Economics (NIE) is concerned with the incentive effects of different rules and their enforcement mechanisms on individual behavior. International trade is composed of transactions between actors from different systems of institutions.

It has been quite some time that NIE has observed a certain blindness of international economics towards the problem of territoriality in international transactions (Schmidtchen 1993; Rodrik 2000; Schmidtchen and Schmidt-Trenz 2006). This implies that studies in international economics tend to treat cross-border transactions as within-border transactions, ignoring potential institutional effects.

However, *“because of the absence of a world state, the property rights of economic agents involved in international trade are often incompatibly defined and insufficiently protected”* (Schmidtchen and Schmidt-Trenz 2006). Rodrik argues that *“[i]nternational law provides at best partial protection against incomplete contracts, and international norms and customs are hardly up to the task either”* (Rodrik 2000). In this work, we will test whether there are informal norms that are actually “up to the task”.

Recently, first attempts to incorporate informal institutions in explaining bilateral trade flows have been put forward. Mutual trust has been found to significantly influence the volume of bilateral trade flows in a sample of EU15 countries (Guiso et al. 2009). Furthermore, measures of cultural distance turned out to be significantly associated with bilateral trade (Linders et al. 2005; De Groot et al. 2004), though these results are presented void of theoretical underpinnings.

Our contribution to this literature is to focus on specific informal constraints rather than aggregate cultural differences or mutual trust (Voigt 2009). Previous approaches focus on institutional distance analogous to geographical distance to explain bilateral trade volumes. We suggest departing from this narrow gravity approach as it doesn't allow inferences regarding the effects of specific institutions.

Using aggregated data from the World Values Survey to measure specific exporting and importing country informal institutions, we find that bilateral trade is (1) negatively affected by importer uncertainty avoidance, (2) positively affected by very high levels of exporter universalism, (3) negatively affected by both exporter and importer patriotism. We also find that several interactions with formal contract enforcement quality.

The rest of this paper is structured as follows: In Section 2, we introduce the standard gravity approach to international trade, its institutional extensions and specific informal institutions that we think might be relevant. In Section 3, we present the used dataset and methodology, followed by the estimation results in Section 4. In Section 5, we close with potential caveats and policy implications.

## **2 Theory**

### **2.1 The gravity approach and the New Institutional Economics**

In international economics, the gravity approach uses the notion of physical gravitational pull between two countries to explain the volume of bilateral trade: (1) The more economic mass the two trading countries incorporate in terms of GDP and (2) the lower the geographical distance between these countries, the more trade does this approach expect between these countries (Baldwin and Taglioni 2006; Deardorff 1998; Frankel and Rose 2002).

Approaching bilateral trade from the viewpoint of the New Institutional Economics implies that we focus on the incentive effect (be they constraining or enabling) of legal and informal rules. Recent studies have accordingly augmented the standard gravity approach with measures of institutional quality and similarity (De Groot et al. 2004), arguing that institutions of similar quality imply familiarity between cross-border exchange partners (Aulakh and Gençtürk 2008), ultimately leading to lowered transaction costs. This approach was then extended to include so-called cultural distance, arguing that the closer the cultures of two potential trading partners are, the more likely it is that they will understand each other and perceive situations similarly (Linders et al. 2005).

By contrast, we are interested in the effects of specific informal constraints on bilateral trade. Though the concept of cultural distance is more in line with the classical gravity approach, it does not allow for inference with regard to specific institutional effects. What is more, the concept of cultural distance cannot differentiate between a situation in which an informal institution (that is conducive to cross-border exchange) is strong in both countries and a situation in which that institution is weak in both countries. The latter case should *ceteris paribus* be associated with less exchange between countries than the former case. Thus, we are much more interested in potential effects of specific informal institutions.

Trade between individuals from two countries involves a cross-border contract and transaction, with both individuals subject to two distinct sets of institutions. This includes formal and informal institutions, the former being different legal systems, especially concerning contract enforcement, the latter being characterized by different values and norms. What distinguishes informal institutions from formal ones is that sanctioning in the case of observed non-compliance with the embodied rule does not occur on the state level, but rather through other members of society or even internally in the mind of the rule-breaker. Previous literature has put forward a fine-grained taxonomy of informal institution (Kiwit and Voigt 1995), but for our purposes, it suffices to define informal institutions as institutions that are not enforced by the state.

In the following sections, we will be considering formal and informal institutions potentially relevant for cross-border exchange. In order to keep the formulation of our hypotheses tractable, we will phrase them from the perspective of the exporting country.

## **2.2 Formal contract enforcement**

*“[...] international exchange is insecure. Shipments may be hijacked. Bribes may be extorted. Contracts may not be enforced.”* (Anderson and Marcouiller 2002)

Because transaction across state borders involves actors from two distinct legal systems, international trade is characterized by problems of contract enforcement that domestic trade is not: If there is breach of contract, (1) which side’s legal rules apply (2) how should enforcement be administered in a foreign country? In the NIE literature, this problem that is rooted in national sovereignty has been coined *constitutional uncertainty* (Schmidtchen 1993; Schmidtchen and Schmidt-Trenz 2006). Higher constitutional uncertainty leads to higher transaction costs for cross-border transactions.

One specific aspect that certainly feeds into the more general problem of constitutional uncertainty is the quality of contract enforcement (Rodrik 2000). If an exporter can choose between two identical trading partners from two different countries, he will *ceteris paribus* prefer to do business with the person from the country with better contract enforcement because the expected transaction costs are lower. Previous theoretical literature has shown that imperfect contract enforcement in the importing country is equivalent to a tariff (Anderson and Young 2006), in particular for industries in which relationship-specific investments matter a lot for intermediate inputs (Nunn 2007). Given these arguments, our conjecture is as follows.

*Hypothesis 1: The stronger the institutions of contract enforcement in either country, the higher the volume of bilateral trade.*

### **2.3 Potentially relevant informal institutions**

Because of the above mentioned constitutional uncertainty that is inherent in cross-border exchange, even good formal contract enforcement in either country might sometimes not suffice to ensure that all efficient transactions are realized. Here, there is a potential role for informal institutions to facilitate trade. Reversely, informal institutions might be able to account for missing trade when formal institutions are strong.

In this section, we discuss several informal institutions that might potentially affect the incentives for cross-border exchange. Several dimensions of norms and values have been proposed to be potentially relevant informal constraints for economic outcomes (Park and Voigt 2008; Voigt 1993): (1) The individual actor is responsible for achieving his goals, (2) successful individuals are perceived as role models, (3) individuals are socially and geographically mobile, (4) individuals are to a certain degree open towards unknown things, (5) individuals believe in equal treatment of all persons, (6) individuals believe in communal involvement, (7) attitude towards hierarchies.

We expect dimensions (4) and (5) in particular to be complementary to strong contract enforcement institutions, as they would tend to lower the potential transaction costs of cross-border exchange. In addition, we include the institution of patriotism, which should be especially relevant for international trade.

First, we consider the institution of uncertainty avoidance (which is the opposite end of dimension 4). This institution comprises procedures and norms at the individual and firm-level to reduce uncertainty (Cyert and March 1992). It has been argued that the institution of uncertainty avoidance helps agents cope with the anxiety associated with uncertainty in general (Sully de Luque and Javidan 2004; Hofstede 1980). Economic exchange is fraught with uncertainties regarding payment, fulfillment and enforcement. Thus, when individuals in a society are characterized by high levels of uncertainty avoidance, transaction costs are higher, *ceteris paribus*, because more resources have to be put into insuring against potential risks. At the same time, individuals with high uncertainty avoidance are less open towards foreigners, including potential trading partners from other cultures. A cross-border transaction is doubly associated with uncertainty, as there is (1) uncertainty with regard to the transaction itself and (2)

uncertainty with regard to the formal enforcement institutions of the other country. We thus expect high levels of aggregate uncertainty avoidance to be associated with low levels of bilateral trade with another country.

*Hypothesis 2: The higher the level of uncertainty avoidance in either country, the lower the volume of bilateral trade.*

Another informal institution that we think is relevant is universalism (Mungiu-Pippidi 2006; Biggart and Delbridge 2004)<sup>1</sup>. This informal institution proscribes that equal treatment should apply to anyone regardless of group affiliation. In a very broad fashion, North argues that highly developed societies are characterized by a so-called open access social order, which inter alia fosters impersonal exchange (North et al. 2006). Thus, when individuals follow the norm that all persons should be treated equally, they will treat potential trading partners from other countries just like potential trading partners from their respective country. The more individuals in a society follow this norm, the lower we expect cross-border transaction costs to be, as foreign trading partners are not viewed with any more suspicion than domestic trading partners.

*Hypothesis 3: The more individuals in either country follow the norm universalism, the higher the volume of bilateral trade.*

In the context of this work, another informal institution has been identified to be potentially relevant: patriotism (de Jong 2009). Patriotism implies the rule that domestic products and services are to be preferred over foreign ones. In the context of equity investment, patriotism has been shown to be a significant factor (Morse and Shive 2011). When individuals express strong patriotic tendencies, they will less likely be inclined to engage in cross-border transactions, as patriotism by definition implies a relative preference for domestic exchange partners. Some studies have also hypothesized indirect effects of patriotism on trade via protectionist preferences (O'Rourke et al. 2001; Mayda and Rodrik 2005).

*Hypothesis 4: The more individuals in either country follow the norm patriotism, the lower the volume of bilateral trade.*

## **2.4 On the inter-relationship between formal and informal institutions**

So far, we have merely discussed potential effects of either formal or informal institutions on trade. However, as Douglass North has pointed out, a country's

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<sup>1</sup> This concept is closely related but distinct from the concept of fairness.

institutional system consists of both formal and informal constraints (North 1990). If we accept this premise, then the effect of informal institutions on the incentives for cross-border exchange should also depend on existing formal institutions.

Logically (and purely abstractly), one can determine four different ways in which formal and informal institutions interact: Their effect on behavior can be (1) complementary, (2) substituting, (3) conflicting or (4) neutral (Kiwit and Voigt 1995)<sup>2</sup>. This differentiation helps us construct theoretical conjectures regarding the potential inter-relationship between formal and informal institutions.

In our context, formal and informal institutions are conflicting when one of them is conducive to cross-border exchange, while the other discourages it.

One could envision a situation in which both strong formal contract enforcement and strong uncertainty avoidance are present. By itself, strong uncertainty avoidance is an impediment to cross-border exchange. At the same time, strong contract enforcement is conducive to trade. This could imply that some transactions will be realized that would otherwise not have been considered.

*Hypothesis 5: The effect of uncertainty avoidance on trade will be weaker the stronger contract enforcement in either country.*

Another relevant situation would be given when there are strong formal contract enforcement institutions in both countries and strong informal institutions of patriotism in either country. Strong patriotism in either country deters cross-border exchange. However, strong contract enforcement institutions in the two exchange partners' countries might enable some transactions that would otherwise not have been realized.

*Hypothesis 6: The effect of patriotism on trade will be weaker the stronger contract enforcement in either country.*

Reversely, complementarity between formal and informal institutions is on hand when their incentive effects are both conducive to international transactions and reinforce each other. This is the case when strong formal contract enforcement is coupled with the institution of universalism. By itself, the former will already ensure that a lot of cross-border exchanges are realized. But in conjunction with a strong prevalence of universalism in either country, even more exchanges will be realized.

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<sup>2</sup> This distinction is much more exact than simply referring to a "clash" (Feige 1997) when formal and informal institutions are not in coherence.

*Hypothesis 7: The effect of universalism on trade will be higher the stronger contract enforcement in either country.*

### 3 Data and Methodology

#### 3.1 Pooled cross-section approach

In order to test our hypotheses, we utilize a straightforward extension of the standard dyadic gravity equation (Rose 2005):

$$\ln(EXP_{ijt}) = \beta_0 + GRAVITY_{ijt}\beta_1 + INST_{ijt}\beta_2 + \varepsilon_{ijt}$$

Estimation will be carried out with pooled ordinary least squares. The dependent variable is  $\ln(EXP_{ijt})$ , the log of exports from country  $i$  to country  $j$  at time  $t$  (in current US dollars). We construct this variable from the Correlates of War dyadic trade dataset (Barbieri et al. 2008, 2009).

The vector  $GRAVITY_{ijt}$  contains explanatory variables from the standard gravity approach:

$\ln(GDP_{it}GDP_{jt})$ , where  $GDP$  is real gross domestic product in constant 1990 dollars (Division 2009),

$DIST_{ij}$ , which is a time-constant measure for the geodesic distance between countries  $i$  and  $j$  (Mayer and Zignago 2006).

The vector  $INST_{ijt}$  contains (1) proxies for the quality of formal contract enforcement, (2) proxies for the informal institution in the exporting or importing country and (3) all two- and three-way interactions of these variables, including the squared informal institution. We estimate this equation separately for each dimension of informal institutions (uncertainty avoidance, universalism, patriotism). Furthermore note that, for each of those informal institutions, we estimate two separate equations: one for exporting country informal institutions, one for importing country informal institutions. This is necessary because WVS data are available for a limited cross-section of countries. Investigating both exporter and importer informal institutions in one equation requires data to be available for both countries, which would severely reduce sample size and introduce selection problems.

A more detailed description of our estimation approach is now<sup>3</sup>:

$$\begin{aligned} \ln(EXP_{ijt}) = & \\ & \beta_0 + \beta_{1,1}\ln(GDP_{it}GDP_{jt}) + \beta_{1,2}DIST_{ij} + \beta_{2,1}CONTR_{it} + \beta_{2,2}CONTR_{jt} + \beta_{2,3}INF_{jt} \\ & + \beta_{2,4}CONTR_{it}^2 + \beta_{2,5}CONTR_{jt}^2 + \beta_{2,6}INF_{jt}^2 \\ & + \beta_{2,7}(CONTR_{it}INF_{jt}) + \beta_{2,8}(CONTR_{jt}INF_{jt}) + \varepsilon_{ijt} \end{aligned}$$

A straightforward implication is that – with the exception of  $\beta_{1,1}$  and  $\beta_{1,2}$  – the estimated coefficients can no longer be directly interpreted as (unconditional) marginal effects. In order to arrive at inferences regarding the effect of the institutional variables, we need to calculate marginal effects conditional on specific values of the respective other covariates.

Because our unit of observation is the dyad (country pair), we have non-independent observations, which in turn leads to biased standard errors. In order to counter this, we employ a full set of time-varying exporter and importer dummies plus a full set of year dummies<sup>4</sup>. By controlling for this broad set of fixed effects, we can safely neglect including any further control variables, as most of those controls' variation is already covered by our fixed effects. Furthermore, we adjust standard errors to account for clustering at the dyad level.

Our proxy for the strength of formal contract enforcement in the importing (exporting) country is  $CONTR_{jt}$  ( $CONTR_{it}$ ). For this, we employ the ICRG indicator for quality of government (Teorell et al. 2010). This is the mean value of several subjective measures provided by the International Country Risk Guide: Corruption, Law and Order and Bureaucratic Quality. Each of these variables covers aspects that are relevant for the quality of contract enforcement. The ICRG indicator is highly correlated with other potential measures, like the World Bank rule of law indicator or the Heritage Foundation's indicator for protection of property rights, but available for a broader time

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<sup>3</sup> This is the equation for importing country informal institutions. For the exporting country, we substitute  $INF_{it}$  for  $INF_{jt}$ .

<sup>4</sup> The first best approach would be to year-varying exporter and importer dummies (Baldwin and Taglioni 2006), but due to the limited availability of our informal institutional variables, this is not feasible. Instead, we opt to vary the country dummies by wave of World Values Survey, which amounts to the five waves: 1981-1989, 1990-1994, 1995-1998, 1999-2004 and 2005-2008.



range. Naturally, the most straightforward and objective measure for contract enforcement would be the check collection variable from the Courts project (Djankov et al. 2003), which is unfortunately not available as time-series. Note also that the ICRG indicator is a much broader measure than for example the Djankov indicator. Potential problems of using such broad measures have recently been discussed (Voigt 2009).

In order to operationalize the concept of informal institutions, we employ data from the World Values Survey (WVS), an extensive survey that has been carried out for representative samples in up to 96 countries since 1981.

To construct an importing (exporting) country's index of uncertainty avoidance  $UNCERT_{jt}$  ( $UNCERT_{it}$ ), we utilize a set of questions from the WVS which ask respondents to identify from various listed groups (e.g. people with a criminal record, homosexuals etc.) those groups that they would not like to have as neighbors. We assume that the more such groups were mentioned by the respondents, the more individuals are bound by the institution of uncertainty avoidance. Calculating the mean over all mentioned groups results in a variable that lies between 0 and 1, with higher values indicating stronger uncertainty avoidance. In turn, this mean is averaged over all individuals of a country-year to result in our aggregate measures of uncertainty avoidance.

In order to arrive at an index of universalism  $UNIV_{jt}$  ( $UNIV_{it}$ ), we consider two responses from the WVS, both of which measure some distinct aspect of that institution: (1) of two otherwise identical secretaries, the more productive one should be paid a higher wage, (2) larger income inequalities are needed for their incentive effect. Using factor analysis, we construct a weighted average of the two, invert the resulting variable and calculate the country mean to obtain our aggregate index of universalism.

Our measure for patriotism  $PATR_{jt}$  is derived from two WVS questions: (1) How proud are you of your nationality? (2) Are you willing to fight for your country? Using factor analysis, we calculate a weighted average. Again, aggregation to the country-year level is achieved by averaging.

Descriptive statistics for the variables employed in this study are in **Table 6**, pairwise correlations can be found in **Table 7**.

## 4 Estimation results

The presentation of our estimation results will proceed in two steps: First, we consider average effects, i.e. marginal effects (expressed as elasticities) holding constant other covariates at their respective means. In order to identify potential non-linearities and interactions, we will secondly consider several conditional effects plots. We will restrict our interpretation to parts of the respective distribution above the 50<sup>th</sup> percentile. This is justified as we are interested in the effects of institutions when they actually matter.

In **Table 8**, we present the estimated average effects. “Average” means that we hold constant the values of respective other institutional variables at their means. For instance, the marginal effect of any importing country informal institution in the above statistical model is:

$$\frac{\partial \ln(EXP_{ijt})}{\partial INF_{jt}} = \beta_{2,3} + 2\beta_{2,6}INF_{jt} + \beta_{2,7}CONTR_{it} + \beta_{2,8}CONTR_{jt}$$

In order to be able to draw inferences regarding the effect of  $INF_{jt}$ , have to evaluate this expression at specific values of  $INF_{jt}$ ,  $CONTR_{it}$  and  $CONTR_{jt}$ . In **Table 8**, we present the effects when inserting the respective mean.

First of all, we can see that the standard gravity explanatory variables,  $\ln(GDP_{it}GDP_{jt})$  and  $DIST_{ij}$ , are estimated to have a significant impact, with the expected signs: Ceteris paribus, more economic mass (geographic distance) is associated with more (less) bilateral trade.

### 4.1 Contract enforcement quality

All equations include our proxies for exporting country and importing country contract enforcement quality. For the former, there is a robust picture: At the mean, higher exporting country enforcement quality is associated with more bilateral trade. For importing country formal institutions, we do not receive a consistent pattern. On balance, we find some evidence for hypothesis 1.

### 4.2 Uncertainty avoidance

At the mean, we find that neither exporting nor importing country uncertainty avoidance is significantly associated with trade levels (**Table 8**, columns 1 and 2). In order to assess whether this result is true for all values of uncertainty avoidance, we will look at conditional effects plots. In **Figure 11**, we have plotted the estimated elasticity of trade with re-

spect to exporter uncertainty avoidance for varying levels of uncertainty avoidance. We find that the estimated effect of exporter uncertainty avoidance on trade is positive and sizable, rising above 1 for very high values of uncertainty avoidance. However, this effect is estimated with considerable error, as the confidence interval includes zero.

For a possible explanation, consider the argument that, in societies with high uncertainty avoidance, it might actually encourage risky behavior aimed at reducing ambiguities associated with uncertainty (Hofstede et al. 2008). This argument is in line with our observation that an increase in uncertainty avoidance is associated with more trade for high values of uncertainty avoidance.

Reversely, we find that importing country uncertainty avoidance is negatively associated with trade (**Figure 12**). From an importer's perspective, this makes sense as highly uncertainty avoiding individuals will trade even less if uncertainty avoidance rises. The effect is very sizeable, as the estimated elasticity almost reaches -4 for very high values of uncertainty avoidance.

On balance, we find that hypothesis 2 can neither be rejected nor confirmed. Rather, our results point out that the effect of uncertainty avoidance on trade differs between exporting countries and importing countries, although the negative effect of importer uncertainty avoidance would seem to be stronger than the positive effect of exporter uncertainty avoidance.

Next, we consider interactions between the effect of uncertainty avoidance and contract enforcement quality. In **Figure 17**, we can see that the effect of exporter uncertainty avoidance does not differ for varying levels of contract enforcement quality. We do find some evidence for an interaction between exporter uncertainty avoidance and importer contract enforcement quality (**Figure 18**): The stronger contract enforcement quality in the importing country, the weaker the positive effect of exporter uncertainty avoidance. Remember that we ascribed the positive sign of this effect to an ambiguity reduction tendency of societies with high uncertainty avoidance. This interaction is in line with that, as better contract enforcement quality in the importing country reduces the need to reduce ambiguities springing from uncertainty.

Turning to importing country uncertainty avoidance (**Figure 20**), we can see that higher importing country contract enforcement quality leads to a stronger negative effect of importer uncertainty avoidance and very sizably so, with elasticities larger than -4 for very high levels of uncertainty avoidance. This is contrary to what we expected as ex-

pressed in hypothesis 5. A possible explanation is that, when importer uncertainty avoidance and importer contract enforcement quality are both strong, cross-border exchange is replaced by domestic exchange, thus leading to the observation of lower bilateral trade. This makes intuitive sense, as good quality of contract enforcement pertains primarily to domestic contracts.

### 4.3 Universalism

In **Table 8** (columns 3 and 4), we find that, at the mean, universalism negatively affects bilateral trade. This is counter to hypothesis 3 and will be analyzed in more details in conditional effects plots.

In **Figure 13**, we plot the effect of exporter universalism on trade. We find that the effect starts out slightly negative for values below the 70<sup>th</sup> percentile, is insignificant above that and turns significantly positive for very high values of the distribution ( $> 90^{\text{th}}$  percentile). This implies that only very strong exporter universalism can enhance trade. Even when it does, the effect is under-proportional, as it never exceeds -1.

The effect of importing country universalism is plotted in **Figure 14**. Here, we find that the effect of universalism on trade is negative, which we cannot explain but might not have to, as the estimated errors are very large.

On balance, we find that there is weak evidence for hypothesis 3, as the results only pertain to very high levels of universalism.

Regarding interactions, we find that the positive effect of exporter universalism does not differ meaningfully for varying levels of importer contract enforcement quality (**Figure 22**), but with exporter contract enforcement quality (**Figure 21**), we do find an interesting interaction: The effect of universalism on trade is strictly positive for low enforcement quality and strictly negative for strong enforcement quality. We can interpret this finding as evidence that universalism and contract enforcement are in a substitutive rather than a complementary relationship: For weak contract enforcement, universalism makes possible that would otherwise not have been realized. For strong contract enforcement, universalism has a very small negative effect on trade, mostly smaller than -0.5, implying it isn't very relevant. Thus, hypothesis 7 has to be reversed. For importer universalism, we do not find any meaningful interaction with contract enforcement quality.

#### 4.4 Patriotism

Looking at the effects of patriotism, we find that the effects of exporter patriotism and importer patriotism are actually very similar (**Figure 15** and **Figure 16**): Stronger patriotism is significantly associated with lower levels of trade. This effect is stronger the higher the level of patriotism. Note that the magnitude of the effect is larger for importing country patriotism. This is in line with hypothesis 4.

The only meaningful interaction we can find here is between importing country patriotism and importing country enforcement quality (**Figure 28**). Here, we can see that the negative effect of importer patriotism is much more pronounced for strong importing country contract enforcement. For weak contract enforcement, the effect of patriotism is constantly close to zero. On the face of it, this is counter-intuitive and not in line with hypothesis 6. However, we can apply the same logic as with uncertainty avoidance: High levels of patriotism in conjunction with strong contract enforcement quality are conducive to domestic trade, apparently so much that domestic trade is substituted for international trade.

### 5 Conclusions and Outlook

In this paper, we have shown that some measures for specific informal institutional constraints are significantly associated with bilateral trade volumes. Additionally, we could find evidence for complementarities between formal and informal constraints. Let us close with some potential problems of our analysis, ways to address them and potential policy implications.

One potential (empirical) problem might be selection bias: Bilateral trade data is available for around 250,000 dyad-years, the number of observations in our analysis lies below 10,000 for the most part. This is due to the fact that (1) the World Values Survey data are only available for a limited number of countries. One possible way to address in future this would be out of sample prediction of missing values for informal institutions.

What about reverse causality? Even though it has been argued that informal institutions are very slow to change and might thus be considered to be strictly exogenous (Williamson 2000), one might argue that cross-border exchange transfers values and norms across borders to some extent. In future research, we will address this with some

form of instrumental variables approach, although previous research on formal institutions has shown that endogeneity is not prevalent (Ranjan and Lee 2007).

One set of informal institutions that has been mentioned in the theoretical literature but which we have not been able to include here is social networks (Andersen 2008). One problem that agents face in cross-border transactions is hold-up: Usually, at least one of the parties involved in the potential trade is required to incur substantial prior costs before the actual bargaining takes place. Because these prior costs are usually rather specific, a hold-up is likely to occur, with the other side trying to exploit their improved bargaining position. Anticipating this, agents are less likely to enter transactions that require prior investments, leading to a lower than optimal number of transactions (Williamson 1979). Andersen points to the informal institution of social networks to resolve hold-up. When potential trading partners from different countries are part of one social network, this network might provide for informal contract enforcement in the presence of hold-up problems. Thus, informal contract enforcement by a social network can be either in complementary or in substitutive relation to existing formal institutions of contract enforcement: the former when formal contract enforcement is strong, the latter when formal contract enforcement is weak. Furthermore, social networks might provide for risk diversification mechanisms especially relevant in cross-border transactions. On balance, the theoretical literature suggests that, the more social networks there are between individuals of two countries, the more transactions we should expect across the borders of these two countries. One big step for future research in this area is definitely to come up with cross-country measure for the number and strength of social networks across borders (Baghdadi and Chepeta 2008; Petropoulou 2005).

Another set of informal institutions that we have not considered in this work is religious institutions. In future work, we would like to include religiosity as well as specific religious norms in our analysis of bilateral trade (Lewer and Van den Berg 2007).

What policy implications can we draw from our empirical results? First and foremost, our results are descriptive ones: We describe whether and in which way informal institutions matter for bilateral trade. As for normative implications, one could suggest that in cases where trade could function well given the formal institutional environment, but is hampered by informal institutions such as patriotism or uncertainty avoidance, the use of international trade intermediaries might help.

## 6 Tables

Table 6: Descriptive statistics (pooled cross-section)

Variable	Observations	Mean	Median	SD	Min	Max
$\ln(GDP_{it}GDP_{jt})$	10509	17.846	17.887	1.421	12.862	21.487
$DIST_{ij}$	10509	8.602	8.791	0.810	4.088	9.892
$CONTR_{it}$	10509	0.707	0.722	0.208	0.160	1.000
$CONTR_{jt}$	10509	0.566	0.556	0.213	0.060	1.000
$UNCERT_{it}$	10509	0.325	0.294	0.120	0.076	0.822
$UNCERT_{jt}$	8458	0.407	0.397	0.152	0.076	0.822
$UNIV_{it}$	9353	0.058	0.079	0.290	-0.774	0.798
$UNIV_{jt}$	8076	0.001	0.001	0.321	-0.774	0.798
$PATR_{it}$	8664	-0.014	0.025	0.329	-1.253	0.674
$PATR_{jt}$	7443	0.031	0.099	0.453	-1.253	0.674

**Table 7: Pairwise correlations (with p-values)**

	$\ln(GDP_{it}GDP_{jt})$	$DIST_{ij}$	$CONTR_{it}$	$CONTR_{jt}$
$UNCERT_{it}$	-0.2813	-0.1326	-0.4267	0.0943
	0	0	0	0
$UNCERT_{jt}$	-0.3623	0.006	0.0129	-0.4721
	0	0.5788	0.2372	0
$UNIV_{it}$	0.1576	0.1033	0.2077	0.0054
	0	0	0	0.5996
$UNIV_{jt}$	0.1161	-0.0448	-0.0158	0.2864
	0	0.0001	0.1562	0
$PATR_{it}$	-0.1314	0.1427	-0.1323	0.0638
	0	0	0	0
$PATR_{jt}$	-0.3128	-0.0879	0.0391	-0.2909
	0	0	0.0007	0



**Table 8: Average marginal effects of informal institutions on bilateral trade**

		Dependent variable: $\ln(EXP_{ijt})$					
Vector	Variable	Uncertainty avoidance		Universalism		Patriotism	
		(1)	(2)	(3)	(4)	(5)	(6)
$GRAVITY_{ijt}$	$\ln(GDP_{it}GDP_{jt})$	0.964***	1.136***	0.837***	1.060***	0.851***	1.023***
		(0.0572)	(0.0620)	(0.0598)	(0.0618)	(0.0602)	(0.0614)
	$DIST_{ij}$	-0.991***	-0.948***	-1.073***	-0.897***	-0.910***	-0.922***
		(0.0434)	(0.0461)	(0.0455)	(0.0475)	(0.0451)	(0.0474)
$INST_{ijt}$	$CONTR_{it}$	0.880**	0.743***	1.439***	1.057***	0.765***	1.173***
		(0.366)	(0.230)	(0.240)	(0.226)	(0.212)	(0.222)
	$CONTR_{jt}$	0.285	-0.916**	0.801***	-0.556**	0.757***	-0.924***
		(0.221)	(0.386)	(0.227)	(0.283)	(0.225)	(0.239)
	$UNCERT_{it}$	0.164					
		(0.264)					
	$UNCERT_{jt}$		0.343				
			(0.249)				
	$UNIV_{it}$			-0.115***			
				(0.0127)			
	$UNIV_{jt}$				-0.000689*		
					(0.000370)		
	$PATR_{it}$					0.0253***	
					(0.00274)		
$PATR_{jt}$						-0.0326***	
						(0.00599)	
<b>Observations</b>		10,509	8,458	9,353	8,076	8,664	7,443
<b>R-squared</b>		0.674	0.644	0.682	0.631	0.662	0.617

Estimation was carried out with Ordinary Least Squares. For the vector  $GRAVITY_{ijt}$ , reported numbers are simple coefficients. For the vector  $INST_{ijt}$ , reported numbers are average conditional elasticities holding constant all other covariates at their respective means. Dyad cluster adjusted robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05. All specifications include full sets of time-varying exporter and importer dummies as well as year dummies.

## 7 Figures<sup>1</sup>

Figure 11: The effect of exporter uncertainty avoidance on trade

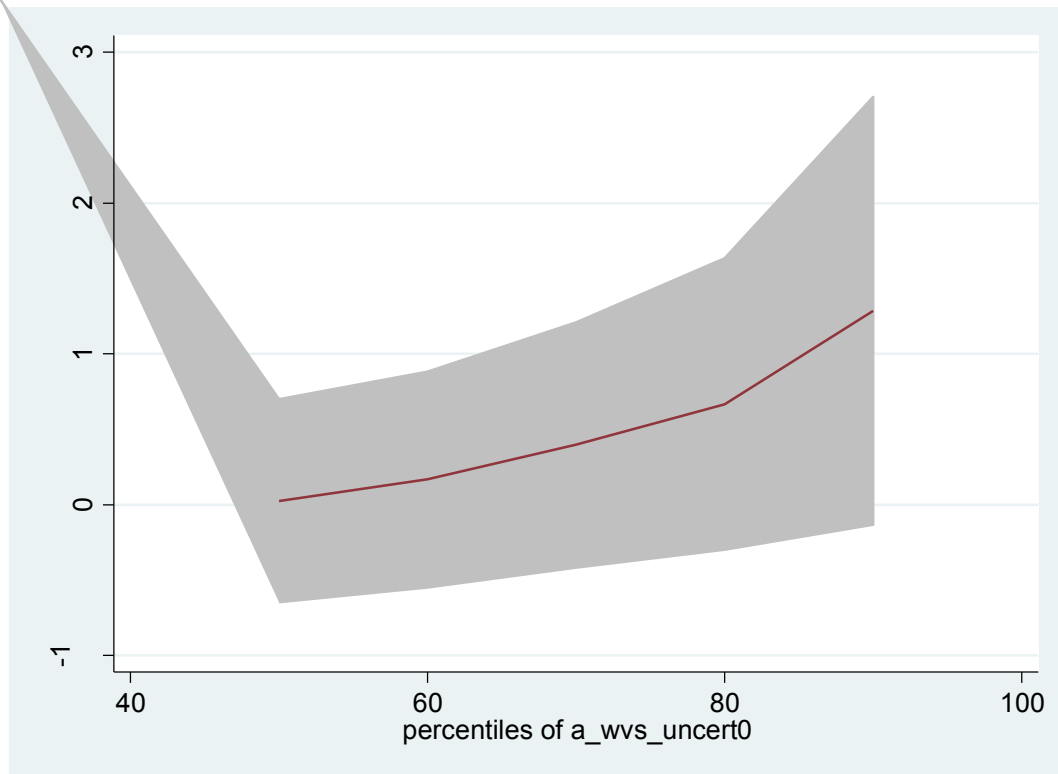
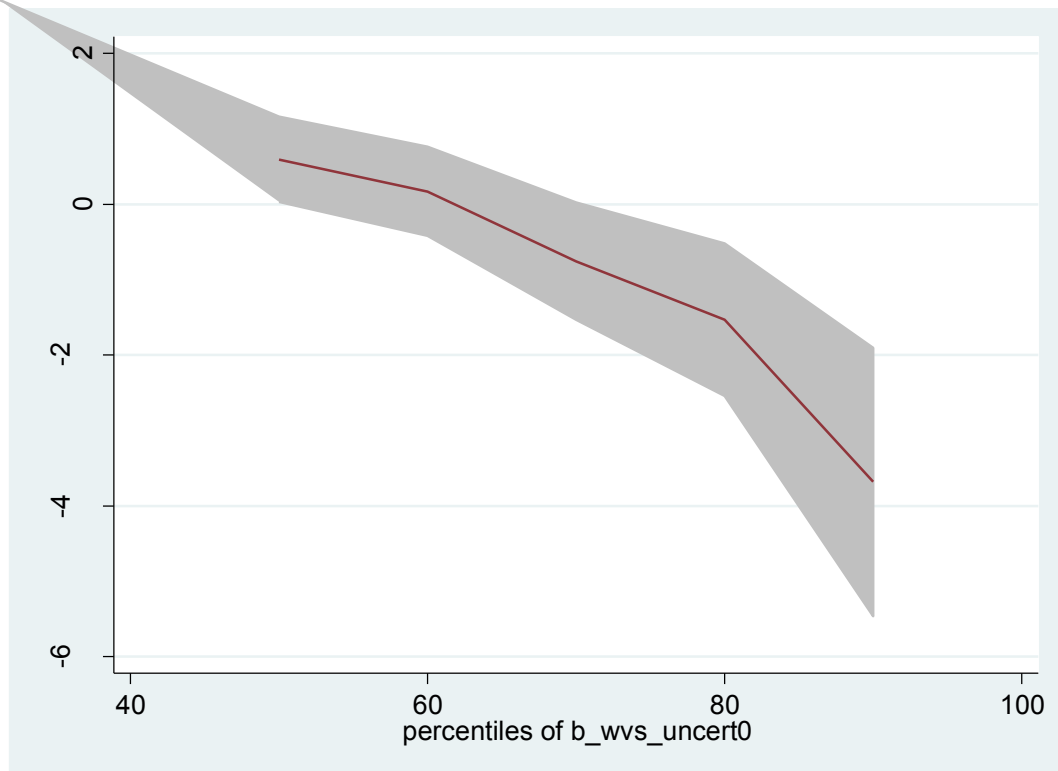
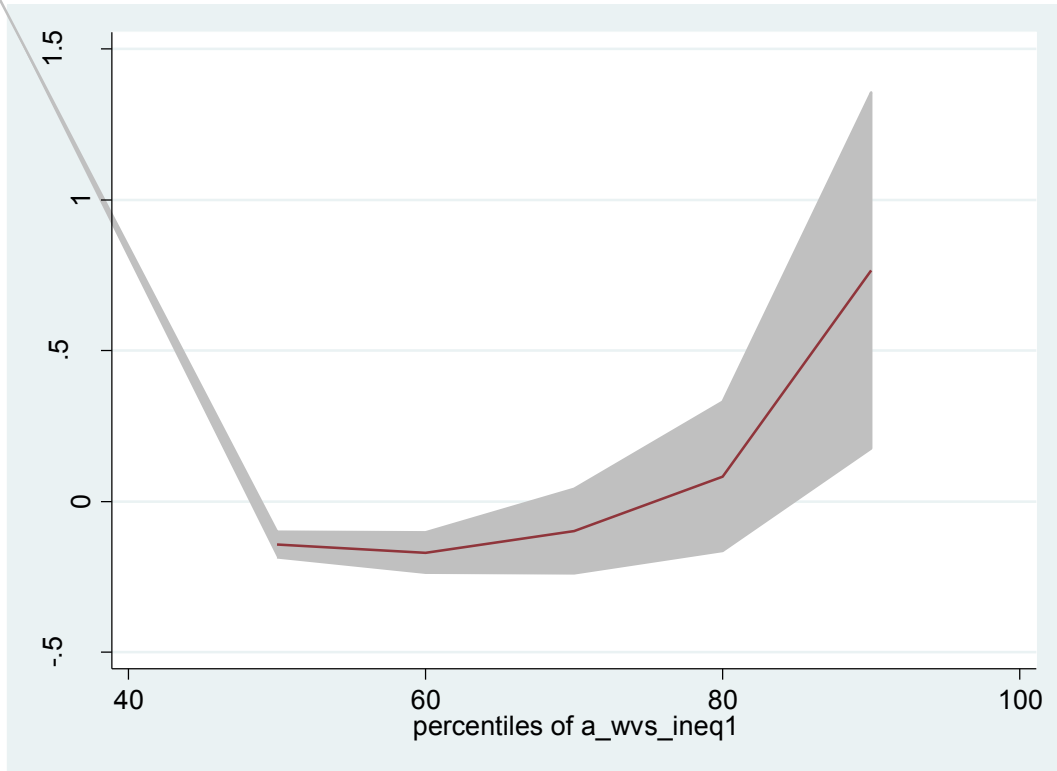


Figure 12: The effect of importer uncertainty avoidance on trade

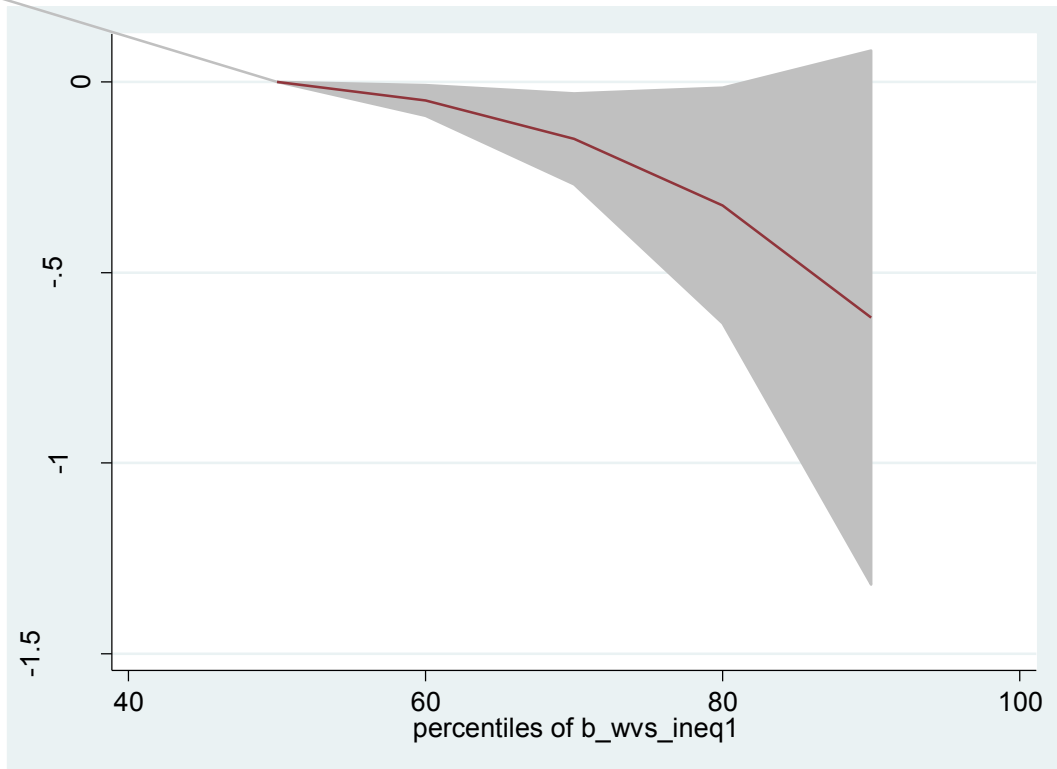


<sup>1</sup> Figures 1 through 6 also plot the 99% confidence interval.

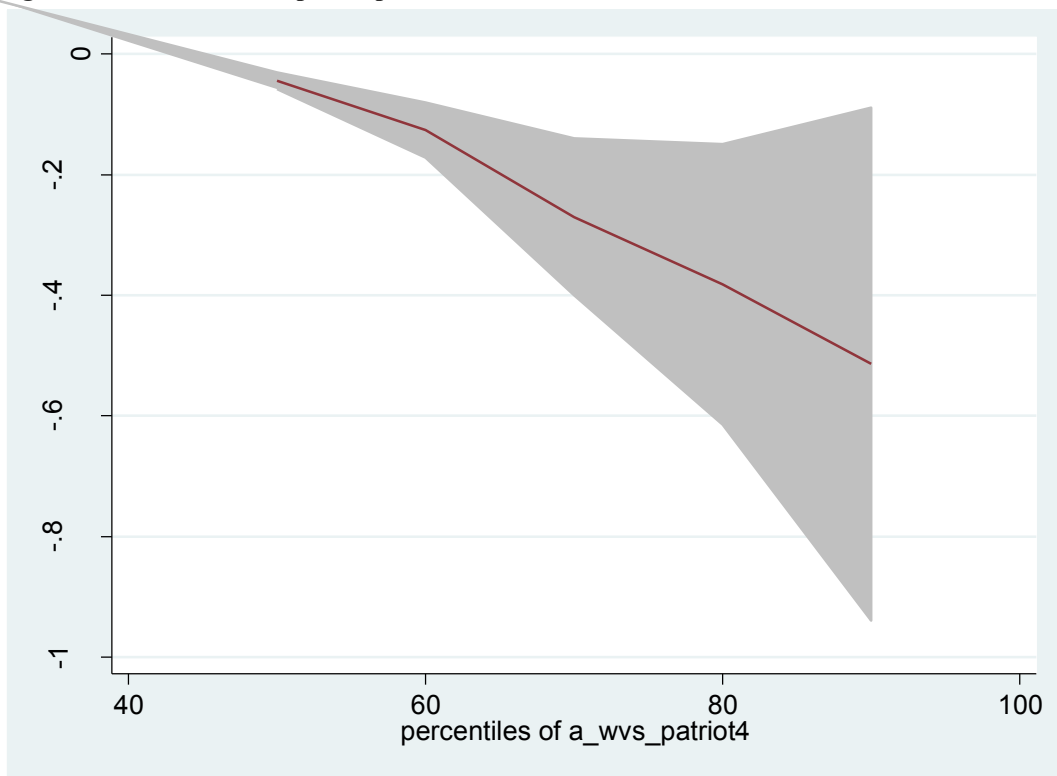
**Figure 13: The effect of exporter universalism on trade**



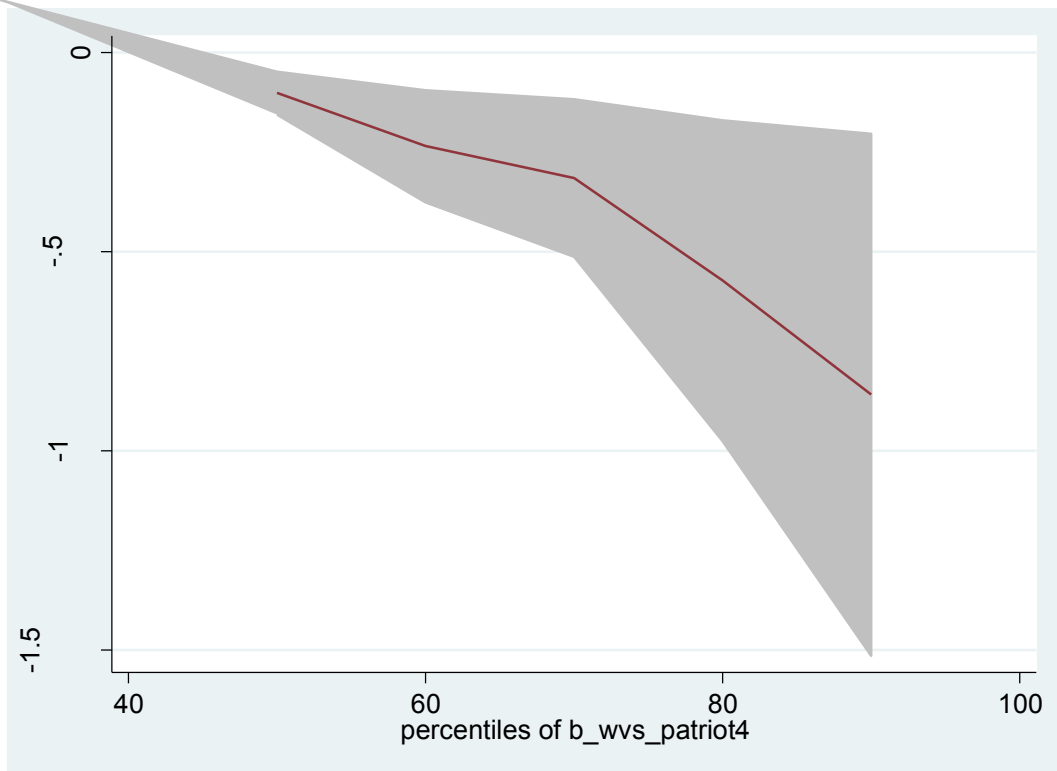
**Figure 14: The effect of importer universalism on trade**



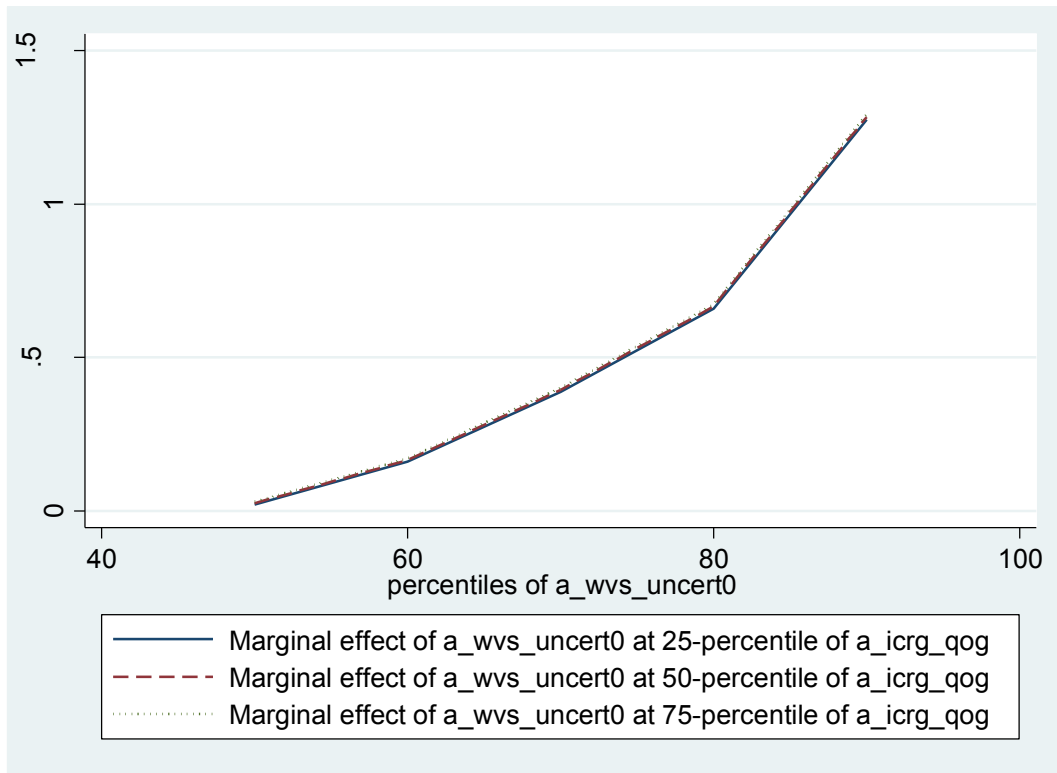
**Figure 15: The effect of exporter patriotism on trade**



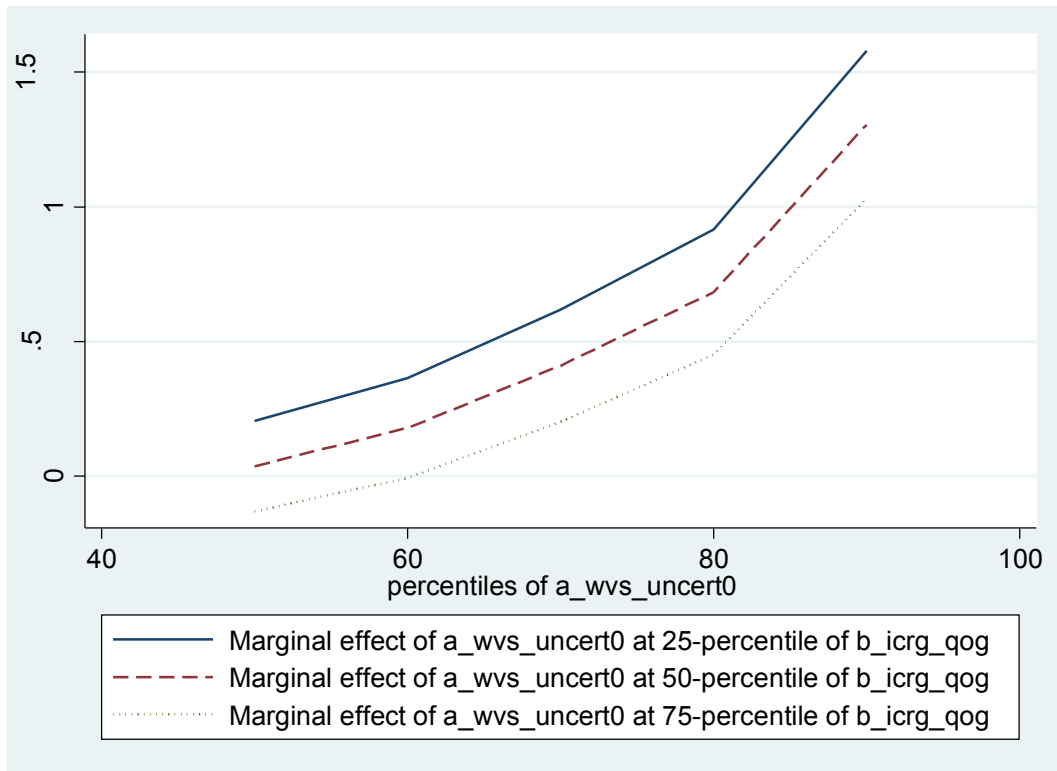
**Figure 16: The effect of importer patriotism on trade**



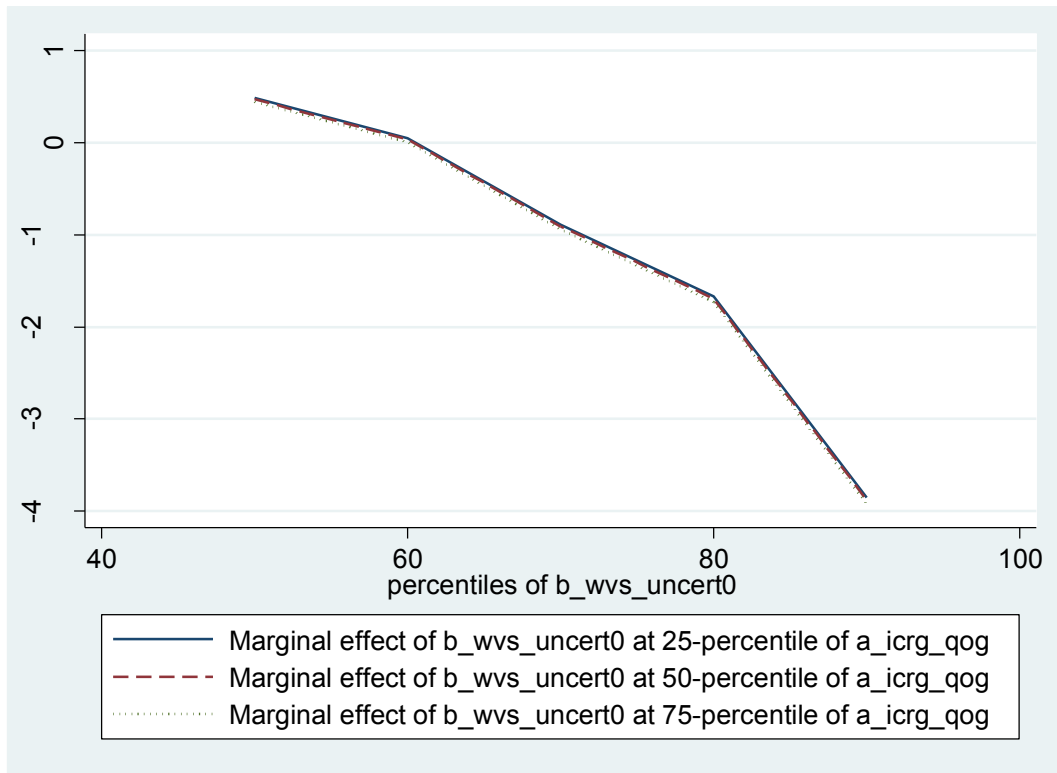
**Figure 17: Interaction between exporter uncertainty avoidance and exporter contract enforcement quality**



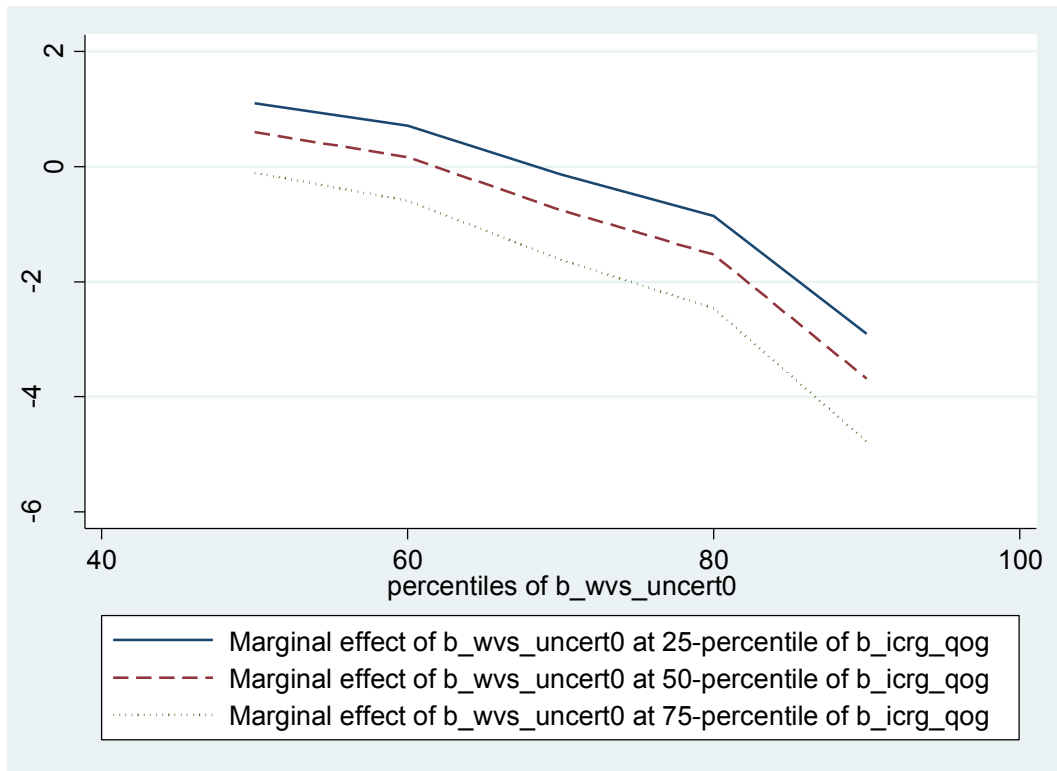
**Figure 18: Interaction between exporter uncertainty avoidance and importer contract enforcement quality**



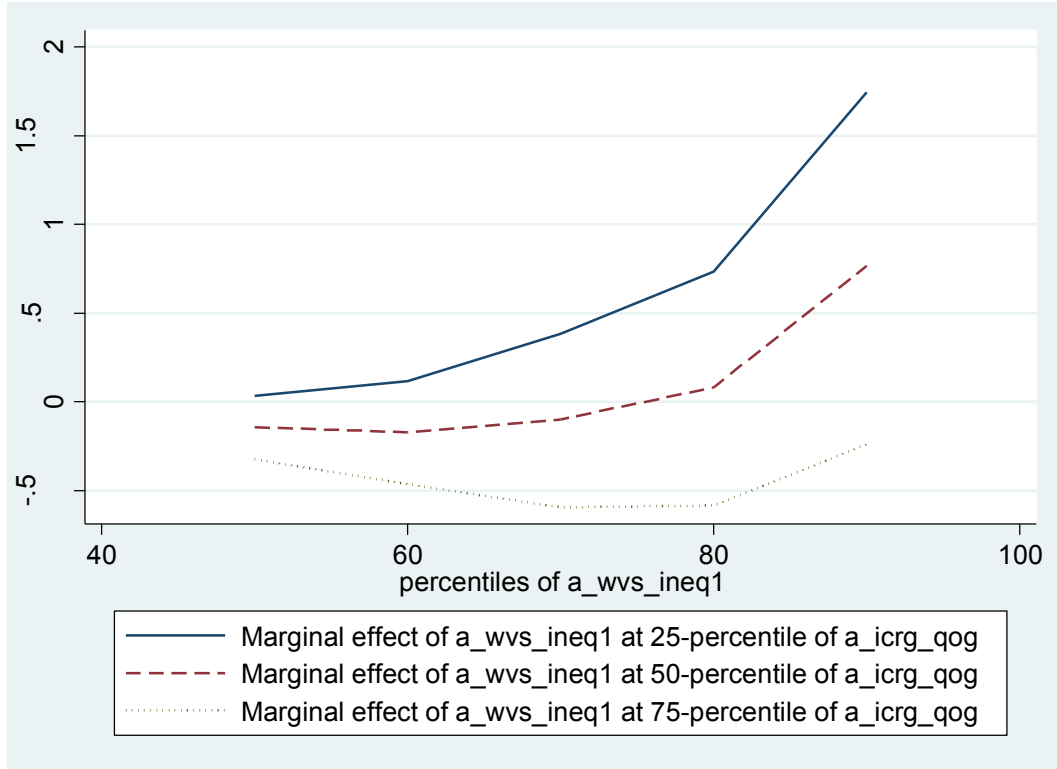
**Figure 19: Interaction between importer uncertainty avoidance and exporter contract enforcement quality**



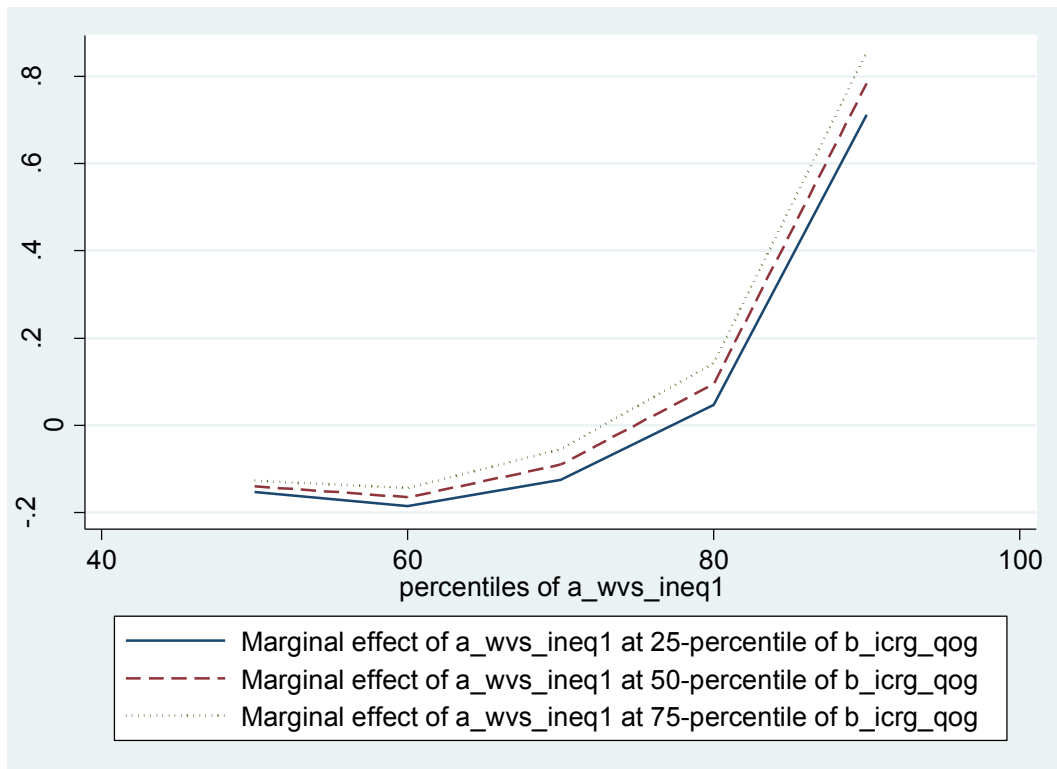
**Figure 20: Interaction between importer uncertainty avoidance and importer contract enforcement quality**



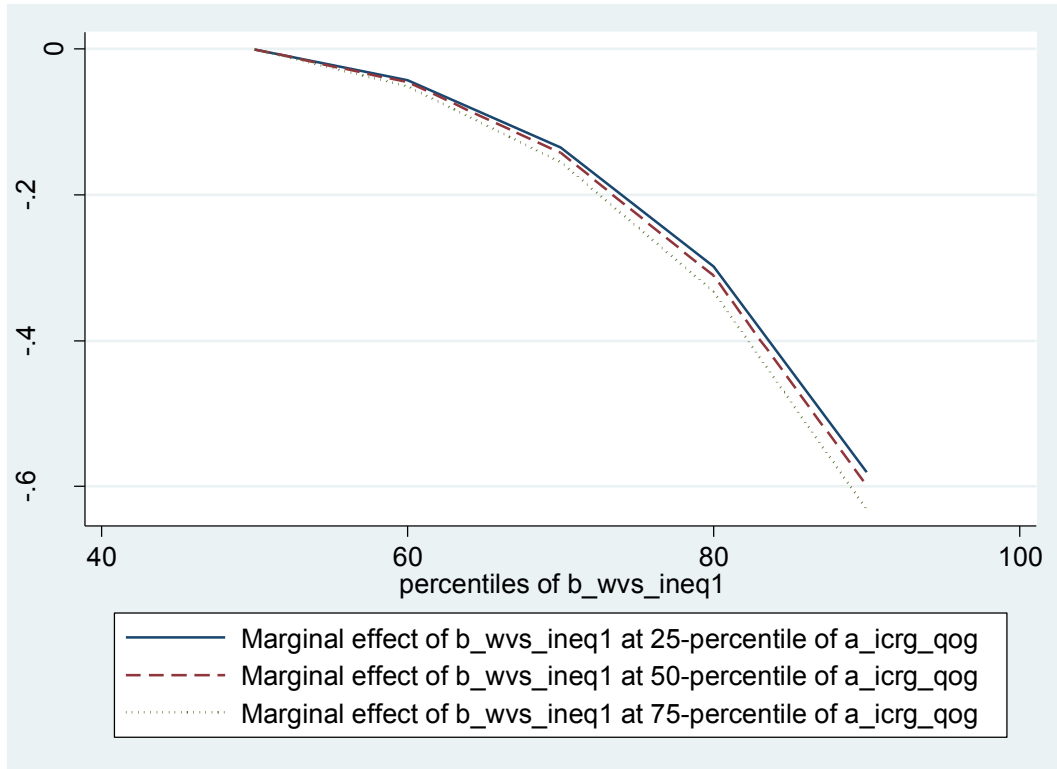
**Figure 21: Interaction between exporter universalism and exporter contract enforcement quality**



**Figure 22: Interaction between exporter universalism and importer contract enforcement quality**



**Figure 23: Interaction between importer universalism and exporter contract enforcement quality**



**Figure 24: Interaction between importer universalism and importer contract enforcement quality**

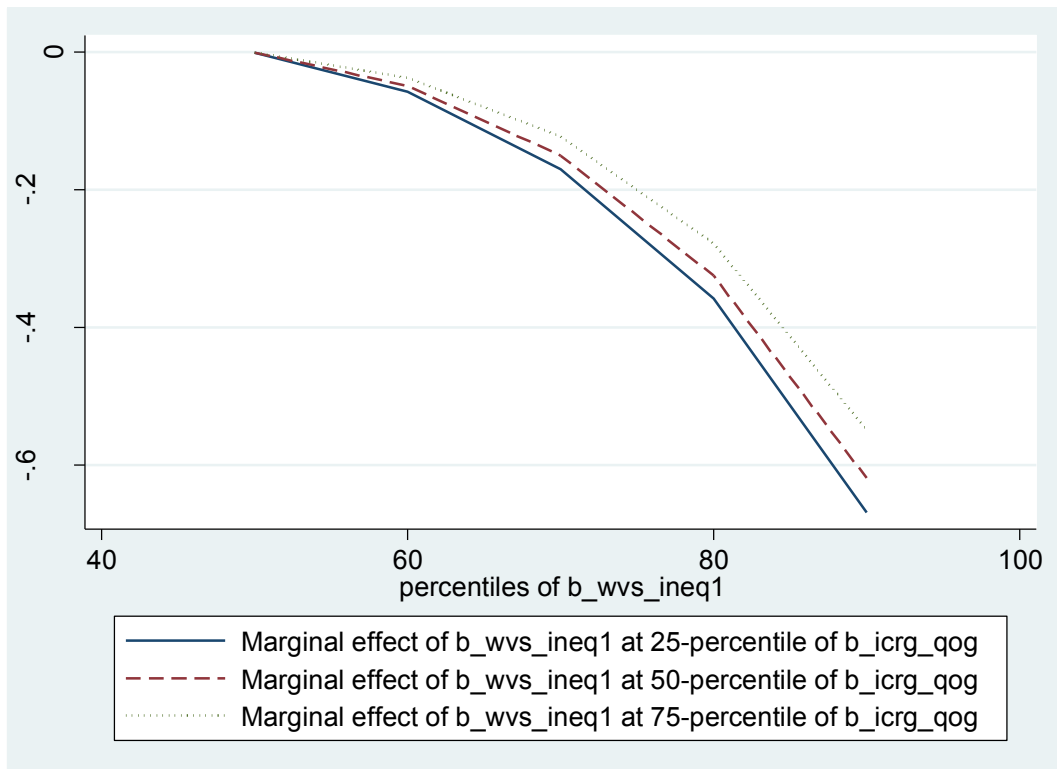




Figure 25: Interaction between exporter patriotism and exporter contract enforcement quality

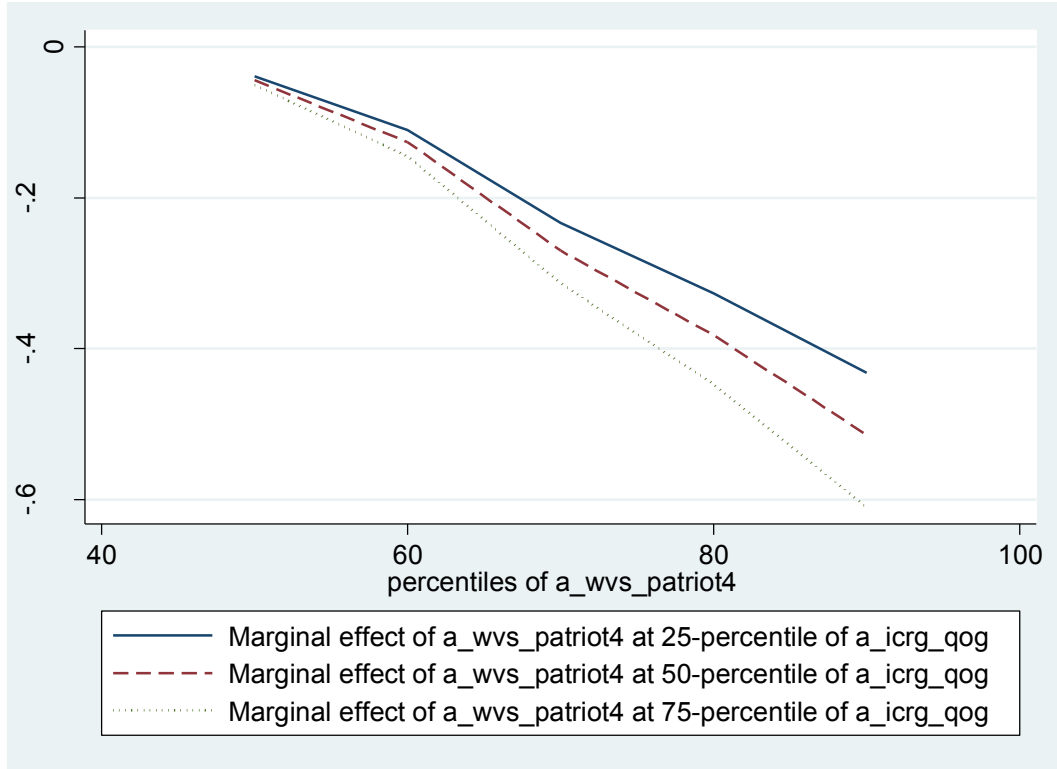


Figure 26: Interaction between exporter patriotism and importer contract enforcement quality

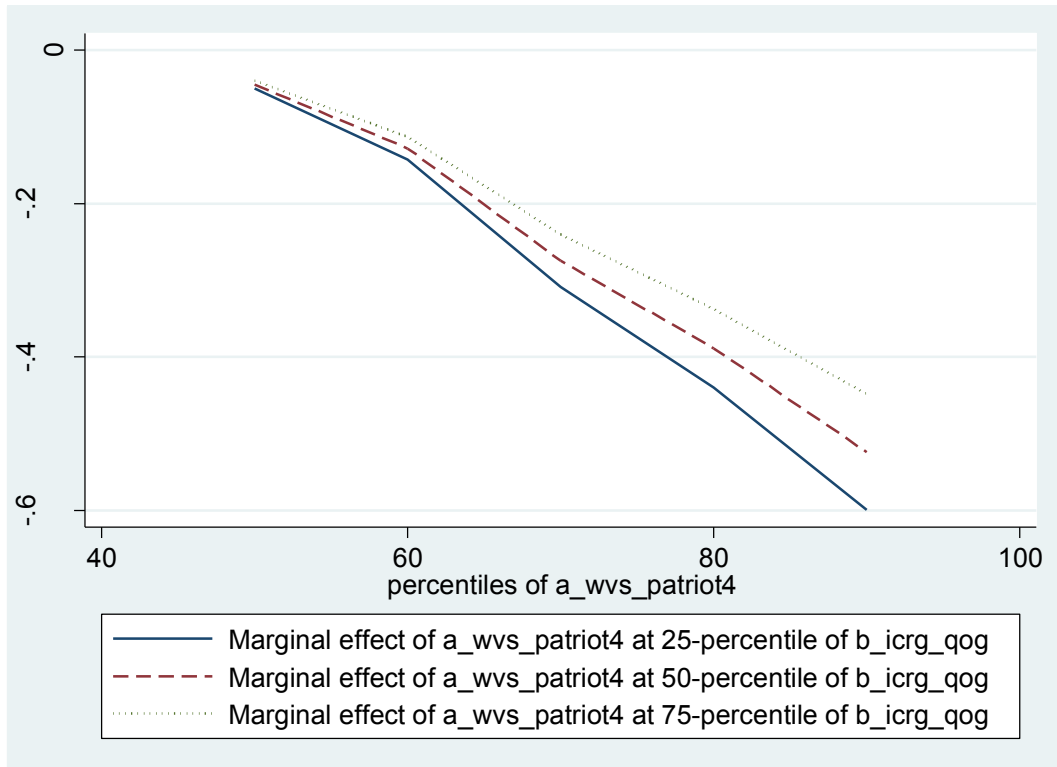


Figure 27: Interaction between importer patriotism and exporter contract enforcement quality

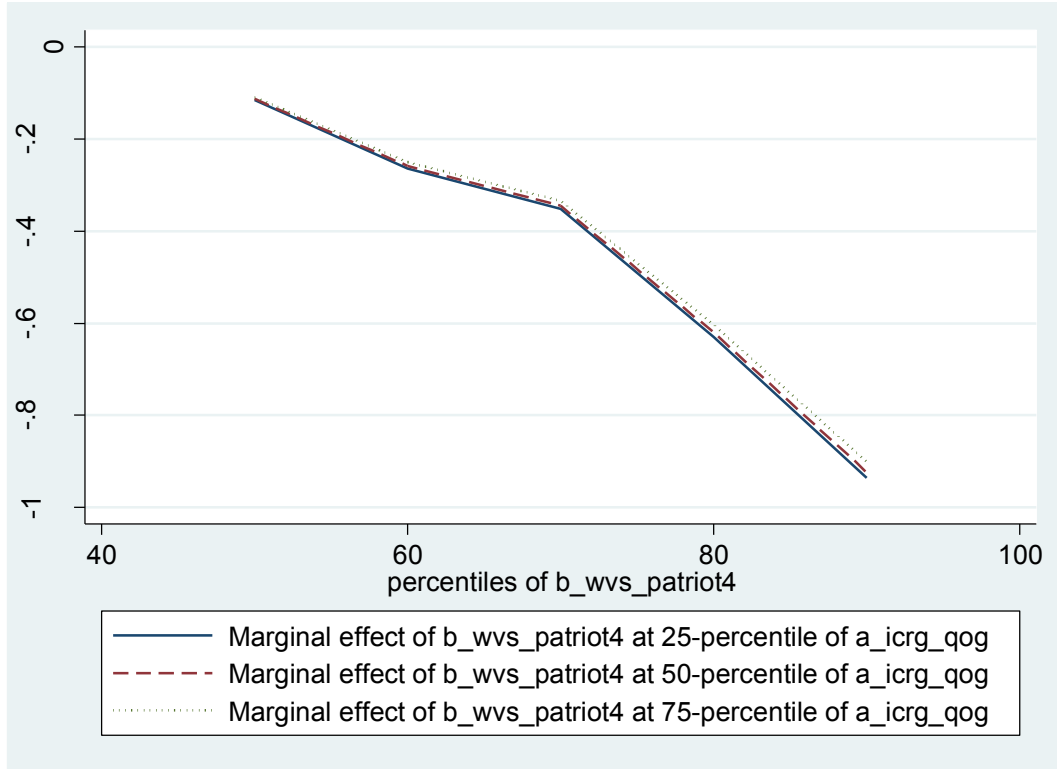
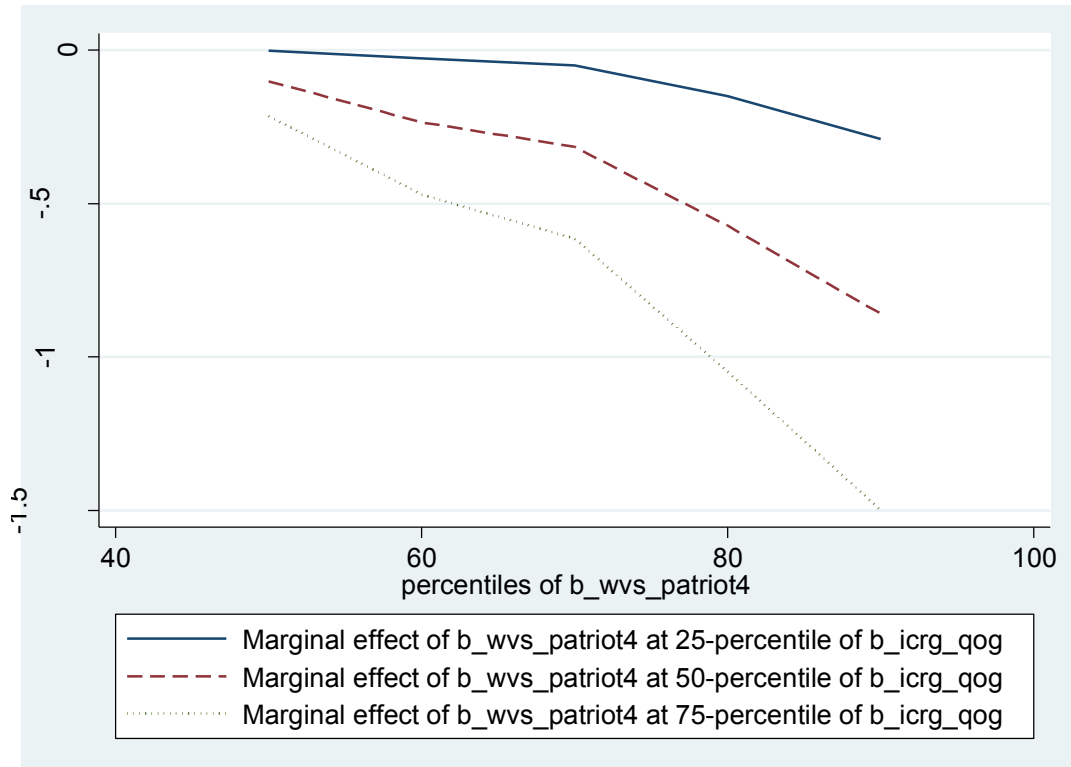


Figure 28: Interaction between importer patriotism and importer contract enforcement quality



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# Does Arbitration Blossom when State Courts are Bad?

Stefan Voigt, Institute of Law & Economics (University of Hamburg)  
and CESifo\*

and

Sang-Min Park, Philipps-University Marburg & University of Kassel<sup>+</sup>

## *Abstract:*

*It is often conjectured that non-state dispute resolution blossoms when state courts are not independent or are perceived as low-quality courts. This conjecture implies a substitutive relationship between state and non-state dispute resolution. This is the first study that puts these hypotheses to an empirical test. It turns out that the lower the perceived quality of state courts, the less frequently conflicting firms resort to them. Second, firms in common-law countries turn away from state courts significantly more often than firms in civil-law countries. This result sheds doubt on the robustness of results generated within the legal traditions literature. Finally, in states that have created the preconditions for arbitration, businesspeople resort significantly less often to state courts. We interpret this as evidence in favor of the substitution hypothesis.*

*Key words: Alternative Dispute Revolution, Quality of Justice, Judicial Independence, Corruption, Private Provision of Public Goods.*

*JEL classification: H42, K42, O17.*

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\* Prof. Dr. Stefan Voigt, Institute of Law & Economics, University of Hamburg, Rothenbaumchaussee 36, 20148 Hamburg, Germany. Telephone: +49-40-42838 5782, Telefax: +49-40-42838 6794, e-mail: [stefan.voigt@uni-hamburg.de](mailto:stefan.voigt@uni-hamburg.de). The authors thank Tobias Krodel for preparing the dataset, Anne van Aaken, Orna Rabinovich-Einy, Bernd Hayo, Janina Satzer, Bruno Schönfelder, Michael Seebauer, Klaus Winkler, and Eun-Young Kim for valuable critique and suggestions. The paper was written while Prof. Voigt was a Senior Fellow at the Institute for Advanced Study in Greifswald, Germany. He thanks the Institute for its hospitality.

+ Sang-Min Park, University of Kassel, Department of Economics, Germany. E-mail: [park@uni-kassel.de](mailto:park@uni-kassel.de).

## Does Arbitration Blossom when State Courts are Bad?

### 1 Introduction

Most economists, even those who are very critical of the state, have traditionally agreed that one of the classical functions of the state is to provide an impartial judiciary that has the function not only to punish criminal behavior, but also to offer impartial third-party dispute resolution to parties who quarrel about the interpretation of contracts voluntarily entered into. This conventional wisdom can be traced back at least to Adam Smith (1776). In a seminal paper, Landes and Posner (1979) challenged that wisdom: they separate the private-good aspect of adjudication (the decision of the particular case at hand) from the public-good aspect of adjudication (the development of law via its interpretation) and conclude that private provision of adjudication is possible as long as the private-good aspect prevailed.

Over the last couple of decades, the notion of alternative dispute resolution (“ADR”) has received quite a boost. Based on the publicity that ADR receives, one gets the impression that ever more conflicts are adjudicated by non-state courts.<sup>1</sup> A couple of questions immediately suggest themselves: Is this a real trend that can be substantiated by hard numbers? If so, what are the reasons for the rise of ADR? In countries in which ADR is strong, is it strong across the board or confined to specific sectors, the size of the conflicting firms, the likelihood of continued interaction, etc.? And: Is ADR particularly strong where the state judiciary is particularly weak, e.g. because it takes too much time, the judiciary is perceived as corrupt or as dependent on other branches of government, etc.?

Answers to these questions might be highly policy-relevant: From previous research (Feld and Voigt 2003, 2006), it is known that the quality of the judiciary and in particular its factual independence are crucial for the growth prospects of a country. If it is impossible to substantially improve the quality of the state judiciary within a short period of time, then the creation of the preconditions for successful ADR might be a viable policy alternative.

We conjecture that ADR is in high demand when state dispute resolution (SDR) is bad and test this conjecture in a cross-country setting. Until now, most empirical studies dealing with ADR have been case studies dealing with single countries.<sup>2</sup>

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<sup>1</sup> Reliable numbers are, however, awfully hard to get. Serious estimates of the percentage of international contracts containing a mandatory arbitration clause range between 20 and 95% (see Voigt 2008a for precise references).

<sup>2</sup> To name just a few: Hendley et al. (2000) and Frye and Zhuravskaya (2000) deal with non-state dispute resolution in Russia. McMillan and Woodruff (2000) analyze the relationship between the

This paper adds to the literature by dealing with the interdependencies between SDR and ADR on a cross-country level for the first time. It turns out that the lower the perceived quality of SDR, the less frequently conflicting firms resort to SDR. Turning away from SDR occurs particularly often when the courts are not perceived as fair and impartial, as honest or uncorrupt, and as consistent in their decisions. Second, in states that have created the preconditions for non-state dispute resolution, businesspeople resort significantly less often to state courts. We interpret this result as evidence in favor of the substitution hypothesis.

The rest of the paper is organized as follows: the next Section presents a number of theoretical arguments on possible relationships between SDR and ADR. Our approach to empirically assess the relative importance of ADR is described in Section 3. The estimation approach and the results are presented in Section 4. Section 5 concludes and discusses possible questions for future research.

## 2 Some Theory

### 2.1 Defining Various Forms of Dispute Resolution

We propose to analytically separate state dispute resolution from non-state dispute resolution. SDR takes place if a dispute is resolved by a state servant in this capacity<sup>3</sup> relying on the power of the state to enforce its decisions even against the will of those concerned and by threatening the use of force. There are many forms of dispute resolution not carried out by the state: arbitration, mediation, conciliation, and so forth. In order to emphasize the dichotomy between disputes resolved by the state and disputes resolved by other mechanisms, all other mechanisms will be referred to as non-SDR here.

In non-SDR, binding decisions can also be produced by experts who are not lawyers<sup>4</sup>. Conflicting parties sometimes prefer “issue experts” when they believe that the traditions in their trade are important, but complex and hard for non-experts to comprehend.

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quality of public- and private-order dispute resolution in Vietnam, Russia, the Ukraine, Romania, Slovakia, and Poland. Galanter and Krishnan (2004) is a careful study of Indian “people’s courts” (*Lok Adalats*). Barfield (2006) describes the relationship between state courts and ADR in contemporary northern Afghanistan. Henrysson and Joireman (2007) emphasize the cost of informal property rights adjudication in Kenya. Schönfelder (2007) analyzes the unexpectedly low use of non-state dispute resolution in Bulgaria and Croatia.

<sup>3</sup> State judges who serve as arbitrators over the weekend are, hence, not counted as producing SDR.

<sup>4</sup> We implicitly assume that the outcome of non-SDR is consistently applied by courts. Niblett (2009) analyzes the case of inconsistent contract enforcement.



## 2.2 A Matter of Choice

Imagine a person interested in exchanging some fairly complex goods with another person in his home country.<sup>5</sup> If they are located in a country with a highly developed institutional system, one would suppose they negotiate a contract that they fix in writing, probably relying on the help of lawyers. Both parties might assume that in case of a conflict, after some bilateral negotiation period, the natural thing is to turn to a state court for conflict resolution.<sup>6</sup> Yet, state courts might be corrupt, subject to direct government influence, very slow, or very costly. Unreliable state courts are thus equivalent to high transaction costs<sup>7</sup>. Our actors will thus seek alternatives with lower transaction costs. Representatives of the New Institutional Economics have identified quite a few mechanisms that are used to economize on transactions costs: (1) the actors could (unilaterally) invest in their reputation – and make the loss of it very costly; (2) they could (bilaterally) exchange hostages to make the contract self-enforcing; (3) they could decide to set up a common firm (i.e. internalize the transaction); (4) they could decide to search for a more reliable (trilateral) conflict resolution, or (5) they could realize that transaction costs outweigh expected rents of the deal and forego an exchange altogether.

Here, we are interested in their choice between SDR and non-SDR (i.e., the choice between the default mechanism and option (4)). But it is important to keep in mind that there are more choices. Option (5) is likely to be most detrimental to the development of an economy, the attractiveness of option (3) depends on corporate law, finance, the characteristics of the exchanged goods, the recurrence of the contractual relationship etc. To simplify the argument, here we will deal only with the choice between SDR and Non-SDR. The simple conjecture to be developed is that if the expected utility connected with non-SDR is higher than the expected utility of SDR, then actors will favor non-SDR over SDR. Their choice

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<sup>5</sup> We hence refrain from analyzing international arbitration, which would imply additional complexity.

<sup>6</sup> Williamson (1985, 20, 32): “Most studies of exchange assume that efficacious rules of law regarding contract disputes are in place and are applied by the courts in an informed, sophisticated, and low-cost way ... the facts, however, disclose otherwise. Most disputes, including many that under current rules could be brought to a court, are resolved by avoidance, self-help and the like ... (And) because the efficacy of court ordering is problematic, contract execution falls heavily on (governance structures).”

<sup>7</sup> See e.g. Gennaioli (2008) for a model in which judicial idiosyncrasies lead to welfare losses. A more general treatment of the effects of inefficiencies in judicial procedures can be found in Djankov et al. (2003).

will thus hinge upon quality and costs of both SDR and non-SDR.<sup>8</sup> The next subsection lists a number of factors conjectured to determine the (perceived) quality of SDR. For the moment, we assume that both the expected utility of non-SDR and the number of transactions are exogenously fixed. This implies that the lower the quality of SDR, the higher the expected demand for non-SDR. The first hypothesis to be developed hence assumes that SDR and non-SDR are substitutes for each other.<sup>9</sup> Later subsections deal with the preconditions and incentives for supplying non-SDR.

### 2.3 State Dispute Resolution and Non-SDR as Substitutes

Suppose that the quality and costs of non-SDR are exogenously given. Then the choice between SDR and non-SDR is determined by the quality and costs of SDR. It seems reasonable to assume that the following aspects determine the choice between SDR and non-SDR:

- (1) The number of procedural steps that need to be complied with in order to produce a binding decision (“procedural formalism”).<sup>10</sup> If these requirements are perceived as redundant and not contributing to the quality of judicial decision-making, but are time-consuming and costly nevertheless, non-SDR might appear relatively more attractive. But if procedural formalism is perceived as important in producing fair and reliable decisions, non-SDR might not be an attractive alternative.
- (2) The perceived expertise of SDR judges; if state judges are perceived as highly qualified and having understanding for the necessities of actors who compete in the market, this will contribute to the quality of SDR. SDR judges are experts in legal procedures but not necessarily in the specific issues being disputed. The more specialized the judges of a country, the higher their expertise can be expected to be. An indirect but straightforward way to

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<sup>8</sup> For simplicity, we assume that the parties to a bilateral contract either both prefer SDR or both prefer non-SDR. It could, of course, very well be that one prefers SDR and the other non-SDR. To keep things simple, we will not deal with this possibility.

<sup>9</sup> In microeconomics, substitutes are conventionally described via their price quantity relations (positive cross price elasticity). Here we assume that lower quality implies higher prices. If the quality of SDR falls, its implicit price rises, and we would expect more people to choose non-SDR. Complements can be described in a similar fashion: If the quality of SDR falls, its implicit price rises. This would lead to reduced demand in non-SDR.

<sup>10</sup> Djankov et al. (2003) interpret a high degree of procedural formalism as indicating the attempt of government to remain in charge of the outcomes produced by the judiciary. Hayo and Voigt (2008) argue that a high degree of procedural formalism can also be interpreted as an attempt to make the judges play by the rules, which would, in turn, increase legal certainty.

take this into account is to use the number of highest courts a country has as a proxy for the degree of specialization among the judges of the country.<sup>11</sup>

- (3) The perceived level of corruption within the judiciary. Corruption among judges means that the higher willingness to pay for a decision might dominate other criteria, such as having complied with a contract. Contracts hence become relatively meaningless in such an environment. If partners are interested in the contents of their contract and corruption within the state judiciary is perceived as high, then non-SDR appears relatively more attractive.
- (4) The perceived degree of judicial independence; lack of corruption in the judiciary refers to independence from the conflicting parties whereas independence refers to the absence of pressure by members of the other government branches. Judicial independence appears particularly relevant in cases in which the government has a stake. If the judiciary's independence from the other branches of government is perceived as low, then non-SDR is relatively more attractive.
- (5) The perceived degree of judicial accountability; judges are supposed to implement legislation. If the judicial system of a country is able to create mechanisms that make judges implement the law, then judicial decision-making is expected to be predictable. Being able to form expectations that have a high chance of turning out to be correct is important in business. A high degree of accountability is thus presumed to make SDR more attractive.<sup>12</sup>
- (6) The monetary costs of using SDR; the lower the monetary costs of SDR, the more attractive is SDR, *ceteris paribus*.
- (7) The time costs of using SDR; time is frequently of the essence in business, so arriving at final decisions fast can be a big asset in favor of SDR.<sup>13</sup>

Some of these factors reinforce each other: if judicial corruption is low, then one would, e.g., expect accountability or predictability to be rather high. Other factors need to be traded off against each other: a high degree of procedural formalism or

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<sup>11</sup> For a more detailed discussion and empirical test, see Voigt (2011). An alternative tack on this issue could be to have a look at the career pattern of SDR judges: if they are made judges very early in life, the chances that they have gathered some of their own experience with having to compete on the market (e.g. as lawyers) appear to be lower than if they are appointed later in life. Yet another alternative could be to take explicit account of the number of "issue experts" represented at special chambers of state courts. In Germany, e.g., so-called *Wirtschaftskammern* ("economic chambers") are primarily staffed with issue experts.

<sup>12</sup> Yet, a case getting to court is sufficient evidence for incompatible expectations of the conflicting parties.

<sup>13</sup> As soon as a case is with a court, the party expecting to lose might have incentives to slow down the process. Whether and to what degree this is possible depends *inter alia* on procedural law.

accountability is likely to be costly in terms of both money and time. A number of implications follow from these observations: the expected utility from the use of SDR also depends on the kind of exchange the interacting partners want to carry out. If it is highly complex and expensive, the expertise of the judges might be key. If, on the other hand, it is the exchange of a commodity, speed and monetary costs might be weighted more heavily. This means that it appears desirable to take into account (i) the sector of the parties, (ii) the size of the contract in monetary terms, but possibly also for (iii) the size of the interacting firms. It further means that it is desirable, though not feasible, to keep the determinants of SDR quality apart and not to lump them into one overall indicator.<sup>14</sup>

We argue that the perceived quality of SDR is determined by these variables. Formulated as hypothesis #1a: *The lower the perceived quality of SDR, the more frequently will non-SDR be used, ceteris paribus.*

This formulation assumes a given quality of non-SDR. Yet, the frequency with which non-SDR is used will also depend on its perceived quality. *Prima facie*, the perceived quality of non-SDR is expected to be determined by exactly the same factors. Formulated as hypothesis #1b: *Under an exogenously given quality of SDR, the number of transactions structured under non-SDR will be higher, the higher the perceived quality of non-SDR.*

Djankov et al. (2003) interpret a high degree of procedural formalism as equivalent to a high degree of interventionism of the sovereign into judicial decision-making. A high degree of formalism should, hence, make SDR less attractive. They further find that civil-law countries systematically have a higher degree of formalism than common-law countries. In combination, these two statements can be formulated as hypothesis #2: *C.p., use of non-SDR will be more frequent in civil-law than in common-law countries.*

Now suppose that many potential contractors perceive the degree of procedural formalism implemented in SDR as too high. It is straightforward to assume that in such a situation, entrepreneurs will try to satisfy the demand for less formal conflict resolution. Yet, conflicting parties might still be interested in getting an enforceable award. Decisions by arbitration organizations are frequently enforceable via state courts. This is not the case with regard to other forms of non-SDR, hence

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<sup>14</sup> Lumping might, however, be necessary out of more pragmatic econometric reasons: given that the number of observations is limited, an overall indicator helps save degrees of freedom. Moreover, to the degree that variables reinforce each other, using an overall indicator might dispense with the problem of multicollinearity.

our emphasis on this more fine-grained delineation.<sup>15</sup> Before non-state courts can issue decisions that are enforceable even in state courts, the state needs to create the respective preconditions.

The procedural law needs to allow for the possibility to have non-state courts decide upon conflicts. Most likely, the procedural law will contain a number of minimum requirements that need to be met before enforceable awards can be issued. They can refer to necessary procedures, the qualifications of arbitrators, and so forth. If arbitral awards are not automatically enforceable, the resources needed in order to make them enforceable need to be taken into account (these include costs in terms of time and money but also the probability of finally getting the award).<sup>16</sup>

States can signal their general attitude toward non-SDR by ratifying a number of international conventions or passing domestic arbitration legislation. These are the U.N. Convention on the Recognition and Enforcement of Foreign Arbitral Awards (the New York Convention) that makes awards issued by foreign non-SDR courts enforceable in their countries. Further, the Convention on the International Centre for the Settlement of Investment Disputes (ICSID) gives private investors who believe that a member state has not complied with its contractual obligations the possibility of a trial against that state. Members thus explicitly choose to have their behavior monitored by third parties. Contracting states to ICSID are required by the Convention to enforce ICSID arbitral awards as *res judicata* in their own territory. Finally, the United Nations Commission on International Trade Law (UNCITRAL) agreed on a Model Law on International Commercial Arbitration in 1985. As of November 2007, more than 51 states had passed legislation based on the Model Law.<sup>17</sup> Given that the contracting parties are already familiar with the Model Law, transaction costs of relying on non-SDR within these states – in particular with regard to international transactions – should be lower than in states that do not have explicit legislation dealing with arbitration or countries that have arbitration legislation that is not based on the Model Law of UNCITRAL.

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<sup>15</sup> The possibility that weak states might not even secure the enforcement of SDR decisions only reinforces the complementarity consideration.

<sup>16</sup> There is a long discussion whether ADR can work even in the absence of the explicit backing by the state judicial system. Landes and Posner (1979, 247f.) argue that non-SDR depends on the enforceability of awards with state courts, whereas Benson (1988, 656f.) argues that non-SDR functioned in the US even before 1920, when a law of the State of New York made arbitration awards enforceable in front of state courts. Benson emphasizes that, historically, the threat of terminating business relationships has been sufficient to ensure compliance with arbitral awards.

<sup>17</sup> To be exact: 51 states plus the Hong Kong and the Macau regions of China, Scotland and Bermuda as part of the U.K., and 6 U.S. states ([http://www.uncitral.org/uncitral/en/uncitral\\_texts/arbitration/1985Model\\_arbitration\\_status.html](http://www.uncitral.org/uncitral/en/uncitral_texts/arbitration/1985Model_arbitration_status.html)).

Formulated as hypothesis #3: *The more of these conventions states have ratified, the more frequently should non-SDR be used in their countries, c.p.*

In the last subsection, the hypothesis that the use of non-SDR should be more frequent in civil-law countries was advanced. In light of the considerations developed here, this hypothesis needs to be reformulated. Assuming that civil-law countries have chosen a high degree of procedural formalism not only in SDR but also in non-SDR, the modified hypothesis #2(mod) is: *C.p., there will be no significant difference in the use of non-SDR between civil-law and common-law countries.*

### 3 Estimation Approach and Data Description

To test whether low quality SDR is correlated with high use of non-SDR, a measure for the use of non-SDR is needed as dependent variable. On the right hand side, a measure for the quality of SDR (i.e. its implicit price) is necessary. Given other potentially relevant covariates in the  $Z$ -vector, the relationship we would like to investigate looks like this:

$$Quant_i^{nonSDR} = f(Qual_i^{SDR}, Z_i) \quad (1)$$

Unfortunately, we will not be able to estimate this equation, because we are not aware of any measure for the quantity of non-SDR across countries. Ascertaining this number is close to impossible: Often, dispute resolution does not take place within formal organizations, but conflicts are settled by village elders or clergy and no statistics are kept at all. But even numbers from formal arbitration organizations are extremely difficult to obtain. In many countries, it is not only one organization that offers non-SDR services, but a number of them; identifying a complete picture is thus difficult. Most of the organizations offering non-SDR do not publish statistics; some might not even keep any. Definitions of what exactly constitutes “arbitration” greatly vary between countries, further increasing the difficulty of comparing.

Because reliable objective data are unavailable, subjective data are used here instead. The Investment Climate Surveys of the World Bank have been carried out in some 50 countries and are based on the answers of more than 30,000 entrepreneurs. One variable contains information on the percentage of payment disputes that companies resolve by court action. The exact wording of the question is: *“Over the last 2 years, what percent of your establishment's disputes over payments were resolved by court action?”*

For a number of reasons, this can only be a crude approximation of the left-hand-side variable of interest. In particular, we do not know what particular means those who did not resolve their payment disputes via courts used. Additionally, we only have the percentage and not the absolute numbers, implying that a direct test of the two competing views is impossible. Because the sample distribution of this variable is skewed toward 100, we recode it into a binary variable  $NonSDR_{ij}$ , taking on value one if firm  $i$  in country  $j$  states to have settled all of its payment disputes out of court, and value zero otherwise. Then, we can specify:

$$P(NonSDR_{ij} = 1 | Z_{ij}, M_j) = F(\alpha Qual_{ij}^{SDR} + \beta Qual_j^{nonSDR} + \gamma Z_{ij} + \delta M_j) \quad (2)$$

for  $j = 1 \dots N$  countries and  $i = 1 \dots n_j$  firms within those countries<sup>18</sup>. The probability that a firm will prefer to settle its payment disputes outside of court is thus a non-linear function  $F$  of firm-level characteristics  $Z_{ij}$  and country-level controls  $M_j$ . We assign  $F$  to be the normal cumulative distribution function and estimate the relationship with maximum likelihood.

We now move to the data we use for the right-hand-side (RHS) variables. Note that some of our RHS variables are measured at the firm-level, denoted by a double index  $ij$ , and some are measured at the country-level, denoted by a single index  $j$ .

Concerning the quality of SDR,  $Qual_{ij}^{SDR}$ , we employ both a subjective and an objective indicator of SDR quality. We begin with the subjective indicator generated as part of the Investment Climate Surveys of the World Bank.

*Confidence<sub>ij</sub>*: More than 30,000 entrepreneurs around the world were asked what level of confidence they had in their judiciary system. More precisely, the variable used here reflects the degree to which firms agree with the statement “I am confident that the judicial system will enforce my contractual and property rights in business disputes”, ranging from 1 (fully disagree) to 6 (fully agree).<sup>19</sup>

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<sup>18</sup> Note the inherently hierarchical nature of our data: Firm level observations are nested within industries within countries. To account for this, we can estimate multi-level regressions which allow for some country- and industry-level randomness in intercepts and coefficients. The results are not affected by this, however.

<sup>19</sup> We have to assume that respondents do not consider non-SDR part of “the judicial system”. The survey that the World Economic Forum carries out annually contains a related variable that has, however, a different emphasis. The variable “Efficiency of the legal framework” asks for consent to the statement “The legal framework in your country for private businesses to settle disputes and challenge the legality of government actions and/or regulations.” Whereas the World Bank variable is interested in private law disputes, the focus of this variable is on disputes regarding public law. Assuming that the state as an actor in domestic affairs is not ready to opt out of SDR, low levels of consent to this statement should not lead to higher use of non-SDR.

Our objective indicator is taken from the LexMundi project by Simeon Djankov and co-authors (Djankov et al., 2003):  $Checks_j$  inversely<sup>20</sup> measures the average number of days it takes in a country to collect on a bounced check. Using this variable is especially fitting as our dependent variable, percentage of disputes resolved out of court, is concerned with disputes over payment issues.

Unfortunately, we are not aware of any indicators proxying for the quality of non-SDR. This implies that no coefficient for the  $Qual_j^{nonSDR}$  variable can be estimated. Devising such an indicator is definitely a desideratum.

We move on to the presentation of our control variables. The choice between SDR and non-SDR could also be influenced by (1) state support for non-SDR, (2) the factual supply of formal non-SDR, and (3) the knowledge that dispute resolution other than SDR exists. We propose to control for state support by a synthetic variable composed of three dummy variables, namely (i) ratification of the New York Convention, (ii) having passed UNCITRAL model law domestically, and (iii) membership in ICSID.<sup>21</sup> The composite indicator  $Arbitration_j$  can accordingly take on values between 0 and 3.<sup>22</sup>

Legal origins ( $CommonLaw_j$ ) are taken into account in order to be able to test hypotheses 2 and 2mod empirically.

It cannot be excluded that autocrats prefer to keep as many things as possible under their control, including conflict resolution. We hence also control for a country's democracy ranking  $PolityIV_j$ , drawing on the Polity IV indicator that ranks countries between -10 (perfect autocracy) and 10 (perfect democracy).

The factual supply of non-SDR is almost as difficult to ascertain as its factual use. Non-SDR will primarily be offered by non-governmental organizations (NGOs) or alternatively by business associations. We thus assume that the potential supply of non-SDR increases in the number of NGOs and business associations, respectively. For lack of a better proxy, the number of existing NGOs ( $NGO_j$ ) and the number of existing business associations ( $BA_j$ ) in a country are thus used as controls for non-SDR supply.

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<sup>20</sup> In order to avoid confusion, we invert this variable, so that higher values are associated with higher quality of SDR, as with the first indicator.

<sup>21</sup> Of course, this variable mainly captures state support for arbitration of conflicts in *international* transactions. We thus have to assume a strong correlation with the latent state support for arbitration in *any* transaction.

<sup>22</sup> Potential users need not necessarily perceive a state's promise to make non-SDR possible by ratifying these conventions as a credible commitment. Such complications will, however, not be dealt with here.



Finally, firms – and others – can demand non-SDR only if they are aware of this tool to resolve disputes. Differences in the available information about the supply of non-SDR thus need to be controlled for. We do this by controlling for

(1) a dummy for Central and Eastern Europe ( $CEE_j$ ); based on the assumption that the state used to be omnipresent in this region until two decades ago, non-SDR is expected to be used less than in other regions;

(2) the degree of an economy’s openness, proxied by the Frankel & Romer trade instrument ( $FrankelRomer_j$ ),

(3) a dummy variable coded 1 if the firm has holdings or operations in other countries and 0 otherwise ( $International_{ij}$ ) and

(4) firm size ( $FirmSize_{ij}$ ), which is a categorical variable taking on values from 1 (small) to 3 (large). The larger a firm is and the more international contacts the firm has, the more likely it is that it has already faced and considered the option of opting out of the national law. However, regarding  $International_{ij}$  and  $FirmSize_{ij}$ , large and internationally operating firms are also more likely to be politically influential and well connected. If these connections enable the firm to get a favorable hearing in state courts, it could be more likely to resort to SDR. There is thus no clear cut hypothesis regarding  $International_{ij}$ . We partly control for this transmission mechanism by including  $State_{ij}$ , the percentage of the firm owned by the state.

In addition, we control for per capita income ( $GDP_j$ ). Given that high-income countries generally enjoy high-quality SDR, we expect this variable to have a negative coefficient.

We also control for the degree of a firm’s informality ( $Informality_{ij}$ ). Informal firms are not registered and therefore refrain from drawing on the formal institutions supplied in their country. Informality can have many reasons such as the difficulty of becoming formal, a high degree of regulation, high tax rates, and so forth. But the informality option is also associated with costs, namely unrealized economies of scale, not being able to rely on “official” financing, and so on. In our context, deficient quality of SDR should not by itself be a reason to remain informal because entrepreneurs can decide to play by the substantive legislation of their country and then opt in favor of non-SDR in case of a conflict. Connecting the degree of observed informality with the reliance on SDR thus allows us to disentangle the reasons for non-SDR: if both the substance of the rules and their enforcement are perceived as weak, then we would expect firms to remain informal altogether (low level of non-SDR). If only the enforcement is weak – but the substantive rules are adequate – then we should expect to see a low level of infor-

mality coupled with a high level of non-SDR. A negative effect of informality on non-SDR could then be interpreted as evidence for such a transmission channel.

Table 9 contains the descriptive statistics on the relevant variables used here. Their exact definitions as well as their sources can be found in Appendix 2.

#### 4 Estimation Results and Possible Interpretations

In Table 11, we regress  $NonSDR_{ij}$  on our two indicators for SDR quality, various firm-level characteristics, country-level controls and industry dummies.<sup>23</sup> The effects we report are conditional marginal effects holding constant the other covariates at their respective means because the simple estimated coefficients are not meaningful by themselves in probit estimations<sup>24</sup>. In columns (1) through (8), we include country controls one by one while including all country controls at once in column (9).

We find a statistically significant (mean conditional) effect of both our subjective, firm-level indicator  $Confidence_{ij}$  and our objective, country-level indicator  $Checks_j$  on  $NonSDR_{ij}$  in all six specifications. This provides evidence that, *ceteris paribus*, both firm-level perceived SDR quality as well as aggregate SDR quality are associated with a higher probability of a firm choosing to settle payment disputes out of court. These results indicate a complementary relationship between state dispute resolution and non-state dispute resolution, rather than the substitutive relationship we had hypothesized (hypothesis #1a).

We can thus conclude that firms turn to alternative dispute resolution not to escape bad state dispute resolution but rather to “fill gaps” in otherwise satisfactory state dispute resolution. The question of non-SDR vs. SDR is thus not a simple matter of choice.

The marginal effect of  $Confidence_{ij}$  lies between 1% and 1.6%, implying that a firm with full confidence in the judicial system is 5 to 8% more likely than a firm with no confidence at all to engage in alternative dispute resolution. The marginal effect of  $Checks_j$  lies between 0.018% and 0.035%, implying that a change of one standard deviation in a country’s SDR quality (which is 260) is associated with a 4.7 to 9.1% higher probability of a firm choosing non-SDR.

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<sup>23</sup> Adding country dummies results in near-perfect collinearity between country dummies and country-level controls, which is why we only include industry dummies.

<sup>24</sup> To prevent the misrepresentation of countries from which there was an above (below) average number of responses, the observations were weighed by the number of firms per country. Further, by controlling for clustering within individual countries, we relax the otherwise required assumption of independence of observations within and across countries.

Because the reported conditional marginal effects hold constant the respective other indicators of SDR quality, it is useful to plot the marginal effect for different values of these other variables<sup>25</sup>. This allows us to draw inferences regarding interactions.

In **Figure 29**, we can see that – holding constant all other covariates – there is some interaction between  $Confidence_{ij}$  and  $Checks_j$ : The marginal effect of  $Confidence_{ij}$  on the probability of non-SDR use is higher the lower the value of country level SDR quality  $Checks_j$ , implying that the gap-filling function of non-SDR is more pronounced when SDR quality is lower. This difference is however rather small for the most part of the distribution of  $Checks_j$ .

Looking at the firm-level controls, we can see that the effect of  $Informality_{ij}$  is robustly estimated to be insignificant. Thus, we cannot find evidence in favor of the transmission channel conjectured above. For  $FirmSize_{ij}$ , we observe a significantly negative and sizable effect: Large firms ( $FirmSize_{ij}=3$ ) are characterized by up to 26% lower probability of using non-SDR than small firms ( $FirmSize_{ij}=1$ ). We can thus support the notion that non-SDR is more relevant for smaller firms. However, we find that marginal effect of  $Confidence_{ij}$  on non-SDR is 2% higher for large firms than for small firms (**Figure 30**). Thus, for large firms, the gap-filling function of non-SDR seems to be more important.

In order to test hypothesis #2 and hypothesis #3, we add  $CommonLaw_j$  (columns 1 and 9) and  $Arbitration_j$  (**Table 11**, columns 2 and 9) to the model. We find a significantly positive effect of  $CommonLaw_j$ : Firms in common law countries are characterized by a 21 to 22 % higher probability of using non-SDR than firms in civil law countries. Hypothesis #2 is thus rejected. The picture is different for  $Arbitration_j$ , for which we do not find any statistically significant effect. The number of ratified arbitration conventions does not seem to matter for the firm-level settlement decision.

Looking at the remaining firm level controls, we observe a significant and negative effect of both  $State_{ij}$  and  $International_{ij}$ . A one standard deviation change in the percentage that a firm is owned by the state is associated with a (0.13 to 0.19% \* 20%) 2.6 to 3.8% lower probability of non-SDR. Firms with holdings in other countries are characterized by a 4.5 to 6% lower probability of preferring non-SDR. The same result cannot be obtained when considering the openness of the economy as a whole:  $FrankelRomer_j$  is not significantly associated with the probability of firms using non-SDR (**Table 11**, columns 8 and 9). However, we do find

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<sup>25</sup> These plots are based on estimation (9). This is the specification with the highest Pseudo-R<sup>2</sup> and the most conservative estimate of the marginal effect.

that firms in Central and Eastern European countries are characterized by an 18 to 20% lower probability of non-SDR (Table 11, columns 7 and 9). All these results (with the exception of *FrankelRomer<sub>j</sub>*) are in line with the conjecture that large firms with more international contacts and government ties are less likely to engage in non-SDR.

Let us move on to the remaining country controls: We do not find any indication that the country level democracy score *PolityIV<sub>ij</sub>* is related to firm-level use of non-SDR (Table 11, columns 3 and 9). This leads us to conclude that, *ceteris paribus*, the firm level calculus on whether to use non-SDR does not depend on whether the country it is located in is democratic or not.

Interestingly, our proxies for the factual supply of non-SDR (*NGO<sub>j</sub>* and *BA<sub>j</sub>*) do not exhibit any robust significant effect on the probability of non-SDR (Table 11, columns 4, 5 and 9), implying either that non-SDR demand dominates supply (firms who choose to settle disputes out of court will find a way to do so) or that there might be a problem with the validity of these proxies in measuring non-SDR supply.

Contrary to our expectations, there does not seem to be a significant effect of per capita income on the probability of non-SDR use (Table 11, columns 6 and 9). This might be due to the other country-level covariates already capturing most of the relevant variation in SDR quality, corroborated by the rather high bivariate correlations between *GDP<sub>j</sub>* and other country controls (Table 10).

## 5 Conclusions and Outlook

What policy recommendations can be drawn from our results? The preferences of the more than 30,000 business people that are the basis of these results seem to indicate that higher perceived quality of SDR leads to higher use of non-SDR. The reverse causal direction (higher use of non-SDR leads to higher SDR quality) seems very unlikely and would have to be addressed by an instrumental variables approach.

In line with the subjective results, we also observe that objective, country-level SDR quality is associated with a higher probability of non-SDR use. These results imply that, objectively, SDR and non-SDR act as complements.

Based on the observation that legal procedures in civil law countries are characterized by a higher degree of formalism (Djankov et al 2003), we conjectured that firms in common law countries are less likely to settle disputes out of court than firms in civil law countries. Our results reject this conjecture.

Finally, we put forward the hypothesis that state support for non-SDR should be associated with more non-SDR use. Indeed, our data show that state support is not associated with the probability of firms using non-SDR. It is rather firms' connectedness with the state that can explain a great deal in firm level non-SDR variation.

Drawing policy conclusions will only be possible if concrete information on the effects of an intensive use of non-SDR on (1) the number of contracts concluded (direct effect) and on (2) changes in SDR (indirect effect) is available.

Sometimes, creating the preconditions for non-SDR has been suggested as a sort of "quick fix" for a low-quality SDR because such reforms would have a quick effect without implying huge government expenditure. Our results indicate that this is not an option, as non-SDR and SDR complement each other.

A report by the Center for Democracy and Governance (1998, 6) observes: "ADR systems tend to achieve efficient settlements at the expense of consistent and uniform practice", which implies a trade-off between the private good and the public good aspect of adjudication that we began this paper with. A functioning "shadow of the law" presupposes consistent decision-making at state courts. This can increase the number of contracts and, hence, the degree of the division of labor realized, without an increase in conflicts taken either to SDR or non-SDR, because actors can form expectations on likely court decisions – and can thus refrain from factually going to court.

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## Tables

**Table 9: Descriptive statistics**

<b>Variable</b>	<b>N</b>	<b>min</b>	<b>max</b>	<b>mean</b>	<b>p50</b>	<b>sd</b>
<i>NonSDR<sub>ij</sub></i>	10,172	0	1	0.636	1	0.481
<i>Confidence<sub>ij</sub></i>	10,172	1	6	3.572	4	1.486
<i>Checks<sub>j</sub></i>	10,172	0	943	697.587	803	260.497
<i>Informality<sub>ij</sub></i>	10,172	0	100	17.431	0	25.838
<i>FirmSize<sub>ij</sub></i>	10,172	1	3	1.912	2	0.788
<i>State<sub>ij</sub></i>	10,172	0	100	4.410	0	19.814
<i>International<sub>ij</sub></i>	10,172	0	1	0.103	0	0.304
<i>CommonLaw<sub>j</sub></i>	10,172	0	1	0.039	0	0.194
<i>Arbitration<sub>j</sub></i>	10,172	1	3	2.289	2	0.692
<i>PolityIV<sub>j</sub></i>	10,172	2.25	10	7.918	8.25	2.130
<i>NGO<sub>j</sub></i>	10,172	5.838	8.258	7.194	7.255	0.556
<i>BA<sub>j</sub></i>	10,172	2	5,279	230.371	71	750.746
<i>GDP<sub>j</sub></i>	10,172	0.784	27.882	4.599	3.183	5.817
<i>CEE<sub>j</sub></i>	10,172	0	1	0.352	0	0.478
<i>FrankelRomer<sub>j</sub></i>	10,172	-1	3.52	1.367	1.98	1.749



**Table 10: Pairwise correlations**

	<i>NonSDR<sub>ij</sub></i>	<i>Confidence<sub>ij</sub></i>	<i>Checks<sub>j</sub></i>	<i>Informality<sub>ij</sub></i>	<i>FirmSize<sub>ij</sub></i>	<i>State<sub>ij</sub></i>	<i>International<sub>ij</sub></i>	<i>CommonLaw<sub>j</sub></i>	<i>Arbitration<sub>j</sub></i>	<i>PolityIV<sub>j</sub></i>	<i>NGO<sub>j</sub></i>	<i>BA<sub>j</sub></i>	<i>GDP<sub>j</sub></i>	<i>CEE<sub>j</sub></i>	<i>FrankelRomer<sub>j</sub></i>	
<i>NonSDR<sub>ij</sub></i>	1.000															
<i>Confidence<sub>ij</sub></i>	0.015	1.000														
	0.121															
<i>Checks<sub>j</sub></i>	0.199	0.061	1.000													
	0.000	0.000														
<i>Informality<sub>ij</sub></i>	0.113	-0.100	0.100	1.000												
	0.000	0.000	0.000													
<i>FirmSize<sub>ij</sub></i>	-0.160	0.094	0.088	-0.045	1.000											
	0.000	0.000	0.000	0.000												
<i>State<sub>ij</sub></i>	-0.167	0.033	-0.076	-0.086	0.161	1.000										
	0.000	0.001	0.000	0.000	0.000											
<i>International<sub>ij</sub></i>	-0.064	0.019	-0.003	-0.018	0.207	-0.017	1.000									
	0.000	0.061	0.789	0.069	0.000	0.080										
<i>CommonLaw<sub>j</sub></i>	0.075	0.061	0.071	-0.094	-0.012	-0.037	0.034	1.000								
	0.000	0.000	0.000	0.000	0.215	0.000	0.001									
<i>Arbitration<sub>j</sub></i>	-0.062	0.010	0.110	-0.129	-0.065	0.030	-0.001	0.168	1.000							
	0.000	0.295	0.000	0.000	0.000	0.002	0.905	0.000								
<i>PolityIV<sub>j</sub></i>	-0.076	0.086	-0.195	-0.097	-0.100	0.028	0.033	0.112	0.248	1.000						
	0.000	0.000	0.000	0.000	0.000	0.005	0.001	0.000	0.000							
<i>NGO<sub>j</sub></i>	-0.132	0.098	-0.178	-0.054	-0.012	0.025	0.009	0.016	0.111	0.556	1.000					
	0.000	0.000	0.000	0.000	0.215	0.012	0.367	0.101	0.000	0.000						
<i>BA<sub>j</sub></i>	0.010	0.113	0.140	-0.034	-0.054	-0.031	-0.023	-0.016	0.119	0.167	0.376	1.000				
	0.304	0.000	0.000	0.001	0.000	0.002	0.022	0.115	0.000	0.000	0.000					
<i>GDP<sub>j</sub></i>	-0.029	0.153	0.070	-0.162	-0.100	-0.040	0.038	0.462	0.251	0.416	0.514	0.581	1.000			
	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
<i>CEE<sub>j</sub></i>	-0.351	-0.090	-0.449	-0.199	-0.046	0.249	-0.050	-0.149	0.052	0.141	0.134	-0.170	-0.133	1.000		
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
<i>FrankelRomer<sub>j</sub></i>	0.110	-0.002	-0.031	0.056	-0.096	-0.113	0.033	0.217	0.285	0.504	0.180	0.157	0.249	-0.348	1.000	
	0.000	0.853	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000		

Reported numbers are respective pairwise correlations with corresponding p-values below.

**Table 11: Probit estimations (conditional marginal effects)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Confidence<sub>ij</sub></i>	0.0138** (0.00475)	0.0142** (0.00493)	0.0135** (0.00409)	0.0157** (0.00448)	0.0143** (0.00475)	0.0134** (0.00481)	0.00962* (0.00471)	0.0142** (0.00446)	0.00966* (0.00447)
<i>Checks<sub>j</sub></i>	0.000326** (5.56e-05)	0.000345** (5.39e-05)	0.000345** (6.25e-05)	0.000312** (5.33e-05)	0.000332** (5.86e-05)	0.000326** (5.84e-05)	0.000182** (5.11e-05)	0.000342** (6.66e-05)	0.000177** (6.54e-05)
<i>Informality<sub>ij</sub></i>	0.000283 (0.000416)	0.000208 (0.000376)	0.000244 (0.000392)	0.000291 (0.000393)	0.000227 (0.000412)	0.000264 (0.000405)	4.35e-05 (0.000335)	0.000180 (0.000419)	0.000239 (0.000207)
<i>FirmSize<sub>ij</sub></i>	-0.127** (0.0174)	-0.128** (0.0180)	-0.127** (0.0175)	-0.127** (0.0179)	-0.127** (0.0176)	-0.127** (0.0174)	-0.124** (0.0172)	-0.125** (0.0163)	-0.124** (0.0189)
<i>State<sub>ij</sub></i>	-0.00176** (0.000203)	-0.00180** (0.000203)	-0.00179** (0.000222)	-0.00185** (0.000210)	-0.00181** (0.000210)	-0.00175** (0.000218)	-0.00132** (0.000244)	-0.00174** (0.000233)	-0.00136** (0.000230)
<i>International<sub>ij</sub></i>	-0.0469** (0.0160)	-0.0447** (0.0163)	-0.0463** (0.0159)	-0.0439** (0.0151)	-0.0443** (0.0156)	-0.0454** (0.0157)	-0.0543** (0.0154)	-0.0467** (0.0158)	-0.0595** (0.0145)
<i>CommonLaw<sub>j</sub></i>	0.208** (0.0555)								0.222** (0.0859)
<i>Arbitration<sub>j</sub></i>		-0.0232 (0.0210)							-0.0240 (0.0162)
<i>PolityIV<sub>j</sub></i>			0.00666 (0.00957)						0.0223 (0.0116)
<i>NGO<sub>j</sub></i>				-0.0429 (0.0267)					-0.0776* (0.0389)
<i>BA<sub>j</sub></i>					1.79e-07 (7.96e-06)				1.31e-05 (1.82e-05)
<i>GDP<sub>j</sub></i>						0.00212 (0.00242)			-0.00382 (0.00572)
<i>CEE<sub>j</sub></i>							-0.179** (0.0504)		-0.198** (0.0617)
<i>FrankelRomer<sub>j</sub></i>								0.0113 (0.0136)	-0.0125 (0.0171)
Dummies included	industry	industry	industry	industry	industry	industry	industry	industry	industry
Observations	10,172	10,172	10,172	10,172	10,172	10,172	10,172	10,172	10,172
Pseudo R <sup>2</sup>	0.140	0.139	0.139	0.140	0.138	0.139	0.149	0.139	0.154

\*\* , \* : Statistically significant at 1%, 5% level. Maximum likelihood estimation with probit link function (using number of firms per country as weights). Reported numbers are conditional marginal effects holding constant all other covariates at their means, country cluster robust standard errors in parentheses.

**Table 12: Detailed descriptions of variables used**

Variable name	Level	Description	Source
<i>NonSDR<sub>ij</sub></i>	Firm	Dummy variable equal to 1 if the firm settles its payment disputes outside of court.	World Bank (2002, 2006); Enterprise Surveys.
<i>Confidence<sub>ij</sub></i>	Firm	Agreement with the statement “I am confident that the judicial system will enforce my contractual and property rights in business disputes.”	World Bank (2002, 2006); Enterprise Surveys.
<i>Checks<sub>j</sub></i>	Country	Inverse number of calendar days from the moment a plaintiff files a lawsuit in court until payment.	Courts (2005)
<i>Informality<sub>ij</sub></i>	Firm	Percentage of sales reported by business for tax purposes.	World Bank (2002, 2006); Enterprise Surveys.
<i>FirmSize<sub>ij</sub></i>	Firm	Number of workers in the firm, classified into small (< 20), medium (20-99) and large (> 100).	World Bank (2002, 2006); Enterprise Surveys.
<i>State<sub>ij</sub></i>	Firm	Percentage of firm owned by government.	World Bank (2002, 2006); Enterprise Surveys.
<i>International<sub>ij</sub></i>	Firm	Dummy variable equal to 1 if the firm has operations in other countries.	World Bank (2002, 2006); Enterprise Surveys.
<i>CommonLaw<sub>j</sub></i>	Country	Dummy variable equal to 1 if the country belongs to the common-law tradition, 0 otherwise.	LLSV (1999) and CIA (2005).
<i>Arbitration<sub>j</sub></i>	Country	The sum of 3 indicator variables: (1) New York Convention, equal to 1 if a country has ratified, 0 otherwise; (2) 1 if a country has passed legislation based on UNCITRAL model law domestically, 0 otherwise; (3) 1 if a country has ratified the ICSID convention, 0 otherwise;	(1): <a href="http://www.newyorkconvention.org">www.newyorkconvention.org</a> (2): <a href="http://www.uncitral.org">www.uncitral.org</a> (3): <a href="http://www.worldbank.org/icsid">www.worldbank.org/icsid</a>
<i>PolityIV<sub>j</sub></i>	Country	Level of democracy with -10 = “perfect” autocracy and 10 = perfect democracy.	Polity IV Dataset
<i>NGO<sub>j</sub></i>	Country	Number of international non-governmental organizations active in a country in 2003 (in logarithms).	Pamela Paxton, Ohio State University.
<i>BA<sub>j</sub></i>	Country	Number of business associations in a country.	(Jac C. Heckelman, 2000)
<i>GDP<sub>j</sub></i>	Country	Per capita GDP in 2003 (unit: thousands).	
<i>CEE<sub>j</sub></i>	Country	Dummy variable equal to 1 if the country is in transition, 0 otherwise. All countries in Central and Eastern Europe plus Cambodia and Syria are coded 1.	
<i>FrankelRomer<sub>j</sub></i>	Country	Frankel-Rome trade instrument: geography-fitted real openness vis-à-vis the rest of the world.	Frankel Romer 1999

Figure 29: Interaction between  $Confidence_{ij}$  &  $Checks_j$

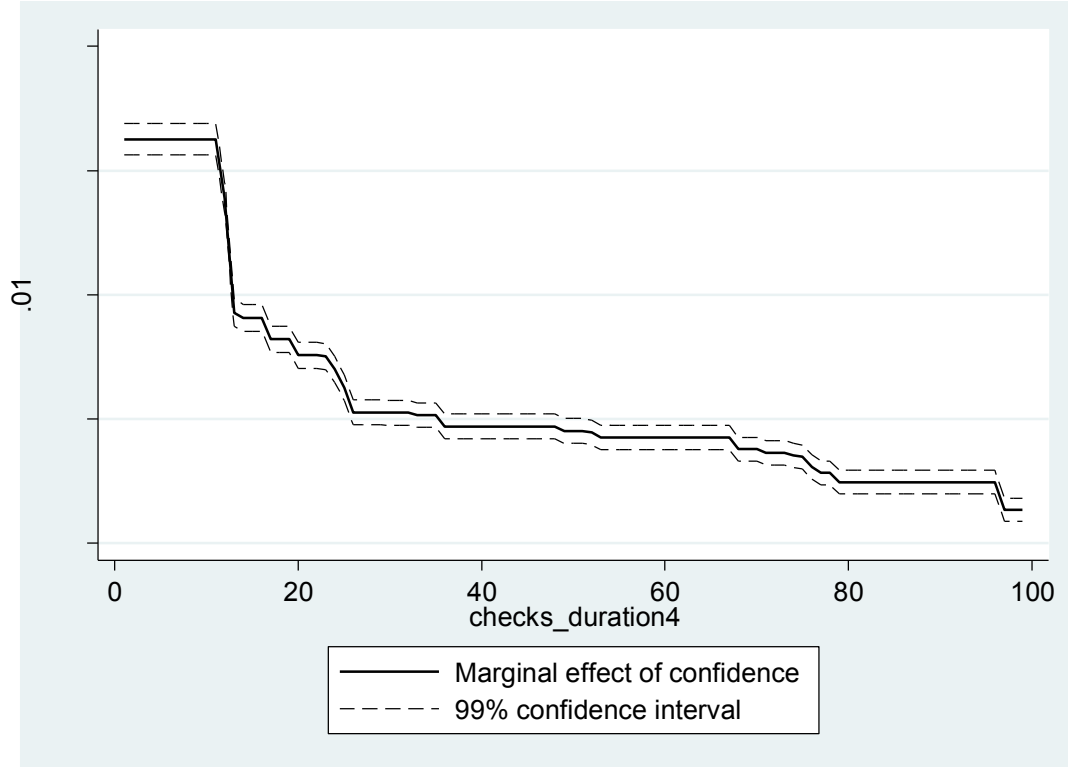


Figure 30: Interaction between  $Confidence_{ij}$  &  $FirmSize_{ij}$

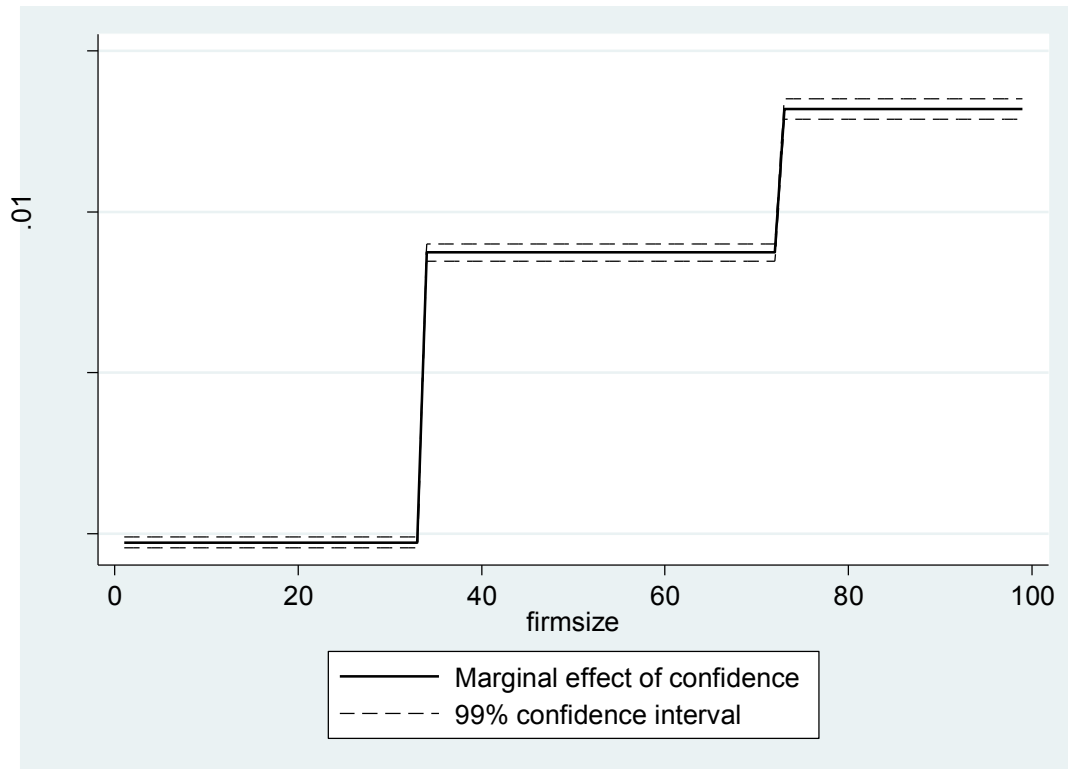


Figure 31:

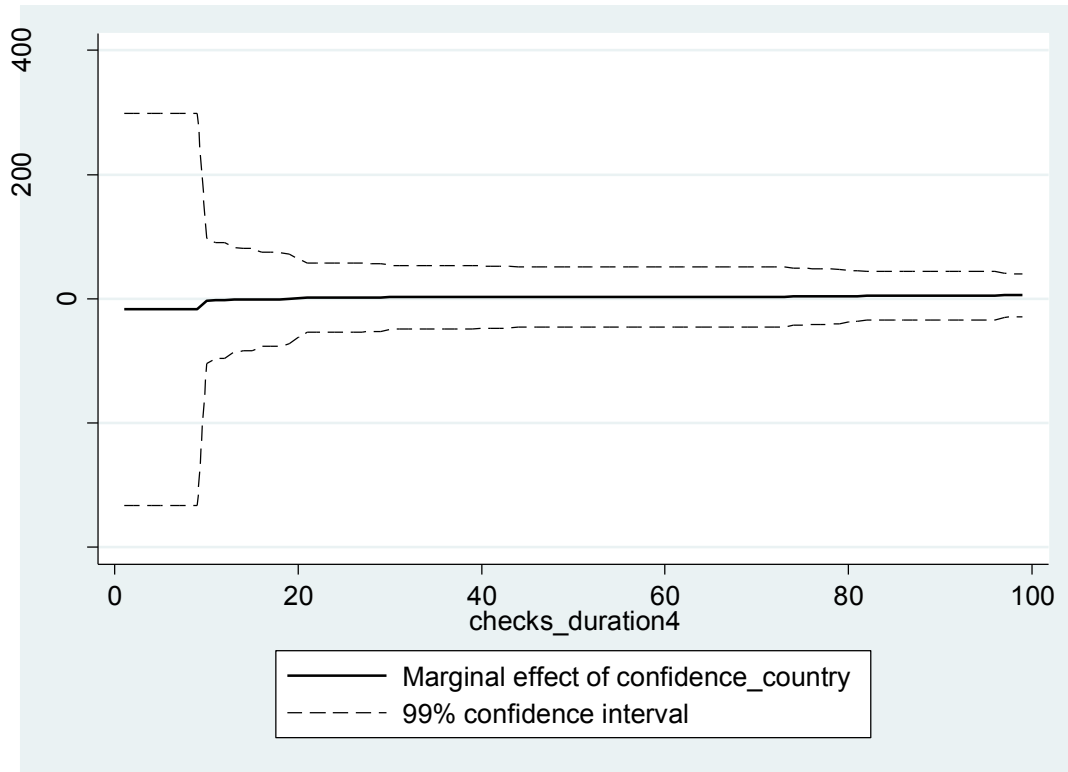


Figure 32

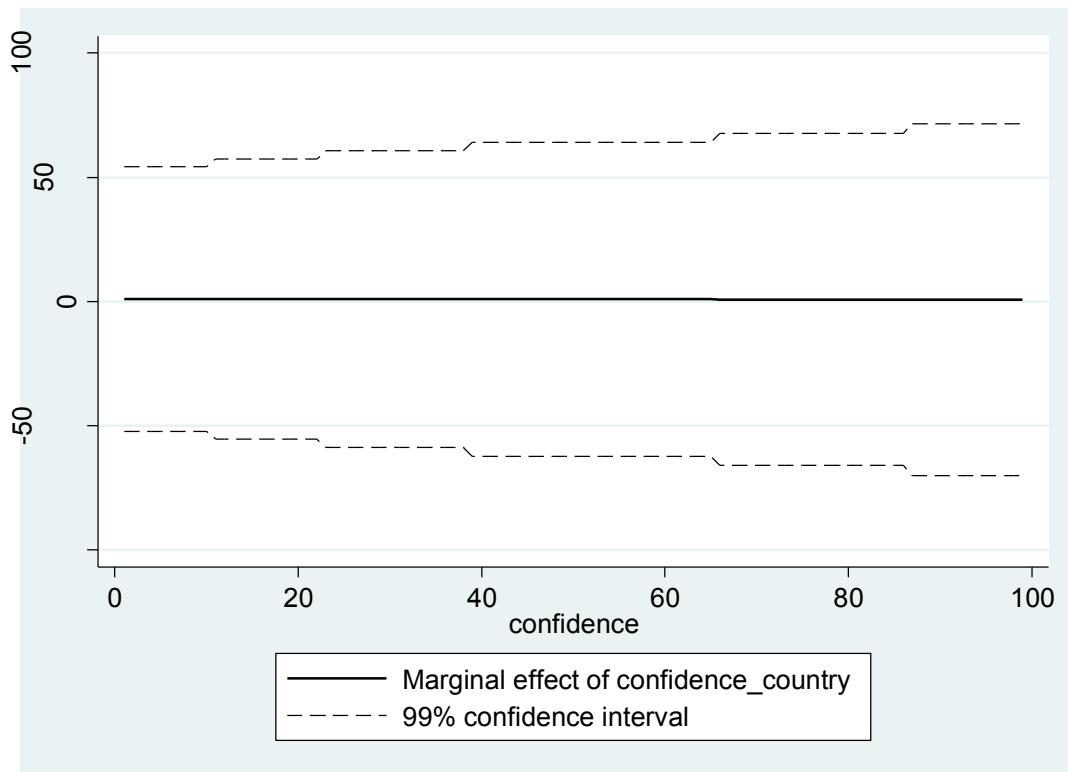


Figure 33

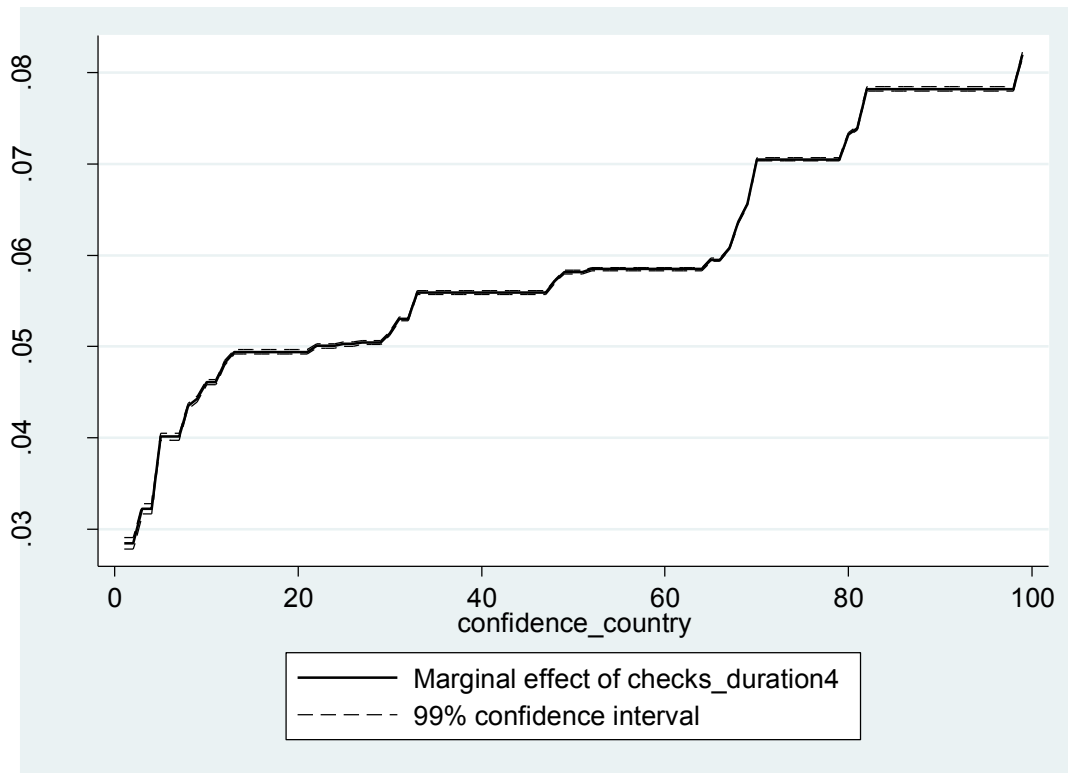
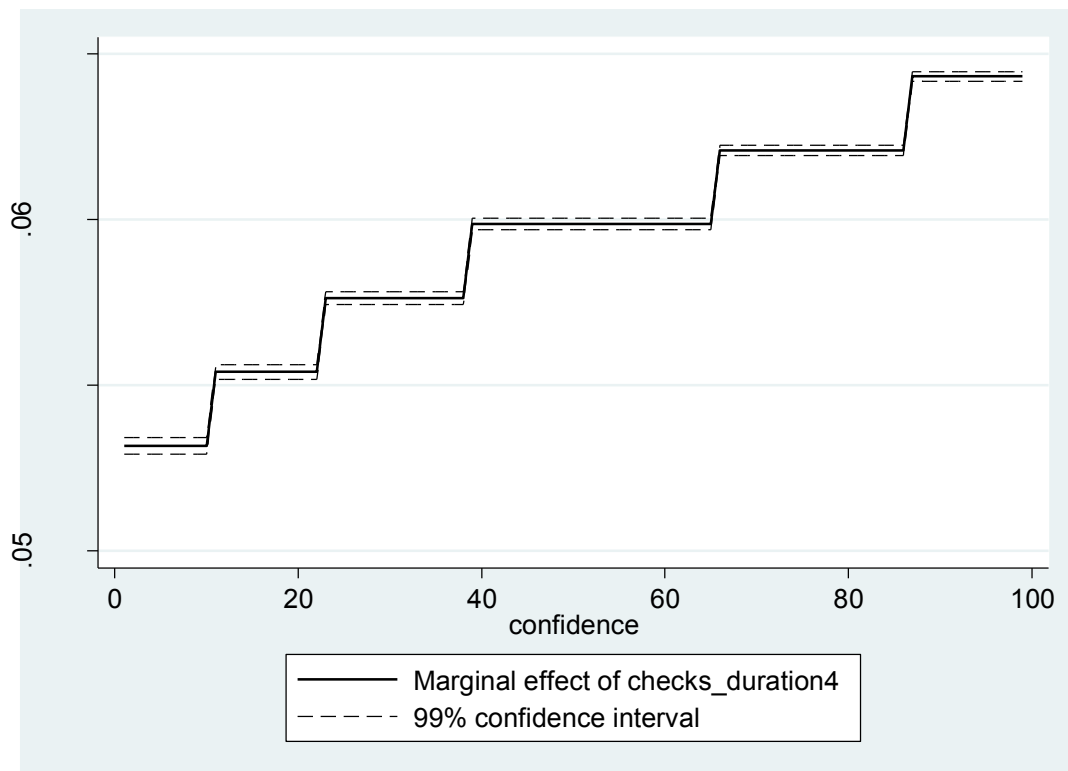


Figure 34



# Religious Loyalty and Acceptance of Corruption

Moamen Gouda  
Philipps-Universität Marburg

Sang-Min Park  
Universität Kassel

## Abstract

This study aims to investigate the relationship between the religiously-induced internalized values of individuals and their specific attitudes regarding accepting corruption. Based on the premises of the New Institutional Economics, we propose that individual level institutions with regard to corruption and religion are associated given the societal institutional context. We use data collected by the World Values Survey on 139,826 individuals in 78 countries with 979 regions surveyed in 13 different years. Our results show that although there is a positive and statistically significant effect of religiosity on the acceptance of corruption on the individual level, such effect is small in magnitude. We find that there is a threshold value of religiosity below which religiosity does not lesser but rather augment acceptance of corruption. Our interpretation for this result is simple; individuals with very low religiosity are generally less bounded by religious norms. Thus, religious norms that are opposed to corruption are also less binding, resulting in a higher propensity of them accepting corruption. Religiosity does lower acceptance of corruption only when it exceeds a certain level of religiosity for a specific individual. We also find that the effect of religiosity on acceptance of corruption does not systematically diverge between individuals of different religious denominations. As for the societal level, our results show that the more accepted corruption is at the societal level, the less of a mitigating effect religiosity has on individual acceptance of corruption.

## Introduction

Although, according to Bhattarai (2009), corruption has no universally accepted definition up till now, international organizations have reached a consensus about the grave negative effects of corruption on both global and local levels. The World Bank classifies corruption as “the single greatest obstacle to economic and social development” (Duasa, 2008), while Transparency international identifies corruption in its mission statement as “one of the greatest challenges of the contemporary world. It undermines good government, fundamentally distorts public policy, leads to the misallocation of resources, harms the private sector and private sector development and particularly hurts the poor” (Transparency International, 2011). In a world economy that was worth USD 30 trillion in 2001-2002, The World Bank estimates that about USD 1 trillion in bribes are paid out each year globally (World Bank, 2004). Transparency International, which publishes an annual report on global corruption, calculated in 2004 the amount lost due to bribery in public procurement worldwide, which amounted to at least USD 400 billion per year (Transparency International, 2006).

This study aims to investigate the relationship between the religiously-induced internalized values of individuals and their specific attitudes regarding accepting corruption. Based on the premises of the New Institutional Economics (NIE), we propose that individual level institutions with regard to corruption and religion are associated given the societal institutional context. We use data collected by the World Values Survey (WVS) on 139,826 individuals in 78 countries with 979 regions surveyed in 13 different years.

Our results show that although there is a positive and statistically significant effect of religiosity on the acceptance of corruption on the individual level, such effect is small in magnitude. Interestingly, we find that there is a threshold value of religiosity below which religiosity does not lesser but rather augment acceptance of corruption. Our interpretation for this result is simple; individuals with very low religiosity are generally less bounded by religious norms. Thus, religious norms that are opposed to corruption are also less binding, resulting in a higher propensity of them accepting corruption. Religiosity does lower acceptance of corruption only when it exceeds a certain level of religiosity for a specific individual. We also find that the effect of religiosity on acceptance of corruption does not systematically diverge between individuals of different religious denominations. As for the societal level, our results show that the more accepted corruption is at the societal level, the less of a mitigating effect religiosity has on individual acceptance of corruption.

This study is divided into six sections. The next section provides a multi-disciplinary literature review on religiosity and corruption while section three presents the theoretical basis for this study as well as our



hypotheses. This is followed by a description of our methodology in section four, the empirical results in section five and conclusions in section six.

## **Literature Review**

There are two previous studies that analyze attitudes toward corruption and religiosity on an individual level. Guiso, Sapienza and Zingales (2003, hereafter GSZ) aim to investigate the effect of religion on people's economic attitudes, while controlling for country-fixed effects. GSZ use data collected by the World Values Survey (WVS) through three waves of surveys (1981-1984, 1990-1993 and 1995-1997) which covered 66 countries. GSZ employ three distinct measures of religiosity simultaneously in each estimation:

- “Raised religiously”, which takes on value one in case the respondent answered positively to the question “Were you brought up religiously at home?”.
- “Currently religious”, which takes on value one in case the respondent states to have attended religious services (apart from weddings, funerals and christenings) at least once a year.
- “Actively religious”, which takes on value one in case the respondent states to have attended religious services (apart from weddings, funerals and christenings) at least once a week.

As for the dependent variables, GSZ categorize economic attitudes in question into six categories; attitudes toward cooperation, women, government, thriftiness, the market economy and its fairness, and legal rules. For the latter category, GSZ base their measurements on a specific question which asks the respondents if they think that certain illegal acts are justifiable or not using a scale between 1 (never justifiable) and 10 (always justifiable). The illegal acts in question are; claiming government benefits to which the respondent is not entitled, avoiding paying fare on public transport, tax frauds, buying stolen goods and accepting bribes. OLS regression results measuring the effect of religiosity on acceptance of bribery mostly find negative effects, regardless of whether they include all religious denominations or estimate separately for each denomination. However, as some of these estimated effects are not statistically significant, GSZ conclude that no inference is possible concerning which religion might be better for economic outcomes.

The second study that we build upon is Gatti, Paternostro & Rigolini (2003, GPR hereafter). While the study of GSZ is broader than ours with respect to the explained variables, the study of GRR investigates a wider range of social effects on attitudes toward corruption. GRR also use data from the WVS, although with a much smaller sample size than GSZ and us, as the analysis mainly focuses on the WVS third wave.

Effects of religiosity are captured by including denomination dummies and a dummy for regular church attendance. GRR find that regular church attendance is negatively associated with acceptance of corruption. They also find that Catholic (Jewish) respondents are characterized by a higher (lower) acceptance of corruption.

Our study differs from those of GSZ and GRR on several levels: (1) We focus on the relationship between attitudes toward corruption and religiosity from an NIE perspective. (2) We use a larger sample, as we are able to include the latest wave of WVS survey responses. (3) We use a synthetic religiosity index instead of three dummy indicators or just a dummy for church attendance. (4) We treat attitudes toward corruption as binary indicator, due to a very skewed distribution.

Attempts to build a theoretical model to analyze corruption's causes and consequences are numerous (for example, Nas, Price and Weber, 1986; Caiden, 1988; Shleifer and Vishny, 1993; Khanafiah and Situngkir, 2004; Mishra, 2006a and 2006b; Khan, 2006; Guerrero and Rodríguez-Oreggia, 2008; and Matei and Matei, 2009). The aforementioned studies are not only based on economic perspectives but are also on other fields of specialization, including finance, public administration, sociology and political science. However, economists were generally interested in modeling the relation between corruption and economic development in specific, as in the works of Macrae, 1982; Ehrlich and Lui, 1999; Barreto, 2000; Mauro, 2002; Barreto and Alm, 2003; Antunes and Cavalcanti, 2003; Basu, 2006; Djumashev, 2006; Mocan, 2007; and Ebben and De Vaal, 2009. As for the empirical research, a growing number of studies investigates the causes and effects of corruption across countries (see, for example, Mauro, 1995; Ades and Di Tella, 1997; Van Rijckeghem and Weder, 1997; Wei, 1997; Mauro, 1998; Brunetti and Weder, 1998; Lambsdorff, 1999; Rose-Ackerman, 1999; Treisman, 1999; Jain, 2001; Herzfeld and Weiss, 2003; Dreher and Herzfeld, 2005; Serra, 2006; Carraro et al., 2006; and Mutascu, 2010). These studies have searched for empirical regularities between corruption and a variety of economic and non-economic determinants. Nevertheless, there is no commonly agreed-upon theory on which to base an empirical model of the causes of corruption on (Alt and Lassen, 2003).

Corruption was only recently incorporated in the interests of sociologists through their examination of social deviance (Naumova, 2009). It is interesting to note that Durkheim's (1893) *De la division du travail social* which initiated the anthropologic and sociological inquiry of social deviance recognized the functional significance of religion as it is repeatedly stated alongside morality and law as one of the principal social facts (Wallwork, 1984). According to Stack and Kposowa (2006), literature on the impact of religion on deviant attitudes and behavior succeeds in establishing a significant negative relation between the individual level of religiosity and the possibility of deviant behavior. Baier and Wright (2001) conduct a

meta-analysis of 60 studies related to this specific relation and find that the mean reported effect size is  $r = -0.12$ , demonstrating that the greater the religiosity the less likely individuals are to engage in criminal activity. The same cannot be said regarding the relation between religion and corruption in sociological studies. Marquette (2010) asserts that the influence of religion on attitudes towards moral issues related to corruption is not clear as many other factors come into the formation of these attitudes such as gender, age, education level and the nature of religion and religious community involved. This claim is supported by the study of Hirschi and Stark (1969) where the relation between church attendance and delinquent attitudes and behavior is investigated. They find that attendance at church does not influence either actual delinquent acts or attitudes towards delinquency, even amongst respondents who believe in a literal hell and devil.

The results of the latter study contradict with those of Tittle and Welch (1983) where the demographics and the religious affiliations of residents of several US states are surveyed. The authors find that there is little to no difference between religious and non-religious respondents regarding behavior that is condemned by society as a whole, such as major theft, assault and tax evasion. However, significant differences are found when it comes to behavior that is not widely condemned by society, such as pot smoking and not standing for the national anthem. This implies that the deterrent impact of religion on attitudes concerning corrupt behavior positively correlates with the intensity of social condemnation of such behavior. As Tittle and Welch's study examines the relation between religiosity and attitudes towards tax fraud, it is noticeable that, according to Stack and Kposowa (2006), only few sociological studies did tackle this relation (Grasmick, Bursik, and Cochran, 1991; Grasmick, Kinsey, and Cochran, 1991; Patee, Milner, and Welch, 1994; and Welch, Tittle, and Patee 1991). A negative relation between religiosity, mostly represented through church attendance, and tax cheating was established in all of the aforementioned studies. However, the scope of the aforementioned studies is limited to USA only. Focusing on examining the same relationship between religiosity and tax fraud, Stack and Kposowa (2006) try to expand this scope by analyzing data on 45,728 individuals in 36 nations from the WVS's second wave which took place during 1990-1993. Moreover, the authors investigate the "moral communities" hypothesis where a strong moral community may be expected to reduce the deviant attitudes and behavior of its individuals despite the individuals' religiosity level. In other words, in such moral community, persons with relatively low levels of religiosity may be influenced by the attitudes and behavior of the highly religious persons in their community. Their results show that the higher the individual's level of religiosity, the lower her acceptability of tax fraud. Results on the moral community's hypothesis were mixed. However, in a separate analysis of individual nations, the existence of a "moral community" (majority of the popu-

lation is identified with a religious group) explains 39 percent of the variation in the presence or absence of the relationship between expected religiosity and acceptability of tax fraud.

This is followed by Beets (2007), which presents two suppositions about the benefits of recruiting the support of religion and its adherents in the fight against corruption. The first states that faithful followers of a certain religion will abstain from corruption because of the inherent theft, dishonesty, illegality, and mistreatment of others that it implies. The second assumption is that those who are not faithful adherents of religions have a high propensity to engage in corruption because of an absence of religious guidance. These two postulations are strongly supported by several studies from different fields even such as Treisman (2000), Brunetti and Weder (2003), Herzfeld and Weiss (2003), Braun and Di Tella (2004), Kunicova and Rose Ackerman (2005), Lederman, et al. (2005), and Mutascu (2010). North and Gwin (2006) argue that a religious society is expected to be relatively more moral than a nonreligious one. Therefore, it is assumed that in countries where religion plays an essential role in the lives of most people, civic employees, as well as others, are likely to obtain their ethical framework at least partly from their religion, directly influencing their tendency to commit corruption. Religion is said to provide its followers with a common language of ethics and, some of which can be interpreted as being of significant importance to fighting corruption. However, as Marquette (2010) argues, a logical fallacy may exist in this argument since it presupposes that all religions emphasize the same moral codes. Moreover, a considerable body of literature proposes that followers of different religions – or even sects of a religion – hold divergent opinions on what constitutes morality (see, for example, Guiso, Sapienza and Zingales, 2003; Al-Marhubi, 2004; Durkheim, 1915; Weber, 2010 and Jagodzinski, 2009). Nevertheless, Luxmoore (1999) rebuts this claim by assuming that since certain values such as fairness and honesty are basic teachings of most - if not all - religions, such religions under consideration can therefore be used as an antidote for corruption. In Table 16, we document how some of the main sources of the major world religions stress the immorality of theft and bribery.

Conversely, in a clear contradiction of the aforementioned assumptions, Marquette (2010) points out that “many of the most corrupt countries in the world (according to Transparency International’s Corruption Perception Index) also rank high in terms of religiosity (using indicators such as those used by the Pew Global Attitudes Project)”. This apparent contradiction can be explained through taking into consideration two main arguments: first, in countries where a high level of both religiosity and corruption exists, other endogenous factors maybe affecting them both. An example of such endogenous factors may be the case where a corrupt theocratic leadership exists in a certain country. Investigating such kinds of endogenous factors is beyond the scope of most literature related to the religion-corruption nexus. However, some control variables related to the political and social environment in sampled countries are taken into con-

sideration in such literature. Second, the level of religiosity might not be the only important explanatory factor when investigating its relation with the perceived corruption levels but also the type of religion. For that reason, various studies use the type of religion as an explanatory variable and find its effect significant on the corruption level in the sampled countries (see, for example, La Porta et al., 1999; Treisman, 2000; Paldam, 2001; Beets, 2007; Shabbir and Anwar, 2007; Samanta and Pleskov, 2009; and Mutascu, 2010). Still, other studies find an insignificant relation between the public level of adherence of a certain religion in a country and its perceived level of corruption (e.g. North and Gwin, 2006; and Flavin and Ledet, 2008). Flavin and Ledet (2008) use survey-based data to check if religiosity has a significant effect on the level of governmental corruption in the US states during the period 1990-2002. Although the authors use three different measures of religiosity, which are religious belief, belonging, and behavior, they find little systematic relationship between any of these measures of religiosity and corruption.

As for economic literature in specific, several studies investigated the relation between religion and corruption (see, for example, La Porta et al., 1999; Treisman, 2000; Paldam, 2001; Bonaglia et al., 2001; Chang and Golden, 2004). Treisman (2000) shows that religion reduces corruption because it aids in organizing civil society and makes citizens more likely to monitor elites. Devettere (2002) points out that the most effective way to combat global corruption is through giving high attention to virtue ethics. Paldham (2001) assumes that religion may limit the effects of this global problem and finds that the percentage of Protestants in a country is negatively related to corruption level. North and Gwin (2006) use a country-aggregated level data to assess whether religion affects the levels of rule of law and corruption. The authors use data on the sampled countries' largest religious group in the years 1900 and 2000 as a proxy of religiosity. Their results show that the proposed effect of religion on corruption and rule of law is inconsistent since it significantly differs depending on the year of religious status data being used. According to Flavin and Ledet (2008), there is a scholarly debate over the appropriate measurement of religiosity. They explain this partly due to "...disagreements among scholars about how best to quantify religion and an individual's underlying "level" of religious belief and devotion when referring to the different ways in which religiosity can be assessed". Religion was assessed through examining the "dominant religion" or "the religion of majority" in a certain country. However, a basic logical fallacy exists in most of these studies by assuming that, since an individual belongs to a certain religion, her behavior is bound by rules of that religion. The level of adherence to a religion is not investigated which can significantly impact the overall conclusion.

From the above, we can deduce that, although the theory supporting the negative relation between religion and corruption may seem more valid and logical, the results of the considerable body of empirical literature tackling this relation remain controversial and inconclusive. Marquette (2010) states that "that

the evidence for a causal relationship between religion (or types of religion) and either higher or lower levels of corruption is in no way convincing". The reason behind this conviction, as the author argues, is that the data -on religion- used in the majority of these studies are aggregated at the country level. Therefore, such studies are clueless with regards to questions such as: (1) the influence of religion on attitude formation, (2) how individuals' attitudes towards corruption are formed and (3) what are the possible lines of actions that the religion(s) permit its followers in order to change corrupt behavior. In order to avoid these pitfalls, the data on religion used through this study will be based on a survey-based dataset, collected by the World Values Survey.

Regarding the first question, we hypothesize that religion forms an essential component of the individual's morality in countries with high rates of religiosity. As for the second question, we hypothesize that religions, in general, endorse honesty and suppress corruption. Therefore, as the degree of religiosity increases on the individual level in a certain society, individuals' general attitudes towards corruption conform more and more with this religion's fundamental teachings towards such kind of ill behavior. It is of difficulty to fully assess the specific attitudes of every religion towards corruption. Therefore, we test the effect of religiosity on corruption with and without taking into consideration the type of religion under investigation. This allows us to assess whether religiosity generically affects corruption or adherence to a certain religion is the main influencer on corruption level in any given country. As for the third unanswered question, it is essential to point out that the lines of actions endorsed by a certain religion against corruption are not practiced in vacuum. In other words, legal and political institutions play a major role in controlling citizens' attitudes towards corruption through offering lines of acceptable attitudes and actions against corruption (e.g. whistle-blowing) and limiting or suppressing other unwanted attitudes and actions (e.g. citizens' vigilante behavior against corrupted officials). Therefore, the legal and political environments of the sampled countries are taken into consideration. Following the tradition of New Institutional Economics (North, 1990), we argue that individual incentives and attitudes regarding corruption are affected not only by the legal system, i.e. formal institutions, but also by the morals and values prevalent in a society, i.e. informal institutions. Consequently, individuals who are constantly exposed to a certain religion will – to a significant extent – adopt its prescribed system of beliefs and values (i.e. informal rules) which then structure their perceived constraints regarding corrupt transactions.

## **Theoretical Background**

Defining what 'religion' is remains a highly controversial issue for anthropologists, sociologists, and historians (as well as economists!). Various definitions for religion are offered by a multitude of social scientists, including Tylor (1871), Durkheim (1915), Frazer (1922), Radin (1957), Wallace (1966), Geertz

(1973), Ortner (1978) and Lechner (2000). Kirkland (1976) points out that this definitional problem was of such dire importance that *the journal of the scientific study of religion* conducted a special symposium under the title “The Problem of Attempting to Define Religion” (1962-63). Nevertheless, one of the intersection points among most of the proposed definitions is that religion consists of a specific set of moral guidelines and behavioral patterns that adherents subscribe to (see, for example, Merriam-Webster online dictionary, 2011; Dictionary.com Unabridged, 2011; American Heritage Dictionary of the English Language, 2009; Collins English Dictionary, 2003). Religion plays a significant role in shaping the prevalent morals and values of individuals in a given society, depending on these individuals’ adherence to the prescribed religious code of conduct. As Iannaccone (1995) states

*“Other institutions hide their attempts to manipulate people’s preferences; religions proudly proclaim their role in the transformation of hearts and minds. Other institutions direct behavior through coercive force or compensatory payment; religions seek to achieve compliance through appeals to what is good and proper (though their normative appeals are often backed up with bribes and threats). Other institutions acknowledge the limited character of their claim on individuals; religions pronounce demands of unlimited scope and extraordinary detail”.*

There is a schism between theology and social sciences on the stance of different religions regarding stealing and bribery. From a theological point of view, all religious sects investigated through this study emphasize through their teachings the immorality of theft and bribery. Table 16 provides a simple survey of religious texts tackling stealing and bribery in main sources of these religions. Such a simple inspection of religious texts is by its nature non comprehensive as such an exercise goes beyond the scope of this study. Nevertheless, Table 16 sheds light on the common teaching of all religions that are avidly against stealing and bribery, which are the main ingredients of corruption.

As it was aforementioned, the effect of religiosity on attitudes concerning corruption remains a debatable issue through the empirical literature of sociology and economics. Several theories are proposed to explain the source of this confusion. Marquette (2010) provides an excellent overview of some of these theories. We summarize the main points of these theories without aspiring to be exhaustive.

Middleton and Putney (1962) explain that uncertainty is created due to the confusion of the scope of empirical research related to religion and morality. They emphasize that there is often a failure to distinguish between two different kinds of ethical standards: the ascetic (i.e. sexual inclinations, gambling) and the social (i.e. cheating, theft). As violating social standards are harmful to every actor in a society, they are tended to be shared by religious and nonreligious actors alike. However, since violations of ascetic stand-

ards are usually not directly harmful to the society, nonreligious persons are expected to be more prescribed to these standards than the religious. Accordingly, differences in behavior between the religious and the nonreligious are apparent in specific areas only, and are a product of divergence in standards rather than to a differential upholding of standards.

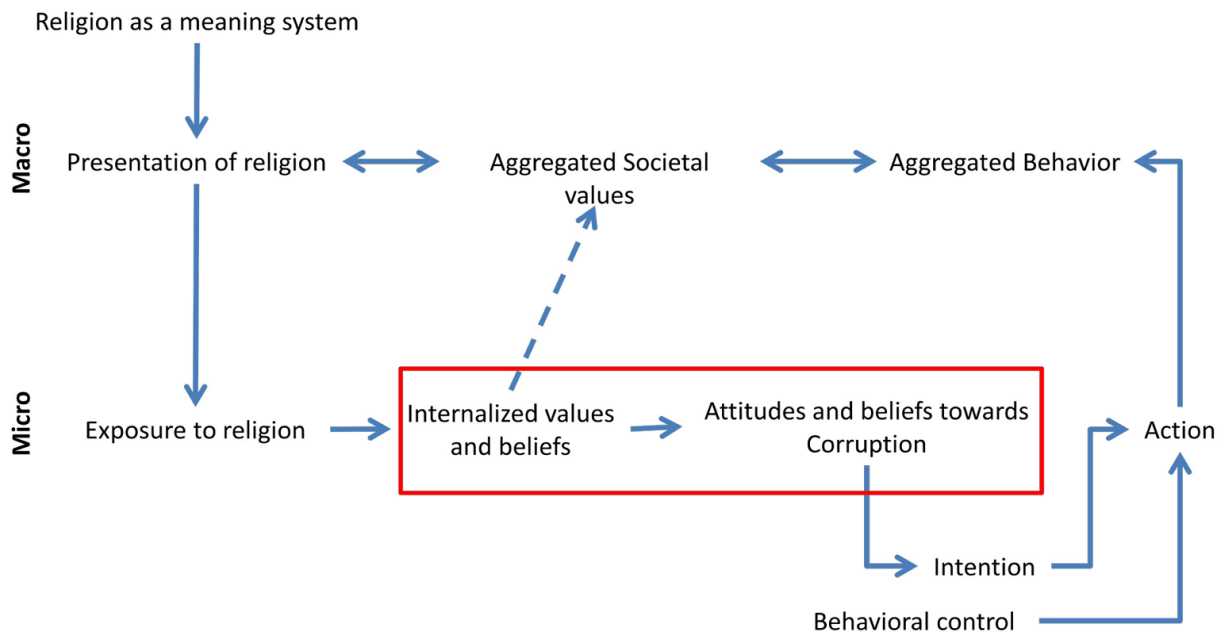
The aforementioned study of Tittle and Welch (1983) base its examination of religiosity and delinquency on the concepts of 'normative dissensus' and 'perceived conformity'. Normative dissensus refers to the condition where disagreement about the undesirability of various behaviors exists, individuals in a given society will have few consistent guidelines or behavioral models; they will be lost in uncertainty, which may stimulate violations of these specific behaviors. In such conditions, religiously endorsed moral commitments can be of significant effect. The authors hypothesize that the extent to which religiosity affects conformity fluctuates directly with (a) general normative dissensus in a given context or (b) with normative dissensus concerning specific offenses. Consequently, religiosity may help in predicting the conformance to rules specifically prohibited by religious institutions but not to rules only prohibited by society as a whole, which actually reflects the effect of normative dissensus. 'Perceived conformity' is built on the concept that a deviant behavior is directly related to excess amount of exposure to social inputs that are favorable to deviance. Consequently, the greater one's religiosity, the less likely will be her exposure to an excess of favorable deviant definitions; hence, the greater the possibility of conformity. The authors conclude that "religiosity has the greatest effect on conformity when each of the four contextual conditions prevail: general normative ambiguity, low social integration, generalized perception of low peer conformity, and a relatively high proportion of people who are not religious" (Tittle and Welch, 1983, p. 674).

Kohlberg (1981) presents a different perspective, claiming that religiosity and moral reasoning are essentially separated since they constitute two different areas of human concern. Although moral decision making is mainly influenced by level of cognitive development (e.g. education) and disclosure to socio-moral incidents, religious reasoning is based upon revelations by religious authorities and is usually emphasizing morality in the first place. In other words, moral reasoning provides moral prescriptions while religious reasoning affirms these moral judgments and views it as meaningful. This claim is apparent in Kohlberg's (1984) theory on stages of moral development, where the author argues that moral reasoning has six identifiable developmental stages. Each one of these stages is more suitable for responding to moral dilemmas than its predecessor. Kohlberg states that the process of moral development is chiefly concerned with justice, and that it continues throughout the individual's lifetime, a notion that spawned dialogue on the philosophical implications of such research. As for religion and morality, Kohlberg and Power (1981) suggest that a seventh stage should be integrated into the theory under the title "transcend-



mental morality” or “morality of cosmic orientation” which links religion with moral reasoning. However, Kohlberg's difficulties in obtaining empirical evidence for even the sixth stage, lead him to underline the speculative nature of this proposed seventh stage (1981).

**Figure 1: The effect of religion on beliefs, values and actions related to corruption**



Source: Jagodzinski (2009), modified by the authors.

It is noteworthy to state that this study is mainly focusing on investigating the specific link between the religiously-induced internalized values and beliefs of individuals on the one hand and their specific attitudes regarding corruption on the other hand (represented by the red rectangle in figure 1), resulting in our main hypothesis:

*Hypothesis 1: Higher individual-level religiosity is associated with lower acceptance of corruption.*

We focus our analysis specifically on the micro-level rather than the macro-level. We are not dealing by any means with the actual actions of those individuals regarding corruption that are administered through their respective societies. The degree of exposure to religion of individuals is thought to be reflected through their internalized values and beliefs and is measured through variables that demonstrate their level of religious adherence. The attitudes and beliefs towards corruption are reflected through the survey respondents' acceptance of corrupt actions such as accepting bribery and tax fraud. Because our framework

explicitly accounts for the micro-macro interaction in values and beliefs, we also propose the following hypotheses:

*Hypothesis 2: Higher country-level acceptance of corruption is associated with higher individual-level acceptance of corruption.*

*Hypothesis 3a: Higher country-level corruption is associated with higher acceptance of corruption.*

*Hypothesis 3b: Higher country-level corruption is associated with lower acceptance of corruption.*

## **Methodology and model specification**

Because our hypotheses relate to individual level incentives and behavior, it is appropriate that we test our hypotheses with individual level data. Naturally, experimental data is hard to come by in this context<sup>1</sup>. Thus, we resort to survey data taken from the World Values Survey (WVS), which measures values and attitudes in representative samples in more than 80 countries around the world (WVS 2010). Index  $i$  denotes individual surveyed,  $j$  denotes country of residence and  $t$  denotes year of survey. Our estimation sample comprises (up to) 139,826 individuals in 78 countries with 979 regions surveyed in 13 different years.

Acceptance of corruption is measured by WVS responses to the question “Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between [...]. Someone accepting a bribe in the course of their duties.” The responses range from 1 (never justifiable) to 10 (always justifiable).

Because the responses to this variables are very skewed towards 1 (almost 75%), we decide to recode this information into a binary format. Our dependent variable  $Corruption_i$  takes on value 0 if respondents answered that bribes are never justified, and value 1 otherwise.

The independent variable of main interest, religiosity, is measured through WVS responses to four questions. These questions are: (1) “Indicate how important it is in your life. Would you say it is: Religion?”, (2) “Apart from weddings, funerals and christenings, about how often do you attend religious services

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<sup>1</sup> Armantier and Boly (2010) provide evidence from a controlled field experiment that religiosity, measured through a post-experimental question of how often the subject goes to church, is associated with a lower probability of subjects accepting bribes.

these days”, (3) “Independently of whether you go to church or not, would you say you are a religious person?”, and (4) “How important is God in your life?”. Analogous to the above corruption index, we construct a weighted index  $Religiosity_i$  of these questions, with weights according to the results from a factor analysis. In order to control for between denomination differences, we also include dummies for the 7 main denominations that the respondent might be affiliated with.

In order to capture the micro-macro interaction of the theoretical model (hypotheses 2 through 3b), we include as independent variables both the aggregated country-level mean for  $Corruption_{jt}$  and the country-level control of corruption measure of the World Bank Governance Indicators,  $WBCorruption_{jt}$ . We estimate

$$\Pr(Corruption_i = 1 | X) = G(\beta_0 Religiosity_i + Z_i^1 \beta_1 + Z_{jt}^2 \beta_2 + u_i) \quad (0.0)$$

with maximum likelihood, where  $G$  is the standard normal cumulative distribution function,  $Z_i^1$  is the vector containing our individual level controls and  $Z_{jt}^2$  is the vector containing our country-level controls.

Several individual-level control variables are included in  $Z_i^1$ . We control for sex ( $Male_i$ ), age ( $Age_i$ ), education ( $Education_i$ ), marital status ( $Married_i$ ) and unemployment status ( $Unemployed_i$ ) of the respondent. To control for income-related differences, we include an ordinal variable ( $Income_i$ ) which is a subjective, self-reported assessment of the respondent’s income level. We also control for the respondent’s financial satisfaction ( $Financial\_satisfaction_i$ ) and generalized trust ( $Trust_i$ ), as low financial satisfaction and low trust might be associated with higher acceptance of corruption.

Unobserved heterogeneity might mean that respondents’ acceptance of corruption and religiosity are affected by the year that the survey was done in and the country or region they live in. There are two distinct approaches to arrange the vector  $Z_{jt}^2$ . The first approach is to include a full set of country and year dummies. This approach accounts for any level differences there might be between countries in different years. The second approach is to include a set of time-varying country-level variables which might be relevant in influencing acceptance of corruption from a macro-level. First of all, this set includes country averages of the individual level variables mentioned above (indexed  $jt$ ). A country’s colonial history might influence its formal and informal institutions, which is why we control for it with a set of according

dummies ( $Colonial\_historyX_i$ )<sup>2</sup>. More institutional variables include an indicator for political stability ( $Stability_{jt}$ )<sup>3</sup>, age of democracy ( $Age\_democracy_{jt}$ ), a dummy for a federalist state ( $Federalism_{jt}$ ). We also control for per capita income ( $GDP_{jt}$ )<sup>4</sup>. These two approaches for arranging the vector  $Z_{jt}^2$  are mutually exclusive as combining both country, region and year dummies with multiple country level variables would result in near perfect multicollinearity. Details on all variables can be found in Table 13 and **Fehler! Verweisquelle konnte nicht gefunden werden.**

## Estimation results

In Probit estimations, the marginal effect of any explanatory variable is (1) inherently non-linear and (2) conditional on values of all other covariates. The main effect of interest, i.e. the marginal effect of religiosity on the probability to accept corruption is

$$\frac{\partial \Pr(Corruption_i = 1)}{\partial Religiosity_i} = g(\beta_0 Religiosity_i + Z_i^1 \beta_1 + Z_{jt}^2 \beta_2) \cdot \beta_0 \quad (0.0)$$

where  $g(z) \equiv \frac{dG}{dz}(z)$ . It is immediately apparent that this marginal effect needs to be evaluated at specific values of  $(Religiosity_i, Z_i^1, Z_{jt}^2)$  in order to be interpreted in a meaningful way. We can also see that interpretations of interaction effects are possible without explicitly including interaction terms as explanatory variables.

In Table 15 we present the average marginal effects from our estimations. In order to compute these, we insert into equation 1.2 the estimated coefficients and the mean values of all independent variables, including the respective variable of interest. This gives us a good first impression of the effects we are interested in. In column 1, we estimate a baseline model without any fixed effects. In columns 2 to 4, we successively add country, year and region fixed effects. Finally, in column 5, we drop the country and region fixed effects while adding a vector of country level control variables.

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<sup>2</sup> La Porta et. al. (1999), Treisman (2000), and Herzfeld and Weiss (2003) show that former British colonies have lower levels of corruption.

<sup>3</sup> See Park (2003).

<sup>4</sup> See, for example, van Rijckeghem-Weder, 1997; Ades-Di Tella, 1999; Treisman, 2000; Rauch-Evan, 2000; Paldam, 2002; Sandholtz and Gray, 2003; Tavares, 2003; Dreher et al. 2004; Chang-Golden; 2004; Kunicova-Ackerman, 2005.

The average marginal effect of religiosity ( $Religiosity_{ij}$ ) is estimated to be negative and significantly different from zero in all five specifications. This is in line with hypothesis 1, implying that, at the individual level, religiosity can act as a deterrent against corrupt behavior. However, the effect is rather small in size: A 1% change in individual religiosity is on average associated with a 0.04% change in individual level acceptance of corruption.

Concerning country level acceptance of corruption ( $Acceptance_j$ ), we find a significantly positive association with individual level acceptance. This is in line with hypothesis 2 and shows that, on average, the more corruption is accepted in one's society, the more likely an individual is to accept corruption. Ranging from 1.342 to 1.61, the effect is quite large in size: A 1% higher aggregate acceptance of corruption is associated with a higher individual acceptance of corruption of around 1.4%.

Interestingly, the World Bank country score on control of corruption ( $CorruptionWB_j$ ) is not significantly associated with individual acceptance of corruption, suggesting that either (1) whether or not a country scores well concerning the World Bank governance variable does not matter for individual level acceptance of corruption or (2) the two opposing effects conjectured in hypotheses 3a and 3b cancel each other out.

Let us move on to the remaining survey level controls: For  $Income_{ij}$ ,  $Uemployed_{ij}$ ,  $Financial\_satisfaction_{ij}$  and  $Trust_{ij}$ , we do not find a significant association with acceptance of corruption. Acceptance of corruption is found to be significantly higher for individuals that are male, younger, unmarried and less well educated, *ceteris paribus*. There is also some evidence that acceptance of corruption differs between individuals of different denominations: While Hindu individuals are characterized by lower acceptance of corruption than others, Jewish, Orthodox and Catholic individuals are characterized by higher acceptance of corruption. Buddhist, Muslim and Protestant individuals do not differ significantly from individuals of 'other religions' denomination.

We have to keep in mind that these average marginal effects represent mere snapshots of the whole picture. In order to gain more complete insights into the effects of religiosity, we will also have to investigate interaction effects. This is achieved by computing the marginal effect of religiosity in equation 1.2 for varying levels in the interacting explanatory variable and plotting the marginal effect. The following graphs are based on column 5 of [Table 15](#).

The first interaction to consider is the interaction of religiosity with itself, i.e. any non-linearities in the effect of religiosity. In [Figure 35](#) we plot the marginal effect of religiosity (i.e. the estimated elasticity) for different percentiles of religiosity, holding constant all other covariates at their respective means. We can

clearly see that the effect of religiosity is non-linear: For low values of religiosity (below the 30-percentile), there is a positive effect. For higher values of religiosity (above the 30-percentile), there is a negative effect on the acceptance of corruption. This implies that there is a threshold value of religiosity below which religiosity does not lower but rather increase acceptance of corruption. We could interpret this as following: For individuals with very low religiosity, religious norms in general are less binding, thus, religious norms that are opposed to corruption are also less binding, resulting in a higher probability for acceptance of corruption. Only above a certain minimum level of religiosity does religiosity actually lower acceptance of corruption. We can also see that the marginal effect of religiosity on acceptance of corruption becomes stronger, the higher the level of religiosity.

We then compare the effect of religiosity between individuals of different religious denominations. In [Figure 36](#) we plot the marginal effect of religiosity by religious denomination. Here, we replicate [Figure 35](#) for different values of religious denomination. It becomes apparent that the effect of religiosity on acceptance of corruption does not systematically differ between individuals of different religious denominations. Differences between denominations are strongest for very extreme values of religiosity. For country-level denomination averages, we do not find any significant interaction in the effect of religiosity (graphs not shown), implying that country level differences in religious denomination do not affect how religiosity and acceptance of corruption interact at the individual level.

Next, we ask how the effect of religiosity depends on societal level acceptance of corruption. In [Figure 37](#), we plot the marginal effect of religiosity for different deciles of aggregated acceptance of corruption. We observe some interaction, but no reversal: the overall trend of the marginal effects curve is the same for all deciles of acceptance of corruption (although the curve is almost flat for the 99-percentile). We can see that the marginal effect of religiosity is more pronounced for lower aggregated acceptance of corruption than for medium to high levels of religiosity. This implies that the more accepted corruption is at the societal level, the less of a mitigating effect religiosity has on individual acceptance of corruption.

For all remaining explanatory variables, we do not find any interaction with the effect of religiosity.

## **Conclusions and outlook**

Although the relevance of institutions for the analysis of human behavior is by now almost indisputable, there seems to be little consensus on how informal institutions affect behavior and other institutions:

*“What is it about informal constraints that gives them such a pervasive influence upon the long-run character of economies?”* (North, 1991, p. 111).

In this study, we have tried to shed some light onto the relationship between two different informal constraints: religiosity and the acceptance of corruption. We find that, although there is a statistically significant association, the effect of religiosity on acceptance is very small in magnitude. One explanation for this very small effect is that religiosity affects acceptance of corruption through different and opposing transmission channels. By promoting intra-group trust instead of inter-group trust (Berggren & Bjornskov 2011), increased religiosity could indirectly lead to higher acceptance of corruption. At the same time, increased religiosity should also lead individuals to be more strongly bound by anti-corruption religious norms. Our exploratory analytical framework can alas not differentiate between these two transmission channels. Future research into this matter will have to provide more explicit theoretical models that are able to cope with this conceptual problem.

**Table 13: Description of individual level variables (all taken from World Values Survey)**

Variable	Description and source	N	Mean	P50	SD	Min	Max
<i>Corruptibility1<sub>i</sub></i>	Weighted average of variables f117 ( <i>Justifiable: Someone accepting a bribe</i> ), f114 ( <i>Justifiable: Claiming government benefits</i> ), f115 ( <i>Justifiable: Avoiding a fare on public transport</i> ), f116 ( <i>Justifiable: Cheating on taxes</i> ).	121337	.027733 1	- .349575 2	1.03732 8	- .764152 2	4.81591 1
<i>Corruptibility2<sub>i</sub></i>	Is someone accepting a bribe acceptable? (f117, ...)	121337	.300576 1	0	.458510 5	0	1
<i>Religiosity<sub>i</sub></i>	Weighted average of variables a006 ( <i>Religion important in life</i> ), f028 ( <i>How often do you attend religious services?</i> ), f034 ( <i>Religious person</i> ), f063 ( <i>How important is God in your life?</i> ).	121337	0.18353 42	0.46579 19	0.91644 8	- 2.50431 2	1.12452 1
<i>Income<sub>i</sub></i>	Self-reported household income, on a scale of societal deciles (x047; 10 = highest income group).	121337	4.53947 3	4	2.39999 3	1	10
<i>Male<sub>i</sub></i>	Indicator variable for sex of respondent (x001; 1 = Male).	121337	0.48964 45	0	0.49989 48	0	1
<i>Age<sub>i</sub></i>	Age of respondent (x003).	121337	40.2220 5	38	15.8093 5	15	99
<i>Married<sub>i</sub></i>	Marital status of respondent (x007; 1 = Married).	121337	0.57320 52	1	0.49461 4	0	1
<i>Unemployed<sub>i</sub></i>	Employment status of respondent (x028; 1 = unemployed).	121337	0.10090 9	0	0.30120 95	0	1
<i>Financial_satisfaction<sub>i</sub></i>	Satisfaction with financial situation of household of respondent (c006; 10 = satisfied).	121337	5.52186 9	6	2.65654 2	1	10
<i>Education<sub>i</sub></i>	Highest educational level attained (x025; 8 = University with degree)	121337	4.45064 6	4	2.30359	1	8
<i>Trust<sub>i</sub></i>	Most people can be trusted (a165; 1 = yes)	121337	0.74486 76	1	0.43593 74	0	1
<i>Denom_Buddhist<sub>i</sub></i>	Indicator variable for religious denomination (f025; 1 = Buddhist)	121337	0.02517 78	0	0.15666 55	0	1
<i>Denom_Hindi<sub>i</sub></i>	Indicator variable for religious denomination (f025; 1 = Hindi)	121337	0.02630 69	0	0.16004 7	0	1
<i>Denom_Jewish<sub>i</sub></i>	Indicator variable for religious denomination (f025; 1 = Jewish)	121337	0.00387 35	0	0.06211 71	0	1
<i>Denom_Muslim<sub>i</sub></i>	Indicator variable for religious denomination (f025; 1 = Muslim)	121337	0.22555 36	0	0.41794 81	0	1
<i>Denom_Orthodox<sub>i</sub></i>	Indicator variable for religious denomination (f025; 1 = Orthodox)	121337	0.10890 33	0	0.31151 91	0	1
<i>Denom_Protestant<sub>i</sub></i>	Indicator variable for religious denomination (f025; 1 =	121337	0.16443	0	0.37067	0	1



	Protestant)		46		1		
<i>Denom_Catholic<sub>i</sub></i>	Indicator variable for religious denomination (f025; 1 = Catholic)	121337	0.25853 61	0	0.43783 19	0	1
<i>Denom_Other<sub>i</sub></i>	Indicator variable for religious denomination (f025; 1 = Other)	121337	0.10890 33	0	0.31151 91	0	1

**Table 14: Description of country level variables**

<b>Variable</b>	<b>Description and source</b>	<b>N</b>	<b>Mean</b>	<b>P50</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
<i>Corruptibility<sub>j</sub></i>	Country average of <i>Corruptibility<sub>ij</sub></i>	121337	0.303918 4	0.274840 7	0.173607 8	0.012666 7	1
<i>CorruptionWB<sub>j</sub></i>	World Bank Governance Indicator “control of corruption” (2.5 = perfect control; Kaufmann et al. 2009)	121337	0.049272 5	- 0.240635 6	0.983581 2	-1.264135	2.38724
<i>Male<sub>j</sub></i>	Country average of <i>Male<sub>ij</sub></i>	121337	0.486483 6	0.495688 1	0.036747 3	0.343	0.568215 9
<i>Age<sub>j</sub></i>	Country average of <i>Age<sub>ij</sub></i>	121337	40.07693	39.69038	5.033365	28.69082	52.45044
<i>Married<sub>j</sub></i>	Country average of <i>Married<sub>ij</sub></i>	121337	0.564083	0.565756 8	0.125816 2	0.143426 3	0.835235 7
<i>Unemployed<sub>j</sub></i>	Country average of <i>Unemployed<sub>ij</sub></i>	121337	0.103735 9	0.084179 4	0.070725 9	0	0.367333 3
<i>Denom_Buddhist<sub>j</sub></i>	Country average of <i>Denom_Buddhist<sub>j</sub></i>	121337	0.024745 3	0.000711 5	0.116159 9	0	0.968057 4
<i>Denom_Hindi<sub>j</sub></i>	Country average of <i>Denom_Hindi<sub>j</sub></i>	121337	0.026267 4	0	0.120475 7	0	0.756121 9
<i>Denom_Jewish<sub>j</sub></i>	Country average of <i>Denom_Jewish<sub>j</sub></i>	121337	0.003972 3	0.000833 3	0.010763 7	0	0.063713 8
<i>Denom_Muslim<sub>j</sub></i>	Country average of <i>Denom_Muslim<sub>j</sub></i>	121337	0.220106 1	0.008285 9	0.359281 4	0	0.988855 9
<i>Denom_Orthodox<sub>j</sub></i>	Country average of <i>Denom_Orthodox<sub>j</sub></i>	121337	0.106979	0.003146 3	0.241358 5	0	0.922562 1
<i>Denom_Protestant<sub>j</sub></i>	Country average of <i>Denom_Protestant<sub>j</sub></i>	121337	0.161808 1	0.047062 8	0.231469 5	0	0.885034 7
<i>Denom_Catholic<sub>j</sub></i>	Country average of <i>Denom_Catholic<sub>j</sub></i>	121337	0.254142 8	0.095	0.300709 6	0	0.944
<i>Colonial_2<sub>j</sub></i>	Indicator variable for colonial origin (Teorell & Hadenius 2005)	121337	0.017167 1	0	0.129894 2	0	1
<i>Colonial_3<sub>j</sub></i>	Indicator variable for colonial origin (Teorell & Hadenius 2005)	121337	0.156588 7	0	0.363414	0	1
<i>Colonial_4<sub>j</sub></i>	Indicator variable for colonial origin (Teorell & Hadenius 2005)	121337	0.009609 6	0	0.097556 8	0	1
<i>Colonial_5<sub>j</sub></i>	Indicator variable for colonial origin (Teorell & Hadenius 2005)	121337	0.221770 8	0	0.415439 4	0	1
<i>Colonial_6<sub>j</sub></i>	Indicator variable for colonial origin (Teorell & Hadenius 2005)	121337	0.045592	0	0.208599 5	0	1

<i>Colonial_7<sub>j</sub></i>	Indicator variable for colonial origin (Teorell & Hadenius 2005)	121337	0.020735 6	0	0.142498 6	0	1
<i>Colonial_8<sub>j</sub></i>	Indicator variable for colonial origin (Teorell & Hadenius 2005)	121337	0.011414 5	0	0.106227 6	0	1
<i>GDP<sub>j</sub></i>	Real GDP per capita (United Nations Statistics Division 2009).	121337	6722.3	2692.564	10104.01	163.3393	40112
<i>Political_stability<sub>j</sub></i>	World Bank Governance Indicator “political stability” (2.5 = perfect stability; Kaufmann et al. 2009)	121337	- 0.206227 6	- 0.235429 7	0.837599 7	-1.734259	1.55767
<i>Age_Democracy<sub>j</sub></i>	Age of democracy. Counts the number of interrupted years of democracy up to year of observation. Own calculation using the revised combined polity score (Marshall & Jaggers 2002).	121337	27.60624	20	21.54908	0	62
<i>Federalism<sub>j</sub></i>	Indicator variable for federal state (1 = federal; Norris 2009).	121337	0.247294 7	0	0.431441 3	0	1

**Table 15: Average marginal effects of Probit estimations (Dependent variable: Acceptance of corruption)**

VARIABLES	(1)	(2)	(3)	(4)	(5)
<i>Religiosity<sub>ij</sub></i>	-0.0373*** (0.00570)	-0.0404*** (0.00675)	-0.0403*** (0.00674)	-0.0468*** (0.00816)	-0.0396*** (0.00712)
<i>Acceptance<sub>j</sub></i>	1.405*** (0.136)	1.478*** (0.208)	1.610*** (0.183)	1.342*** (0.114)	1.467*** (0.115)
<i>CorruptionWB<sub>j</sub></i>	-0.00830** (0.00411)	0.0214 (0.0306)	0.0313 (0.0265)	0.0147 (0.0293)	0.00117 (0.00196)
<i>Income<sub>ij</sub></i>	-0.0229 (0.0354)	0.0211 (0.0405)	0.0204 (0.0404)	-0.00570 (0.0458)	0.000606 (0.0375)
<i>Male<sub>ij</sub></i>	0.0545*** (0.0147)	0.0512*** (0.0165)	0.0516*** (0.0166)	0.0562*** (0.0199)	0.0482*** (0.0180)
<i>Age<sub>ij</sub></i>	-0.366*** (0.0332)	-0.368*** (0.0328)	-0.366*** (0.0340)	-0.424*** (0.0420)	-0.363*** (0.0343)
<i>Married<sub>ij</sub></i>	-0.0657*** (0.0177)	-0.0681*** (0.0133)	-0.0690*** (0.0124)	-0.0845*** (0.0131)	-0.0719*** (0.0133)
<i>Unemployed<sub>ij</sub></i>	0.00231 (0.0283)	0.0313* (0.0179)	0.0312 (0.0191)	0.0184 (0.0190)	0.0255 (0.0191)
<i>Financial_satisfaction<sub>ij</sub></i>	0.0177 (0.0267)	0.0114 (0.0249)	0.0213 (0.0237)	0.0172 (0.0266)	0.0457** (0.0227)
<i>Education<sub>ij</sub></i>	-0.165*** (0.0323)	-0.205*** (0.0254)	-0.202*** (0.0243)	-0.219*** (0.0331)	-0.200*** (0.0280)
<i>Trust<sub>ij</sub></i>	-0.0376 (0.0306)	-0.0536 (0.0332)	-0.0494 (0.0320)	-0.0415 (0.0349)	-0.0401 (0.0383)
<i>Denom_Buddhist<sub>ij</sub></i>	-0.175 (0.213)	0.105** (0.0523)	0.105** (0.0519)	0.142*** (0.0465)	0.0887 (0.0550)
<i>Denom_Hindi<sub>ij</sub></i>	-0.188** (0.0804)	-0.374*** (0.0860)	-0.376*** (0.0907)	-0.253*** (0.0727)	-0.371*** (0.0895)
<i>Denom_Jewish<sub>ij</sub></i>	0.351*** (0.0658)	0.313*** (0.0591)	0.304*** (0.0629)	0.263*** (0.0750)	0.270*** (0.0565)
<i>Denom_Muslim<sub>ij</sub></i>	0.176 (0.134)	-0.0592 (0.0737)	-0.0690 (0.0720)	-0.0436 (0.0654)	-0.0920 (0.0796)
<i>Denom_Orthodox<sub>ij</sub></i>	0.106** (0.0485)	0.113** (0.0501)	0.100** (0.0466)	0.0884* (0.0491)	0.0981** (0.0467)
<i>Denom_Protestant<sub>ij</sub></i>	-0.00892 (0.0617)	0.00506 (0.0593)	-0.00162 (0.0623)	0.0174 (0.0648)	-0.0128 (0.0592)
<i>Denom_Catholic<sub>ij</sub></i>	0.0926** (0.0397)	0.0900*** (0.0322)	0.0906*** (0.0345)	0.125*** (0.0408)	0.0872*** (0.0320)
<i>Male<sub>j</sub></i>					-0.0910 (0.359)
<i>Age<sub>j</sub></i>					-0.578** (0.274)
<i>Married<sub>j</sub></i>					0.337* (0.181)
<i>Unemployed<sub>j</sub></i>					-0.0757** (0.0327)
<i>GDP<sub>j</sub></i>					-0.0164 (0.0255)

<i>Political_stability<sub>j</sub></i>					0.0231
					(0.0187)
<i>Age_Democracy<sub>j</sub></i>					0.295***
					(0.0427)
<i>Federalism<sub>j</sub></i>					-0.0226
					(0.0209)
<i>Denom_Buddhist<sub>j</sub></i>					-0.0165***
					(0.00417)
<i>Denom_Hindi<sub>j</sub></i>					-0.0106
					(0.00746)
<i>Denom_Jewish<sub>j</sub></i>					0.00287
					(0.00664)
<i>Denom_Muslim<sub>j</sub></i>					0.0251
					(0.0404)
<i>Denom_Orthodox<sub>j</sub></i>					0.00109
					(0.0128)
<i>Denom_Protestant<sub>j</sub></i>					-0.0197
					(0.0323)
<i>Denom_Catholic<sub>j</sub></i>					0.00284
					(0.0289)
Fixed effects	none	country	country, year	country, year, region	year
Countries	78	78	78	74	73
Regions	979	979	979	903	893
Years	13	13	13	13	12
Observations	139,826	139,826	139,826	125,387	121,337
Pseudo R-squared	0.2211	0.2344	0.2365	0.1474	0.2229

Estimation with Ordinary Least Squares (with number of respondents per country as weights). Reported numbers are estimated elasticities (with respect to a 1% change for continuous variables and a 1 unit change for dummy variables). Country cluster robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 16: Selected texts on theft and bribery from main sources of major world religions

Judaism	Judeo-Christian	Christianity	Islam	Buddhism	Hinduism
<p><b>Maimonides, Mishneh Torah, Hilchot Gezeilah 1:2</b> It is forbidden to rob or to <b>steal</b> even a minor amount from either a Jew or a gentile.</p> <p><b>Sefer HaChinuch, 259</b> And it is biblically forbidden to <b>steal</b> even a minor amount; even a gentile - it is forbidden to steal from him or to cheat him. And if you stole from him or cheated him you must return the stolen money or object.</p> <p><b>Shulchan Aruch Choshen Mishpat 359:1</b> It is forbidden to rob or to cheat even a minor amount from either a Jew or a gentile.</p> <p><b>Shulchan Aruch (Code of Jewish Law) Choshen Mishpat 348:2</b></p>	<p><b>Old Testament Exodus 20:14-16</b> “You shall not steal.”</p> <p><b>Exodus 23:7-9</b> “Do not accept a <b>bribe</b>, for a <b>bribe</b> blinds those who see and twists the words of the innocent.</p> <p><b>Leviticus 19:10-12</b> “Do not <b>steal</b>. “Do not lie. “Do not deceive one another.</p> <p><b>Deuteronomy 5:18-20</b> “You shall not steal.</p> <p><b>1 Samuel 8:2-4</b> But his sons did not follow his ways. They turned aside after dishonest gain and accepted <b>bribes</b> and perverted justice.</p> <p><b>Job 36:17-19</b> Be careful that no one entices you by riches; do not let a large <b>bribe</b> turn you aside.</p> <p><b>Psalms 15:4-5</b> who lends money to the poor without interest; who does not accept a <b>bribe</b> against the innocent. Whoever does these things will</p>	<p><b>New Testament Matthew 15:18-20</b> For out of the heart come evil thoughts—murder, adultery, sexual immorality, <b>theft</b>, false testimony, slander.</p> <p><b>Matthew 19:17-19</b> “Which ones?” he inquired. Jesus replied, ““You shall not murder, you shall not commit adultery, you shall not <b>steal</b>, you shall not give false testimony,</p> <p><b>Mark 7:20-22</b> For it is from within, out of a person’s heart, that evil thoughts come—sexual immorality, <b>theft</b>, murder,</p> <p><b>Luke 18:19-21</b> You know the commandments: ‘You shall not commit adultery, you shall not murder, you shall not <b>steal</b>, you shall not give false testimony, honor your father and mother.’ ”</p> <p><b>John 10:9-11</b> The thief comes only to <b>steal</b> and kill and destroy; I have come that they may have life, and have it to the</p>	<p><b>Qur’an Al-Baqara, Chapter #2, Verse #188</b> (Pickthal) And eat not up your property among yourselves in vanity, nor seek by it to gain the hearing of the judges that ye may knowingly devour a portion of the property of others wrongfully.</p> <p><b>Al-Maeda, Chapter #5, Verse #38</b> “As for the thief, both male and female, cut off their hands. It is the reward of their own deeds, an exemplary punishment from Allah. Allah is Mighty, Wise.”</p> <p><b>An-Nisa, Chapter #4, Verse #161</b> “And of their taking usury when they were forbidden it, and of their devouring people’s wealth by false pretences, We have prepared for those of them who disbelieve a painful doom.</p> <p><b>Hud, Chapter #11 Verse #85</b> O my people! Give full measure and full weight in justice, and wrong not people in respect of their goods.</p>	<p><b>Second Precepts Of Buddhism</b> “I undertake the training rule to abstain from taking what is not given“</p> <p><b>Buddha’s teaching in Anguttaranikaya</b> “Monks, through repeated stealing and robbing, one is liable to be reborn in hell or in the animal realm or in the realm of hungry ghosts. At the very least, stealing leads to damage and loss of property.”</p> <p><b>Mahasi Sayadaw in Sallekha Sutta</b> “Other people may steal or loot what is not given by the owner. We will avoid doing so”</p> <p><b>Dhammika Sutta, v. 20</b> A disciple then knowing [the law] should refrain from stealing anything at any place; should not cause an-</p>	<p><b>The 10 Vedic Restraints- YAMA 3: Asteya, Nonstealing</b> Uphold the virtue of non stealing, neither thieving, coveting nor failing to repay debt. Control your desires and live within your means. Do not use borrowed resources for unintended purposes or keep them past due. Do not gamble or defraud others. Do not renege on promises. Do not use others’ name, words, resources or rights without permission and acknowledgment.</p> <p><b>The 10 Vedic Restraints- YAMA 8: Arjaya, Honesty</b> Maintain honesty, renouncing deception and wrongdoing-</p>

<p>Anyone who steals even a minor amount violates the prohibition of [Leviticus 19:11] "You shall not <b>steal</b>" and is required to repay [the amount stolen] whether one steals from a Jew or a gentile.</p>	<p>never be shaken.</p> <p><b>Ecclesiastes 7:6-8</b> Extortion turns a wise person into a fool, and a <b>bribe</b> corrupts the heart.</p> <p><b>Isaiah 33:14-16</b> Those who walk righteously and speak what is right, who reject gain from extortion and keep their hands from accepting <b>bribes</b>, who stop their ears against plots of murder and shut their eyes against contemplating evil—</p> <p><b>Amos 5:11-13</b> For I know how many are your offenses and how great your sins. There are those who oppress the innocent and take <b>bribes</b> and deprive the poor of justice in the courts.</p>	<p>full.</p> <p><a href="#">Romans 2:20-22</a> you, then, who teach others, do you not teach yourself? You who preach against <b>stealing</b>, do you steal?</p> <p><a href="#">Ephesians 4:27-29</a> Anyone who has been <b>stealing</b> must <b>steal</b> no longer, but must work, doing something useful with their own hands, that they may have something to share with those in need.</p> <p><a href="#">Revelation 9:20-21</a> Nor did they repent of their murders, their magic arts, their sexual immorality or their <b>thefts</b>.</p>	<p>And do not evil in the earth, causing corruption.</p> <p><b>Hadith</b> <b>Sunan Abu-Dawud, Book #24, Hadith #3573</b> Narrated Abdullah ibn Amr ibn al-As: "The Apostle of Allah (peace be upon him) cursed the one who offers <b>bribe</b> as well as one who accepts <b>bribe</b>."</p> <p><b>Sunan Abu-Dawud, Book #23, Hadith #3534</b> Narrated AbuUmamah: The Prophet said: If anyone intercedes for his brother and he presents a gift to him for it and he accepts it, he approaches a great door of the doors of usury.</p>	<p>other to steal anything, should not consent to the acts of those who steal anything, should avoid every kind of theft.</p>	<p>ing. Act honorably even in hard times. Obey the laws of your nation and locale. Pay your taxes. Be straightforward in business. Do an honest day's work. Do not bribe or accept bribes. Do not cheat, deceive or circumvent to achieve an end. Be frank with yourself. Face and accept your faults without blaming them on others.</p>
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Source: (Judism) Student, Gil (2000). Theft from Gentiles. Retrieved November 11, 2011 from: <http://www.angelfire.com/mt/talmud/theft.html> (Judeo-Christian and Christianity) Bible- New International Version, search words „theft“ „steal“ „bribe“, retrieved November 11, 2011 from: <http://www.biblegateway.com/>, (Islam-Qur'an) Pickthall, M.M. (1995). The meaning of the glorious Qur'an. New Delhi: Madhur Sandesh Sangam, retrieved November 11, 2011 from: <http://www.khayma.com/librarians/call2islaam/quran/pickthall/index.html>. (Islam-Hadith) Abu-Dawud (n.a.), Sunan Abu-Dawud, Kitab Al-Aqdiyah, Book #24, Hadith #3573 and Book #23, Hadith #3534, Retrieved November 11, 2011 from <http://www.yanabi.com/Hadith.aspx?HadithID=143455> and <http://www.yanabi.com/Hadith.aspx?HadithID=143848> (Buddhism) Wat Palelai Singapore (n.a.). Sila and the five precepts. Retrieved November 11, 2011 from: <https://sites.google.com/site/watpalelai/buddhism/practices/the-five-precepts>. Venerable Mahāsi Sayādaw (2006). A Discourse on the Sallekha Sutta. Bhikkhu Pesa, Association for Insight Meditation. [http://www.dhammadownload.com/resources/Mahasi\\_2/A%20Discourse%20on%20the%20Sallekha%20Sutta.pdf](http://www.dhammadownload.com/resources/Mahasi_2/A%20Discourse%20on%20the%20Sallekha%20Sutta.pdf) (Hindusm) Vedic Knowledge online (n.a.), Yamas and Niyamas, retrieved November 11, 2011 from: <http://veda.wikidot.com/yama-niyama#toc5>





Figure 35: Marginal effect of religiosity

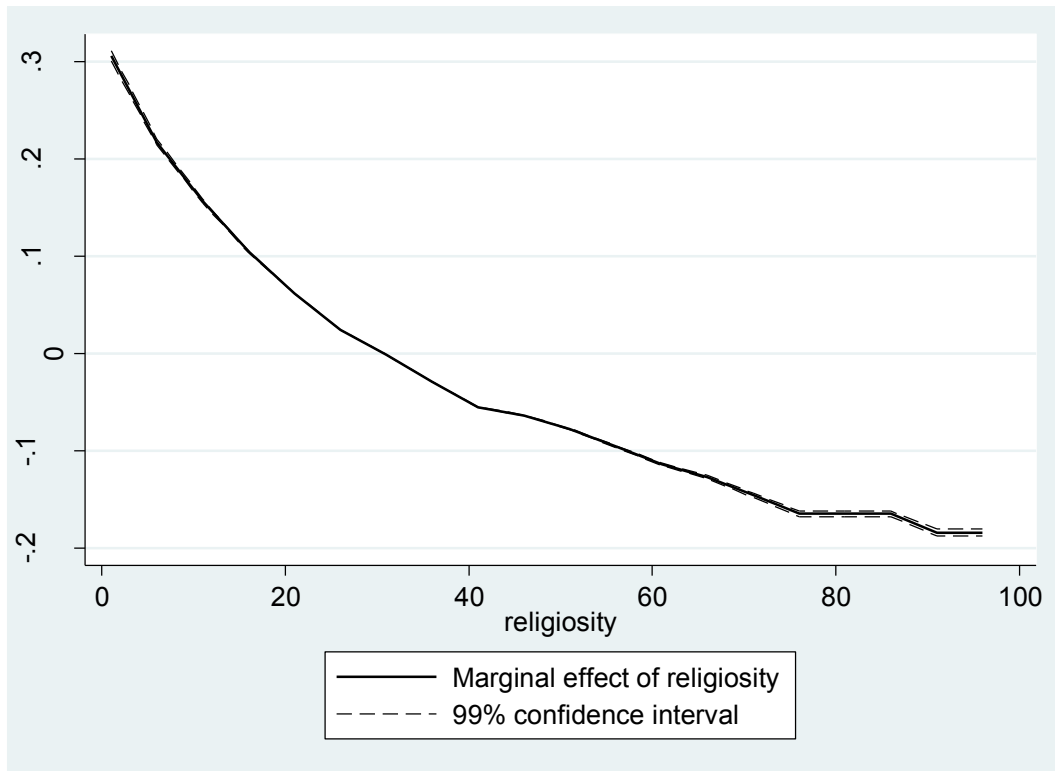


Figure 36: Marginal effect of religiosity by religious denomination

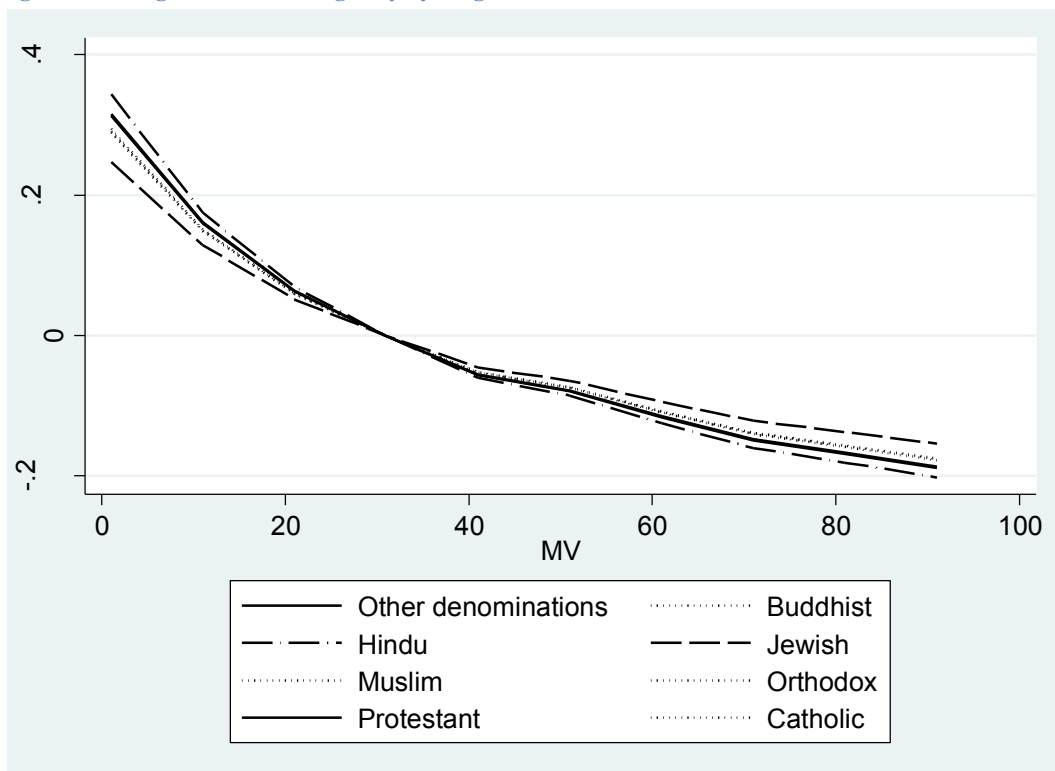
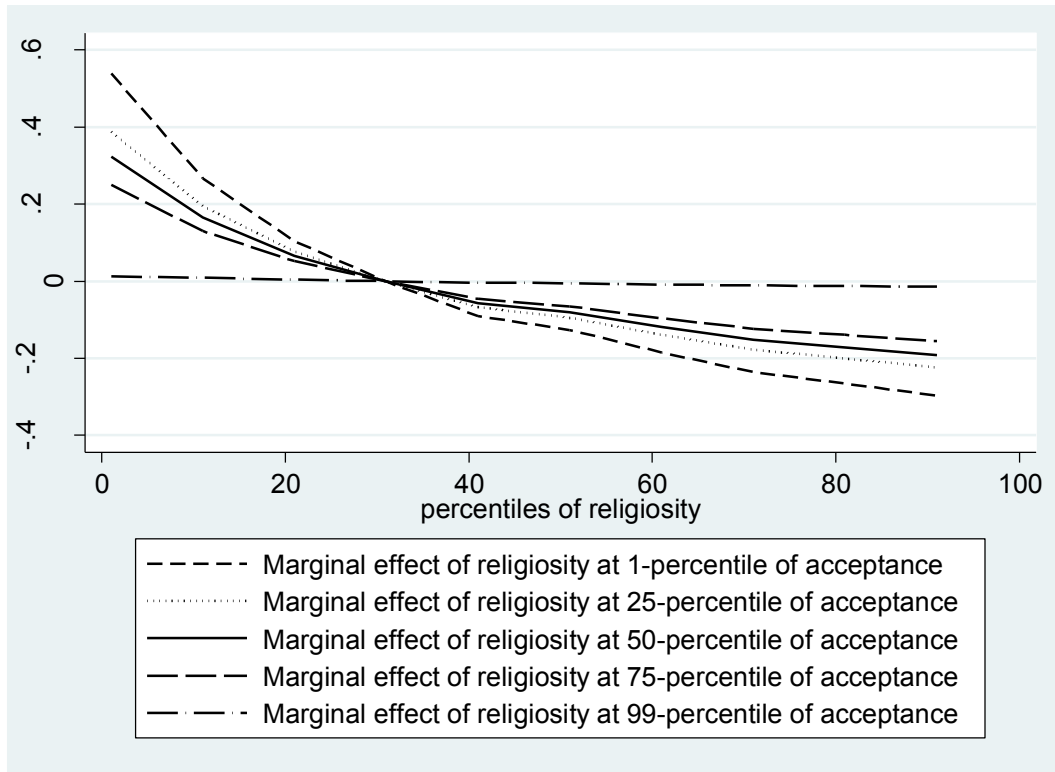


Figure 37: Marginal effect of religiosity by acceptance of corruption (country)



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