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Trust, confidence and economic growth: An evaluation of the Beugelsdijk Hypothesis

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by

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Trust, Confidence and Economic Growth

An Evaluation of the Beugelsdijk Hypothesis

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Abstract

This paper analyses the hypothesis that the robust relationship between trust – as measured by the World Values Survey’s question “In general, do you think that most people can be trusted, or that you can’t be too careful in dealing with people?” – and economic growth, established by empirical macroeconomic growth literature (Knack & Keefer, 1997; Zak & Knack, 2001; Beugelsdijk, de Groot, & van Schaik, 2004; Dearmon & Grier, 2009) in fact captures the well-functioning of institutions.

Our results reveal that the correlation between trust and economic growth is robust in terms of statistical significance and sign of the estimated coefficient, when controlling for the respondents’ perceived well-functioning of institutions. While underlining the existing empirical evidence that trust matters in explaining differences in economic performance, our results also show that this influence is largely independent of institutional well-functioning.

JEL Classification: B40, O11, Z13

Keywords: Trust, Institutions, Economic growth

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1. Introduction

The importance of social capital and implicit institutions to economic growth and development has increasingly been acknowledged by economists (see, for instance, the comprehensive volume edited by Ostrom & Ahn, 2003). While the idea that networks, trust and informal institutions heavily influence day-to-day life has been accentuated in other social sciences, at least, since the 1960s (see, for instance, Rosenberg, 1956; Granovetter, 1973) the widespread and intensive research currently (still) prevailing in economics, was triggered by the first systematic conceptualization of the concept of social capital by James S. Coleman (1988) and the subsequent persuasive studies by Robert D. Putnam (1993) and Francis Fukuyama (1995).

Trust is thereby seen as one of the most important dimensions (Fukuyama, 1995; Knack & Keefer, 1997; Zak & Knack, 2001; Uslaner, 2002). Societies with more trusting people are found to have less crime, better working democratic institutions, less corruption, and more open economies that are (additionally) growing at a faster rate. Fukuyama (1995) argues that complementary to a society's endowment with traditional factors like capital and labor, a propensity to trust in other people, even without any prior acquaintance, constitutes an additional form of (social) capital fostering the success in economic competition. Trust between people reduces transaction costs and facilitates successful collective action (Ostrom & Ahn, 2003), thus contributing to the economic performance in advanced economies.

On the empirical side various lines of research have tried to identify the role of trust on economic outcomes and economic behavior (for a critical review see, for instance, Durlauf, 2002). The seminal contributions linking trust to the macroeconomic growth literature stem from Knack & Keefer (1997), and Zak & Knack (2001). Using a cross-section of countries to determine the long-term economic payoff of social capital both find that generalized trust has a significant positive impact on economic growth. A number of further studies have refined and contributed to the understanding of the linkage between generalized trust and economic development on a macro-level, and the interaction of trust with other human and social capital (Beugelsdijk, de Groot, & van Schaik, 2004; Bjørnskov, 2005; Berggren, Elinder, & Jordahl, 2008; Dearmon & Grier, 2009). Beugelsdijk, de Groot, & van Schaik (2004) perform an extreme bounds analysis (Leamer, 1985) on the data provided by Zak & Knack (2001), where the independent is the per capita GDP growth over the period from 1970 to 1992, and the core independents consisting of the initial level of per capita GDP in 1970, schooling attainment in 1970, and the price of

investment goods as a percentage of US prices in 1970. They add 22 switch variables in groups of three, ranging from black market premium, to the size of labor force to ethnolinguistic fractionalization. Altogether they estimate 1540 equations, finding highly robust results for the positive correlation between economic growth and generalized trust. Dearmon & Grier (2009) find support for the trust-growth relation using a panel of 51 countries. They additionally show that trust significantly interacts with both physical and human capital, applying a plethora of robustness checks.

Berggren, Elinder, & Jordahl (2008) find that the correlation between trust and growth in cross-country analysis is sensitive to the estimator used and the number of observations included into the estimation.¹ They, however, conclude that “[e]ven though trust may not be robustly related to growth, it could still be important to some degrees – and at least as important as many other ‘classic’ variables.” (Berggren, Elinder, & Jordahl, 2008: 267).

All of these studies have in common that the empirical measure used to proxy trust is based on the question: “In general, do you think that most people can be trusted, or that you can’t be too careful in dealing with people?” as proposed by Morris Rosenberg in 1956. The actual values are taken from the World Values Survey (WVS) that contains extensive information on attitudes and norms of respondents in a large number of societies. Trust is measured as the percentage of persons replying “most people can be trusted” in each country.

However, the validity of this trust measure has been called into question by a number of recent publications (Glaeser, Laibson, Scheinkam, & Soutter, 2000; Miller & Mitamura, 2003; Beugelsdijk, 2006; 2008). Beugelsdijk (2006; 2008) argues that there is a mismatch between the theoretical argument, based in transaction cost theory, and the empirical operationalization of trust, based on the WVS’ “generally speaking...” question. He argues that the latter does not measure trust between people but confidence in the well-functioning of institutions.² Following an argumentation introduced by Yamagishi & Yamagishi (1994), and Sapienza, Toldra, & Zingales (2007) of a distinction between trust as a cognitive bias (called benevolence-based trust) and the perception that the incentive structure deters the interaction partner from defecting (labeled deterrence-based trust), Beugelsdijk posits that the generalized trust measure corresponds to the latter category.

¹ The sensitivity of this relationship to the countries included in the estimation was already reported by Beugelsdijk (2006).

² This is what we will call the Beugelsdijk hypothesis.

In what follows we set out to test the Beugelsdijk hypothesis by running a series of growth estimations, similar to Zak & Knack (2001), but additionally testing for the robustness of the trust measure when including variables that proxy the WVS' respondents perception of the well-functioning of institutions. The rest of the paper is thus structured as follows. Section 2 discusses the trust measure as used in macroeconomic growth estimations. Section 3 provides an overview over the discussion on the generalized trust measure, specifically addressing the question of the long-term stability and the validity of the trust measure. Results are presented in Section 4, while the last section concludes.

2. The trust measure

In most literature dealing with cross-country analysis, trust refers to the concept of generalized trust, which is to be distinguished from particularized trust. Whereas the latter describes the trust between people who know each other from either face-to-face interactions or via third parties, the prior describes its extensions to people of whom the trusting part has no direct information. Moreover, trust as understood in economics does not refer primarily to trusting behavior (Glaeser, Laibson, Scheinkam, & Soutter, 2000) but to the assessment of the trustworthiness of (relevant) others.

Trustworthiness is an important motivation to engage in trusting behavior and an essential antecedent of trust in psychological theory (Mayer, Davis, & Schoorman, 1995; Colquitt, Scott, & LePine, 2007), but is mediated by a number of trustor specific characteristics, such as the preference for risk, altruism, and reciprocity (Sapienza, Toldra, & Zingales, 2007). It entails the expectation that the other party will perform a certain action. Lewis and Weigert (1985: 970) note:

First, trust is based on a cognitive process which discriminates among persons and institutions which are trustworthy, distrusted or unknown. In this sense we cognitively choose whom we will trust in which respects and under which circumstances, and we base the choice on what we take to be "good reasons", constituting evidence of trustworthiness.

In this understanding, trustworthiness follows from prior experiences with and the reputation of the potential trustee, or her characteristics. This view is very similar to game-theoretical concepts of reputation effects, and is thus understandable for most economists and political scientists, due to the

impressive theoretical work on this concept. Trusting behavior then constitutes a part of a strategy or is contained in a set of preferences.³

However, decisions about trust often have to be made before enough time has passed to gather sufficient information on the trustworthiness of the other party. Julian Rotter (1967) was among the first to argue that trust may also be seen as a form of personality. He defined interpersonal trust as a form of generalized expectation that the words or promises of any given person could be relied on. This non-experience-based ascription of trustworthiness to strangers has been referred to by other scholars as trust propensity (Mayer, Davis, & Schoorman, 1995), dispositional trust (Kramer, 1999), generalized trust (Stack, 1978), and moralistic trust (Uslaner, 2002). Coleman (1988), Fukuyama (1995) and Uslaner (2002; 2008) extend the argument to social and ethical bases, arguing that trusting behavior towards strangers arises from a community's shared „set of moral values in such a way as to create regular expectations of regular and honest behavior“ (Fukuyama, 1995: 153). These values are learned early in life and passed on from parents to their children. Rice and Feldman (1997) find that values of different ethnic groups in the United States are highly correlated to the values in their countries of origin, even several generations after their families migrated to the US. Uslaner (2008) extends this finding to generalized trust values. In this view trusting behavior is rather a trait that people acquire in the early phases of socialization.⁴

In the macro-economic literature it is usually measured as the response to the question “In general, do you think that most people can be trusted, or that you can't be too careful in dealing with people?” The answer is a binomial choice between “most people can be trusted” and “can't be too careful”, where the trust measure is given by the percentage or share of subjects in each country giving the prior reply. Starting from the seminal work of Morris Rosenberg (1956) this method of measurement has become the most widely employed survey questionnaire measure of trust in the social sciences. It is included in a considerable number of national and cross-national surveys, of which the most prominent is the World Values Survey.

³ A very comprehensive overview on the different views on the issue of trust can be found in the volume edited by Elias Khalil (2003).

⁴ The linkage between experience-based and value-based trust is a matter of ongoing debate. Putnam's (1993) idea that experience-based trust spills over into generalized trust via commitment in voluntary organizations has been disputed in recent studies (Claibourn & Martin, 2000; Uslaner, 2002). However, there are numerous indications that trust propensity may alter the interpretation of others' actions (Colquitt, Scott, & LePine, 2007), and that (conversely) personal experiences and the economic context influence the perceived trustworthiness of strangers (Uslaner, 2002).

3. The discussion on the measurement of generalized trust

The discussion on the measurement of generalized trust basically circles around two central assumptions. The first refers to the stability of the generalized trust measure over extended periods of time. The second, which has gained some attention recently, centers on the validity of the “generally speaking...” question. We will deal with both assumptions at a time, arguing that the assumption of time-invariance may be problematic, and testing the validity of the “generally speaking...” question.

3.1 The stability of the trust measure

From the difference between trust as taste or strategy and trust as trait follows that the prior, being based solely on personal experience, is rather fragile whereas the second, based on values, is highly stable over long periods of time. Given that the propensity to trust is learned in the formative years of early childhood it is reasonable to assume that such imprinting will significantly shape a person’s trust patterns. In an early study Katz and Rotter (1969) showed that 75 percent of the variation in trust values of college students could be explained by their parents’ trust values. Uslaner (2002) reports that across a series of panel surveys, ranging between 2 and 17 years, between 75 percent and 86 percent of the respondents gave consistent answers to the “generally speaking...” question. Additionally, given the results by Rice and Feldman (1997), and Uslaner (2004), cited in the previous section, it must be assumed that the propensity to trust is strongly influenced by cultural elements that are transmitted intergenerationally over extended periods of time. Bjørnskov (2005) argues that the propensity to trust must be in equilibrium at the level of society, as repeated misfits between expectations and behavior would lead an individual to eventually update her beliefs. As individuals act on their beliefs by reciprocating trust (cf. Guerra & Zizzo, 2004), such an equilibrium will probably turn out to be self-enforcing. Under such circumstances beliefs will be confirmed by the behavior of others, and neither updating nor a change in behavior should occur.

The long-term stability of generalized trust is especially important to economic literature, as it allows to assume that this societal feature is exogenous to economic development, and thus fit to be included in growth estimations inspired by the seminal work of Robert Barro (1991) (cf. Knack & Keefer, 1997; Zak & Knack, 2001; Beugelsdijk, de Groot, & van Schaik, 2004; Bjørnskov, 2005; Dearmon & Grier, 2009). As trust values are measured on an irregular basis, the stability assumptions allows inferring that the values were the same prior to the period of observed economic development.

However, whereas economic literature assumes time-invariant trust values, sociological and political sciences only conjecture stable, but not immovable trust patterns. Eric M. Uslaner, using American National Election Survey data, observes that in the United States

Trust is one of the most stable values, but it has fallen sharply from its high in the boom years of the 1960s. [...] Trust has fallen from 58 percent in 1960, the first time the question appeared on a national survey, to about 36 percent in 1996. (Uslaner, 2002: 160)

Thus, we have to acknowledge that even though generalized trust may be stable over some time it may nevertheless be subject to change. There are a number of reasons to believe that social trust can significantly change over time. First, even if trust propensity is learned in early childhood and comparatively stable over a life-time, changes in the demographic composition of a society could severely affect the trust value. Putnam (2000) shows that younger Americans are a lot less trusting than their older fellow citizens, indicating a cohort effect on generalized trust levels. Additionally, as descendants of immigrants exhibit similar levels of trust as the current inhabitants of their country of origin (Rice and Feldman, 1997), migration, both to and from a country, may also alter trust patterns. Second, the ongoing globalization has repeatedly sparked concerns that the economic integration across national borders leads to processes of global value adaptation, undermining features such as trust or social cohesion (Bauman, 1998; Ritzer, 2004). The rationale here can be traced back to the equilibrium property of trust as proposed by Bjørnskov (2005). As globalization is characterized by an increasing international mobility (of labour, capital, etc.) and accelerating global social interactions, transactions between members of low-trust and high-trust societies become more and more likely, possibly functioning as a form of exogenous shock to both groups (Whalley, 2005). Third, there is increasing evidence that economic development may, as such, also exert an influence on the levels of generalized trust, indicating an endogenous process. In fact the strong correlation between trust and growth found in many studies could also be due to the fact that rich people can simply afford to trust, as defection may not have such devastating consequences for them as for poorer people. This assumption is corroborated by micro-based findings that both a person's real income and the median income of her area of living are positively correlated with the exhibited value of generalized trust (Alesina & La Ferrara, 2000). Another robust result from most cross-country estimations is that economic inequality exerts a strong influence on the level trust (Zak & Knaack, 2001; Uslaner, 2002; Bjørnskov, 2005).

Table 1 tracks the stability of the generalized trust measure over time.⁵ The dependent variable is the level of generalized trust which depending on data availability measured at each wave of the WVS, starting from the second time of measurement. Thus only countries are included who have been part of the WVS for at least two times (a total number of 70 countries). These values are regressed on the initial values of trust (as measured the first time the country took part in the WVS) and dummies for each wave. The table thus repeats the stability exercise by Volken (2002) and Bjørnskov (2005), but including the fifth wave of the WVS and applying panel estimates for the first time. Instead of adding, whether the country has been a part of the Warsaw Pact, we include a variable denoting if there has appeared a major policy shift in the time between the first and the consecutive measurements, as indicated by the Polity IV data set (Integrated Network for Societal Conflict Research, 2007). This is due to the fact that important changes, dismantling the entire system of society have not only taken place in the transitional economies, but also in South Africa, for instance. Thus considering policy change should give a more exhaustive impression.

The results indeed suggest that there is a strong influence of the initial values of trust, and that there seems to be a negative influence of dramatic changes in policy. However, columns 2 to 4 indicate that the trust levels differ significantly between the waves. More explicitly it seems that in the second wave observed levels of trust were higher than for the consecutive waves, indicating a gradual decline in trust levels worldwide. This is consistent with observation by Putnam (2000) and Uslaner (2002) for the United States.

Table 1. Stability of the generalized trust measure^{a,b}

Estimation method	1	2	3	4	5	6	7
	OLS	OLS	FE	FE	OLS	FE	FE
<i>Variables of interest</i>							
Initial trust	0.760*** (9.68)	0.770*** (10.03)			1.009*** (10.05)		
Policy change	-0.056** (-2.37)	-0.050** (-2.14)	-0.089 (-1.19)	-0.089 (-1.19)	-0.107*** (-2.86)	-0.087 (-1.54)	-0.087 (-1.54)
Study	0.193*** (11.35)	0.213*** (10.98)	0.211*** (10.19)	0.211*** (10.19)	0.145*** (2.62)	0.145** (2.55)	0.145** (2.55)
Second wave			0.056*** (2.97)			0.054*** (3.28)	
Third wave		-0.059*** (-3.26)	0.002 (0.11)	-0.054*** (-2.85)	-0.060*** (-3.48)	-0.004 (-0.20)	-0.057*** (-3.25)
Fourth wave		-0.037** (-2.31)	0.024 (1.52)	-0.032* (-1.88)	-0.036** (-2.51)	0.018 (1.08)	-0.036** (-2.47)
Fifth wave		-0.066***		-0.056***	-0.056***		-0.054***

⁵ The data base to these and the following exercises is comprehensively discussed in section 4.

		(-3.78)		(-2.97)	(-3.50)		(-3.28)
Observations	175	175	175	175	76	76	76
(Adj./overall) R ²	.64	.66	.15	.15	.80	.11	.11
F/Wald statistic	216.34	249.51	28.27	28.27	139.54	5.20	5.20

^a, dependent variable is the generalized trust value at the time of measurement

^b, all regressions include a constant term (t-values in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level

Not for all countries in the sample the first observation coincides with the first wave and not all initial trust values stem from the early 1980ies. Hence, the results could be influenced by a sampling bias. Therefore columns 5 to 7 repeat the exercise including a subset of countries who were all included in the first wave of the WVS (a total number of 23 countries). While underlining the strong effect of initial trust values, and hence the stability of generalized trust values, it also emphasizes the fact that these values are not immovable. Between 64 percent and 80 percent of the variation is explained in the OLS estimation. However, if the effects are fixed across all countries these values drop to 15 percent and 11 percent, respectively, underlining the strong effect of the initial values.

In summary, it needs to be stressed, that the general assumption, most prevalent in economics, that the national trust scores are fixed across time does not hold if subjected to econometric scrutiny. However, the results indicate that changes taking place are small and probably slow. Compared to the influence of the initial trust values, the coefficients for the particular waves are, at best, less than one tenth in magnitude. Nevertheless, the results in Table 1 show that the national trust scores differ across the waves. To account for these differences we will refrain from using average growth rates over several decades, as is usually done in cross-country analysis (Knack & Keefer, 1997; Zak & Knack, 2001; Beugelsdijk, de Groot, & van Schaik, 2004; Bjørnskov, 2005), and instead follow the example of Dearmon and Grier (2009) and use observation windows for each country and year in which the survey was conducted. This procedure entails the additional advantage that it increases the overall number of observations, as for each country this number increases from one to the number of surveys in which the country was included, such that the total number of observations n , increases from $n = i$ to $n = i \times j$, with $i = 1, \dots, l$ countries in $j = 1, \dots, k$ survey waves.

3.2 The validity of the “generally speaking...” question

The validity of the measurement of trust, as conducted by the “generally speaking...” question, has recently received growing attention in psychology and economics (Glaeser, Laibson, Scheinkamn, & Soutter, 2000; Miller & Mitamura, 2003; Beugeldijk, 2006; Sapienza, Toldra, & Zingales, 2007; Uslaner, 2008; Beugeldijk, 2008). The cause of this discussion can be found in the ever-more fine grained differentiation of the concept of trust on the individual/firm level, where a plethora of types and typologies of trust were introduced in recent years (cf. Das & Teng, 2001).⁶ Calculus-based trust, for instance, derives from the trustor’s perception that the trustee will perform an action that is beneficial for the trustor. This perception can be motivated by a number of circumstances. In relational trust, it stems from repeated interactions, where reliability and dependability in past interactions, induce positive anticipations of the trustee’s intention (Rousseau, Sitkim, Burt, & Camerer, 1998).

Referring to a transaction cost reducing argument macro-economic literature, on the other hand usually applies the single concept of generalized trust, which has been introduced above. This form of trust is measured using the “generally speaking...” question. However, whether this question really measures trust propensity is still a question of debate and has sparked a heated argument in economics, amongst others, between Sjoerd Beugeldijk and Eric M. Uslaner in the Cambridge Journal of Economics in 2008.

There is good reason to believe that the generalized trust question indeed measures average trust propensity in a society. The first thing to note is that this basic propensity, which is acquired in early childhood, has been established by a long and venerable tradition in developmental psychology (Rotter, 1967; Stack, 1978; Mayer, Davis, & Schoorman, 1995; Kramer, 1999; Colquitt, Scott, & LePine, 2007). It refers to the generalized expectancy that others (independent of prior experiences) can be relied on, e.g. to honor their obligations, act and negotiate predictably and fair while faced with the opportunity to behave opportunistically (Zaheer, McEvily, & Perrone, 1998). In the Pilot to American Nation Election Survey in 2000 a subsample of respondents were asked to take part in a ‘think aloud’ experiments, requesting them to state what they thought the respective questions implied. 72% of those taking part in the experiment gave “general” responses to the “generally speaking...” question, while only a minority referred to personal experiences or their personal environment (Uslaner, 2002: 72 et seq.). Knack and Keefer (1997) cite a study conducted by the Reader’s Digest in which wallets containing \$50 worth of cash, as well as the phone number and the address of the alleged owners were “accidentally”

⁶ There is also a special issue on the economic implications of trust on the firm/individual level in the Academy of Management Review, 1998, Vol. 23 (3).

dropped in 20 European and 10 US cities. The percentage of wallets returned intact (by strangers) correlated at $\rho = 0.67$ with the World Values Survey “generally speaking...” question. It correlated much lower with a question assessing trust in family members, such that the “generally speaking...” question seems to capture a more generalized trust, as opposed to particularized trust in people whom one knows from repeated interactions. Sapienza, Toldra, & Zingales (2007), running a modified version of the trust game (Berg, Dickhaut, & Kevin, 1995), find that the sender’s expectation of the trustworthiness of the receiver is highly correlated with the answer given to the generalized trust question (and a good predictor of the amount transferred in the first stage of the trust game).

However, there are both methodological and theoretical problems that may impede the validity of the “generally speaking...” question. First, it has been repeatedly criticized that the wording of the trust item is somewhat ambiguous, especially with respect to the frame of reference respondents refer to when thinking about “people” (Knack & Keefer, 1997; Bjørnskov, 2005). While it may be clear that it is sufficient to ensure that this frame is extended beyond the vicinities of friends and family, it is less clear how much further it reaches (Hardin, 2002). Estimation results will be biased if the implications of “most people” differ systematically across societies (e.g. respondents in low-trust countries consider only persons they, at least infrequently, interact with, while respondents from high-trust countries consider indeed all people in their country or even in the world).⁷ Second, Miller and Mitamura (2003) argue that the internal validity and interpretative meaning of the trust item, assessed by the WVS, may be severely obstructed due to systematic conflation of two different concepts. They hold that the survey question does not constitute a single scale, but matches two different discrete items. As the respondents can choose between “most people can be trusted” and “can’t be too careful”, they argue that the binomial choice is not trust and distrust, but trust and caution. The latter pair, however, can hardly be viewed as opposites.⁸ Experiments show that when trust is measured on a separate scale by removing caution, Americans exhibit higher levels of generalized trust than Japanese, which contradicts the results obtained from the WVS. Cross-country comparisons may then yield biased results if caution is more

⁷ Putnam (2000: 137 et seq.) additionally argues that the responses to the “general speaking...” question are ambiguous with respect to the objectivity of change in peoples’ behavior. Note that it does not make a difference for the underlying argument if the level of honesty really changes or people become more paranoid (due to lurid media reports or for other reasons). As people can be expected to act on their beliefs, the perception of reduced levels of trustworthiness will lead to less trusting behavior (whether objectively justified or not), likewise reducing the perception of general trustworthiness by others. This should eventually shift the equilibrium to a new and lower trust value.

⁸ “[C]ertainly it is possible for a person to believe most people can be trusted, and at the same time believe that it is prudent to be cautious. It is reasonable, for example, to believe that the overwhelmingly majority of people will never try to burglarize one’s house, but still choose to lock one’s door.” (Miller & Mitamura, 2003: 63)

advised in one society than in another. Also, risk-preferences and risk perception is known differ across cultures (Weber & Hsee, 1998), which may put an additional bias on the estimated trust scores.

Questions concerning the validity of the “generally speaking...” question also arise from a more theoretical point of view. Beugeldijk (2006; 2008) argues that the transaction cost reducing argument put forward in economics may not be as easily transferable from the micro to the macro level as is purported in the literature. His critique refers only partially to the well-known problem of aggregation, which holds that the aggregation of individual behavior becomes a critical undertaking, once the population is not homogenous in the observed behavior (Hildenbrand, 2008). This implies that micro-level constructs, like trust, cannot simply be aggregated over (highly) heterogenous populations, which is the case for generalized trust (Glaeser, Laibson, Scheinkamn, & Soutter, 2000), assuming that the obtained macro-level value is still a valid representation of its individual-level counterpart (Morgeson & Hofmann, 1999). Dissecting the theoretical reasoning behind the seminal article by Knack and Keefer (1997), he goes on claiming that in the theoretical argumentation put forward by macro-economic literature there is an inconsistent leap from trust to confidence. Whereas the concept of trust refers to the transaction cost argument, as explicated above, the concept of confidence, as taken from Arrow (1972),⁹ refers to the positive role of well-functioning institutions in economic development.

Beugeldijk (2006: 376) thus suggests:

that the question ‘Generally speaking, would you say most people can be trusted, or that you cannot be too careful in dealing with people?’ used in macro studies like those of Knack and Keefer (1997) and Zak and Knack (2001) is not the proper way to measure the degree of trust. [...] The fact that this question results in lower scores on trust in poorer countries than in richer countries does not imply that high levels of trust are important for economic development. It does not, for the simple reason that it does not do justice to the important distinction between micro and macro trust. Of these two types of trust, the WVS ‘generally speaking’ question comes closest to the latter one, macro trust. But given the theoretical reasoning [...], *a low score on this variable does not imply a lack of interpersonal trust in poor countries, but only shows the lack of well-functioning institutions.* (italics added by Volland)

⁹ Arrow (1972: 360) discussing a book by Richard M. Titmuss (1971: *The Gift Relationship: From Human Blood to Social Policy*, Pantheon Books, London), argues that any “expression of impersonal altruism [...] is not the richness of family relationships or the close ties of a small community [...]. It is rather a diffuse expression of confidence by individuals in the workings of a society as a whole.”

The generalized trust question then elicits the respondent's belief in the certainty with which a trustee behaving opportunistically will be punished, i.e. how high the costs for defection are if a trustee decides to play a one-shot strategy. Given this reasoning a finder returns a stranger's wallet intact because she fears legal prosecution or other social ostracism. When the functioning of institutions improves people may therefore risk exhibiting a higher willingness to be vulnerable (Mayer, Davis, & Schoorman, 1995: 712), because the improvement of institutions increases the chances of being convicted for - and hence the opportunity costs of - opportunistic behavior. The importance of well-functioning institutions, the security of property and contractual rights, and the efficiency of governments in providing public goods and creating government policies, have a long-standing tradition in the economics of development (cf. Olson, 1982; Weingast, 1997). North (1991: 54), for instance, holds that "the inability of societies to develop effective, low-cost enforcement of contracts is the most important source of both historical stagnation and contemporary underdevelopment in the Third World" because "the absence of secure property and contractual rights discourages investment and specialization." (Knack & Keefer, 2003: 56). Telling a story about the relationship between economic growth and generalized trust, would thus simply boil down to re-telling the story about the relationship between economic growth and well-functioning institutions.¹⁰

Beugelsdijk (2006) substantiates his argument that the macro-foundations of the trust measure are well-functioning institutions, by a sequence of principal component analyses (PCA), showing strong links between government performance and generalized trust on a macro level. In fact, generalized trust loads strongly (0.8) on one dimension with variables describing quality of governance, amongst others contract enforceability (0.917), the rule of law (0.91), social infrastructure (0.936), and the Transparency International corruption index (0.925). However, as Uslaner (2008) points out, the analysis suffers from several shortcomings. First, excluding relevant cases by restricting the analysis to Europe, necessarily introduces a selection bias. Second, the restricted number of observations (41 societies) and the comparatively high number of variables (18), results in only 2.3 observations per manifest variable invoking an issue of insufficient degrees of freedom.¹¹ Recently, Peres-Neto, Jackson, and Somers (2005) conducted an extensive simulation study, showing that the results of different PCA approaches are

¹⁰ Several authors (cf. Yamagishi & Yamagishi, 1994; Sapienza, Toldra, & Zingales, 2007) have suggested a distinction between two different types of trust. One is based on "deterrence" and thus corresponds to the well-functioning of institutions and the other is based on "benevolence" and thus corresponds to the general cognitive bias described above. The essence of Beugelsdijk's critique is the argument that the "generally speaking..." question measures only the prior form of trust.

¹¹ In order to avoid computational difficulties, the general rule of thumb usually referred to in the literature specifies between 5 and 10 observations per variable as a bare minimum, (cf. Burstyn, 2004; Uslaner, 2008).

highly sensitive to the number of observations and variables. In another simulation study Dray (2008) shows that the power of a PCA depends inversely on the number of observations. Additionally, the eigenvalues of the covariance matrix are affected by the number of observations, in a way that the eigenvalues increase with decreasing observations (Watkins). Thus, the eigenvalues obtained from Beugelsdijk's analysis may also be biased due to the low number of observations. Hence, even if one buys into the argumentation put forth by Beugelsdijk (2006; 2008), there may be serious doubt concerning the results of the statistical analysis presented.

4. Data and Empirics We will try to test Beugelsdijk's hypothesis applying a classical econometric approach. We will therefore run Barro-type growth estimations including both generalized trust and proxies for the well-functioning of institutions. Our approach is thus comparable to most cross-country analysis since the seminal work by Knack and Keefer (1997). It is similar to the approach by Zak and Knack (2001), however using a larger and more balanced data set and a panel of countries. Additionally, we derive the proxies for the well-functioning of institutions from the same data set than our trust values (hence, the WVS), and thus do not have to employ data from other surveys, like the Business Environmental Risk Intelligence or the International Country Risk Guide, based on (potentially) different samples. Since, in our approach, the same subjects answer on both the trust and well-functioning of institutions questions, we minimize problems arising from systematic differences between the data sets.

Aside from the WVS, the main datasets used in our empirical analysis are the Penn World Tables, version 6.3 (Heston, Summers, & Aten, 2009) and The World Bank's World Development Indicators and Global Development Finance (The World Bank, 2010). Additionally we obtained average years of schooling from Barro and Lee (1993) and enrollment rates for primary, secondary and tertiary education from various issues of the UNESCO's Statistical Yearbook (before 2000) and the Education Digest (after 2000). Some data were additionally added from the Historical Data Files of the International Macroeconomic Data Set (US States Department of Agriculture, 2010), the Total Economy Database (Conference Board, 2010), the External Wealth of Nations Mark II (Lane & Milesi-Ferretti, 2007), the UCDP/PRIO Armed Conflict Dataset, version 4-2009 (Department of Peace and Conflict Research, Uppsala University, 2008), the Polity IV: Regime Authority Characteristics and Transitions Datasets, version 2007 (Integrated Network for Societal Conflict Research, 2007), and various versions of the CIA's World Factbook. Finally, ethnic fractionalization of countries was taken from Fearon (2003) and Roeder (2001), and religious

denomination from Sala-i-Martin (1997) and the Quality of Government Data, version 17June09 (Teorell, Charron, Samanni, Holmberg, & Rothstein, 2009).

Following Dearmon and Grier (2009) we will use observation windows for each WVS country/wave. We thereby pay tribute to the finding that generalized trust values are not time-invariant, but subject to change. While results presented in section 3.1 suggest not to treat generalized trust as a fixed value over extended periods of time, they also emphasize that it is nevertheless save to assume that these values change at best marginally over short time periods. Thus, similar to the studies that have been conducted since the seminal work of Knack and Keefer (1997), our dependent is the average growth rate of a country in a period ranging from four years prior to the observation to four years after the WVS-observation. Thus if the WVS was conducted in country i in 1991, the observation window will cover the period from 1987 to 1995.¹² Independent variables are taken either as averages over the same period or, depending on pending problems of endogeneity, in the year prior to the first year of the observation window. WVS data are the limiting factors in terms of observations and countries. We obtain a total of 277 observations, stretched over a period from 1981 to 2009.

4.1. Trust and well-functioning institutions

We obtain the trust value as the share of people in each country answering “most people can be trusted” to the dichotomous “generally speaking...” question in the combined European and World Values Survey, including all five waves conducted between 1981 and 2009, and corresponding to 355,298 individual cases from 98 world societies. Values range from a low of 0.028 in Brazil in 1997 to a high of 0.741 in Norway in 2007. The surveys include between 393 (Malta, 1991) to 6,025 (Colombia, 1999) respondents, designed to be nationally representative samples. 27 additional observations were taken from the Life in Transition Survey (LITS) conducted by the European Bank for Reconstruction and Development (EBRD) that asked the same “generally speaking...” question.

We employ three different proxies of the well-functioning of institutions. These proxies are derived from a set of questions, aimed to access the subject’s confidence in various organizations and institutions,

¹² Note that estimating growth models using a panel approach and (shortened) observation windows, generally leads to similar results than in cross-country analysis (Grier & Tullock, 1989; Islam, 1995; Dawson, 1998; Dearmon & Grier, 2009). To control for possible effects of endogeneity the analysis were also conducted using an observation window reduced to the four years following the WVS-observation, leading to similar results.

ranging from Churches to international institutions, like the NATO or NAFTA to political institutions like the government or the presidency. The question is phrased: "I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all?" The answer is coded from 1 (a great deal of confidence) to 4 (none at all). We will concentrate on the items "The Police", "The Justice System", and "The Civil Services" as they represent the major institutions assuring and enforcing contractual and property rights, and are closely connected to the efficiency of government. To generate comparable values we estimated the share of people who answered that they had a great deal or some confidence in the relevant institutions. A forth measure that assesses the (subjective impression on the) extent of political corruption, was taken from Transparency International's Corruption Perception Index (CPI). It is obtained from a minimum of three surveys per country that ask for the perceptions on the degree of corruption in each country by businessmen, risk analysts and the general public (Graf Lambsdorff, 2000). Values range from 0 (highly corrupt) to 10 (highly clean).¹³ As the CPI was surveyed for the first time in 1995 we have to extrapolate the corruption values for earlier country/year averages from the first available estimate.

For a number of reasons, we believe that these subjective assessments of institutional well-functioning are better suited for the purpose of this contribution than alternative (objective) measures like the International Country Risk Guide (ICRG) used by other studies (cf. Zak & Knack, 2001). First, it assesses institutional well-functioning from the same sample as generalized trust, and thus minimizes problems arising from systematic differences between the data sets. Second, Beugelsdijk (2006; 2008) argues that trust as assessed by the "generally speaking..." question is simply a proxy for the well-functioning of institutions, and may say nothing about the trust between people, even in so-called "low-trust" countries. However, from his line of argument it becomes apparent that it is less the well-functioning of institutions, per se, but rather the people's confidence in well-functioning of institutions.¹⁴ It is evident that whereas the prior might be better measured by objective criteria, as for instance applied in the

¹³ Note, that the perceived prevalence of political corruption was assessed by the WVS in the 3rd wave (1994-1999) only. Thus the number of observations is limited to 51 country/wave values. In the WVS the prevalence of corruption was assessed by the following question: "How widespread do you think bride taking and corruption is in this country?" Potential values range from 1 (Almost no public officials engaged in it) to 4 (Almost all public officials are engaged in it). A comparison of the CPI values with the aggregated corruption assessment from the WVS reveals that both values are highly correlated ($n = 51$; $\rho = 0.9025$). In order to preserve the panel structure of our data and the high number of observations employing CPI values as a proxy for the perception of the prevalence of corruption seems justified.

¹⁴ See also the quote from Arrow (1972) in footnote 9.

ICRG, the latter will provide a better predictor for behavior. My trusting behavior should not differ if I am wrongly or correctly under the impression that the legal system and its executive organs are unwilling or unable to defend my property or prosecute others who have wronged me.

Table 2 gives some descriptive statistics on the four measures of institutional well-functioning. It is apparent that a higher amount of people express confidence in public institutions, like the legal system and the police than is given by the generalized trust measure. Additionally, the standard deviation of all measures of institutional well-functioning is bigger than for the generalized trust question, indicating a greater volatility in these measures than in generalized trust.

Table 2. Descriptives for the WVS Trust and Confidence Measures

Name	1	2	3	4	5
	Mean	Standard Deviation	Minimum	Maximum	Observations
Generalized trust	0.3076103	0.1520799	0.0280456	0.7416503	277
Confidence in Police	0.5584045	0.1967426	0.127551	0.932377	265
Confidence in Justice System	0.5081973	0.1723109	0.0815627	0.9031359	231
Confidence in Civil Services	0.4548692	0.1662355	0.0582121	0.959596	237
Perception of Corruption	4.967316	2.416118	0.69	10	272

Source: European and World values Survey, Life in Transition Survey, Transparency International Corruption Perception Index

A more reliable, indication on the link between generalized trust and confidence in the well-functioning of institutions can be obtained from looking at the correlation structure. Figure 1 to Figure 4 present the correlation between generalized trust and confidence in the respective institutions for all four measures.

Insert Figures 1 to 4 here

The number of observations and Pearson's product-moment correlation coefficient (ρ) are given on the bottom right-side of the plot area. The correlation coefficients range between $\rho = 0.0306$ for confidence in the civil services to $\rho = 0.5583$ for confidence in the police. Especially prevalence of corruption and confidence in the police are strongly correlated with generalized trust supporting the argument put forward by Beugelsdijk (2006; 2008). In order to see whether there were apparent differences between countries, depending on their status of development, observations were divided

into Low-income, Middle-income and high-income countries, along the lines of the World Bank Country Classification from 2000 (World Bank, 2004). However, while high-income countries exhibit, on average, higher trust and higher confidence values, the linkage between trust and confidence in institutions seems to differ only in the case of corruption. While for high income countries the correlation between generalized trust and corruption is high and positive ($\rho = 0.6876$), suggesting a link between trust and corruption, the same value is low and negative for low and middle income countries ($\rho = -0.1917$ for low income countries and $\rho = -0.2268$ for middle income countries). Thus, if we posit a causal link from corruption to trust (as it is, for instance, suggested by Zak and Knack (2001), and Bjørnskov (2005)) the effect is different for developing and developed countries. Whereas trust decreases with corruption in highly developed countries, it has little to no effect in developing economies. The reasons therefore may be plentiful. First, high-trust equilibria may simply be more fragile than low-trust equilibria, i.e. if I already distrust the people around me, the marginal effects of corruption on my perception of other's trustworthiness may be small to non-existent. On the other hand, given that the correlation for developing countries is negative, another explanation may be warranted. If corruption is high, people with insufficient funding to bribe officials may have to cooperate more closely with fellow citizens in order to make ends meet. This forced cooperation may eventually lead to increases in trust.¹⁵

4.2. Trust, Investment and Growth

While regressing generalized trust on institutional well-functioning shows robust correlations between trust and well-functioning institutions at the macro level (cf. Zak & Knack, 2001; Bjørnskov, 2005) it is, nevertheless, insufficient to test the "Beugelsdijk-hypothesis" that there may be a mismatch between theoretical reasoning and the empirical operationalisation of trust. In fact, including formal institutions in such an estimation raises the variation explained only by six to nine percent compared to a base model containing GDP, average schooling, and a property rights index (Zak & Knack, 2001). Instead of trying to estimate the effects of formal institutions on generalized trust we will therefore estimate the effects of these measures on economic growth. The rationale behind this estimation strategy is simply that if generalized trust (as measured by the "generally speaking..." question) indeed assesses the perceived well-functioning of institutions, including additional variables accounting for the same quality should introduce high levels of multicollinearity, canceling the significance of the highly correlated

¹⁵ Note, that a similar argument on the development of trust due to "forced" cooperation is made by Dudley (2010) for the case of the invention of general purpose technologies during the industrial revolution.

variables (Berry, 1993). In case generalized trust is a surrogate for an aggregated measure of institutional well-functioning, not correlated (highly) to each single institutional measure, adding its components to the estimation should both alter the size of the coefficient and eventually render the variable insignificant in favor of its better fitting components.

We thus run Barro-type growth regressions, where the dependent is the annual average growth rate in the observation window. The specification of the base model corresponds to the one by Zak and Knack (2001) and Beugelsdijk, de Groot, & van Schaik (2004) with the independent variables being the real GDP per capita (from Heston, Summers, & Aten, 2009) in the year prior to the observation window, average schooling attainment (mean years of schooling for the population aged 25 and older) from Barro and Lee (1993), and the price of investment goods relative to US prices (Heston, Summers, & Aten, 2009) for the same year. Additionally it contains the trust value. Wave-dummies are included to control for global economic phenomena like the oil crises in the late 1970s and early 1980s, or the dot-com bubble in the late 1990s and its subsequent stock market crash in the early 2000s.

To investigate whether the obtained estimates deviate in size or robustness from the ones obtained by standard cross-country analysis we include a number of control variables. The controls largely correspond to the ones that have been employed in growth estimations so far (Barro, 1991; Sala-i-Martin, 1997; Knack & Keefer, 1997; Zak & Knack, 2001; Beugelsdijk, de Groot, & van Schaik, 2004; Bjørnskov, 2005). They include openness of the economy to trade, the size of the population (in millions of people), the average life expectancy in years, the size of the rural population, the share of industry and agriculture in value added, military expenditures, per capita energy use, fuel exports as % of total exports, ore and metal exports as % of total exports, the external wealth of the country (in billions of US \$), and the political stability of the country. Values for all these variables were taken from the year preceding the first year of the observation window. The share of investment in GDP, the real interest rate, the growth of the real exchange rate to the US \$, and the democracy score were taken as annual averages over the observation period. Time-invariant variables included the land-surface area (in $km^2 \times 10^3$), the average latitude of a country, a dummy denoting membership in the Commonwealth of Nations/ former British colony, and a dummy for access to international waters. Other dummies code whether the country was a member of the European Union or its predecessors at any time in the observation window, the intensity of any armed conflict, both in and up to 15 years before the observation period. Ethnic fractionalization and the fraction of different religions and denominations in

a country were estimated for each observation using a variety of different sources.¹⁶ A complete list of variables including a description and information on the sources can be found in the Appendix.

5. Results

5.1. Comparability of cross-section and panel data

Table 3 presents the results for the baseline model and the robustness checks. To ensure sufficient degrees of freedom three to four variables were included at a time. All estimations were conducted using OLS and random effects panel estimation.¹⁷ As the signs, coefficients, and p-values are similar, we report OLS estimates only for the baseline model.

Insert Table 3 here

The estimates obtained from Table 3 are largely similar to the ones from prior cross-country estimations (cf. Barro, 1991; Knack & Keefer, 1997; Zak & Knack, 2001; Beugelsdijk, de Groot, & van Schaik, 2004) and therefore do not require extended discussion. Columns (1) and (2) report the estimates from the baseline model. Contrary to standard cross-country results the sign of schooling is positive in all estimations. Berggren, Elinder, & Jordahl (2008) show that even in cross-country estimation the sign for schooling becomes positive when estimated over a later time sample. This may be due to the fact that most of the countries added in the later waves of the WVS were (developing) countries, like Mali, with low average schooling. However, given that the coefficient is significant in only five out of 12

¹⁶ As in most countries censuses are few and far between these numbers are extrapolated from the closest existing estimation obtained from the various sources.

¹⁷ Note, that we additionally conducted fixed effects estimation (excluding the wave dummies), due to the fact that a number of Hausman tests (1978) revealed a possible bias in the random effects estimates. However, although the size of the coefficients differed in fixed effects estimation, the signs were identically in almost all estimations, suggesting robust results from our reported random effects estimators. We do not report fixed effects estimation, here, due to two basic reasons. First, fixed-effects estimators are known to become very inefficient when applied with slowly changing regressors, as the fixed effect will “soak up” most of the explanatory power of these variables, making it hard for them to appear either substantively or statistically significant (Beck, 2001; Plümper & Troeger, 2007). Since it was established in section 3.1 that generalized trust changes only slowly over time, using unit fixed effects seems unwarranted. Second, fixed effects are run to calculate within subject effects. We are, however, also interested in the between effects of trust and confidence on countries’ economic growth. We report the median theta values for each RE-estimation. It is defined as $\theta = 1 - \sqrt{\sigma_e^2 / (T \times \sigma_u^2 + \sigma_e^2)}$ with $T = 1, \dots, t$ denoting the number of waves, σ_u^2 the variance between the countries, and σ_e^2 the variance within the countries. If theta tends to 0 the variance within the countries is much larger than the variance between the countries. In such a case RE estimates will be substantially biased. However, median theta values reported exceed .6 in most estimations, lending additional credit to our RE-models.

regressions, caution is advised when interpreting this result. Also, we do not find the significant (negative) relationship between growth and the price of investment goods relative to US prices usually reported in cross-country literature.

Of the local and regional variables only the size of the population is significantly correlated with growth, which could be due to either a corresponding larger labor force or owed to a larger internal demand. Comparable to most cross-country findings (cf. Sala-i-Martin, 1997) the (significant) coefficient of openness indicates that growth is higher in countries with a higher share of exports and imports in GDP.¹⁸ Note, that including a dummy for countries belonging to the European Union or its predecessor organizations considerably reduces the coefficient of generalized trust. Given that the EU dummy removes all the variation from European countries from the estimation, it raises the question whether general trust is as relevant to economic growth in developing countries. While our results point to a larger impact of trust on developed economies' growth, Knack & Keefer (1997) find that trust has the largest impact on developing countries, and Dearmon & Grier (2009) find no significant differences between those two.

Given that the relationship of growth and the share of investment in GDP is one of the most stable in economic growth accounting (cf. Sala-i-Martin, 1997; Beugelsdijk, de Groot, & van Schaik, 2004) our finding in equation (6) is not too surprising. The same equation shows that higher military expenditures are, on average, accompanied by significantly lower growth rates, which corresponds to frequent findings in cross-country growth literature (Ram, 1995; Aizenman & Glick, 2006). We also find that the structure of the industrial base matters, as countries with a higher share of services in value added, also exhibit higher rates of growth (Column (7)).

None of the political variables in our estimation (Columns (9) and (10)) were found to correlate significantly with growth. The only exception is whether the country experienced a considerable policy shift during the period of observation. Most of the country/wage observations that fall into this category are related to countries formerly belonging to the Warsaw Pact. Hence, the break-down of the economies in Eastern Europe following the end of communist rule is mirrored in this estimate.

¹⁸ Note, that we employ a different measure of openness than Sala-i-Martin (1997) or Beugelsdijk, de Groot, & van Schaik (2004).

Mirroring a century-old discussion in the social sciences we find significant correlations between the share of different religions and denominations, and economic growth (cf. Sala-i-Martin, 1997).¹⁹ However, unlike the standard results we find no significant linkage between growth and Protestantism. Positive correlations exist between growth and the share of Catholics and Confucians, and a negative correlation with the share of Muslims in a country. As the only countries with substantial shares of Confucians can be found in East-Asia (China, Taiwan, South Korea, Hong Kong, and Singapore) the large estimate can partially be ascribed to the rapid growth of the region during the last part of the 20th century.

Caution is advised, however, when interpreting these results as none of them were checked for robustness by controlling for additional variables. On the other hand, the most robust estimates in this exercise are the ones for initial GDP per capita and for generalized trust. The fact that growth is on average smaller where initial GDP is already high is one of the most robust results from the growth estimation literature (Barro & Sala-i-Martin, 2004). The significant positive correlation between trust and growth replicates the results from most studies probing into the linkage between trust and economic development (cf. Knack & Keefer, 1997; Zak & Knack, 2001; Beugelsdijk, de Groot, & van Schaik, 2004; Dearmon & Grier, 2009).²⁰ In the case of generalized trust even the size of the coefficients matches the prior results. As the estimations from our panel robustly replicate prior results from cross-section and panel estimation, we may conclude that our specification captures the relationship between generalized trust and growth similar to the specifications on which Beugelsdijk's critique is based.

3.1. The Beugesldijk hypothesis

Given that we have found a robust positive correlation between economic growth and generalized trust, we will now go on to probe into the linkage between growth, trust and confidence in the well-functioning of institutions. Table 4 presents the results from a series of estimations based on the same baseline model as in the previous exercise.

¹⁹ Max Weber's ground-breaking work in the article "Die protestantische Ethik und der Geist des Kapitalismus" was first published in "Archiv für Sozialwissenschaften und Sozialpolitik" in 1904 (Vol. 20) and 1905 (Vol. 21). For a more recent discussion in economics cf. (Guiso, Sapienza, & Zingales, 2003).

²⁰ The studies by Berggren, Elinder, & Jordahl (2008), and Beugelsdijk (2006), who show that the significance and the size of the coefficient are sensitive to the number of countries included in the regression, are exceptions to that point.

Insert Table 4 here

Columns (1) to (4) present estimations where each of the variables measuring well-functioning institutions were separately added, to see whether any of these variables already had an influence on the size, sign or significance of the generalized trust coefficient. However, neither the sign nor the alpha-error probability of the trust coefficient changes substantially. While we find no statistically significant correlation between growth and confidence in the police, and growth and confidence in civil services, the linkages of growth to both confidence in the legal system and the perception of corruption are significant at the 5% level. Economic growth is higher, where (perceived) corruption is lower. This result is in line with a stream of (theoretical and empirical) literature, arguing that corruption is detrimental to economic growth, as it essentially constitutes an additional tax on business transactions and raises barriers to market entry by excluding those that lack the necessary funding to bribe officials (Murphy, Shleifer, & Vishny, 1993; Mauro, 1995; Mo, 2001).²¹

What is however surprising is the negative coefficient of confidence in the legal system. Accepting the size of the coefficient, this would imply that an increase of one percent of people claiming to have at least some trust in their country's justice system is, on average, accompanied by a decrease in growth of .02 percentage points.

The fact that the correlation between trust and growth remains unchanged in the first four estimations could be due to the fact that neither of the four confidence variables captures the well-functioning of institutions, alone. In fact, it can easily be argued that "the well-functioning of institutions" is a complex phenomenon and is constituted by efficient governance and reliable protection and enforcement of property rights. An indication therefore is the volatility of the generalized trust coefficient in absolute terms between the first four estimations, with the largest value exceeding the smallest by almost 40 percent. We thus include all four variables simultaneously in estimation (5). The result, however, confirms the findings from the previous estimations. An analysis of the variance inflation factors from the OLS estimation reveals the presence of potentially problematic multicollinearity in the data,²² reducing but not deleting the significance of the generalized trust measure. To check how much the results are driven by correlation between the confidence variables, we conduct a principal component

²¹ The opposing school of thought emphasizes the beneficial effects of corruption on growth - especially in developing economies - maintaining that corruption introduces efficiency in the economy, amongst others, by avoiding bureaucratic delay and reducing uncertainty (Leff, 1964; Acemoglu & Verdier, 1998).

²² The largest VIF reaches a value of 4.67 which is identical to a tolerance level below the threshold of .25, given in the literature (O'Brien, 2007).

analysis (PCA) on the four variables measuring the well-functioning of institutions. Two factors with an eigenvalue exceeding the threshold of one are identified. Eigenvalues are plotted in Figure 5 and factor loadings are given in Table 5.²³

Insert Figure 5 here

Table 5. Principal Component Analysis of Confidence Measures

Name	1 Factor 1	2 Factor 2	3 Unexplained Variance
Confidence in Police	0.5805	0.2205	0.1159
Confidence in Justice System	0.5536	-0.2537	0.1753
Confidence in Civil Services	0.4242	-0.6478	0.1243
Perception of Corruption	0.4202	0.6837	.08372

Source: European and World values Survey, Life in Transition Survey, Transparency International Corruption Perception Index

The factors obtained from the PCA substituted the original variables in a subsequent estimation (Column (6)), yielding however no different results from the previous estimation.

Given that the generalized trust measure is derived from the WVS' "generally speaking..." question, the results obtained are inconsistent with the Beugelsdijk hypothesis of a match between the answering behavior to this question and the well-functioning institutions.

4. Conclusions

In this contribution, we have evaluated what we call the Beugelsdijk hypothesis, applying Barro-type growth estimations to a panel of countries. The Beugelsdijk hypothesis is derived from a discussion between Sjoerd Beugelsdijk (2006; 2008) and Eric M. Uslaner (2008) as presented in the Cambridge Journal of Economics (Vol. 32). It holds that there is a mismatch between economic theorizing and empirical operationalization of the concept of trust, using aggregated answers from the World Values Survey's "generally speaking..." question. It further posits that this item corresponds to the well-functioning of institutions instead, claiming that it rather reflects the respondent's perception of the

²³ A Kaiser-Meyer-Olkin test (overall KMO: 0.62) revealed only miserable to mediocre sampling adequacy, indicating that the variables have too little in common to warrant a PCA. As the results from the PCA are simply used for a last check on the robustness of the results we proceed, nevertheless, with the estimation.

effectiveness of public institutions in creating an incentive structure that deters interaction partners from defecting, than a cognitive bias or propensity to accredit strangers with a certain level of general trustworthiness.

Our results reveal that the correlation between trust and economic growth is robust in terms of statistical significance and sign of the estimated coefficient, when controlling for the respondents' perceived well-functioning of institutions. These results are inconsistent with the Beugelsdijk hypothesis, and lend credit to validity of proxying trust by the WVS' "generally speaking..." question, common in the economic growth literature. While trust may indeed consist of two components – one based on benevolence and the other on deterrence (Yamagishi & Yamagishi, 1994; Sapienza, Toldra, & Zingales, 2007) – the values taken from the WVS do not correspond to the latter category. Our overall conclusion is that, while the well-functioning of public institutions is an important aspect in explaining differences in economic development (cf. Grier & Tullock, 1989; Islam, 1995; Sala-i-Martin, 1997), it does not capture the whole picture. Especially, it does not explain the influences of generalized trust on economic development. We therefore add further empirical evidence to the literature that trust propensity matters for explaining variations in economic growth.

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Appendix

Figure 1. Correlation between Generalized Trust and Confidence in Police^a



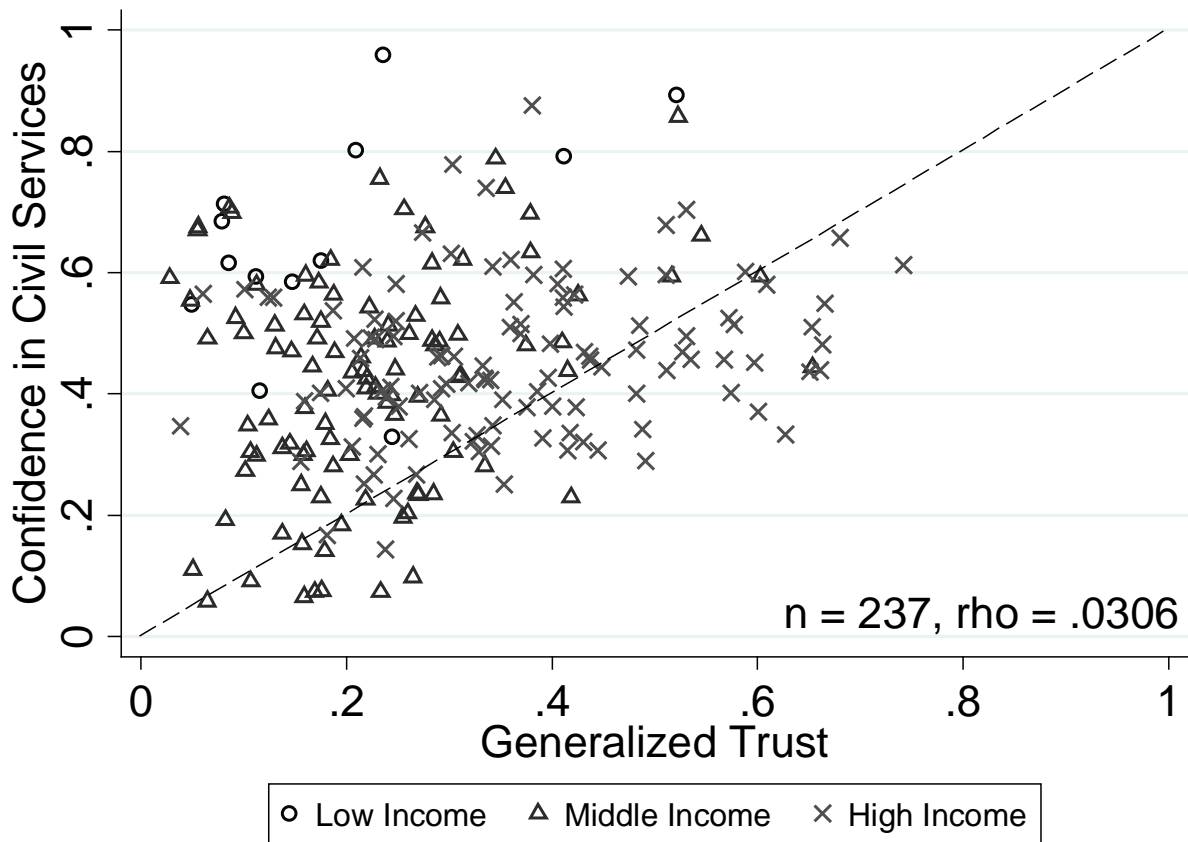
^a, The differentiation between Low-, Middle- and High-Income Countries follows the World Bank List of Economies (April 2010)
Source: European and World Values Survey 1981-2009; Life in Transition Survey, 2006

Figure 2. Correlation between Generalized Trust and Confidence in the Justice System^a



^a, The differentiation between Low-, Middle- and High-Income Countries follows the World Bank List of Economies (April 2010)
Source: European and World Values Survey 1981-2009; Life in Transition Survey, 2006

Figure 3. Correlation between Generalized Trust and Confidence in Civil Services^a



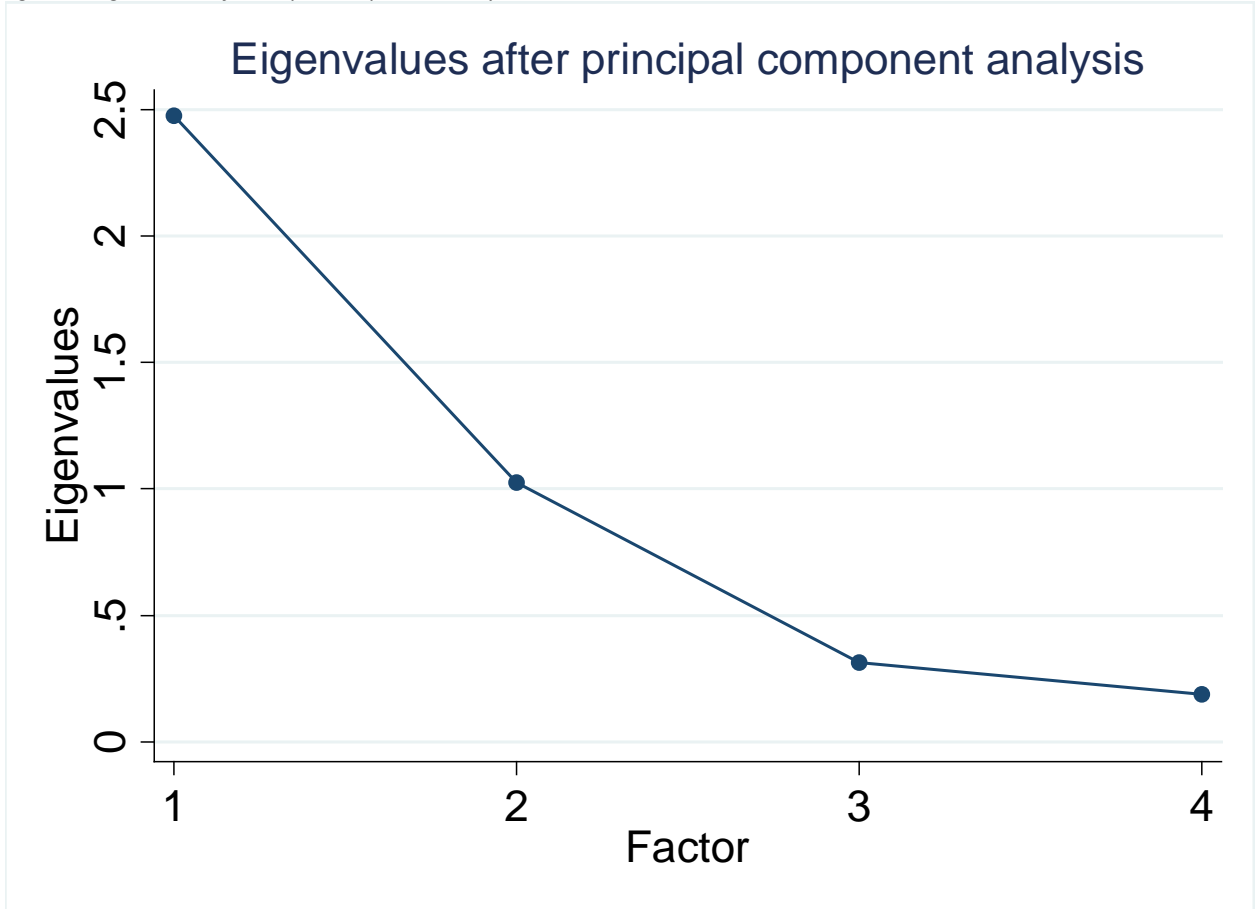
^a, The differentiation between Low-, Middle- and High-Income Countries follows the World Bank List of Economies (April 2010)
Source: European and World Values Survey 1981-2009; Life in Transition Survey, 2006

Figure 4. Correlation between Generalized Trust and the Perception of Prevalence of Political Corruption^a



^a, The differentiation between Low-, Middle- and High-Income Countries follows the World Bank List of Economies (April 2010)
Source: European and World Values Survey 1981-2009; Transparency International: Corruption Perception Index

Figure 5. Eigenvalues of Principal Component Analysis^a



^a , Variables include Confidence in Police, Confidence in Legal System, Confidence in Civil Services, Perception of Corruption
Source: European and World Values Survey 1981-2009; Transparency International: Corruption Perception Index

Table 3. Growth, Investment, and Socio-demographics^{a,b}

	1	2	3	4	5
Estimation method	OLS	RE	RE	RE	RE
<i>Baseline</i>					
GDP in $t - 5$	-0.0758*** (.0236)	-0.1861*** (.0443)	-0.1879*** (.0466)	-0.1823*** (.0558)	-0.2394*** (.0376)
Schooling	.0197 (.0878)	.2431 (.1576)	.1797 (.1816)	.1394 (.1839)	.4143*** (.1238)
Price of Investment good	-0.5146 (.5125)	.3868 (.5931)	0.3276 (.5981)	.5804 (.7228)	.2611 (.6294)
Generalized Trust	4.142*** (1.299)	3.833*** (1.123)	3.5173*** (1.2150)	3.5356*** (1.1419)	2.6272** (1.0207)
<i>Controls</i>					
Area			-0.0001 (.0002)		
Population			.0034* (.002)		
Rural Population			-0.0228 (.0247)		
Life expectancy				-0.0095 (.1076)	
Energy use				-0.0001 (.0001)	
Latitude				.0231 (.0239)	
Openness					.0098* (.0054)
International Waters					.5821 (1.0268)
EU					.9928*** (.3068)
Commonwealth					.4833 (.8507)
Wave dummies	Yes	Yes	Yes	Yes	Yes
Observations	220	220	216	213	212
Adj. R ²	0.25				
overall R ²		0.21	0.26	0.22	0.25
F/Wald statistic	7.93	83.84	93.22	95.97	119.99
θ median		0.6282	0.618	0.6484	0.6591

^a, dependent variable is the growth rate of real GDP

^b, all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level

Table 3 continued. Growth, Investment, and Socio-demographics^{a,b}

Estimation method	6	7	8	9
	RE	RE	RE	RE
	<i>Baseline</i>			
GDP in $t - 5$	-2.2475*** (.0544)	-2.2738*** (.0472)	-2.2093*** (.0389)	-2.2034*** (.0561)
Schooling	.3447** (.1384)	.1499 (.1614)	.3585*** (.1141)	.1421 (.1694)
Price of Investment good	1.2449* (.7006)	.2707 (.5551)	1.060* (.6119)	.2417 (.5539)
Generalized Trust	2.6795*** (.9758)	2.7365** (1.0922)	2.0509** (1.0241)	3.5355*** (1.1213)
	<i>Controls</i>			
Military expenditure	-.4348*** (.1552)			
Investment	.1313*** (.0467)			
Primary	-.0017 (0.0159)			
Agriculture	-.1904*** (.0485)			
Industry	-.1074*** (.0367)			
Fuel exports	.0181 (.0148)			
Ore and metal exports	.0169 (.0537)			
External Wealth	-.0003 (.0004)			
Real interest rate	$1.44 \cdot 10^{-7}$ $(9.29 \cdot 10^{-8})$			
Real exchange rate	-.0711* (.0422)			
Stability	.0058 (.0083)			
Break	-1.2657*** (.4599)			
Polity IV	.0553 (.0507)			
Wave dummies	Yes	Yes	Yes	Yes
Observations	149	196	170	213
Adj. R ²				
overall R ²	0.42	0.2	0.31	0.22
F/Wald statistic	93.78	94.9	82.43	95.97
θ median	0.6011	0.6354	0.7008	0.6484

^a, dependent variable is the growth rate of real GDP

^b, all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level

Table 3 continued. Growth, Investment, and Socio-demographics^{a,b}

Estimation method	10	11	12
	RE	RE	RE
	<i>Baseline</i>		
GDP in $t - 5$	-2.002*** (.0483)	-.1991*** (.0415)	-.2227*** (.0442)
Schooling	.1892 (.1630)	.2854* (.1455)	.2594* (.1441)
Price of Investment good	.4053 (.6630)	.5923 (.6119)	.2194 (.5018)
Generalized Trust	3.7706*** (1.1174)	4.0889*** (1.1647)	4.0467*** (1.1256)
	<i>Controls</i>		
Pre-War	-.0630 (.4258)		
In-War	-.5209 (.3642)		
Ethnic	-1.4416 (1.1376)		
Catholic		1.4239* (.8296)	
Confucian		8.5071*** (3.3204)	
Hindu		3.0033 (1.8367)	
Protestant			.0295 (.0288)
Muslim			-2.3199** (.8988)
Orthodox			-3.4699 (2.1395)
Wave dummies	Yes	Yes	Yes
Observations	219	220	220
Adj. R ²			
overall R ²	0.24	0.28	0.25
F/Wald statistic	102.08	93.22	98.69
θ median	0.6229	0.6177	0.6292

^a, dependent variable is the growth rate of real GDP

^b, all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level

Table 4. Growth, Trust, and Confidence ^{a,b}

	1	2	3	4	5	6
Estimation method	RE	RE	RE	RE	RE	RE
	<i>Baseline</i>					
GDP in $t - 5$	-.2041*** (0.0459)	-.1816*** (.0455)	-.1837*** (.0494)	-.2517*** (.0520)	-.2373*** (.0561)	-.1063*** (.0336)
Schooling	.2525 (.1623)	.0997 (.1661)	.2048 (.1703)	.1712 (.1691)	.0078 (.1937)	-.1025 (.1125)
Price of Investment good	.3542 (.6172)	.4696 (.7711)	.2981 (.5656)	.0806 (.5343)	-.2005 (.7309)	-1.2333* (.7292)
Generalized Trust	4.0588*** (1.2342)	5.2694*** (1.3643)	3.396** (1.5213)	3.1812*** (1.0869)	3.4295* (2.0510)	3.8106** (1.8756)
	<i>Variables of Interest</i>					
Confidence in Police	0.5238 (1.3876)				2.4332 (1.7218)	
Confidence in Legal System		-2.4286** (1.1956)			-2.5688 (1.8088)	
Confidence in Civil Services			-1.1772 (1.1542)		-1.0807 (1.6841)	
Corruption Perception Index				.4590** (.1878)	.3676* (.2011)	
Factor 1						.2844 (.1743)
Factor 2						.4105 (.2705)
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	210	186	201	219	172	172
overall R ²	0.22	0.26	0.14	0.22	0.2	0.19
Wald statistic	85.41	91.38	52.74	86.73	50.20	50.55
θ median	0.6292	0.5748	0.6384	0.6305	0.5947	0.595

^a, dependent variable is the growth rate of real GDP

^b, all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level

Table 6. Variable Description and Data Sources

Name	Description	Source
Study	Data from EVS (1), WVS (2) or LITS (3)	European and World Values Survey, Life in Transition Survey
Wave	1 – 1981 to 1984 2 - 1989 to 1993 3 – 1994 to 1999 4 – 1999 to 2004 5 – 2005 to 2009	EVS/WVS; LITS
GDP	Real Gross Domestic Product per capita	Penn World Tables, version 6.3
Price of Investment Good	Price Level of Investment Good relative to the United States	Penn World Tables, version 6.3
Openness	Openness of the economy (Exports and Imports divided by GDP)	Penn World Tables, version 6.3
Investment in GDP	Share of Investment in GDP	Penn World Tables, version 6.3
Area	Area in 1000 km ²	Penn World Tables, version 6.3
Population	Size of Population	World Development Indicators
Rural Population	Rural Population in % of total Population	World Development Indicators
Labor Force	Size of Labor Force	World Development Indicators
Life Expectancy	Life expectancy in years	World Development Indicators
Agriculture	Share of agriculture in value added	World Development Indicators
Industry	Share of Industry in value added	World Development Indicators
Military	Military expenditures as percentage of the GDP	World Development Indicators
High-Tech	High-tech exports as percentage of total exports	World Development Indicators
Inflation	Average Inflation	World Development Indicators
Energy	Energy Use in tons of oil equivalent	World Development Indicators
Assistance	Average official development assistance and official aid in current US \$	World Development Indicators
Fuel	Fuel Exports as % of Total Exports	World Development Indicators
Ores and metals	Ore and Metal exports as % of total exports	World Development Indicators
Interest Rate	Real Interest Rate	Global Finance Development
Interest Payment	Interest Payment as percentage of expenses	Global Finance Development
Debt Service	Total debt service in % of GNI	Global Finance Development
Exchange Rate	Average growth of real exchange to the US \$ over observation period	Historical Data Files of the International Macroeconomic Data Set
External Wealth	Total Assets less total Debt	External Wealth of Nations Mark II
Labor Productivity	Labor productivity per hour worked in 1990 US \$	Total Economy Database

per hour		
Labor Productivity per employee	Labor productivity per person engaged in 1990 US \$	Total Economy Database
Stability	Number of years since the most recent policy change (as denoted by the variable “durable”) before the observation period	Polity IV: Regime Authority Characteristics and Transitions Datasets
Break	Dummy for a policy change to have occurred during the observation period	Polity IV: Regime Authority Characteristics and Transitions Datasets
Polity IV	Democracy score (as denoted by the variable “Polity2”)	Polity IV: Regime Authority Characteristics and Transitions Datasets
Pre-War	Intensity of any armed conflict that appeared up to 15 years prior to the observation. 0 – No armed conflict 1 – Minor armed Conflict (between 25 and 999 battle-related deaths) 2 – War (more than 1000 battle-related deaths)	UCDP/PRIO Armed Conflict Dataset, version 4-2009
In War	Intensity of armed conflict during observation period (see Pre-War)	UCDP/PRIO Armed Conflict Dataset, version 4-2009
Fearon Ethnic	Ethnic Fractionalization (time-invariant)	Fearon (2003)
Ethnic	Ethnic Fractionalization (changing)	Fearon (2003), Roeder (2001), CIA World Factbook
Schooling	Average years of schooling in total population, prior to observation	Barro and Lee (1993)
Primary	Primary School enrollment rate (gross) 10 years prior to the observation window	UNESCO Statistical Yearbook/ Education Digest, various issues
Secondary	Secondary School enrollment rate (gross) 5 years prior to the observation window	UNESCO Statistical Yearbook/ Education Digest, various issues
Tertiary	Tertiary School enrollment rate (gross) 5 years prior to the observation window	UNESCO Statistical Yearbook/ Education Digest, various issues
Communist	Under communist rule any time during observation period	
Post-Communist	Under communist rule prior to the observation period but any time between 1945 and 1992	
International Water	Access to international waters	CIA World Factbook
Latitude	Average latitude of the country (deviations from the equator positive)	
OPEC	Member of the OPEC	
EU	Member of the European Union , the European Community or the European Economic Community	
Commonwealth	Member of the Commonwealth of Nations/ former British Colony	http://www.commonwealth-of-nations.org/Member_Countries-

		Brief_Intro,38,30,1
Developing Country	World Bank Classification in Low, Middle and High income countries	The World Bank
Buddhist	Fraction of Buddhists in Population	Sala-i-Martin (1997); CIA World Factbook; Teorell, Charron, Samanni, Holmberg, & Rothstein (2009)
Catholic	Fraction of Catholics in Population	Sala-i-Martin (1997); CIA World Factbook; Teorell, Charron, Samanni, Holmberg, & Rothstein (2009)
Confucian	Fraction of Confucians in Population	Sala-i-Martin (1997); CIA World Factbook; Teorell, Charron, Samanni, Holmberg, & Rothstein (2009)
Hindu	Fraction of Hindu in Population	Sala-i-Martin (1997); CIA World Factbook; Teorell, Charron, Samanni, Holmberg, & Rothstein (2009)
Jew	Fraction of Jews in Population	American Jewish Year Book, various issues
Muslim	Fraction of Muslims in Population	Sala-i-Martin (1997); CIA World Factbook; Teorell, Charron, Samanni, Holmberg, & Rothstein (2009)
Orthodox	Fraction of Orthodox in Population	Sala-i-Martin (1997); CIA World Factbook; Teorell, Charron, Samanni, Holmberg, & Rothstein (2009)
Protestant	Fraction of Protestants in Population	Sala-i-Martin (1997); CIA World Factbook; Teorell, Charron, Samanni, Holmberg, & Rothstein (2009)