PAPER

Inter-firm Trust and Access to Financing

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Abstract   All cross-transactions among firms require an element of trust, meaning that in areas where a mutual trust is high, moral hazard problems associated with contract enforcement would be relatively low. This is true even in circumstances where third party enforcement is well institutionalized and market-supporting institutions are more advanced. Although it has rarely been studied empirically, the role of trust on financial development is recognized as one of the important mechanisms through which social capital fosters economic development. In our study, we investigate the association between inter-firm trust and access to bank financing for 11,500 firms across developing and transitional countries. Our empirical analyses suggest that enterprises in countries with high levels of inter-firm trust are more likely to obtain bank loans and less likely to report access to financing as a major obstacle to their business growth. This result remains robust with the inclusion of many controls and various specification checks as well as econometric adjustments for the potential endogeneity of trust and access to financing.

1. Introduction

Lack of access to financial services among entrepreneurs is a serious problem in developing and transitional countries. Current development theories see the inclusive financial system as a critical factor for generating higher growth, lower poverty and narrower income inequality. In theory, there are a wide range of ways and means that help overcoming access barriers and supporting broader financial

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inclusion. Although it has rarely been verified in the empirical literature, the role of trust on financial development is recognized as one of the important mechanisms through which access to financial services can be boosted. The concept of social capital in general, and trust in particular has crucial implications for advancing our understanding of how entrepreneurs' access to financial services can be improved. Unlike very few studies that investigate trust and financial access in the context of developed countries, our study attempts to analyze the relationship between these two concepts in the context of developing and transitional countries. In general, our paper makes several compelling contributions to address the following gaps in literature on trust and access to finance.

First, and perhaps most importantly, this is the first study which specifically focuses on the relationship between trust and financial access among firms in developing and transitional countries. Following the trust measure suggested by Raiser et al. (2008), we are the first to empirically test the association between inter-firm trust and two different measures of financial access of which one is absolute, and the other is perceptional. Second, the dataset utilized in our study is more comprehensive than the datasets used in the previous studies. Unlike previous works that derived trust and financial access measures from aggregated and household-level sources, we construct both indicators directly from nationally representative firm-level datasets from 30 developing and transitional countries. Furthermore, we combined the micro-data with a diverse set of aggregated macroeconomic indicators in order to reflect the general level of economic, financial and institutional development in the countries. Third, we employ two simultaneous equation specifications with instrumental variables to isolate reverse causality between trust and financial development. In this way, we tried to establish and quantify causal effect of trust on the financial access of firms.

Our results suggest that trust among businesses is strongly associated with the financial outreach of firms. The higher the inter-firm trust in a country, the higher a firm's probability of obtaining credit and less complaining about financing as a major or severe obstacle to their growth. The results remain the same even after controlling for a wide range of covariates as well as geographic groupings. Using instrumental variable techniques to deal with the potential endogeneity of trust also leaves the results unchanged. In line with the results of earlier studies, we also find that size, obtaining international certificates, capacity utilization and the sectoral origin of firms are significantly related to their financial outreach. In addition to the firm-level characteristics, macroeconomic variables such as GDP per capita, inflation and Rule of Law also explain access to finance.

The rest of the paper proceeds as follows: the next section briefly reviews the underlying literature in the field. Section 3 discusses the notion of trust and financial access, and explains the conceptual framework of the association between trust and

access to finance; Section 4 describes the data and empirical methodology; Section 5 presents the empirical results of the relationship between trust and financial access; and finally Section 6 concludes.

2. Literature Review

Research regarding the potential link between institutions and economic performance has become widespread since the publication of Acemoglu et al.'s (2001) seminal paper. Consequently, in recent years, theme related to the developmental impact of social capital, the natural or informal complement of institutions, has also become increasingly popular in the economic literature. This popularity has further been promoted by influential papers written by Putnam (1993) and Fukuyama (1995). Putnam (1993), for example, documented a strong positive relationship between the degree of individuals' free association with one another and economic performance in Italy. Fukuyama (1995) also showed the strong effect of social capital on economic development, and since then a large body of empirical literature has emerged to verify the benefits that social capital has on economic outcomes (Helliwell and Putnam 1995, Knack and Keefer 1997, Knack and Zack 2001). Helliwell and Putnam (1995) noted that, when holding income constant, regions of Italy with high levels of social capital grew faster than did regions without high levels of social capital. Knack and Keefer (1997) showed that higher levels of trust were more conducive to growth in a sample of 29 market economies, while Knack and Zack (2001) found this relationship to be persistent even after controlling for the quality of law enforcement.

Social capital is generally defined as the degree of trust, co-operative norms and networks and associations within a society and therefore, trust and social capital are usually used interchangeably in the literature (Putnam et al. 1993, Knack and Keefer 1997, La Porta et al. 1997, Knack and Zak 2001, Bowles and Ginits 2002). In addition to its direct effect on economic performance, various arguments have been put forward regarding the ways in which trust can be associated with economic phenomena through indirect mechanisms (Knack 2002, Durlauf and Fafchamps 2004). For example, La Porta et al. (1997) found trust to be correlated with measures of education and health, while Bjornskov (2012) showed that trust affects both schooling and rule of law. Positive associations between trust and international trade have been investigated by Butter and Mosch (2003), while Ackerman (2001) and Ahlerup et al. (2009) documented some interchangeability between social capital and formal institutions.

Despite the theoretically straightforward association between financial development and trust, there are only two fundamental studies that have investigated this link empirically. First, in a cross-country analysis, Calderon et al. (2002) have

empirically tested the relationship between trust and different variables of financial development. Their study concludes that social trust is strongly associated with financial development and efficiency indicators. A second study has been conducted by Guiso et al. (2004) where they empirically tested the relationship between social capital and different measures of financial development in Italy. The authors suggest that households are more likely to use checks, invest in stocks, have access to credit lines and use less informal credit in the areas of Italy where social capital is high. To our knowledge, these are the only two papers that have empirically analyzed the role of social trust in financial development.

3.   Conceptual and Methodological Framework

A.   Concept of Trust

Theory and empirical evidence point to the important role that trust has in increasing the number of mutually beneficial business transactions. As argued by Arrow (1972), virtually all inter-firm transactions require an element of trust, meaning that an absence of trust reduces the number of mutually beneficial trades that can take place. With this primary argument in mind, in our paper we suggest the level of prepayment demanded by firms from their customers as a measure of (dis)trust. This measure is based on the study by Raiser et al. (2008), where the authors interpreted prepayment as a measure of (dis)trust. In order to construct our trust variable we used the answer to one of the questions raised in the Business Environment and Enterprise Performance Survey (BEEPS): "What percentage of total annual sales were paid for before the delivery in last fiscal year?".

Prepayment as an indicator of trust is a somewhat generalized measure of trust and reflects the confidence levels towards every type of private enterprise (e.g. foreign, domestic, small, medium and large companies etc.). However, it is narrower than a typical generalized trust metric of the World Values Surveys (WVS), which may not provide a good representation of the existing moral resources in the business sectors of developing and transitional countries (Raiser et al. 2008). Therefore, our measure of trust can also be considered to be a localized indicator, since more a generalized trust variable must also capture the level of trust towards individuals, government institutions, foreigners etc., which we do not capture in our trust measure.

In general, we assume that an enterprise will forgo prepayment if it has enough trust in its customer, either through repeated experience in trading with that customer, or through a recommendation from a third party. Our main assumption is that an enterprise will only attempt to acquire prepayment if it doubts that its money will be paid fully and/or on time. That is, the higher (lower) the prepayment, the lower (higher) the trust in customers.

As a driving force of inter-firm trust, one should not avoid the significance of

enforcing legal contracts in any country. As an example, a supplier may decide to ask for a higher level of prepayment in case of falling into the circumstance that third party enforcement would be insufficient. Nevertheless, prepayment as a measure of trust can also be problematic. The main difficulty with our measure of trust is that it may reflect credit market imperfection, which is common in transitional countries (Bonin et al. 2005). When suppliers lack working capital, they may ask for prepayments to supply their cash requirement. A second problem may arise due to the type of goods being sold, where demand for prepayments may be more prevalent in some sectors than in others (Raiser et al. 2008). A third problem concerns the issue of using trade credits as an alternative measure of trust, which can also be complex and problematic. Given that a detailed discussion of that advantages and disadvantages of our trust measure is provided by Raiser et al. (2008), we confine ourselves to only a brief discussion of the topic, and conclude that prepayment is a powerful proxy for trust.

B.   Concept of Access to Finance

The concept of access to finance has become a popular topic in the recent literature. Claessens (2006) defines access to finance as the availability of a supply of financial services at reasonable quality and cost. The terms financial access and financial usage have been proposed to be synonymous by Demirguc et al. (2008). Furthermore, Beck and Demirguc (2008) suggest that the firm-level metrics of financial outreach provide a more precise way to measure access to finance.

   In our study, we use two measures as proxies for access to finance by firms. The first measure, *Having a Credit,* is a supply-side proxy that shows whether a firm has a loan or line of credit. The following question from the BEEPS survey was used to construct the first measure, "At this time, does this establishment have a line of credit or a loan from a financial institution?". The main strength of this measure is that it reflects actual access to credits, the main element of financial services that are needed, and there is no leeway for firms to provide a wrong or incomplete answer. However, the main problem with this measure is that it does not reflect the extent of access to finance, since it only allows us to know whether a firm uses a loan or not. As suggested by Beck and Demirguc (2008), measures of financial outreach can be either voluntary or non-voluntary. According to the *Having a Credit* metric, firms that have access but choose not to use services (voluntary absence of finance) are treated in the same way as are those who have no access to finance. This leads to a partially biased estimate in terms of the general access to finance, and therefore an alternative measure of access to finance is proposed in this study.

   The second measure, *Financing Obstacle*, is a demand-side proxy and reflects a firm's perceptions regarding the degree of difficulty of accessing external

finance. To construct our second measure of financial access, we use the following question from the BEEPS survey: "How problematic is financing for the operation and growth of your business?". Despite its broader definition when compared to the *Having a Credit* question, using perception-based measures can be also problematic. Since our measure comprises of unaudited self-reporting of financing obstacle, it is possible that while firms report financing obstacles, they are actually not constrained by them. Moreover, this measure does not capture the supply side of the market that is financial institutions' willingness to supply financial services. However, there is empirical evidence showing that among few, firms' perception on financing obstacles is strongly associated with their growth rates (Beck et al. 2005).

C.   How Does Trust Affect Access to Finance?

Using the inter-firm trust indicator, we assume that in countries where trust is generally high, the supply of financial services would be enhanced. Conversely, in areas where trust is very low, moral hazard problems associated with financing may be increased for lending to businesses. Below, we will elaborate on the ways in which high levels of trust in business transactions may improve firms' access to financial services.

As discussed by Guiso et al. (2004), a financial contract is ultimately a trust-intensive contract. In addition to the legal enforceability of contracts, the extent to which the lender trusts the borrower can also affect the use and availability of financial services. If, for example, creditors doubt that borrowers will be willing or able to repay their debts, fewer financial institutions will be willing to extent them credits. This is true even in circumstances where third party enforcement is strong, market-supporting institutions are more advanced, and where the opportunistic behavior of borrowers can be avoided by additional clauses such as collateral requirements or by courts.

Financial institutions may also consider firms that exhibit high levels of trust in their partners and have wide networks to be more successful and trustworthy. As argued by Barr (1998), entrepreneurs with larger and more diverse set of networks might have more productive enterprises, resulting in the achievement of better credit ratings. The level of trustworthiness can be viewed as even greater if a firm's trusted companies overlap with the financial institution's existing clientele. In this case, the role of an existing member of a financial institution can be twofold. First, it can act as a screening device for loans (Varian 1990, and Ghatak 1999). This is simply because financial institutions are more likely to rely on relationships with well-known business partners than on more formal mechanisms to make decisions and resolve disputes. Second, peer's pressure or advice are also essential elements of high levels of trust between a financial institution and a new customer since an

existing customer would wish to preserve its corporate reputation and trustworthiness in front of a financial institution.

In light of the above-mentioned arguments, we expect that in our study, the trust-intensive nature of financial contracts will be even more prevalent because of the developing and transitional country context of the study. The following three reasons may support this idea.

First, because of weak formal contract enforcement mechanisms, a financial institution would be more likely to rely on trust indicators in developing and transitional countries. In such countries, banking practices suffer from a number of problems such as asymmetric information, insufficient physical collateral, low legal enforcement and ineffective court systems. Empirical evidence suggests that in high-income countries, enforcement of contract matters most for financial development, while in developing countries information infrastructure is more critical (Djankov et al. 2007). Hence, we can assume that trust would strongly and positively associate with access to financial services in our set of countries.

Second, in general, developing and transitional countries experience lower levels of generalized trust which allows them to benefit from localized trust in their formal financial sector development. Low levels of trust toward others are generally associated with high levels of trust within subgroups such as family, friends and coworkers (Fukuyama 1995). For this reason, we would expect that the likelihood of better access to external finance will be larger in the countries with high levels of inter-firm trust.

Third, the extent to which a financial contract requires trust should also depend on the level and quality of human capital in the developing countries, where the environment is plagued by relatively weak human capital. Low levels of education impede the degree of sophistication of investors, which in turn will require greater levels of trust to make the same investment (Guiso et al. 2004). Hence, we expect financial institutions in developing and transitional countries to rely more on trust as a substitute for their relatively weak level of competency and experience.

4.   Reverse Causality: Does Financial Outreach Influence Trust?

It is worth noting that simultaneity may be a potential problem in our study as it is possible that firms can afford to be more trusting in countries where access to finance is growing. A more developed financial system may improve the trust of firms which may be encouraged to intermediate or function financially. Furthermore, better access to financial services may encourage firms to expand their business and hereafter, develop higher trust towards clients in order to keep their business growing. Financial deepening can increase incentives for firms to incorporate (Demirguc et al. 2006). All these arguments might suggest that our trust measure

might be an endogenous variable, which would render rather biased estimates. For controlling such simultaneity bias, we use instrumental variables (IV) procedure which requires finding instruments that are both correlated with trust (good instruments), but which have no independent correlation with the dependent variable (valid instruments). To find the best instruments for trust, we follow both Alesina and Ferrare (2000) and Calderon et al. (2002), and use cultural diversity and crime variables that associate with inter-firm trust, but may not have a direct effect on access to finance. The *Soviet* dummy as a proxy for cultural diversity is justified by the notion that transitional countries that used to be part of the Post-Soviet Union might share cultural traits and a historical heritage that would have an effect on the level of trust in those countries, and which may be different from other transitional economies. The *Crime* variable is proposed to capture the level of insecurity of business in terms of crime, theft and disorder, with the assumption that enterprises that face more criminal activity and theft may begin from a baseline of a lower level of trust in others.

4.   Data and Empirical Specification

A.   *Data*

In our paper we utilize the dataset of the Business Environment and Enterprise Survey (BEEPS) IV, which is a joint initiative of the European Bank for Reconstruction and Development (EBRD) and the World Bank Group (the World Bank). The survey was conducted in 2009 and collects data from 11,500 enterprises operating in the manufacturing and service sectors in 29 transitional countries from Eastern Europe and the Commonwealth of Independent States (including Mongolia) [1]. Turkey was also included in the survey for comparison purposes. Table A.1 in the appendix reports the number of firms surveyed from each country.

The Survey uses standardized instruments and a uniform sampling methodology with the following objectives:

(a) To provide statistically significant business environment indicators that are comparable across all of the world's economies;
(b) To assess the constraints to private sector growth and enterprise performance;
(c) To build a panel of firm-level data that will make it possible to track changes in the business environment over time, and
(d) To stimulate policy dialogue on the business environment and to help shape the agenda for reform.

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1 Albania, Armenia, Azerbaijan, Belarus, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Macedonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyz Republic, Latvia, Lithuania, Moldova, Mongolia, Poland, Romania, Russia, Serbia & Montenegro, Slovak Republic, Slovenia, Tajikistan, Turkey, Ukraine, and Uzbekistan

There are three levels of stratification: industry, size and region. The survey universe was defined as 'private business establishments with at least five full-time employees'. Government departments including military, police, education, health and similar activities were excluded. The structure of the BEEPS IV questionnaire consists of three modules. First, the basic questionnaire, the Core Module, includes all common questions asked to all establishments from all sectors (manufacturing, services and IT). The second expanded variation, the Manufacturing Questionnaire, is built upon the Core Module and adds some specific questions relevant to the sector. The third expanded variation, the Services Module, is also built upon the Core Module and adds to the core specific questions relevant to either retail or Information Technology (IT). The BEEPS IV covers topics such as firm characteristics (i.e. firm's age, size, owner, legal status), access to infrastructure (i.e. electricity, transportation, water), government relations (i.e. regulations, tax administration, corruption, construction permits), labor (i.e. number of temporary employees, permanent jobs), firm performance (i.e. capacity utilization, sales, export), access to finance (i.e. saving accounts, sources of investment financing), and business obstacles (i.e. ranking the 15 most important obstacles to business).

In general, several academic papers and policy documents have been produced using the BEEPS data base as a good source for across-country and across-time analysis. A detailed list of papers that has used the BEEPS IV database can be obtained from the World Bank's enterprise surveys web site at www.enterprisesurveys.org. In addition to the BEEPS IV micro data, we also include country-level information on the macro and institutional variables that might affect the degree of access to finance by firms.

B.   *Empirical Specification*

The main objective of our study is to evaluate how inter-firm trust affects access to finance among firms in developing and transitional countries. To do this, we model the financial outreach of firm. We use two proxies that have been employed as outcome variables measuring access to finance. Both of them are dummy variables reflecting actual, as well perceptional, aspects of access to finance. The first dependent variable, *Having a Credit,* indicates whether a firm has a credit or line of finance in the fiscal year surveyed. The following question on the BEEPS IV dataset was used to construct this dependent variable, "At this time, does this establishment have a line of credit or a loan from a financial institution." The variable is a dummy variable and answers consist of either 0 (no) or 1 (yes).

The second variable, *Financing Obstacle*, is a subjective variable and reflects a firm's perceptions regarding the degree of difficulty of having an access to external finance. In order to construct our dummy variable for financing obstacles, we use the following question from the survey: "How problematic is financing for the operation and growth of your business?". Answers vary between 0 (no obstacle), 1 (minor obstacle), 2 (moderate obstacle), 3 (major obstacle), and 4 (very severe obstacle). Based on these answers, we construct our dependent variable which is a new binary variable getting 1 if a firm considers financing as either a major or very severe obstacle (answers 3 or 4 to the question), 0 if otherwise (answers 0, 1 or 2 to the question). Given that both our outcome variables are binary, we perform our estimation in three steps. In the first step, we use the binominal probit regression model. Here, we include firm-level variables first, as not to overload the specification, and then we add country fixed effects as well as country-specific covariates. We run these models for whole sample, containing 30 developing and transitional countries.

Second, we run the pooled regression with all firm-level and country-specific covariates for European and Asian countries separately. This allows us to check the robustness of our coefficients and to see whether the results are geographically bound or not.

Third, we address the possible existence of reverse causality between trust and financial access using the instrumental variables method, namely bivariate probit model. In general, we assume that a firm's underlying response can be described by the following equation:

$$Y_{i,k} = \alpha + F(X'\beta) + C(Z'\gamma) + T'\delta + u$$

where

Y_i- underlying probability that firm i in country k, has access to financing.

$F(X'\beta)$ - is the vector of firm-level independent variables.

$C(Z'\gamma)$ - is the vector of country-specific explanatory variables.

$T'\delta$ - is the measure of inter-firm trust.

u - is a disturbance parameter, and it is assumed that the parameter has normal distribution.

As a main independent variable, we construct our trust variable, *Average Trust*, using the answers to the BEEPS IV question on "What percentage of total annual sales were paid for before the delivery in the last fiscal year?". We calculate the average opposite value of this statement for each country. As such, our country-level trust scores indicate the percentage of firms, on average, that trust in their

customers.[2]

To study the determinants of a firm's access to finance, we proceed in three steps. First, as has been done in previous studies, we use a wide set of firm-level controls (Beck et al. 2005). We expect a firm's access to finance to be related to its size, age, export status, sectoral origin, capacity utilization, ownership status and external auditing experience. Second, controlling for country fixed effects is also important because certain countries may be more prone to reporting better access to finance. Therefore, we do not want to bias our results if our regressors systematically co-varies with this episode of more intensive reporting of financial development, and therefore prefer to include country dummies. Third, we also include several country-level variables in our analysis. We use GDP per capita, inflation and Rule of Law to measure overall economic development, financial perfection and legal system efficiency, respectively. Table A.2 in the appendix reports the sources and definitions of the country-level dataset, along with the actual interview questions.

Finally, as explained above, we use equation (1) as the baseline to address the possible existence of reverse causality between trust and financial access. In this regard, we employ two additional indicators to instrument our trust variable. The first is *Soviet,* a dummy which gets 1 if a transitional country was a member of Post-Soviet Union, and otherwise it gets 0. The second is the *Crime* variable which we construct from the answers to the following question of BEEPS IV: "How much of an obstacle are crime, theft and disorder to this establishment?". Answers vary between 0 (no obstacle), 1 (minor obstacle), 2 (moderate obstacle), 3 (major obstacle), and 4 (very severe obstacle). As instrumental variable methods, we employ two different models: (i) standard simultaneous equations (2SLS) to perform standard IV tests and (ii) the bivariate probit model which explicitly takes into account the binominal nature of the outcome variable (Sajaia 2006).

5.   Empirical Results and Discussions

A.   Descriptive Analysis

In Table 1, we report summary statistics of access to finance indicators for each country, where we see a large variation in access to finance across countries, ranging from Uzbekistan (16.4) to the Slovenia (77.5) for the measure of *Having a Credit* and from Russia (40.2) to the Estonia (6.3) for the measure of *Financing Obstacles*.

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2 In unreported regressions we also analyzed a firm-level trust variable instead of a country average measure. While the results were unchanged in a majority of the specifications, in a very few cases we found the variable statistically insignificant. Since Raiser et al. (2008) also found country-level trust to be a more robust metric, we stick to it and report only the results of the aggregated measure.

Table 1 Summary statistics of access to finance, by country

Country	Having Credit				Financing Obstacle				Total #
	No		Yes		No		Yes		
	#	%	#	%	#	%	#	%	
Albania	89	51	86	49	152	87	23	13	175
Belarus	116	46	138	54	169	67	85	33	254
Georgia	216	59	152	41	246	67	122	33	368
Tajikistan	246	69	109	31	269	76	86	24	355
Turkey	441	39	693	61	977	86	157	14	1,134
Ukraine	554	67	277	33	535	64	296	36	831
Uzbekistan	306	84	60	16	276	75	90	25	366
Russia	556	56	439	44	595	60	400	40	995
Poland	219	50	215	50	336	77	98	23	434
Romania	236	47	270	53	353	70	153	30	506
Serbia	122	31	266	69	274	71	114	29	388
Kazakhstan	322	59	221	41	375	69	168	31	543
Moldova	193	53	170	47	231	64	132	36	363
Bosnia and Herzegovina	113	31	246	69	265	74	94	26	359
Azerbaijan	308	81	72	19	273	72	107	28	380
Macedonia	148	41	217	59	277	76	88	24	365
Armenia	203	55	166	45	254	69	115	31	369
Kyrgyz Republic	180	77	54	23	176	75	58	25	234
Mongolia	157	43	205	57	236	65	126	35	362
Estonia	117	43	153	57	253	94	17	6	270
Kosovo	206	77	63	23	241	90	28	10	269
Czech Republic	121	51	117	49	184	77	54	23	238
Hungary	159	55	131	45	262	90	28	10	290
Latvia	108	40	163	60	205	76	66	24	271
Lithuania	110	40	164	60	206	75	68	25	274
Slovak Republic	139	52	129	48	229	85	39	15	268
Slovenia	62	22	214	78	227	82	49	18	276
Bulgaria	159	55	129	45	241	84	47	16	288
Croatia	47	30	112	70	125	79	34	21	159
Montenegro	48	41	68	59	105	91	11	9	116
Total	6,001	52	5,499	48	8,547	74	2,953	26	11,5

In the following two charts, we aim to depict the association between financial access and the average trust level in each country. Chart 1 shows that there is substantial variation with regard to having a loan among transitional countries, with banked private firms being less common in economies with lower inter-firm trust, such as most of the countries in the Commonwealth of Independent States (CIS). Furthermore, having a loan or obtaining a line of credit tends to be higher in countries where inter-firm trust is also high. For example, access to credit is apparently better in Slovenia, Croatia, Serbia and Turkey where inter-firm trust is also prevalent, while CIS countries such as Uzbekistan, Azerbaijan, Tajikistan and Kyrgyz Republic are found to experience lower access to credit and lower inter-organizational trust.

Figure 1 Having a credit vs. inter-firm trust in transitional countries
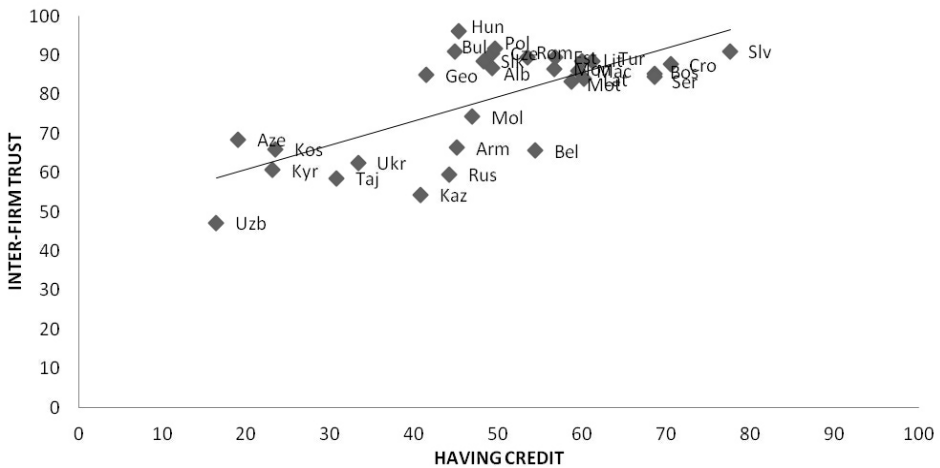
Chart 2 shows the association between inter-firm trust and self-reported financing obstacle. A cursory examination of the chart shows that self-reported financing obstacle is lower in countries where generalized inter-firm trust is high. Despite some minor differences, the results of Chart 2 mirror the outcomes of Chart 1. For example, the majority of CIS countries which were found to have both low levels of inter-firm trust and low access to lines of credit (e.g. Russia, Ukraine, Azerbaijan) seem to also exercise high levels of self-reported financing obstacles. Conversely, fewer firms in the relatively advanced European countries (e.g. Estonia, Hungary, Turkey) report that financing is a major or severe obstacle to their growth, with apparently higher inter-firm trust.

Figure 2 Financing obstacle vs. inter-firm trust in transitional countries
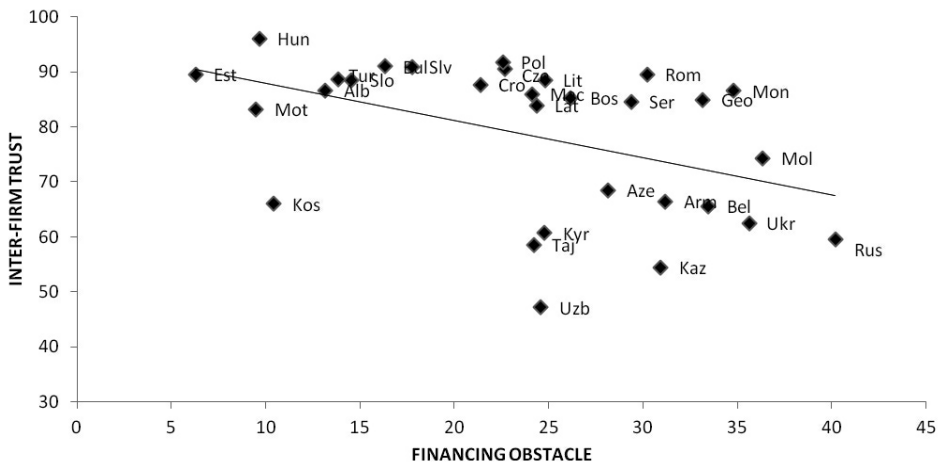
The cross-correlation between our financial access indicators and trust, as well as a broad array of firm-level and country-specific indicators is shown in Table 2. Both Having a Credit and Financial Obstacle are correlated with the trust variable. Although this correlation is not that high in absolute terms, it appears to be both statistically and economically significant. A firm operating in a country with a high level of trust tends to have better access to credit and usually do not report access to finance an obstacle to its growth.

When examining the correlation between access to finance indicators and different control variables, we can identify some other interesting findings from Table 2. First, all control variables (except foreign ownership) seem to statistically correlate with the *Having a Credit* measure, while some correlations such as size, auditing status and capacity utilization were found not to be statistically significant with regard to the measure of *Financing Obstacle*. In terms of *Having Credit*, some control variables are more strongly correlated with the dependent variable than are others. For example, being large, audited and having any international certificate are all positively and strongly correlated with *Having a Credit*. As far as the *Financing Obstacle* is concerned, having a quality certificate and being owned by foreigners are negatively correlated with self-reported financing obstacle, while being older and belonging to the manufacturing sector seems to positively correlate with reporting poor access to finance. Finally, according to Table 2 results, we also note that all country-specific variables are significantly (statistically and economically) correlated with both proxies of financial access.

Table 2 also shows that many of the control variables are correlated with each other. For example, externally audited as well as export oriented firms tend to be older, larger, and foreign-owned, while older firms tend to be larger and involved

Table 2 Cross-correlation

	Having Credit	Financing Obstacle	Trust	Age	Small	Medium	Manufacturing	Trade	External Audit	Certificate	Foreign Owner	Capacity Utilization	Export Status	GDP p.c.	Inflation	Rule of Law
Having Credit	1															
Financing Obstacle	0.052***	1														
Trust	0.196***	-0.12***	1													
Age	0.064***	0.02**	0.018***	1												
Small	-0.17***	0.02**	-0.004*	-0.2***	1											
Medium	0.022***	-0.01	-0.01	-0.01	-0.59***	1										
Manufacturing	0.042***	0.039***	-0.04***	0.116***	-0.15***	0.055***	1									
Trade	-0.03***	-0.01	0.01	-0.08***	0.142***	-0.05***	-0.64***	1								
External Audit	0.166***	-0.01	0.143***	0.156***	-0.26***	0.015**	0.065***	-0.06***	1							
Certificate	0.117***	-0.05***	0.194***	0.114***	-0.24***	0.009	0.156***	-0.15***	0.228***	1						
Foreign Owner	0.004	-0.04***	0.065***	-0.02***	-0.13***	-0.03***	0.012	-0.04***	0.136***	0.156***	1					
Capacity Utilization	0.054***	0.012	-0.02*	0.091***	-0.11***	0.02***	0.637***	-0.41***	0.064***	0.153***	0.048***	1				
Export Status	0.091***	-0.02**	0.148***	0.035***	-0.15***	-0.01	0.162***	-0.16***	0.108***	0.151***	0.188***	0.212***	1			
GDP p.c.	0.168***	-0.06***	0.51***	0.053***	-0.05***	0.01	0.064***	-0.05***	0.111***	0.182***	0.035***	0.093***	0.094***	1		
Inflation	-0.15***	0.105***	-0.64***	-0.003	-0.01	0.016	0.083***	-0.03***	-0.02***	-0.16***	-0.07***	0.044***	-0.09***	-0.61***	1	
Rule of Law	0.155***	-0.11***	0.828***	-0.01	-0.03***	-0.004	-0.06***	0.031***	0.125***	0.169***	0.074***	-0.04***	0.138***	0.578***	-0.65***	1

in manufacturing rather than trade and other services. Furthermore, the country-level trust variable is also correlated with other aggregate variables, showing that economies with higher levels of inter-firm trust tend to have larger GDP per capita, lower inflation and better Rule of Law.

B. Econometric Results

1. Having a Credit

In order to investigate the true effect of inter-firm trust on financial access, together with all firm characteristics and country-specific controls that explain our dependent variable, we conduct a multivariate analysis. Columns (1), (2) and (3) of Table 3 report marginal effects of binominal probit estimates for *Having a Credits* using the whole sample of 30 countries. The reported estimates in Column (1), which display marginal effects of firms-level variables on the *Having Credits*, show that access to credit is positively associated with level of trust. After controlling for firm-specific variables, a 1 unit increase in country-level trust is associated with a 0.7 percentage point higher probability that the firm has a credit from a financial institution. This effect is statistically significant at the 1-percent level.

Most control variables coefficients in Column (1) are statistically significant and have the expected signs. For example, large size, external auditing status, having international certification, being export oriented and higher capacity utilization are all positively associated with access to credit, and all these controls have statistically significant coefficients. However, age and sectoral origin of firm appear to be statistically non-significant. Finally, being owned largely by foreign individuals or companies is negatively associated with the probability of having a credit. This however, may be partially due to foreign-owned enterprises having less necessity for borrowing money since they may have more access to internal capital resources than do firms that are domestically owned.

Table 3 Effect of trust on having a credit. (The symbols ***, **, * mean that the coefficient is statistically different from zero, respectively, at the 1-, 5-, and 10- percent levels.)

	(1)	(2)	(3)	(4)	(5)	(6)
Trust	0.0070***	0.0151***	0.0070***	0.0067***	0.0096***	0.0039***
	(0.0004)	(0.0016)	(0.0007)	(0.0014)	(0.0010)	(0.0033)
Age	0.0001	-0.0003	-0.0001	0.0001	-0.0011*	-0.0001
	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0006)	(0.0008)
Small	-0.2168***	-0.2282***	-0.2119***	-0.2460***	-0.1800***	-0.2055***
	(0.0132)	(0.0135)	(0.0137)	(0.0177)	(0.0219)	(0.0367)
Medium	-0.1051***	-0.1134***	-0.1087***	-0.1193***	-0.1068***	-0.1048***
	(0.0130)	(0.0132)	(0.0135)	(0.0175)	(0.0211)	(0.0346)

	(1)	(2)	(3)	(4)	(5)	(6)
Manu-facturing	-0.0030	-0.0023	0.0124	0.0274	-0.0260	0.0119
	(0.0148)	(0.0152)	(0.0157)	(0.0200)	(0.0253)	(0.0395)
Trade	0.0247*	0.0257*	0.0318*	0.0303*	0.0238	0.0306**
	(0.0143)	(0.0146)	(0.0152)	(0.0192)	(0.0247)	(0.0381)
External audit	0.0883***	0.0882***	0.0983***	0.1156***	0.0638***	0.1028***
	(0.0102)	(0.0108)	(0.0108)	(0.0141)	(0.0171)	(0.0275)
Certifi-cate	0.0227*	0.0250**	0.0129	-0.0150	0.0479**	0.0174
	(0.0119)	(0.0123)	(0.0125)	(0.0161)	(0.0202)	(0.0316)
Foreign owner	-0.0014***	-0.0013***	-0.0013***	-0.0014***	-0.0006	-0.0013***
	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0005)
Capacity utiliza-tion	0.0005***	0.0004***	0.0003**	0.0003**	0.0001	0.0003***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0004)
Export status	0.0468***	0.0373**	0.0585***	0.0478**	0.0618**	0.0638***
	(0.0177)	(0.0181)	(0.0188)	(0.0238)	(0.0307)	(0.0474)
GDP p.c.			0.0442***	0.0428**	0.0289***	0.0426***
			(0.0076)	(0.0171)	(0.0104)	(0.0191)
Inflation			-0.0061***	-0.0034	-0.0217***	-0.0082***
			(0.0019)	(0.0034)	(0.0037)	(0.0052)
Rule of Law			0.0691***	0.0752***	0.0990***	-0.0259
			(0.0134)	(0.0214)	(0.0253)	(0.0535)
Pseudo R2	0.0682	0.0977	0.0699	0.0617	0.0859	-
Obs.	11500	11500	10507	6396	4111	10507

Notes: Probit estimations report marginal effects that are calculated as Average Partial Effects. Column (1) – only firm-level independent variables; Column (2)– firm-level independent variables and country fixed effects; Column (3) – firm-level and country-level independent variables; Column (4) and (5) - firm-level and country-level independent variables only for Europe and Asia samples respectively; Column VI – Bivariate probit model. Standard errors are in parentheses. ***, ** and, * - significant at the 1%, 5% and 10% level respectively.

Column (2) of Table 3 displays the marginal effects of the probit model with country fixed effects. Here, we include country dummies in the core regression, as specified in Column (1). The results show that the positive and significant relationship between inter-firm trust and access to banking services is highly robust. However,

the economic magnitude of this effect is relatively small, suggesting that a 1 percent increase in aggregate trust level is associated with a 0.15 percentage point greater likelihood of a firm having credit. Other covariates remain statistically as well economically significant.

In Column (3) of Table 3, we also control for some country-specific variables in order to isolate the impact of trust from other aggregate indicators. The magnitude and significance of the effect of trust remains the same as in Column (1), suggesting that the probability of having credit increases by 0.7 percentage points when country level inter-firm trust increases by 1 percent. Moreover, in countries where GDP per capita and Rule of Law are high, firms are more likely to obtain credit. Finally, firms operating in countries with high inflation, appear to have lower access to credit.

In Column (4) and (5), the same model of Column (3) is being used with splitting the sample into Europe and Asia respectively. In brief, neither economic nor statistical significance of the effect of inter-firm trust on having credit has changed. Other results are also largely the same as in Column (3), meaning that none of the marginal effects of covariates changed the sign, while very few changed in terms of significance level.

As mentioned, the results of binominal probit estimates of the relationship between aggregate trust and access to finance must be interpreted cautiously because of the potential reverse causality between these two variables. Column (6) of Table 3 displays the results of the main regression equation of the bivariate probit model. We find that trust is strongly related to financial access, and the model passes all statistical tests for instrumental variable procedures (Sargan's test for overidentification, the Anderson canonical correlation test for joint significance and the Wu-Hausman test for endogeneity)[3], meaning that estimating the bivariate probit instead of the single equation probit appears to be more appropriate.

In Column (6) the results of the simultaneous equations bivariate probit regression are reported in marginal effects. These results suggest that a 1 unit increase in country-level trust among businesses increases the probability of having credit by 0.4 percentage points. Between firm-level and country-specific variables, the same controls remained statistically as well as economically significant, and their magnitudes are very similar to the ones obtained in Column (3). The degree of legal enforcement is also positively related to financial access, and this association is statistically insignificant.

2. Financing Obstacle

Thus far, we have restricted our econometric analysis to the association between

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3 In addition to the bivariate probit model, we have also run the same bivariate probit model with 2SLS in order to perform the standard tests of the IV estimates (the results of the 2SLS model can be provided upon the request).

aggregate trust and *Having Credit*. However, we know that having credit can only partially reflect the true picture regarding firms' access to finance. As discussed earlier, when a firm has access to (denial of) a loan or line of credit from a financial institution it does not necessarily mean that it has better (worse) access to finance when compared to a firm with zero (more) borrowing. In this regard, we use our second measure of access to finance namely *Financing Obstacle,* and employ the same model specifications used above to estimate the effect of trust on financial outreach. As was elaborated above, we expect access to finance to be a less severe obstacle for firms operating in countries with higher levels of inter-firm trust.

In Table 4, we use the four model specifications that we employed in Table 3 and find a striking confirmation of our expectations. Column (1) of Table 4 reports the marginal effect of aggregated inter-firm trust on the self-reporting of financing obstacle. Trust has a negative and statistically significant impact on the degree of financing obstacle. A one unit increase in inter-firm trust in a country reduces the probability of a firm's financing access to be a major or severe obstacle by 0.35 percentage points. Among firm-level covariates, age, size, sectoral origin, ownership structure and international certification appear to be statistically significant in terms of explaining a firm's reporting on financing obstacles. However, external auditing status, capacity utilization and the export orientation of firms are found not to be statistically significant in explaining subjective financing obstacles. Among statistically significant covariates, for example, older enterprises and firms within manufacturing were more likely to have reported access to finance as a severe obstacle than were younger firms and companies operating in other sectors. Interestingly, foreign-owned firms seem to report less financing obstacles, which confirms the result we obtained for *Having a Credit*. This can help justify our argument that firms owned by foreigners do not obtain credit as frequently as do domestic firms, largely because the former have enough internal investment resources available to them not to need to apply for credit.

Table 4 Effect of trust on financing obstacle

	(1)	(2)	(3)	(4)	(5)	(6)
Trust	-0.0034***	-0.0055***	-0.0025***	-0.0017***	-0.0037	-0.0030***
	(0.0003)	(0.0015)	(0.0006)	(0.0002)	(0.0009)	(0.0037)
Age	0.0006***	0.0006***	0.0006**	0.0006*	0.0000	0.0006**
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0005)	(0.0009)
Small	0.0205*	0.0255***	0.0224*	0.0157	0.0133	0.0234*
	(0.0118)	(0.0120)	(0.0124)	(0.0162)	(0.0196)	(0.0386)
Medium	0.0031	0.0051	0.0034	0.0091	-0.0127	0.0040
	(0.0114)	(0.0114)	(0.0119)	(0.0154)	(0.0186)	(0.0369)

	(1)	(2)	(3)	(4)	(5)	(6)
Manufac-turing	0.0530***	0.0478***	0.0527***	0.0460***	0.0499**	0.0526***
	(0.0125)	(0.0126)	(0.0133)	(0.0172)	(0.0211)	(0.0419)
Trade	0.0210*	0.0135	0.0179	0.0007	0.0490**	0.0177
	(0.0126)	(0.0126)	(0.0134)	(0.0172)	(0.0216)	(0.0409)
External audit	0.0119	0.0135	0.0049	0.0038	0.0040	0.0057
	(0.0088)	(0.0092)	(0.0093)	(0.0124)	(0.0146)	(0.0294)
Certifi-cate	-0.0271***	-0.0179*	-0.0258**	-0.0098	-0.0369**	-0.0251**
	(0.0100)	(0.0103)	(0.0106)	(0.0139)	(0.0169)	(0.0341)
Foreign owner	-0.0006***	-0.0007***	-0.0006***	-0.0010***	0.0001	-0.0006***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0004)	(0.0006)
Capacity utiliza-tion	-0.0002	-0.0002	-0.0003*	-0.0003	-0.0003	-0.0003*
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0004)
Export status	0.0010	0.0169	-0.0018	0.0271	-0.0234	-0.0009
	(0.0153)	(0.0159)	(0.0164)	(0.0218)	(0.0260)	(0.0513)
GDP p.c.			0.0073	0.0158	-0.0178**	0.0071
			(0.0062)	(0.0147)	(0.0086)	(0.0194)
Inflation			0.0044***	0.0057*	0.0073**	0.0041**
			(0.0016)	(0.0030)	(0.0031)	(0.0055)
Rule of Law			-0.0162	-0.0670***	0.0848	-0.0093
			(0.0118)	(0.0188)	(0.0511)	(0.0592)
Pseudo R2	0.0160	0.0460	0.0199	0.0384	0.0148	-
Obs.	11500	11500	10507	6396	4111	10507

Column (2) of Table 4 reports the estimates of the same binominal probit model with country fixed effects. We find that our variable of trust is significantly associated with financing obstacle, suggesting that a 1 percent increase in aggregate trust leads to a 0.55 percentage point reduction in the probability of a firm self-reporting as financially constrained. The patterns and magnitudes of other estimates remained very similar to those obtained in Column (1).

In Column (3) we add the country-level variables and re-run the model. We confirm the finding that firms in countries with higher trust levels face lower

financing obstacles. The results also indicate that firms in countries with higher levels of GDP per capita and Rule of Law report lower financing obstacles, although the estimates appear statistically insignificant. However, the inflation level was found to be positive and significant at the 1 percent level, suggesting that enterprises in countries with higher inflation levels are more likely to face higher financing obstacles. When we include country-specific variables, the firm-level covariates found to be significant in predicting firms' financing obstacles continue to be significant with one additional variable, namely capacity utilization, becoming significant as well.

In Column (4) and (5), we again split the whole sample into European and Asian countries and rerun the model specified in Column (3) respectively. In general, the results of Column (4) and (5) show that our findings are not geographically bound for financing obstacle either, and the conclusions above hold true irrespective of the country context.

Finally, in Column (6) we provide the marginal effects of the simultaneous equations bivariate probit regression for the independent variable Financing Obstacle. As was expected, trust was found to be statistically as well as economically significant, even when we instrument our basic measure of trust with Soviet and Crime dummies. A one unit increase in aggregated inter-firm trust reduces the probability of financing obstacles for firms by 0.3 percentage points. All other control variables have the expected sign and most of them are statistically significant.

6. Conclusion

As suggested by Beck and Demirguc (2008), the agenda on access to finance is still unfinished and there is more research needed to identify critical barriers preventing firms from financial outreach and inclusion. While supply-side barriers were found to be important in excluding some fraction of businesses in transitional countries, cultural impediments such as inter-firm trust appear also to be critical in obtaining formal financial services. Provided that formal institutions are commodities which are in relatively short supply in developing and transitional economies, our results suggest that developing trust among businesses is likely to prove to be a powerful tool for expanding access to finance.

Third party enforcement through mutual trust and networks may be a useful complement to enforcement through formal institutions such as courts. The efforts aimed at building trust among businesses can prove to be even more important to success in transitional countries where legal enforcement is often inadequate. With this conclusion in mind, the question regarding how to eradicate the ultimate causes of distrust among businesses in transitional countries becomes one of the key components of reforms towards enhancing financial inclusion.

Our results are also a fruitful avenue for further research on the importance of inter-firm trust on economic outcomes. For example, some of the numerous possible topics for future research that have been identified include the link between inter-firm trust and a wide range of firm-level performance metrics including the growth, innovation, profitability etc.

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Appendix

Table A.1. Country samples

	Country	Observation
1	Albania	175
2	Armenia	369
3	Azerbaijan	380
4	Belarus	254
5	Bosnia & Herzegovina	359
6	Bulgaria	288
7	Croatia	159
8	Czech Republic	238
9	Estonia	270
10	Fyr Macedonia	365
11	Georgia	368
12	Hungary	290
13	Kazakhstan	543
14	Kosovo	269
15	Kyrgyz Republic	234
16	Latvia	271
17	Lithuania	274

	Country	Observation
18	Moldova	363
19	Mongolia	362
20	Montenegro	116
21	Poland	434
22	Romania	506
23	Russia	995
24	Serbia	388
25	Slovak Republic	268
26	Slovenia	276
27	Tajikistan	355
28	Turkey	1,134
29	Ukraine	831
30	Uzbekistan	366
	Total	11500

Table A.2. Variable description and data sources

Variable	Description	Source	Year
Firm-level variables			
Having Credit	Dummy variable is equal to 1 if firm has a loan or line of credit, otherwise 0	BEEPS	2009
Financing Obstacle	Dummy is equal to 1 if financing constraint is cited as "moderate" or "major obstacle", otherwise 0.	BEEPS	2009
Trust	Percentage of total sales for which firms are not paid in advance of delivery (country average)	BEEPS	2009
Age	Number of years since establi-shment began operations	BEEPS	2009
Small	Dummy variable is equal 1 if the business employs less 20 people, otherwise 0.	BEEPS	2009
Medium	Dummy variable is equal to 1 if the business employs more than 20 and less than 100 people, otherwise 0.	BEEPS	2009

Manufac-turing	Dummy variable is equal to 1 if firm is in the manufacturing indust-ry, otherwise 0.	BEEPS	2009
Trade	Dummy variable is equal to 1 if firm is in the retail trade and servi-ces industry, otherwise 0.	BEEPS	2009
External audit	Dummy variable is equal to 1 if financial statements of firm checked & certified by external auditor in last fiscal year, otherwise 0.	BEEPS	2009
Certificate	Dummy variable is equal to 1 if firm has internationally recognized quality certification, otherwise 0.	BEEPS	2009
Foreign Ownership	Percentage of firm owned by priva-te foreign individual, companies or organizations.	BEEPS	2009
Capacity Utilization	Percentage of capacity utilization of establishment in the last year.	BEEPS	2009
Export status	Dummy is equal to 1 if over 50 per-cent of firm's products & services were export sales, otherwise 0.	BEEPS	2009
Country-level variables			
GDP per capita	GDP per capita in USD per year (Log)	EBRD	2008
Inflation	Increase of consumer prices (annual average)	EBRD	2006-08
Rule of Law	Rule of Law Index	WGI	2006-08