The Importance of Trust for Investment: Evidence from Venture Capital

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Abstract

This paper examines the effect of trust in a micro-economic environment, where trust is clearly exogenous. Using a hand-collected data on European venture capital, we show that the Eurobarometer measure of trust among nations significantly affects investment decisions. This holds even after controlling for investor and company fixed effects, geographic distance, information and transaction costs. The national identity of venture capital firms' partners is shown to matter for the effect of trust. We also considers the relationship between trust and sophisticated contracts involving contingent control rights. We find trust and sophisticated contracts to be complements, not substitutes.

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"There are countries in Europe [...] where the most serious impediment to conducting business concerns on a large scale, is the rarity of persons who are supposed fit to be trusted with the receipt and expenditure of large sums of money." (John Stuart Mill)

1 Introduction

Intuitively, many economist recognize the importance of trust for economic transactions. As part of the recent literature on "social capital," the work of Knack and Keefer (1997), Temple and Johnson (1998), and Zak and Knack (2001) establishes a positive relationship between trust and economic growth. Yet, this macro-oriented literature struggles with issues of endogeneity. A micro-based approach holds promise for a cleaner identification of the effect of trust on economic transactions.

In this paper we use micro data on venture capital investments, containing information on how venture capital firms across Europe invest in companies that may be located in the same or different countries. We use the Eurobarometer measure of bilateral trust among nations to examine two central issues: Does trust affect the likelihood of making an investment? And does trust affect the contracts between investors and entrepreneurs? We find that trust is an important determinant of venture capital investment decisions, even after controlling for several other factors. Moreover, higher trust is associated with more sophisticated contracts.

What do we mean by trust? The social capital literature conceptualizes trust as a subjective belief about the likelihood that a potential trading partner will act honestly. It is important to distinguish different types of trust. In a recent survey article, Durlauf and Fafchamps (2006) provide a useful distinction between generalized and personalized trust. The former pertains to the preconceptions that people of one identifiable group have for people from another identifiable group. The latter concerns the evolving relationship between two specific agents. In this paper we only focus on generalized trust, so that we are concerned with what might be considered cursory beliefs, generalizations about others, even stereotypes. An important caveat is that our analysis does not consider personalized trust, i.e., how individuals interact over time to build better economic relationships.

Why should trust matter? Economic theory provides a number of reasons why trust should—or should not—matter. If agents have common priors and update them based on the available information, then no systematic differences should persist at the level of generalized trust (which, by construction, excludes private information). The problem with this argument is that trust differentials are remarkably persistent. Differences in subjective beliefs can thus be thought of as non-common priors (Morris (1995)). These are likely to arise in situations where agents have little objective information, and thus rely more on social cues for making decisions. Another line of argument is that even if trust differences persist, they should not matter, because sophisticated investors can undo such biases by taking advantage of arbitrage opportunities. An interesting counter-argument to this is that lack of trust may be self-fulfilling, i.e., it may be explained by the existence of multiple equilibria (Greif (1993)). Arbitraging trust differentials may not be feasible, precisely because the other party has low trust. From this discussion it becomes also clear

that from a theoretical perspective, any empirical effect of trust neither proves nor refutes irrational behavior.

Why study trust in the context of venture capital? First, venture capital provides a useful testing ground for the effects of trust because both sides of the above arguments can be applied. On the one hand, one can reasonably argue that venture capitalists are sophisticated investors who would not act upon poorly-informed priors, and who are well positioned to exploit any arbitrage opportunities. On the other hand, one might argue that the financing of new companies inherently involves limited hard information, high (Knightian) uncertainty, and considerable scope for opportunistic behavior. Investors may therefore be more prone to rely on soft information, including social beliefs such as trust.

Second, the venture capital industry is tiny relative to the economy. According to the European Venture Capital Association, total investments in venture capital (excluding buyouts) accounted for less than 0.1% of European GDP in 2004. Venture capital activity is clearly irrelevant to the formation of trust among nations. We thus have a setting where we need not worry about reverse causality. Trust among nations can affect individual venture capital investments, but these investments do not have a reverse causality effect on trust among nations. This considerably helps with empirically identifying the effects of trust.

One challenge with venture capital is obtaining the data. We use a hand-collected dataset on European venture capital investments for the period 1998-2001. It contains investors and companies from all across Europe, providing rich variation in investment patterns. It also contains unique and useful details, such as the precise geographic location of every single company and investor, and information about investment contracts that cannot be obtained from any of the publicly or commercially available database.

Given its subjective nature, it is appropriate to measure trust by surveying opinions. We adopt the approach of Guiso, Sapienza and Zingales (2005) of using the Eurobarometer survey data of bilateral trust among nations. This measure is based on how much citizens of one country say they trust the citizens from all other European countries (including their own). We use country fixed effects for both investors and companies, so that all of the analysis concerns differences in the relative trust among nations. We show that our results are robust by exploring a variety of alternative approaches to measuring trust, such as using a measure of trust which more closely reflects the socioeconomic profile of venture capital investors, or considering trustworthiness instead of trust by looking at trust from the company's, rather than the investor's, perspective.

Our econometric specification considers all potential matches between investors and companies in our sample, and ask which matches are actually realized. Given that we do not have a natural experiment, the main identification challenge is controlling for omitted variable bias. Our micro-level data is rich enough to control not only for country fixed effects, but also for investor and even company fixed effects. This eliminates a large number of alternative interpretations. For example, our fixed effects account for all country-specific factors, such as regulation, taxes and any country-specific institutions. They also account for differences in countries' investment opportunities, and they take care of any systematic differences in the quality of investors or companies across countries. In fact, given our fixed effects, the only variables that matter are *relative* (or so-called

dyadic) measures between the investor and the company. Trust is obviously such a relative measure. We are also able to calculate a very precise measure of geographic distance, that is the actual kilometric distance between the investor's and the company's town.[1] Another important relative measure concerns the availability of information about other countries. We measure the amount of information about foreign countries available through each country's business press. Another set of alternative explanations concern differences in transaction and enforcement costs. For this, we consider measures of language overlap, and similarity of legal systems.

A central result is that higher trust significantly increases the probability of realizing an investment. The effect of trust is economically large, and continues to hold across a number of alternative specifications. For example, economists have argued that culture may affect economic outcomes through two main channels: beliefs (such as trust) and taste-based preferences. In our context we can ask whether investors really invest in the countries they trust, and not just the countries they like. We introduce two novel proxies for taste-preferences among nations. The first is based on the flow of tourists across countries, the second on voting patterns from the Eurovision Song Contest, a unique pan-European cultural event. We find that the main effect of trust survives against all of these alternative explanations.

Another issue concerns the role of individuals within firms. Venture capital firms have relatively simple decision-making structures, where the power to make investments resides with a handful of partners. We ask whether the presence of foreign partners affects the firm's investment decisions, and find that having a foreign partner from the same country as the company increases the likelihood of investing. In addition, the presence of a foreign partner from a third country where trust for the company's countrymen is higher than in the investor's host country also facilitates making an investment.

Our data allows us to examine the relationship between trust and contracting practices, which had not previously been studied. We focus on the use of contingent control rights. A large literature, based on information asymmetries, argues that sophisticated contracts help making economic interactions possible (see Stiglitz (2004) for an overview). The prior venture capital literature (Hellmann (2006), Kaplan and Strömberg (2003)) argues that sophisticated contracting clauses can be used to balance the interests of investors and entrepreneurs, but that specifying and verifying these clauses can be challenging. We consider two alternative hypotheses about the relationship between trust and these sophisticated contracts. If sophisticated contracts help to overcome information asymmetries, then trust and sophisticated contracts would be substitutes, but if trust is a requisite for such contracts, then they would be complements. We examine a variety of contingent control rights, and find that the effect of trust on their use is positive and significant. This supports the complements hypothesis, where trust is important for writing sophisticated contracts.

Our paper builds on the seminal work of Guiso, Sapienza and Zingales (2005), which establishes the importance of trust for trade and investment flows. We build on their analysis in several important respects. First, their analysis remains at the macro level,

[1] Such precision allows us to avoid some of the measurement problems that have plagued the literature on trade and geography, which typically uses a much coarser measure—the distance between capital cities (Head and Mayer (2002), Helliwell and Verdier (2001)).

i.e., at the level of country pairs. We are able to analyze micro data at the level of individual investor-company pairs, which allows us to control for a comprehensive set of alternative explanatory factors, and thus to better isolate the role of trust. Second, because we focus on a small segment of the economy, we can safely eliminate any concerns about the endogeneity of trust. We can thus bypass all the difficulties of having to find appropriate instruments for the determinants of trust.[2] Third, our analysis takes an important additional step, examining not only whether transactions occur, but how they are structured. This allows us to address questions about the relationship between trust and contracts that are not addressed by Guiso, Sapienza and Zingales.

Our results naturally contribute to the broader literature on social capital (see Dasgupta (2003), Durlauf and Fafchamps (2006) and Guiso, Sapienza and Zingales (2006) for some recent surveys). Much of this literature has focussed on the importance of trust in an environment in which there is little legal enforcement. For example, Neace (1999) documents that entrepreneurs in the former Soviet republics consider trust a key criterion for business success. Johnson, McMillan and Woodruff (2002) show that well-functioning courts are a prerequisite for entrepreneurs to trust and contract with external suppliers. Guiso, Sapienza, and Zingales (2004) show that social capital has a stronger effect where legal enforcement is low, and among less educated people. Our study shows that trust may continue to play a role, even in the context of developed countries. Moreover, our results suggest that even with good legal enforcement, people do not rely on sophisticated contracting to overcome lack of trust.

Trust is also an important concept in the emerging behavioral finance literature. The paper most closely related to our is Guiso, Sapienza and Zingales (2007), which documents that trust affects the willingness to invest money in the stock market. Guiso, Sapienza and Zingales (2005) also explore how trust affects portfolio investments across countries. In a broader sense, our paper also contributes to research on the well-known 'home bias' puzzle (French and Poterba (1991), Karolyi and Stulz (2003), Lewis (1999)).

This paper makes a novel contribution to the venture capital literature, introducing trust as an important factor that has not been considered so far. The analysis builds on a number of papers that explain the contractual features observed in venture capital. See in particular Dessein (2005), Gompers (1997), Hellmann (1998, 2006), Hellmann and Puri (2002), and Kaplan and Strömberg (2003, 2004). A recent spate of papers also examines how legal systems influence venture capital contracts. See, in particular, Bottazzi, Da Rin and Hellmann (2005), Cumming, Schmidt and Walz (2005), Kaplan, Martel and Strömberg (2003), and Lerner and Schoar (2005). The analysis of these papers is orthogonal to ours, in the sense that our fixed effects already absorb all cross-country differences in legal systems. That is, the effects of trust observed in this paper go beyond differences in legal systems. Finally, recent work by Hochberg, Ljungqvist and Lu (2006a,b) examines the importance of social networks in venture capital.

The remainder of this paper is structured as follows. Section 2 explains our data and variables. Section 3 examines the effect of investment formation. Section 4 examines the effect of trust on contracts. It is followed by a brief conclusion.

[2] Obviously our analysis cannot—and doesn't try to—explain the formation of trust itself. See Alesina and La Ferrara (2002) and Glaeser et al. (2000) for contributions to the analysis of this question.

2 Data and variables

Table 1 provides descriptive statistics for all the variables used in the analysis.

2.1 Data on venture investments

Our data come from a variety of sources. Our primary source is a survey of 750 venture capital firms in the following seventeen European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the UK. Venture firms were included in our sample if they satisfied three conditions: (i) they were full members of the European Venture Capital Association (EVCA) or of a national venture capital organization in 2001, (ii) they were actively engaged in venture capital and (iii) they were still in operations in 2002.[3]

We asked each venture capital firm information about each first round of venture financing they made between January 1998 and December 2001. The questions centered on key characteristics of the venture firm and on their involvement with portfolio companies. We also asked information on some characteristics of the firm's venture partners and on its portfolio companies.[4]

We received 124 usable responses, which we cross-checked using investor and company websites, commercial databases (Amadeus, Worldscope, and VenturExpert), and trade publications. For this paper we use data on 108 venture firms (and their portfolio companies). Eight are from either Norway or Switzerland, countries for which there are no available data on trust, and eight invested solely outside the European Union or provided us with insufficient information.

While there is some variation in response rates across countries, our data represent a comprehensive cross-section which provides a good coverage of all countries, with an overall response rate of nearly 16%. This response rate is significantly larger than the typical response rate for comparable surveys of industrial firms, which is around 9% (see the discussion by Graham and Harvey (2001)). No single country dominates the sample, and no country is left out. Remarkably, the larger venture capital markets (France, Germany, and the UK) show a response rate above 13%. Finally, our data are not dominated by a few large respondents: the largest venture capital firm accounts for only 5% of the observations, and the largest 5 venture capital firms for only 16% of the observations. In Bottazzi, Da Rin and Hellmann (2005, 2006) we provide a more extensive discussion of the data, and report some additional tests that confirm the representativeness of this sample.

[3] We excluded from our survey private equity firms that *only* engage in non-venture private equity deals such as mezzanine finance, management buy-outs (MBOs) or leveraged buy-outs (LBOs), but we included private equity firms that invest in *both* venture capital and non-venture private equity deals. For these, we considered only their venture capital investments. See Fenn, Liang and Prowse (2003) for a discussion of the structure of the private equity market.

[4] Throughout the paper we reserve the term 'firm' for the investor (i.e., the venture capital firm) and the term 'company' to the company that receives the venture capital financing.

2.2 Unit of observation

We adopt two units of observation. In the first part of the analysis, we focus on the formation of deals. For this we construct the sample of all potential deals, consisting of every possible pairing between investors which have responded to our survey and their portfolio companies. The unit of observation is the individual investor-company pair (as in Sørensen (2005)). We construct such pairs from the 108 venture firms and the 1,216 companies in our dataset. For each company we consider that it could in principle be financed by any of the respondent venture firms. We also take into account that some individual pairs are not potential deals because the venture capitalist began operations after the date the company was seeking an investment. Our potential deals dataset includes 107,390 potential deals.

One obvious limitation of our analysis is that to be included in our sample, a company must have received funding from at least one investor. We clearly cannot observe all the 'marginal' companies that never received any funding from any venture capitalist.[5] What does it mean to exclude these marginal potential deals? Our analysis examines whether trust affects investment decisions among all 'infra-marginal' companies. This excludes any effect that trust may have on the marginal companies. It is possible that higher levels of trust increase the overall size of the venture capital market. In this case, it is likely that our analysis understates the total effect of trust. In fact, there is some evidence that countries with higher level of trust have larger venture capital markets. Figure 1 shows the positive relationship between the per-capita amount of (aggregate) venture capital investment (in euros) and the level of trust received by each of our sample countries.

In the second part of the analysis we focus on the question of how trust affects venture capital contracts. For this part of the analysis we use what we call the realized deals sample, which consists of all the actual investments that we observe in our data. Our realized deals sample contains a total of 1,277 deals, into 1,216 companies, made by 108 venture capital firms. The reason there are more deals than companies is that 54 companies receive financing from more than one of our venture investors.

2.3 Dependent variables

In the first part of the analysis we ask whether a particular investor finances a particular company. The dependent variable is DEAL, which is a dummy variable that takes the value 1 if the venture capital firm has invested in a particular company; 0 otherwise.

In the second part of the analysis we address the relation between trust and contracts. For this we construct five dependent variables which capture the extent to which sophisticated contracting is used in each deal. We consider four types of contingent control rights, whereby the investor is granted the rights to certain actions in case the company fails to meet specified performance targets. We look at the right to take control of the board of directors, to obtain voting majority, to liquidate the company, and to fire the founder/CEO ('termination').

For contingent board rights, our survey instrument asked: *Does your firm has a right*

[5] Note that even if we did, their observations would fall out of the regression by the time we consider the conditional logit model.

to obtain control of the board of directors contingent on the realization of certain events? (Possible answers were: *Yes, No.*). Based on this, CONTINGENT BOARD RIGHTS is a dummy variable that takes the value 1 if the venture capital firm responded *Yes*, and 0 if it responded *No.*

For contingent voting rights, our survey instrument asked: *Does your firm has a right to obtain voting rights contingent on the realization of certain events?* (Possible answers were: *Yes, No.*). Based on this, CONTINGENT VOTING RIGHTS is a dummy variable that takes the value 1 if the venture capital firm responded *Yes*, and 0 if it responded *No.*

For contingent liquidation rights, our survey instrument asked: *Does your firm has a right to liquidate the company contingent on the realization of certain events?* (Possible answers were: *Yes, No.*). Based on this, CONTINGENT LIQUIDATION RIGHTS is a dummy variable that takes the value 1 if the venture capital firm responded *Yes*, and 0 if it responded *No.*

For contingent termination rights, our survey instrument asked: *Does your firm has a right to fire the founder/CEO contingent on the realization of certain events?* (Possible answers were: *Yes, No.*). Based on this, CONTINGENT TERMINATION RIGHTS is a dummy variable that takes the value 1 if the venture capital firm responded *Yes*, and 0 if it responded *No.*

Finally, we build an index measure of contingent control rights by summing over the four contingent control dummies. This variable is called CONTINGENT CONTROL RIGHTS, and takes value between 0 and 4.

2.4 Independent variables

2.4.1 Country-dyad level

Some of our dependent variables vary at a level that we call a 'country dyad,' which is the unique pair of an investor's country and a company's country. Table 2 shows the correlation structure of the independent variables that vary at the country-dyad level.

Central to the analysis is our measure of trust. Our analysis is based on the Eurobarometer measures of trust, previously used by Guiso, Sapienza and Zingales (2005), who describe the Eurobarometer survey in detail. Eurobarometer is a large survey about the social and political attitudes of citizens of the European Union. The survey is executed periodically for the European Commission since 1970. Our trust measure is derived from the Eurobarometer survey waves from 1990 to 1996. Note that we deliberately chose not to collect trust data directly from our survey respondents, since such a measure would have serious endogeneity problems. The Eurobarometer measures, on the contrary, have the important advantage that they are clearly exogenous to the investments made by venture capitalists.

Our trust variable is calculated by taking the responses to the following question: *"I would like to ask you a question about how much trust you have in people from various countries. For each, please tell me whether you have a lot of trust, some trust, not very much trust or no trust at all."* The answers are coded over a scale from 1 (no trust at all) to 4 (a lot of trust). TRUST is computed as the percentage of the individuals which respond 4—i.e., that they trust a lot people from the other country.

How reliable is this measure of trust? First, note that the bilateral nature of the data distinguishes between being trusting and being trustworthy (see also Glaeser et. al. (2000)). Second, the trust measure reflects many of the patterns one would intuitively expect: People typically have the highest trust for their own country; Scandinavian countries receive a lot of trust and are also more trusting; the British trust the French less than other nations; and the French are happy to reciprocate. We also examine how the Eurobarometer trust measure relates to the World Values Survey (WVS) measure of trust, which has played a central role in the prior literature (Knack and Keefer (1997)).[6] A strong correlation between these two measures would suggest a reliable measurement of trust that does not depend on the details of how the surveys were implemented. The correlation coefficient is 0.72, significant at the 1% level.[7] Trust also shows a strong correlation with two widely used index measures, corruption (0.47) and rule of law (0.55).[8] This provides reassurance about the reliability of our trust measure.[9]

The remaining country-dyadic variables are the following. We consider three variables that are standard controls in the literature on geography and trade, measuring whether a pair is either located in the same country, or in neighboring countries, and how economically far away are two countries. Formally, FOREIGN–DEAL is a dummy variable that takes the value 1 if the investor and company are from different countries, 0 otherwise. COMMON–BORDER is a dummy variable that takes the value 1 if two countries share a land border, 0 otherwise (including domestic deals). GDP–DIFFERENCE is the absolute difference in the levels of per capita GDP, averaged over the 1998–2001 period (the data is obtained from Datastream).

Our next variable attempts to capture search costs, broadly defined. INFORMATION is calculated as the percentage of times a country is mentioned in another country's main business newspaper. The data is obtained from the Factiva database, which contains information about the extent of business press coverage available in each country. Following Guiso, Sapienza and Zingales (2007), for each country dyad we record the number of articles in country i's main available business newspaper, that mentioned country j, or citizens of country j, in the headlines. We divide this number by the total number of articles in the newspaper which are related to all the (foreign) countries in our sample. Since we cannot generate a reliable count of domestic articles, we set the INFORMATION variable to zero for domestic country pairs (i=j).

We consider two country-dyadic variables that capture transaction costs, broadly defined. They measure the similarity of languages and of legal systems. LANGUAGE–

[6] The WVS survey question is *"Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?"* The main difference with the Eurobarometer is that the WVS only measures the overall level of trust held by citizen of one country, rather than bilateral country-dyadic trust.

[7] We take into account that the Wordl Values Survey does not ask about trust in citizens of foreign countries, so that the appropriate comparison is with the Eurobarometer trust measure expressed only for citizens of the same country.

[8] The corruption index is the 1998–2001 average of the measure published by Transparency International (www.transparency.org); the rule of law index is the 2000 value published by the World Bank (www.doingbusiness.org).

[9] Guiso, Sapienza and Zingales (2005) report an additional validation of the Eurobarometer measure based on asking people about the likelihood that a lost wallet be returned, that further confirms its validity.

OVERLAP is the percentage of people who speak the same language in each pair of countries, summed across all primary languages spoken in those two countries. This variable is naturally set to 1 for domestic deals. The data comes from www.ethnologue.com. LEGAL–DIFFERENCE is a dummy variable that takes the value 1 if the investor and company are located in countries with different legal origins; 0 otherwise. Following La Porta et. al. (1997) we distinguish between four legal origins: common law, French-origin civil law, German-origin civil law and Scandinavian-origin civil law.

To capture taste-based preferences, we consider two novel proxy measures. TOURISM is the number of nights spent at hotels for holiday purposes by citizens of country i in country j, averaged over the period from 1998 to 2001. This variable is set to 0 for domestic deals. The data come from Eurostat, and are available for the stays of citizens of European countries. EUROVISION, is the percentage of votes from citizens of country i to the song of country j in the Eurovision Song Contest, averaged over the period from 1998 to 2001. This variable is set to 0 for domestic deals. The data are obtained from the www.eurovision.tv website.

To measure the economic relationships between countries we use two standard measures from the trade literature. EXPORTS is the volume of exports from country i to country j (in billions of dollars), averaged over the period from 1998 to 2001. This variable is set to 0 for domestic deals. The data come from the UN World Trade (COMTRADE) database. FDI is the volume of foreign direct investments from country i to country j (in billions of dollars), averaged over the period from 1998 to 2001. This variable is set to 0 for domestic deals. The data come form OECD.

2.4.2 Other independent variables

DISTANCE is the natural logarithm of one plus the distance between the venture capital firm and the company. We identify the exact longitudinal and latitudinal coordinates for each venture capital firm and company. This data is obtained from www.multimap.com. We then use the geodetic formula to compute the distance in kilometers. This variable differs for each potential deal.

INDUSTRY is set of a dummy variables that characterize companies' sector of operations. We obtain the data from our survey instrument, which gave the following choices: *Biotech and pharmaceuticals; Medical products; Software and internet; Financial services; Industrial services; Electronics; Consumer services; Telecommunications; Food and consumer goods; Industrial products (including energy); Media & Entertainment; Other (specify).* These variables vary at the level of the individual company.

EARLY–STAGE is a dummy variable that takes values 1 if a company's stage is reported as seed or start-up; 0 otherwise. We obtain the data from our survey instrument, which asked: *Indicate the type of your first round of financing to this company (check one).* Possible answers were: *Seed; Start-up; Expansion; and Bridge.* This variable varies at the level of the individual company.

INDUSTRY–FIT is the share of investments of a venture capital firm in the same industry in which the company operates. This variable is constructed within the dataset and is based on the above definition of INDUSTRY. This variables differs for each potential deal.

STAGE–FIT is the share of investments of a venture capital firm in the same stage at which the company is receiving financing. This variable is constructed within the dataset and is based on the above definition of STAGE. This variables differs for each potential deal.

INVESTOR–FIXED–EFFECTS. We construct a set of 108 dummy variables, one for each investor.

INVESTOR– and COMPANY–COUNTRY–FIXED–EFFECTS. We also construct a set of dummy variables for investors' and the companies' countries.

PARTNER–MATCH is a dummy variable that takes value 1 if the investors has at least one partner of the same nationality of the company; 0 otherwise.

PARTNER–TRUST is the difference between the average trust of an investors' partners in the company's country citizens and the trust of the investor's country citizens in the company's country citizens.

3 The role of trust for deal formation

3.1 Methodology

We begin by asking what factors affect a venture capitalist's decision to invest in a company. This requires estimating the probability that a specific venture capitalist invests in a specific firm. Formally, our econometric specification is given by:

$$DEAL_p = \alpha + X_n'\beta_n + X_p'\beta_p + X_i'\beta_i + X_c'\beta_c + \varepsilon_p \tag{1}$$

Let i index investors and c index companies, let $p = (i, c)$ index the investor-company pairs, and let n index investor-company country dyads. The dependent variable is DEAL, which is a dummy variable for whether, in a given pair p, the investor i makes a deal with company c. The intercept term is denoted by α. The vector X_n' represents variables that vary at the country dyadic level, namely TRUST, FOREIGN–DEAL, COMMON-BORDER, INFORMATION, GDP-DIFFERENCE, LANGUAGE-OVERLAP, and LEGAL–DIFFERENCE. The vector X_p' represents variables that vary at the investor-company pairs level, namely DISTANCE, INDUSTRY-FIT and STAGE-FIT. The vectors X_i' and X_c' represent variables that vary across investors and companies respectively. We discuss them below. Since the key independent variables vary at the level of the country dyad (n), our logit model clusters the standard errors of ε_p at the level of the country dyad. Clustering also implies the use of robust standard errors.

To estimate the probability that a deal occurs, we use a logit model (we obtain the same result using a Probit). To control for investor characteristics we can afford to use a complete set of investor fixed effects (i.e., 108 dummies). This is clearly the most powerful way of controlling for any effects that are investor-specific, including, of course, the investor's nationality. To control for company characteristics, we use STAGE and INDUSTRY. In addition, we use a complete set of company country fixed effects. This means that we control for the overall level of trustworthiness (e.g., on average Swedes are trusted more than Spaniards). As a consequence our trust variables always reflect *relative trust* (e.g., relative to the average level of trust, the Spaniards are more trusted

by the French than by the British). Moreover, the country fixed effects control for all country-specific effects, such as the legal and institutional environment.[10]

With over one thousand companies in our sample we cannot add a fixed effect for every company. However, to control even more finely for company characteristics, we also consider a conditional logit model (Chamberlain (1980)). This effectively includes both investor and company fixed effects, thus providing the richest possible set of controls. This provides a semi-parametric estimation of the logit model, without need to estimate the individual company fixed effects.

3.2 Main results

The estimates from the simple and conditional logit models are reported in Table 3. In column *(i)* we report the results of the logit estimation without any of the country-dyadic control (except those related to geography, namely domestic and common border); in column *(ii)* we add the country-dyadic controls. In columns *(iii)* and *(iv)* we report the results from the conditional logit model, first without and then with country-dyadic controls.

The most important result concerns the effect of trust. We find that the coefficient on TRUST is positive and significant at the 1% level across all specifications. This clearly supports the hypothesis that trust affects the likelihood of making an investment.

In addition to being statistically significant, the estimated coefficient measures an economically important effect. We focus on column *(ii)* in Table 3, which is our main specification, although the results for the other specifications are very similar. The logit regression estimates the odds ratio, defined as the ratio of the probability of success to the probability of failure of the event (in our case of a deal being made). Consider a 1% increase in the percentage of people that express high trust. An example (drawn near the median of the trust distribution) is that 15.3% of Spaniards have high trust for Germans, and 16.3% of Dutch have high trust for Germans. Such a 1% increase generates an 7.5% increase in the probability of reaching a deal.[11] Another example would be to consider moving from the 25th to the 75th percentile of the trust distribution. For example, 10.5% of British people highly trust Germans, which is at the 25th percentile, while 24.8% of Norwegians highly trust Germans, which is at the 75th percentile. Moving from the 25th to the 75th percentile of the trust distribution then corresponds to a 105% increase in probability of reaching a deal—in other words, it more than doubles it.

Table 3 contains several other interesting results. Geographic distance is very important. The coefficient for DISTANCE has a negative sign and is statistically highly significant in all specifications. This confirms the notion that venture capital is a highly localized activity, and that investing at a distance is something that venture capitalists tend to avoid. In terms of the other geographic controls, we find that the coefficients

[10] For example, one may think that the the decision to invest depends on the level of a country's English language proficiency, in addition to language overlap (see the discussion below). However, there is no need to control for English language proficiency, since any such variation is already captured by the country fixed effects.

[11] At low levels of predicted probability, the marginal increase in probability is very close to the increase in the odds ratio given by the estimated coefficient.

for FOREIGN–DEAL and for GDP–DIFFERENCE are negative and significant, as expected. The coefficient for COMMON–BORDER remains insignificant, except in column *(iv)*. INFORMATION is positive and statistically highly significant. This result suggests that search costs, broadly defined, matter. The result is even more surprising given the fact that our information measure is only a rough proxy for differences in the amount of information available. LANGUAGE–OVERLAP and LEGAL–DIFFERENCE remain insignificant in all specifications. Throughout all regressions we find that INDUSTRY–FIT and STAGE–FIT are highly significant, with an (expected) positive sign. This shows that specialization is an important aspect of the venture capital market: to attract investments companies need to fit into investors' strategic preferences.

3.3 Alternative measures of trust

A potential concern is that, since our trust variable measures the trust of an average citizen, it may not accurately reflect the beliefs of venture capitalists. That is, the average citizen's trust may not apply to the socioeconomic group that venture capitalists belong to.[12] We therefore recalculate our measure of trust for a subset of the population that is more likely to correspond to the average venture capitalist. Since the Eurobarometer includes some information on the socioeconomic characteristics of respondents, we restrict our attention to respondents whose profile broadly corresponds to that of professionals. More precisely, we consider respondents who are in the upper half of the income distribution, were at least 20 years old when finishing their last studies (meaning they have at least a bachelor degree), and are between 34 and 50 years old—which corresponds to one standard deviation away from the sample mean age for the venture partners from our survey. We find that our socioeconomic refinement of the trust variable is highly correlated with the main measure of trust (the correlation coefficient is 0.99), suggesting that differences in the socioeconomic group have little effect on trust. When we use the socioeconomic refinement, instead of the main trust measure, the results, for both trust and all other variables, remain unaffected.

Our analysis so far focuses on the investor's trust in the company's country. This reflects the notion that investors are the main decision maker. However, entrepreneurs also have to accept their investors. We thus also consider trust from the company's perspective. Company trust can be thought of as the trustworthiness of the investor. These two measures contain strong elements of reciprocity and are highly correlated. Including both measures in the same regression would thus be meaningless. Instead, we reran all of our regressions substituting 'investor' trust with 'company' trust. The information variable is our only other asymmetric variable, so we also rebuild it from the company's perspective. All of our results remain intact when we adopt the company's perspective.[13]

Our main trust measure is the percentage of people reporting a high level of trust in another country's people. A natural concern is how robust our findings are to using alternative measures of trust. From the Eurobarometer survey we can also obtain the

[12] For example, while it may be true that the French are hardly enjoying a high level of trust in the pubs of East London, what we care about is what trust they enjoy in the wine bars of the City of London.

[13] Since both parties have to agree to the deal, it may be that what matters is the lower (or possibly higher) of the two trust levels. We reran all of our regressions using the lower (and also the higher) of 'investor' and 'company' trust, finding again that all our results remained intact.

'average' level of trust expressed. This means imposing a cardinal interpretation over an ordinal measure, which is why we prefer not to use it in our main analysis. Still we reran the regressions of Table 3 using this measure of average trust. In the basic logit model trust is marginally significant at the 11% confidence level, and in the conditional logit it is strongly significant at the 1% level.

3.4 Alternative explanations

We now discuss to what extent one can distinguish the effect of trust from other explanations. This is a challenge for the entire research on trust, given its inherently subjective nature. The base model already controls for three important alternative explanations. First, we control for geographic factors, using a very precise measure of distance between each individual investor and each individual company, as well as controls for domestic deals, common borders, and differences in GDP per capita. Second, we control for search costs. Our information proxy is a broad measure of the availability of business information. Third, we control for transactions costs, since language overlap and commonality of legal systems are likely to affect the costs of closing a deal.

There is a long tradition in economics of distinguishing beliefs from preferences, dating back at least to the seminal works of Becker (1957) and Arrow (1973). Guiso, Sapienza and Zingales (2006) also emphasize that culture affects economic outcomes mainly through beliefs and preferences. In our context, we would like to distinguish how much investors 'trust', based on beliefs, versus how much investors 'like' other countries, based on taste. Our main concern is to ensure that our central result on trust is not driven by investor's tastes. Liking is a subjective concept that is difficult to measure, so we consider two different proxies. First, we use relative tourism flows as a proxy for taste-based preferences, since tourism flows reflect patterns of cultural preferences among nations. Admittedly, this is a noisy measure of preferences, but it has the advantage of being a bilateral measure. Moreover, the country fixed effects remove any common factors that may affect tourism (e.g., the fact that Italy has more tourist attractions than Denmark). Second, we exploit data from the Eurovision Song Contest, which is a popular and uniquely European event. It is an annual televised music contest among European countries, where each country is allowed to send one candidate. The crucial aspect is that viewers from around Europe vote for their favorite contestant (excluding their domestic candidate). While the absolute ranking presumably depends on contestants' quality, prior research has argued that the relative vote ranking reflect patterns of how much people from one European country like others (Clerides and Stengos (2006), Fenn et. al. (2006)).

Columns *(i)* and *(ii)* of Table 4 report the results of adding the TOURISM and EUROVISION taste proxies to our main logit regression. We find that the effect of trust is not affected by their inclusion, both in statistical and economic terms. Moreover, the tourism and Eurovision proxies themselves are statistically not significant. Thus our main results about trust do not appear to be driven by taste-based preferences.

Another questions is to what extent the relationship between trust and venture investments differs from the relationship between trust and trade, identified by Guiso, Sapienza and Zingales (2005). To examine this, we include measures of trade or foreign direct investments (FDI) as additional controls. One reason for doing this is that existing patterns

of trade may facilitate venture investments, and possibly also proxy for opportunities. Another reason is to test whether trust matters *more* for venture investment than for general trade flows. However, there is also a caveat for including trade as a right hand side control. The prior work of Guiso, Sapienza and Zingales (2005) establishes a positive relationship between trust and trade. Including trade in our equation therefore introduces multicollinearity, i.e., the model may be over-specified. With this caveat, columns *(iii)* and *(iv)* of Table 4 report the results of adding TRADE and FDI to our main regression model. As expected, we find that both TRADE and FDI are positive and statistically significant. However, their inclusion does not affect the significance of the trust variable. This suggests that, even after possibly over-specifying the model, we continue to find that trust matters. In fact, the evidence suggests that trust matters more for venture capital investment than for aggregate trade and FDI flows.

3.5 Partners' trust

So far our analysis measures trust using the venture capital firm's headquarter location. An intriguing aspect of our data is that we also have information on the nationalities of the venture capital partners that work for the venture capital firm. We may therefore examine whether having a foreign partner changes a venture capital firm's likelihood of making certain investments.

To examine the importance of partner nationality we consider two types of effects. First, we consider whether any of the partners of the venture capital firm have the same nationality as the company. The natural hypothesis is that having a partner from the same country of the company increases the likelihood of investing. For example, since the British have low trust in the French, we ask wether a British firm with a French partner is more likely to invest in a French company than a British firm with only British partners. The PARTNER–MATCH variable captures this effect. It can be interpreted as representing a variety of factors, including language, trust, information and even personal networks.

To further isolate the effect of trust, we also consider a second measure. For every potential deal, we calculate the average trust implied by the nationalities of all the individual partners working for the venture capital firm. To return to our example, suppose that the British venture capital firm had no French partner, but it had an Italian partner. Italians have higher trust for the French than the British. Intuitively, the PARTNER–TRUST measure of average partner trust allows us to examine whether the presence of an Italian partner increases the likelihood that the British venture capital firm makes an investment in the French firm.[14]

Table 5 reports the results with these two additional variables. The results show that the composition of partners inside the venture capital firm indeed matters for investment decisions. Column *(i)* shows that PARTNER–MATCH is positive and statistically

[14]Not surprisingly, the average partners' trust of an investor is highly correlated with our main investor trust variable. Including both measures in the same regression would thus be incorrect. PARTNER–TRUST is therefore defined as the *difference* between the average partner's trust and the investor's trust, so that it captures the additional information contained in individual partners' nationalities. As a robustness check we also replaced TRUST with the simple average partners' trust in the models of Table 3, finding that this substitution does not affect any of our results.

highly significant, indicating that the presence of a foreign partner with the same nationality as the company directly increases the likelihood of a deal. Column *(ii)* shows that PARTNER–TRUST is also positive and statistically highly significant, suggesting that the more indirect effect of the national composition of partners also affects investment decisions. Since these two variables measure somewhat distinct concepts, column *(iii)* reports the results of including both, showing that both variables continue to be positive and significant. Moreover, the statistical and economic significance of the main trust variable is barely affected by the inclusion of these additional partner measures.[15]

We believe that these results give us a deeper understanding of the economic importance of trust. Our data allows us to identify the economic effect of trust at a rather fine level of detail. The fact that we continue to find significant effects of trust when looking at variation of partners within firms, provides strong evidence for the importance of trust for investment.

3.6 Further robustness

In defining the sample of potential deals, we deliberately refrain from imposing restrictions on the set of admissible potential deals, other than requiring that the venture capital firm was in existence at the time that the company was seeking funding. This means that we let the econometric model determine what matches are more or less likely. An alternative approach is to impose additional restrictions on the set of admissible potential deals, making assumptions about which pairs have a zero probability of resulting in a deal. While we prefer not to make such assumptions for the main model, we also want to consider imposing some additional restrictions to make sure that our results are not driven by our sample construction criteria.

First, we note that not all venture capital firms make investments abroad. Public venture capitalist are sometimes not allowed to invest abroad, others may have a preference for not doing so. As a robustness check we consider the sub-sample of deals that involve only those venture capitalist that make at least one investment abroad. We re-estimate our results from Table 3 for this sub-sample of deals and find that none of our results are affected.

Second, we observe that some of the venture capital firms in our sample never invest in certain sectors, or never invest at certain stages. We therefore exclude all those potential deals for which the investor never invests in a company's sector or stage. Again find that none of our results are affected by this restriction. We then combine these three restrictions on foreign, sector, and stage investments—excluding potential deals where the investor is never investing abroad or in a company's sector or stage—and again find that the joint restrictions do not affect our results.

Our data contains investors from 15 countries but companies from 18 countries. To make sure that this imbalance does not affect any of the results, we rerun all of our results eliminating the companies from the three non-EU countries (Norway, Switzerland, and the US), but find that this did not affect any of our results.

[15] The PARTNER–MATCH and PARTNER–TRUST variables also have a sizeable effect of the probability of closing a deal. The presence of a partner of the same nationality of the company increases the odds ratio sixfold, and an increase of 1% in PARTNERS–TRUST increases the odds ratio by 8%.

The construction of our sample involves multiple observations for the same company. One concern may be that the standard independence assumption of the logit model may be violated in this context.[16] We rerun our logit regressions clustering standard errors by company instead of country-dyad, finding that this does not reduce statistical significance levels. We also consider two-dimensional clustering, by company and investor, as suggested by Thompson (2006). We find again that this does not reduce the sign or statistical significance levels of any coefficient.

A few of the companies in our sample make multiple deals with different investors. Instead of conditioning the conditional logit model on individual companies, we can condition on individual deals. This even more fine-grained approach does not affect any of our results.

Our unit of analysis is the potential deal, but our key dependent variable, TRUST, varies at a higher level of aggregation, namely the country-dyad. Our base specification thus clusters by country-dyads. As an additional robustness check we consider aggregating the data to the level of the country-dyads. This involves a considerable loss of information, since we have to discard most of the micro-level information. Still, we consider a Poisson model—using a negative binomial model yields similar results—where the dependent variable is the number of deals in each country dyad, and the independent variables are just the country-dyad controls. We find that the coefficient on trust continues to be significant at the 1% level. This suggests that our key results hold irrespective of the unit of analysis used.

The prior social capital literature argues that trust among nations is related to the history of wars, to religious similarities, and even to genetic similarities (Guiso, Sapienza and Zingales (2005)). These variables have no obvious connection to venture capital investments, and there is a considerable risk of over-specifying the model, because these variables have been shown to be correlated with trust. Still, as a robustness check we confirm that the main effect of trust continues to hold even after controlling for these additional factors.

Finally, just in case one is still worried that there remain any unobserved peculiarities in our data that drive the results, we construct a falsification exercise. Instead of giving each investor and company its true country identity, we randomly assign it. Based on these false identities, we recalculate all the country-dyadic variables. The coefficient of TRUST in our main regressions becomes utterly insignificant, providing further reassurance that our main result is not an artifact of the sample, but reflects a real and robust economic phenomenon.

4 The role of trust for contracts

4.1 Motivation

In this section we examine the relationship between trust and contracts. The results from the previous section raise the question of whether contracts can overcome a lack of trust. A large theory literature suggests that sophisticated contracts may address problems of

[16] This is not an issue for the conditional logit model, which directly accounts for the interdependence of observations within groups.

asymmetric information.[17] A natural hypothesis is that parties have an incentive to write more sophisticated contracts if there is an underlying lack of trust, so that contracts can be thought of as a remedy to address trust problems. An alternative hypothesis is that writing sophisticated contracts is only worth the effort when parties share high trust, and that in low trust situations parties prefer simpler contracts. This alternative hypothesis relates to the recent work of Hart and Moore (2007), which emphasizes the importance of a common understanding of contractual terms. The key difference between the two hypotheses concerns the credibility of sophisticated contracts. When trust and contracts are substitutes, the contracting parties believe that sophisticated contracts work, and have a greater need for them in situations of low trust. When trust and contracts are complements, instead, lack of trust creates doubt about the value of sophisticated contracting. Remember also that we are looking at generalized trust. The two hypotheses therefore do not concern the inter-personal trust among contracting parties, but the general trust they have for citizens of their countries, which includes trust in their legal systems and institutions.[18]

We test these alternative hypotheses in the context of venture capital, where we can draw on a prior literature that already establishes the importance of sophisticated contractual arrangements. The theoretical work of Dessein (2005) and Hellmann (2006) explains how simple control structures may give too much power either to the investor or the entrepreneur, and how contingent control structures can achieve more balanced and efficient outcomes. The empirical work of Kaplan and Strömberg (2003) and Kaplan, Martel and Strömberg (2003) documents the use of these contingent control rights. They note that in practice it can be quite difficult to specify and verify these contingencies. This suggests that contingent control rights are a suitable contractual feature to focus on in our context. We examine four contingent control rights, pertaining to the composition of the board of directors, the allocation of voting rights, the decision to liquidate the company's assets, and the ability to terminate the founders' employment contract. These control rights all address major areas of potential conflict between investors and entrepreneurs (Sahlman (1990)).

4.2 Estimation results

To analyze contracts, our unit of analysis is no longer the sample of all potential deals, but the sample of realized deals. Each of our four contingent control rights variables is a dummy variable, so that we use a logit model (using a Probit model does not change our results). We also create a simple index of contingent control rights, which counts the number of control rights used, for which we use a Poisson model. Formally, our econometric specification is given by:

[17] See Stiglitz (2000) for an overview. The work of Chen (2000) and Casadesus-Masanell (2004) focuses more specifically on trust.

[18] A prior literature examines interactions between contracts and personalized trust. Greif (1993, 2006) and McMillan and Woodruff (2002) suggest that trust and contracts are substitutes, arguing that long-term relationships becomes more important when the legal system makes formal contracting difficult. Poppo and Zenger (2002), however, provide evidence that suggests that relationships and contracts can also be complements.

$$Contract_r = \alpha + X_n'\beta_n + X_r'\beta_r + X_i'\beta_i + X_c'\beta_c + \varepsilon_p \quad (2)$$

where $r = (i, c)$ indexes the *realized* investor-company pairs. The dependent variables are CONTINGENT–BOARD–RIGHTS, CONTINGENT–VOTING–RIGHTS, CONTINGENT–LIQUIDATION–RIGHTS, CONTINGENT–TERMINATION–RIGHTS, and their summary index, CONTINGENT–CONTROL–RIGHTS. The X vectors represents the same variables as in Section 3, with two exceptions. First, because the sample of realized deals is much smaller, adding investor fixed effect would clearly over-specify the model. Therefore, the X_i' vector now represents investor country fixed effects. Second, we noted above that the information variable captures search costs that affect deal formation. In this section we are focusing on the next stage of the investment process, where the two parties have already found each other, so we omit INFORMATION from the X_c vector.[19]

Table 6, where each column represents a different dependent variable, reports our findings. The most important result is that the coefficient of TRUST is positive and statistically significant for all five dependent variables. This result is not consistent with the 'substitutes' hypothesis, where contingent contracts are used to address lack of trust. Instead, it is consistent with the 'complements' hypothesis, where trust is a prerequisite for sophisticated contracting. We believe that this is a new and intriguing result.

In Table 6 the coefficients for FOREIGN–DEAL are positive and statistically significant in almost all regressions, while those of COMMON–BORDER are mostly negative and statistically significant. One might expect foreign deals to involve greater uncertainty and asymmetric information. Yet, we find that contingent controls rights are used less often for domestic deals (and deals with neighboring countries). This finding is consistent with the received wisdom in the literature that sophisticated contracts help align asymmetries. Interestingly, the results for TRUST and FOREIGN–DEAL point in different directions. Both foreign deals and higher trust are associated with more contingent contracts. This implies that, if the only problem is that a deal is with a foreign counterpart, then sophisticated contracts can be used to address those asymmetries. However, if there is a more fundamental trust problem, simpler contracts are preferred. This suggests that lack of trust is a different issue than the standard problem of asymmetric information that has dominated much the financial economics literature so far.

None of the other controls variables have systematic significant effects that persists across the various dependent variables, although different variables are statistically significant in individual regressions. One possible reason for this is that multi-colinearity is stronger in the realized deals sample, which consists of deals that were formed partly for their country-dyadic characteristics. Indeed, the correlation among the country-dyadic variables is larger in this sample than in Table 2.

[19] Since the realized deal sample consists of deals that were formed partly for their country-dyadic characteristics, the correlation coefficients among the country-dyadic variables are typically larger than in Table 2. This means that multi-collinearity might be an even stronger problem in the realized deals sample.

4.3 Endogenous selection

Our interpretation of the main trust coefficient is based on examining variations in trust across a set deals that are assumed to be otherwise comparable. Our relatively fined-grained control variables give us some confidence in the assumption that those deals are comparable in terms of their observable characteristics. The question remains whether our results could be driven by selection on unobservables. For example, it could be that the only investments that are made in low trust situations are simpler, less risky deals that require fewer contingent control rights. Since we cannot observe the business nature of a deal, we may incorrectly attribute to trust what is in effect due to an (unobservable) selection effect.

To address concerns about selection on unobservables, we estimate a Heckman selection model. The selection equation is given by (1) and the outcome equation by (2). The econometric identification of the system is obtained by one 'excluded' variable that is unique to the selection equation. This variable is INFORMATION, which captures aspects of the search process that precede the contracting stage. At the time of contracting, it is reasonale to assume that the amount of press coverage is no longer relevant, since by then the two parties have already found each other. Put differently, the basic informational problem that investors may have, i.e. limited awareness about country-specific opportunities, has already been solved by then. In addition, we note that the investor fixed effects further help with econometric identification, since they also appear only in the outcome regression. Because of the large number of observations (over 100,000 in the selection equation) and control variables (including over 100 dummy variables), we could only achieve convergence in STATA by imposing two simplifications. First, we have to use a linear probability model for the outcome equation.[20] Second, we cannot achieve converge for the maximum likelihood model, so we use the two-step estimation procedure (note that this method still achieves consistent estimators).

Table 7 reports the results of the Heckman selection model. The most important result is that TRUST remains positive and statistically significant, suggesting that our previous findings are not affected by unobservable selection issues. Interestingly, we also find that the estimates of Mills' λ are positive and significant in all equations, suggesting that unobservable selection effects have a positive effect on contingent control rights. There is thus some evidence that selection effects may indeed affect contractual choices, but that they are not related to the main trust effect.

4.4 Further robustness

We perform several robustness checks also for the realized deals sample. We use a probit model, and we employ the socioeconomic measure of trust, the measure of trust from the company perspective, and the cardinal measure of trust. We also add the two measures of partner's trust, and the tourism, Eurovision Song Contest, export and FDI variables. We then cluster standard errors at the investor instead of country-dyad level and confirm our findings. We also check that the results for contracts do not depend on any single country,

[20] To validate these assumptions we confirm that the linear probability model yields the same results as the logit (and Poisson) regressions.

or by the inclusion of deals with companies located in non-EU countries.

We find that the coefficient of TRUST is positive and statistically significant in most specifications, insignificant in very few specifications, and never negative and significant (details are available upon request). In addition, we perform some additional robustness checks that are unique to the realized deals sample. Because we only use investor country fixed effects, it is possible to add further investor characteristics. Building on our prior work (Bottazzi, Da Rin and Hellmann (2005, 2006)), we introduce controls for the size, age and type of venture capital firms, and for the amount invested in each company, but find that this does not affect any of the results of Table 6. We also add controls for whether deals were syndicated, and whether the venture capital firm was the lead investor, but again find that this does not affect any of the results.

5 Conclusion

Economists often distrust explanations that rely on subjective beliefs. Trust is a subjective belief, but so is economists' distrust of trust-based explanations. Hence the importance of empirically demonstrating the effect of trust.

No single paper can definitively establish the full economic importance of trust. The approach taken in this paper is to examine the effect of trust in a tightly defined environment, venture capital, where we can obtain micro level data. This has the advantage that we can safely dismiss concerns about reverse causality, and that we can control for a large number of alternative factors. The paper finds that trust has a significant effect on the investment decisions of venture capital firms, even after controlling for a host of other variables, including investor and company fixed effects, geographic controls, differences in information, languages and legal systems, and even taste-based preferences.

Our paper opens up further lines of research. For example, our results on the composition of partners inside a firm suggests that it is worthwhile to examine under which circumstances trust matters more or less, and how the presence of heterogenous agents can affect trust in teams. Another open question in the social capital literature is the relationship between generalized trust and contracts. Our analysis suggests that they are complements, not substitutes, but future research might try to examine why this is so, and describe in a more comprehensive manner what contractual features are most likely to be affected by trust.

The analysis also suggests some tentative policy conclusion. Governments across the globe are seeking to attract venture capitalists to invest in their countries (Bottazzi and Da Rin (2002), Da Rin, Nicodano, and Sembenelli (2006)). Our analysis suggests that investments ought to be expected mostly from countries with well established trust for the recipient country. This provides some guidance as to what countries might be the most promising targets for government that want to attract foreign venture capital investments.

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Table 1
Descriptive statistics

This Table provides the mean, minimum and maximum values of our dependent and independent variables; we do not report these values for investor and company country dummies, and for industry dummies. For dummy variables we report the frequency of observations. Variables are defined in Section 2.

	POTENTIAL DEALS SAMPLE			REALIZED DEALS SAMPLE		
VARIABLE	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Deal	0.012	0	1	–	–	–
Contingent Board Rights	–	–	–	0.386	0	1
Contingent Voting Rights	–	–	–	0.342	0	1
Contingent Liquidation Rights	–	–	–	0.317	0	1
Contingent Termination Rights	–	–	–	0.323	0	1
Contingent Control Rights	–	–	–	1.296	0	4
Trust	20.402	3.680	71.600	43.448	7.120	71.600
Information	0.085	0	0.664	0.028	0	0.664
GDP Difference	4.617	0	34.352	1.068	0	25.546
Language Overlap	0.152	0	1	0.836	0	1
Legal Difference	0.285	0	1	0.872	0	1
Distance	6.720	0	9.322	3.829	0	9.176
Common Border	0.318	0	1	0.866	0	1
Foreign Deal	0.893	0	1	0.180	0	1
Industry Fit	0.144	0	1	0.365	0.017	1
Stage Fit	0.509	0	1	0.708	0.048	1
Tourism	13.929	0	168.339	2.602	0	84.807
Eurovision	-0.430	–6.758	9.870	-0.008	–5.249	5.250
Exports	15.343	0	60.991	4.533	0	60.991
FDI	5.651	0	62.514	2.702	0	62.514
Partner-Match	0.028	0	1	0.038	0	1
Partner-Trust	0.059	–30.165	20.018	-0.731	–30.165	9.773
Number of observations	*107,390*			*1,277*		
Number of companies	*1,216*			*1,216*		
Number of venture firms	*108*			*108*		

Table 2: Correlations

This Table provides pairwise correlations (and significance levels, in brackets) among the country-dyadic variables defined in Section 2.

	Trust	Inform.	GDP Differ.	Lang. Overlap	Legal Differ.	Common Border	Tourism	Euro-vison	Exports	FDI
Trust	1.000									
Information	–0.219 (0.94)	1.000								
GDP Diff.	–0.357 (0.00)	0.073 (0.00)	1.000							
Lang. Overlap	0.676 (0.00)	–0.191 (0.00)	–0.290 (0.00)	1.000						
Legal Difference	–0.065 (0.00)	0.207 (0.00)	0.150 (0.00)	0.124 (0.00)	1.000					
Comm. Border	0.031 (0.00)	0.314 (0.00)	–0.118 (0.00)	–0.018 (0.00)	0.377 (0.00)	1.000				
Tourism	–0.173 (0.00)	0.086 (0.00)	0.091 (0.00)	–0.087 (0.00)	0.002 (0.62)	0.138 (0.00)	1.000			
Eurovision	0.120 (0.00)	0.101 (0.00)	0.090 (0.00)	0.160 (0.00)	0.272 (0.00)	0.207 (0.00)	0.333 (0.00)	1.000		
Exports	–0.207 (0.00)	0.457 (0.00)	–0.211 (0.00)	–0.190 (0.00)	0.065 (0.00)	0.531 (0.00)	0.391 (0.00)	0.056 (0.00)	1.000	
FDI	–0.171 (0.00)	0.277 (0.00)	–0.047 (0.00)	0.001 (0.80)	0.058 (0.00)	–0.006 (0.00)	0.054 (0.00)	–0.069 (0.00)	0.518 (0.00)	1.000

Table 3
The main model

This Table reports results of logit and conditional logit regressions with investor fixed effects for the potential deals sample. The dependent variable is DEAL. Variables are defined in Section 2. Company controls are complete sets of dummies for each company's country, industry and stage. Columns (i) and (ii) report results of logit regressions discussed in Section 3. Columns (iii) and (iv) report results from conditional logit regressions also discussed in Section 3. For each independent variable, we report the estimated coefficient and the z-score (in parenthesis) computed using (Huber-White) heteroskedasticity-robust standard errors, clustered by country-dyad. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

	(i) Logit	*(ii)* Logit	*(iii)* Cond. Logit	*(iv)* Cond. Logit
Trust	0.072***	0.075***	0.070***	0.067***
	(4.69)	*(4.70)*	*(7.33)*	*(6.98)*
Information		3.964***		4.054***
		(3.59)		*(5.83)*
GDP Difference		–0.156**		–0.149***
		(–2.35)		*(–3.31)*
Language Overlap		0.349		0.051
		(0.73)		*(0.12)*
Legal Difference		–0.052		–0.239
		(–0.18)		*(–1.08)*
Distance	–0.224***	–0.219**	–0.394***	–0.383***
	(–2.63)	*(–2.56)*	*(–13.82)*	*(–13.30)*
Foreign Deal	*–2.142****	*–1.532***	–1.513***	–1.473***
	(–3.92)	*(–1.98)*	*(–4.85)*	*(–2..59)*
Common Border	0.136	–0.240	–0.067	–0.457**
	(0.49)	*(–0.94)*	*(–0.35)*	*(–2.29)*
Industry Fit	6.928***	6.967***	6.679***	6.759***
	(28.44)	*(28.62)*	*(27.38)*	*(26.92)*
Stage Fit	2.944***	2.994***	2.858***	2.923***
	(12.52)	*(12.92)*	*(18.17)*	*(18.17)*
Investor Fixed Effects	Included	Included	Included	Included
Company Controls	Included	Included	Included	Included
Observations	*107,390*	*107,390*	*107,390*	*107,390*
Pseudo R^2	*0.4995*	*0.5044*	*0.5987*	*0.6043*
Number of venture firms	*108*	*108*	*108*	*108*
Number of companies	*1,216*	*1,216*	*1,216*	*1,216*

Table 4
Additional models

This Table reports results of logit regressions with investor fixed effects for the potential deals sample. The dependent variable is DEAL. Variables are defined in Section 2. Company controls are complete sets of dummies for each company's country, industry and stage. Columns (i) through (iv) report results of logit regressions which include the TOURISM, EUROVISION, EXPORT and FDI variables, respectively. For each independent variable, we report the estimated coefficient and the z-score (in parenthesis) computed using (Huber-White) heteroskedasticity-robust standard errors, clustered by country-dyad. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

	(i) Logit	*(ii)* Logit	*(iii)* Logit	*(iv)* Logit
Trust	0.083***	0.074***	0.062***	0.074***
	(4.81)	*(4.32)*	*(4.01)*	*(4.30)*
Tourism	0.002			
	(0.24)			
Eurovision		-0.047		
		(-0.58)		
Exports			0.035***	
			(4.29)	
FDI				0.046***
				(5.56)
Information	3.834***	5.996**	2.997***	5.299***
	(3.71)	*(2.45)*	*(2.93)*	*(4.27)*
GDP Difference	–0.164**	–0.188***	–0.131**	–0.138**
	(–2.28)	*(–3.19)*	*(–2.14)*	*(–2.22)*
Language Overlap	–0.239	0.464	–0.202	–0.352
	(–0.43)	*(1.08)*	*(–0.33)*	*(–0.47)*
Legal Difference	–0.138	–0.105	0.333	–0.239
	(–0.45)	*(–0.28)*	*(0.96)*	*(–0.72)*
Distance	–0.214**	–0.230***	–0.215***	–0.214**
	(–2.36)	*(–2.56)*	*(–2.49)*	*(–2.48)*
Foreign Deal	*–1.174*	–1.398*	–3.056***	*–2.842***
	(–1.46)	*(–1.69)*	*(–3.31)*	*(–2.68)*
Common Border	–0.324	–0.393	–0.733**	–0.071
	(–1.17)	*(–1.52)*	*(–2.32)*	*(–0.26)*
Industry Fit	6.952***	7.055***	7.020***	7.090***
	(31.38)	*(24.55)*	*(28.18)*	*(28.21)*
Stage Fit	2.982***	3.043***	2.998***	2.981***
	(12.16)	*(12.52)*	*(13.00)*	*(12.57)*
Investor Fixed Effects	Included	Included	Included	Included
Company Controls	Included	Included	Included	Included
Observations	*97,618*	*91,162*	*107,390*	*101,697*
Pseudo R^2	*0.4972*	*0.5224*	*0.5072*	*0.5138*
Number of venture firms	*102*	*108*	*108*	*108*
Number of companies	*1,216*	*1,195*	*1,216*	*1,211*

Table 5
Partner effects

This Table reports results of logit regressions with investor fixed effects for the potential deals sample. The dependent variable is DEAL. Variables are defined in Section 2. Company controls are complete sets of dummies for each company's country, industry and stage. Columns (i) to (iii) report results of regression models which include measures of the PARTNER-MATCH and PARTNER-TRUST variables discussed in section 3.5. For each independent variable, we report the estimated coefficient and the z-score (in parenthesis) computed using (Huber-White) heteroskedasticity-robust standard errors, clustered by country-dyad. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

	(i) Logit	*(ii)* Logit	*(iii)* Logit
Trust	0.072***	0.082***	0.076***
	(4.74)	(4.96)	(4.88)
Partner-Match	1.987***		1.577***
	(3.75)		(2.74)
Partner-Trust		0.090***	0.064***
		(4.05)	(2.81)
Information	4.291***	3.971***	4.001***
	(3.74)	(3.74)	(3.83)
GDP Difference	–0.149**	–0.159**	–0.154**
	(–2.18)	(–2.41)	(–2.24)
Language Overlap	–0.201	–0.038	–0.478
	(–0.35)	(0.07)	(–0.78)
Legal Difference	–0.152	–0.017	–0.076
	(–0.51)	(–0.05)	(–0.25)
Distance	–0.221**	–0.223***	–0.223**
	(–2.55)	(–2.57)	(–2.56)
Foreign Deal	–2.198***	–1.881***	–2.462***
	(–2.76)	(–2.38)	(–2.90)
Common Border	–0.233	–0.241	–0.230
	(–0.90)	(–0.94)	(–0.89)
Industry Fit	6.931***	7.027***	6.978***
	(27.19)	(28.31)	(27.21)
Stage Fit	2.998***	3.009***	3.000***
	(12.71)	(13.04)	(12.86)
Investor Fixed Effects	Included	Included	Included
Company Controls	Included	Included	Included
Observations	*107,390*	*107,390*	*107,390*
Pseudo R^2	*0.5085*	*0.5072*	*0.5099*
Number of venture firms	*108*	*108*	*108*
Number of companies	*1,216*	*1,216*	*1,216*

Table 6
Contingent control rights

This Table reports results of poisson and logit regressions for the sample of realized deals. Column (i) reports results of a Poisson regression whose dependent variable is CONTINGENT–CONTROL–RIGHTS. Columns (ii) through (v) report results of logit regressions whose dependent variables are CONTINGENT–BOARD–RIGHTS, CONTINGENT–VOTING–RIGHTS, CONTINGENT–LIQUIDATION–RIGHTS, and CONTINGENT–TERMINATION–RIGHTS. Variables are defined in Section 2. Company controls are complete sets of dummies for each company's country, industry and stage. We also control for investor nationality. For each independent variable, we report the estimated coefficient and the z-score (in parenthesis) computed using (Huber-White) heteroskedasticity-robust standard errors, clustered by country-dyad. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

	Index	Board	Voting	Termination	Liquidation
	(i)	*(ii)*	*(iii)*	*(iv)*	*(v)*
	Poisson	Logit	Logit	Logit	Logit
Trust	0.055***	0.197***	0.238***	0.188**	0.140**
	(4.55)	(3.12)	(4.47)	(2.15)	(2.16)
GDP Difference	–0.028***	–0.641***	0.190	–0.031	–0.695**
	(–1.19)	(–3.36)	(0.96)	(–0.12)	(–2.26)
Language Overlap	0.302	–4.904***	3.884***	0.540	1.327
	(0.60)	(–3.03)	(2.56)	(0.39)	(1.03)
Legal Difference	0.126	2.254**	–1.970*	–0.281	–1.179
	(0.33)	(2.14)	(–1.78)	(–0.22)	(–1.09)
Distance	–0.006	0.033	–0.112***	–0.017	0.039
	(–0.43)	(0.90)	(–2.73)	(–0.55)	(1.20)
Foreign Deal	1.921***	0.410	10.343***	6.947*	6908**
	(2.66)	(0.20)	(4.42)	(1.85)	(2.34)
Common Border	–1.019***	–2.667***	–1.119	–2.386***	–1.886***
	(–3.18)	(–3.40)	(–1.55)	(–3.14)	(–2.75)
Industry Fit	–0.064	0.557	–0.374	0.125	–0.221
	(–0.16)	(0.51)	(–0.71)	(0.20)	(–0.19)
Stage Fit	–0.044	1.282***	0.107	–0.208	–0.954*
	(–0.15)	(3.12)	(0.14)	(–0.26)	(–1.88)
Investor Nationality	Included	Included	Included	Included	Included
Company Controls	Included	Included	Included	Included	Included
Observations	1,066	1,122	1,046	1,047	1,048
Pseudo R^2	–	0.2240	0.2860	0.1829	0.1792

Table 7
Heckman selection model

This Table reports results of linear two-step Heckman regressions. Columns (i) through (v) report results of regressions whose dependent variables are CONTINGENT–CONTROL–RIGHTS, CONTINGENT–BOARD–RIGHTS, CONTINGENT–VOTING–RIGHTS, CONTINGENT–LIQUIDATION–RIGHTS, and CONTINGENT–TERMINATION–RIGHTS. All variables are defined in Section 2. Company controls are complete sets of dummies for each company's country, industry and stage. We also control for investor nationality. The upper panel reports results from the outcome equation and the lower panel from the selection equation. For each independent variable, we report the estimated coefficient and the z-score (in parenthesis) computed using (Huber-White) heteroskedasticity-robust standard errors, clustered by country-dyad. Values significant at the 1%, 5% and 10% level are identified by ***, **, *.

	Index	Board	Voting	Termination	Liquidation
	(i)	(ii)	(iii)	(iv)	(v)
Trust	0.094***	0.019***	0.031***	0.028***	0.017***
	(4.87)	(2.79)	(4.85)	(4.17)	(2.48)
GDP Difference	-0.016	–0.138	0.012	-0.008	-0.007
	(-0.54)	(–1.26)	(1.23)	(-0.68)	(-0.68)
Language Overlap	0.786*	–0.347	0.529***	0.230	0.294
	(1.46)	(–1.78)	(2.92)	(1.20)	(1.54)
Legal Difference	–0.401	0.123	–0.314***	–0.134	–0.195
	(–0.11)	(0.94)	(–2.58)	(–1.04)	(–1.54)
Distance	–0.060***	–0.005	–0.026***	–0.017**	–0.006
	(–3.05)	(–0.80)	(–3.99)	(–2.55)	(–0.84)
Foreign Deal	3.007***	-0.038	1.311***	0.963***	0.796***
	(3.46)	(-0.12)	(4.48)	(3.12)	(2.59)
Common Border	–1.100***	–0.236**	–0.151*	–0.284***	–0.259***
	(–3.99)	(–2.41)	(–1.63)	(–2.94)	(–2.66)
Industry Fit	0.724***	0.309***	0.070	0.246***	0.170***
	(2.98)	(3.69)	(0.88)	(2.97)	(2.07)
Stage Fit	0.281	0.296***	0.074	0.083	–0.077
	(1.62)	(4.84)	(1.30)	(1.37)	(–1.28)
Investor Nationality	Included	Included	Included	Included	Included
Company Controls	Included	Included	Included	Included	Included
			SELECTION EQUATION		
Trust	0.031***	0.034***	0.031***	0.033***	0.033***
	(5.96)	(6.74)	(6.03)	(6.45)	(6.58)
Information	1.310***	1.672***	1.329***	1.640***	1.640***
	(3.78)	(5.09)	(3.87)	(4.96)	(5.00)
GDP Difference	–0.069***	–0.070***	–0.069***	–0.069***	–0.069***
	(–5.39)	(–5.43)	(–5.40)	(–5.39)	(–5.37)
Language Overlap	0.248	0.184	0.268	0.174	0.187
	(1.41)	(1.06)	(1.53)	(0.99)	(1.07)
Legal Difference	–0.119	–0.102	–0.123	–0.107	–0.110
	(–1.11)	(–0.96)	(–1.15)	(–1.01)	(–1.04)
Distance	–0.125***	–0.122***	–0.125***	–0.122***	–0.124***
	(–13.23)	(–13.20)	(–13.26)	(–13.19)	(–13.37)
Foreign Deal	0.416***	-0.453	-0.421*	-0.469*	0.664***
	(-1.59)	(-1.77)	(1.62)	(-1.81)	(3.76)
Common Border	–0.077	–0.107	–0.068	–0.104	–0.097
	(–0.83)	(–1.17)	(–0.73)	(–1.13)	(–1.06)
Industry Fit	3.216***	3.207***	3.245***	3.201***	3.212***
	(26.02)	(27.84)	(26.44)	(27.52)	(27.78)
Stage Fit	1.384***	1.375***	1.385***	1.366***	1.367***
	(15.12)	(15.64)	(15.39)	(15.31)	(15.50)
Mills λ	0.583***	0.144***	0.096***	0.175***	0.144***
	(5.15)	(3.75)	(2.58)	(4.62)	(3.82)
Observations	*107,390*	*107,390*	*107,390*	*107,390*	*107,390*
Realized deals	*1,066*	*1,131*	*1,093*	*1,105*	*1,126*
Wald χ^2	*2,401.90*	*2,529.18*	*2,581.89*	*2,403.53*	*2,437.88*