CAN TRUST SUBSTITUTE FOR QUALITY INSTITUTIONS TO PROMOTE

ECONOMIC GROWTH?

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by

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The Undersigned, appointed by the dean of the Graduate School, Have examined the thesis entitled

Can Trust Substitute for Quality Institutions to Promote Economic Growth?
Presented by Charvel C. Vizitei, a candidate for the degree of Masters of Political Science and herby certify that, in their opinion, it is worthy of acceptance.

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Proffessor Jonathan Krieckhaus

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Proffessor Leslie Schwindt-Bayer

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Proffessor Tola Olu Pearce

TO MY WONDERFUL FAMILY

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Many studies have set out to show the effects of cultural variables on development outcomes, specifically trying to explain economic growth variation across countries. When social factors were found responsible for varying economic outcomes in Northern and Southern Italy in Robert Putnam's "*Making Democracy Work" (1993)*, the inclusion of social capital along side physical and human capital factors of production became widely accepted in economic, political science and sociology research. Many subsequent studies establish the link between a generally cooperative trusting society and positive economic payoffs, but little research has been done to flesh out how social capital variables work with other established causal variables to bring about these outcomes (Bjornskov, 2010).

Knack and Keefer's (1997) has become one of the most heavily cited works in reference to the question about the economic benefits of trusting societies. They exhaustively examine the role of social capital in standard growth equations and find that indeed generalized trust, a component of social capital, is a strong predictor of growth. Within their study they argue that trust's impact on growth may be conditional on the institutional features of the country, but they do not adequately test this hypothesis.

In this paper I reexamine this study and find that their treatment of the interaction between trust and institutional quality is not adequately developed. I theorize that trust and institutions can substitute for one another. To test this I include a new interaction term between institutional quality and trust. The results from this test and subsequent marginal effects analysis lend support for the hypothesis that trust can substitute for institutions as a predictor of growth in low institutional quality environments, but as the

state improves in efficiency the need for trust to be present for growth to occur diminishes.

I argue that trust affects growth independently by reducing transaction costs between individuals engaging in economic activities. If every commercial transaction is based on trust, as Kenneth Arrow claims (1972, pg. 357), then the presence of a general confidence in the reciprocity of others will lead to more and increasingly profitable economic exchanges. Institutions similarly reduce transaction costs between economic agents because they act as external backers of agreements and impartial protectors of property rights. However, well functioning institutions release economic agents of the need to trust each other, as the sanctioning power of the state replaces trust as a facilitator of transactions. Therefore trust should have a diminishing impact on growth as the quality of the institutional environment increases.

The History of Social Capital Research

While the question of whether or not cultural variables influence economic growth patterns is not new to political science, the last twenty years has seen increasing interest in measurable cultural variables employed to empirically test this effect. Political scientists, economists, and sociologists have come to largely agree that social capital is a component in political and economic development equal to traditionally accepted forms of capital such as physical and human capital.

This is largely due to the seminal work of Robert Putnam. In his book *Making Democracy Work* (1993), Putnam used a comparison of societies in the north and south of Italy. His natural experiment evaluates how two regions with identical institutions can

come to such different political and economic outcomes. What he finds is that the north outperforms the south on solving most collective action problems, a phenomenon he attributes to higher levels of civic engagement or civic-mindedness. He makes the claim that 'civic-ness' is what is really driving economic outcomes rather than political institutions and arrangements as much of the democracy and growth literature argues.

From the understanding that some cultural values do have political and economic payoffs, the concept of 'social capital' has been applied to many questions in social science ranging from studies of economic growth (Knack and Keefer, 1997; Collier and Gunning, 1999; Knack and Zak, 2001), to studies looking at institutional quality (Bjornksov, 2010; Richey, 2010), to studies examining welfare structures in modern democracies (Rothstein and Uslaner, 2005) and to political participation and voting behavior (Ikeda and Richey, 2005).

What is Social Capital?

Social capital can be thought of as an "attribute of individuals and of their relationships that enhance their ability to solve collective action problems" (Ostrom and Ahn, 2010; pg.17). This definition encompasses two distinct lines of social capital research: that of work done on organizational density, and work done looking at the levels of 'trustworthiness' in a society. Putnam's original argument focused on how involvement in groups that engaged individuals in societal issues would cause these individuals to feel a larger stake in the success of their community, be more concerned with the political outcomes, and participate more vigorously in their economy.

An alternative view focuses on generalized trust as an output of social capital. Generalized trust allows for individuals to rely on norms of reciprocity to grease the wheels, so to speak, for collective action. Trust enables economic transactions based on future promises, confidence in governing officials and the system of governance, and reduces the need to spend energy protecting oneself from outside threats. Ostrom and Ahn (2010) theorize that a general trust of those individuals for which you have little background information may even be partially a result of involvement in civic organizations, thereby making trustworthiness a more parsimonious way of understanding social capital.

Studies of trust have developed in recent years somewhat independently of social capital research. While trust is a component of social capital, literature in economics has abandoned its root in social capital theory to examine the specific ways trust can function in economic transactions. This study will mainly take this economic conception of trust, however it is worth remembering that trust is indeed a component of social capital, and therefore the conclusions of this study speak to a broader literature.

Many studies have been conducted to show that countries with a larger percentage of the population responding in surveys as 'trusting' also have higher GDP/capita and higher growth rates. Why is this? Several theories argue that there is a direct theoretical means by which trust influences growth. However, these studies allow for indirect linkages that may also be at work. In plain terms, institutions can act as a means of transmission through which trust can facilitate economic growth. Incidentally, institutional structures and rules have been seen as also having an independent positive impact on growth. Disentangling this theoretically is complicated.

Research indicates four distinct ways that generalized trust and institutions can cause growth. First, trust has a transaction cost cutting effect, second other theories argue that it is institutions which reduce transaction costs facilitating growth. Thirdly, some authors argue that trust impacts growth by working through institutions – in its most basic sense saying that trust causes good institutions which in turn causes positive economic outcomes. Lastly, and this is the position I argue, there is some indication that there is an interactive effect of trust on growth conditioned on institutional quality.

Figure 1: Graphical Representation of Causality Arguments
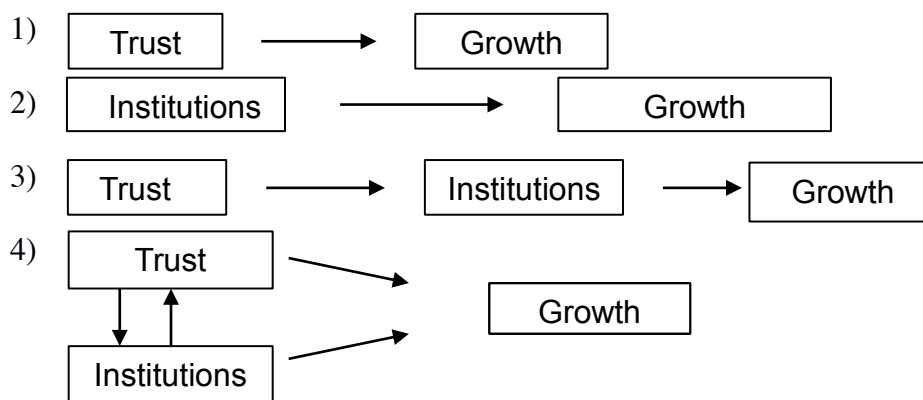
Most critical to my argument are theories one and four, but it is worthwhile examining all of these links. It is also important to note that none of the studies exclude the possibility of these other causal connections, nor are they theoretically mutually exclusive. However, to have a clear understanding of the relationship I am advocating, some effort must be spent understanding these alternatives.

The Link Between Trust and Growth

How, specifically, can trust function as a form of capital in economic growth equations? This direct relationship (argument 1, Figure 1) as already noted, argues that

trust lowers transaction costs. If strangers can trust each other they can trade with each other on the basis of this trust, potentially without contracts or at the very least without excessively complicated ones (Dincer and Uslaner, 2009; Knack, 1999). Uslaner (2002) notes that trust in strangers also leads to tolerance, broadening the scope of individuals to engage with in market transactions in a society. Additionally, trust may lead to economic growth through increasing incentives to innovation (Knack and Keefer, 1997). The argument states that entrepreneurs without trust may spend time and resources on monitoring employees, and protecting property and contractual rights rather than on innovation. Empirically, this logic appears to be consistently validated.

Four studies in particular stand out as specifically addressing the question of whether or not this generalized trust measure has an impact on economic outcomes – specifically growth. Stephen Knack and Philip Keefer's extensive 1997 analysis of the impact on social capital on growth shows that higher trusting countries outperform their low trusting peers in terms of development. The study observes 29 countries through the world values survey responses to a question about generalized trust. Their argument, which is a common one in the literature, states that strong levels of interpersonal trust allow for one participant in an economic exchange to reasonably expect the other participant to follow through on their side of the agreement. Allocating fewer resources for personal protection, and monitoring for harmful behavior thus reduces transaction costs in high trusting societies. These societies are also "less dependent on formal institutions to enforce agreements"(Knack & Keefer 1997, pg. 1253). In this way interpersonal trust can contribute to the economic development of a country bestowing positive economic benefits to those citizens within the state.

Zak and Knack (2001) take this logic further. These authors test similar hypothesis on 41 countries and through the use of formal modeling techniques prove that variation in economic outcomes is largely dependent on the transaction costs associated with ensuring that any economic exchanges are protected. High trusting societies therefore have lower transaction costs associated with investment and lending and experience higher levels of economic growth.

Dincer and Uslaner (2009) use the 50 states within the US to control for differences in the interpretation of trust questions reducing the survey error that comes from cross national surveys. Looking at data from the GSS, they too establish an independent and robust link from generalized trust to economic development. They show that even in highly developed countries with established legal protections for property rights generalized trust still exhibits a positive influence on economic growth rates.

In a related vein, Paldam and Svenden (2001) asses the absence of trust in the East European transition to market capitalism. They show that although human capital and physical capital were readily available to these societies, they still did not experience the expected levels of economic growth after transition. They argue that it is low levels of generalized trust, a factor of production intentionally eliminated by the communist system, that causes these societies to turn to 'black/grey' markets for exchange, limiting aggregate economic growth from normal markets. When communism was replaced, grey/black markets tolerated under the regime caused people to trust and do business with a very small number of individuals thereby limiting economy-building investment and stifling growth.

Institutions and Growth

Much of the literature on institutions and growth show that quality institutions with low corruption and high levels of protection of property rights will facilitate economic development (argument 2, Figure 1). Douglas North's (1991) famous argument shows that institutions that reliably protect an individual's property rights reduce the costs associated with economic activity thereby creating a climate for healthy investment and trade.

What institutions are then important for economic growth? Rodrik (2000) finds that it is specifically regulatory institutions that are tasked with curbing fraud and monopolies, those that promote the rule of law, a body of law that clearly defines property rights, and stable governing institutions which manage risk and conflicts within society. When these are present and strong, an environment for growth and investment is created. However Rothstein and Teorell (2008) stress that these institutions have to function well in practice for these effects to be seen; namely they find that impartiality within these structures is critical for any good to come from them. Corruption and inefficiencies in these offices will have negative economic consequences.

Trust, Institutions and Growth

Bjornskov(2008) discusses two likely mechanisms by which trust can result in more efficient government indirectly (argument 3, Figure 1). First, high trust countries will foster an environment where corruption is not tolerated or for that mattered

considered. High trust generates a normative environment that encourages actors to honor contracts, as breaking that trust will result in punishment (Arrow, 1972). Those who consider themselves trusting will also behave in a way that values reciprocity and impartiality (Uslaner, 2005). The more trusting the population, the more likely trusting people will work in public institutions. This is critically tied to the enforcement branches of government: police and judges in higher trusting environments tend to enforce the laws more equitably and take fewer bribes. The second mechanism is that electoral incentives are stronger in high trust countries. Countries that have a more engaged and trusting electorate will be more willing to hold governments accountable for their decisions (Putnam, 1993; Knack, 1992). Accordingly, quality institutions are then conditioned on trust.

My Argument

What we can see from the preceding discussion of theoretical links between trust and growth is that high levels of trust and well functioning institutions are probably both necessary for economic growth. It is also probable that trust can have an alternative indirect effect on growth by bettering the institutions of government.

However the argument can be made that there is an interaction between trust and institutions that results in growth (argument 4, Figure 1). In countries with well functioning institutions there is little need for generalized trust to necessarily be present for the economy to function and grow. If the state acts as a third party enforcer of private agreements, then the role of trust in allowing individuals to make assessments about their potential trading partners is diminished (Herreros, 2010). In other words, institutions act

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to substitute for trust in economic transactions and may even undermine trust between parties to such a transaction (Ullman-Margalit, 2004; Nissenbaum, 2004). Therefore countries with well-established, highly functional institutions need not rely on the level of social trust among their citizens to see economic growth because the barriers to cooperation (distrust) have been overcome by the enforcement of property rights by state institutions.

Breaking this argument down, we see that trust is required for economic success. Trusting that trading partners will not go back on their word, or attempt to inflict harm through any given transaction, will reduce the need for protection measures. We also see that the main purpose of institutions in generating economic growth is to sanction and prevent this sort of malfeasance. Thus both trust and the presence of quality institutions are working towards the same goal: giving actors confidence in their market decisions. It can be argued that quality institutions actually reduce an individual's need to trust, so in well functioning states social trust is an unnecessary factor of production because confidence in the market is insured by the state.

This generates a new question: if institutions can substitute for trust to allow for economic growth, can trust (which is also shown to facilitate such transactions) actually substitute for quality institutions – when they are lacking – to show some economic benefit? If the answer is "yes", the intervening variable of institutional quality becomes an important factor in determining the effect social capital, or generalized trust, has on economic development. In countries where institutions are strong and do effectively sanction those who would cheat or compromise a contract, levels of generalized trust would matter less in determining development and growth outcomes. However, in

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countries where these enforcing institutions are weak, corrupt or of low capacity, social capital should have a clearer predictive value when looking at economic growth. In other words, countries with a less efficient state apparatus, but comparatively higher levels of generalized trust, should experience higher levels of economic growth than their low-efficiency low-trust peers.

Because generalized trust enables individuals to make economic decisions based on expectations of reciprocity they are more willing to engage in economic transactions than those individuals who believe that they need to spend their energies protecting themselves from maleficence. In the presence of poorly functioning sanctioning institutions where such maleficence is likely to go unsanctioned, it would require trust rather than reliance on the state to expect that an economic transaction will be beneficial. Therefore it is reasonable to expect higher levels of growth in countries with weak institutions but relatively high levels of trust.

The main purpose of this present study will be to offer the first accurate test of the hypothesis that trust has a conditional impact on growth given varying levels of institutional quality. Knack and Keefer(1997) also attempt to address this issue. In their model they use an interaction between their variable TRUST and the GDP of that country to model the conditional impact of social capital on growth dependent on national income. They find that in their sample poorer countries see a greater effect of trust on growth than the wealthier countries in the sample. However, interacting Trust and GDP may not truly test the theory that institutions are an important intervening presence. The authors argue that poorer countries ought to have institutional situations where contracts are not 'reliably enforced', but they neither cite nor show how GDP is related to

institutional quality. If it is the quality of institutions that will determine the relative impact of social capital on economic development, then Trust should be combined with a direct measure for institutional effectiveness or quality to get at the true interactive effect. Furthermore, the study does not include an examination of the marginal effects of such an interaction, nor does it discuss the interaction or constituent terms other then to say that it confirms their hypothesis. Although the test in their study appears as a side note within their larger analysis, the substantive importance of this interaction is hardly unimportant. The implications of these conditional effects for understanding variation in economic growth in underdeveloped countries are substantial. If this study finds that trust can 'pick up the slack' left behind by poor functioning institutions, then measures to protect and foster social capital should be encouraged to substantively benefit individuals in these countries.

To assess this relationship this study will test the following hypothesis:

H1: An increase in generalized trust will be associated with a larger increase in growth when institutional quality is lower than when state institutions are efficient.

Data and Methods

Testing this hypothesis, I closely follow the methodology of the 1997 Knack and Keefer study. To do this I create a model using similar variables over the same 29 countries and time range (1981-1992). The Knack and Keefer study (along with others) has established that trust is indeed to impact economic growth with this sample under various constraints. However, this sample has been criticized for a number of

irregularities by Beugelsdijk and Schaik(2004) who find that the results for their coefficients and standard errors for these effects are not robust depending on the measures for human capital (educational attainment). These authors determine that the limited sample size and the small proportion of observations coming from low trust countries cause the observed irregularities.

Once I have established that my data exhibit the expected connections, I will apply a new interaction between a measure of institutional quality and generalized trust to examine how trust affects growth depending on the institutional situation in each country. Instead of GDP at the beginning of the period, I will interact values from the International Country Risk Guide that reflect perceived corruption and bureaucratic inefficiency with World Value Survey generalized trust data. In examining the marginal effects of such an interaction as well as the independent effects of each component part, I will more narrowly examine the intervening relationship than was observed in the original study.

Generalized trust is measured by individual level survey data collection. Many such surveys exist for regional data; latinobarometer, and the eurobarometer to name a few examples, but cross-national cross-regional data on this subject comes overwhelmingly from the World Values Survey. To get at the concept of trusting those with whom an individual does not have substantial knowledge, the survey asks the question "In general would you say most people can be trusted?". Respondents have a dichotomous choice between "yes, generally speaking" and "you can never be too careful". The majority of studies using this measure will take the percentage within a society who answered "yes…" as a measure of the trustworthiness in a given society.

Measuring trust in this way has its shortcomings. Theoretically it is important to remember that responding in the affirmative is a product of social capital, not the capital itself. However, much in the same way that educational attainment measures human capital, or GDP measures physical capital, positively viewing trust in strangers can act as measure of social capital. Second, as this is survey data, bias can be introduced for a myriad of respondent reasons. Particularly of concern to some authors is that respondents may rate themselves more or less trusting than they actually are, or some may not understand the question and make a decision based on how well they trust people they know well, rather than strangers. However, Knack and Keefer (1997) find that other studies that have shown alternative measures for trustworthiness correlate very highly with the world values survey findings, thus allowing them the confidence to use the measure in their own study.

For the time period in this sample, very few countries were participating in individual level surveys that asked questions about perceptions of society and government. In fact due to the cost associated with conducting these sorts of social surveys, Western Europe and the United States were the only available sources for data on these topics. Beginning in 1980 the World Values Survey branched out from Europe to collect data on similar questions in Latin America, Africa, and Asia. Between the first and second wave of the survey, the two data sets available to the authors at the time of their writing, the WVS conducted extensive survey research in 29 countries interviewing thousands of respondents. Specifically 21 countries are represented in the 1981 survey

and 28 countries in the 1990-1991 survey. Each country was observed once in the Knack

and Keefer study.[1]

Independent Variable: Trust

Knack and Keefer (1997) use the World Values Survey measure for generalized

trust as their main independent variable acting on economic growth. This value is

generated by calculating the percentage of respondents in each country who responded

positively to the question "In general, do you think most people can be trusted?". As

much of the social capital literature will attest to, the causal relationship between growth

and trust may be endogenous. Uslaner (2002) makes the case that the only way to actually

generate social capital is to increase the standard of living for individuals, something that

is difficult to do in the absence of economic growth. To deal with this alternate causal

relationship, Knack and Keefer are careful to choose their measure of performance after

the collection of the social capital measure whenever possible.

Dependent Variable: Growth

Using the same measure of growth I follow Knack and Keefer in the use the

average percentage of GDP growth per capita over the 1980-1992 period as the main

dependent variable in their test. Their data comes from Penn World Tables version 5.6,

and in an effort to replicate this as closely as possible I also used the older version of

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[1]

The authors feel comfortable including some countries trust scores as of 1981
and others as the score from the 1991 wave because of the countries that were surveyed
twice the correlation between the two values was .91 (Knack and Keefer, 1997; pg.1262)

these data. The growth equation uses PWT value for real GDP/capita in 1992 subtracted by the real GDP/capita value in 1980 divided by the 1980 value. This is then averaged over the 12 year time period in question.[2] The original study reports this as a ratio rather than a percentage and I do the same for the sake of consistency.

Control Variables

GDP at the start of the period- The measure of GDP in 1980 is also collected from PWT v. 5.6. This variable is used in the calculation of growth as described above, but it is used differently as a control variable. It represents a measure of physical capital, one of the three acknowledged factors of production that are known to lead to growth, hence its inclusion in the model. However the original study reports this data differently than PWT as it directly shows this information. In the Knack and Keefer study it appears that they have reported these values in thousands of dollars rather than the four-digit number found in PWT data set. This is important to remember for interpretation purposes

Education-

This variable adds human capital to the function of economic growth. The authors follow the lead of Robert Barro's 1991 study that lists primary school and secondary school enrollment as determinants of growth. The Knack and Keefer study

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[2]

In some cases, due to missing data, this is averaged over a shorter time frame. South Korea(11 years), Argentina (10 years) and Portugal (10 years).

uses the proportion of the population that had enrolled in primary school and or in secondary school in 1960 as their measure. Since the publication of the original work, the Barro-Wolf (1991) data set has been updated and incorporated into a larger data set published by Barro and Lee. The current study utilizes this updated data. Educational enrollment is broken down by age-range showing the percentage of the population that had enrolled in primary or secondary education in each year. To ensure that the measure was accounting for all individuals eligible for education I used the proportion of 20-24 year olds who had at one time enrolled if not completed either primary or secondary school. Both primary and secondary education are expected to have a positive impact on economic growth. It should be noted that the data used in this study is necessarily different than the data used in the original piece.

Price of Investment goods-

The price of investment goods is recorded in 1980 relative to the US dollar at that time. Knack and Keefer pulled this data from Penn World Tables v. 5.6, this study uses the same source. As the price of investment goods rise, growth is expected to be negatively affected as the cost of inputs directly impacts production. Although the price of investment goods is listed in the PWT data set in hundreds of dollars, the authors, and subsequently this study divide that number by 100.

The Interaction Terms

The main purpose of this study is to determine if trust can act as a substitute for institutions in so far as economic growth is concerned. Knack and Keefer (1997) argue

that trust may be "more essential where contracts are not reliably enforced by the legal system…"(pg.1260) To test this they interact GDP at the beginning of the period (GDP80) with their measure for social capital (TRUST). As has already been stated, although there is a correlation between GDP and institutional quality (for this data, R-square is 0.65), measuring GDP is not actually assessing the impact of institutions. GDP can be relatively high in countries with very corrupt, and inefficient states in the presences of high priced commodities, therefore an attempt to make inferences about how trust and institutions interact to generate economic growth may lead to biased coefficients and incorrect expectations.

To more closely assess the relationship between institutions and trust, I have attempted to come up with a more precise measure of institutional quality. In the later half of the Knack and Keefer study, they attempt to answer several other questions about trust. To that end, they create a measure for institutional quality out of two measures from the ICRG data. In keeping with this method, I create an additive index between the ICRG measure for corruption and bureaucracy quality. The corruption score given by the ICRG ranges from 0 to 6, with the lower scores indicating high levels of corruption. To illustrate Belgium and the UK score a 6. The ICRG ranking is not completely based on day-to-day rent seeking behavior that is most commonly met directly by business. Instead of import and export bribes and exchange controls and the like, the ICRG measure is 'more concerned' with a broader assessment of corruption in the country taking into account excessive patronage, secret party funding, nepotism and excessively close ties between business and politics. Although the argument I am largely making revolves around the first type of corruption, where broader corruption exists, day to day

corruption is likely to follow, therefore I feel comfortable including this measure in the institutional quality index.

The second measure I include looks at bureaucratic quality. This measure ranges from 0-4 and measures the relative independence that bureaucratic institutions have from the political process. Countries that have high scores in this measure have bureaucracies with establish recruitment and training procedures, employ based on expertise, and have fewer interruptions in government services connected with government and policy changes.

The index used in this study adds these measures together for an overall score between 0 and 10, with 10 representing countries that have higher quality state institutions. As lower corruption and larger separation from the political process ought to make navigating the rules for economic activity easier, this should be positively related to growth in its own right. When included in the interaction term, I expect institutional quality to exhibit a positive overall effect when trust is held constant at zero. Similarly, trust on its own should exhibit a positive effect on economic growth, and when included in the interaction term (holding institutional quality at zero) that positive impact should hold. The interaction term should show a negative impact on growth, as this would indicate diminishing returns to the value of trust or institutions as one or the other increases.

I used regular OLS regression on these data, and generated the marginal effects of the interaction between trust and institutions. An analysis of the results follows in the next section.

Results

      To keep the results of the models in perspective it is useful to look at the data on generalized trust throughout the sample. Figure 1 graphically shows the percentage of the sample in each country that responded to the WVS survey with the belief that 'most people can be trusted'. There is significant variation throughout the sample with Norway reporting over 60% of individuals claiming to be trusters and Brazil reporting the lowest percentage, as just fewer than 7% of the population felt as though strangers can be trusted. The average level of trust across the sample was 35% of the population with a high standard deviation of +/-14% .

[Figure 2: Trust Across Countries]

      Additional summary statistics show that the average rates of growth over the sample is 1.15% per year between 1980 and 1992. The average initial GDP in 1980 was $8,740 and on average 53% of each country's population was at least enrolled in primary school and 28% were enrolled in secondary school in 1960. It is also clear that the sample is heavily weighted toward countries that score high in the ICRG rankings for institutional quality. Recall that the maximum score on the additive index is 10, and the sample average is 8.13. Although the sample includes countries like Nigeria, which only scores a 1.5, the majority of the sample would be considered more efficient states. The summary statistics are reported in table 1.

[Table 1: Summary Statistics]

The results reported in Knack and Keefer (1997) are reported in Table 2. Model 1 shows that while controlling for physical and human capital, social capital can be seen as an independent predictor of growth. For every 10% increase in trust between strangers there is a corresponding 4/5ths percentage point increase in annual growth in GDP/capita. Although this effect is the smallest of all of the variables, it independently and significantly has a positive effect on economic growth.

The control variables also behave as the authors expected, with primary and secondary education being positively and significantly related to growth and showing that the price of investment goods has a negative impact on growth. For every one hundred dollar increase in the price of investment goods there is a 3% decrease in growth.

[Table 2: Knack and Keefer (1997) Reported Results]

The second model shown in table 2 reports the original study's results of a model including an interaction term between generalized trust and GDP in 1980. The authors hypothesize that trust will have a greater impact at lower levels of GDP than higher because low GDP countries are less likely to have institutions that effectively protect property rights. Comparing Models 1 and 2 we can see that the impact of trust when GDP in 1980 is held constant at zero, actually has larger positive impact than before it was combined with GDP. The interaction term is negative and significant. Knack and Keefer claims this supports their hypothesis that trust matters more when institutions are weak. However, it is impossible to see the true effects of trust and GDP on growth other than to

notice the effect of either constituent term when the other is held at zero. As trust and

GDP will never be zero, inferences from this are limited (Brambor et al. 2006). However

the negative coefficient for the interaction gives some indication that there are

diminishing effects of trust on growth when conditioned on GDP.

Tabel 3 shows the results of four models that I ran on the data set replicated on the

original Knack and Keefer (1997) study. Model three reports the results of the same

regression equation used by the authors in Model 1. Comparing this to Model 3 some

differences emerge. Most obviously, the coefficients for the effect of the primary and

secondary education change dramatically. Education data is the only data source that

could not be directly replicated for this study, so it is reasonable to expect that the

coefficients would be different. While the direction and significance of the tests remains

the same as in the original study and replication, we can give credence to the findings of

Beugelsdjk et al. (2004) that claim the Knack and Keefer study does not have robust

coefficients conditional on the education data employed in the study. Using these data

dramatically changes the size of the impact educational enrollment makes and reduces the

size of the effect of trust on growth. Substantively, each of the physical, human and

social capital measures behaves as expected. More importantly for the purposes of this

study, the results of Model 3 show that trust continues to have a positive and significant

impact on growth.

[Table 3: Reconstructed Dataset Models]

Model 4 introduces the institutional index created from the ICRG data. The literature has lead me to hypothesize that institutional quality ought to have an independent positive effect on growth when included in the regression equation. However, these data do not support these hypotheses. Although there is a positive coefficient, it is statistically indistinguishable from zero, and the effect is very small. While this finding is surprising it hardly invalidates research that consistently shows the positive effect quality institutions have on growth. It is possible that these findings are a result of multicoliniarity between GDP and the ICRG index, or that quality educational institutions are absorbing the independent effect of low levels of corruption and high levels of institutional professionalism.

In their model GDP acts as a proxy for quality institutions, I argue that this is a poor measure and that quality institutions, while related to GDP, are not dependent on it. In an effort to correct for this and more accurately examine the relationship between social capital, institutions and growth, Model 5 includes the interaction between the ICRG index of institutional quality and trust. This interaction is added to the replication dataset. Looking at the constituent terms of the interaction, we can see that the institutions variable has a positive and a fairly strong influence on growth when trust is held constant at zero, and similarly trust is positive and significant cause of growth when institutions score a zero in terms of quality. However the negative and significant impact of the interaction lends support to the idea that trust may substitute for good institutions when corruption is high and bureaucratic efficiency is low. To truly assess the relationship, it is necessary to calculate the marginal effects of this interaction term (Brambor et al., 2005).

[Figure 3: Marginal Effects of Trust on Growth as Institutional Quality Changes]

Figure 3 plots the marginal effect of trust on growth as institutional quality increases. The solid line shows the marginal effect of trust on growth conditioned on institutional quality. This clearly shows that at low levels of institutional quality, trust has a larger impact on growth than when the institutional quality score is higher. This relationship is statistically significant for all levels of institutional quality. The lowest level of institutional quality in the sample is 1.5, this graph shows that a country with an institutional quality level that low will see trust cause .25% of an increase in growth. The plot shows diminishing returns on trust as institutional quality increase. Interestingly, trust still matters as a predictor of growth even when the conditioning variable is at its zenith. This indicates that quality institutions cannot completely replace the need for trust in economic transactions. Unintentionally, this finding further confirms the value of including cultural variables in growth equations. Given these results I feel comfortable making the inference that trust and institutions can substitute for one another, in these low institutional quality environments. Thus, I find evidence in support of my hypothesis that although well functioning institutions and trust both work towards growth, trust plays a bigger role where institutions are weak.

Knack and Keefer (1997) do test this hypothesis but they do so by interacting GDP and trust, which does not empirically (or theoretically) address the real issue of institutional quality. In order to compare the effects of their proxy measure in the interaction term with my institutional quality measure I standardized these two measures

setting both means to zero and the standard deviations of each measure to one. I then ran the interaction models again with these standardized variables. The results can be seen in Table 4.

[Table 4: Standardized Interactions Table]

The interaction between trust and the ICRG index has a 10% larger effect than trust and GDP. The inaccurate proxy used by Knack and Keefer actually shows less of an impact on growth, so it is interesting to note that institutions, measured more accurately, matter more when looking at trust and growth than we could previously infer from other studies.

Discussion

What does a confirmation of this hypothesis mean in terms of social capital and growth relationships? Simply put, trust means more for economic development in countries where institutions are not fulfilling their obligations to protect property rights and underwrite contracts. The vast majority of social capital research is done on the developed world. Here institutions are functioning well and those institutions that directly enforce and apply the law are relatively independent from politics, and generally staffed with competent personnel. The developing world does not always enjoy these luxuries. When we see that trust plays a role in substituting for these institutions, trust becomes more interesting and more valuable and therefore future research should be applied to the development context.

If generalized trust is such a valuable commodity in a country where institutions do not function well, the obvious connection to draw from it would be that trust in society should be protected and fostered. Research on generating trust runs into a significant

theoretical snag. As with all cultural variables, trust is necessarily endogenous. Growth and economic prosperity may actually be a factor for increased trust. Eric Uslaner (2003) qualifies this as saying that it is the distribution of wealth that actually produces trust within a country. Any movement to improve equality within a society will translate into increased levels of generalized trust. Rothstein and Uslaner (2005) call this a 'virtuous circle', where increased equality leads to more trust, which brings with it the previously mentioned positive economic benefits, which then leads to increased investment in education, health care, and other egalitarian measures. Future research on the topic should continue the search for exogenous generators of trust, and focus these tests on the developing world, where social capital could see the largest impact.

This study could also benefit from further refinements. At the time the Knack and Keefer piece was written, social capital data was very spare and limited to developed countries where survey research has had a long history. The vast majority of the countries included in the study had institutional quality score well above 6. With few examples of low scoring countries within the data set, inferences drawn from the marginal effects may be questioned.

Today data exists on a much wider sample of countries. Of particular interest are Latin American countries. The original study only included data from Argentina, Mexico and Brazil. As Latin American countries have had longer histories of democracy, a wide range of growth patterns, and see more variation in levels of social capital, and institutional quality (than western Europe) these countries may provide an interesting robustness check for this study. In any case a larger sample would eliminate the issues

found by Beugelsdijk et al. (2004) and would allow more degrees of freedom in the statistical analysis allowing researchers to test more variables.

Utilizing more recent data may also prove to provide more insight into the connections analyzed in this study. More data exists for recent periods both in terms of social capital survey questions and for alternative measures for institutional quality. ICRG is the only source to rate institutional quality as far back as the 1980s, but it is an expert survey that is directed at companies wishing to make informed investment decisions rather than a scientific assessment of such institutions. More recent studies exist to more objectively address these questions, and testing such variables in place of ICRG data may add a much needed robustness check to these findings.

[Figure 2: Trust Across Countries]

Trust Across Countries

Trust levels from WVS 1980-1990
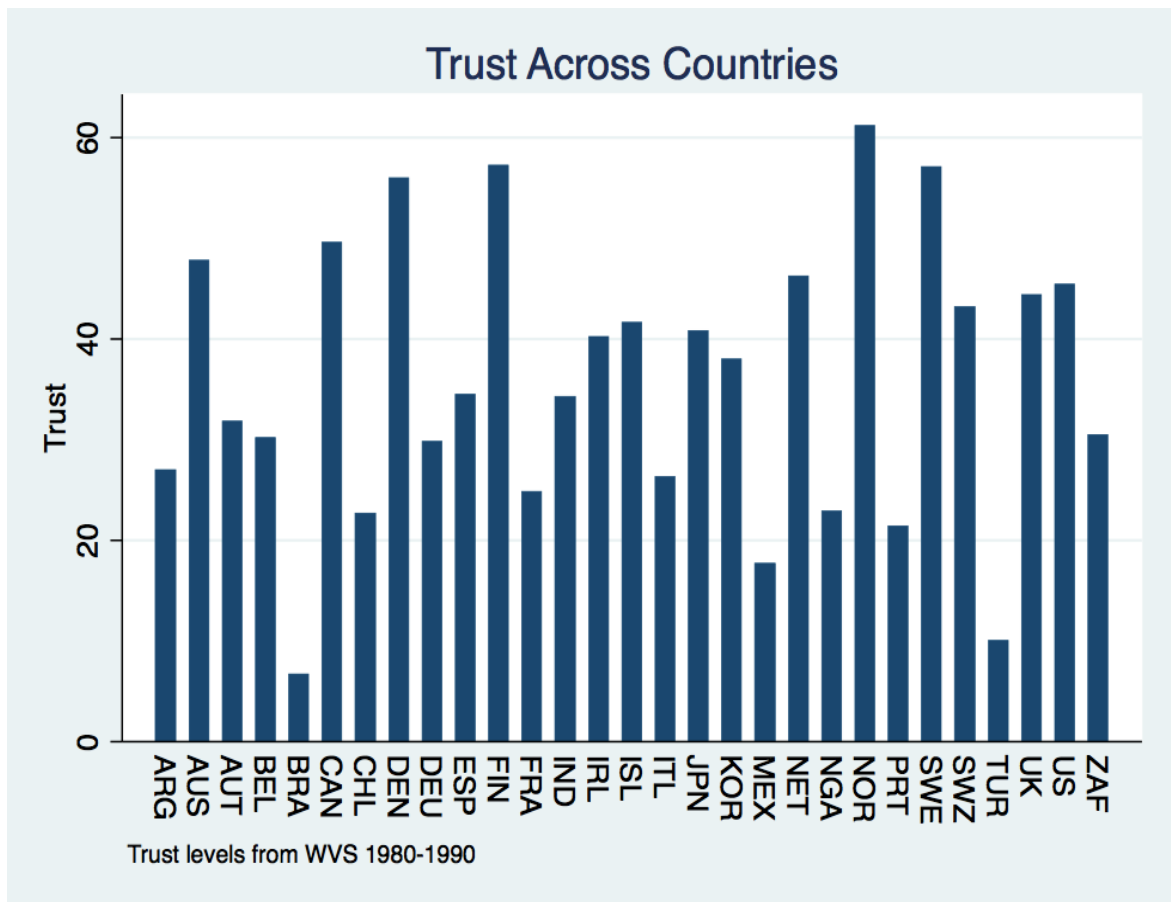
[Table 1: Summary Statistics]

TABLE 1				
Summary Statistics				
	Mean	Std. Dev	Min	Max
Growth	1.15	1.81	-3.9	5.2
GDP80	8.74 ($8740)	4.17 ($4170	0.882 ($882)	15.311($15311)
PRIM60	0.54	0.19	0.13	0.9
SEC60	0.28	0.16	0.05	0.63
PI80	1.09($109)	.305($30.5)	0.53($53)	1.86($186)
TRUST	35.8	14.02	6.7	61.2
ICRG index	8.13	2.26	1.5	10

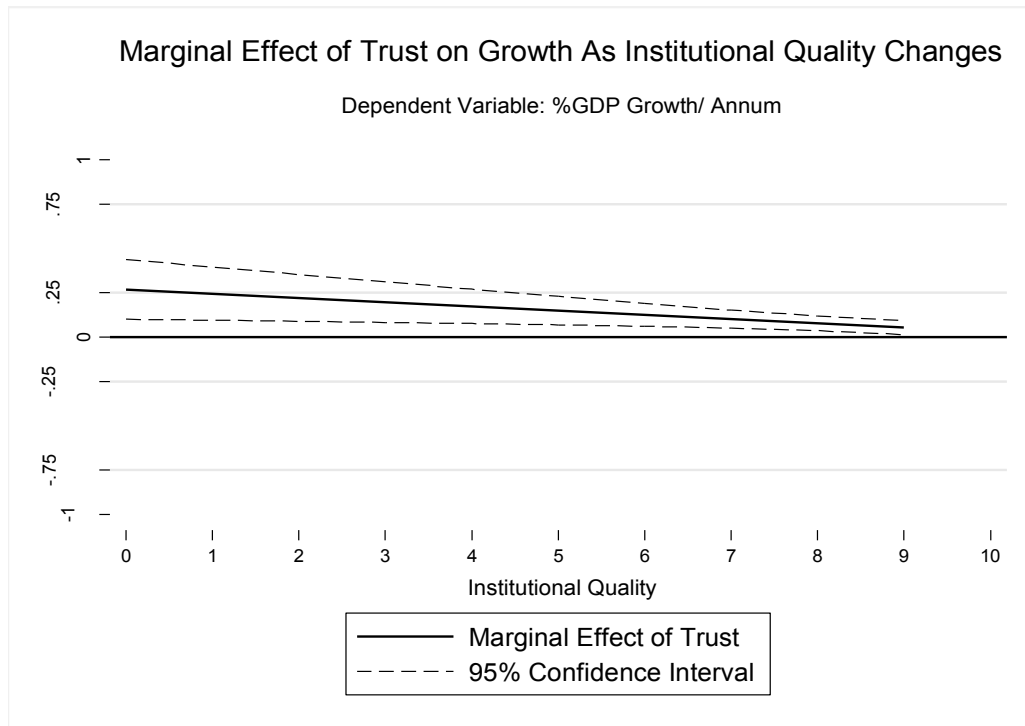|	TABLE 2	
	Dependent Variable: % GDP Growth/ Year	
	Model 1	Model 2
GDP 1980	-0.36***	0.152
	(0.131)	(0.2.74)
Primary School 1960	6.192***	4.818**
	(1.051)	(1.709)
Secondary School 1960	2.194**	1.256**
	(1.632)	(1.930)
Price of Investment Goods 1980	-3.693***	-3.930***
	(0.867)	(0.755)
Trust	0.082**	0.192**
	(0.030)	(0.060)
Trust*GDP	--	-0.013*
		(0.006)
N	28	28
Adjusted R-Square	0.6	0.61

Significance: p<0.05*, p<0.01**, p<0.001***

[Table 2: Knack and Keefer (1997) Reported Results]

[Table 3: Reconstructed Dataset Models]

Table 3			
Dependent Variable: Average % GDP Growth/Year			
	Model 3	Model 4	Model 5
GDP 1980	-0.202*	-0.225	-0.167*
	(0.084)	(0.102)	(0.094)
Primary School 1960	7.204**	7.297**	7.204***
	(1.988)	(2.038)	(1.821)
Secondary School 1960	8.675**	8.721**	7.793**
	(2.515)	(2.566)	(2.322)
Price of Investment Goods 1980	-5.209***	-5.306***	-5.566***
	(0.979)	(1.023)	(0.925)
Trust	0.063**	0.059**	0.268**
	(0.020)	(0.022)	(0.086)
ICRGIndex	--	0.091	0.746**
		(0.212)	(0.323)
Trust*GDP	--	--	--
Trust*ICRGIndex	--	--	-0.024*
			(0.009)
N	28	28	28
Adjusted R-Square	0.6	0.61	0.7

Significance: $p<0.05$, $p<0.01$**, $p<0.001$****

[Figure 3: Marginal Effects of Trust on Growth as Institutional Quality Changes]

Marginal Effect of Trust on Growth As Institutional Quality Changes

Dependent Variable: %GDP Growth/ Annum

[Table 4: Standardized Interactions Table]

TABLE 4		
Dependent Variable: % GDP Growth/ Year		
	Model 6	Model 7
GDP 1980	--	-0.166
		(0.94)
srv_GDP 1980	1	--
	(-0.797)	
Primary School 1960	6.19**	7.204***
	(1.83)	(1.822)
Secondary School 1960	7.397**	7.793**
	(2.314)	(2.322)
Price of Investment Goods 1980	-5.606***	-5.66***
	(0.893)	(0.925)
Trust	0.065**	0.074*
	(0.018)	(0.021)
srv_ICRGIndex	--	1.68*
		(0.728)
Trust*srv_GDP	-0.048*	--
	(0.019)	
Trust*srv_ICRGIndex	--	-0.054*
		(0.022)
N	28	28
Adjusted R-Square	0.698	0.704

Significance: p<0.05*, p<0.01**, p<0.001***

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