

# The Impact of the Legal Environment on Venture Capital & Private Equity in Africa: Empirical Evidence

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Jonathan Adongo\*

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## *Abstract*

Using a novel dataset, I empirically assess the impact of the legal environment on venture capital and private equity activity across 50 African countries between 2004 and 2010. Preliminary results indicate that a better legal environment increases market entry by investors and entrepreneurs. While seed, start-up or early stage venture capital increases with better rule of law, expansion stage venture capital decreases and private equity is practically zero. In addition, both venture capital and private equity increase where strength of property rights is weaker. These findings suggest that venture capital substitutes for debt financing from other sources e.g. banks, in weaker legal environments.

*Key words:* Venture capital; Enterprise policy; Africa

*JEL category:* G24, L53, O55

\*Jonathan Adongo is a PhD Economics candidate at the Department of Economics and Finance, Middle Tennessee State University, Murfreesboro, TN 37132, email: [ja2r@mtmail.mtsu.edu](mailto:ja2r@mtmail.mtsu.edu)

## 1. INTRODUCTION

Whether laws influence venture capital and private equity activity determines if government efforts to improve the legal environment are necessary in this area of finance.<sup>1</sup> In this paper I empirically test the null hypothesis that the legal environment has no effect on venture capital or private equity activity. The legal environment is represented by the court system, which consists of legitimate enforcement mechanisms to protect investors (company and bankruptcy or reorganization laws) and intellectual property (Smith and Ueda, 2006).<sup>2</sup> These mechanisms influence the "... the nature of legal obligations that [parties to an agreement have to each other], as well as...how courts interpret and enforce these obligations..." (Shleifer and Vishny, 1997, p.750).

It is not entirely clear that the legal environment influences venture capital or private equity. Coase (1960) argues that "absent significant transaction costs, capital suppliers and users ... negotiate, agree, and privately contract on the efficient level of investor protection when that level is not provided by the law... [because parties can contractually opt out to fill in the gap left by the weak legal environments]" (Bergman and Nicolaievsky, 2007, p.739).<sup>3</sup> An alternative set of theories with a similar view that the legal environment should not matter was developed by Alchian (1950) and Stigler (1958). They argue that product market competition takes care of any potential moral hazard issues because entrepreneurs rent labour and capital on the spot market every minute at a competitive price, and hence have no resources left over to divert to their own use. Finally, in practice venture capital and private

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<sup>1</sup> Entrepreneurs at the seed, start-up, or early stage of venture capital are involved in proof of concept and incipient activities. Those at the expansion stage of venture capital are involved in high-growth activities. Finally, those at the private equity stage are mature companies involved in restructuring or buyouts (Sahlman, 1990; Fenn et al., 1996).

<sup>2</sup> Legitimate, as opposed to illegitimate, enforcement mechanisms provide credibility to implicit or explicit threats because the offending party is persuaded that the aggrieved party will go to court, which legally enforces contracts and relies on the state's monopoly over legitimate force (Fafchamps et al., 1995).

<sup>3</sup> Coasian and product market competition assumptions are adopted by theoretical models that focus on how agency problems (moral hazard and adverse selection) are solved by an intermediary. These models take for granted the existence of a relatively strong legal environment that is necessary for the credibility of threats (Chan, 1983; Amit et al., 1990; Trester, 1994; Cable and Shane, 1997; Bergemann and Hege, 1998; Elitzura and Gaviols, 2003).

equity investors have developed operating procedures to mitigate moral hazard by the entrepreneur.<sup>4</sup> These procedures rely on relatively simple interventions that put a light burden on the legal system and are suitable for even poorly informed and motivated courts (Shleifer and Vishny, 1997, p.758).<sup>5</sup>

Alchian's (1950) and Stigler's (1958) product market competition theories, however, hinge on the assumption of capital not being sunk. In reality, production capital is highly specific and sunk and entrepreneurs cannot rent it every minute. Therefore, investors that sink the capital need to be assured that they get back the return on this capital (Shleifer and Vishny, 1997, p. 738). A good legal infrastructure provides this assurance. Also, the effectiveness of the operating procedures used by investors e.g. the rights inherent in an investor's stake depend on the enforcement mechanism in place. These issues imply that the legal environment should matter.

Bergman and Nicolaievsky (2007) identify that the viewpoint that legal systems do not matter is not supported by empirical evidence. They argue that to resolve this puzzle requires testing the assumption that enforcement in different legal systems is equivalent.<sup>6</sup> Testing this assumption requires a sample of countries with diverse legal environments (La Porta et al., 1998, p. 1117). Some macro level studies do this using panel datasets with the country as the unit of observation (Jeng and Wells, 2000; Allen and Song, 2002; Kumar and Orleck, 2002; Lerner and Schoar (2005); Bonini and Alkan, 2011).<sup>7</sup>

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<sup>4</sup> The procedures include providing staged financing, designing explicit contracts that specify various cash flow rights and purchasing a controlling equity stake. The stake confers rights "to inspect the entrepreneur's facilities, books, and records; receive timely financial reports and operating statements ... [and] ... intervene quickly, should company performance suffer, through positions on boards of directors and, to a lesser extent, through voting control" (Fenn et al., 1996, p. 33 and p. 43; Sahlman, 1990, p. 508). In weaker environments there is greater reliance on implicit contracts and higher ownership stakes (Shleifer and Vishny, 1997, p. 769).

<sup>5</sup> Fafchamps et al. (1995; p. 12) argue that access to collateral, harassment of defaulters, reputation-building arising from the promise of future business and trust through the cultivation of honest commercial practices are also important contract enforcement mechanisms. We will not explore these issues in this paper but they would be a fruitful area for incorporating behavioural issues into this analysis or tackling collateral based financing in a similar framework in future research. However, we try to control for trust to mitigate potential omitted variable bias in our estimates.

<sup>6</sup> Where the assumption does not hold, one can argue that "a legal system with low investor protection ... is associated with courts that are anaemic in the enforcement of contracts ..." (Bergman and Nicolaievsky, 2007, p. 739).

<sup>7</sup> In Adongo (2010) I used a cross-section dataset to identify determinants of venture capital activity, including the legal environment, at the country level.

Some micro level studies also test the assumption using panel datasets with the investor as the unit of observation (Bottazzi et al., 2009; Cumming et al., 2010).

In this paper I compare the results of a macro versus micro level approach that tests whether an aggregated measure of the legal environment matters for various measures of venture capital and private equity activity including market tightness, the number of deals formed by stage as a percentage of the number of deals formed overall, and the decision to invest in a country. I will then disaggregate the legal environment measure to investigate which of its components matter most.

The key contribution of this paper will be to incorporate investors' team level, human capital measures capturing their education and career profiles into the micro level analysis on the link between the legal environment and venture capital or private equity activity. So far these variables have not been included in prior studies even though they are direct measures of investors' experience that influence differences in how they assess investment opportunities. In addition, I measure venture capital and private equity activity by the actual number and type of deals. I also include start-up costs and bankruptcy laws as additional country characteristics that were not included in previous studies due to lack of data.<sup>8</sup> Finally, I provide evidence from a region that is missing in the literature by relying on a novel dataset that captures the investments by a sample of 396 investors in 3,367 venture capital or private equity companies across 50 African countries between 2004 and 2010.<sup>9</sup>

One concern with a study that only includes legal enforcement measures in investigating the link between the legal environment and venture capital or private equity activity is potential endogeneity bias. This may be an issue where there is more frequent interaction between investors and the court system to clarify or settle contract disputes with their portfolio companies in countries with relatively higher venture capital or private equity activity. This could lead to the changes in enforcement mechanisms that make it conducive for venture capital or private equity investment (Smith and Ueda, 2006).

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<sup>8</sup> The omitted variable bias that arises if these additional country and investor characteristics are ignored may result in unreliable estimates.

<sup>9</sup> Current literature on legal determinants of venture capital or private equity is limited to North America, Europe, Asia or Australia.

In this paper I adopt three alternative strategies to mitigate this issue.<sup>10</sup> First, I lag the measure of legal enforcement by five years. Second, I adopt a fixed effect panel specification (Chamberlain, 1982). Finally, I use an instrumental variable estimation technique that includes a variable that is related to the legal enforcement mechanism but is not related to venture capital or private equity activity.

The instrument I adopt is the legal jurisdiction, which represents the rules and procedures that the court system follows in adjudicating disputes between investors and entrepreneurs. It is related to the enforcement mechanism through its effect on the strength of the rights inherent in an investor's controlling equity stake, which depend not only on the strength and reliability of its enforcement but also on the legal rules of the jurisdiction in which the equity stake is issued (Hart, 1995; Parker, 2007). Furthermore, venture capital or private equity activity cannot influence the legal jurisdiction because they "... are exogenous as a country involuntarily adopted them through colonization or conquest [by one of the European countries to which they owe the origin of their laws] and even in the case where countries adopted legal jurisdiction freely as in former Spanish colonies, the crucial consideration was language and the broad political stance of the law rather than the treatment of investor protections" (La Porta et al., 1998, p. 1126; Siems, 2006).

Legal jurisdictions differ across African countries and fall into two main categories: common law and civil law. Common law countries include those colonized by the United Kingdom (UK). Civil law countries include those colonized by Germany, France, Belgium, Netherlands, Italy, Portugal, and Spain. This results in a further sub-categorization of civil law into German, French, and Scandinavian civil law.<sup>11</sup> In addition, there are countries on the continent with pluralistic legal systems that are a combination of common and civil law.

In common law systems, law is made by judges and subsequently incorporated into legislature. Civil law "originates in Roman law [ . It] uses statutes and comprehensive codes as a primary means of

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<sup>10</sup> The three approaches are also used by Cawley (2004) who faced a similar issue in his study on the link between obesity and wages.

<sup>11</sup> "The French commercial code was written under Napoleon in 1807 and brought by his armies to Belgium, the Netherlands, part of Poland, Italy, and western regions of Germany"( La Porta et al., 1998, p. 1118)

ordering legal material, and relies heavily on legal scholars to ascertain and monitor its rules” (La Porta et al., 1998, p. 1118). Therefore, some authors argue that common law systems are more adaptable (and therefore better) than civil law systems (Smith and Ueda, 2006). Company and bankruptcy or reorganization laws “are part of the commercial codes in civil-law countries and exist as separate laws, mainly in the form of acts, in common law countries” (La Porta et al., 1998, p. 1120).

Following this introduction, the rest of this paper is organized as follows: Section 2 summarizes the related literature that has investigated the link between the legal environment and venture capital or private equity. Section 3 discusses the data and methods that I will adopt to achieve the paper’s objective. Section 4 presents the results of applying the methodology and discusses the findings. Finally, Section 5 presents the conclusions.

## **2. LITERATURE REVIEW**

Using search theory, Silveira and Wright (2007) predict that the legal environment is positively related to market activity. Their model demonstrates that a better legal environment reduces the cost of entry into a market or the time spent monitoring an investment. This increases market tightness, which leads to a higher number of deals.<sup>12</sup>

Using a principal-agent framework Bottazzi et al. (2009) model the bargaining relationship between an investor and a venture capital entrepreneur in a static setting, where the former has all the bargaining power.<sup>13</sup> Their theory recognizes that the success of a portfolio company depends on effort from both the investor and the entrepreneur and moral hazard may be an issue for both parties.<sup>14</sup> Bottazzi et al. augment their double moral hazard, principal-agent model with a legal system component and develop three predictions to interpret how the legal environment influences venture capital and private equity activity. One of these is that a better legal environment should be positively related to more venture

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<sup>12</sup> For details on the relevant section of their model, see Silveira and Wright (2007, p. 11-12).

<sup>13</sup> Although I frame the agency relationship between an investor and the entrepreneur, with the former as the principal, it also occurs in the reverse direction with the entrepreneur as the principal and the investor as the agent. It can also occur between limited partners (from whom investors raise funds), and the investor (Jensen and Meckling, 1976). It can also occur between a syndicate of investors, who invest in a single portfolio company. These extensions are beyond the scope of this paper.

<sup>14</sup> For details on their theory see Bottazzi, et al. (2009, p. 563-568)

capital or private equity activity because investors and entrepreneurs expect the other party to exert more effort. In a weaker legal environment with less credible sanctions for breach of contract, entrepreneurs (investors) will be able to identify weaknesses through which they can undertake moral hazard. Shifting more equity to the investor (entrepreneur) will not be enough to fully limit the loss from this.<sup>15</sup> Therefore, investors (entrepreneurs) will have less incentive to participate in weak legal systems (Fafchamps et al., 1995; Bottazzi et al., 2009).

However, Bottazzi et al. (2009) indicate that a negative relationship may arise between the legal environment and venture capital or private equity activity because of the role of debt. Better legal systems place more emphasis on the use of debt to provide downside protection of investors' cash flow rights (Bottazzi et al. 2009, p. 566).<sup>16</sup> In these better legal environments, debt is less likely to be secured and have more covenants (Qian and Strahan, 2004). The use of unsecured debt is not as attractive in weaker legal environments and more equity needs to be provided to an entrepreneur to prevent them from undertaking moral hazard. Therefore, one can argue that equity from venture capital or private equity investors substitute for pure debt financing in weaker environments up to a point, while pure debt financing substitutes for debt from private equity investors in better legal environments.

Bottazzi et al. (2009) also demonstrate that the optimal amount of debt increases in a better legal system up to a certain threshold and then decreases. Therefore, expansion stage venture capital or private equity which relies on some debt should increase non-linearly in weaker legal systems.

Bottazzi et al. (2009) also demonstrate that investors originating from countries with predominantly better legal environments use more debt and have stronger incentives to develop value-adding competencies.<sup>17</sup> This prediction is empirically supported by Kaplan et al. (2007) who find that most of the venture capital contractual variation between common law and civil law countries in their

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<sup>15</sup> Shifting more equity to investors further dilutes entrepreneurs' ownership stakes and is a disincentive to their effort.

<sup>16</sup> Debt has no effects on the incentives of the entrepreneur because it leaves the owner's stake intact (Bottazzi et al., 2009, p. 566).

<sup>17</sup> The USA and UK substantially rely on legal protection of investors, while in much of Continental Europe as well as in Japan, legal protection of investors is considerably weaker ... (Shleifer and Vishny, 1997, p. 769).

sample of high-income European countries is explained by the fact that investors use contracts that are similar to the ones they employ in their home countries.<sup>18</sup>

One branch of empirical studies test the hypothesis that the legal environment influences venture capital or private equity activity at the macro level using panel datasets with the country as the unit of observation (Jeng and Wells, 2000; Allen and Song, 2002; Kumar and Orleck, 2002; Lerner and Schoar (2005); Bonini and Alkan, 2011).

Jeng and Wells (2000) used data covering the period between 1986 and 1995 to analyze whether initial public offerings (IPOs) were a determinant of venture capital funds invested by limited partnerships across 15 Organization for Economic Co-operation and Development (OECD) including Australia, New Zealand, Japan and Israel as well as countries in North America and Europe. In their analysis they controlled for potential endogeneity issues between IPOs and venture capital activity using variables capturing the legal environment as instruments. Based on between regression results they found that the coefficient on the rule-of-law was zero and insignificantly related to the combined early and expansion stages of venture capital activity. These results suggest that the legal environment measured by the rule of law may not matter. In addition, they found that relative to a common law system, having a German civil law system was negatively significant (Jeng and Wells 2000, p. 265).

Allen and Song (2002) used data for the 1990's covering 16 Asian countries, 16 European countries and the United States of America (USA) to analyze the relationship between venture capital funds invested as a percentage of GDP and the effectiveness of corporate governance, measured by creditor rights and rule of law. They found that the variable measuring rule of law was negatively and significantly related to overall venture capital and private equity activity. This finding supports the notion that the legal environment negatively influences venture capital activity. In their analysis by stage of investment they found that rule of law was negatively but insignificantly related to the early stage of venture capital and the private equity stage but was positively but insignificantly related to the

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<sup>18</sup> I do not test this hypothesis in this paper because I would need to model the relationship between the investors and their limited partners (Bottazzi et al., 2009, p. 567).



expansion stage of venture capital. In addition, they also found that relative to a common law system having a German civil law system was negatively and significantly related to overall venture capital and private equity activity. In their analysis by stage of investment this relationship was insignificant across all stages. Furthermore, both the German and Scandinavian civil law systems were only negative for the early and expansion stages of venture capital but positive for the private equity stage. The French civil law system was negative only for the early stage of venture capital but positive for the expansion stage of venture capital and private equity stages (Allen and Song, 2002, p.27 - 28).

Kumar & Orleck (2002) used data covering 9 countries in North America and Europe over the period between 1986 and 1999 and a shorter period from 1994 to 1999 to identify factors influencing private equity or venture capital financing commitments as a percentage of GDP. Using a pooled regression technique they found that the legal environment variable is positively significant. This finding supports the notion that the legal environment influences venture capital activity.

Lerner and Schoar (2005) used data covering the period from 1987 to 2003 on contract details from 210 private equity transactions by 28 investors in non-OECD countries including Ghana, South Africa and Tanzania. In their analysis they separately include legal origin dummies and a time-to-resolve-contract-dispute variable to capture the quality of enforcement. They found that relative to the French civil law system, investors in common law systems use significantly less equity or debt and have significantly higher valuations of their investments. They also found that legal systems with quicker times to resolve disputes also have higher investment valuations. Finally, they found that transaction variation is “... not driven by the tendency of common law-based funds to invest in common law countries” (Lerner & Schoar, 2005, p. 225).

Bonini and Alkan (2011) used data covering the period from 1995 to 2002 across 16 countries in Europe, North America and Asia to identify the determinants of venture capital funds invested. In one of their ordinary least squares regressions, Bonini and Alkan (p.36 - 37) included legal origin variables and

found that the relative to a common law system all civil law systems are negatively and significantly related to the amount of venture capital funds invested in a country (except the French civil law system which is insignificant for early stage funds invested). Finally they find that corruption, which proxies for public trust, was negatively significant.

Another branch of empirical studies test the hypothesis that the legal environment influences venture capital or private equity activity at the micro level using panel datasets with investors as the units of observation (Bottazzi et al., 2009; Cumming, Schmidt and Walz, 2010).

Bottazzi et al. (2009) tested the predictions of their double moral hazard model using data covering the period from 1998 to 2001 across 17 European countries. They found that better rule of law and common law systems (relative to civil law systems) are associated with more investor involvement in portfolio companies and more use of debt instruments for downside protection.<sup>19</sup>

Cumming, Schmidt and Walz (2010) used data consisting of 3,848 portfolio companies spanning the period from 1971 to 2003 across 39 countries in North America, Europe and Latin America to assess the influence of the legal environment on venture capital markets. Using Cox proportional hazard, ordered logit, and Heckman two-step regression techniques, they found that the legal environment is positively and significantly related to faster deal origination and screening (which reflects due diligence), a higher probability of syndication (where different investors invest in a single portfolio company), a lower probability of harmful co-investment, and more board representation (which reduces moral hazard).

So far macro and micro level empirical studies have generated useful insights on whether the legal environment influences the amount of funds invested in venture capital or private equity and how it influences the nature of the transactions. However, none of the studies have investigated whether the legal environment influences the number of deals and if the results are robust to controlling for investors' human capital, which is a feature of their quality. In this paper I fill this gap in the literature.

### **3. METHODOLOGY**

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<sup>19</sup> They add the rule of law and legal jurisdiction variables separately in their model arguing that a simultaneous inclusion suffers from the severe multicollinearity effect identified by Berkowitz et al. (2003).

In this section I discuss the data, methods and empirical model used to test the hypothesis.

### **3.1. Data**

The data used in this paper is obtained from various publicly available secondary sources. The number, type and location of deals formed, and investors' team-level human capital traits representing their education and work experience, as well as their other non-human capital traits are obtained from a sample drawn from a hand collected dataset that captures the investments into portfolio companies by 645 investors in Africa.

In compiling this dataset the specific details on investors' characteristics and the portfolio companies they invested in are downloaded from the investors' websites or obtained from their audited annual reports and other unaudited publications e.g. newsletters. These investors are identified from publications and member lists of industry associations including the African Venture Capital Association, Emerging Markets Private Equity Association, South African Venture Capital Association, and the Tunisian Venture Capital Association (AVCA, 2004; AVCA, 2006; EMPEA 2009; SAVCA, 2005; Mthomboti, 2008 & ATIC, 2009). Restricting the dataset to these sources, would result in an analysis that is limited to members of industry associations that suffers from a potential selection problem because only the most successful investors may subscribe to these associations.

To mitigate this problem an extensive effort was conducted to identify other investors and their investments using other secondary sources. These additional sources include the Venture Capital Funds Index, which is an industry directory listing (Rhijn, 2008), delegate lists and output from industry conferences, prior employers stated on team members' profiles posted on investors' websites, and *africa-assets.com* and *privateequityafrica.com* that are online portals that began to provide data on venture capital and private equity transactions in Africa from January, 2011.

One human capital characteristic I measure is whether or not an investor attended a high reputation university. I rely on prior literature that has investigated the effect of human capital on deal formation in venture capital markets to determine the set of high reputation universities that team members graduated from (Sunesson, 2009; Bengtsson and Hsu, 2010; Zarutskie, 2010; Bottazzi et al.,

2011). Since this literature restricts its choices to USA or UK education systems, I relied on the Top 200 global ranking of universities compiled by Quacquarelli Symonds (2004) to select other choices. For Africa, I selected the only universities that appear on the rankings in any year the index covers. The universities included in this paper encompass the Top 10 engineering, economics, law, and masters in business administration (MBA) schools (Li and Ueda, 2006).<sup>20</sup>

Start dates and end dates are important to measure how investors' team level, human capital profiles change over time. Most start dates, which are defined as the year a team member joined an investor's team, are explicitly indicated in their profiles or are issued in a press release. I obtained those that were not from annual reports, LinkedIn and Bloomberg's online portal. Most departure dates, which are defined as the year a team member left an investor's team, are not explicitly stated in their profiles. In cases where this information was not provided and unavailable from LinkedIn or Bloomberg, I defined the team member's departure date as the last year they appeared in an annual report or by the year prior to which they are announced to have joined a new investor's team.

The resulting dataset compiled from this effort represents the most comprehensive data on venture capital and private equity activity in Africa, to date. With only 43 investors reporting to the 2005 survey by the African Venture Capital Association (AVCA, 2006), 44 investors reporting to the 2006 survey by South African Venture Capital Association (SAVCA, 2007) and 156 investors reporting to the 2011 survey by the Emerging Markets Private Equity Association (Coller Capital and EMPEA, 2011) relying on these datasets would not be as comprehensive. Also, the VentureXpert database identifies 235 deals between investors and venture capital entrepreneurs in Africa, between 2000 and 2008 (Brander et al., 2010). From 2004 to 2008, I identify 675 deals with 330 of these being in the seed, start-up or early stages. Finally, the Emerging Markets Private Equity Association's dataset indicates that there were 87

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<sup>20</sup> The universities include US: Brown, University of California-Berkeley, University of Chicago, Columbia, Cornell, Dartmouth, Duke, Harvard, Massachusetts Institute of Technology, University of Pennsylvania, Princeton, Yale, Stanford; Canada: McGill, University of Toronto; UK: Cambridge, Oxford, Imperial College, King's College, London School of Economics; France: Sorbonne University; Italy: Bocconi University; Netherlands: Tilburg University; Australia: University of New South Wales; China: Tsinghua University; South Africa: University of Cape Town, University of Witwatersrand, and University of Stellenbosch.

deals between investors and venture capital or private equity entrepreneurs in sub-Saharan Africa between 2008 and 2009.<sup>21</sup> The dataset in this paper identifies 1, 013 venture capital or private equity deals in the same sub-region over the same period.

From the overall hand collected dataset of investments by 645 investors, I eliminate observations that represent follow-on investments by the same investor into the same portfolio company.<sup>22</sup> I also correct for syndicated deals that involve multiple providers investing in a single portfolio company by restricting the deal to the lead investor, defined as the one that purchases the highest stake in a portfolio company or provides the most financial capital, because they are the ones who negotiate terms with the entrepreneur and interact with them.

Due to the self-reported nature of the data, only 3,844 can be identified as deals occurring between an investor and an entrepreneur from 2004 to 2010. After the adjustments in the previous paragraph I end up with 3,367 observations representing initial deals by one of 396 lead investors across 50 African countries.<sup>23</sup> 623 of these are seed, start-up, or early stage venture capital deals, 480 are expansion stage venture capital deals, 831 are private equity deals and 1,433 are deals whose stage is unknown.

I obtain the aggregate rule of law measure and the control of corruption measure, which is a proxy for public trust in this paper, from the Worldwide Governance indicators database (Kauffman et al. 2011). These two variables were collected bi-annually from 1996 and annually from 2002. I allocate countries to legal jurisdiction categories based on Kritzer (2002).

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<sup>21</sup> I would like to thank the Emerging Markets Private Equity Association for providing top-level figures on the number of deals in sub-Saharan Africa from their database for this comparison.

<sup>22</sup> The restriction to initial investments accounts more accurately for investors' and entrepreneurs' current decisions as opposed to decisions made in prior periods, when market conditions may have been different. In addition, it limits the interaction between investors and entrepreneurs to one period where equilibrium payoffs and matches are determined simultaneously.

<sup>23</sup> Based on geographic categorization these include Northern Africa: Algeria, Egypt, Libya, Morocco, Sudan, and Tunisia; Eastern Africa: Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Seychelles, Somalia, Tanzania, and Uganda; Southern Africa: Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe; Western Africa: Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo, and Western Sahara; Central Africa: Burundi, Central African Republic, Cameroon, Chad, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon, Rwanda, and São Tomé e Príncipe.

I obtain the disaggregated components of the rule of law measure related to contract enforcement from the World Bank's Doing Business databases. I also obtain the strength of property rights measure from this source. Compilation of the Doing Business data began in 2004. This determines the earliest cut-off date that I consider in the analysis. I obtain the private trust measures from Rounds 2, 3 and 4 of the Afro barometer Survey, which biannually collects information on national public attitudes in various African countries (Kibirige et al., 2011). I obtain the disaggregated measure related to the likelihood of crime and violence from the World Bank's Enterprise surveys.

I obtain the non-legal characteristics of the market (country) in which venture capital or private equity activity occur from the World Development Indicators and Global Development Finance databases that are publicly accessible via an online data portal provided by the World Bank (2011). The data are reported by government agencies, obtained through field surveys, or compiled from data collection efforts by other agencies e.g. the International Monetary Fund, United Nations, and World Economic Forum. The self-reported nature of the data results in missing observations in some of the variables obtained from these sources.

### **3.2. Empirical strategy**

I test the null hypothesis that the legal environment does not influence venture capital or private equity activity in Africa using the country of destination paradigm that is used to record where funds are invested i.e. the countries they go to, which is contrary to the country of management paradigm that is used to record funds raised i.e. the country where the investor is based (EVCA, 2001).<sup>24</sup>

I use a macro and micro level strategy to test the null hypothesis that the legal environment does not influence venture capital or private equity activity. In the macro level approach I adopt a panel data specification with the country as the unit of observation. I estimate this specification using ordinary least squares.

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<sup>24</sup> The country of destination paradigm would be more appropriate if our focus was to investigate the relationship between limited partners and investors.

In the micro level approach I adopt a discrete choice framework which adopts the potential pairs method of constructing alternative choices that could occur but never do in a two-sided matching specification (Fox, 2008 and 2010).<sup>25</sup> In this paper, I interpret the results as investors' matches to countries.<sup>26</sup> I estimate this specification using a conditional logit regression that estimates the likelihood that an investor selects a particular country as a function of its legal environment, controlling for its other attributes and the investors' own characteristics (McFadden, 1974).<sup>27</sup>

In these micro level models I cluster the data at the country level based on a suggestion that "... with nested levels of clustering, clusters should be chosen at the most aggregate level ... to allow for correlations among [agents] at that level" (Baum et al., 2010:21).<sup>28</sup>

To correct for the missing observations in the independent variables I adopt a multiple imputation by chained equations technique. This approach imputes missing values by drawing possible values from a non-parametric distribution and generating various plausible datasets, whose combined results are used to arrive at coefficient estimates with standard errors that reflect the uncertainty from imputation (Rubin, 1987). This is contrary to a mean substitution technique that imputes a single value for missing observations, which may bias parameter estimates towards zero (Acock, 2005).<sup>29</sup>

To control for potential endogeneity between venture capital or private equity activity and the legal environment I use three separate approaches. First, I lag the measure of legal enforcement by five years based on the assumption that the lagged value weight is uncorrelated with the current venture

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<sup>25</sup> See Sorenson and Stuart (2001), Jepsen and Jepsen (2002), Bengtsson and Hsu (2010) and Bottazzi et al. (2011) for empirical examples of alternative choice construction in the potential pairs matching framework setting.

<sup>26</sup> The potential pairs specification is an empirical expression of a local product maximization condition based on single-agent responses under price-taking behaviour. The condition states that total production value from any two actual matches exceeds that of any counterfactual alternatives. It is akin to the pairwise stability concept, which posits that matches are stable in equilibrium if no currently matched outcomes are willing to exchange partners to form new matches (Yang et al., 2009).

<sup>27</sup> The interpretation in this specification is that an investor's choice to enter a particular market provides a higher indirect utility than the choice to enter an alternative country (McFadden, 1974).

<sup>28</sup> With the data representing a sample of deals in a market, the logic of the asymptotics is that I expect to observe more and more deals from this market (Santiago and Fox, 2008). Clustering deals at the investor level, which is the adopted by Sørensen (2007) and Bottazzi et al. (2011) would suggest that I observe all investors but do not capture all current deals they make, which is not the case.

<sup>29</sup> Rubin (1987) recommends that 5 imputed datasets are enough for 95% confidence in results with 50% of observations missing. This paper uses 10 imputed datasets.

capital or private equity activity residual. Second, I adopt a fixed effect panel specification (Chamberlain, 1982). This is based on the assumptions that all unobservable heterogeneity is constant within groups and is differenced away. Finally, I use an instrumental variable estimation technique that includes a variable that is related to the legal enforcement mechanism but is not related to venture capital or private equity activity. In this paper the instrument I adopt is the legal jurisdiction category that a country belongs.

### 3.3. Empirical Model

Using Stata, a statistical software package, I estimate the empirical model outlined in Equation 1.

$$y_{ct} = X_{ct}\beta' + \Gamma_{ct} + \delta_c + \varepsilon_{ct} \quad (1)$$

Where:

$y$  is a vector representing the dependent variable. In Model 1 it represents the tightness of a market, which is defined as the ratio of investors to the number of deals, regardless of type (Silveira and Wright, 2006) in a market (a specific country,  $c = 1, \dots, 50$ , in a specific year  $t = 2004, \dots, 2010$ ). In Model 2, 3 and 4 it represents the number of initial early stage venture capital (seed, start-up, or early), expansion stage venture capital, and private equity deals, respectively, as a percentage of the overall number of deals formed in a market. In Model 5 it is a binary indicator where one represents an investors' choice to enter a market or zero otherwise. The zeros in this indicator are restricted to investors' alternative *regional* choices.<sup>30</sup>

$X$  represents the key independent variables where I estimate the coefficient vector  $\beta$ . In one specification it is a matrix consisting of the strength of property rights index, which is a proxy for intellectual rights protection in a market.<sup>31</sup> This index ranges between 0 and 10 where higher values represent stronger property rights.<sup>32</sup> The matrix also includes a rule of law score that is an aggregate legal enforcement indicator ranging between -2.5 and 2.5. This score measures the extent to

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<sup>30</sup> I can expand the set of alternatives to any country on the continent, but with most investors stating that their scope of investments is the region this assumption is reasonable.

<sup>31</sup> The strength of property rights determines the reliability of enforcement and is defined as not only the delimitation of legal rights to modify or alienate things, but also the adjudication of disputes on who owns a particular item or sum of money (North,1993).

<sup>32</sup> It is aggregated from individual measures capturing the number of procedures, time in days, and cost as a percentage of value to register property.



which agents have confidence in and abide by the rules of society, in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence (Kauffman et al., 2011).<sup>33</sup>

In another specification, the matrix consisting of a disaggregated version of the rule of law score that includes the number of days to enforce a contract, which is a proxy for the efficiency of the judicial system, and the cost of enforcement as a percentage of the claim. It also includes a measure of the percentage of a representative sample in a country that trusts courts of law, which is a proxy for private trust in this paper. In addition, it includes a control of corruption score ranging between -2.5 and 2.5, which is a proxy for public trust in this paper.<sup>34</sup> This score captures the level to which a country is able to control corruption or fear of expropriation by public officials, therefore a higher ranking is interpreted as less corruption in a country. Finally, it includes a measure of losses as a percentage of firms' sales in a market that occur due to theft, robbery, vandalism and arson and a proxy for the likelihood of crime and violence component of the aggregate enforcement indicator in this paper.

Furthermore, the matrix includes the instruments to control for potential endogeneity represented by separate binary indicators where one represents whether a market's legal jurisdiction is common (the reference category), civil or pluralistic, or zero otherwise. The civil legal system categories include German, Portuguese, Spanish, Belgian, Dutch, or French legal jurisdiction. The pluralistic legal jurisdiction categories include Common-Islamic, Common-French, Common-Civil, Common-Italian-Islamic, German-Belgian, French-German, and French-Islamic.

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<sup>33</sup> While Jeng and Wells (2002) include anti-director and shareholder rights in their analysis, I do not include these variables in my paper because these laws are more applicable to public firms.

<sup>34</sup> Trust among citizens in a country is related to legal protection because it influences the effectiveness of public (and private) institutions including the court system (Bruton et al., 2005, p. 745; La Porta et al., 1997, p. 1150, Lingelbach et al., 2009, Bottazzi et al., 2011).

$\Gamma$  represents a matrix of control variables. From Model 1 to 4 it only consists of non-legal market characteristics. The first of these is a disclosure index ranging between 0 and 10 that captures the degree to which investors are protected by the disclosure of ownership and financial information.<sup>35</sup> Controlling for this is important because the verifiability of contracts between two entities in court relies on a reliably interpretable measure of firms' income or assets (La Porta et al., 1998, p. 1140). Furthermore, it gives the investor a reliable basis to exercise implicit agreements.

The second is the amount of domestic credit provided by the banking sector as a percentage of GDP.<sup>36</sup> This controls for the opportunity cost (higher values increase this cost) of opting for the financial, human and social capital offered by investors relative to pure credit financing from banks and other credit lending institutions (Romain and Potterie, 2003b; Félix et al., 2007).

The third is the employment rigidity in the labour market, which captures the quality of the conventional labour market.<sup>37</sup> It controls for the occupational choice to pursue entrepreneurship (Poschke, 2010).<sup>38</sup>

Fourth, I control for the cost of starting up a business as a percentage of income per capita and the cost of closing a business measured as the recovery rate from declaring bankruptcy in terms of cents on

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<sup>35</sup> Inclusion of this index corrects for the proxy in Jeng & Wells (2000), who used accounting standards of *public firms* to capture financial reporting standards for venture capital. However, it is not able to correct for the potential omitted variable bias from using only accounting standards to capturing information disclosure. Wright and Robbie (1996) found that accounting information is only one part of the providers' overall assessment with other elements, such as discussion with personnel and access to unpublished and subjective assessments being widely used" (Jeng & Wells, p. 30). The role of these other sources of obtaining information in the South African venture capital and private equity market is confirmed by Morris et al., (2000; p. 73).

<sup>36</sup> Attempts to include the real lending rate, measured by the lending interest rate minus the consumer price index inflation rate with a base year of 2005 suffered from severe multicollinearity with the start-up costs measure i.e. collinearity > 0.8.

<sup>37</sup> Alternative measures that I do not include because they measure the same concept are the average compensation level as a proportion of firms' expenses to proxy for wage levels in a country, and the labour force participation rate of individuals aged 15 and over in a market.

<sup>38</sup> The effect of employment rigidity is ambiguous. On one hand, rigid labour markets are associated with higher wage employment. This creates incentives for relatively risk averse, high ability individuals to stay in employment leading to fewer entrepreneurs and lower venture capital or private equity activity (Rissman, 2003; Parker, 2007, p. 704-705). On the other hand, higher employment rigidity results in employers being less willing to hire leading to higher rates of self-employment, a larger pool of entrepreneurs and more venture capital or private equity activity (Bernanke et al., 1999).

the dollar. These measures also control for the opportunity cost of pursuing entrepreneurship as an occupational choice.

Fifth, I include the growth rate of real GDP per capita in purchasing power parity terms with a base year of 2005. This controls for the finding that macroeconomic expansions lead to an increase in the number of start-ups, which is related to an increase in demand for venture capital funds and a higher level of venture capital activity (Achs and Audretsch, 1994). It also controls for the effect of GDP on financial market size including depth (valuation of securities) and breadth, which is important for IPO exits (La Porta et al., 1997, p. 1139; Jeng & Wells, 2000). In addition, it controls for the hypothesis that larger economies have different ownership patterns.

Sixth, I include the per capita number of listed domestic companies to control for stock market vitality and the hypothesis that an active stock market is an incentive for investors and entrepreneurs to enter a market (Jeng & Wells, 2000).<sup>39</sup> It also controls for cyclical stock market factors that are not captured by GDP growth which affect incentives and could confound our legal infrastructure variables if they are ignored (Gompers et al., 2008).<sup>40</sup>

Seventh, I include the number of scientific and technical journals published in the fields of physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences. This controls for the innovative structure of a market.<sup>41</sup>

Finally, I include the highest marginal corporate tax rate. A higher corporate tax rate should reduce venture capital activity to the extent that it reduces incentives to be self employed and should have

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<sup>39</sup> An attempt to include the stock turnover ratio alongside this variable suffered from severe multicollinearity.

<sup>40</sup> Market capitalization as a percentage of GDP is not appropriate because a stock market be dominated by the largest public firms that are not candidates for venture capital or private equity financing in the first place (La Porta et al., 1997, p. 1132).

<sup>41</sup> Alternative measures such as research and development (R&D) expenditure as a percentage of GDP or the number of patents per capita applied for by residents of a country, suffer from relatively too few datapoints over the analysis period.

a larger impact on the effective tax burden of investors than the individual income tax (Kumar and Schuetze, 2007, p. 18; Bonini and Alkan, 201; Porteba, 1989, p.375).<sup>42</sup>

In addition to the non-legal market characteristics, Model 5 includes investors' human and non-human capital characteristics. The investors' human capital characteristics capture their team level education and work experience profiles using similar categories to those used by Zarutskie (2010).<sup>43</sup>

The variables that capture education include the proportion of a team's members with a Bachelors, Masters or Doctoral degree. They also include the proportion of a team's members that have obtained post-graduation industry qualifications from non-university institutions e.g. certified accountant (CA), chartered financial analyst (CFA), project management professional (PMP), advanced management programs, executive education programs, etc. In addition, they include the proportion of a team's members that have graduated from a high reputation university. Finally, they include the discipline(s) majored in at university by a team's members i.e. business, economics, law, and science, technology or engineering (sci-tech-eng) and a catchall other education category.

The variables that capture work experience include the proportion of a team's members with prior non-venture capital or non-private equity finance experience, venture capital or private equity finance experience at another investor, chief executive officer or upper level management work experience that is not obtained from being a former entrepreneur, strategy consulting or management consulting experience, start-up experience from being a former entrepreneur and prior experience in sci-tech-eng jobs.

The variables capturing non-human capital traits include the proportion of females in a team, which captures its gender composition. I also include the investors' age which I measure as the difference

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<sup>42</sup> Attempts to include measures of the capital gains tax rate to control for the opportunity cost of pursuing entrepreneurship versus a workers employed compensation package (Porteba 1989, p. 379; Keuschnigg and Nielsen, 2004), and its difference with the personal income tax measures to control for the hypothesis that a decrease in the difference between them will induce more people to leave their job and become entrepreneurs (Da Rin et al., 2006), was not possible due to too few datapoints and variation over the sample period.

<sup>43</sup> I measure the human capital variables as the proportion of the trait in an investor's or entrepreneur's team in a similar fashion to Dimov et al. (2007). For example, if a team with 10 members has 3 individuals with prior science, technology or engineering experience a proportion of 0.3 indicates that 30% of the team have this trait.

between the year a deal occurs and the investor's year of establishment.<sup>44</sup> I also include the proportion of teams' members that report their education and work experience as a proxy for information availability.

In addition, I include an indicator that captures the distance between an investor and a market in which a deal occurs, where one indicates that an investor has no office presence on the continent; two indicates the deal occurs with an investor who has an office on the continent but not in the region; three indicates the deal occurs with an investor who has an office in the region but not in the market; and four indicates the deal occurs with an investor who has an office in the same market.

I also include an investor's cumulative stage-specific experience in a market relative to that of all other investors in that market. I measure this as the ratio of the number of seed, start-up and early venture capital (or expansion venture capital or private equity) deals an investor has realized in a market up to the year preceding the particular year in which a deal occurs to the same stage specific deals in that market over the same period.

Furthermore, I include the investor's size, which I measure by the number of funds an investor manages. This controls for the hypothesis that larger investors may have more resource laxity and thus are more inclined to realize deals at the venture capital stage, which are thought to be more difficult to fund or experimental (Dimov et al., 2007). Including the number of funds also controls for potential monitoring costs that may affect an investor's decision to undertake an additional investment.

Finally, I include the investor type i.e. public, corporate, finance or private. This controls for their differing incentives to make deals in different stages.  $\delta$  refers to the unobserved component term that represents individual effects and  $\varepsilon$  refers to a random disturbance term. The variables are more extensively defined in Table 1 and summarized in Table 2 and Table 3.

#### **4. RESULTS AND DISCUSSION**

Preliminary results of the fixed effects specification of the macro model are presented in Table 4. They indicate that a better legal environment increases market entry by investors and entrepreneurs.

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<sup>44</sup> I add 0.5 to this to prevent zero values for ages where a match occurs in the same year an investor or entrepreneur is established.

While seed, start-up or early stage venture capital increases with better rule of law, expansion stage venture capital decreases and private equity is practically zero. In addition, both venture capital and private equity increase where strength of property rights is weaker. These findings suggest that venture capital substitutes for debt financing from other sources e.g. banks, in weaker legal environments.

[To be completed]

## 5. CONCLUSION

Studies have shown that venture capital and private equity influence employment dynamics, innovation, and productivity (Engel, 2002; Davis et al. 2008; Kortum and Lerner, 2000; Romain and Potterie, 2003a). The impact of these factors on short-term individual welfare and long-term economic growth raise a question on the role various stakeholders can play to boost these types of financing. Governments as one stakeholder are a part of this conversation. They provide public goods such as the court system, police, taxation and the funding of basic research. In this paper I focused on the court system which represents the legal environment.

[To be completed]

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**Table 1: Definition and Source of Variables**

Variable	Definition	Type	Source
<i>Dependent Variable</i>			
MrkTight	Ratio of the number of investors to the number of deals regardless of stage in a market	Continuous	Author's dataset
Early	Seed, start-up or early stage venture capital deals as a share of the number of all deals in a market	Continuous	Author's dataset
Expansion	Expansion venture capital deals as a share of the number of all deals in a market	Continuous	Author's dataset
Private Equity	Private equity deals as a share of the number of all deals in a market	Continuous	Author's dataset
Entry	Equal to one if an investors enters a market or zero otherwise	Binary	Author's dataset
<i>Key Independent Variables</i>			
Strength of property rights	Property rights index	Continuous	Doing Business
Rule of Law	Extent to which agents have confidence in and abide by the rules of society, in particular the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence	Continuous	Governance Indicators
Judicial efficiency	Number of days to enforce a contract	Continuous	Doing Business
Cost of legal action	Cost to enforce a contract recorded as a percentage of the claim, assumed to be equivalent to 200% of income per capita. Only official costs required by law are recorded, including court and enforcement costs and average attorney fees where the use of attorneys is mandatory or common	Continuous	Doing Business
Public trust	Control of corruption, which measures the extent to which public power is exercised for private gain, including petty and grand forms of corruption, as well as "capture" of the state by elites and private interests	Continuous	Governance Indicators
Private trust	One minus the proportion of a representative sample of a population that do not trust courts of law at all	Continuous	Afro barometer Survey
Likelihood of crime or violence	If there were losses, losses are due to theft, robbery, vandalism or arson that occurred on establishment's premises calculated as a percentage of annual sales	Continuous	Enterprise Surveys
Common	Equal to one if Gambia, Ghana, Kenya, Liberia, Malawi, Mauritius, Sierra Leone, Tanzania, Uganda, Zambia, or zero otherwise.	Binary	Kritzer (2002)
German civil	Equal to one if Benin, Guinea, or zero otherwise.	Binary	Kritzer (2002)
Dutch civil	Equal to one if Botswana, Lesotho, Namibia, South Africa, Swaziland, Zimbabwe, or zero otherwise.	Binary	Kritzer (2002)
Belgian civil	Equal to one if Burundi, Democratic Republic of Congo, or zero otherwise.	Binary	Kritzer (2002)
Portuguese civil	Equal to one if Angola, Cape Verde, Guinea-Bissau, Mozambique, or zero otherwise.	Binary	Kritzer (2002)
Spanish civil	Equal to one if Equatorial Guinea, or zero otherwise.	Binary	Kritzer (2002)
French civil	Equal to one if Burkina Faso, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Djibouti, Gabon, Madagascar, Mali, Niger, Senegal, or zero otherwise.	Binary	Kritzer (2002)
Common-French	Equal to one if Cameroon, Seychelles or zero otherwise.	Binary	Kritzer (2002)

Common-Islamic	Equal to one if Nigeria, Sudan, or zero otherwise.	Binary	Kritzer (2002)
Common-Italian-Islamic	Equal to one if Ethiopia, Eritrea, Somalia, or zero otherwise.	Binary	Kritzer (2002)
German-Belgian	Equal to one if Rwanda, or zero otherwise.	Binary	Kritzer (2002)
German-French	Equal to one if Togo, or zero otherwise.	Binary	Kritzer (2002)
French-Islamic	Equal to one if Algeria, Egypt, Libya, Mauritania, Morocco, Tunisia, or zero otherwise.	Binary	Kritzer (2002)
<i>Control Variables</i>			
<i>Country Characteristics</i>			
GDP growth	Annual real GDP growth rate per capita in PPP in 2005US\$	Continuous	World Development Indicators and Global Development Finance
Employment rigidity	A rigidity of employment index measures the regulation of employment, specifically the hiring and firing of workers and the rigidity of working hours. This index is the average of three sub-indexes: a difficulty of hiring index, a rigidity of hours index, and a difficulty of firing index. The index ranges from 0 to 100, with higher values indicating more rigid regulations	Continuous	Doing Business
Disclosure index	Measures the degree to which investors are protected through disclosure of ownership and financial information. The index ranges from 0 to 10, with higher values indicating more disclosure	Continuous	Doing Business
Innovation	number of scientific and technical journals published in the fields of physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences	Continuous	World Development Indicators and Global Development Finance
Corporate tax rate	Highest marginal corporate tax rate	Continuous	World Development Indicators and Global Development Finance
Listed domestic companies	The per capita number of domestically incorporated companies listed on the country's stock exchanges at the end of the year. This indicator does not include investment companies, mutual funds, or other collective investment vehicles.	Continuous	World Development Indicators, Global Development Finance, and individual country stock market websites
Bank credit	Domestic credit by banking sector as a percentage of GDP	Continuous	World Development Indicators and Global Development Finance
Start-up costs	percentage of a country's income per capita involved in launching a commercial or industrial business with at least 10 and up to 50 employees and start-up capital of 10 times the economy's income per capita	Continuous	Doing Business
Bankruptcy costs	Recovery rate after closing a business or resolving insolvency in terms of cents on the dollar	Continuous	Doing Business
<i>Venture Capital or Private Equity Firm Characteristics</i>			
Bachelors	Proportion of team with a bachelor's degree	Continuous	Author's dataset
Masters	Proportion of team with a master's degree	Continuous	Author's dataset
PhD	Proportion of team with a PhD degree	Continuous	Author's dataset
Certification	Proportion of team with a post-bachelor's certification e.g. CA, CFA, PMP, AMP.	Continuous	Author's dataset
Ivy	Proportion of team with any degree from a top-ranked university	Continuous	Author's dataset

Business_ edu	Proportion of team that graduated university as a business major	Continuous	Author's dataset
Economics_ edu	Proportion of team that graduated university as an economics major	Continuous	Author's dataset
Law_ edu	Proportion of team that graduated university as a law major	Continuous	Author's dataset
STEM_ edu	Proportion of team that graduated university as science, technology, engineering or mathematics major	Continuous	Author's dataset
Other_ edu	Proportion of team that graduated university in another area not affiliated with the other four categories e.g. language, history, political science, etc.	Continuous	Author's dataset
Finance_exp	Proportion of team with prior non-venture capital or non-private equity finance work experience	Continuous	Author's dataset
VCPE_exp	Proportion of team with prior venture capital or private equity finance work experience	Continuous	Author's dataset
STEM_exp	Proportion of team with prior science, technology or engineering work experience	Continuous	Author's dataset
CEOUM_exp	Proportion of team with prior CEO or upper management work experience	Continuous	Author's dataset
Consult_exp	Proportion of team with prior consulting experience work experience	Continuous	Author's dataset
Startup_exp	Proportion of team with prior experience starting an own business	Continuous	Author's dataset
Gender	Proportion of females in an investment team	Continuous	Author's dataset
Age	Year of investment minus year of establishment plus 0.5	Continuous	Author's dataset
Distance	Equal to one if investor has no office presence on the continent when deal occurs; two if an investor who has an office on the continent but not in the region where deal occurs; three if an investor who has an office in the region but not in the market where deal occurs; and four if an investor has an office in the same market where deal occurs	Ordinal	Author's dataset
Investment experience	Ratio of the number of investments made by firm prior to year t and the average of the number of investments made by all firms prior to year t	Continuous	Author's dataset
Type	Equal to one if an investor is public, two if an investor is corporate, three if an investor is finance, and four if an investor is private	Ordinal	Author's dataset

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**Table 2: Summary Statistics for macro level model**

Variable	Mean	Standard Deviation	Minimum	Maximum
<i>Dependent:</i>				
MrkTight	0.556	0.278	0.056	1.333
early	0.255	0.205	0.030	1
expansion	0.243	0.223	0.016	1
Private equity	0.302	0.239	0.026	1
<i>Key Variables:</i>				
Strength of property rights	4.35	2.271	1	10
Rule of law	-0.706	0.654	-2.68	1
Cost of legal action	47.88	35.684	14.3	151.8
Judicial efficiency	654.34	229.21	260	1280
Public trust	-0.616	0.585	-1.92	1.15
Private trust	0.864	0.0655	0.706	0.971
<i>Controls:</i>				
Disclosure	4.755	1.994	0	8
GDP growth	0.026	0.039	-0.125	0.338
Employment rigidity	36.604	16.649	0	73
Start-up costs	180.59	417.14	2.1	6375.5
Bankruptcy costs	17.923	15.425	0	60.3
Journal publications	163.02	462.61	0	2915.5
Bank credit	34.106	45.843	-65.934	235.063
Listed domestic companies	6.208e-006	1.254e-005	6.592e-008	7.141e-005
Corporate tax rate	30.83	5.9737	10	50
country	26.75	15.357	1	53
year	2007	2.003	2004	2010

**Table 3: Correlation matrix for macro model**

Variable	MrkTight	Early	Expansion	Private equity	Property rights	Rule of law	Cost of legal action	Judicial efficiency
<i>Dependent:</i>								
MrkTight	1							
Early	0.4912	1						
Expansion	0.5278	0.4111	1					
Private equity	0.3299	0.2093	0.168	1				
<i>Key Variables:</i>								
Property rights	-0.2365	-0.2629	-0.1858	-0.3226	1			
Rule of law	-0.295	-0.2431	-0.2926	-0.1364	0.2315	1		
Cost of legal action	0.1851	0.1048	0.2105	0.1071	-0.1344	-0.2545	1	
Judicial efficiency	0.0376	0.1255	0.1276	-0.0062	-0.2928	-0.0155	-0.0907	1
Public trust	-0.2441	-0.1411	-0.1835	-0.0538	0.1871	0.894	-0.2517	-0.0465
Private trust	0.063	-0.3344	-0.1481	-0.032	0.3022	0.268	0.1869	-0.1872
<i>Controls:</i>								
Disclosure	0.0354	-0.0928	-0.1342	0.0199	-0.1058	-0.0566	0.0159	0.1006
GDP growth	-0.0133	-0.0695	-0.0614	0.0153	0.1417	0.0977	-0.0053	-0.0512
Employment rigidity	0.2588	0.1998	0.0447	0.2487	-0.5321	-0.2858	0.152	0.1584
Bank credit	-0.1604	-0.1842	-0.2009	-0.0148	0.0938	0.2583	-0.257	-0.0048
Startup cost	0.1515	0.3341	0.4028	0.3915	-0.0297	-0.3144	0.1983	-0.0329
Bankruptcy cost	-0.2514	-0.2818	-0.2562	-0.3376	0.4033	0.5018	-0.3099	-0.0245
Listed domestic companies	0.1681	0.0809	0.0673	0.3128	-0.1323	0.4817	-0.2066	0.2494
Journals published	-0.2336	-0.2747	-0.292	-0.2032	0.2259	0.2579	-0.171	0.0825
Corporate tax	0.2055	0.1824	0.1444	0.2131	-0.0498	-0.3534	0.3295	-0.2152

**Table 4 continued: Correlation matrix for macro model**

Variable	Public trust	Private trust	Disclosure	GDP growth	Employment rigidity	Bank credit	Start-up cost	Bankruptcy cost	Listed companies	Journals published	Corporate tax
<i>Key Variables:</i>											
Public trust	1										
Private trust	0.1995	1									
<i>Controls:</i>											
Disclosure	-0.0726	0.1291	1								
GDP growth	0.0081	0.2405	-0.2019	1							
Employment rigidity	-0.3145	-0.0629	0.2272	0.0468	1						
Bank credit	0.3232	-0.0173	0.0735	0.0462	-0.0681	1					
Startup cost	-0.2998	-0.1363	0.1051	0.0497	0.1701	0.0916	1				
Bankruptcy cost	0.4305	0.1587	0.0041	0.0728	-0.3888	0.0259	-0.2567	1			
Listed companies	0.4333	0.0834	0.182	0.0375	-0.1351	0.3776	-0.0255	0.1464	1		
Journals published	0.203	0.0919	0.2411	0.0444	-0.0497	0.5	-0.1099	0.2485	-0.0048	1	
Corporate tax	-0.3328	0.0592	-0.0882	0.1463	0.2451	0.0302	0.102	-0.2262	-0.4676	-0.0829	1



**Table 5: Preliminary results for macro model**

Variable	Fixed Effects								IV (To be completed)
	MrkTight		Early		Expansion		Private equity		
Property rights	0.0297 (0.0564)	0.1350 (0.1017)	-0.0398 (0.0305)	-0.0153 (0.0325)	-0.2385*** (0.0274)	-0.1777*** (0.052)	-0.0699* (0.0381)	0.0123 (0.0764)	
Rule of law	0.1040 (0.2941)	0.3055 (0.2563)	0.1495 (0.1375)	0.0133 (0.1708)	-0.2064 (0.162)	-0.4373* (0.236)	0.0007 (0.1665)	0.0668 (0.224)	
Judicial efficiency									
Cost of legal action									
Public trust									
Private trust									
Crime or violence									
Controls:									
Time	No	Yes	No	Yes	No	Yes	No	Yes	
Log-likelihood	48.4677	52.408	83.3698	87.684	64.7496	80.0623	59.2695	61.9914	
R-squared	0.7273	0.7608	0.9207	0.9348	0.9008	0.9498	0.7953	0.8182	
P-value of F-statistic	0.0274	0.0383	0.0018	0.0089	0.0014	0.0005	0.0339	0.0802	
Durbin-Watson	2.1499	2.1654	2.2224	2.5047	2.393804	1.8756	1.705	1.8111	
Akaike criterion	-28.936	-30.816	-104.74	-107.37	-69.4993	-94.1246	-60.5389	-59.9827	
Schwarz criterion	42.2722	46.6748	-49.43	-46.706	-15.2994	-34.5047	-7.5083	-1.4662	
P-value for common intercept	0.0510	0.0471	0.0109	0.0263	0.0022	0.0012	0.0862	0.127	
P-value for joint significance of time dummies		0.0014		0.4191		0.0012		0.3551	
# of observations	60	60	44	44	45	45	46	46	

Note: Each specification controls for GDP growth per capita, disclosure levels, employment rigidity, start-up costs, bankruptcy costs, bank credit, scientific or technical journals published, corporate tax rates, and number of listed domestic companies per capita. Results are not from multiple imputed dataset. Standard errors are in parentheses. \*\*\*p<0.01; \*\*p<0.05; \*p<0.1