EMPIRICAL STUDIES IN INTERNATIONAL

ENTREPRENEURIAL FINANCE

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ABSTRACT

This dissertation consists of three empirical studies in entrepreneurial finance around the world. The first essay empirically compares the impact of entrepreneurship on GDP, unemployment, exports, and patents by examining three international datasets. The findings of this essay point to institutional and cultural impediments to the effectiveness of entrepreneurship around the world. The impact of entrepreneurship is significantly mitigated by excessively strong creditor rights that limit entrepreneurial risk taking. Furthermore, the data indicate that cultural attitudes associated with low risk taking limit the effectiveness of entrepreneurship. The results of this essay also show how different definitions of new business entry matter for empirical analysis of entrepreneurship across countries.

The second essay documents angel investors' investment behaviors and performances around the world as compared with private equity (PE) and venture capital (VC) funds. Angel investors finance small high growth entrepreneurial firms in exchange for equity. Unlike PE/VC funds, which invest capital from institutional investors, angels invest their own money. We compare the impact from legal and cultural conditions on disintermediated angel finance versus intermediated PE/VC finance. The data indicate that, relative to PE/VC funds, angel investors are more sensitive to stock market conditions, legal environments, and Hofstede's cultural conditions. The data further indicate that investee firms funded by angels are less likely to successfully exit in either an IPO or acquisition, on average, whether those angels are involved in the first round or later stages.

The third essay studies the different effects of legal and institutional factors on private equity divestment strategies of IPOs and acquisitions in the emerging markets. The data indicate that PE fund managers have a higher probability of successful exits in countries with better business and legal environments. We also find that PE investors are better able to mitigate the potential costs associated with inefficient and corrupt business environments to increase the probability of exits by IPOs in countries with higher levels of corruption. Moreover, our findings suggest that market shocks arguably concentrated in the developed markets result in a negative ripple effect as the probability of successful exits decreases for PE investors in emerging markets.

To my lovely wife, Qi and my parents.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

Introduction

Entrepreneurial finance is the study of valuation and resource allocation in new business ventures and it has played a more and more important role in the development of the economy and financial markets. This dissertation contributes to the literature of both entrepreneurship and finance by providing insights about the economic impact of entrepreneurship with regards to the new business entry, how angel investors make investments as compared with PE/VC funds around the world as well as the divestment strategies of PE investors in the emerging markets.

All three essays in this dissertation are related to entrepreneurship and finance, discussing topics from the initial business entry stage that has significant impact on the economic development across countries, to the investment stage that compares angel investors with PE/VC funds from the perspective of legal and cultural institutions, and then to the divestment stage that investigates how PE investors exit their investments in the emerging markets. This dissertation not only provides theoretical and empirical evidences to develop current literature in both entrepreneurship and finance, it also provides practical and policy implications to encourage more entrepreneurial activities around the world.

In recent years, it has become increasingly recognized that entrepreneurship is a key driver of economic growth (e.g., Acs et al., 2008; Audretsch, 2007a, b; Audretsch and Acs, 2008; Audretsch et al., 2009; Baumol, 1990; Chavis et al., 2011; Fairlie and Chatterji, 2009; Klapper and Love, 2011; Marcotte, 2012; McMullen, 2011; Naude, 2010;

Stam and Wennberg, 2009; Thirik et al., 2008). For this reason, government bodies around the world have sought ways to stimulate growth through entrepreneurship, including access to entrepreneurial finance (Bonini et al., 2012; Fossen, 2011; Nahata, 2008; Wang and Wang, 2012) and appropriate governance and legal protections for contracts, shareholders and creditors (e.g., Acemoglu and Johnson, 2005; Fan and White, 2003; Klapper et al., 2006; Armour and Cumming, 2006, 2008). For instance, many government bodies around the world have implemented direct investment programs to finance entrepreneurs through incubation centers and government venture capital funds (Cumming and Fischer, 2012). Governments have likewise implemented tax policies to stimulate entrepreneurial activity (World Bank, 2004). Prior work is highly consistent with the view that these policies are important for stimulating entrepreneurship (Keuschnigg and Nielsen, 2003, 2004).

In the first essay, we seek not to assess and measure the determinants of entrepreneurial activity, but rather, the effect of entrepreneurial activity through newly established firms on economic growth. Our approach differs from national studies of the effect of entrepreneurship on growth (e.g., Audretsch and Keilbach, 2004, 2007) in two primary ways. First, we examine newly available international data, which enables one to assess whether or not there are legal and institutional differences across countries that enhance or impede the effect of entrepreneurship on growth. Second, we examine three different datasets that cover the same statistics but with different measurements and with different countries. To this end, we explore whether or not the relationship between entrepreneurship and growth is contingent on the use of different data, different countries, and different time periods. Third, we contribute to the theoretical entrepreneurship

literature by examining the economic implications of entrepreneurship in reference to legal and institutional barriers, and by providing international evidence in reference to different datasets that measure entrepreneurship in different ways.

In our analyses, we examine three datasets over the years 2004-2011 that offer different measures of new business starts, and each with different coverage in terms of years and countries. The first and largest entrepreneurship dataset is that from the World Bank. The second sample is from the OECD and the third sample is from Compendia. The data highlight a number of interesting features about the impact of business starts on GDP/capita, exports/GDP, unemployment, and patents per population. First, there are significant differences across the data in terms of both the summary statistics and the regression analyses. In the summary statistics, the OECD data show a negative effect of business starts on GDP/capita, exports/GDP and patents per population, and a positive effect of business starts on unemployment. In the regression analyses, these effects are statistically insignificant when we control for other things being equal. Put differently, the implication from the OECD data is that business starts are either harmful to the economy, or the data are incomplete or improperly measured for the purpose of assessing the economic impact of business start-ups. Because both the World Bank and Compendia data offer the exact opposite inferences, we are inclined to believe that the OECD data that we examine herein are not perfectly appropriate for assessing the economic effects of business starts.

Second, from the World Bank and the Compendia data, we infer that business starts positively impact GDP/capita, exports/GDP, and patents per population, and negatively impact unemployment. These findings are statistically and economically

significant in regression analyses controlling for other things being equal. In the course of our analyses, we discovered that many of these country-year level control variables are highly correlated, and hence we acknowledge at the outset that the economic significance of our findings is highly contingent on the regression specifications. Nevertheless, in a wide range of plausible specifications, our findings are highly statistically significant. Moreover, even in our most conservative estimates, the data indicate that the economic significance of our results is very pronounced.

Third, we show that the effect of entrepreneurship on economic outcomes is mitigated by legal and institutional barriers to risk taking, but enhanced by investors that stimulate risk taking. In particular, countries with stronger creditor rights make costs of borrowing relatively higher for entrepreneurs, thereby reducing entrepreneurial risk taking. Similarly, countries with higher uncertainty avoidance indices, or less cultural acceptance of risk, similarly have a smaller impact of entrepreneurship. Therefore, our study has shown how legal, institutional and cultural barriers to risk-taking influence the overall economic impact of entrepreneurship. Entrepreneurs are more likely to set up new entities and in turn have more positive impact on the economic growth only if the benefits of forming new ventures outweigh the related costs arising from such legal, institutional and cultural barriers. In addition, we find evidence consistent with the view that top tier venture capital funds enhance the impact of entrepreneurship.

Intuitional theory is the cornerstone of a wide array of work in management, law, economics, and finance. Despite decades of development of work on topics that include the impact of legal institutions and culture on management theory and practice, there is scant theory or evidence that compares the importance of these institutional forces for

individuals versus organizations. The second essay attempts to fill this gap by examining the specific context of angel investments versus venture capital and private equity investments.

Originally, the term "angel" referred to wealthy individuals who funded the expensive Broadway theatre productions in New York. It was first used as a business term when William Wetzel completed his pioneering study on how entrepreneurs raised seed capital in the U.S. and described the investors who supported those entrepreneurs as "angels" (Wetzel, 1983). Colorful quotes such as the one above illustrate the oft-repeated view that there is a culture to angel investing. However, unlike leading work in the private equity (PE) and venture capital (VC) literature (Batjargal, 2007; Guler and McGahan, 2007; Zacharakis, McMullen, and Shepherd, 2007; Madhaven and Iriyama, 2009; Guler and Guillen, 2010; Iriyama, Li, and Madhaven, 2010; Gu and Lu, 2010; Li and Zahra, 2012; Dai and Nahata, 2016), there is little theory or evidence on angel investments around the world and the comparative role of international differences in cultural and legal institutions in the determinants of and outcomes from angel investments.

In this essay, we seek to add to the angel literature by examining institutional theory and international evidence on differences between angel investments and PE/VC investments. We aim to shed light on how angel investments look around the world, how angel involvement is different from PE/VC funds, and what legal and cultural environments affect angel investments and divestments, and whether or not legal and cultural conditions are more important for individual angel investors versus PE/VC

organizations. We also consider whether regulatory changes have promoted more angels and PE/VC funds activities.

Our analysis exploits the comprehensive data collected at the deal level of investee firms from PitchBook, which comprise 85,940 completed private equity (PE) deals from 96 countries from 1977 to 2012. Within those deals, 5,397 from 42 countries are involved with angels (either single funded by angels or coinvested/syndicated with PE/VC funds). The dataset allows us to directly compare angels and PE/VC funds at both the deal and investee firm level.

The data indicate that, relative to PE/VC funds, angels prefer investing in smaller entrepreneurial firms in wealthier countries with better stock market conditions, worse legal environments, and countries with cultures characterized by higher levels of individualism and lower levels of risk-taking. Such behaviors are robust both for the first-round deals and deals at all other stages. We also find that relative to PE/VC funds, those investee firms funded by angels have a lower probability of having successful exits, in either IPO or acquisition. However, better legal environments can help mitigate the negative effects, especially for IPO exits (see also Nahata, 2008; Nahata et al., 2014). Moreover, in our subsample tests, the "stepping stone" logic of angels still cannot be proven, as we find that firms who have received angel investments in the first round have lower probabilities of successfully exiting in later stages. At a country/market level, we also find significant determinants that can work together to build a well-rounded environment and spawn both angels and PE/VC funds activities. In addition to these findings, we also perform difference-in-differences tests to confirm that more stringent

disclosure regulation and more forgiving bankruptcy law changes can also spawn the entrepreneurial activities induced by angels and PE/VC funds.

The development and importance of emerging markets within the global financial system can no longer be questioned. Emerging market economies contribute more than two-thirds of global growth and more so their growth is projected to increase. It is suggested by IMF (2014) that growth levels reached 4.7 percent in 2013, 4.9 percent in 2014 and potentially 5.3 percent in 2015. Brazil, Russia, India, China and South Africa (BRICS countries) currently rank within the top 10 largest economic entities. Without emerging markets, worldwide economic growth would be much lower than it currently is.

Financial institutions have for years sought to take advantage of this growth. As a result of the unprecedented growth in many emerging markets in the 1990's, increasing numbers of private equity (PE) investors have navigated these risky markets to profit from not only the economic growth but also the lowering of state intervention in those markets (Leeds and Sunderland, 2003). The opportunities for PE investments were thought to have developed significantly in both scale and quality in emerging markets over the past decades. However, at the same time, the same investors were quick to come to the realization that there were challenges within the emerging markets that they were not prepared for resulting in unmet expectations. Not only were these emerging markets still relatively immature and, under-developed, but there were, and arguably are, insurmountable regulatory restrictions and corporate governance weaknesses. Also amid the expectation of emerging hot spot PE markets such as China and India achieving GDP growth rates in double-digits, it is possible that as a result of too much capital chasing too few good deals, PE investors may have rushed to invest without adequately preparing for

the risks of a prolonged slowdown (Cumming and Macintosh, 2006; Ippolito, 2007; Aizenman and Kendall, 2012; Klonowski, 2013). The third essay thus aims to explore the determinants of successful PE investments by measuring successful PE exits. We analyze the relationship between the development of business environments and legal protections and successful exit. We would be remiss in our analysis if we did not consider the role of corruption on the potential of success for PE investments in that previous researches have established the negative effect of corruption on the cost of doing business (Fisman and Wei, 2004; Fisman and Miguel, 2007; Fisman and Svensson, 2007; Fisman and Miguel, 2007; Fisman et al., 2008). With more studies documenting the impact of corruption on the cost of doing business at both the economic and firm-specific levels (Mauro, 1995; Rodriguez, Uhlenbruck and Eden, 2005), very few of those studies focus on the PE investments in these corrupt jurisdictions. In a more recent study of Cumming, Fleming, Johan and Takeuchi (2010), they used 21 Asia-Pacific countries data to provide competing hypotheses regarding the impact of corruption on PE investments across markets. Our study aims to test similar competing hypotheses in emerging markets with wider range countries (35 jurisdictions worldwide) using a longer sample period (1992 - 2012). Finally, we also seek to determine whether the dot com bubble and the recent financial crisis had any effect on PE investments in emerging economies.

We believe our research will shed light on relatively opaque PE activities in emerging markets. PE investors, as sophisticated financial intermediaries catering to equally if not more sophisticated institutional investors, primarily invest in relatively high risk, illiquid securities in private firms. Given that such investee firm characteristics are combined with high risk and volatile political environments in emerging markets, we can

8

safely deduce that PE investments in emerging economies are riskier than that of developed countries. As such, the divestment or exit strategy which is the measure of success of an investment might be planned and executed by considering more critical factors. Our study is related to a growing body of research that establishes legal protection to be important factors to explain the size, structure and success of PE investments, results of course varying depending on the data analyzed (Lerner and Schoar, 2005; Cumming et al., 2006; Cressy et al., 2007; Cao and Lerner, 2009; Johan and Najar, 2011).

Our study benefits from the comprehensiveness of PitchBook's deal level database which provides us a unique opportunity to investigate the PE exit probabilities across emerging markets. The data documents the heterogeneities of investee firm-level characteristics together with business environments, legal conditions, security market structure and performance, macroeconomic and cultural dimensions as well as industry dispersions. We present our robust results based on 2,733 PE deals of 1,499 investee firms to investigate PE exits strategies and impact from multi-facet factors. Our findings suggest that better business and legal environments in emerging markets increase the probability of successful exits for PE investors. We also find that PE investors are better able to mitigate the potential costs associated with inefficient and corrupt business environments to increase the probability of exits by IPOs in countries with higher levels of corruption. Moreover, our findings suggest that market shocks arguably concentrated in the developed markets result in a negative ripple effect as the probability of successful exits, especially by way of IPOs, decreases for PE investors in emerging markets.

Our study complements the growing literature on private equity, business ethics, corruption and IPO. We believe our findings not only support those of Cumming, et. al (2006) and Cumming et. al, (2010), but also augment both studies as our analysis comprises more jurisdictions and include the unique period of the recent financial crisis. Our analysis of PE investments in emerging markets also adds to the existing international comparative literature on PE and emerging markets to provide more updated information regarding PE divestment strategies as well as to provide an analysis on the impacts from dot com bubble and the recent financial crisis on those divestment strategies in emerging markets.

The rest of this dissertation is organized as follows: Chapter 2 presents the first essay, *The Economic Impact of Entrepreneurship: Comparing International Datasets*. The second essay entitled *Angel Investors around the World*, is presented in Chapter 3. Chapter 4 covers the third essay *Private Equity Exits in Emerging Markets*. Chapter 5 concludes.

Chapter 2

The Economic Impact of Entrepreneurship: Comparing International Datasets

2.1. Introduction

Neoclassical studies of growth have focused on the role of capital and labor in stimulating economic development (Solow, 1956, 1967). In more recent years, however, it has become increasingly recognized that entrepreneurship is a key driver of economic growth (e.g., Acs et al., 2008; Audretsch, 2007a, b; Audretsch and Acs, 2008; Audretsch et al., 2009; Baumol, 1990; Chavis et al., 2011; Fairlie and Chatterji, 2009; Klapper and Love, 2011; Marcotte, 2012; McMullen, 2011; Naude, 2010; Stam and Wennberg, 2009; Thirik et al., 2008). For this reason, government bodies around the world have sought ways to stimulate growth through entrepreneurship, including access to entrepreneurial finance (Bonini et al., 2012; Fossen, 2011; Nahata, 2008; Wang and Wang, 2012) and appropriate governance and legal protections for contracts, shareholders and creditors (e.g., Acemoglu and Johnson, 2005; Fan and White, 2003; Klapper et al., 2006; Armour and Cumming, 2006, 2008). For instance, many government bodies around the world have implemented direct investment programs to finance entrepreneurs through incubation centers and government venture capital funds (Cumming and Fischer, 2012). Governments have likewise implemented tax policies to stimulate entrepreneurial activity (World Bank, 2004). Prior work is highly consistent with the view that these policies are important for stimulating entrepreneurship (Keuschnigg and Nielsen, 2003, 2004).

In this essay, we seek not to assess and measure the determinants of entrepreneurial activity, but rather, the effect of entrepreneurial activity through newly

established firms on economic growth. Our approach differs from national studies of the effect of entrepreneurship on growth (e.g., Audretsch and Keilbach, 2004, 2007) in two primary ways. First, we examine newly available international data, which enables one to assess whether or not there are legal and institutional differences across countries that enhance or impede the effect of entrepreneurship on growth. Second, we examine three different datasets that cover the same statistics but with different measurements and with different countries. To this end, we explore whether or not the relationship between entrepreneurship and growth is contingent on the use of different data, different countries, and different time periods. Third, we contribute to the theoretical entrepreneurship literature by examining the economic implications of entrepreneurship in reference to legal and institutional barriers, and by providing international evidence in reference to different datasets that measure entrepreneurship in different ways.

In our analyses, we examine three datasets over the years 2004-2011 that offer different measures of new business starts, and each with different coverage in terms of years and countries. The first and largest entrepreneurship dataset is that from the World Bank. The World Bank sample comprises information on business starts for 125 countries. The second sample is from the OECD, which covers 24 countries from Western and Eastern Europe as well as Brazil, Canada and the U.S. The third sample is from Compendia, which covers 11 Western European Countries, Canada and the U.S.

The data highlight a number of interesting features about the impact of business starts on GDP/capita, exports/GDP, unemployment, and patents per population. First, there are significant differences across the data in terms of both the summary statistics and the regression analyses. In the summary statistics, the OECD data show a negative

effect of business starts on GDP/capita, exports/GDP and patents per population, and a positive effect of business starts on unemployment. In the regression analyses, these effects are statistically insignificant when we control for other things being equal. Put differently, the implication from the OECD data is that business starts are either harmful to the economy, or the data are incomplete or improperly measured for the purpose of assessing the economic impact of business start-ups. Because both the World Bank and Compendia data offer the exact opposite inferences – i.e., that business starts have a positive economic impact – we are inclined to believe that the OECD data that we examine herein are not perfectly appropriate for assessing the economic effects of business starts.

Second, from the World Bank and the Compendia data, we infer that business starts positively impact GDP/capita, exports/GDP, and patents per population, and negatively impact unemployment. These findings are statistically and economically significant in regression analyses controlling for other things being equal. In the course of our analyses, we discovered that many of these country-year level control variables are highly correlated, and hence we acknowledge at the outset that the economic significance of our findings is highly contingent on the regression specifications. Nevertheless, in a wide range of plausible specifications, our findings are highly statistically significant. Moreover, even in our most conservative estimates, the data indicate that the economic significance of our results is very pronounced. Based on the most complete World Bank data, we show that a 1% increase in new business starts in one year improves GDP/capita in the subsequent year by approximately 0.24% relative to the mean values, reduces unemployment by 0.13%, increases exports/GDP by 0.03%, and increases patents per

13

population by 0.29%. Put differently, a 1-standard deviation increase in business density gives rise to a 38.44% increase in GDP/capita relative to mean values, a 20.02% reduction in unemployment, a 5.33% increase in exports/GDP, and a 51.99% increase in patents per population.

Third, we show that the effect of entrepreneurship on economic outcomes is mitigated by legal and institutional barriers to risk taking, but enhanced by investors that stimulate risk taking. In particular, countries with stronger creditor rights make costs of borrowing relatively higher for entrepreneurs, thereby reducing entrepreneurial risk taking. Similarly, countries with higher uncertainty avoidance indices, or less cultural acceptance of risk, similarly have a smaller impact of entrepreneurship. Therefore, our study has shown how legal, institutional and cultural barriers to risk-taking influence the overall economic impact of entrepreneurship. Entrepreneurs are more likely to set up new entities and in turn have more positive impact on the economic growth only if the benefits of forming new ventures outweigh the related costs arising from such legal, institutional and cultural barriers. In addition, we find evidence consistent with the view that top tier venture capital funds enhance the impact of entrepreneurship. Note, by contrast, that we do not find similar evidence of other legal and institutional differences across countries; for example, the physical cost of exports is not statistically related to the propensity of start-ups to stimulate exports.

This essay is organized as follows. The next section discusses the prior literature and hypotheses. Thereafter we present the data, summary statistics, and regression evidence. The last section provides concluding remarks and discusses the limitations of this essay as well as future research directions.

2.2. Related Literature and Hypotheses

Prior research is consistent with the view that entrepreneurial activities in newly established firms will have a pronounced effect on economic growth for the following reasons. First, start-ups have a direct effect in facilitating the development of new capacities. The importance of entrepreneurs was first fully recognized by Schumpeter (1911/1934, 1939, 1942). Schumpeter described the entrepreneurial process of initiating radical structural change and growth through creative destruction. The absence of entrepreneurship would hinder growth, as without entrepreneurs, the capital, labor and technology would be lacking the mechanism to instigate economic development. The importance of entrepreneurs in economic growth has been well established by Baumol (1990) and Audretsch (2007a, b), among others, as reviewed in a comprehensive literature review by Fritsch (2013).

Second, start-ups have an indirect effect of exiting capacities. For instance, new entrepreneurs may displace incumbent businesses through competition and market selection. Start-ups have an indirect supply-side effect of securing efficiency and stimulating productivity. Baumol (1990) explains how start-ups can force incumbent firms to operate more efficiently. Fritsch (2013) explains that start-ups further accelerate structural change, amplify innovation,[1] and enable a greater variety of products and problem solutions. This in turn facilitates improved competitiveness and growth.

Third, entrepreneurs in newly established firms typically take risk in a way that is disproportionate relative to established firms. These risks include but are not limited to spending money on research and development, developing new products, ideas, services,

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[1] In this essay we examine innovation by measuring patent counts by country and year. Alternative proxies to measuring innovation are discussed by Judge et al. (2013), among others.

product applications, among other things. While these types of risk-taking activities likewise take place in large firms, newly established firms do not have a track record that enables the same type of assessment of whether or not the idea behind the new firm will work. By contrast, established firms extending into new business lines or services do so typically leveraging off their established presence in their current activities. Given the risk costs of engaging in entrepreneurship in newly established firms are greater than engaging in entrepreneurship in established firms, the expected productivity from entrepreneurship among smaller firms is expected to be larger.

Fourth, start-ups have a disproportionate impact on economic growth because small firms have larger growth potential than larger firms (Almus and Nerlinger, 2000). Larger firms exhibit more pronounced diseconomies of scale. Larger and more established firms involve greater organization monitoring due to hierarchical structures. New firms involve smaller more flexible employee organization structures, and encourage experimentation. New ideas are rewarded in entrepreneurial firms with stock options and incentive compensation.

Fifth, start-ups have the potential to disproportionately impact exports insofar as there exists "born-global firms" (Knight and Cavusgil, 2004) as early adopters of internationalization. Many companies successfully expand into foreign markets from or near their date of founding. Knight and Cavusgil (2004), among others, explore cultural, capabilities and resource-based explanations of such internationalization that is potentially disproportionate among born-global firms.

16

Overall, therefore, the periods in which countries have relatively more new start-ups are more likely to experience greater economic impacts in subsequent years, as summarized in our first hypothesis.

H1. *Entrepreneurship will positively impact GDP/capita, exports/GDP, and patents per population, and negatively impact unemployment.*

International differences in the impact of entrepreneurship on economic outputs are impeded by legal and institutional factors that discourage risk taking activities. Barriers to the impact of entrepreneurship on growth include risk taking disincentives, including strong creditor rights which increase investor protection in times of bankruptcy (Glaeser et al., 2004; Armour and Cumming, 2006; Archarya et al., 2009). Barriers to the impact of entrepreneurship likewise include cultural differences across countries. Most notably, countries with stronger aversion to taking risk due to cultural norms will have less impact associated with new business starts. Relatedly, prior work is highly consistent with the view that venture capital is the 'money of innovation' thereby positively impacting the effectiveness of entrepreneurship (see, e.g., Groh et al., 2010; Groh, and von Liechtenstein, 2011; Klonowski, 2012; Nahata et al., 2013). However, not all venture capital is equal, as 80% of venture capital returns are earned by the top quartile funds (Cumming and Johan, 2013), and hence one would expect that if there is a role from venture capital, then it is from the effect from top tier funds. The importance of entrepreneurial risk taking is reflected in our second hypothesis.

H2a. *Legal and institutional factors that mitigate risk taking such as creditor rights and uncertainty avoidance will moderate the positive impact of entrepreneurship on GDP/capita, exports/GDP, and patents/population, and the negative impact of entrepreneurship on unemployment.*

H2b. *Institutional factors that encourage risk taking such as top tier venture capital investment will exacerbate the impact of entrepreneurship.*

These hypotheses are tested with three alternative datasets that are introduced in the next section. The subsequent section thereafter provides regression evidence.

2.3. Data and Summary Statistics

In our analyses, we examine three datasets that offer different measures of new business starts, and each with different coverage in terms of years and countries. The largest entrepreneurship dataset in terms of the greatest number of country-years is from the World Bank, and available online at the World Bank's doingbusiness.org webpage.[2] As at January 2013, the World Bank sample comprises information on business starts from 2004-2011 for 125 countries. The second sample is from the OECD, which covers 24 countries from Western and Eastern Europe as well as Brazil, Canada and the U.S. from 2004-2007.[3] The third sample is from Compendia, which covers 11 Western European Countries, Canada and the U.S. from 2004-2009.[4]

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[2] http://www.doingbusiness.org/data/exploretopics/entrepreneurship
[3] http://dx.doi.org/10.1787/9789264097711-en
[4] The Compendia data date as early as 1995, but for reasons of comparison with the OECD and World Bank data, we examine the subset of data starting in 2004. See

The main variables in the dataset are described in Table 2.1. The main economic output variables that we investigate as dependent variables include GDP/capita, exports/GDP, unemployment, and patents per 1,000 populations. In our regression analyses these output variables are analyzed with a 1-year lead period relative to the explanatory variables. The explanatory variables include the new business entry rate, variables for economic conditions, as well as legal and institutional variables.

The new business entry rate takes on slightly different definitions depending on the data source examined, as explicitly defined in Table 2.1. In the World Bank dataset, New Density refers to the number of newly registered limited liability companies per 1,000 working age people between the ages 15-64. In the OECD dataset, the Birth Rate refers to new employer enterprises with at least 1 employee in the birth year, or in the year prior to the birth year. The Birth Rate is relative to the population of enterprises with at least 1 employee. In the Compendia dataset, the Entry Rate is the share of new business owners as a share of the labor force, but with corrections to international differences and time-series differences to definitions of the terms business ownership and labor force so that the data are comparable across countries and over time.

The cross-sectional summary statistics that show the relationship between new business entries and GDP/capita, unemployment, exports/GDP, and patents per 1,000 population are presented in Figures 2.1-2.4, respectively. In Panels A-C of Figures 2.1-2.4 we show the World Bank data, the OECD data, and the Compendia data, respectively. Consistent with H1 as stated in the previous section, the World Bank and Compendia data both indicate that there is a positive relationship between new business entries and

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http://data.ondernemerschap.nl/webintegraal/userif.aspx?SelectDataset=31&SelectSubset=113&Country=UK

GDP/capita, exports/GDP, and patents per 1,000 populations, and a negative relationship between new business entries and unemployment. However, by contrast, the OECD data indicate that there is a negative relation between new business entries and GDP/capita, exports/GDP, and patents per 1,000 populations, and a positive relationship between new business entries and unemployment. This lack of consistency with the OECD data and the fact that these cross-sectional relations are simply not plausible leads us to believe that the OECD data are perhaps not the best source for the purpose of examining the effect of new business entries on economic outputs.

We examine the data in a panel setting across countries and years. As a first step, we present simple correlations in Table 2.2 to highlight the relations across the variables. The correlations in Table 2.2 confirm the graphical relations in Figures 2.1-2.4 for the three different datasets. Also, the correlations highlight some potential issues of collinearity across different explanatory variables, for which we are careful to consider in our multivariate empirical tests in the next section.

2.4. Regression Analyses

Our regressions use standard panel data methods. We reports both random-effect and fixed-effect panel estimates in Panels A and B of Tables 2.3-2.5, respectively. Tables 2.3-2.5 use the same regression models, with the differences being that Table 2.3 uses the World Bank data, Table 2.4 uses the OECD data, and Table 2.5 uses the Compendia data.

In our main regression analyses we consider the impact of new business rates on GDP/capita, unemployment, exports/GDP, and patents per 1,000 populations, with the dependent variables leading 1-year ahead. The regressions include control variables for

economic conditions, as well as legal and institutional conditions. The main regression models make use of the following specification:

Economic Output (1 year lead) = f (New Business Rates, MSCI Returns, Creditor Protection, Creditor Protection * New Business Rates, Uncertainty Avoidance Index, Uncertainty Avoidance Index * New Business Rates)

All of the variables are defined in Table 2.1. For regressions that explain exports/GDP, we also include explanatory variables for the costs of exports and the interaction term between the costs of exports and new business rates. To be sure, there are a very large number of explanatory variables that could have been included but are not. The main reason for a parsimonious specification is as follows. First, the selected variables are plausibly pertinent to entrepreneurship and the impact of entrepreneurship on economic outputs for the purpose of testing H1. The specifications enable assessment of mitigating factors on the impact of entrepreneurship through creditor protection rights and uncertainty avoidance, for the purpose of testing H2a. Second, the variables not selected are highly collinear and hence additional control variables for the available set of countries and years are not perfectly tractable without introducing spurious results in the regressions. Such collinear variables that could have been included, but are not, include other cultural variables measured by Hofstede, as well as other legal and institutional variables from the World Bank's Doing Business webpage, among other sources. We selected and reported these variables in order to assess factors that are directly pertinent to entrepreneurship and the incentives that entrepreneurs have with respect to risk taking.

While our right-hand-side variables are lagged by 1-year, it is technically possible that due to expectations, entrepreneurship may be endogenous to future values of GDP/Capita, unemployment, exports/GDP, and patents/population. We check for this possible reverse causality in the Appendix, and do not find significant evidence.

Note that for all four of our dependent variables, our results are scaled in terms of population (GDP/capita, unemployment and patents per 1,000 population), and economic output (exports/GDP). Ideally we would like to scale patents by research activity in a country, but such a measure is difficult to reliably obtain. Even in countries where there is aggregate data on R&D expenses, many firms across countries have distorted incentives for tax reasons to classify items as R&D when they are something other than R&D. Moreover, there are time delays with translating R&D into patents which varies by industry, among other things. Hence, for our patents measure we use a consistent measure with dividing by population in the denominator. Similar to the raw measurement, there are extreme outlier countries. We therefore exclude the top 10% of patent-years in the data in order to make relatively comparable the sample of country-years. We note that with the full sample without excluding outliers, and with the full sample with winsorizing outliers, there are no significant factors that affect patenting in the regression specifications for the datasets considered.

Note that in each of the three datasets, the entrepreneurship indicators are right-skewed, as are our dependent variables. We exclude the top 5% of the outliers from the regression analyses from each of our regression models since these observations are highly influential in terms of the economic significance if they are included or winsorized (although the statistical significance remains similar regardless). Our economic

significance calculations below are based on the restricted sample after removing outliers, not the full sample as reported in Table 2.1.

Finally, regarding our specifications, note that our only variable which does not vary over time is the uncertainty avoidance index (Table 2.1). As such, this variable is included in the random-effects panel data estimates but necessarily excluded from the fixed-effects panel data (by country and year) estimates.

In Table 2.3 for the World Bank data, the random effect estimates in regressions Models (1), (3) and (4) for GDP/capita, exports/GDP, and patents per population, respectively, indicate a positive and statistically significant effect of new business starts (significant at the 5% level in Model 1, and 1% level in Models 3 and 4). The economic significance is large when one does not account for the mitigating factors (i.e., the interaction effects): for 1 standard deviation increase in new business density increases the subsequent year GDP/capita by 197.06% relative to the mean value of all the country-years in the data (Table 1), increases the subsequent year exports/GDP by 105.11% relative to the mean value of all country-years, and increases patents per population by 213.52%. In Table 2.3 Models (2) and (6) consider the impact of new business density on unemployment. The data indicate that new business reduces unemployment in the subsequent year, and this effect is significant at the 10% level for the random effect estimate in Model (2) but insignificant with the fixed effect estimate in Model (6). The economic significance in Model (2) is large: for 1 standard deviation increase in new business density reduces unemployment in the subsequent year by 96.43% relative to the average value of unemployment in the country-years in the sample, without accounting for the interaction effects.

We noted above that there are interaction effects or mitigating factors with some of the included variables, and some of these factors are collinear, and hence we re-ran these panel regressions without any control variables other than new business density (not explicitly reported in the tables but available on request). The results in all specifications but exports/GDP are statistically significant at the 1% level, but the economic significance is much lower. For 1 standard deviation increase in new business density, there is a 38.71% increase in GDP/capita, a 13.58% reduction in unemployment, and a 6.97% increase in patents per population.

Regarding the economic significance of these moderating effects in H2a, the data indicate that a 1 standard deviation increase in new density has a mitigated impact (i.e., the increase is smaller) on GDP/capita by 10.18% through creditor rights (Model 1) relative to the average level of GDP/capita in the country years in the data, has a mitigated impact on exports/GDP by 4.90% (Model 3), a mitigated impact on patents per population by 10.79% (Model 4), and a mitigated impact on unemployment (i.e., the reduction is smaller) by 3.83% (Model 2). The data further indicate that through uncertainty avoidance, a 1 standard deviation increase in new density has a mitigated impact (i.e., the increase is smaller) impact on GDP/capita by 1.59% (Model 1) relative to the average level of GDP/capita in the country years in the data, a mitigated impact on exports/GDP by 0.73% (Model 3), a mitigated impact on patents per population by 1.59% (Model 4), and a mitigated impact on unemployment (i.e., the reduction is smaller) by 0.86% (Model 2).

Taken together with the direct and moderating effects, the net effect of new business density relative to the average levels in the data show that a 1 standard deviation

increase in business density gives rise to a 38.44% increase in GDP/capita, a 20.02% reduction in unemployment, a 5.33% increase in exports/GDP, and a 51.99% increase in patents per population.[5] Overall, the World Bank data very strongly support H1 that entrepreneurship stimulates GDP/capita, exports/GDP and patents per population, and mitigates unemployment. The data provide similarly strong support for H2a: risk taking disincentives, both by law and culture, mitigate the positive impact of entrepreneurship.

Finally, note the control for economic conditions in terms of the MSCI returns have the expected effect in Models (1) – (3) and (5) – (7). MSCI returns are positively associated with GDP/capita and exports/GDP, and negatively associated with unemployment. There is no relation between MSCI returns and patents per population in Models (4) and (8), which is consistent with the view that the incentive to innovate can be pronounced in times of both strong and weak economic conditions.

Table 2.4 with the OECD birth rate data shows no consistent evidence with Table 2.3 with the World Bank data. All variables are statistically insignificant in Table 2.4, but for one exception – creditor rights in Model (13) is significant at the 10% level. The insignificance of the birth rate in Table 2.4 is consistent with the Panel B graphs depicted in Figures 2.1-2.4.

Table 2.5 with the Compendia data, by contrast, shows quite consistent results with the World Bank data in Table 2.3. That is, Table 2.5 is very supportive of both H1 and H2a. Again, these differences in support of H1 across Tables 2.3-2.5 are graphically depicted with Figures 2.1-2.4. There are some differences in the results between Tables 2.3 and 2.5, which are largely expected due to the smaller number of countries and years

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[5] Put differently, a 1% increase in new business starts in one year improves GDP/capita in the subsequent year by approximately 0.24% relative to the mean values, reduces unemployment by 0.13%, increases exports/GDP by 0.03%, and increases patents per population by 0.29%.

in the Compendia data relative to the World Bank data. In terms of the economic significance of a 1 standard deviation increase in the entry rate from the mean in the sample, and taking into account the interaction effects, the regressions predict there is a 36.38% increase in GDP/capita, a 17.32% reduction in unemployment, a 24.97% increase in exports/GDP, and an 11.78% increase in patents per population. We believe these economic significance estimates are too high, and an artifact of the smaller samples and collinearity across variables. In view of the much larger sample with the World Bank data, we believe the economic and statistical significance is best measured with the World Bank data discussed above in conjunction with Table 2.3 discussed above.

Table 2.6 presents regressions using the World Bank data on the subset of countries and years for which there is Compendia data (Panel A) and OECD data (Panel B). The data in Panel A with the Compendia data highlight the continued statistical significance in support of H1 and H2a. In terms of the economic significance of a 1 standard deviation increase in new density from the mean in the subsample, and taking into account the interaction effects, the regressions predict a 349.06% increase in GDP/capita, a 108.82% reduction in unemployment, a 57.29% increase in exports/GDP, and a 65.91% increase in patents per population. In Panel B, however, there is less support for H1 and H2a. The only significant factor in Panel B is for H1 in respect of GDP in regression Model (29), which is significant at the 1% level. As a result, we may infer that the issue of insignificance with the OECD data is mainly attributable to the smaller number of years and countries in the OECD data. However, to some degree, at least with respect to the impact on GDP/capita, the differences in the inferences are

attributable to definitions of business entry in the World Bank and Compendia measures relative to the OECD measure.

In our final set of regressions in Table 2.7, we present evidence to ascertain whether successful venture capital has an exacerbating impact on the subsequent year's GDP/capita. We proxy our measure of success in a way consistent with Nahata's (2008) measure of venture capital fund manager reputation; that is, successful venture capital funds that have had IPO exits (see Table 2.1). The data show venture capital has a pronounced impact, consistent with the value-added and risk taking incentives from venture capital (see H2b and accompanying text). In particular, the economic significance in the most conservative estimate (Model 35) is such that a 1 standard deviation increase in venture capital from the average level is associated with a 34.35% increase in GDP/capita relative to the average level in the country-years in the data. The other findings are generally consistent with those reported above. But we note that the data in Table 2.7 are based on a restricted sample[6] of countries as listed in Table 2.7 due to data availability, as data source is less complete in the other countries; and hence we do not include venture capital in the other regression tables. Also, we note that when we run regressions based on the full amount of venture capital in these countries and not the successful investments, the results for the interaction term show no significant economic impact, which highlights the pronounced effect of successful venture capital. Finally, we note that when we run the regressions on the other dependent variables for patents per population, unemployment and exports/GDP, the data indicate that venture capital

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[6] Since we used a method to set constrains on several independent variables to filter out the relatively most successful country and year observations (for example, set VC variable is over its mean value, etc), the available observation sharply decreased due to data availability.

(successful or otherwise) has no impact. These and other robustness checks are available on request.

We have carried out a number of additional robustness checks that are available on request but not reported herein for reasons of conciseness. For example, we have considered subsets of the data by different years and countries, and the findings are robust. Our regressions control for changes in economic conditions over time and consider both fixed and random effects specifications, and as such, subsets of the data did not give rise to materially different results so long as there were sufficient observations in the sample.

2.5. Discussion and Conclusion

In this essay, we tested the hypothesis that the economic activity that results from entrepreneurial activity is relatively more pronounced in newly established firms, and therefore new business entry has a positive impact on GDP/capita, exports/GDP, and patents per population, and a negative impact on unemployment. Further, we found evidence of a moderating impact of legal and institutional impediments to risk taking for the strength of the relationship between new business entry and economic outcomes for both creditor rights and cultural uncertainty avoidance. As well, we found evidence of a pronounced impact from top-quartile venture capital fund investment.

We examine three recently available international datasets from the World Bank, the OECD, and Compendia to test these hypotheses. The World Bank and Compendia data are highly consistent with the view that new business entry positively impact GDP/capita, exports/GDP, and patents per population, and negatively impacts

28

unemployment. The OECD data do not support these hypotheses. The inferences with the OECD data are in part attributable to differences in the definitions of new business entry from our three different international datasets, as well as differences in countries and years for which those data are available. Such results are not the spurious reflection of recent global financial crisis periods. It appears that the World Bank data are the most reliable and largest for the purpose for assessing the impact of new business entry on economic outcomes.

As mentioned, in the Appendix of this essay we address issues of causality. Standard Granger causality tests do not provide support for the notion that endogeneity has significantly influenced our findings, particularly with reference to the World Bank data. Future research may nevertheless explore further differences between the OECD data and the World Bank and Compendia data in respect of differences in the definitions entrepreneurship. It is possible that poorer countries have entrepreneurs that are more likely to register as sole proprietors and partnerships rather than limited liability companies, and as such endogeneity may play a stronger role in explaining the findings with the OECD data which includes sole proprietorships and partnerships. Our tests, however, showed quite consistent evidence across the World Bank data and OECD country-year observations (Table 2.6, Panel B).

A contribution of the study is how legal and institutional barriers to risk-taking influence the impact of entrepreneurship. Said differently, entrepreneurship is an important channel through which institutional factors have a real impact on country GDP, growth, and exports. Stepping back though, institutional/legal barriers, if present, are likely to have a negative impact on entrepreneurship itself. So, entrepreneurs will form

29

their ventures only if the benefits of doing so outweigh the costs arising out of legal/institutional barriers. And such benefits are likely to arise from increased impact through growth, exports, and patents. Admittedly, the counterfactual of not forming a venture because of institutional barriers is unobservable. Hence the study is conditional on entrepreneurial risk taking. And even so, the results show that institutional barriers have a negative impact on the real effects of entrepreneurship. So, not only barriers influence the decision to become an entrepreneur but also conditional on becoming so, they have a negative impact on GDP and future growth. As such, it is worth highlighting the potential negative impact of institutional and legal barriers to entrepreneurship in relation to the impact of economic outcomes.

As additional years of data become available, further research could better assess the importance of other legal and institutional factors that impact entrepreneurial activities and the effect of such activities on economic outcomes. Also, other economic outcomes could be examined, such as different proxies for innovation other than patents. Further, different policy instruments could be considered with additional data, possibly with the use of natural experiments associated with policy changes in the future.

2.6. Appendix

In Tables 2.3-2.7 lagged values of New Density caused new values of GDP/Capita, Unemployment, Exports/GDP, and Patents/Population. Here, we consider the possibility of the reverse causation as expected values of GDP/Capita, for example, could give rise to new density. We focus our tests on the World Bank data. Table A2.1 presents regressions with New Density as a dependent variable and lagged values of New

Density, GDP/Capita, Unemployment, Exports/GDP, and Patents/Population on the right-hand-side each separately (Models A1 – A4), and jointly (Model A5).[7] If the right-hand-side coefficients for GDP/Capita, Unemployment, Exports/GDP, and Patents/Population are positive and significant then we worry about reverse causality. The data, however, show insignificant coefficients for GDP/Capita, Unemployment, and Patents/Population in Models (A2), (A4) and (A5), and a negative and significant coefficient for GDP/Capita in Model (A1) (the latter result suggesting that more business are started in times of economic downturns). Therefore, we do not worry about reverse causality affecting the positive affect of lagged New Density on GDP/Capita, Unemployment, and Patents/Population as documented in Tables 2.3-2.7. We do find in Models (A3) and (A5) a positive and statistically coefficient on lagged Exports/GDP, but the economic significance is very small such that a 1-standard deviation increase in lagged exports/GDP causes a 0.6% and 0.8% increase in New Density in Model (A3) and Model (A5), respectively. Overall, therefore, we believe there is relatively little concern that all of our major independent variables (GDP/capita, unemployment, exports/GDP, patents/population) do not Granger cause the new business entry rate, which further confirms the tests of our hypotheses H1, H2a and H2b.

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[7] The mirror or reverse specification with lagged New Density on the right-hand-side and GDP/Capita, Unemployment, Exports/GDP, and Patents/Population on the left-hand-side is not presented for conciseness, but is consistent with Tables 2.3-2.7 which show a causal link between New Density and these economic outcomes.

Figure 2.1. Entrepreneurship and GDP/Capita

Panel A. World Bank New Density
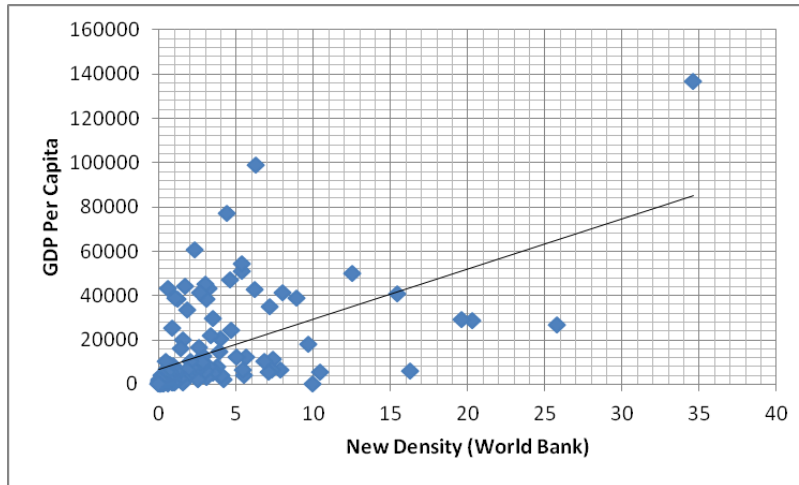
Panel B. OECD Birth Rate
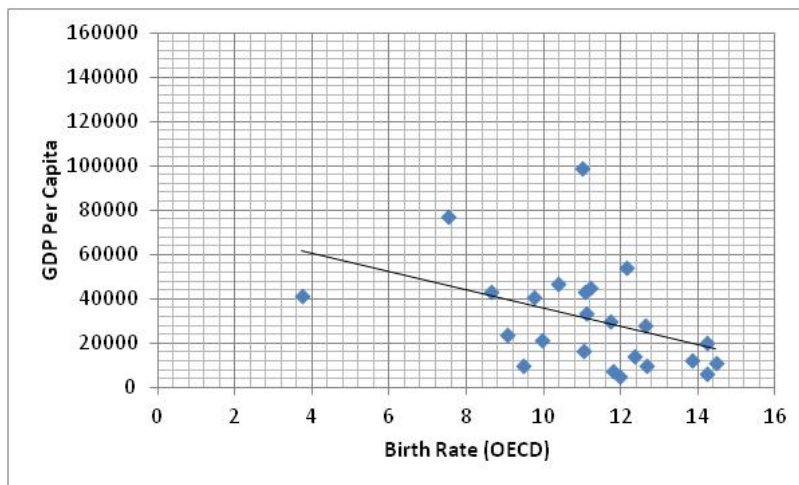
Panel C. Compendia Entry Rate
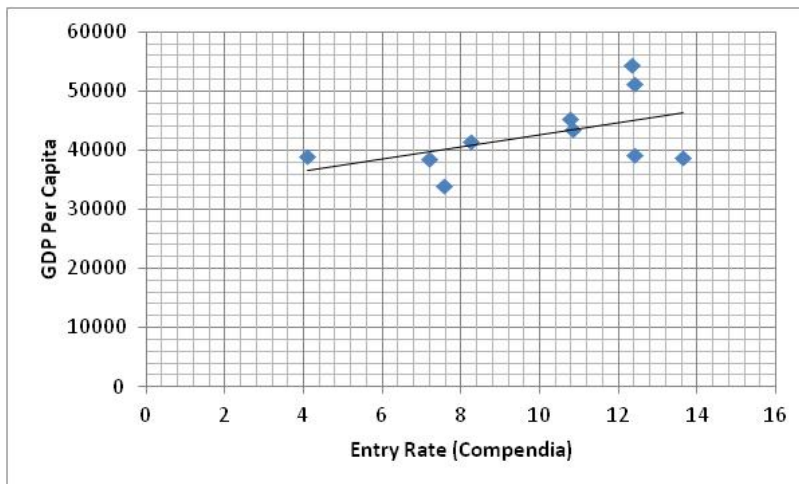
Figure 2.2. Entrepreneurship and Unemployment

Panel A. World Bank New Density

Panel B. OECD Birth Rate

Panel C. Compendia Entry Rate

33
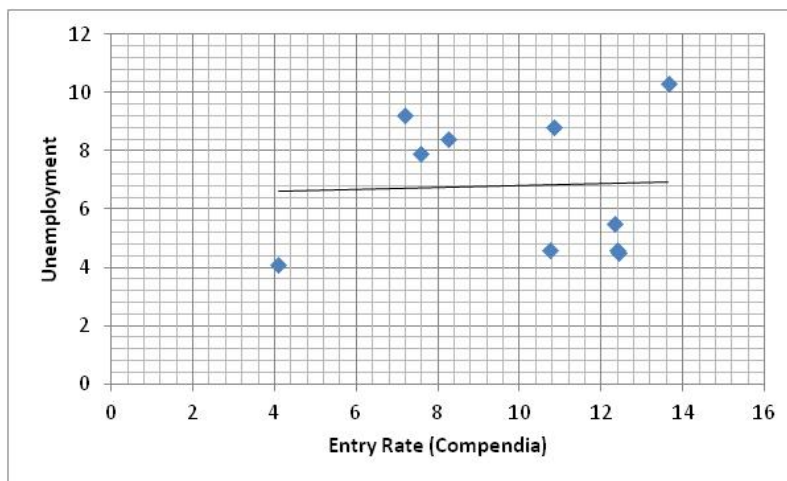
Figure 2.3. Entrepreneurship and Exports per GDP

Panel A. World Bank New Density

Panel B. OECD Birth Rate

Panel C. Compendia Entry Rate

34
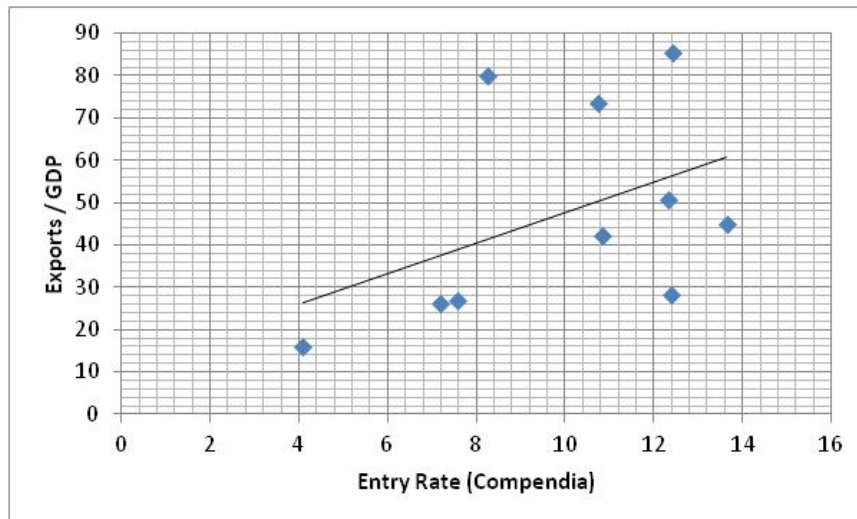
Figure 2.4. Entrepreneurship and Patents per 1,000 Population

Panel A. World Bank New Density [Outliers Removed]
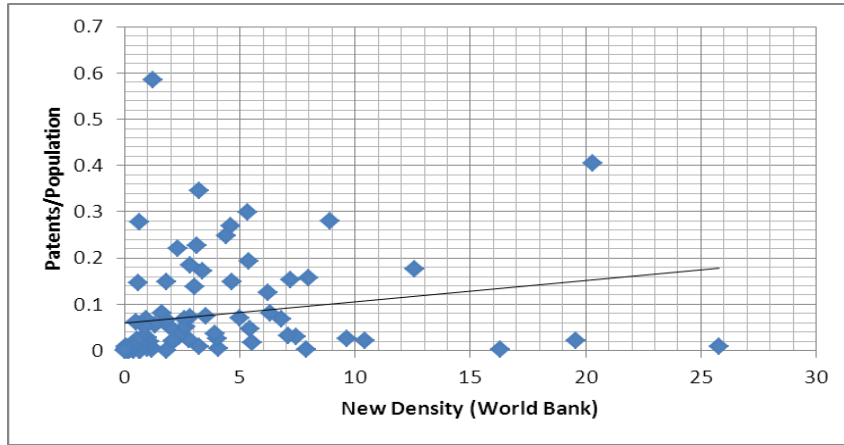
Panel B. OECD Birth Rate [Outliers Removed]
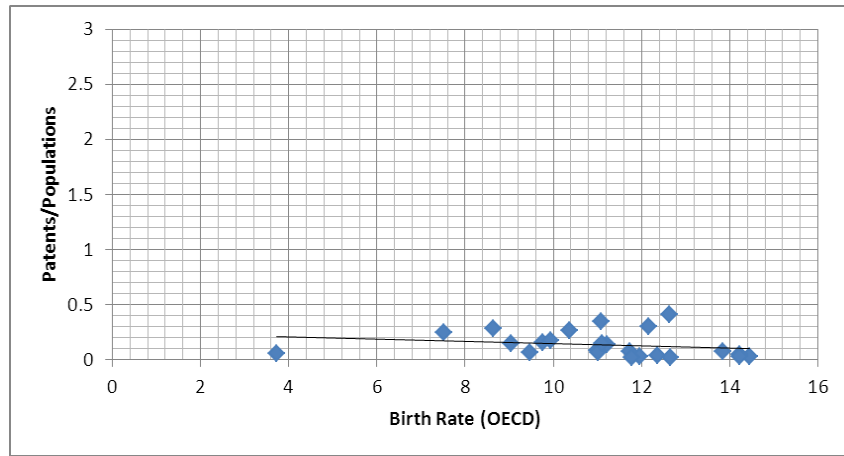
Panel C. Compendia New Entry Rate [Outliers Removed]
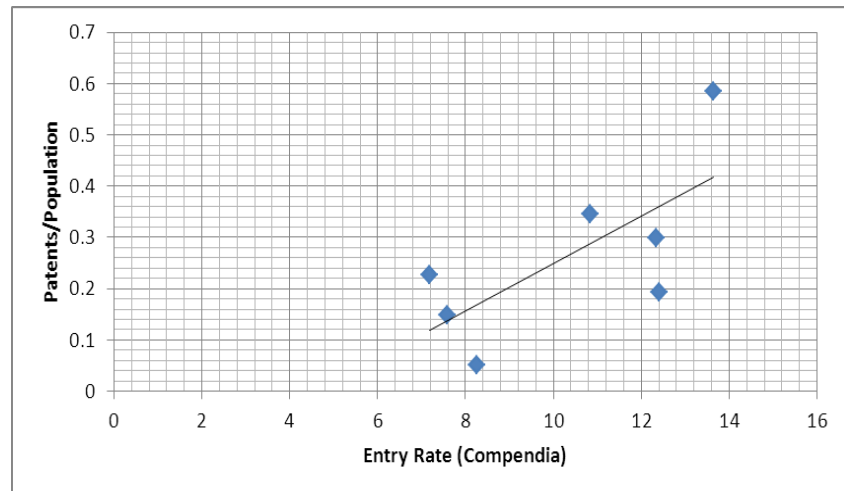
Table 2.1. Variable Definitions and Summary Statistics

This table provides definitions of the main variables in the dataset, the data sources, and summary statistics.

Variable Name	Definition	Mean	Median	Standard Deviation	Minimum	Maximum	Number of observations
GDP Per Capita	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Source: World Bank. Lead values are used for this variable for the dependent variables in the regressions.	11785.14	4006.731	17689.45	125.236	134914.7	1242
Unemployment	Unemployment refers to the share of the labor force that is without work but available for and seeking employment. Definitions of labor force and unemployment differ by country. Source: World Bank. Lead values are used for this variable for the dependent variables in the regressions.	8.953	7.4	6.532	0.5	47.5	536
Exports / GDP	Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. Source: World Bank. Lead values are used for this variable for the dependent variables in the regressions.	43.89	37.824	29.472	0	241.402	1098
Patents per 1,000 populations	Patent applications are worldwide patent applications filed through the Patent Cooperation Treaty procedure or with a national patent office for exclusive rights for an invention--a product or process that provides a new way of doing something or offers a new technical solution to a problem. A patent provides protection for the invention to the owner of the patent for a limited period, generally 20 years. Source: World Bank. Lead values are used for this variable for the dependent variables in the regressions and this variable is scaled by 1,000 populations for each country to match other dependent variables.	0.137608	0.037581	0.3612103	1.31E-05	2.716478	539
New Density (World Bank)	New Density is the number of newly registered limited liability companies per 1,000 working-age people (those ages 15-64). Source: World Bank. Available for Years 2004-2011 for 125 countries.	28.554	1.51	301.001	0	4388.97	859

36

Variable	Description						
Birth Rate (OECD)	An employer enterprise birth refers to the birth of an enterprise with at least one employee, including limited liability companies and all other legal forms of enterprise such as partnership and sole proprietorship. The population of employer enterprise births consists first of "new" enterprise births, i.e. new enterprises reporting at least one employee in the birth year; and second, enterprises that existed before the year under consideration but were then below the threshold of one employee, and that reported 1 or more employees in the current, i.e. birth, year. Employer enterprise births do not include entries into the population due to: mergers, break-ups, split-off or restructuring of a set of enterprises. They also exclude entries into a sub-population resulting only from a change of activity. The employer enterprise birth rate corresponds to the number of births of employer enterprises as a percentage of the population of active enterprises with at least one employee. Source: Entrepreneurship at a Glance 2011. Access the complete publication at: http://dx.doi.org/10.1787/9789264097711-en. Available for 24 countries for the years 2004-2007.	11.1	11.171	2.552	3.65	18.122	71
Entry Rate (Compendia)	The dataset COMPENDIA contains harmonized data on the number of business owners and the business ownership rate (number of business owners as share of labor force) for 30 OECD countries over the period 1970-2007. The acronym COMPENDIA stands for "COMParative ENtrepreneurship Data for International Analysis". Business ownership rates have been made comparable across countries and over time. For that purpose figures from official OECD statistics have been corrected for deviating business ownership definitions and for trend breaks. Available for the years 1995-2009 for 11 countries.	10.363	10.2	2.584	4.1	17.7	57
MSCI Returns	Annual MSCI country-specific stock market returns.	0.058	0.096	0.224	-0.727	0.825	1353
Strength of Creditor Protection	Strength of creditor rights protection, as measured by the World Bank doing business reports on an annual basis.	5.423	5	2.482	0	10	1606
Cost of Exports	Cost of exporting containers, as measured by the World Bank doing business reports on an annual basis.	1330.451	1100	843.065	390	8450	1451
Uncertainty Avoidance	Hofstede's index of uncertainty avoidance. The uncertainty avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? Countries exhibiting strong UAI maintain rigid codes of belief and behavior and are intolerant of unorthodox behavior and ideas (i.e., high index scores mean people in the country do not like uncertainty). Weak UAI societies maintain a more relaxed attitude in which practice counts more than principles. Source: http://geert-hofstede.com/dimensions.html.	64.967	68	22.342	8	112	582
VC	The number of venture capital-backed IPOs by the VC funds in the respective country-year. Source: Thompson SDC.	4.0841	0	17.7413	0	196.74	672

Table 2.2. Correlations

This table provide correlations across the main variables in the dataset. * Significant at least the 5% level of significance.

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
[1]	GDP/capita	1										
[2]	Unemployment	-0.29*	1									
[3]	Exports/GDP	0.38*	-0.19*	1								
[4]	Patents/population	0.29*	-0.19*	-0.06	1							
[5]	New Density	0.42*	-0.20*	0.32*	0	1						
[6]	Birth Rate	-0.35*	0.23	-0.01	-0.31*	0.21	1					
[7]	Entry Rate	0.40*	-0.18	0.21	-0.12	0.39*	0.4	1				
[8]	MSCI Returns	0.04	-0.05	0.08*	-0.01	0	-0.08	0.12	1			
[9]	Strength of Creditor Protection	0.33*	-0.11*	0.23*	0.18*	0.39*	-0.13	0.67*	0.01	1		
[10]	Cost of Exports	-0.24*	0.14*	-0.19*	-0.08	-0.21*	-0.16	-0.53*	0.04	-0.16*	1	
[11]	Uncertainty Avoidance	-0.18*	0.15*	-0.37*	0.05	-0.23*	0.06	-0.65*	-0.06	-0.51*	0.07	1
[12]	VC	0.23*	-0.08	-0.09*	0.28*	0.11*	-0.32*	0.09	0	0.25*	-0.02	-0.21*

Table 2.3. Regression Models for the Impact of Entrepreneurship: World Bank Data

This table presents random and fixed effects panel data estimates of the impact of entrepreneurship on GDP per capita, unemployment, exports, and patents. In Panel B for the fixed effects estimates the Uncertainty Avoidance Index is dropped due to lack of time variation. The regressions for patents exclude the 99th percentile outlier country-years for new density and patents. Variables are as defined in Table 2.1. *, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Panel A. Random Effects Estimates

	(1) GDP Per Capita		(2) Unemployment		(3) Exports/GDP		(4) Patents/Population	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
New Density	4306.712	2.39**	-1.6011	-1.94*	8.5547	2.47***	0.0545	4.73***
MSCI Returns	1255.609	1.84*	-1.22	-3.31***	4.11	3.95***	-0.0027	-1.23
Strength of Creditor Protection	930.0081	2.37**	-0.2231	-0.94	0.7007	1.06	0.0029	1.88*
Strength of Creditor Protection * New Density	-222.5856	-1.67*	0.0635	1.12	-0.3988	-1.66*	-0.0028	-2.73***
Cost of Exports					0.0007	0.23		
Cost of Exports * New Density					-0.0016	-1.6		
Uncertainty Avoidance	-29.6149	-0.25	-0.5583	-1.70*	-0.4643	-2.59***	0.0004	1.41
Uncertainty Avoidance * New Density	-34.781	-2.37**	0.0142	1.98**	-0.0596	-2.22**	-0.0004	-5.53***
Constant	15375.04	1.71*	13.7066	4.22***	68.6363	4.68***	-0.0206	-0.83
Number of Observations	303		201		236		130	
Adjusted R2	0.1519		0.0865		0.3359		0.5773	

Panel B. Fixed Effects Estimates

	(5) GDP Per Capita		(6) Unemployment		(7) Exports		(8) Patents/Populations	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
New Density	3701.831	1.94*	-1.5784	-1.35	1.6747	0.46	0.0477	3.53***
MSCI Returns	1219.152	1.79*	-1.2098	-3.24***	3.8091	3.91***	-0.0028	-1.32
Strength of Creditor Protection	793.6668	1.97**	-0.2592	-0.79	0.006	0.01	0.0024	1.41
Strength of Creditor Protection * New Density	-185.1751	-1.3	0.0475	0.59	-0.0455	-0.18	-0.0025	-2.20**
Cost of Exports					0.0019	0.66		
Cost of Exports * New Density					-0.001	-1.03		
Uncertainty Avoidance * New Density	-30.0046	-1.96**	0.0144	1.46	-0.0043	-0.16	-0.0004	-4.02***
Constant	13864.36	5.13***	10.4979	4.87***	43.5774	7.71***	0.0131	1.13
Number of Observations	303		201		236		130	
Adjusted R2	0.1593		0.0734		0.2956		0.5262	

Table 2.4. Regression Models for the Impact of Entrepreneurship: OECD Data

This table presents random and fixed effects panel data estimates of the impact of entrepreneurship on GDP per capita, unemployment, exports, and patents. In Panel B for the fixed effects estimates the Uncertainty Avoidance Index is dropped due to lack of time variation. The regressions for patents exclude the 99th percentile outlier country-years for Birth Rate and patents. Variables are as defined in Table 2.1. *, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Panel A. Random Effects Estimates

	(9) GDP Per Capita		(10) Unemployment		(11) Exports/GDP		(12) Patents/Population	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Birth Rate	-1401.733	-0.26	-0.1918	-0.24	0.2373	0.04	-0.0049	-0.32
MSCI Returns	8907.129	1.42	-0.6424	-0.7	-2.5371	-1.17	0.002	0.16
Strength of Creditor Protection	-1451.671	-0.29	0.0843	0.12	2.2644	0.49	0.0016	0.08
Strength of Creditor Protection * Birth Rate	104.2457	0.24	-0.013	-0.21	-0.0015	0	-0.0005	-0.33
Cost of Exports					0.0272	0.61		
Cost of Exports * Birth Rate					-0.0007	-0.22		
Uncertainty Avoidance	-502.9548	-1.12	0.0174	0.27	0.0154	0.04	-0.0033	-1.51
Uncertainty Avoidance * Birth Rate	1.3829	0.03	0.0035	0.59	0.0061	0.25	0.0001	0.62
Constant	84887.79	1.41	4.8937	0.57	9.0941	0.13	0.3262	1.53
Number of Observations	44		44		30		22	
Adjusted R2	0.4965		0.4471		0.0395		0.4848	

Panel B. Fixed Effects Estimates

	(13) GDP Per Capita		(14) Unemployment		(15) Exports		(16) Patents/Population	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Birth Rate	3265.812	0.67	-0.8202	-0.85	0.0528	0.01	-0.0052	-0.29
MSCI Returns	4699.575	0.95	-0.492	-0.5	-2.5348	-1.07	0.0012	0.09
Strength of Creditor Protection	12629.89	1.91*	-0.8486	-0.65	2.7109	0.51		
Strength of Creditor Protection * Birth Rate	-292.5706	-0.79	0.025	0.34	-0.0441	-0.11	-0.0008	-0.44
Cost of Exports								
Cost of Exports * Birth Rate					-0.0001	-0.04		
Uncertainty Avoidance * Birth Rate	-11.4339	-0.29	0.0081	1.04	0.0055	0.2	0.0001	0.66
Constant	-54921.77	-1.19	12.9725	1.42	29.9783	0.71	0.0661	2.03*
Number of Observations	44		44		30		22	
Adjusted R2	0.0672		0.3891		0.0002		0.2671	

Table 2.5. Regression Models for the Impact of Entrepreneurship: Compendia Data

This table presents random and fixed effects panel data estimates of the impact of entrepreneurship on GDP per capita, unemployment, exports, and patents. In Panel B for the fixed effects estimates the Uncertainty Avoidance Index is dropped due to lack of time variation. The regressions for patents exclude the 99th percentile outlier country-years for Entry Rate and patents. Variables are as defined in Table 2.1. *, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Panel A. Random Effects Estimates

	(17) GDP Per Capita		(18) Unemployment		(19) Exports/GDP		(20) Patents/Population	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Entry Rate	10367.57	2.92***	-3.2088	-3.07***	41.4951	3.50***	0.0053	0.27
MSCI Returns	1813.176	0.95	-1.0182	-1.63	2.9351	0.33	-0.006	-0.88
Strength of Creditor Protection	7397.961	2.68***	-1.1348	-1.38	41.6173	4.32***	-0.042	-4.18***
Strength of Creditor Protection * Entry Rate	-776.5009	-2.56**	0.1871	2.10**	-4.1748	-4.10***	0.0024	1.96*
Cost of Exports					0.0735	2.67***		
Cost of Exports * Entry Rate					-0.0043	-1.07		
Uncertainty Avoidance	555.5857	1.90*	-0.1888	-2.19**	0.9601	0.87	0	0.02
Uncertainty Avoidance * Entry Rate	-69.2284	-2.50**	0.0245	3.00***	-0.1363	-1.23	-0.0002	-1.02
Constant	-48837.09	-1.42	30.632	3.01***	-384.1444	-3.18***	0.2819	1.66*
Number of Observations	46		46		32		14	
Adjusted R2	0.5535		0.5687		0.5664		0.9887	

Panel B. Fixed Effects Estimates

	(21) GDP Per Capita		(22) Unemployment		(23) Exports		(24) Patents/Population	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Entry Rate	3478.345	0.66	-3.1247	-1.78*	-3.0064	-0.6	0.0258	0.86
MSCI Returns	2135.336	1.12	-0.9378	-1.48	6.4387	3.97***	-0.0071	-1
Strength of Creditor Protection	2919.022	0.78	-0.9002	-0.72	0.9764	0.26		
Strength of Creditor Protection * Entry Rate	-181.2494	-0.39	0.1094	0.72	-0.1464	-0.32	-0.0011	-0.26
Cost of Exports					-0.0423	-1.47		
Cost of Exports * Entry Rate					-0.0014	-0.69		
Uncertainty Avoidance * Entry Rate	-28.6341	-0.74	0.0338	2.64***	0.0581	1.6	-0.0002	-1.02
Constant	17600.68	0.6	17.7122	1.83*	95.4722	3.17	0.0506	1.34
Number of Observations	46		46		32		14	
Adjusted R2	0.3483		0.2886		0.0139		0.8634	

Table 2.6. Regression Models for the Impact of Entrepreneurship:
World Bank Data, Compendia and OECD Country-Year Observations

This table presents random and fixed effects panel data estimates of the impact of entrepreneurship on GDP per capita, unemployment, exports, and patents. In Panel B for the fixed effects estimates the Uncertainty Avoidance Index is dropped due to lack of time variation. The regressions for patents exclude the 99th percentile outlier country-years for new density and patents. Variables are as defined in Table 2.1. *, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Panel A. Random Effects Estimates: World Bank Data with Compendia Country-Year Observations

	(25) GDP Per Capita		(26) Unemployment		(27) Exports/GDP		(28) Patents/Population	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
New Density	21418.59	3.73***	-4.8137	-1.70*	36.491	2.12**	0.106	3.04***
MSCI Returns	1970.383	1.11	-0.948	-1.33	7.9311	0.96	-0.005	-1.01
Strength of Creditor Protection	5177.067	3.65***	-0.2174	-0.3	21.0257	5.04***	0.026	2.50**
Strength of Creditor Protection * New Density	-1894.214	-4.17***	0.3143	1.37	-4.4159	-2.85***	-0.009	-2.62***
Cost of Exports					0.1375	2.35**		
Cost of Exports * New Density					-0.0148	-1.1		
Uncertainty Avoidance	151.5718	0.73	-0.071	-0.71	-1.3779	-1.72*	0.001	0.2
Uncertainty Avoidance * New Density	-54.1446	-1.02	0.02	0.8	0.1811	0.86	-0.001	-2.67***
Constant	-16315.42	-0.79	17.9055	1.76*	-131.515	-2.09**	0.014	0.07
Number of Observations	43		43		34		33	
Adjusted R2	0.6333		0.2495		0.6447		0.3464	

Panel B. Random Effects Estimates: World Bank Data with OECD Country-Year Observations

	(29) GDP Per Capita		(30) Unemployment		(31) Exports		(32) Patents/Population	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
New Density	23571.41	3.26***	-0.6964	-0.53	6.7097	0.87	-0.041	-0.56
MSCI Returns	3084.922	0.77	-0.561	-0.59	-2.2282	-0.97	-0.008	-0.14
Strength of Creditor Protection	7259.166	2.86***	-0.171	-0.48	5.8751	1.62	0.008	0.44
Strength of Creditor Protection * New Density	-1886.28	-3.45***	0.0315	0.34	-0.5061	-0.8	0.004	0.81
Cost of Exports					0.0459	1.53		
Cost of Exports * New Density					-0.0019	-0.37		
Uncertainty Avoidance	104.7732	0.35	0.0178	0.34	0.03	0.07	-0.003	-1.09
Uncertainty Avoidance * New Density	-96.22	-1.61	0.0063	0.54	-0.0303	-0.41	0	0.21
Constant	-36055.39	-1.2	6.6216	1.27	-23.9101	-0.51	0.364	1.19
Number of Observations	42		42		28		38	
Adjusted R2	0.3222		0.4309		0.5192		0.6825	

Table 2.7. Regression Models for the Impact of Venture Capital on Entrepreneurship

This table presents random effects panel data estimates of the impact of venture capital on entrepreneurship on GDP per capita. The models restrict the sample to include different countries for which data are available Australia, Belgium, Brazil, Finland, France, Germany, India, Israel, Japan, Korea, Netherlands, Singapore, Sweden, Switzerland, and exclude outliers at the 95, 99, and 90th percentiles. VC is the total value of VC investment at the top quartile. Other variables are as defined in Table 2.1. *, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

	(33) GDP Per Capita		(34) GDP Per Capita		(35) GDP Per Capita	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
New Density	28999.074	1.76*	31496.915	1.99**	31410.603	2.62***
MSCI Returns	4700.6535	0.8	2030.9126	0.37	4484.8476	1.3
Strength of Creditor Protection	9446.7806	1.97**	11123.457	2.39**	10561.037	2.98***
Strength of Creditor Protection * New Density	-2767.5292	-1.65*	-3367.437	-2.06**	-3293.6705	-2.65***
VC	165.593	0.47	120.4639	0.38	228.1982	0.83
VC * New Density	196.323	1.91*	213.6556	2.27**	123.4118	1.71*
Uncertainty Avoidance	285.897	0.88	118.1956	0.37	30.6753	0.12
Uncertainty Avoidance * New Density	-72.8475	-0.84	-44.5685	-0.53	-37.435	-0.59
Constant	-68580.307	-1.5	-68107.22	-1.56	-58283.144	-1.76*
Number of Observations	33		32		44	
Adjusted R2	0.3294		0.3987		0.439	

Table A2.1. Granger Causality Tests of New Density

This table presents Granger causality tests between GDP/Capita, Unemployment, Exports/GDP and Patents. *, **, ***
Significant at the 10%, 5%, and 1% levels, respectively.

	Model (A1)		Model (A2)		Model (A3)		Model (A4)		Model (A5)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
New Density										
Lag 1	0.9384	68.36***	0.9924	83.71***	0.9786	93.16***	0.9653	89.10***	0.9469	73.21***
GDP per capita										
Lag 1	-0.00001	-4.11***							-0.000002	-0.63
Unemployment										
Lag 1			0.0008	0.09					0.0099	0.72
Exports/GDP										
Lag 1					0.0054	3.73***			0.0075	4.45***
Patents/Population										
Lag 1							-0.0575	-0.42	0.0255	0.17
Constant	0.427	5.47***	0.1201	1.04	-0.0888	-1.15	0.2131	3.07***	-0.1293	-0.69
F-test	F(1, 709) = 16.93		F(1, 482) = 0.01		F(1, 677) = 13.94		F(1, 439) = 0.17		F(4, 375) = 5.08	
	Prob > F = 0.0000		Prob > F = 0.9302		Prob > F = 0.0002		Prob > F = 0.6764		Prob > F = 0.0005	

44

Chapter 3

Angel Investors around the World

"What bugs me is this whole start-up scene is a lifestyle, and there are these [angel] investors

who think it's sexy and want to be part of that lifestyle."

-- New York Times, December 2015, "Tips for the Aspiring Angel Investor"[8]

3.1. Introduction

Intuitional theory is the cornerstone of a wide array of work in management, law, economics, and finance. Despite decades of development of work on topics that include the impact of legal institutions and culture on management theory and practice, there is scant theory or evidence that compares the importance of these institutional forces for individuals versus organizations. This essay attempts to fill this gap by examining the specific context of angel investments versus venture capital and private equity investments.

Originally, the term "angel" referred to wealthy individuals who funded the expensive Broadway theatre productions in New York. It was first used as a business term when William Wetzel completed his pioneering study on how entrepreneurs raised seed capital in the U.S. and described the investors who supported those entrepreneurs as "angels" (Wetzel, 1983). Colorful quotes such as the one above illustrate the oft-repeated view that there is a culture to angel investing. However, unlike leading work in the private equity (PE) and venture capital (VC) literature (Batjargal, 2007; Zacharakis, McMullen, and Shepherd, 2007; Madhaven and Iriyama, 2009; Guler and Guillen, 2010;

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[8] http://www.nytimes.com/2015/10/03/your-money/tips-for-the-aspiring-angel-investor.html?_r=0

Iriyama, Li, and Madhaven, 2010; Li and Zahra, 2012; Jääskeläinen and Maula, 2014; Liu and Maula, 2016; Dai and Nahata, 2016), there is little theory or evidence on angel investments around the world and the comparative role of international differences in cultural and legal institutions in the determinants of and outcomes from angel investments.

In this study, we seek to add to the angel literature by examining theory and international evidence on differences between angel investments and PE/VC investments. We aim to shed light on how angel investments look around the world, how angel involvement is different from PE/VC funds, and what legal and cultural environments affect angel investments and divestments. We also consider whether regulatory changes have promoted more angels and PE/VC funds activities.

Our analysis exploits the comprehensive data collected at the deal level of investee firms from PitchBook, which comprise 85,940 completed private equity (PE) deals from 96 countries from 1977 to 2012. Within those deals, 5,397 from 42 countries are involved with angels (either single funded by angels or coinvested/syndicated with PE/VC funds). The dataset allows us to directly compare angels and PE/VC funds at both the deal and investee firm level.

The data indicate that, relative to PE/VC funds, angels prefer investing in smaller entrepreneurial firms in wealthier countries with better stock market conditions, worse legal environments, and countries with cultures characterized by higher levels of individualism and lower levels of risk-taking. Such behaviors are robust both for the first-round deals and deals at all other stages. We also find that relative to PE/VC funds, those investee firms funded by angels have a lower probability of having successful exits, in

either IPO or acquisition. However, better legal environments can help mitigate the negative effects, especially for IPO exits (see also Nahata, 2008; Nahata et al., 2014). Moreover, in our subsample tests, the "stepping stone" logic of angels still cannot be proven, as we find that firms who have received angel investments in the first round have lower probabilities of successfully exiting in later stages. At a country/market level, we also find significant determinants that can work together to build a well-rounded environment and spawn both angels and PE/VC funds activities. In addition to these findings, we also perform difference-in-differences tests to confirm that more stringent disclosure regulation and more forgiving bankruptcy law changes can also spawn the entrepreneurial activities induced by angels and PE/VC funds. Our tests results are robust under various clustering methods to correct standard errors while controlling fixed effects and are robust when performing propensity score matching.

Our study adds to the small but growing literature on angel investors. While the existing literature has focused more on PE/VC finance, many studies have found that angels are as important as VCs for start-ups, and the total market for angels is approximately the same size as the VC market (Sohl, 2003; Mason and Harrison, 2002; Goldfarb, Hoberg, Kirsch and Triantis, 2007; Sudek, Mitteness and Baucus, 2008; Shane, 2008; OECD report, 2011); as such, more research on angels is clearly warranted. The most basic reason, we believe, for comparative lack of work on angels is the fact that data are readily available on PE/VC deals but scantly available on angels.

Prior research has established that angels play a more and more important role in funding entrepreneurs in the seed and early stages, and their importance in the entrepreneurial economy has been recognized in recent years (Wetzel, 1987; Mason and

Harrison, 1995; Morrissette, 2007). Angels usually can be found among the friends or family members of an entrepreneur, and their capital support could be a one-time injection or an ongoing support over the lifecycle of the start-up. Besides the financial support, most of the angels often provide managerial assistances as well (Landstrom, 1993; Shane, 2009; Maxwell, Jeffrey and Lévesque, 2011). Angels also geographically prefer investing in local firms; they do not prefer using conventional control mechanisms such as board seats, staging financings, or contracting provisions, and they usually hold small positions in the investee firms as compared with VCs (Wong, Bhatia and Freeman, 2009; Wong, 2010; ARI Halo Report, 2015).

Recent empirical studies of angels are more focused on their contributions to the investee firms as well as documenting the differences between VCs and angels. Kerr, Lerner, and Schoar (2014) found that angels can improve the survival, exits, employment, patenting, web traffic, and financing of investee firms using a regression discontinuity analysis. Although their study only used two angel groups' investments, their findings confirm the positive side of angel group financing in that firms funded by those groups are achieving successful exits and reaching high employment levels. In another recent study, Lerner, Schoar, Sokolinski, and Wilson (2015) extended the results of Kerr et al., (2014) to an international setting by using 13 angel groups from 12 countries and confirmed similar positive outcomes. This study also compared the firms funded and unfunded by angels to determine if the development stage and maturity of the startups is negatively related to the angel host countries' entrepreneurship friendliness. But, unfortunately, these studies cannot investigate the interrelationships between angels and VCs. Hellmann, Schure and Vo (2015) found that the investor type is dynamically

persistent as well as angels and VCs are dynamic substitutes of which companies that obtained more angel financing in the past are less likely to subsequently obtain VC funding, and vice versa. Their tests results favor the views that VC funding is still associated with better exit outcomes. Dutta and Folta (2016) find successful exit rates are more likely to be associated with VCs, but they also found that angels have as equivalent an impact as VCs on improving the innovation rates using patents data.

Moreover, there are several theoretical studies that have built useful foundations to compare angels and VCs. Under the assumptions that VCs add value to the investee firms while angels do not, Chemmanur and Chen (2014) developed a model to explain the reasons behind why entrepreneurs might want to obtain angel investments first before approaching VCs. Schwienbacher (2009) assumed that both angels and VCs can add value, and his model explains the differences in choosing early-stage financiers between angels and VCs from the perspective of entrepreneurs. Hellmann and Thiele (2014) provides a "Friends or Foes" theory that explicitly models the interdependences between angels and VCs. Their model assumes that the investee firms want to proceed from angel financing to VC financing, those VCs might use their market power or control rights to squeeze out angels in later stages. Angels need to seek alternative exit routes when facing situations like this. One key insight from this theory is that the bargaining dynamics between angels and VCs may determine whether the relationship between them is complements or substitutes.

Our study builds on these important prior studies by providing large sample empirical evidence on angel investments versus PE/VC investments around the world. To the best of our knowledge, our study is the first to use a multi-country private equity deal-

level database to observe the investment behaviors of angels versus PE/VC funds. We not only document angel activities around the world but also show how legal and cultural differences affect (not intermediated) angel investors versus (intermediated) PE/VC funds. We provide evidence that legal and cultural differences around the world have a more pronounced impact on angel investors relative to PE/VC funds.

The remainder of this essay is organized as follows. The next section discusses the prior literature and develops our hypotheses. Thereafter we present the data and our summary statistics, followed by the regression analyses and robustness checks. The final sections discuss some limitations of the dataset and possible extensions, as well as some concluding remarks and an outlook for future research.

3.2. Hypotheses

There is extant research confirming the significant role of private equity investments that are catalysts for entrepreneurial growth and innovation and, thus, are spawning economic growth around the world (Timmons and Bygrave, 1986; Grossman and Helpman, 1991; Gompers and Lerner, 1999; Cumming and Johan, 2013; Makhene, 2009). Prior studies of angels, however, mainly focus on the U.S. market (Kerr et al., 2014; Dutta and Folta, 2016). Very few studies jump beyond this scope to consider the international differences between angels and PE/VC funds. Mason and Harrison (2002) study the U.K. cases by using survey methods while Li, Shi, Wu, Wu, and Zheng (2015) discuss the Chinese government policies in promoting angel investments. Ding, Sun, and Au (2014) compare the angels' selection criteria in China and Denmark. Most of these studies offer single-country or two-country comparison analyses of angels, and they do

not consider the institutional differences between angels and PE/VC funds in an international setting. The most recent international angel study is Lerner et al., (2015) which focuses on the heterogeneity of angel groups' countries, but their study does not discuss the characteristics of entrepreneurial firms in different institutional environments across the world. In the literature of VC and entrepreneurship, international studies have highlighted that institutional differences matter for financial market and economic development as well as the contractual provisions and oversight intensity of PE/VC funds transactions (Cumming and Johan, 2013; Nahata et al., 2014; Lerner and Schoar, 2005). However, previous studies of angels have not considered such international differences. Our study fills the gap and complements previous studies to investigate how angels are different from PE/VC funds when making their investment decisions facing different institutional environments across the globe.

Angel investors have a long history as informal investors in the narrow subset of the private equity market (Lamoreaux, Levenstein and Sokoloff, 2004; Shane, 2009). A current trend for angels is to form angel groups to pool money in order to make larger investments like seed-stage VC funds (Shane, 2012; Kerr et al., 2014; Lerner et al., 2015). Such an assembly of angels, however, only account for about 2% of the total investments they have made (Wiltbank and Boeker, 2007).

Prior literature has outlined several major differences between angels and PE/VC funds. First, angels prefer investing in the seed or early stage of the start-ups, while PE/VC funds usually take part in later-stage deals when firms get more mature. Second, the investment screening process is more sophisticated for PE/VC funds, such that due diligence and term sheet tools are used to build their portfolios (Cumming and Johan,

2013). On the other hand, angels select projects only based on their personal relationships and use relatively informal procedures (Sudek, 2006). Third, the investment amount is much smaller for angels (Ibrahim, 2008). Although Sohl (2003) estimated that there are around 300,000 to 350,000 angels in the U.S. who invest about $30 billion in around 50,000 firms yearly, the average investment amount is only around $1 million to $2 million. Fourth, angels use their own money to invest, while PE/VC funds as financial intermediaries invest in private firms on behalf of their investors (Avdeitchikova et al., 2008). In this way, theoretically, they are facing different incentives and constraints where their investment risk tolerance profile and expected returns are deemed to be different. Aernoudt (1999) estimated that PE/VC funds are looking for investment projects with expected returns around 35% to 45%, while angels only expect returns around 20%. Fifth, there are different fee structures for the two types: angels only pay fees when they form groups to make investments, but PE/VC funds have management fees plus a carried interest rate of up to 20% to 30% (Cochrane, 2005). Moreover, according to the survey study of Shane (2005), angels are not only investing for financial returns but also for other social or economic reasons, such as supporting communities, favoring known partners, finding a job, learning, helping a company succeed, and for fun, etc. Angels also invest their knowledge and time (Chua and Wu, 2012). It seems the original aim for angels is quite different from PE/VC funds; they are investing in the person more than the company, and they want the company to succeed but not merely for a huge profit on their investments.

Because PE/VC funds invest "other people's money," while angels invest their own money, we may expect that angel investments will be more closely linked to legal,

economic, and cultural conditions relative to PE/VC investments, even after controlling for all things being equal in terms of the types of investments. PE/VC funds act as intermediaries between large institutional investors and entrepreneurial firms, while angel investors invest their own capital without the process of financial intermediation. Prior work has well established that PE/VC activity is positively affected by better economic conditions, better stock market development, better legal protections for minority shareholders, and cultures favoring entrepreneurship development (Nahata, 2014).

The governance structure imposed in a venture capital fund through institutional investor veto rights, monitoring through annual (or semi-annual or quarterly) reports, and limited partnership agreements implies that PE/VC funds activities will be less sensitive to behavioral biases than angel investors that can act without such constraints and oversight. PE/VC funds managers face less-pronounced risks associated with losing their own money and have primarily financial reasons for investment; by contrast, angels invest their own money directly and may do so not only for purely financial reasons. We can expect that angel investments will be subject to cultural conditions of uncertain avoidance. Furthermore, as they typically make investment decisions by themselves, angels are more likely to be in individualistic societies. Finally, as individuals are more financially constrained in economic downturns relative to PE/VC funds, and because angel investment decisions are made alone and are more subject to behavioral biases, angel investments are more likely to be affected by economic conditions relative to PE/VC funds.

Hypothesis 1: *The difference between angel investment and PE/VC investment will be more pronounced with respect to legal, economic, and cultural conditions around the world.*

PE/VC funds can provide benefits such as certification, guidance, and network to start-ups, and such certification and endorsement has been shown to be very important for the investment performances and exits in previous studies (Megginson and Weiss, 1991; Stuart, Hoang and Hybels, 1999; Hsu, 2004; Hochberg, Ljungqvist and Lu, 2007; Dutta and Folta, 2016). Angels are different from PE/VC funds, as we have discussed; they may lack the expected expertise and benefits, which can bring a certification effect to the investee firms, especially during the divestment stages. Therefore, we expect that by controlling international differences, the successful exit rates will be lower for the investee firms funded by angels, as posited in Hypothesis 2a:

Hypothesis 2a: *Firms funded by angels will have a lower probability of exiting successfully by IPO or acquisition compared with firms with PE/VC funds.*

Although angels might not be as good as PE/VC funds at bringing start-up IPOs or acquisition exits, if such a company attracts angel investments in its early stage, this still sends a positive signal to the market and enables further credit through the investment tracking process. Moreover, it has been documented that PE/VC funds rarely invest in companies who received angel funding before; only a very small fraction of those companies will attract PE/VC funding later on (Shane, 2009). Ibrahim (2008) also

found that angels will try to simplify contract terms to seek selling companies or attract PE/VC funds to reduce costs. In this sense, if those companies succeed in IPO or acquisition exits, it is still possible that the certification effect from angels exists (Kerr et al., 2014). This is similar to a common view that angel financing is a "stepping stone" to obtain venture capital, and angels and VCs are synergistic members of a common financing ecosystem. The best companies like Google, Facebook, and Tesla Motors all benefit from the combination of these attributes and powerfully illustrate such "stepping stone" logic. We, therefore, expect that investee firms who have received angel investments in the first round might have a better chance to exit successfully by an IPO or acquisition, as summarized in Hypothesis 2b:

Hypothesis 2b: *Firms receiving angel investments in the first round will have a relatively higher probability of exiting successfully by IPO or acquisition.*

In addition to the above hypotheses regarding the international institutional differences between angels and PE/VC funds as well as the performances in terms of successful exits, we extend our study to explore a national/market level test to find out what factors can determine the density of both angel and PE/VC funds activities. Over the past four decades, there are extant researches confirming the significant role of private equity investments that are catalysts for the entrepreneurial growth and innovation and thus are spawning the economic growth (Timmons and Bygrave, 1986; Grossman and Helpman, 1991; Gompers and Lerner, 1999; Armour and Cumming, 2006; Cumming and MacIntosh, 2006; Cumming and Johan, 2007; Strömberg, 2009; Makhene, 2009; De

Beer and Nhleko, 2009). Therefore, we propose that those previously confirmed determinants to define better macroeconomic conditions, better stock market development, better legal protections for minority shareholders and cultures favoring entrepreneurship development can also be applied to define the desired grounds to spawn more angel and PE/VC activities, as summarized in Hypothesis 3:

Hypothesis 3: *Higher density of angel and PE/VC funds activities is associated with better macroeconomic conditions, better stock market development, better legal protections for minority shareholders and lower cultural levels of individualism and uncertainty avoidance around the world.*

It has been documented that going public is one of the main objectives of VC-backed companies (Black and Gilson, 1998). If entrepreneurs share this common objective with their investors, whether they are angels or PE/VC funds, they will follow the IPO disclosure rules to prepare their financial statements. Cumming and Walz (2010) find that higher-quality prospectus disclosure mitigates fraud and earnings management, and thus enhances the impact of VC finance on entrepreneurial activity. It is obvious that a higher-quality of securities regulation and better disclosure magnifies the impact of VC-induced entrepreneurial spawning, and such an effect of changes on spawning outcomes are more pronounced for those countries with such disclosure rule changes (Cumming and Knill, 2012). We thus believe that angel and PE/VC activities will also be higher in countries that undergo more stringent disclosure regulation changes, as summarized in our Hypothesis 4a:

Hypothesis 4a: *For countries with more stringent disclosure regulation change, the entrepreneurial spawning activities induced by angels and PE/VC funds will be more.*

Another important aspect of the legal environment is bankruptcy law. Personal bankruptcy law deals with individuals who are unable to pay off their debts; thus, the level of punishment or forgiveness from this law is the critical factor in determining the debtor's consequences of failure. Both angels and entrepreneurs may face similar insolvent situations if misfortune happens with their own businesses. It has been documented that a more forgiving bankruptcy law can be understood as a partial insurance contract offered to entrepreneurs against the consequences of failure (Jackson, 1985; Adler, Polack, and Schwartz, 2000; Lee, Peng and Barney, 2007). Moreover, bankruptcy law has also been shown to be related to the credit supply of entrepreneurial activities, where less severe bankruptcy laws are correlated with a greater incidence of credit rationing by lenders to small businesses (Berkowitz and White, 2004), and greater state-level exemptions in bankruptcy law in the U.S. are associated with an increase in overall entrepreneurship (Fan and White, 2003).

In addition, bankruptcy law determines the availability of a "fresh start" in the event that any failures happen to the entrepreneurs (White, 2005). In this sense, a forgiving bankruptcy law, which can offer such "fresh start" opportunities from pre-bankruptcy debts, permits entrepreneurs to enter into the economy again rapidly after business failures (Georgakopoulos, 2002; Landier, 2004; Ayotte, 2007). In fact, such repeat entrepreneurship is not uncommon in countries where a "fresh start" is permitted

(Baird and Morrison, 2005; Stam, Audretsch and Meijaard, 2008). In a cross-jurisdictional setting, Armour and Cumming (2008) find that "forgiving" personal bankruptcy law has a statistically and economically significant positive effect on entrepreneurship using self-employment rates. We thus propose that in those countries with more "forgiving" bankruptcy law changes will have a positive impact on the activities of entrepreneurs, and such impacts are expected to be associated with a greater overall level of angel investment relative to the impact on PE/VC activity documented in prior work (Armour and Cumming, 2006), as summarized in our last Hypothesis 4b:

Hypothesis 4b: *For countries with more forgiving bankruptcy law change, the entrepreneurial spawning activities induced by Angel investors and PE/VC funds will be more.*

3.3. Data and Summary Statistics

Our analysis exploits the comprehensive data collected at the deal level of investee firms from PitchBook, which comprise 85,940 completed PE deals in 42,617 investee firms from 96 countries from 1977 to 2012. Among those deals, 5,397 deals in 4,266 investee firms from 42 countries are involved with angels (either single funded by angels or coinvested/syndicated with PE/VC funds). Such a dataset allows us to compare angel deals and PE/VC deals at the same time to shed more lights on this underdeveloped area in academia.

In order to provide a detailed picture for how angel investors evolve as a more and more important financial source for entrepreneurial firms, Figure 3.1 and 3.2 outline

both the angels and PE/VC funds activities from 1977 to 2012. Over a 36-year period, we can see that the overall trends for both angels and PE/VC funds activities are upward sloping, with small zigzags that capture the dot-com bubble and the recent financial crisis. In terms of the total number of deals for each year, we see that angels present a little different trend compared with PE/VC funds. It seems that the number of deals completed by angels was not hit too hard by the recent financial crisis, as the total numbers for each year rebounded very quickly. Combined with the trend for total deal sizes, we find that angels and PE/VC funds have quite different manners. In Figure 3.1 for angels, the total deal sizes peaked in 2007 and continued shrinking until recently. While in Figure 3.2 for PE/VC funds, the total deal sizes trend was much more synchronized with the total number of deals completed. Angels seemed to be more cautious after the financial crisis than PE/VC funds.

After showing the overall picture of both angels and PE/VC funds activities during our sample period, we further present some key features of our PitchBook data. Table 3.1 summarizes the key features associated with the sample distribution of completed deals across the world. Table 3.1 Panel A presents the top 10 country distribution for those completed deals in three separate groups: All Deals, All Angel Deals, and All PE/VC Deals. The U.S., Canada, and the U.K. are always the Top 3 players in all three categories. Most of the Top 10 countries in three categories are OECD countries in developed markets, but India and China cannot be neglected as active members from emerging markets. In terms of the industry distribution for our data, among the Top 10 industries we listed, in three categories, high-growth and high-tech industries interchanging their ranks with software industries always ranked No. 1 for each

59

category. However, we still see that angels prefer investing and becoming involved in deals in the retail industry, which differentiate them from PE/VC funds.

In Table 3.2, we further present the characteristics of angel-involved deals in 42 countries across the world. We aim to show a detailed picture for how angels were involved in all rounds, including the first round, and their successful exit rates, both at the investee firm level and the deal level. In Table 3.2 Panel A, we focus on investee firm level characteristics. For each of the 42 countries that have completed angel-involved deals, we calculate the total number of investee firms, the percentage of firms with angel financing (at all rounds), the percentage of firms with angel financing (during the first round), and the percentage of firms with successful exits. On average, we have shown that about 11% of investee firms in those 42 countries have angels involved, with about 8% of those firms with angels in the first round; about 24% of those investee firms will have successful exits in either IPO or acquisition. In Table 3.2 Panel B, we present similar characteristics as in Panel A, but with a focus at the deal level. As shown in Panel B, although there are, on average, more than 2,000 deals completed for each country yearly, only about 7% will be angel involved deals. This is not surprising, as angel data are rarely available; therefore, our PitchBook data only capture some of the big and prominent players in this market. Furthermore, only 5% of those deals will receive angel involvement in the first round, and about 15% of the total deals will have successful exits.

Table 3.3 summarizes the main variables in our dataset. We aim to investigate the preferences of picking investee firms among different investor types. The different indicator variables of All Angels, Pure Angels, Mixed Angels, and PE/VC funds will be our main dependent variables. The explanatory variables include the GDP per capita for

the economic conditions, the domestic stock market capitalization and MSCI returns for each country's stock market conditions, the minority shareholders protection index for the legal environment, Hofstede's dimensions of cultural variables, as well as a variety of other control variables to capture investee firm and industry characteristics.

From our data, we can empirically confirm that there are many differences between angels and PE/VC funds in different countries over our sample period. This provides us with a unique opportunity to explore all the possible reasons behind their investment and divestment behaviors and to compare the two investor types. Moreover, the PitchBook database provides detailed information on testing international differences across countries over time, which can shed further light on angel behaviors.

In Table 3.4, we present a pair-wise correlation matrix for each of our variables for this study. Note that our correlations highlight some potential collinearity issues across different explanatory variables, which we explore in our multivariate empirical tests in the next section. We choose the most related variables and those ones having the most explanatory power in the following multivariate tests.

Before we start the multivariate regression analysis, we must first show some of the highlighted details from our PitchBook data and provide the preliminary means difference tests results regarding the different characteristics between the several subgroups in Table 3.5. In panel A of Table 3.5, we divide our entire data sample by All Angel Deals versus All PE/VC deals. We then divide the All Angel Deals into Pure Angel and Mixed Angel deals to further compare different characteristics among those subgroups. Below, we summarize several interesting results in different categories: First, in terms of deal characteristics, angels will always involve themselves in smaller size

deals, and they prefer getting involved with active investee firms with more deal making every year. Second, in terms of investee firm characteristics, we find that angels' firms have a smaller number of employees, and when PE/VC funds are co-investing/syndicating in the same deal, the company valuation is significantly lower than Pure Angel-involved deals. This is consistent with the "Friends or Foes" theory proposition that when VC joins the deal in later stage they will lower the company valuation to squeeze the angels out (Hellmann and Thiele, 2015). Third, in terms of the country characteristics differences, angel deals are quite different in almost all facets we list: they prefer being in a) countries with larger entrepreneurial density, b) wealthier countries with a larger stock market, c) countries with a better legal environment, and d) countries with cultures favoring individualism and entrepreneurship. Although the means difference tests have shown those characteristic differences are significant, in actual numbers the differences are trivial, which will require more focus in future multivariate tests. Fourth, in the last category of exit outcomes, we find that angels are relatively poor performers in either taking the investee firms going public or being acquired, compared with PE/VC funds that possess more sophisticated investors. The only subpanel in which angels perform a little better is in comparing Pure Angels with Mixed Angels. It seems co-investment/syndication does not increase the likelihood of exiting successfully. Both parties fighting for control rights might explain the poor results here.

As we outline several interesting comparison results between subgroups in Panel A of Table 3.5, we extend our analysis to present more results between the U.S. and the non-U.S. subsamples. Combined with the overall trends shown in Figure 3.1 and 3.2, we also separate our sample into a pre- and post-financial crisis period to provide a more

detailed picture for the data. In the first subpanel of Panel B in Table 3.5, we show that the U.S. is an active and mature market for entrepreneurial activities. Although the U.S. deals have smaller sizes and those U.S. investee firms are relatively smaller and receiving lower company valuations, this market is much more active in terms of the total number of deals per year and have much more angel activities each year. The density for both angels and PE/VC funds activities is much higher in the U.S. compared with the rest of the world. The U.S. is a quite different market in terms of country characteristics in this subpanel, which further emphasizes the importance of our study compared with previous studies, which focus only on the U.S. angel market. Our study provides more evidence that shows how angels and PE/VC funds differ internationally. The only category we highlight is the exit outcome. The U.S. subsample performs worse than counterparties around the world in terms of successful exit rates.

With regards to the recent financial crisis, in the second subpanel of Panel B in Table 3.5, we find that deal making is decreasing while the sizes of the deals are shrinking. However, the angel market has actually become even more active since the financial crisis; the total numbers of deals are larger and the density of angel activities is even larger at the country level. Also, deals are occurring in wealthier countries with a larger stock market and a better legal environment. Moreover, we find that the recent financial crisis hit the IPO market harder than the acquisition market, as happened during the post-financial crisis period; the overall successful exit rates actually increase, and this is mainly driven by the increasing rates of acquisition. The IPO rates significantly declined after the financial crisis and such trend reflects possible prudent and cautious moods among entrepreneurs, angels, and PE/VC funds to bring private firms public.

3.4. Regression Analyses and Robustness Checks

Now that we have laid out some of the unique interesting results from our means difference tests and some consistent findings from other studies, we perform our regression analyses in this section, mainly using clustered PROBIT models by controlling year effects in addition to controlling the industry and country fixed effects. We report associated marginal effects on each explanatory variable. We also perform several subsample tests and show several robustness checks before drawing our conclusions.

3.4.1. What factors determine angel investments versus PE/VC investments?

In our main regression analyses, as shown in Table 3.6, we use dummy variables to indicate different investor types as the main dependent variables. Throughout Models (1) to (4), the All Angels dummy is the major dependent variable and the dummies for Pure Angels, Mixed Angels, and PE/VC funds act as dependent variables in Models (5) to (7), respectively. We add different control variables from various facets in order to test how different investors prefer choosing investee firms and making their investments internationally. The regressions include control variables for economic and stock market conditions, legal environments, investee firm characteristics, as well as for Hofstede's cultural dimensions. The main PROBIT regression models in Table 3.6 use the following specification:

Dummy Variable of Investor Type = f (Economic and Stock Market Conditions, Legal Environments, Investee Firm Characteristics, Hofstede's Cultural Dimensions, Industry and Country Dummies)

Most of the major variables are defined in Table 3.3. Note that there are a large number of explanatory variables that we could have included but chose to exclude. The primary reasons for our parsimonious specification are as follows. First, the selected variables are plausibly pertinent to investment choices across different facets and are chosen for the purpose of testing Hypothesis 1 and the following hypotheses. Second, note that the excluded variables are highly collinear. Hence, any additional control variables for the available sets of countries and years would not be perfectly suitable without potentially introducing spurious results into the regressions. Examples include some of the other dimensions of Hofstede's cultural variables, as well as other legal and institutional variables. In untabulated tests and analysis, we included all of the six dimensions of Hofstede's cultural variables in our main regressions and found out that the individualism and uncertainty avoidance indices are the most pronounced cultural factors and the main results did not change when including all six dimensions. Similar results have been found if we replace the minority shareholder protection index with other legal variables such as the legal origins or other legality indices. Our selection and reporting of variables was conducted to assess the factors that directly capture the differences of investors in different institutional environments across the world.

In order to present a clear picture for how angels make investment decisions given different institutional environments, we add different facets step by step from Model (1) to Model (4). In Model (1) of Table 3.6 Panel A, we use the natural logarithm of GDP per capita to proxy the economic condition and the natural logarithm of domestic stock market capitalization, as well as the MSCI returns, to proxy the stock market conditions. From the results of Model (1), we find that angels prefer investing in and choosing

65

investee firms in countries with a higher GDP per capita (significant at 1%) and a smaller stock market (significant at 10%) with higher returns (significant at 5%). The economic significances are also large: angels are 12.59% more likely to be involved in deals where there is a 1% increase in the natural logarithm of GDP per capita; they are also 3.81% less likely to be involved in deals where there is a 1% increase in the natural logarithm of domestic stock market capitalization, and they are 3.60% more likely to be involved in deals where there is a 1% increase in the MSCI returns.

In addition to the Model (1) specification, we added a minority shareholders protection index into the regression Model (2) to capture the legal environments. The minority shareholders protection index is the coded weighted average index on the ten key legal provisions identified by legal scholars as most relevant to the protection of minority shareholder rights (Guillén and Capron, 2015): 1) the power of the general meeting for de facto changes; 2) an agenda-setting power; 3) the anticipation of a facilitated shareholder decision; 4) the prohibition of multiple voting rights; 5) independent board members; 6) the feasibility of directors' dismissal; 7) private enforcement of directors' duties (derivative suit); 8) shareholder action against resolutions of the general meeting; 9) mandatory bid; and 10) disclosure of major share ownership (Lele and Siems, 2007; Siems, 2008). Higher values indicate "better" degree of minority shareholders' protection and legal systems.[9] From the results in Model (2), we see, somewhat surprisingly, that the marginal effects of the minority shareholders protection index returns negative results (significant at 1%). If there is a 1% increase in the minority shareholders protection index, the angel involvement will be 3.03% lower.

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[9] We are grateful to Mauro Guillén and Laurence Capron for sharing their minority shareholders protection index. This legal index is dynamic over the years to capture a more comprehensive legal environment with more countries and years covered.

Angels prefer investing in and choosing those investee firms in countries where the legal environment is worse relative to PE/VC funds. As discussed in Hellmann and Thiele (2015), a better legal environment might incur higher costs of contracting for angels, as they might circumvent to reduce such costs and prefer making more deals in those firms residing in worse legal environments.

As we move on to test any impact from investee firm level characteristics, we utilize two variables to capture the size and activeness of the investee firm. The natural logarithm of the number of employees is used to capture the firm size effect, and the number of deals per year for each investee firm is used to capture the investee firm and entrepreneurs' activities within a calendar year. Model (3) in Panel A returns consistent results for other explanatory variables; all signs remain the same, with three variables reducing the statistical significance. For our interested variable of investee firm characteristics, we find that angel investors prefer investing in and choosing those investee firms with more active entrepreneurs and in smaller sizes (both significant at 1%). The marginal effects of Model (3) also indicate that at a 1% increase in the natural logarithm of the number of employees, angel involvement will be 1.20% lower, and a 1% increase in the number of deals per year will increase the angel involvement likelihood by 0.62%.

There are more and more international studies determining that cultural dimensions cannot be neglected in exploring institutional differences around the world. Following the literature confirming that cultural dimensions are related to entrepreneurship at the national level (Shane, 1993; Hayton, George and Zahra, 2002; Cumming, Johan and Zhang, 2014), we choose two out of six Hofstede's cultural

dimensions: individualism (IDV) and uncertainty avoidance (UAI) in our study to further control for the cultural environment in Model (4) in Panel A. The results in Model (4) show that the national cultural environment seems to have an insignificant impact on the angel's investment decisions; other factors, such as legal environments, stock market conditions, and investee firm characteristics are more important determinants for angel investors' decisions.

Up to Model (4), we have outlined a picture of how angels, relative to PE/VC funds, make their investment decisions and choose investee firms based on different preferences: smaller firms with active entrepreneurs residing in countries with better stock market returns and worse legal environments. In the next step, we further test whether Pure Angels and Mixed Angels will have any different preferences. In Model (5) of Panel A, we reserve all the explanatory variables as in Model (4) with the Pure Angels dummy as the main dependent variable; the results have shown that Pure Angel investors prefer investing in and choosing those smaller investee firms with active entrepreneurs in countries where stock market returns are higher and the legal environment is worse. In Model (6) of Panel A, we re-run the similar regression model using a Mixed Angels dummy as the dependent variable; the results are qualitatively unchanged compared with Model (4) for all angel investors. In the final Model (7) in Panel A, a PE/VC funds dummy is used as the dependent variable. The results show the quite different behaviors from such sophisticated investors as PE/VC funds; relative to angel investors, they prefer investing in and choosing larger investee firms with less active entrepreneurs residing in countries with worse stock market returns and better legal environments. Thus, our Hypothesis 1 is partially supported from our tests in Table 3.6 in Panel A.

As a robustness check, we present our regression tests using only the first-round deals to explore the different investor preferences in Panel B of Table 3.6. As most of the angels are involved in early and seed stages of start-up development, it is worthwhile to perform a subsample test to determine whether or not their decisions are similar at the initial stages, and we expect the results to be more compelling. Throughout our Models (8) to (14), all the tests replicate the specifications from Models (1) to (7) in Panel A, and the results support our Hypothesis 1 fully; the statistical significances are even more substantial for the first-round deal tests. Angels have quite different investment behaviors compared with PE/VC funds: They prefer investing in and choosing smaller investee firms with more active entrepreneurs residing in countries with better economic conditions, smaller stock markets with higher returns, as well as having national cultures favoring more individualism and less risk-taking. And the economic significances are much larger for the first-round deal tests: Given results from our Model (11) as a main example, a 1% increase in the natural logarithm of GDP per capita will increase the angel involvement likelihood by 14.88%; a 1% increase in the natural logarithm of domestic stock market capitalization will decrease the angel involvement likelihood by 5.56%; a 1% increase in the MSCI returns will increase the angel involvement likelihood by 3.62%; a 1% increase in the minority shareholders protection index will decrease the angel involvement likelihood by 2.90%; a 1% increase in the natural logarithm of the number of employees will decrease the angel involvement likelihood by 1.17%; a 1% increase in the number of deals per year will increase the angel involvement likelihood by 3.57%; a 1% increase in the individualism index will increase the angel involvement likelihood by

1.28%; and a 1% increase in the uncertainty avoidance index will increase the angel involvement likelihood by 0.62%.

3.4.2. Is there a certification effect from angel investors on successful exits?

After we present the different investment behaviors between angels and PE/VC funds, we want to determine how angels perform from their investments in those investee firms. Are they receiving higher or lower returns compared with other investors? Since it is hard to get creditable performance measures like IRRs or performance multiples, we follow previous literature (Shane, 2005; Wiltbank, 2005; DeGennaro and Dwyer, 2010) to explore the successful exit rates as an alternate measure for the performances. The successful exits include either an initial public offering (IPO) exit or a successful acquisition exit. Similar to Table 3.6, we use clustered PROBIT models by controlling year effects in addition to controlling the industry and country fixed effects in Table 3.7. Our main regression models use the following specification[10]:

Dummy Variable of Successful Exits Type = f (Investor Type Dummy, Economic and Stock Market Conditions, Legal Environments, Investee Firm Characteristics, Hofstede's Cultural Dimensions, Industry and Country Dummies)

We report the successful exit tests first in Panel A and then perform IPO and acquisition exit tests in Panels B and C, respectively. We also perform interaction tests of

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[10] For conciseness, we exclude all control variables which contain the exact same variables in Table 4.6: LN of GDP per capita, LN of Domestic Market Capitalization, MSCI Returns, Minority Protection Index, LN of Number of Employees, Number of Deals per Year, IDV, and UAI. These variables are all excluded in Table 4.7, 4.8, and 4.9.

the minority shareholders protection index to determine whether a better legal environment can help increase successful exit performance.

In Panel A of Table 3.7, all dependent variables across Models (1) to (8) are the dummy variables indicating whether or not the deal is a successful exit, either in IPO or acquisition format. From Models (1) to (3), all three angel investor type dummies return significant negative marginal effects at the 1% level, which confirms our Hypothesis 2a, that firms funded by angels have a lower probability to exit successfully by either IPO or acquisition compared with firms with PE/VC funds. The economic significances are significant, as All Angels will be 26.61% less likely to exit successfully relative to PE/VC funds; and for Pure Angels and Mixed Angels, the likelihoods are 18.05% and 31.89% lower, respectively. The certification effect as documented in the literature about VCs cannot apply to angels. Model (4) results confirm the previous view, and PE/VC funds will have a 26.61% higher probability of bringing investee firms public or exiting through acquisitions. In Model (5), we further include both the Mixed Angels dummy and the PE/VC funds dummy at the same time to compare whether the co-investment/syndication actions with PE/VC funds of angels will increase their successful exit rates. Unfortunately, the PE/VC funds certification effect still exists. We have found that only pure PE/VC funds financed firms will achieve better exit outcomes; those companies do not mix angel and PE/VC funding, and the results are consistent with the view that VCs tend to do best when investing on their own (Goldfarb, Hoberg, Kirsch and Triantis, 2012). The split of control rights drives one explanation for these results between angels and PE/VC funds that might aim to obtain more aggressive control rights (Goldfarb et al., 2012). Note that if we interacts the minority shareholders protection

71

index with the angel-related investor type dummies in Models (6) to (8), we find that better legal protection can help increase the successful exit rates for angels, especially for Pure Angels. But the marginal effects become statistically insignificant, which led us to perform additional subsample tests on IPO or acquisition exits of legal protection impacts.

In Panels B and C of Table 3.7, the main results stay similar to the results in Panel A; firms funded by angels have a lower probability of exiting successfully by IPO or acquisition, and the certification effect only applies to PE/VC funds. For example, Panel B results indicate that angels will be 8.23% less likely to exit by IPO relative to PE/VC funds, and Panel C results indicate that angels will also be 20.73% less likely to exit by acquisition relative to PE/VC funds. Moreover, from our interaction tests in Panels B and C, we find that the legal environment is very important in shaping a good capital market. From the results of Models (14) and (15), we can see that better legal protection of minority shareholders increases the likelihood for angels to exit by IPO. But, from the results of Models (22) to (24), we do not find similar results to support that better legal protection of minority shareholders increases the likelihood for angels to exit by acquisition. Better legal protection of minority shareholders will have a much bigger impact on IPO exits than on acquisition exits for angels relative to PE/VC funds.

Although our tests in Table 3.7 help support our proposition in Hypothesis 2a, we speculated whether angels could provide any favorable signals to future investors or buyers. We created a dummy variable to capture those firms that have received their first-round funding from angels and re-ran similar tests of Table 3.7 to explore this possibility. In Table 3.8, we included the new dummy variable as the main explanatory variable with different exit dummies as dependent variables. The results from Table 3.8 did not support

our Hypothesis 2b and show that firms receiving angel investments in the first round will still have a relatively lower probability of exiting successfully, especially through an acquisition exit. Although Model (2) returns negative but insignificant marginal effects, combined with the results from Models (1) and (3), we can confirm that the "stepping stone" logic cannot be applied to angels, at least in our dataset. Furthermore, the economic significances cannot be neglected, for the firms receiving angel investments in the first round will be 4.41% less likely to exit successfully, 0.33% less likely to exit by IPO, and 4.72% less likely to exit by acquisition relative to those firms without first-round angel investments.

3.4.3. What environments spawn angel activities?

After investigating the exit performance for angels as well as PE/VC funds, we extended our study to perform tests at the national level to determine what factors would spawn angel activities within a country and what policies might be utilized in the future to promote more entrepreneurial activities induced by angels and PE/VC funds. As a first step, we generated several dependent variables to capture the density of angels and PE/VC fund activities at the national level. For example, in Table 3.9 of Model (1), the dependent variable is Angel Density (scaled by Total Population), which is the sum number of all angel deals within a specific country in a calendar year; we then divided the sum by the total population of this country in that year (in millions). The other three dependent variables in Models (2) to (4) were created using similar methods, with Model (2) using total GDP as the denominator and Models (3) and (4) for PE/VC funds densities. We used the double clustered OLS models by controlling both investee firm and year

effects in addition to controlling the industry fixed effects, but we relaxed the country fixed effects to reduce collinearity issues. Our main regression models use the following specification:

Density Variables = f (Economic and Stock Market Conditions, Legal Environments, Investee Firm Characteristics, Hofstede's Cultural Dimensions, Industry Dummies)

We found very consistent results across all models in Panel A of Table 3.9, where higher angel density and PE/VC funds density are associated with larger GDP per capita, larger domestic stock market capitalization, better minority shareholder protection, smaller investee firms with more active entrepreneurs, and with national cultures favoring less individualism and encouraging more risk-taking. The economic significances are also non-negligible: for example, given results from Model (1) in Panel A, a one standard deviation increase in the natural logarithm of GDP per capita increases the angel density by 47.81%; a one standard deviation increase in the natural logarithm of domestic market capitalization increases the angel density by 38.84%; a one standard deviation increase in the MSCI returns increases the angel density by 11.32%; a one standard deviation increase in the minority shareholder protection index increases the angel density by 26.22%; a one standard deviation decrease in the natural logarithm of number of employees increases the angel density by 6.42%; a one standard deviation increase in the number of deals per year increases the angel density by 4.60%; a one standard deviation decrease in the individualism index increases the angel density by 53.20%; and, a one standard deviation decrease in the uncertainty avoidance index increases increase the

angel density by 15.52%. All other models in Panel A of Table 3.9 return similar results with comparable economic significances. Note that our results are consistent with previous findings in the literature which emphasize that some key factors for successful angel investing will be in areas with more supplies of both wealthy people and entrepreneurs as well as those located in large cities or tech hubs where there are friendly attitudes towards entrepreneurship (Shane, 2005; DeGennaro, 2010). Our study extended such views on the U.S. studies to an international atmosphere, which could help policy makers across the world to build and foster a healthy space for both angels and PE/VC funds.

Furthermore, we present additional one-year lead dependent variable analysis in Panel B, in addition to the contemporaneous analysis in Panel A of Table 3.9; the results are robust and consistent. All the main explanatory variable signs and statistical significances did not change, and such an effect is very consistent for increasing the density of entrepreneurial activities within a country. Overall, countries with a higher GDP per capita, a larger stock market, a better legal environment, and a culture favoring less individualism and more risk-taking will supply more entrepreneurs and investors. Thus, the density for entrepreneurial activities will be enhanced. Our Hypothesis 3 has been fully supported in tests of Table 3.9.

3.4.4. Do changes in disclosure regulation and bankruptcy law have an impact on angel activities?

In order to complement our previous results regarding angels and PE/VC funds activities around the world, we further performed difference-in-differences tests to assess

specifically the effects from regulatory changes in specific countries that are associated with more stringent disclosure rules and more forgiving bankruptcy law changes. Cumming and Johan (2013) found that more stringent securities regulation is positively associated with the supply and performance of VC as well as the entrepreneurial spawning induced by VC around the world. More stringent disclosure rules will enhance the entrepreneurial activities as predicted in their study, which inspired us to perform similar tests regarding angels[11]. Following Armour and Cumming (2008) who found that "forgiving" personal bankruptcy law has a positive effect on entrepreneurship, we carried out a similar search of all bankruptcy law changes across all of the countries and years covered by our sample[12].

Before we move on to talk about the difference-in-differences analysis results, we first ran preliminary means difference tests in Table 3.10. In panel A of Table 3.10, we compared the characteristics under the disclosure regulation changes. The first subpanel presents the results for all deals, then for angel deals and PE/VC deals, subsequently. We find that regulation changes that emphasize more disclosure have a significant impact with regard to different characteristics of our sample. After the disclosure regulation change, the total number of deals decreases while the number of angel deals increases; the investee firm company valuation becomes larger, but the firm sizes are shrinking; the four density variables all increase after the disclosure regulation change, indicating such

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[11] Following Cumming and Knill (2012), the countries with disclosure regulatory changes in the sample term examined are: the United States ("SOX," 2002); South Korea ("Addendum to Securities Exchange Act," 2004); Mexico ("Code of Best Practices," 2005); Brazil ("Novo Mercado," 2005); and India ("Clause 49," 2005).

[12] Following Armour and Cumming (2008) and the data from the International Insolvency Institute, the countries with bankruptcy law changes in the sample term examined are: Austria, Belgium, Brazil, Bulgaria, Canada, China, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Malaysia, the Netherlands, New Zealand, the Philippines, Poland, Portugal, Singapore, South Korea, Spain, Sweden, Switzerland, Thailand, Turkey, the United Kingdom, the United States, Uruguay, and Vietnam.

rule change is favorable for fostering more angel and PE/VC activities. These trends are consistent for both angels and PE/VC funds. The successful exit rates are also declining, but such change is mainly driven by the decreasing IPO exit rates and PE/VC deal performances.

In panel B of Table 3.10, we compare the characteristics under the bankruptcy law changes. Similar to Panel A, we have found quite similar results regarding the deal, the investee firm, and the density characteristics; only the exit outcomes return different results, where the acquisition rates increase after the bankruptcy law change, and such change is mainly driven by PE/VC deals. Moreover, we find that both regulatory changes are in favor of spawning more entrepreneurial activities induced by both angels and PE/VC funds. The four density variables and the number of angel deals are significantly higher during the periods after the regulatory changes and the results are consistent across all means tests in Table 3.10. However, for angels, both regulatory changes seem not to affect their divestment strategies which infer again that they are a different investor type compared with sophisticated investor types like PE/VC funds. Their risk profiles and preferences might be completely different.

Table 3.11 reports the difference-in-differences regressions for the four alternative angel and PE/VC activity densities as dependent variables to test the impact from disclosure regulation changes. We looked for the key variables (Treat1 * After1) across all models to support our means difference tests of Table 3.10. From the results in Table 3.11, we find that the four entrepreneurial density variables all return positive coefficients and are statistically significant at 1% level. We find these difference-in-differences tests to be quite compelling as they highlight the effect of changes on subsequent

entrepreneurial spawning densities, and show directly that entrepreneurial spawning activities induced by angels and PE/VC funds are more pronounced for countries with more stringent disclosure regulation change, in support of our Hypothesis 4a. We have also reports the difference-in-differences regressions results in Table 3.12 to test the impact from bankruptcy law changes. We find qualitative similar results in Table 3.12 that the difference-in-differences tests results highlight the effect of changes on subsequent entrepreneurial spawning densities, and show directly that entrepreneurial spawning activities induced by angels and PE/VC funds are more pronounced for countries with more forgiving bankruptcy law change, in support of our H4b.

In addition, Table 3.13 reports the difference-in-differences regressions for our four alternative angel and PE/VC activity densities as dependent variables in order to test the impact from both disclosure regulation and bankruptcy law changes jointly. We looked for the key variables of (Treat1 * After1) * (Treat2 * After2), Treat1 * After1, and Treat2 * After2. Table 3.13 indicates those key variables for testing the four entrepreneurial density variables all returned positive coefficients and most are statistically significant at a 1% level. These difference-in-differences tests are quite compelling, as they highlight the effect of changes on subsequent entrepreneurial spawning densities and show directly that entrepreneurial spawning activities induced by angels and PE/VC funds are more pronounced for countries with both more stringent disclosure regulation changes and more forgiving bankruptcy law changes. For countries with both policy changes, the angel activity density will increase by 83.88% (Model (1)) and 70.83% (Model (2)) and the PE/VC activity density will increase by 40.85% (Model (3)) and 22.02% (Model (4)). Both disclosure regulation and bankruptcy law changes will

78

have larger impact on angels than on PE/VC funds. When we look at the effect just from disclosure regulation change, it will have relatively larger impact on PE/VC funds as such a policy change will increase the PE/VC activity density by 49.47% (Model (3)) and 53.65% (Model (4)) but will increase the angel activity density by 24.48% (Model (1)) and 27.33% (Model (2)). In untabulated results available on request, we have found qualitatively similar outcomes when testing bankruptcy law and disclosure regulation changes in separate regressions in terms of both the statistical and economic significance.

3.5. Discussion of Limitations and Possible Future Datasets

For the first time, we have presented large sample international evidence on angel deals around the world. However, our data are not without limitations; we hope our work will inspire others to continue to research in the future. We cannot rule out endogeneity fully, and our dataset suffers some problems that might cause concerns for the results. For example, we cannot identify the substantial heterogeneity across angels, as Lerner et al., (2015) did; we don't know whether they are a group of wealthy investors, business angels, or some other organizational structures; but, given our summary statistics, the magnitude of the impact we have documented in this study is likely to capture some of the large and successful angels in the market.

Moreover, we do not know all of the angels in all countries around the world; however, our findings are robust to subsamples of the data and randomly kick out different countries from of the sample. Our conclusions are based on the data we have from PitchBook; it might be better to consider other datasets in the future. Our data also have the limitations on variables regarding financial performance results at the investee

firms. If those variables are available in the future, we can investigate whether angels or PE/VC funds can bring benefits to those investee firms and by how much.

3.6. Conclusions and Future research Directions

Our analysis exploits the comprehensive data collected at the deal level of investee firms from PitchBook, which comprise 85,940 completed private equity deals from 96 countries spanning from 1977 to 2012. Within these deals, there are 5,397 deals in 42 countries involved with angels (either single funded by angels or coinvested/syndicated with PE/VC funds). Such dataset allows us to compare angels and PE/VC funds at both the deal and investee firm level at the same time. We find that, relative to PE/VC funds, angels prefer investing in active smaller entrepreneurial firms in wealthier countries with better stock market conditions, worse legal environments, and having cultures favored in higher levels of individualism and lower levels of risk-taking. Such behaviors are robust both for the first round deals and deals at all other stages. We also find that, relative to PE/VC funds, those investee firms funded by angels have a lower probability of having successful exits, in either IPO or acquisition; but, better legal environments can help mitigate the negative effects on IPO exits. Moreover, in our subsample tests, the "stepping stone" logic of angels still cannot be proven, because we find that firms who have received angel investments in the first round will have lower probabilities to successfully divest in later rounds. At a country/market level, we also find significant determinants, which can work together to build a well-rounded environment and spawn both angels and PE/VC funds activities. In addition to these results, we also performed difference-in-differences tests to confirm that more stringent disclosure

regulations and more forgiving bankruptcy law changes can also spawn the entrepreneurial activities induced by angels and PE/VC funds. Our test results are robust under various clustering methods to correct standard errors while controlling fixed effects and are robust when performing propensity score matching.

Angels still remain an underdeveloped area for study in academia; with more creditable data becoming available in the future, researchers can explore more in this area and shed more lights on what angels prefer, how they make investments, both locally and internationally, where the preferred locations are, how they syndicate or co-invest with other investors, which financial contracts they are using to control the rights of the firms, what the real relationships between entrepreneurs and angels are, or how the heterogeneity among angels will have a different impact on their investments, etc.

Our study also contains several policy implications that governments of countries around the world might consider to promote entrepreneurial activities; economic and stock market development conditions are important, but other factors like cultures and the national attitudes towards promoting entrepreneurship will also be an important area to develop. In addition, legal reforms could also be focused on setting more stringent disclosure regulations and drafting more forgiving personal bankruptcy laws.

3.7. Appendix

There are worries that possible sample selection bias might cause problems for our exit outcomes test results in the study; we use propensity score (PS) matching methods (Rosenbaum and Rubin, 1983) to address such problems following Lee and Wahal (2004), and after the PS matching, we generate two subsamples to perform the

81

counterfactual analysis on the exit outcomes in our study. We want to find the impact of angel funding against specific alternative counterfactuals, such as whether the investee firms would have been better off with PE/VC funding or been worse off with angel funding.

It is true that PE/VC funds may choose those investee firms and deals which have certain types of inherent characteristics, making them fit their exit strategies as compared with angels. What if angels could choose and invest in similar firms and deals like PE/VC funds? What would the exit outcomes be? Is there any certification effect from angels? Such potential endogeneity problems may be particularly important with regards to successful exits, and we aim to address those problems.

To create the first subsample, we performed the PS matching, based on the deal sizes and investee firm industries as PE/VC funds' selection criteria to match angels' criteria. Then we posed more strict matching criteria based on all characteristics, as presented in Table 3.5, to generate the second subsample. We present the means difference test results in Table A3.1, which include the original unmatched sample differences between All Angel Deals and All PE/VC deals and the two PS-matched subsamples differences in the other two subpanels. As shown in Table A3.1, we find that, as compared with the original unmatched sample, PE/VC funds select quite different deals, as the differences between almost all of their characteristics are significantly different from the angels'. In the subsequent two subpanels, we find that, after the PS matching, the two new subsamples present almost the same characteristics between angels and PE/VC funds. Those matched subsamples help us limit the selection bias to

some extent. We move on to perform our counterfactual analysis to see whether angels will have certification effects on the exit outcomes.

As the two new subsamples present almost the same characteristics, we are confident in performing a similar regression test, as we did in Table 3.7. We report our PROBIT regression results in Table A3.2. What if angels were investing in and choosing investee firms and deals that have almost the same characteristics as those of PE/VC funds? We have previously found that the certification effects only apply to PE/VC funds; we propose that angels could also have such certification effects on exit outcomes. However, after we perform our subsample tests, we found as consistent results as we found in Table 3.7; Models (1) to (3) return similar results with the marginal effects, for the angel dummies are all negative and statistically significant at a 1% level. Angels will be 26.61% less likely to exit successfully in our original sample; they will also be 41.80% and 41.93% less likely to exit successfully in our two newly PS-matched samples, respectively. Angels do not provide any certification effects like their counterparts, PE/VC funds, even if they are investing in and choosing investee firms and deals having almost the same characteristics. It seems that PE/VC funds can bring more expertise to the investee firms and have a higher likelihood of exiting their investments by IPO or acquisition. There might be other unobserved characteristics that can explain such results, but by using propensity score matching methods, we provide another robustness check for our main results.

In addition to the PS matching method we have applied to address the potential selection bias concerns, we further divide our whole sample into U.S. and Non-U.S. subsamples to provide additional support and evidences for our main hypotheses. In

83

Table A3.3, we replicate our main clustered PROBIT regression models used in Tables 3.6, 3.7 and 3.8 and report the results in Panels A to C, respectively. In Panel A of Table A3.3, we can find that the U.S. subsample tests return even larger marginal effects for the main determinants for how angels make investments as compared with the original models in Table 3.6. Although the Non-U.S. subsample tests return less significant results, the firm size effect as well as the legal environment impact is still large and persistent. In Panel B of Table A3.3, the models for both the U.S. and Non-U.S subsamples return quite consistent results as the main models in Table 3.7. Firms that funded by angels have relatively lower probability of exiting successfully by IPO or acquisition, and the certification effect only applies to PE/VC funds. Similar to our speculation in Table 3.8, the "stepping stone" logic is still of interest and we perform similar tests for both the U.S. and Non-U.S subsamples in Panel C of Table A3.3. The results give us a little surprise that the Non-U.S. subsample returns statistically positive and significant marginal effects on the successful exit rates and IPO exit rates. Several possible reasons come out of mind that such worse results for the U.S. sample for angels might due to the fact that it is very easy or might be too easy to start a business in the U.S. And another explanation is that the data coverage on failed deals might better in U.S., and we deal with such possible sample bias by excluding the U.S. as a robustness check here. Although the U.S. subsample returns consistent results as the main models in Table 3.8, the results from the Non-U.S. subsample tests support our Hypothesis 2b. To some extent, this "stepping stone" logic works and we find partial evidence to support this proposition.

84

Figure 3.1: Angel Activities Trend over 1977 - 2012

Total Deal Sizes (in M$) — Number of Angel Deals
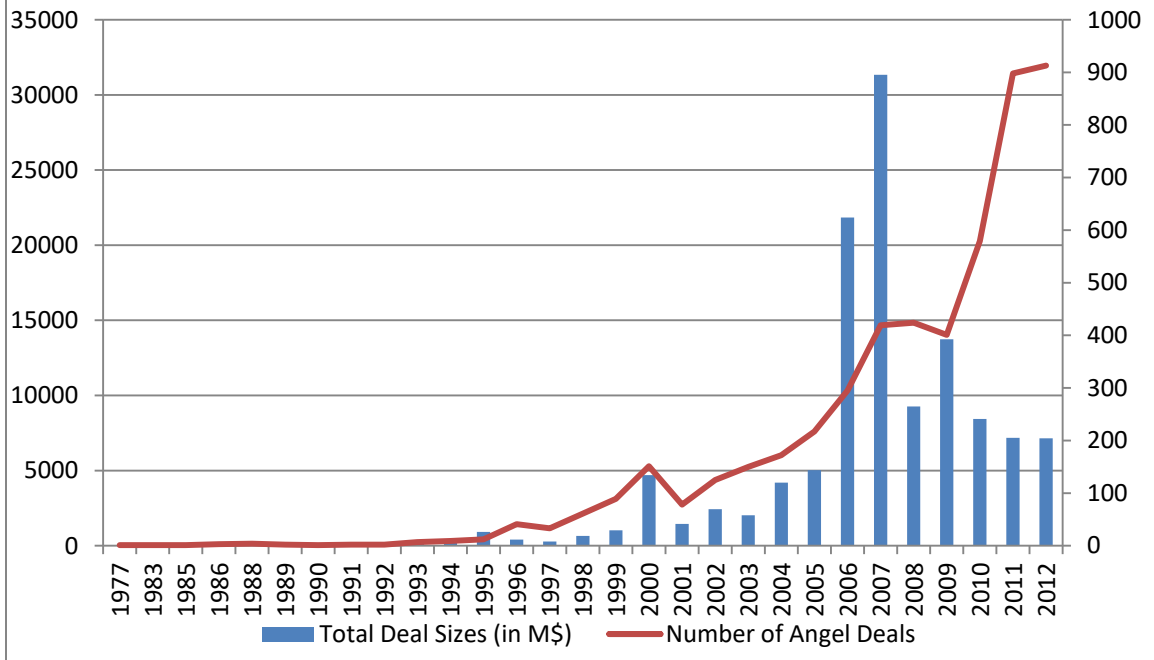
Figure 3.2: PE/VC Activities Trend over 1977 - 2012

Total Deal Sizes (in M$) — Number of PE/VC Deals
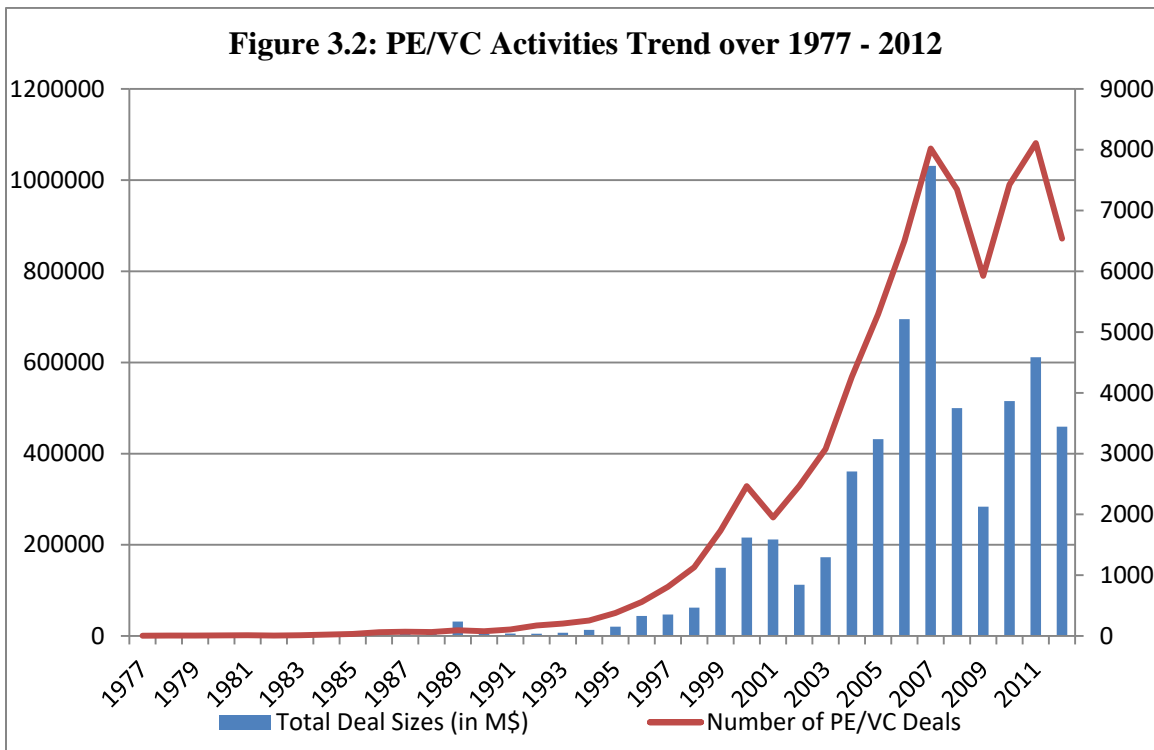
Table 3.1. Top 10 Country and Industry Distribution for Completed Deals

This table summarizes the key features associated with the sample distribution of completed deals in the world. In this table, we show the top 10 countries and industry distribution for those completed deals in three separate groups: all, Angels and PE/VC.

Panel A: Top 10 Countries in terms of Number of Deals

All Deals		All Angels Deals		All PE/VC Deals	
Country		Country		Country	
United States	73910	United States	4839	United States	69071
Canada	2770	Canada	143	Canada	2627
United Kingdom	2281	United Kingdom	123	United Kingdom	2158
India	735	Israel	52	India	694
Germany	661	India	41	Germany	623
France	592	Germany	38	France	569
China	516	France	23	China	500
Israel	512	Ireland	17	Israel	460
Netherlands	306	China	16	Netherlands	299
Ireland	255	Spain	11	Australia	239

Panel B: Top 10 Industries in terms of Number of Deals

All Deals		All Angels Deals		All PE/VC Deals	
Industry		Industry		Industry	
Software	17235	Software	2129	Software	15106
Commercial Services	10096	Media	612	Commercial Services	9570
Commercial Products	6751	Commercial Services	526	Commercial Products	6624
Media	4809	Pharmaceuticals and Biotechnology	262	Healthcare Devices and Supplies	4554
Healthcare Devices and Supplies	4794	Healthcare Devices and Supplies	240	Pharmaceuticals and Biotechnology	4279
Pharmaceuticals and Biotechnology	4541	Retail	196	Media	4197
Communications and Networking	3675	Communications and Networking	156	Communications and Networking	3519
Healthcare Services	2833	Commercial Products	127	Healthcare Services	2758
Consumer Non-Durables	2509	IT Services	114	Consumer Non-Durables	2417
Computer Hardware	2379	Computer Hardware	94	Computer Hardware	2285

Table 3.2. Country Distribution Characteristics at Investee Firm-Level and Deal-Level - Angel Activities in All Rounds, 1st Round and Exits in Percentages

This table summarizes the detailed features associated with the country distribution of investee firms and completed deals in the world. In Panel A, we show the total number of investee firms in each country and the associated angel activity percentages both in all rounds and in the 1st round as well as the percentage of portfolio firms with successful exits. In Panel B, we show the total number of completed deals in each country and the associated angel activity percentages both in all rounds and in the 1st round as well as the percentage of portfolio firms with successful exits.

Country	Panel A: Investee Firm-Level Country Distribution Characteristics				Panel B: Deal-Level Country Distribution Characteristics			
	Total Number of Firms	% of Firms with Angel Financing, all rounds	% of Firms with Angel Financing, first round	% of Firms with Successful Exits	Total Number of Deals	% of Deals with Angel Financing, all rounds	% of Deals with Angel Financing, first round	% of Deals as successful exits
Argentina	24	25.00	20.83	20.83	44	13.64	11.36	11.36
Australia	177	3.39	3.39	23.73	247	3.24	2.43	17.81
Austria	37	2.70		18.92	64	1.56		14.06
Belgium	73	6.85	4.11	24.66	138	4.35	2.17	16.67
Bermuda	53	13.21	11.32	41.51	126	6.35	4.76	18.25
Brazil	120	5.00	4.17	19.17	185	4.32	2.70	15.68
Bulgaria	17	5.88		29.41	34	2.94		14.71
Canada	1542	7.85	6.16	23.15	2770	5.16	3.43	13.94
Chile	23	4.35		13.04	34	2.94		8.82
China	273	5.13	4.40	21.98	516	3.10	2.33	12.21
Colombia	19	5.26	5.26	36.84	28	3.57	3.57	32.14
Croatia	1	100.00			2	50.00		
Czech Republic	28	3.57		25.00	50	2.00		16.00
Denmark	61	1.64	1.64	13.11	103	1.94	0.97	7.77
Finland	67	8.96	8.96	17.91	105	5.71	5.71	11.43
France	298	5.70	4.36	23.15	592	3.89	2.20	11.99
Germany	369	9.49	8.13	25.75	661	5.75	4.54	15.89
Hong Kong	61	3.28	3.28	18.03	87	2.30	2.30	12.64
India	364	9.34	7.14	14.29	735	5.58	3.54	7.89
Ireland	120	10.83	6.67	20.00	255	6.67	3.14	10.20

Israel	240	16.67	12.08	18.33	512	10.16	5.66	8.79
Italy	104	4.81	4.81	26.92	200	2.50	2.50	17.50
Japan	98	2.04	2.04	20.41	151	1.32	1.32	14.57
Jordan	2	50.00	50.00	50.00	4	25.00	25.00	25.00
Luxembourg	12	16.67	16.67	25.00	29	6.90	6.90	13.79
Mexico	45	4.44		26.67	74	2.70		18.92
Netherlands	161	3.73	2.48	25.47	306	2.29	1.31	14.38
Norway	70	1.43		21.43	108	0.93		16.67
Panama	3	33.33	33.33	33.33	4	25.00	25.00	25.00
Poland	30	3.33	3.33	16.67	41	2.44	2.44	12.20
Portugal	20	5.00	5.00		21	4.76	4.76	
Romania	11	9.09	9.09	27.27	13	7.69	7.69	23.08
Russia	36	5.56	2.78	25.00	68	4.41	1.47	13.24
Singapore	50	4.00	4.00	22.00	92	2.17	2.17	14.13
Slovenia	5	20.00	20.00		6	16.67	16.67	
South Africa	20	5.00	5.00		24	4.17	4.17	
South Korea	47	2.13	2.13	27.66	77	1.30	1.30	23.38
Spain	114	6.14	2.63	21.05	207	5.31	1.45	12.08
Sweden	110	2.73	2.73	19.09	179	2.23	1.68	12.29
Switzerland	106	4.72	3.77	25.47	209	2.87	1.91	13.88
United Kingdom	1253	7.82	5.19	20.91	2281	5.39	2.85	12.10
United States	35896	10.56	7.66	21.73	73910	6.55	3.72	11.31
On Average	1003.81	10.87	8.42	23.81	2030.76	6.61	5.00	15.05

Table 3.3. Variable Definitions and Summary Statistics

This table provides definitions of the main variables in the dataset, the data sources, and summary statistics.

Variable Name	Definition	Mean	Median	Standard Deviation	Minimum	Maximum	Number of observations
Main Dependent Variables							
All Angels Dummy	A dummy variable equal to 1 for deals with angel investor.	0.063	0.000	0.243	0.000	1.000	85940
Pure Angel Dummy	A dummy variable equal to 1 for deals with only one angel investor.	0.017	0.000	0.128	0.000	1.000	85940
Mixed Angels Dummy	A dummy variable equal to 1 for deals with both angel investor and PE/VC investors.	0.046	0.000	0.210	0.000	1.000	85940
Pure PE/VC Dummy	A dummy variable equal to 1 for deals with PE/VC investors.	0.937	1.000	0.243	0.000	1.000	85940
Deal Characteristics							
Deal Size	Firm-level deal size (in M$) for the investee companies.	116.750	10.300	807.991	0.010	101002.500	52922
No. of Deals per Year	Firm-level number of deals has been made in a year for the investee companies.	1.186	1.000	0.523	1.000	11.000	85940
Total No. of Deals	Firm-level total number of deals has been made over the whole sample period for the investee companies.	3.508	3.000	2.889	1.000	41.000	85940
No. of Angel Deals per Year	Firm-level number of deals has been made in a year for the investee companies with angel investor.	343.993	365.000	264.790	1.000	818.000	76992
No. of Investors	Firm-level number of investors of each completed deal for the investee companies.	1.909	1.000	1.496	1.000	22.000	85940
Investee Company Characteristics							
Company Valuation	Firm-level valuation (in M$) for the investee companies at the time of deal completed.	611.590	120.355	2853.799	0.010	118802.500	12758
No. of Employees	Firm-level number of employees in the investee companies.	1368.882	110.000	9976.233	1.000	805600.000	42893
Country Characteristics							
Angel Density (scaled by Total Population)	The total number of angel deals within a country for a specific year divided by the total population of that country in the same year.	1.162	1.190	1.017	0.001	30.977	76998
Angel Density (scaled by Total GDP)	The total number of angel deals within a country for a specific year divided by the total GDP of that country in the same year.	0.024	0.025	0.017	0.000	0.360	76998
PE/VC Density (scaled by Total Population)	The total number of PE/VC deals within a country for a specific year divided by the total population of that country in the same year.	14.983	18.667	9.421	0.001	232.475	80105
PE/VC Density (scaled by Total GDP)	The total number of PE/VC deals within a country for a specific year divided by the total GDP of that country in the same year.	0.320	0.384	0.161	0.000	6.101	80084

GDP per Capita	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Source: World Bank.	43606.000	47001.430	9418.821	308.535	193892.300	80090
Domestic Market Capitalization	The domestic market capitalization of a stock exchange is the total number of issued shares of domestic companies, including their several classes, multiplied by their respective prices at a given time from the World Federation of Exchanges. This figure reflects the comprehensive value of the market at that time, in M$. Source: http://www.world-exchanges.org/statistics/statistics-definitions.	13900000.000	16200000.000	5566940.000	6.200	20300000.000	79782
MSCI Returns	The country-specific Morgan Stanley Capital International index return, a proxy for stock market conditions in each country.	0.054	0.094	0.157	-0.684	1.437	79891
Minority Shareholders Protection Index	The minority shareholders protection index is the coded weighted average index on the ten key legal provisions identified by legal scholars as most relevant to the protection of minority shareholder rights (as per Guillen and Capron, 2015): powers of the general meeting for de facto changes; agenda-setting power; anticipation of shareholder decision facilitated; prohibition of multiple voting rights; independent board members; feasibility of directors' dismissal; private enforcement of directors' duties (derivative suit); shareholder action against resolutions of the general meeting; mandatory bid; and disclosure of major share ownership (as per Lele and Siems, 2007 and Siems, 2008). Higher values indicate "better" degree of minority shareholders' protection and legal systems.	7.019	7.250	0.521	1.000	8.250	77240
IDV	Hofstede's index of individualism versus collectivism. The high side of this dimension, called individualism, can be defined as a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families. Its opposite, collectivism, represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty. A society's position on this dimension is reflected in whether people's self-image is defined in terms of "I" or "we." Source: http://geert-hofstede.com/national-culture.html.	87.883	91.000	10.976	11.000	91.000	85514

90

UAI	Hofstede's index of uncertainty avoidance. The Uncertainty Avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? Countries exhibiting strong UAI maintain rigid codes of belief and behavior and are intolerant of unorthodox behavior and ideas. Weak UAI societies maintain a more relaxed attitude in which practice counts more than principles. Source: http://geert-hofstede.com/national-culture.html.	46.928	46.000	7.681	8.000	112.000	85514
Exit Outcomes							
Successful Exits	A dummy variable equal to 1 for either IPO or Acquisition exit.	0.116	0.000	0.320	0.000	1.000	85940
IPO Exits	A dummy variable equal to 1 for an IPO exit.	0.017	0.000	0.128	0.000	1.000	85940
Acquisition Exits	A dummy variable equal to 1 for an Acquisition exit.	0.099	0.000	0.298	0.000	1.000	85940

Table 3.4. Pair-wise Correlations Matrix

This table provides correlations across the main variables in the dataset. * Significant at least the 5% level of significance.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]
All Angels Dummy	1																						
Pure Angel Dummy	0.50*	1																					
Mixed Angels Dummy	0.85*	-0.03*	1																				
Pure PE/VC Dummy	-1	-0.50*	-0.85*	1																			
LN of GDP per capita	0.03*	0.01*	0.03*	-0.03*	1																		
LN of Domestic Market Capitalization	0.03*	0.01*	0.02*	-0.03*	0.42*	1																	
MSCI Returns	0	0.01	0	0	-0.11*	-0.02*	1																
Minority Protection Index	0.04*	0.02*	0.03*	-0.04*	0.42*	0.59*	-0.11*	1															
LN of Number of Employees	-0.12*	-0.06*	-0.10*	0.12*	-0.23*	-0.22*	0.07*	-0.23*	1														
Number of Deals per Year	0.02*	0.02*	0.01*	-0.02*	0.02*	0.04*	-0.01	0.04*	0.03*	1													
IDV	0.02*	0.01*	0.02*	-0.02*	0.69*	0.72*	-0.07*	0.42*	-0.20*	0.03*	1												
UAI	-0.01*	0	-0.01	0.01*	-0.06*	-0.38*	-0.01*	-0.19*	0.09*	-0.01*	-0.38*	1											
Angel Density (scaled by Total Population)	0.08*	0.03*	0.07*	-0.08*	0.36*	0.18*	0.10*	0.54*	-0.18*	0.06*	0.28*	-0.06*	1										
Angel Density (scaled by Total GDP)	0.09*	0.04*	0.08*	-0.09*	0.40*	0.28*	0.10*	0.54*	-0.21*	0.07*	0.28*	-0.05*	0.97*	1									
PE/VC Density (scaled by Total Population)	0.05*	0.02*	0.04*	-0.05*	0.46*	0.35*	-0.01*	0.69*	-0.22*	0.05*	0.49*	-0.21*	0.82*	0.81*	1								
PE/VC Density (scaled by Total GDP)	0.05*	0.02*	0.04*	-0.05*	0.49*	0.50*	-0.01*	0.70*	-0.26*	0.05*	0.52*	-0.23*	0.74*	0.77*	0.96*	1							
Successful Exits	-0.09*	-0.04*	-0.08*	0.09*	-0.01	-0.02*	0.03*	-0.03*	0.10*	-0.05*	-0.01*	0.01*	0	0	-0.02*	-0.02*	1						
IPO Exits	-0.03*	-0.02*	-0.03*	0.03*	-0.06*	-0.04*	0.06*	-0.07*	0.14*	0.02*	-0.03*	0	-0.04*	-0.05*	-0.05*	-0.06*	0.36*	1					
Acquisition Exits	-0.08*	-0.04*	-0.07*	0.08*	0.02*	-0.01	0.01*	0	0.04*	-0.07*	0	0.01*	0.01*	0.01*	0	0	0.92*	-0.04*	1				
Deal Size	-0.03*	-0.02*	-0.03*	0.03*	0	-0.05*	0.02*	-0.04*	0.22*	-0.01	-0.04*	0.03*	-0.01*	-0.02*	-0.02*	-0.03*	0.10*	0.02*	0.10*	1			
Company Valuation	0	0.01	0	0	-0.01	-0.04*	0.02*	-0.01	0.22*	0.29*	-0.06*	0.04*	0.04*	0.04*	0.01	0	0.01	0.05*	-0.02*	0.71*	1		
Total No. of Deals	0	0	-0.01	0	0	0.06*	-0.04*	0.01	0.06*	0.46*	0.07*	-0.03*	-0.05*	-0.05*	0	0.01*	-0.04*	0.06*	-0.07*	-0.01	0.26*	1	
No. of Angel Deals per Year	0.09*	0.04*	0.08*	-0.09*	0.40*	0.49*	0.11*	0.53*	-0.25*	0.08*	0.30*	-0.08*	0.78*	0.89*	0.65*	0.68*	0	-0.05*	0.02*	-0.03*	0.04*	-0.05*	1
No. of Investors	0.15*	-0.08*	0.23*	-0.09*	0.02*	0.03*	-0.02*	0	-0.15*	-0.01*	0.03*	-0.02*	-0.01*	-0.01*	0.01*	0.02*	-0.20*	-0.08*	-0.18*	-0.01*	0.04*	0.11*	-0.02*

Table 3.5. Mean Descriptive Statistics by Main Characteristics

This table provides the main mean descriptive statistics across different main characteristics by different deals. The table also provides the two-sample means test results between major characteristics groups in our data. Panel A presents the mean comparison tests among all angel deals, pure angel deals, mixed angel deals and pure PE/VC deals, Panel B presents the mean comparison tests for US vs. Non-US deals and Pre vs. Post Financial Crisis deals. The means test is a two-sample t-test with equal variance. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: Descriptive Statistics - Mean Comparison Tests among All Angels, Pure Angel, Mixed Angel and Pure PE/VC Deals						
	All Angel Deals vs. Pure PE/VC Deals			Pure Angel Deals vs. Mixed Angel Deals		
	All Angel Deals	All PE/VC Deals	Mean Differences	Pure Angel Deals	Mixed Angel Deals	Mean Differences
Deal Characteristics						
Deal Size	27.821	124.884	-97.063***	10.481	33.437	-22.956
No. of Deals per Year	1.223	1.183	0.040***	1.247	1.214	0.033**
Total No. of Deals	3.482	3.509	-0.028	3.602	3.439	0.163**
No. of Angel Deals per Year	431.338	337.825	93.513***	427.586	432.535	-4.948
No. of Investors	2.799	1.849	0.950***	1.000	3.441	-2.441***
Investee Company Characteristics						
Company Valuation	595.046	611.848	-16.802	946.253	518.697	427.557
No. of Employees	509.982	1413.984	-904.002***	500.153	513.275	-13.122
Country Characteristics						
Angel Density (scaled by Total Population)	1.466	1.141	0.325***	1.424	1.479	-0.055
Angel Density (scaled by Total GDP)	0.030	0.024	0.006***	0.029	0.030	-0.001
PE/VC Density (scaled by Total Population)	16.696	14.867	1.828***	16.380	16.796	-0.417
PE/VC Density (scaled by Total GDP)	0.349	0.318	0.031***	0.345	0.350	-0.005
GDP per Capita	45513.550	43476.870	2036.683***	45068.630	45655.460	-586.836**
Domestic Market Capitalization	14700000.000	13900000.000	846793.600***	14600000.000	14700000.000	101250.800
MSCI Returns	0.057	0.054	0.003	0.062	0.055	0.007
Minority Shareholders Protection Index	7.093	7.011	0.082***	7.088	7.094	-0.006
IDV	88.840	87.819	1.021***	88.478	88.969	-0.491*
UAI	46.726	46.942	-0.217**	46.797	46.700	0.097
Exit Outcomes						
Successful Exits	0.005	0.123	-0.118***	0.010	0.003	0.007***
IPO Exits	0.000	0.018	-0.018***	0.001	0.000	0.001*
Acquisition Exits	0.005	0.105	-0.100***	0.009	0.003	0.006***

Table 3.5. Mean Descriptive Statistics by Main Characteristics (Continued)

	Pure Angel Deals vs. Pure PE/VC Deals			Mixed Angel Deals vs. Pure PE/VC Deals		
	Pure Angel Deals	All PE/VC Deals	Mean Differences	Mixed Angel Deals	All PE/VC Deals	Mean Differences
Deal Characteristics						
Deal Size	10.481	124.884	-114.403***	33.437	124.884	-91.447***
No. of Deals per Year	1.247	1.183	0.064***	1.214	1.183	0.031***
Total No. of Deals	3.602	3.509	0.092	3.439	3.509	-0.070
No. of Angel Deals per Year	427.586	337.825	89.761***	432.535	337.825	94.710***
No. of Investors	1.000	1.849	-0.849***	3.441	1.849	1.592***
Investee Company Characteristics						
Company Valuation	946.253	611.848	334.405	518.697	611.848	-93.151
No. of Employees	500.153	1413.984	-913.831**	513.275	1413.984	-900.709***
Country Characteristics						
Angel Density (scaled by Total Population)	1.424	1.141	0.283***	1.479	1.141	0.338***
Angel Density (scaled by Total GDP)	0.029	0.024	0.006***	0.030	0.024	0.006***
PE/VC Density (scaled by Total Population)	16.380	14.867	1.512***	16.796	14.867	1.929***
PE/VC Density (scaled by Total GDP)	0.345	0.318	0.027***	0.350	0.318	0.032***
GDP per Capita	45068.630	43476.870	1591.760***	45655.460	43476.870	2178.596***
Domestic Market Capitalization	14600000.000	13900000.000	770026.100***	14700000.000	13900000.000	871276.900***
MSCI Returns	0.062	0.054	0.008*	0.055	0.054	0.001
Minority Shareholders Protection Index	7.088	7.011	0.077***	7.094	7.011	0.083***
IDV	88.478	87.819	0.659**	88.969	87.819	1.150***
UAI	46.797	46.942	-0.145	46.700	46.942	-0.242*
Exit Outcomes						
Successful Exits	0.010	0.123	-0.113***	0.003	0.123	-0.120***
IPO Exits	0.001	0.018	-0.017***	0.000	0.018	-0.018***
Acquisition Exits	0.009	0.105	-0.096***	0.003	0.105	-0.102***

Table 3.5. Mean Descriptive Statistics by Main Characteristics (Continued)

Panel B: Descriptive Statistics - Mean Comparison Tests for US vs. Non-US and Pre vs. Post Financial Crisis						
	US Deals vs. Non-US Deals			Pre Financial Crisis Deals vs. Post Financial Crisis Deals		
	US Deals	Non-US Deals	Mean Differences	Pre Financial Crisis Deals	Post Financial Crisis Deals	Mean Differences
Deal Characteristics						
Deal Size	97.798	239.285	-141.487***	130.475	103.538	26.937***
No. of Deals per Year	1.195	1.129	0.065***	1.138	1.237	-0.099***
Total No. of Deals	3.619	2.826	0.793***	3.705	3.294	0.411***
No. of Angel Deals per Year	383.284	8.561	374.723***	169.358	507.261	-337.903***
No. of Investors	1.931	1.771	0.160***	1.932	1.883	0.048***
Investee Company Characteristics						
Company Valuation	522.527	940.119	-417.592***	492.290	806.369	-314.078***
No. of Employees	1133.142	3369.230	-2236.088***	1413.038	1310.516	102.523
Country Characteristics						
Angel Density (scaled by Total Population)	1.251	0.400	0.851***	0.607	1.681	-1.074***
Angel Density (scaled by Total GDP)	0.026	0.008	0.018***	0.014	0.034	-0.020***
PE/VC Density (scaled by Total Population)	16.677	4.395	12.283***	11.759	18.046	-6.287***
PE/VC Density (scaled by Total GDP)	0.356	0.093	0.264***	0.268	0.369	-0.102***
GDP per Capita	45053.450	34546.230	10507.210***	39828.630	47194.830	-7366.194***
Domestic Market Capitalization	15800000.000	1802092.000	14000000.000***	13600000.000	14200000.000	-556171.400***
MSCI Returns	0.051	0.073	-0.022***	0.091	0.019	0.072***
Minority Shareholders Protection Index	7.101	6.298	0.804***	6.870	7.163	-0.293***
IDV	91.000	68.030	22.970***	88.372	87.352	1.020***
UAI	46.000	52.842	-6.842***	46.882	46.979	-0.097*
Exit Outcomes						
Successful Exits	0.113	0.131	-0.018***	0.109	0.122	-0.013***
IPO Exits	0.016	0.023	-0.008***	0.023	0.010	0.013***
Acquisition Exits	0.097	0.107	-0.010***	0.086	0.113	-0.026***

Table 3.6. PROBIT Regression Models for How Angel Investors Make Investments

This table presents clustered PROBIT model results of the determinants of Angel versus PE/VC investments and we report the associated marginal effects on those determinants. All dependent variable across Model (1) to (14) is different indicator dummy variable to capture All Angels, Pure Angel, Mixed Angel and Pure PE/VC investors, all other variables are as defined in Table 3.3. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: For All Rounds Deals														
	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)		Model (7)	
	All Angels		All Angels		All Angels		All Angels		Pure Angel		Mixed Angels		Pure PE/VC	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
LN of GDP per capita	0.1259	2.89***	0.1961	3.43***	0.0262	1.15	0.0262	1.15	-0.0059	-0.82	0.0326	1.73*	-0.0262	-1.15
LN of Domestic Market Capitalization	-0.0381	-1.95*	-0.0535	-2.96***	-0.0098	-1.10	-0.0098	-1.10	0.0003	0.11	-0.0103	-1.32	0.0098	1.10
MSCI Returns	0.0360	2.00**	0.0418	2.51**	0.0208	1.93*	0.0208	1.93*	0.0087	3.07***	0.0124	1.38	-0.0208	-1.93*
Minority Protection Index			-0.0303	-2.58***	-0.0206	-3.36***	-0.0206	-3.36***	-0.0047	-2.19**	-0.0165	-3.38***	0.0206	3.36***
LN of Number of Employees					-0.0120	-8.67***	-0.0120	-8.67***	-0.0031	-9.19***	-0.0091	-7.20***	0.0120	8.67***
Number of Deals per Year					0.0062	2.69***	0.0062	2.69***	0.0024	2.00**	0.0037	1.89*	-0.0062	-2.69***
IDV							0.0028	1.04	0.0001	0.22	0.0024	1.04	-0.0028	-1.04
UAI							0.0000	-0.03	0.0000	0.05	0.0001	0.07	0.0000	0.03
Industry Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	79229		76651		39304		39304		38171		39253		39304	
Pseudo R2	0.0609		0.0627		0.0709		0.0709		0.0682		0.0627		0.0709	

Table 3.6. PROBIT Regression Models for How Angel Investors Make Investments (Continued)

Panel B: For Only 1st Round Deals														
	Model (8)		Model (9)		Model (10)		Model (11)		Model (12)		Model (13)		Model (14)	
	All Angels		All Angels		All Angels		All Angels		Pure Angel		Mixed Angels		Pure PE/VC	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
LN of GDP per capita	0.2251	4.47***	0.2891	4.84***	0.1488	3.19***	0.1488	3.19***	0.0264	1.74*	0.1287	3.21***	-0.1488	-3.19***
LN of Domestic Market Capitalization	-0.0779	-3.46***	-0.0928	-4.50***	-0.0556	-3.27***	-0.0556	-3.27***	-0.0069	-1.39	-0.0505	-3.37***	0.0556	3.27***
MSCI Returns	0.0449	2.08**	0.0501	2.58***	0.0362	1.92*	0.0362	1.92*	0.0105	1.63	0.0273	1.74*	-0.0362	-1.92*
Minority Protection Index			-0.0277	-2.34**	-0.0290	-2.36**	-0.0290	-2.36**	-0.0140	-3.65***	-0.0177	-1.70*	0.0290	2.36**
LN of Number of Employees					-0.0117	-5.82***	-0.0117	-5.82***	-0.0048	-5.24***	-0.0078	-4.80***	0.0117	5.82***
Number of Deals per Year					0.0357	5.87***	0.0357	5.87***	0.0116	3.49***	0.0245	5.14***	-0.0357	-5.87***
IDV							0.0128	2.62***	0.0013	1.62	0.0100	2.43**	-0.0128	-2.62***
UAI							0.0062	2.52**	0.0012	1.17	0.0048	2.34**	-0.0062	-2.52**
Industry Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	37301		35981		15876		15876		14064		15800		15876	
Pseudo R2	0.1043		0.1072		0.1177		0.1177		0.131		0.0911		0.1177	

Table 3.7. PROBIT Regression Models for Exits Outcomes

This table presents clustered PROBIT model results of the determinants of exit outcomes and we report the associated marginal effects of those determinants. The dependent variables across Model (1) to (24) are different exits dummy variable to capture all successful exits, all IPO exits and all acquisition exits, all other variables are as defined in Table 3.3. For conciseness, we exclude all control variables which contain the exact same variables in Table 3.6: LN of GDP per capita, LN of Domestic Market Capitalization, MSCI Returns, Minority Protection Index, LN of Number of Employees, and Number of Deals per Year, IDV and UAI. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: For All Successful Exits	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)		Model (7)		Model (8)	
	Successful Exits Marginal Effects	z score	Successful Exits Marginal Effects	z score	Successful Exits Marginal Effects	z score	Successful Exits Marginal Effects	z score	Successful Exits Marginal Effects	z score	Successful Exits Marginal Effects	z score	Successful Exits Marginal Effects	z score	Successful Exits Marginal Effects	z score
All Angels	-0.2661	-16.19***									-0.2796	-0.98				
All Angels * Minority Protection Index											0.0019	0.05				
Pure Angel			-0.1805	-7.18***									-0.7495	-1.42		
Pure Angel * Minority Protection Index													0.0808	1.08		
Mixed Angels					-0.3189	-10.90***			-0.1348	-3.15***					-0.0642	-0.25
Mixed Angels * Minority Protection Index															-0.037	-1
Pure PE/VC							0.2661	16.19***	0.1852	7.39***						
Controls	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	39835		39835		39835		39835		39835		39835		39835		39835	
Pseudo R2	0.0427		0.032		0.0409		0.0427		0.043		0.0427		0.0321		0.0409	

Table 3.7. PROBIT Regression Models for Exits Outcomes (Continued)

Panel B: For All IPO Exits	Model (9)		Model (10)		Model (11)		Model (12)		Model (13)		Model (14)		Model (15)		Model (16)	
	IPO Exits Marginal Effects	z score	IPO Exits Marginal Effects	z score	IPO Exits Marginal Effects	z score	IPO Exits Marginal Effects	z score	IPO Exits Marginal Effects	z score	IPO Exits Marginal Effects	z score	IPO Exits Marginal Effects	z score	IPO Exits Marginal Effects	z score
All Angels	-0.0823	-4.77***									-0.5623	-5.01***				
All Angels * Minority Protection Index											0.0688	4.12***				
Pure Angel			-0.0544	-2.76***									-1.0118	-5.01***		
Pure Angel * Minority Protection Index													0.1353	4.63***		
Mixed Angels					Omitted				Omitted						Omitted	
Mixed Angels * Minority Protection Index															Omitted	
Pure PE/VC							0.0823	4.77***	0.0577	2.82***						
Controls	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	39391		39391		37868		39391		37868		39391		39391		37868	
Pseudo R2	0.1395		0.1333		0.1307		0.1395		0.1321		0.1397		0.1336		0.1307	

Table 3.7. PROBIT Regression Models for Exits Outcomes (Continued)

Panel C: For All Acquisition Exits																
	Model (17)		Model (18)		Model (19)		Model (20)		Model (21)		Model (22)		Model (23)		Model (24)	
	Acquisition Exits Marginal Effects	z score	Acquisition Exits Marginal Effects	z score	Acquisition Exits Marginal Effects	z score	Acquisition Exits Marginal Effects	z score	Acquisition Exits Marginal Effects	z score	Acquisition Exits Marginal Effects	z score	Acquisition Exits Marginal Effects	z score	Acquisition Exits Marginal Effects	z score
All Angels	-0.2073	-12.14***									0.0131	0.07				
All Angels * Minority Protection Index											-0.0314	-1.18				
Pure Angel			-0.1374	-5.74***									-0.1916	-0.43		
Pure Angel * Minority Protection Index													0.0077	0.12		
Mixed Angels					-0.2477	-10.00***			-0.1071	-3.03***					0.1019	0.54
Mixed Angels * Minority Protection Index															-0.0502	-1.89**
Pure PE/VC							0.2073	12.14***	0.1416	5.87***						
Controls	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	39829		39829		39829		39829		39829		39829		39829		39829	
Pseudo R2	0.0374		0.0274		0.0359		0.0374		0.0378		0.0375		0.0274		0.036	

Table 3.8. Regression Models for Testing 1st-Round Angel Certification Effect on Exits
This table presents clustered PROBIT model results of the determinants of exit outcomes, and we report the associated marginal effects of those determinants. We analyze separately the impact of firms with first-round angel finance. All dependent variables across Model (1) to (3) are different exits with a dummy variable to capture all successful exits: all IPO exits and all acquisition exits; all other variables are as defined in Table 3.3. For conciseness, we exclude all control variables which contain the exact same variables in Table 3.6: LN of GDP per capita, LN of Domestic Market Capitalization, MSCI Returns, Minority Protection Index, LN of Number of Employees, and Number of Deals per Year, IDV and UAI. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	Model (1) Successful Exits		Model (2) IPO Exits		Model (3) Acquisition Exits	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
Firms with 1st-round Angel Financing	-0.0441	-5.07***	-0.0033	-0.68	-0.0472	-5.82***
Controls	Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes	
Number of Observations	23504		23340		23494	
Pseudo R2	0.0601		0.1661		0.0492	

Table 3.9. Regression Models for Density Tests

This table presents double clustered OLS model results of the determinants of Angel density. Panel A presents the contemporaneous analysis and Panel B presents the 1-year lead dependent variable analysis, all other variables are as defined in Table 3.3. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: Contemporaneous Dependent Variable Analysis								
	Model (1)		Model (2)		Model (3)		Model (4)	
	Angel Density (scaled by Total Population)		Angel Density (scaled by Total GDP)		VC/PE Density (scaled by Total Population)		VC/PE Density (scaled by Total GDP)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
LN of GDP per capita	1.024	3.37***	0.0187	3.25***	7.2385	6.45***	0.116	5.79***
LN of Domestic Market Capitalization	0.3805	4.76***	0.008	5.36***	4.5284	6.90***	0.0972	8.73***
MSCI Returns	0.7328	1.36	0.0138	1.32	2.5262	0.61	0.0411	0.59
Minority Protection Index	0.5121	2.96***	0.0096	2.93***	5.4758	5.04***	0.103	5.76***
LN of Number of Employees	-0.0312	-4.35***	-0.0006	-4.38***	-0.2624	-7.88***	-0.0046	-8.21***
Number of Deals per Year	0.0895	3.84***	0.0017	3.98***	0.2437	1.80*	0.0034	1.48
IDV	-0.0493	-3.16***	-0.0009	-3.12***	-0.3212	-5.89***	-0.0056	-5.47***
UAI	-0.0206	-3.33***	-0.0004	-3.26***	-0.1175	-4.73***	-0.0022	-4.51***
Constant	-14.1809	-5.41***	-0.2732	-5.50***	-139.5022	-16.12***	-2.6146	-17.68***
Industry Effects	Yes		Yes		Yes		Yes	
Country Effects	No		No		No		No	
Year Effects	Yes		Yes		Yes		Yes	
Number of Observations	38687		38687		39886		39886	
R2	0.4652		0.4747		0.7047		0.7371	

Panel B: Lead 1-year Dependent Variable Analysis								
	Model (5)		Model (6)		Model (7)		Model (8)	
	Angel Density (scaled by Total Population)		Angel Density (scaled by Total GDP)		VC/PE Density (scaled by Total Population)		VC/PE Density (scaled by Total GDP)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
LN of GDP per capita	0.5047	6.18***	0.0093	6.02***	3.3561	7.27***	0.049	5.75***
LN of Domestic Market Capitalization	0.2061	5.47***	0.0043	5.97***	2.8999	11.36***	0.0616	12.47***
MSCI Returns	-0.0573	-0.16	-0.0017	-0.25	-2.4843	-1.93*	-0.0542	-2.41**
Minority Protection Index	0.3438	4.98***	0.0063	4.85***	2.5193	8.29***	0.0424	8.32***
LN of Number of Employees	-0.0229	-2.97***	-0.0004	-3.16***	-0.1464	-3.68***	-0.0025	-3.39***
Number of Deals per Year	0.0472	0.64	0.0009	0.67	0.1429	0.32	0.0028	0.36
IDV	-0.0258	-6.59***	-0.0005	-6.59***	-0.1623	-6.08***	-0.0027	-5.15***
UAI	-0.007	-3.67***	-0.0001	-3.57***	-0.0591	-3.24***	-0.0011	-2.94***
Constant	-7.0155	-9.75***	-0.1331	-9.58***	-67.5293	-15.22***	-1.2064	-14.01***
Industry Effects	Yes		Yes		Yes		Yes	
Country Effects	No		No		No		No	
Year Effects	Yes		Yes		Yes		Yes	
Number of Observations	36215		36215		37440		37437	
R2	0.1398		0.1543		0.1847		0.2039	

Table 3.10. Mean Comparison Tests - Disclosure Regulation and Bankruptcy Law Changes

This table provides the main mean descriptive statistics across different main characteristics by all completed deals, angel deals and PE/VC deals. The table also provides the two-sample means test results between major characteristics groups in our data. Panel A presents the mean comparison tests of Pre vs. Post Disclosure Regulation change, Panel B presents the mean comparison tests of Pre vs. Post Bankruptcy Law change. The means test is a two-sample t-test with equal variance. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: Post Disclosure Regulation Change vs. Pre Disclosure Regulation Change - Mean Characteristics Comparisons									
	All Deals			Angel Deals			PE/VC Deals		
	Post Disclosure Regulation Change	Pre Disclosure Regulation Change	Mean Differences	Post Disclosure Regulation Change	Pre Disclosure Regulation Change	Mean Differences	Post Disclosure Regulation Change	Pre Disclosure Regulation Change	Mean Differences
Deal Characteristics									
Deal Size	98.249	108.117	-9.869	21.763	18.424	3.339	105.874	114.101	-8.228
No. of Deals per Year	1.215	1.175	0.040***	1.231	1.349	-0.118***	1.214	1.167	0.048***
Total No. of Deals	3.533	3.996	-0.463***	3.225	5.936	-2.711***	3.556	3.899	-0.343***
No. of Angel Deals per Year	440.893	79.934	360.959***	531.047	85.098	445.948***	434.145	79.671	354.474***
No. of Investors	1.95	2.058	-0.108***	2.842	3.164	-0.322***	1.883	2.003	-0.119***
Investee Company Characteristics									
Company Valuation	590.179	390.61	199.569***	628.37	181.511	446.859	589.577	393.2	196.377***
No. of Employees	1091.338	1542.028	-450.690***	326.438	724.815	-398.378	1133.934	1585.704	-451.770***
Country Characteristics									
Angel Density (scaled by Total Population)	1.435	0.283	1.152***	1.716	0.302	1.415***	1.414	0.282	1.131***
Angel Density (scaled by Total GDP)	0.03	0.008	0.022***	0.035	0.008	0.026***	0.029	0.008	0.021***
Institutional Density (scaled by Total Population)	18.774	5.322	13.451***	19.514	5.594	13.920***	18.718	5.309	13.410***
Institutional Density (scaled by Total GDP)	0.395	0.148	0.247***	0.403	0.156	0.247***	0.394	0.148	0.246***
Exit Outcomes									
Successful Exits	0.115	0.141	-0.026***	0.004	0.003	0	0.124	0.148	-0.024***
IPO Exits	0.012	0.04	-0.028***	0	0	0	0.013	0.042	-0.029***
Acquisition Exits	0.103	0.101	0.002	0.003	0.003	0	0.111	0.106	0.005

Table 3.10. Mean Comparison Tests - Disclosure Regulation and Bankruptcy Law Changes (Continued)

Panel B: Post Bankruptcy Law Change vs. Pre Bankruptcy Law Change - Mean Characteristics Comparisons									
	All Deals			Angel Deals			PE/VC Deals		
	Post Bankruptcy Law Change	Pre Bankruptcy Law Change	Mean Differences	Post Bankruptcy Law Change	Pre Bankruptcy Law Change	Mean Differences	Post Bankruptcy Law Change	Pre Bankruptcy Law Change	Mean Differences
Deal Characteristics									
Deal Size	120.343	108.863	11.48	29.312	23.663	5.65	130.044	113.83	16.214**
No. of Deals per Year	1.217	1.163	0.054***	1.236	1.246	-0.01	1.216	1.159	0.056***
Total No. of Deals	3.337	3.91	-0.573***	2.944	5.359	-2.416***	3.368	3.843	-0.474***
No. of Angel Deals per Year	453.732	116.662	337.070***	527.318	114.774	412.544***	447.755	116.753	331.002***
No. of Investors	1.906	2.048	-0.142***	2.821	3.017	-0.196***	1.834	2.003	-0.169***
Investee Company Characteristics									
Company Valuation	768.269	396.184	372.085***	822.135	230.085	592.05	767.344	398.383	368.961***
No. of Employees	1263.558	1581.711	-318.153***	448.966	661.345	-212.379	1309.323	1624.569	-315.246***
Country Characteristics									
Angel Density (scaled by Total Population)	1.502	0.404	1.098***	1.74	0.4	1.340***	1.483	0.404	1.079***
Angel Density (scaled by Total GDP)	0.031	0.01	0.021***	0.035	0.01	0.025***	0.03	0.01	0.020***
Institutional Density (scaled by Total Population)	17.948	8.418	9.529***	18.925	8.425	10.500***	17.871	8.418	9.453***
Institutional Density (scaled by Total GDP)	0.372	0.21	0.162***	0.388	0.211	0.176***	0.37	0.21	0.161***
Exit Outcomes									
Successful Exits	0.12	0.126	-0.006**	0.005	0.006	-0.001	0.129	0.132	-0.002
IPO Exits	0.011	0.031	-0.019***	0	0	0	0.012	0.032	-0.020***
Acquisition Exits	0.109	0.095	0.014***	0.005	0.006	-0.001	0.117	0.099	0.018***

Table 3.11. Countries with Disclosure Regulation Changes: Difference-in-Differences Tests

This table presents the double clustering difference-in-differences testing model results by controlling individual investee firms and years effects estimates of testing the treat-after effects before and after the disclosure regulation changes on different investee firm, country and exits characteristics by controlling different facets of characteristics in addition to controlling the fixed effects of industry groups. All dependent variable across Model (1) to (4) are four major density variables, Treat1 is a dummy variable capturing the disclosure regulation change countries, After1 is a dummy variable capturing the after-disclosure regulation change effect, Treat1 * After1 is a dummy variable capturing the treat-after effect for disclosure regulation change. All control variables in all testing models in Table 3.6 are the same as those in Table 3.5. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	Model (1) Angel Density (scaled by Total Population)		Model (2) Angel Density (scaled by Total GDP)		Model (3) PE/VC Density (scaled by Total Population)		Model (4) PE/VC Density (scaled by Total GDP)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Treat1 * After1	1.5121	4.16***	0.029	4.20***	13.9633	9.67***	0.2622	9.73***
Treat1	1.1409	2.60***	0.0213	2.53**	-3.837	-1.99**	-0.0819	-2.34**
After1	-1.344	-3.79***	-0.0261	-3.89***	-5.0875	-3.92***	-0.099	-4.07***
Controls	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
Country Effects	No		No		No		No	
Year Effects	Yes		Yes		Yes		Yes	
Number of Observations	38594		38594		39740		39740	
R2	0.6204		0.6265		0.8516		0.8752	

Table 3.12. Countries with Bankruptcy Law Changes: Difference-in-Differences Tests

This table presents the double clustering difference-in-differences testing model results by controlling individual investee firms and years effects estimates of testing the treat-after effects before and after the bankruptcy law changes on different investee firm, country and exits characteristics by controlling different facets of characteristics in addition to controlling the fixed effects of industry groups. All dependent variable across Model (1) to (4) are four major density variables, Treat2 is a dummy variable capturing the bankruptcy law change countries, After2 is a dummy variable capturing the after-bankruptcy change effect, Treat2 * After2 is a dummy variable capturing the treat-after effect for bankruptcy law change. All control variables in all testing models in Table 3.6 are the same as those in Table 3.5. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	Model (1) Angel Density (scaled by Total Population)		Model (2) Angel Density (scaled by Total GDP)		Model (3) PE/VC Density (scaled by Total Population)		Model (4) PE/VC Density (scaled by Total GDP)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Treat2 * After2	0.8853	2.74***	0.0171	2.85***	16.193	7.89***	0.3164	8.07***
Treat2	-0.6557	-0.94	-0.0166	-1.25	-23.4981	-9.64***	-0.4722	-10.45***
After2	-0.0956	-0.38	-0.0024	-0.57	-8.8898	-5.45***	-0.1976	-6.41***
Controls	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
Country Effects	No		No		No		No	
Year Effects	Yes		Yes		Yes		Yes	
Number of Observations	38594		38594		39740		39740	
R2	0.6501		0.6517		0.8822		0.8778	

Table 3.13. Countries with Disclosure Regulation and Bankruptcy Law Changes: Difference-in-Differences Tests

This table presents clustered difference-in-differences testing model results by controlling individual investee firms and years effects estimates of testing the treat-after effects before and after the disclosure regulation changes on different investee firm, country and exits characteristics by controlling different facets of characteristics in addition to controlling the fixed effects of industry groups. All dependent variable across Model (1) to (4) are four major density variables, Treat1 is a dummy variable capturing the disclosure regulation change countries, After1 is a dummy variable capturing the after-disclosure regulation change effect, Treat2 is a dummy variable capturing the bankruptcy law change countries, After2 is a dummy variable capturing the after-bankruptcy change effect, Treat1 * After1 is a dummy variable capturing the treat-after effect for disclosure regulation change, Treat2 * After2 is a dummy variable capturing the treat-after effect for bankruptcy law change and (Treat1 * After1) * (Treat2 * After2) is a dummy variable capturing the double treat-after effect for both policy changes. All control variables in all testing models in Table 3.6 are the same as those in Table 3.5. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	Model (1) Angel Density (scaled by Total Population)		Model (2) Angel Density (scaled by Total GDP)		Model (3) PE/VC Density (scaled by Total Population)		Model (4) PE/VC Density (scaled by Total GDP)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
(Treat1 * After1) * (Treat2 * After2)	0.9746	4.15***	0.0172	3.87***	6.1205	5.40***	0.0705	3.38***
Treat1 * After1	0.2845	1.90*	0.0066	2.23**	7.4117	6.51***	0.1717	8.45***
Treat1	0.6134	1.57	0.0118	1.53	-2.1885	-1.75*	-0.0414	-1.62
After1	-0.2837	-1.69*	-0.0067	-1.99**	-1.6735	-2.22**	-0.0549	-3.12***
Treat2 * After2	0.0488	0.13	0.001	0.11	6.0283	4.95***	0.1333	5.78***
Treat2	0.1337	0.2	-0.0007	-0.06	-10.4302	-5.76***	-0.2267	-6.65***
After2	-0.1134	-0.34	-0.0012	-0.15	-5.4971	-4.69***	-0.1024	-4.76***
Controls	Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes	
Country Effects	No		No		No		No	
Year Effects	Yes		Yes		Yes		Yes	
Number of Observations	38687		38687		39886		39886	
R2	0.6851		0.6868		0.936		0.9267	

107

Table A3.1. Mean Descriptive Statistics - Unmatched vs. Matched Sample Means Comparisons

This table provides the main mean descriptive statistics across different main characteristics by All Angel Deals vs. Pure PE/VC Deals. The table also provides the two-sample means test results between major characteristics groups in our data. We present three subpanel analyses which the first subpanel shows the previous unmatched sample characteristics and the subsequent two subpanels are based on propensity score matching methods based on two different criteria. The means test is a two-sample t-test with equal variance. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	PE/VC Deals			ter PS Matching: All Angel Deals vs. Pure PE/VC De			ter PS Matching: All Angel Deals vs. Pure PE/VC De		
	All Angel Deals	All PE/VC Deals	Mean Differences	All Angel Deals	All PE/VC Deals	Mean Differences	All Angel Deals	All PE/VC Deals	Mean Differences
Deal Characteristics									
Deal Size	27.821	124.884	-97.063***	427.658	405.161	22.498	427.658	287.757	139.901
No. of Deals per Year	1.223	1.183	0.040***	1.243	1.139	0.104	1.243	1.174	0.069
Total No. of Deals	3.482	3.509	-0.028	4.389	3.569	0.819	4.389	3.361	1.028**
No. of Angel Deals per Year	431.338	337.825	93.513***	297.792	263.556	34.236	297.792	285.333	12.458
No. of Investors	2.799	1.849	0.950***	2.771	1.576	1.194***	2.771	1.688	1.083***
Investee Company Characteristics									
Company Valuation	595.046	611.848	-16.802	761.922	712.46	49.461	761.922	516.034	245.888
No. of Employees	509.982	1413.984	-904.002***	3789.896	1623.306	2166.59	3789.896	2268.514	1521.382
Country Characteristics									
Angel Density (scaled by Total Population)	1.466	1.141	0.325***	0.987	0.877	0.11	0.987	0.948	0.039
Angel Density (scaled by Total GDP)	0.03	0.024	0.006***	0.021	0.019	0.002	0.021	0.021	0
PE/VC Density (scaled by Total Population)	16.696	14.867	1.828***	13.183	13.348	-0.165	13.183	13.966	-0.783
PE/VC Density (scaled by Total GDP)	0.349	0.318	0.031***	0.285	0.296	-0.011	0.285	0.309	-0.024
GDP per Capita	45513.55	43476.87	2036.683***	41747.43	41921.746	-174.316	41747.43	42077.268	-329.838
Domestic Market Capitalization	14700000	13900000	846793.600***	12685752.3	13938458.2	-1252705.890*	12685752.3	14608973.7	-1923221.410***
MSCI Returns	0.057	0.054	0.003	0.066	0.056	0.01	0.066	0.073	-0.007
Minority Shareholders Protection Index	7.093	7.011	0.082***	6.884	6.974	-0.09	6.884	6.95	-0.066
IDV	88.84	87.819	1.021***	88.007	89.618	-1.611	88.007	89.264	-1.257
UAI	46.726	46.942	-0.217**	45.847	46.035	-0.188	45.847	46.34	-0.493
Exit Outcomes									
Successful Exits	0.005	0.123	-0.118***	0.042	0.257	-0.215***	0.042	0.306	-0.264***
IPO Exits	0	0.018	-0.018***	0.007	0.056	-0.049**	0.007	0.111	-0.104***
Acquisition Exits	0.005	0.105	-0.100***	0.035	0.201	-0.167***	0.035	0.194	-0.160***

Table A3.2. PROBIT Regression Models for Exits Outcomes - Propensity Score Matching Sample Tests

This table presents clustered PROBIT model results by controlling individual investee firms and years effects estimates of testing the exits outcomes by controlling different facets of characteristics in addition to controlling the fixed effects of industry groups and countries and we report the associated marginal effects in the table. All dependent variable across Model (1) to (3) is successful exits dummy variable to capture all successful exits, either an IPO exit or an acquisition exit, all other variables are as defined in Table 3.3. All control variables in all testing models in Table A3.2 are the same as those in Table 3.5. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	Model (1)		Model (2)		Model (3)	
	Unmatched Sample: Successful Exits		Matched Sample 1: Successful Exits		Matched Sample 2: Successful Exits	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
All Angels	-0.2661	-16.19***	-0.4180	-6.20***	-0.4193	-6.20***
Controls	Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes	
Number of Observations	39835		8053		7969	
Pseudo R2	0.0427		0.0678		0.0679	

Table A3.3. Robustness Checks for U.S vs. Non-U.S. Subsamples

This table presents clustered PROBIT model results by replicating main results from Tables 3.6, 3.7 and 3.8. All dependent variable across Model (1) to (4) in Panel A is indicator dummy variable to capture All Angels investors. All dependent variables across Model (1) to (6) in Panels B and C are successful exits dummy variable to capture all successful exits, either an IPO exit or an acquisition exit, all other variables are as defined in Table 3.3. All control variables in all testing models in Table A3.2 are the same as those in Table 3.5. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: PROBIT Regression Models for How Angel Investors Make Investments - All Rounds and 1st Round Only								
	U.S. Subsample				Non-U.S. Subsample			
	Model (1)		Model (2)		Model (3)		Model (4)	
	All Angels - All Rounds		All Angels - 1st Round Only		All Angels - All Rounds		All Angels - 1st Round Only	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
LN of GDP per capita	0.0490	1.85*	0.2787	5.78***	-0.0069	-0.26	-0.0169	-0.55
LN of Domestic Market Capitalization	-0.0136	-1.39	-0.0856	-5.11***	-0.0086	-0.59	-0.0188	-1.12
MSCI Returns	0.0225	1.78*	0.0544	2.59***	0.0106	0.77	-0.0164	-0.74
Minority Protection Index	-0.0278	-3.65***	-0.0582	-4.68***	-0.0108	-1.09	-0.0169	-2.05**
LN of Number of Employees	-0.0124	-8.82***	-0.0116	-5.59***	-0.0065	-4.20***	-0.0081	-3.53***
Number of Deals per Year	0.0059	2.24**	0.0369	5.67***	0.0057	0.71	0.0043	0.27
IDV	omitted	omitted	omitted	omitted	0.0042	0.45	-0.0050	-0.44
UAI	omitted	omitted	omitted	omitted	0.0028	0.42	-0.0051	-0.61
Industry Effects	Yes		Yes		Yes		Yes	
Country Effects	No		No		Yes		Yes	
Year Effects	Yes		Yes		Yes		Yes	
Number of Observations	36399		14474		2640		1210	
Pseudo R2	0.0708		0.1237		0.0884		0.1005	

Table A3.3. Robustness Checks for U.S vs. Non-U.S. Subsamples (Continued)

Panel B: PROBIT Regression Models for Exits Outcomes

	U.S. Subsample						Non-U.S. Subsample					
	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
	Successful Exits		IPO Exits		Acquisition Exits		Successful Exits		IPO Exits		Acquisition Exits	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
All Angels	-0.2859	-18.91***	-0.0788	-4.71***	-0.2278	-15.84***	-0.1291	-2.07**	omitted	omitted	-0.072	-1.38
Controls	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Country Effects	No		No		No		Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	36477		36145		36477		3338		2943		3329	
Pseudo R2	0.0462		0.142		0.0431		0.0432		0.1303		0.0332	

Panel C: Regression Models for Testing 1st-Round Angel Certification Effect on Exits

	U.S. Subsample						Non-U.S. Subsample					
	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
	Successful Exits		IPO Exits		Acquisition Exits		Successful Exits		IPO Exits		Acquisition Exits	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
Firms with 1st-round Angel Financing	-0.0489	-4.80***	-0.0051	-1.09	-0.0516	-5.23***	0.1101	2.72***	0.0527	1.86*	0.062	1.52
Controls	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Country Effects	No		No		No		Yes		Yes		Yes	
Year Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	21863		21729		21863		1636		1516		1624	
Pseudo R2	0.0608		0.1666		0.052		0.0733		0.1714		0.0589	

111

Chapter 4

Private Equity Exits in Emerging Markets

4.1. Introduction

The development and importance of emerging markets within the global financial system can no longer be questioned. Emerging market economies contribute more than two-thirds of global growth and more so their growth is projected to increase. It is suggested by IMF (2014) that growth levels reached 4.7 percent in 2013, 4.9 percent in 2014 and potentially 5.3 percent in 2015. Brazil, Russia, India, China and South Africa (BRICS countries) currently rank within the top 10 largest economic entities. Without emerging markets, worldwide economic growth would be much lower than it currently is. Financial institutions have for years sought to take advantage of this growth. As a result of the unprecedented growth in many emerging markets in the 1990's, increasing numbers of private equity (PE) investors have navigated these risky markets to profit from not only the economic growth but also the lowering of state intervention in those markets (Leeds and Sunderland, 2003). The opportunities for PE investments were thought to have developed significantly in both scale and quality in emerging markets over the past decades. However, at the same time, the same investors were quick to come to the realization that there were challenges within the emerging markets that they were not prepared for resulting in unmet expectations. Not only were these emerging markets still relatively immature and, under-developed, but there were, and arguably are, insurmountable regulatory restrictions and corporate governance weaknesses. Also amid the expectation of emerging hot spot PE markets such as China and India achieving GDP growth rates in double-digits, it is possible that as a result of too much capital chasing too

few good deals, PE investors may have rushed to invest without adequately preparing for the risks of a prolonged slowdown (Cumming and Macintosh, 2006; Ippolito, 2007; Aizenman and Kendall, 2012; Klonowski, 2013). Our study thus aims to explore the determinants of successful PE investments by measuring successful PE exits. We analyze the relationship between the development of business environments and legal protections and successful exit. We would be remiss in our analysis if we did not consider the role of corruption on the potential of success for PE investments in that previous researches have established the negative effect of corruption on the cost of doing business (Fisman and Wei, 2004; Fisman and Miguel, 2007; Fisman and Svensson, 2007; Fisman and Miguel, 2007; Fisman et al., 2008). With more studies documenting the impact of corruption on the cost of doing business at both the economic and firm-specific levels (Mauro, 1995; Rodriguez, Uhlenbruck and Eden, 2005), very few of those studies focus on the PE investments in these corrupt jurisdictions. In a more recent study of Cumming, Fleming, Johan and Takeuchi (2010), they used 21 Asia-Pacific countries data to provide competing hypotheses regarding the impact of corruption on PE investments across markets. Our study aims to test similar competing hypotheses in emerging markets with wider range countries (35 jurisdictions worldwide) using a longer sample period (1992 - 2012). Finally, we also seek to determine whether the dot com bubble and the recent financial crisis had any effect on PE investments in emerging economies.

We believe our research will shed light on relatively opaque PE activities in emerging markets. PE investors, as sophisticated financial intermediaries catering to equally if not more sophisticated institutional investors, primarily invest in relatively high risk, illiquid securities in private firms. Given that such investee firm characteristics are

113

combined with high risk and volatile political environments in emerging markets, we can safely deduce that PE investments in emerging economies are riskier than that of developed countries. As such, the divestment or exit strategy which is the measure of success of an investment might be planned and executed by considering more critical factors. Our study is related to a growing body of research that establishes legal protection to be important factors to explain the size, structure and success of PE investments, results of course varying depending on the data analyzed (Lerner and Schoar, 2005; Cumming et al., 2006; Cressy et al., 2007; Cao and Lerner, 2009; Johan and Najar, 2011).

Our study benefits from the comprehensiveness of PitchBook's deal level database which provides us a unique opportunity to investigate the PE exit probabilities across emerging markets. The data documents the heterogeneities of investee firm-level characteristics together with business environments, legal conditions, security market structure and performance, macroeconomic and cultural dimensions as well as industry dispersions. We present our robust results based on 2,733 PE deals of 1,499 investee firms to investigate PE exits strategies and impact from multi-facet factors. Our findings suggest that better business and legal environments in emerging markets increase the probability of successful exits for PE investors. We also find that PE investors are better able to mitigate the potential costs associated with inefficient and corrupt business environments to increase the probability of exits by IPOs in countries with higher levels of corruption. Moreover, our findings suggest that market shocks arguably concentrated in the developed markets result in a negative ripple effect as the probability of successful exits, especially by way of IPOs, decreases for PE investors in emerging markets.

Our study complements the growing literature on private equity, business ethics, corruption and IPO. We believe our findings not only support those of Cumming, et. al (2006) and Cumming et. al, (2010), but also augment both studies as our analysis comprises more jurisdictions and include the unique period of the recent financial crisis. Our analysis of PE investments in emerging markets also adds to the existing international comparative literature on PE and emerging markets to provide more updated information regarding PE divestment strategies as well as to provide an analysis on the impacts from dot com bubble and the recent financial crisis on those divestment strategies in emerging markets.

The remainder of this chapter is organized as follows. We discuss extant literature and develop our hypotheses in Section 4.2. Section 4.3 presents the data and our summary statistics, while section 4.4 presents the regression analyses. Section 4.5 provides an outlook for future research and concludes.

4.2. Literature Review and Hypotheses

PE investors divest their holdings or exit from their investments in five ways: initial public offerings (IPOs), acquisitions, secondary sales, buybacks and write-offs (Black and Gilson, 1998; Cumming and Johan, 2013). The last two methods of exits are deemed to be the least successful from the perspective of the PE investor and the investee firm as they do not result in any significant inflow of additional capital into the firm. The IPO is deemed to be the most successful method of exit from all parties concerned due to the potential for new capital inflow to the firm and the potential for profit for the PE investors (Black and Gilson, 1998; Cumming and MacIntosh, 2003a, b; Fleming, 2004;

Schwienbacher, 2008; Cumming and Johan, 2013). In this study, we focus on the first two main strategies not only in unison but separately as well to test whether divestment strategies are different across emerging markets, and to acknowledge differences between public exits (IPOs) versus private exits (acquisitions).

There is a developed body of literature examining how legal institutional environments impact economic growth and equity returns. Cross-jurisdictional studies categorize countries and financial markets by differences in legal origins and qualities (La Porta et al., 1998a, b; Botazzi et. al., 2009) and others use the World Bank's ease of doing business index to proxy the business environment as the index ranks economies on their ease of starting a business, getting credit, protecting minority investors and/or enforcing contracts (Ho and Wong, 2007; Groh et. al., 2009). A high ease of doing business ranking means the regulatory environment is more conducive to the starting and operating a business and therefore PE investors investing in firms situated in these countries with better legal and business environments might potentially benefit as this enables PE investors to more effectively provide advice during the investment process but also to affect organizational changes to ensure efficient exits from the same firms (Cumming and Johan, 2007, 2008, and 2013). This is the basis of our first hypothesis.

Furthermore, better legal conditions and business environments will together facilitate better enforcement of private equity contracts, and information asymmetries between PE investors, investee firms and outside investors during both investment and divestment periods can be alleviated in a more efficient way (La Porta et al., 1998a, b; Lerner and Schoar, 2005; Cumming et. al., 2006). Therefore, all else being equal, we believe that there is a higher probability for PE investors to exit from their investments in

high risk firms in relatively high risk emerging markets in countries with better legal and business environments. We therefore hypothesize the following Hypothesis H1a:

H1a. *Better business and legal environments in emerging markets will increase the probability for PE investors to exit from their investments successfully.*

As we mentioned earlier, we would be remiss in our analysis if we did not take into account the role of corruption in the emerging markets we are considering. Extant research has established the distortionary effects of corruption on foreign direct investment (Habib and Zurawicki, 2001 and 2002; Wei, 2000; Javorcik and Wei, 2009). While corruption has previously been viewed was implicit in various measures of both economic and political risk, for the purposes of our study we believe it is appropriate to view corruption measures as separate explaining variable of PE investment success. For example, Tanzi (1998) suggests that by making regulatory controls ineffective, corruption acts as an arbitrary tax and Wei (1997) finds that the unpredictability of corruption adds to investment risk, therefore apart from the legal and business conditions PE investors consider while making investment and divestment decisions, another important institutional idiosyncrasy they take into consideration is the corruption level within certain jurisdictions (Wong et al., 2013). On the one hand, corruption might reduce economic endeavors by increasing transaction costs and business uncertainties (Shleifer and Vishny, 1993; Fisman and Svensson, 2007), building barriers to investments (Cuervo-Cazurra, 2006; Hakkala, Norbäck and Svaleryd, 2008) and as suggested by Rose-Ackerman (1998), by increasing the misallocations of resources. On the other hand,

117

it has been suggested that some corruption might actually be beneficial, particularly in weak institutional settings such as those in emerging markets, to circumvent bureaucratic obstacles, inefficient public procurements and rigid legislation (Leff, 1964; Lien, 1990; Huntington, 1968; Vaal and Ebben, 2011). It can be beneficial to entrepreneurial endeavors and economic growth in dysfunctional institutional settings (Egger and Winner, 2005; Levy, 2007; Méon and Weill, 2010).

As sophisticated financial intermediaries, PE investors are expert at utilizing their skills and value-add capabilities to mitigate the potential agency problems, especially those resulting from corruption. We are in line with Cumming et. al. (2010) in their supposition that sophisticated PE investors are able to not only identify, but more significantly circumvent the bureaucratic and regulatory obstacles to bring about organizational change in the investee firms, thus generating absolutely higher returns as they exit successfully from their investments. By providing both advice and monitoring to investee firms and implementing both new governance and incentive structures within those firms, we expect PE investors to enjoy better returns from more successful exits in those markets (Cumming et. al., 2010). As such, we posit in Hypothesis H1b:

H1b. *Higher levels of corruption in emerging markets will increase the probability for PE investors to exit from their investments successfully.*

There is a wide body of research that establishes the expertise of private equity investors at timing the market, or knowing when to most profitably exit from their investments (Lerner, 1994; Gompers, 1996; Megginson and Weiss, 1991; Gompers et. al.,

2008). As we mentioned earlier, the IPO is deemed to be the most profitable, hence sought after, mode of exit for PE investors. While numerous studies have taken into account the effect of the dot com bubble in their analysis of IPOs, we seek to include the recent financial crisis in ours for the following reasons. Although the global financial crisis broke out in earnest in soon after August 2007, it was clear that an earthquake had hit the developed economies and that emerging economies would be affected, but it was unclear how and when it would do so. There was no doubt there would be a negative ripple effect but as to whether the ripple would be more tsunami-like for some economies but not others was unknown then. Like the dot com bubble, the crisis originated in a developed economy, but unlike the dot com bubble, the recent financial crisis occurred during an unprecedented period of heightened interconnectivity of global financial markets. PE investors, who albeit are skilled at making and divesting from investments may not have been adequately prepared for the extent of the effects of the crisis on the financial markets in emerging economies. The recent global financial crisis also gave policymakers a chance to pass more stringent rules to regulate the financial market, and the activities of financial intermediaries more specifically. The adoption of Dodd-Frank Act in the U.S. and the Alternative Investment Fund Managers Directive (AIFMD) in the E.U. are two examples of regulatory changes resulting in closer monitoring of the PE industry in developed markets. The combination of an unforeseen market shock originating from a developed economy and the ensuing increased oversight of PE activities also originating from developed economies makes this analysis more pertinent in the context of emerging markets. We are thus taking this opportunity to determine the extent of the ripple effects of the global financial crisis on PE investors in emerging

economies. We use as guidance the findings of Cumming and Zambelli (2013) that use Italy as a unique example to test the impact of excessive regulatory changes on PE returns and firm performance. They find that extreme regulatory changes in Italy reduced the supply of capital as well as the likelihood of a PE investor to exit from his investment by an IPO, especially during the post-crisis period. In addition, we also refer to Ritter (1998, 2003) who suggests that it is more expensive to go public than to exit via other vehicles due to the obligatory legal, financial, and other professional advisors required to initiate the process, the transaction costs of preparing a prospectus, and the well documented "under-pricing effect" of IPOs, not to mention the ongoing costs of reporting requirements for publicly listed firms. Considering increased costs associated with IPOs during and after the global financial crisis, numerous IPO market professionals have expressed the view that regulatory changes together with changes in investor sentiment have changed the dynamics of the IPO marketplace (Henry and Gregoriou, 2013). In brief, while the literature in the area of law and finance and corporate governance document that better legal environments will foster better financial markets, few have considered the altered business environment after the recent global financial crisis. In our investigation into whether the financial markets in emerging markets have been reshaped during and after the crisis, we hypothesize in Hypothesis H2:

H2. *The recent financial crisis as a market shock will decrease the probability for PE investors to exit from their investments successfully.*

4.3. Data and Summary Statistics

We use PitchBook's PE deals database as our main data source while at the same time merging other data from Transparency International, the World Federation of Exchanges and the World Bank to construct our main variables. The PitchBook data provide investee firm-level PE deal characteristics which include not only deal sizes but also PE investee firms' geographical and industry information. Our sample data span from 1992 to 2012, with a total of 3,087 PE deals in 1,648 investee firms from 35 countries around the world. As we are primarily focusing of PE exits from investments as a measure of success, we only track completed deals. Other deals which are in progress, postponed or failed, we exclude from the following analysis. Our final sample comprises a total of 2,733 PE deals in 1,499 investee firms from 35 countries.[13]

Our cross-jurisdictional analysis across different PE divestment strategies adds to the existing literature on single country or regional analysis. Our study is the first and relatively the most comprehensive study to discuss PE investments in emerging markets and the associated main exit strategies for PE investors. Not only the BRICS countries are included in our sample, we also have PE deals in other countries where less attention has been paid so far. We believe this significantly differentiates our study from recent work that has only focused PE exits in China, India or the Asian region (Kuchimov, 2010; Prahl, Zeisberger and Cannarsi, 2011).

Figure 4.1 illustrates how PE investments in the emerging markets have changed over the periods from 1992 to 2012. The number of deals per year increased dramatically within this period with a peak of 361 deals in 2011. Although we notice a sharp decline

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[13] Note: In the subsequent reported Table 4.2, not all variables have 2,733 observations (88.5% of the original data 3,087 observations) because of data limitation. Some of the variables do not occur in some of the years or not reported for some of the countries and territories.

from 328 deals in 2007 to 247 deals in 2009 due to the recent financial crisis around the world, PE investments rebounded very quickly in these young and growing markets. In terms of dollar amounts invested in emerging markets, Figure 4.1 shows us that the trend almost co-moves with the total number of deals in each year. The aggregated deal sizes in each year are increasing from about only $1.5 billion in 2002 to the peak of about $51 billion in 2007. Both PE investors and entrepreneurs in emerging markets have obviously built fast-growing and promising alternative investment markets to fuel the economic growth.

Table 4.1 summarizes the key features associated with our sample distribution of a total of 2,733 completed PE deals in emerging markets. The industry distribution is widely dispersed in emerging markets with a total of 40 industries related to those PE investee firms. The top 5 most invested deals are in the software, commercial services, media, communications and networking and retail industries. Among the top are traditionally preferred PE investor industries such as software, pharmaceuticals and biotechnology; but we also find several other PE investments made in less traditional industries such as agriculture or the forestry industry. This enables us to investigate the heterogeneity of industries in our exploration of the determinants of successful PE exits in emerging markets.

Moreover, there are ten major terminology definitions from international organizations and financial institutions for emerging markets: IMF, BRICS plus Next Eleven, FTSE, MSCI, S&P, J.P. Morgan EM bond index, Dow Jones, Russell, Columbia University's Emerging Market Global Players (EMGP) and BBVA Research. We matched all countries in our PitchBook dataset to make sure at least one of the definitions

can be applied. In this way, we have found 35 countries in our sample can be defined as an emerging market and we list those countries in Table 4.1, with BRICS countries coming on top of the league table in terms of total number of deals completed.[14] Usually when referring to emerging markets, BRICS countries are mentioned and studied the most extensively. However, in Table 4.1, we provide additional information on deals in other less researched countries like Argentina, Poland, Turkey, etc, which enriches our study and adds to existing literature. We believe the obvious heterogeneity in country-specific characteristics such as business environments, legal origins, business cultures and levels of economic developments, will help us perform a more comprehensive study. Another point to note from Table 4.1 is that the emerging market countries seem to be concentrated in the middle income group as defined by the World Bank. This creates another facet to discuss as to whether the income levels of those emerging market countries affect both PE investments and divestments in these countries.

Table 4.2 summarizes the main variables in our dataset. As we investigate the probability of successful exits within emerging markets, we use the IPO exits dummy and acquisition exits dummy as the main dependant variables. The explanatory variables include the country-specific corruption perceptions indices (CPI) from Transparency International, the ease of doing business rankings from the World Bank, and the legal origins to proxy the business environments and legal conditions; the GDP per capita, the MSCI returns, the domestic stock market capitalizations and the financial crisis period dummy to proxy the security market and macroeconomic conditions in emerging markets

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[14] 3 out of 5 BRICS countries are in the TOP 5 list and 4 out 5 countries are in the TOP 10 list, South Africa is an outlier within the BRICS group in our sample with fewer deals completed.

and one of the six Hofstede's dimensions of cultural variables, as well as a variety of control variables to capture the investee firm and industry characteristics.

Our primary variables of interest are those variables that proxy the emerging markets' business environments and legal origins as well as the financial crisis period dummy, which is defined as a variable that equals to one for all PE deals completed during the 2007 to 2009 period, and equals to zero otherwise. We believe our study serves to fill a research gap as it focuses on the potential business environment change brought about by the financial crisis and empirically tests whether global financial crisis changes PE investors' behavior, especially their exit strategies in emerging markets.

Table 4.3 presents the pair-wise simple correlations to highlight the relationship across major variables. The correlations in Table 4.3 confirm the hypothetical relationship between PE exit strategies and the business environment as well as the global financial crisis at the investee firm deal level. For example, we find that when the ease of doing business ranking is lower (the rank number is larger and thus the business environment is worse), it is less likely for PE investors to exit, and especially to successfully exit by using acquisition strategies. And when we look at the financial crisis period dummy's relationship with other variables, we also find that the business environment gets worse in emerging markets and the security market performance lower during the global financial crisis period. However, note that our correlations also highlight some potential colinearity issues across different explanatory variables, which we explore in our multivariate empirical tests in the next section.

Our data provides us with a unique opportunity to explore all possible reasons behind PE investors' behavior. For example, in addition to the different business

environments factors, there might be other reasons or factors influencing such divestment strategies for PE investors, for example, cultural dimensions or income levels in those countries. Moreover, the PitchBook database provides detailed information on testing international differences across countries and over time, which can further explain the reasons behind those strategies.

We examine the data in PROBIT regression models across countries and years. Our first step is to show some of the highlighted features from our PitchBook deals data, and provide preliminary means difference tests results. In panel A of Table 4.4, we divide our entire data sample into two groups to determine whether a specific completed deal is a result of a PE exit strategy or not. Regarding the comparison of business environments, on average, those exited deals are in countries with better business environments. The ease of doing business rankings are relatively higher (ranked about 6 ranks higher), although there is no significant difference with regards to the CPI scores.

In panel A of Table 4.4, we also find that compared with those exited deals, other types of deals are significantly smaller in terms of deal sizes. This is not surprising, because PE exits usually occur at later stages over the investment cycles; the larger the size of such deal, the higher chance PE investors will get higher realized returns from their initial investments. Moreover, when we look at the macroeconomic and security market conditions in emerging markets for those exited and other types of deals, we can find that the stock market returns are relatively higher in those countries for exited deals, which implies that if PE investors and entrepreneurs use equity as their main security alignment in the contracts, market timing is an important sentiment to consider before executing the exit strategies. We should also note that the domestic market capitalizations

in those countries for exited deals are relatively smaller (on average about 12% less) than those countries for other types of deals, suggesting that PE investors may find it easier to exit in smaller emerging security markets.

Panel B of Table 4.4 divides our sample by PE exit types, and then further sorts them by the financial crisis period dummy to show if PE investors' exit strategies change during this specific crisis period. Clearly, when combining all the successfully exited deals together, we can observe several interesting features in our dataset: First, the business environment seems to be worse in emerging markets during the financial crisis period. The CPI scores are lower, the ease of doing business ranks are lower and the legal environment is relatively worse, especially for those IPO deals. Second, deal sizes are smaller during the global financial crisis, only IPO deals have bigger deal sizes during the crisis period. PE investors seem to act as more cautious players and exit their investments only if the deal sizes are large enough to get the expected realized returns. Third, in terms of the macroeconomic and security market conditions changes, we can also find that during the crisis period, PE investors tend to choose larger security markets to exit their investments. As larger security market might be more liquid than smaller ones; therefore, such type of markets will accelerate the exits.

Another important point to note from Table 4.4 Panel B is the number of employees across different type of exit strategies. Although the differences between the two categories are insignificant, this number decreases in two out of three sub-panels, especially for the IPO deals. The financial crisis did have impact on the investee firms with possible layoffs and size shrinking. IPO exits have the highest number of employees for our two types of exit strategies. This suggests that the number of employees in

126

investee firms may serve as a good control variable to measure the determinants of investee firm success. Moreover, other type of exit strategies usually have less number of investee firm employees which also suggests that acquisition strategy is usually carried out during growth and expansion stages or when such investee firms need to seek restructuring. We discuss this notion in more detail in later sections, and we provide robust results to confirm our findings.

We mentioned in an earlier section that La Porta et al. (1997, 1998) have found legal origin to be a significant determinant in shaping financial markets around the world. In panel C of Table 4.4, we summarize the different deal characteristics by legal origins in our dataset. Those exited deals in common law countries will have relatively better business environment, macroeconomic and cultural conditions in terms of significantly higher CPI scores, significantly higher GDP per capita and higher entrepreneurial risk-taking scores (UAI). Although other indicators return insignificant results, we still find consistent results with La Porta et al. (1998, 2006) that residing in a better legal environment helps protect PE investors' values. In return, those PE investors will have higher chances to exit their investments easier, and enjoy a better governance environment where barriers to exit can be lowered.

Panel D of Table 4.4 summarizes the mean characteristics test results between the BRICS and non-BRICS subsamples in emerging markets. As their important roles in the global economy have been more and more recognized, BRICS countries usually referred the most as emerging markets in the literature and media which encourages us to perform additional tests to find out more interesting results in this subsample. In our tests, we did find that 7 out of 9 main features of our BRICS subsample return significant differences

127

between their counterpart countries in emerging markets. BRICS emerging markets have relatively worse business environment in terms of lower CPI scores and lower ranks in the ease of doing business ranks; and they have lower GDP per capita but larger and better performed security market in terms of larger domestic market capitalization and MSCI returns as well as a cultural environment favoring risk-taking with larger sizes of investee firms in terms of the number of employees. Such differences are worthy of performing more detailed regression analysis in the following section.

4.4. Regression Analyses

Now that we have laid out some of the unique features and consistent findings from other studies, we perform our regression analyses using clustered PROBIT models by controlling year effects in addition to controlling the industry and country fixed effects. We report associated marginal effects on each explanatory variable. We also perform several subsample tests and show several robustness checks before drawing our conclusions.

In our main regression analyses, we consider whether the exit strategy is associated with different business environments and legal origins, macroeconomic and security market conditions as well as other factors. We then consider the subsamples of the two main exit strategies of IPO and acquisition to investigate how different types of exits will be affected by the same set of factors considered in emerging markets. In addition, we also perform tests regarding the BRICS countries to provide more comprehensive analysis. The main regression models use the following specification:

Dummy Variable of Successful Exits Type = f (Business Environment Conditions, Legal Origins, Macroeconomic and Security Market Conditions, Cultural Variables, Investee Firm Characteristics and Industry and Country Dummies)

Most of our major variables are defined in Table 4.2. Note that there are a large number of explanatory variables that we could have included but chose to exclude. The primary reasons for our parsimonious specification are as follows. First, the selected variables are plausibly pertinent to the probability of PE exits in emerging markets for the purposes of testing H1a and H1b. The specifications enable us to assess the factors on possible different exit strategies through other control variables in order to test other hypotheses. Second, note that the excluded variables are highly collinear. Hence, any additional control variables for the available sets of countries and years would not be perfectly suitable without potentially introducing spurious results into the regressions. Examples include some other cultural variables measured by Hofstede, as well as other legal variables such as the German or French law origin dummies. Our selection and reporting of variables was conducted to assess the factors that directly impact possible PE exiting strategies and hopefully to capture all related facets of factors that PE investors would consider before making such business decisions.

Before we present the main regression results, let us look at Figure 4.2 first. We use time-series graph to show the trend for the number of PE exits over the sample period from 1993 to 2012. These three trend lines almost co-move with each other and move in the similar upward directions. For each sample year, usually the numbers of acquisition exits are more than IPO exits. One interesting feature from Figure 4.2 is that those

numbers of exits by different strategies all peak in 2007, the PE investors seem to choose exits around the financial crisis and they seem to have the possible "crisis timing" ability. Another important feature from Figure 4.2 is the upward slopes we observe for the different types of exits, the emerging PE market is growing in a healthier and more mature manner with more and more PE investors divest by using different strategies. We thus want to perform additional subsample tests to confirm whether different type of divestment strategies will have been associated with different levels of impacts from our explanatory variables.

In Panel A of Table 4.5, all dependent variables across Models (1) to (3) are the dummy variables indicating whether or not the deal is a successful exit (as a whole), or either in an IPO or acquisition format, respectively. From Models (1) to (3), most of our two business and legal environment conditions variables return statistically significant marginal effects at the 1% and 5% levels, which confirms our H1a that better business and legal environments in emerging markets will increase the probability for PE investors to exit from their investments successfully. Although Model (3) for acquisition exits returns insignificant results on these two variables, the other two models generate non-negligible economic significance. For example, in Model (1), a 1% increase in the ease of doing business rankings will increase the successful exits likelihood by 0.50%. Put it in a more numerical and vivid way, if the ease of doing business ranking for a country will increase from a rank of 86 to 80, the successful PE exits likelihood will increase by 3.75%. And a 1% increase in the common law legal origin will increase the successful exits likelihood by 41.66%. Model (2) for our IPO exits returns even larger marginal effects as expected. Therefore, our hypothesis H1a is confirmed.

With regards to our hypothesis H1b, we only found statistically significant result in Model (3) on the acquisition exits. A 1% increase in the CPI score will increase the acquisition exits likelihood by 16.18%, which is quite compelling and this model indicates that the higher the CPI score, the less corrupt environment is in that country and the higher acquisition exits likelihood will be in such an environment. If we view that less corruption is an indicator for better business environment, our H1a gets another support from our Model (3) result. However, since Models (1) and (2) in Panel A did not return statistically significant results with different signs, our hypothesis H1b cannot be validated. In addition to these results, we also find that the size of the exited deals is an important factor in the divestment decisions as larger deals will drive higher probability to divest, no matter what exit format is used. Throughout Models (1) to (3) in Panel A, all the marginal effects for LN of deal size are statistically positive at 1% level and the economic significance is also large with a 1% increase in the LN of deal size will increase the successful exits likelihood by 9.01% (also about 6.50% and 3.56% increases for IPO and acquisition exits, respectively). The higher the deal size both parties agree on a PE exit, the higher probability such a deal will be successfully completed. Moreover, the domestic security market capitalization matters more for IPO deals while a cultural environment favoring less risk-taking will increase the acquisition exits probability.

In order to provide more robust results regarding our H1a and H1b, we followed previous literature that using BRICS countries as our major emerging markets players. In Panel B of Table 4.5, we replicated all the specifications in Panel A by using BRICS countries only. Although Model (4) did not return statistically significant result, Models (5) and (6) gave some support for our H1a and H1b. For example, Model (5) indicates

131

qualitatively similar results to Model (2) in Panel A with quite comparable economic significance on the ease of doing business rankings. Surprisingly, the CPI score returns quite different results in Models (5) and (6). For acquisition exits test in Model (6), the result is very similar to our Model (3) in Panel A and helped support H1a instead. But the results for IPO exits in Model (5) for BRICS countries, we find some supporting evidence for H1b that higher levels of corruption in emerging markets will increase the probability for PE investors to exit from their investments successfully, especially by using IPO strategy. A 1% decrease in the CPI score will increase the IPO exits likelihood by 27.57%, indicating that a more corrupt business environment in BRICS countries will enhance the PE investments exit probability. Partially this finding is consistent with the results found in Cumming et. al (2010) which finds that PE managers have the ability to mitigate the potential for corruption in such a country. While their study focuses on the buyout returns, ours look at the probability of successfully divesting in emerging markets. Our new results add to the literature to help understand and explore divestment strategies in a different manner in emerging markets.

Given all of the results we have found in Table 4.5, we can confirm that our hypothesis H1a is fully supported that better business and legal environments in emerging markets will increase the probability for PE investors to exit from their investments successfully. Although we cannot find strong support for our hypothesis H1b, what we want to argue is that the corruption level within a country still has non-negligible impact on the divestment strategies, the format of the exit strategy will be quite different given different levels of corruption and somehow PE managers might have the ability to mitigate the potential impact from the corrupt environments. It seems the debate

132

regarding this double-sword role of corruption will continue in the literature and we should take a separate view on the divestment strategies of different formats.

In order to explore whether the global financial crisis as a market shock will have any impacts on the PE investments exit probability, we use the dummy variable which equals one for all completed PE deals in emerging markets occurred during the period of 2007 to 2009 and equals zero for rest of the deals throughout all of the model specifications. We expect the sign for the financial crisis dummy to be negative, indicating less likelihood for PE investors to divest during the financial crisis due to possible changes in emerging markets business environments, the security market conditions and the investee firm characteristics. Combining the means difference test results from Panel B in Table 4.4, we did notice several changes in emerging markets for those exited deals, especially for those IPO deals. For example, during the financial-crisis period, PE investors tend to exit in countries with larger security market with relatively better business and legal environments, and "time" the market to exit in those security markets when higher returns observed. In this manner, it seems that PE investors have some possible "crisis timing" ability to circumvent the negative impact from the financial crisis to exit successfully. From our regression models in Table 4.6, we can find that Models (1) to (3) return all negative marginal effects with Model (2)'s result is significantly negative at 5% level. The economic significance is also large: a 1% increase in the likelihood of deals completed during the financial crisis period, the probability for successful exits will decrease by 5.94% and for IPO exits, such probability will decrease even larger by 12.72%. Although Models (4) to (6) in Panel B of Table 4.6 to test the BRICS countries subsample did not return any significant results regarding the

financial crisis period dummy, we believe that our proposition in hypothesis H2 still stands and the recent financial crisis as a market shock did decrease the PE exits probabilities, especially for IPO exits. BRICS countries can be viewed as featured emerging markets, but our more broad analysis highlights the importance to consider other emerging economies to come to a thorough conclusion.

Moreover, as documented in Ritter (1998, 2003), it is more expensive to go public than to exit via other vehicles due to the obligatory legal, financial, and other professional advisors required to initiate the process, the transaction costs of preparing a prospectus, and the well documented "under-pricing effect" of IPOs, not to mention the ongoing costs of reporting requirements for publicly listed firms. Considering more expensive costs associated with IPOs and during the global financial crisis, numerous IPO market professionals have expressed that regulatory changes together with changes in investor sentiment, have changed the dynamic of the IPO marketplace (Henry and Gregoriou, 2013), our results in Model (2) of Panel A in Table 4.6 concur those views and confirm our hypothesis H2 in a robust way. For PE investors in emerging markets, they tend to bring investee firms public in countries with relatively better business and legal environments as well as larger domestic security markets but be more cautious to complete such IPO deals during the crisis period. After we controlled for multiple facets of variables and clustered the countries, industries and years fixed effects to correct the model standard errors, we still can find very robust results. In this way, we think our tests confirm our hypothesis H2 that the recent financial crisis as a market shock will decrease the probability for PE investors to exit from their investments successfully, especially by using IPO as the main strategy.

134

Besides our predicted negative ripple effect from the recent global financial crisis, in Table 4.7, we also included another dummy variable which equals to one for deals exited during the period of 2000 to 2002 capturing the dot com bubble and equals to zero otherwise. This market crash caused about $5 trillion loss of market values of companies and if this crash had the similar contagious effect on the emerging PE markets, we would see a similar negative coefficient for this dummy variable. However, in our Table 4.7 tests, the marginal effects are zero across all main and subsample tests specifications and the standard errors and t-statistics are automatically omitted. Given all the other results did not change at all, our proposition is that during the dot com bubble period, the PE market development in emerging markets is trivial and we can barely find many successful exits during that period, at least in our data sample, as recalled results in our Figure 4.1 and 4.2. Moreover, this result also serves emphasis on the later contagious effect from the recent financial crisis on emerging PE market. With the geometric progressive development in emerging markets, the connections between developed and emerging markets countries reinforced, thus the ripple effect from the recent financial crisis will be much more contagious as compared with the dot com bubble.

Overall, our PitchBook deals data and the associated full sample and subsample tests strongly support our hypothesis H1a that better business and legal environment in emerging markets will increase the probability for PE investors to divest. Our hypothesis H1b still cannot be fully confirmed as different divestment strategies will have quite opposite views on corruptions. The "greasing the wheels" hypothesis by Vaal and Ebben (2011) seems to be effective in some of our settings for the IPO exits which highlight the superb abilities of those PE investors in emerging markets. They still can circumvent and

135

execute their divestment strategies successfully even in those emerging markets with higher levels of corruptions. But for acquisition exits, such argument will be invalid and the debate for the role of corruptions in business and finance literature will be continued. In addition, our hypothesis H2 is also supported by our tests that the recent financial crisis as a market shock will decrease the probability for PE investors to exit from their investments successfully because this crisis will change the business and legal environments, the security market conditions and the investee firm characteristics and thus the IPO exits will be much less likely relative to acquisition exits during this crisis period.

4.5. Discussions and Conclusions

This essay investigates the success of PE investment in emerging markets by analyzing successful PE exits. We use private equity deal level data from 2,733 PE deals in 1,499 investee firms from 35 countries worldwide, spanning the 1992-2012 period. We find that better business and legal environments in emerging markets increases the probability for PE investors to exit successfully. We also find that PE investors are better able to mitigate the potential costs associated with inefficient and corrupt business environments to increase the probability of exits by IPOs in countries with higher levels of corruption. However, such "greasing the wheels" proposition cannot be applied to acquisition exits and the competing views of corruption will still be a debate in the literature. Moreover, we document that the recent global financial crisis as a market shock decreases the PE exits probabilities in emerging markets, especially for the strategy to divest by IPOs. All impacts are relatively persistent after controlling for the

136

macroeconomic and security market conditions, cultural dimensions, deals and investee firms' characteristics in addition to controlling for the fixed effects of industries, countries and years.

However, while our results shed light on an area less well researched, we also need to highlight some of the limitations in our study and encourage future researchers in their studies of private equity investments in emerging markets. First, our study suffers to a certain extent from data limitation in that we do not have the detailed performance data associated with those exited deals of different PE investors. If we had been able to obtain such data, we would have been able to perform a deeper analysis to which exit strategy would generate the highest realized returns for PE investors. Second, the financial data at the investee firm level is in our view still rather limited. When we add those data into the multivariate regression models, we suffer lack of observations after controlling a wide variety of important variables. Although we suffer such data limitation, we also perform another means comparison tests in Appendix based on very limited investee firm-level financial data on hand and aimed to compare, at the time of exits, what type of exits will bring investee firm the relatively better performance. We believe that when more detailed financial information is made available, future researchers could, for example, determine what changes PE investors bring to the investee firms, both financially and operationally. Another question that could potentially be answered is what will be the future for emerging PE market development after the financial crisis?

Overall, we believe our findings are useful for policymakers, PE investors as well as entrepreneurs in emerging markets. All three parties should work together to build a more attractive PE playground in emerging markets not just because this market is

perceived to gain from diversification benefits and returns, but because it is actually a market with prosperity and broader growth opportunities. Entrepreneurs can use the capital and advanced skills learned from PE investors to make projects more successful, PE investors can add value in terms of management skills and operational strategies to the investee firms and can divest more efficiently and profitable thus encouraging more fund inflows. A virtuous circle thus can be built up to increase private equity investments in emerging markets.

4.6. Appendix

Although our sample suffers data limitation, we still want to perform means comparison tests to our best efforts with the rather limited investee firm-level financial data on hand to get a brief picture of how investee firms performed at the time of exits across different divestment strategies. In Table A4.1, our analysis focused on IPO and acquisition exits and our comparison tests did reveal some interesting features based on our very limited financial data at the investee firm level.

As shown in Table A4.1, we used five financial performance variables and one operational performance variable for IPO exits and acquisition exits, respectively. We aim to compare and find out which divestment strategy can bring the investee firms relatively better firm-level performances at the time of exits. From the results in Table A4.1, we can find that the means tests of the five financial variables return mixed results. First, acquisition exits outperformed IPO exits in three out of five financial variables. In terms of revenue, gross profit and EBITDA for those exited deals by using acquisition strategy, the investee firm will have better performances compared with IPO counterparts

138

and for EBITDA, the difference is statistically significant. Second, IPO exits outperformed in two out of five financial variables. At the time of exits, those investee firms will have significantly higher net income level, while the EBITDA margin (EBITDA scaled by total revenue) is about 7.6% higher but statistically insignificant. The financial performance variables gave us a rather vague picture of the investee firm performance at the time of exits: sometimes IPO exits will do better, sometimes acquisition exits will be the winner. Third, in terms of the only one operational performance variable of investee firm employee number, IPO exits will have significant higher number of employees at the investee firm level. As documented in former sections, we used this operational performance variable to proxy the size of the investee firm. It is understandable that PE investors will bring investee firms public only if such a firm is relatively more successful and mature, which can be reflected in the number of employees. In this way, from our means tests, we have shed some lights on the different performances that, both financially and operationally, PE investors bring to the investee firms. In the future, when more financial and operational performance data can be made available, more detailed univariate and multivariate tests can be performed to find out more interesting results.

Figure 4.1: Deal Numbers and Sizes over 1992 - 2012

Total Deal Size (M$)   Total Number of Deals
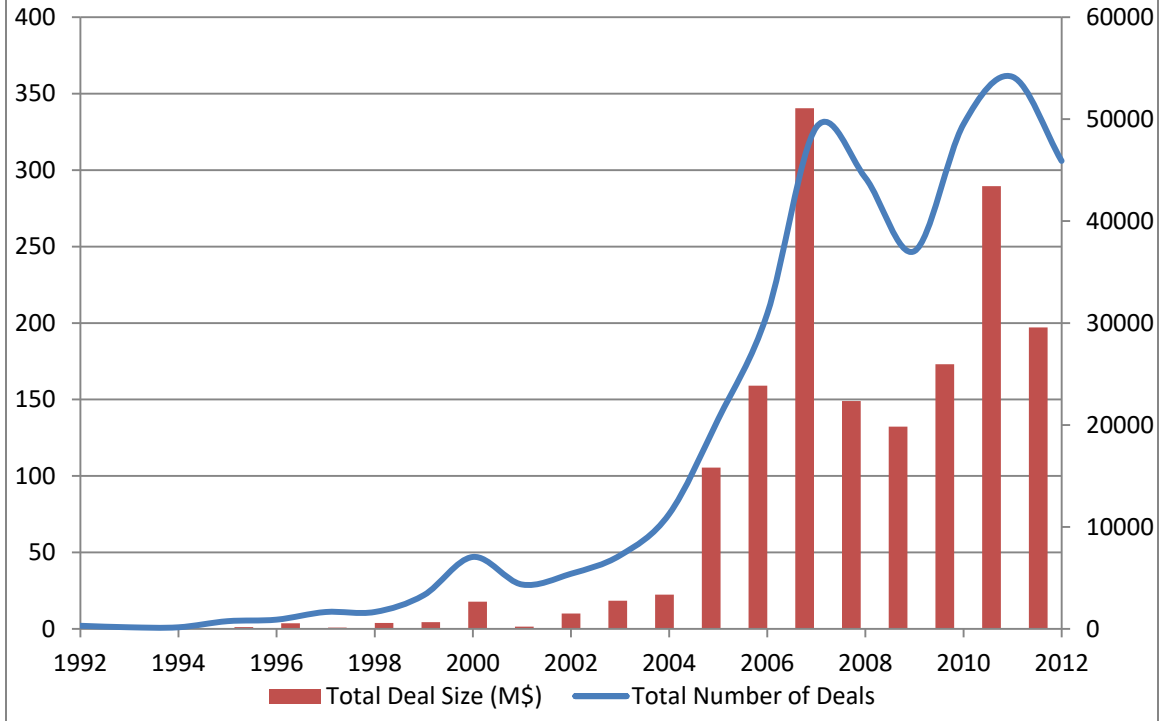
Figure 4.2: PE Exits over 1993 - 2012 (by Different Channels)

Successful Exits   IPOs   Acquicisions
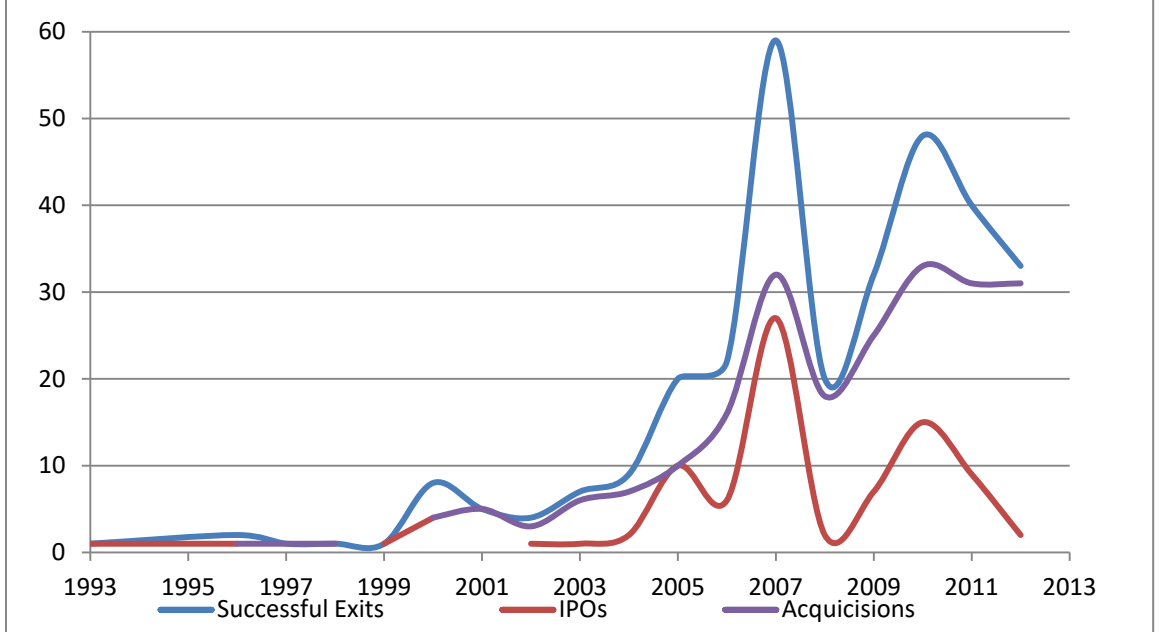
Table 4.1. Sample Distribution for Completed Deals

This table summarizes the key features associated with the sample distribution of 2,733 completed private equity deals in the emerging market.

Year Distributions		Industry Distributions		Country Distribution		Company Country Income Group	
1992	2	Agriculture	10	Argentina	44	High income: non-OECD	91
1993	1	Apparel and Accessories	32	Brazil	185	High income: OECD	748
1994	1	Capital Markets/Institutions	51	Bulgaria	34	Lower middle income	796
1995	5	Chemicals and Gases	24	Chile	34	Upper middle income	1098
1996	6	Commercial Banks	69	China	516		
1997	11	Commercial Products	131	Colombia	28		
1998	11	Commercial Services	346	Czech Republic	50		
1999	22	Commercial Transportation	56	Egypt	5		
2000	47	Communications and Networking	142	Estonia	12		
2001	29	Computer Hardware	77	Greece	16		
2002	36	Construction (Non-Wood)	4	Hungary	41		
2003	48	Consumer Durables	20	India	735		
2004	75	Consumer Non-Durables	105	Indonesia	16		
2005	137	Containers and Packaging	14	Israel	512		
2006	206	Energy Equipment	38	Latvia	3		
2007	328	Energy Services	33	Lithuania	3		
2008	295	Exploration, Production and Refining	45	Malaysia	10		
2009	247	Forestry	10	Mexico	74		
2010	330	Healthcare Devices and Supplies	98	Morocco	2		
2011	361	Healthcare Services	79	Nigeria	6		
2012	306	Healthcare Technology Systems	1	Peru	10		
		Insurance	45	Philippines	16		
		IT Services	65	Poland	41		
		Media	151	Romania	13		
		Metals, Minerals and Mining	16	Russia	68		
		Other Business Products and Services	65	Slovenia	6		
		Other Energy	1	South Africa	24		
		Other Financial Services	81	South Korea	77		
		Other Healthcare	2	Taiwan	45		
		Other Information Technology	1	Thailand	29		
		Other Materials	6	Turkey	40		
		Pharmaceuticals and Biotechnology	94	Ukraine	4		
		Restaurants, Hotels and Leisure	58	United Arab Emirates	17		
		Retail	135	Venezuela	5		
		Semiconductors	23	Vietnam	12		
		Services (Non-Financial)	79				
		Software	458				
		Textiles	15				
		Transportation	41				
		Utilities	12				

Table 4.2. Variable Definitions and Summary Statistics

This table provides definitions of the main variables in the dataset, the data sources, and summary statistics.

Variable Name	Definition	Mean	Median	Standard Deviation	Minimum	Maximum	Number of observations
Business Environments and Legal Origins:							
Corruption Perceptions Index (CPI)	The CPI scores and ranks countries/territories based on how corrupt a country's public sector is perceived to be. The CPI is the most widely used indicator of corruption worldwide. Ranges from 0 to 10. Higher numbers indicate less corrupt countries. Source: http://www.transparency.org/research/cpi/overview.	4.140	3.600	1.232	2.000	8.000	2498
Ease of Doing Business Rankings	Economies are ranked on their ease of doing business, from 1–189. A high ease of doing business ranking means the regulatory environment is more conducive to the starting and operation of a local firm. The rankings are determined by sorting the aggregate distance to frontier scores on 10 topics, each consisting of several indicators, giving equal weight to each topic. Source: http://www.doingbusiness.org/rankings.	86.042	89.000	40.854	8.000	163.000	2073
Common Law Dummy	A dummy variable equal to 1 if a country's legal origin is common law as specified in LLSV 1998.	0.488	0.000	0.500	0.000	1.000	2733
Security Market and Macro Conditions:							
GDP per capita	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Source: World Bank	9554.902	5196.895	10199.700	308.535	46402.640	2463
LN of GDP per capita	The natural log of GDP per capita.	8.500	8.556	1.230	5.732	10.745	2463
MSCI Returns	The country-specific Morgan Stanley Capital International index return over the entire 1992-2012 sample period, a proxy for stock market conditions in each country.	0.114	0.059	0.285	-0.684	1.437	2486
Domestic Market Capitalization	The domestic market capitalization of a stock exchange is the total number of issued shares of domestic companies, including their several classes, multiplied by their respective prices at a given time from the World Federation of Exchanges. This figure reflects the comprehensive value of the market at that time, in $M. Source: http://www.world-exchanges.org/statistics/statistics-definitions	1315914.000	860396.300	1215525.000	6.200	3941039.000	2365
LN of Domestic Market Capitalization	The natural log of domestic market capitalization, in $M.	13.309	13.665	1.541	1.825	15.187	2365

142

Financial Crisis Period Dummy	A dummy variable equal to 1 for the period between 2007 to 2009 to cover the recent financial crisis period.	0.347	0.000	0.476	0.000	1.000	2504
Dot-com Bubble Period Dummy	A dummy variable equal to 1 for the period between 2000 to 2002 to cover the dot-com bubble period.	0.036	0.000	0.185	0.000	1.000	2504
BRICS Country Dummy	A dummy variable equal to 1 for the BRICS countries: Brazil, Russia, India, China and South Africa.	0.559	1.000	0.497	0.000	1.000	2733
Investment Characteristics:							
Deal Size	Firm-level deal size, in $M.	138.611	19.725	514.138	0.010	12450.000	1782
LN of Deal Size	The natural log of deal size, in $M.	3.032	2.982	2.008	-4.605	9.429	1782
Number of Employees	Firm-level number of employees in the investee companies.	6429.075	1000.000	27943.030	2.000	385609.000	850
LN of Number of Employees	The natural log of number of employees.	6.848	6.908	2.061	0.693	12.863	850
Culture Conditions:							
UAI	Hofstede's index of uncertainty avoidance. The uncertainty avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? Countries exhibiting strong UAI maintain rigid codes of belief and behavior and are intolerant of unorthodox behavior and ideas. Weak UAI societies maintain a more relaxed attitude in which practice counts more than principles. Source: http://geert-hofstede.com/dimensions.html.	59.258	64.000	23.349	30.000	112.000	2718
Exits Outcomes:							
Successful Exits Dummy	A dummy variable equal to 1 for IPO or Acquisition exit.	0.115	0.000	0.319	0.000	1.000	2733
IPO Exits Dummy	A dummy variable equal to 1 for an IPO exit.	0.033	0.000	0.178	0.000	1.000	2733
Acquisition Exits Dummy	A dummy variable equal to 1 for an Acquisition exit.	0.082	0.000	0.275	0.000	1.000	2733

Table 4.3. Pair-wise Correlations Matrix

This table provides correlations across the main variables in the dataset. * Significant at least the 5% level of significance.

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
[1]	Corruption Perceptions Index (CPI)	1																	
[2]	Ease of Doing Business Rankings	-0.80*	1																
[3]	Common Law Dummy	0.20*	0.08*	1															
[4]	GDP per capita	0.83*	-0.76*	0.16*	1														
[5]	LN of GDP per capita	0.76*	-0.79*	-0.18*	0.90*	1													
[6]	MSCI Returns	-0.14*	0.09*	-0.02	-0.21*	-0.22*	1												
[7]	Domestic Market Capitalization	-0.52*	0.59*	-0.01	-0.58*	-0.56*	0.03	1											
[8]	LN of Domestic Market Capitalization	-0.50*	0.63*	0.07*	-0.53*	-0.58*	0.08*	0.87*	1										
[9]	Financial Crisis Period Dummy	-0.01	-0.03	-0.03	-0.04	-0.03	-0.03	0.05*	0.10*	1									
[10]	Dot-com Bubble Period Dummy	0.03		0.01	-0.04	-0.06*	-0.11*	-0.15*	-0.22*	-0.14*	1								
[11]	BRICS Country Dummy	-0.68*	0.79*	0.02	-0.71*	-0.73*	0.12*	0.78*	0.83*	0.04*	-0.07*	1							
[12]	Deal Size	-0.02	-0.01	-0.14*	-0.02	0.03	0.03	0.02	0.03	0.02	-0.03	0	1						
[13]	LN of Deal Size	-0.17*	0.08*	-0.28*	-0.18*	-0.06*	0.11*	0.14*	0.12*	0.07*	-0.05*	0.11*	0.48*	1					
[14]	Number of Employees	0.55*	-0.55*	-0.10*	0.69*	0.78*	-0.15*	-0.80*	-0.76*	-0.04	0.08*	-0.76*	0.02	-0.07*	1				
[15]	LN of Number of Employees	-0.10*	0.05	-0.06	-0.11*	-0.09*	0	0.12*	0.11*	0.03	-0.02	0.13*	0.25*	0.20*	-0.16*	1			
[16]	UAI	-0.45*	0.31*	-0.11*	-0.41*	-0.37*	0.05	0.23*	0.24*	0.07	0.01	0.32*	0.30*	0.52*	-0.27*	0.41*	1		
[17]	Successful Exits Dummy	-0.02	-0.05*	-0.09*	0.01	0.05*	0.06*	-0.04	-0.03	0.01	0.03	-0.04*	0.23*	0.33*	0.04*	0.05	0.07*	1	
[18]	IPO Exits Dummy	-0.04*	0.03	-0.05*	-0.07*	-0.05*	0.13*	0.07*	0.06*	0.02	0	0.06*	0.18*	0.22*	-0.07*	0.09*	0.11*	0.51*	1
[19]	Acquisition Exits Dummy	0.01	-0.08*	-0.07*	0.05*	0.08*	-0.01	-0.09*	-0.08*	-0.01	0.03	-0.09*	0.14*	0.23*	0.09*	-0.01	-0.01	0.83*	-0.06*

Table 4.4. Mean Descriptive Statistics by Main Characteristics

This table provides the main mean descriptive statistics across different main characteristics by exited and other deals, during and non-during financial crisis by different exit channels, common law legal origin vs. other legal origins as well as BRICS emerging markets versus Non-BRICS emerging markets comparisons. The table also provides the two-sample means test results between major characteristics groups in our data. The means test is a two-sample t-test with equal variance. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: Descriptive Statistics - Mean Characteristics of Completed Deals, Exits vs. Other Deals

	Corruption Perceptions Index	Ease of Doing Business Ranks	Legal Origin - Common Law	GDP per capita ($)	MSCI Returns	Domestic Market Capitalization (M$)	Deal Size (M$)	UAI	Number of Investee Company Employees
Exits Deals	4.091	80.598	0.362	9755.410	0.163	1188243.000	479.098	61.901	9644.444
Other Deals	4.147	86.803	0.504	9526.138	0.107	1334109.000	98.453	58.913	5832.640
Difference	-0.056	-6.204**	-0.142***	229.272	0.056***	-145866.300*	380.645***	2.989**	3811.803

Panel B: Descriptive Statistics - Mean Characteristics of Completed Exited Deals, Financial-Crisis Period vs. Non-Financial-Crisis Period

	All Successful Exits								
	Corruption Perceptions Index	Ease of Doing Business Ranks	Legal Origin - Common Law	GDP per capita ($)	MSCI Returns	Domestic Market Capitalization (M$)	Deal Size (M$)	UAI	Number of Investee Company Employees
Financial-Crisis Period	4.068	83.775	0.333	9051.447	0.196	1363695.000	437.301	60.091	7895.250
Non-Financial-Crisis Period	4.104	78.133	0.381	10139.070	0.144	1088384.000	497.354	63.203	10767.380
Difference	-0.036	5.642	-0.048	-1087.623	0.052	275311.400*	-60.053	-3.112	-2872.133
	IPO Exits								
	Corruption Perceptions Index	Ease of Doing Business Ranks	Legal Origin - Common Law	GDP per capita ($)	MSCI Returns	Domestic Market Capitalization (M$)	Deal Size (M$)	UAI	Number of Investee Company Employees
Financial-Crisis Period	3.639	91.361	0.222	4730.750	0.424	2077805.000	557.464	45.028	10759.140
Non-Financial-Crisis Period	4.000	94.781	0.453	7062.451	0.216	1515352.000	533.396	54.019	20601.200
Difference	-0.361	-3.420	-0.231**	-2331.701	0.208***	562452.800**	24.068	-8.991*	-9842.064
	Acquisition Exits								
	Corruption Perceptions Index	Ease of Doing Business Ranks	Legal Origin - Common Law	GDP per capita ($)	MSCI Returns	Domestic Market Capitalization (M$)	Deal Size (M$)	UAI	Number of Investee Company Employees
Financial-Crisis Period	4.275	80.133	0.387	11182.200	0.084	1001611.000	317.138	67.419	5795.067
Non-Financial-Crisis Period	4.141	73.333	0.356	11220.040	0.119	933685.300	470.457	66.470	4982.784
Difference	0.134	6.800	0.031	-37.843	-0.035	67926.220	-153.319	0.949	812.282

Table 4.4. Mean Descriptive Statistics by Main Characteristics (Continued)

Panel C: Descriptive Statistics - Mean Characteristics of Completed Exited Deals, by Country Legal Origins									
	Corruption Perceptions Index	Ease of Doing Business Ranks	Legal Origin - Common Law	GDP per capita ($)	MSCI Returns	Domestic Market Capitalization (M$)	Deal Size (M$)	UAI	Number of Investee Company Employees
Legal Origin - Common Law	4.514	81.183	N/A	12123.220	0.169	1187324.000	354.430	57.553	7089.667
Other Legal Origins	3.853	80.261	N/A	8371.151	0.159	1188789.000	556.478	64.380	10950.860
Difference	0.661***	0.922	N/A	3752.071***	0.009	-1465.197	-202.048	-6.827**	-3861.197

Panel D: Descriptive Statistics - Mean Characteristics of Completed Exited Deals, by China and the rest of Emerging Markets									
	Corruption Perceptions Index	Ease of Doing Business Ranks	Legal Origin - Common Law	GDP per capita ($)	MSCI Returns	Domestic Market Capitalization (M$)	Deal Size (M$)	UAI	Number of Investee Company Employees
BRICS Emerging Markets	3.381	110.138	0.365	3892.654	0.225	2081077.000	504.549	45.717	14880.560
Non-BRICS Emerging Markets	4.806	45.457	0.359	15811.020	0.099	264620.400	446.900	78.503	3273.833
Difference	-1.426***	64.681***	0.006	-11918.370***	0.126***	1816457.000***	57.649	-32.786***	11606.730*

Table 4.5. Probit Models for Successful Exits

This table presents clustered PROBIT model results of the determinants of successful exit outcomes and we report the associated marginal effects of those determinants. The dependent variables across Model (1) to (6) are different exits dummy variable to capture all successful exits, all IPO exits and all acquisition exits, all other variables are as defined in Table 4.2. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: All Sample Tests

	(1) Successful Exits		(2) IPO Exits		(3) Acquisition Exits	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
Corruption Perceptions Index (CPI)	0.0348	0.30	-0.0934	-1.10	0.1618	2.52**
Ease of Doing Business Rankings	-0.0050	-2.65***	-0.0054	-3.52***	-0.0009	-0.44
Common Law Dummy	0.4166	2.40**	0.7149	4.21***	-0.2105	-1.06
LN of GDP per capita	-0.1462	-0.56	-0.2040	-1.48	0.1306	0.82
MSCI Returns	0.1401	1.20	0.1041	1.43	0.0851	1.57
LN of Domestic Market Capitalization	0.1191	1.00	0.1880	2.69***	-0.1002	-1.23
LN of Deal Size	0.0901	6.95***	0.0650	4.85***	0.0356	4.60***
UAI	0.0565	1.35	0.0270	0.90	0.0616	1.94*
LN of Number of Employees	-0.0173	-1.18	0.0098	0.99	-0.0191	-1.61
Year Effects	Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes	
Number of Observations	358		317		321	
Pseudo R2	0.2726		0.4379		0.2347	

Panel B: BRICS Sub-Sample Tests

	(4) Successful Exits		(5) IPO Exits		(6) Acquisition Exits	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
Corruption Perceptions Index (CPI)	0.1445	1.63	-0.2757	-1.82*	0.1457	2.29**
Ease of Doing Business Rankings	-0.0021	-0.60	-0.0055	-2.61***	0.0000	0.00
Common Law Dummy	-0.2389	-0.59	-0.1948	-0.85	0.1583	0.64
LN of GDP per capita	-0.1694	-0.62	-0.2507	-1.55	0.1341	0.75
MSCI Returns	0.1642	1.25	0.1228	1.39	0.0910	1.17
LN of Domestic Market Capitalization	0.0888	0.83	0.2152	2.51**	-0.1120	-1.81*
LN of Deal Size	0.0891	4.93***	0.0954	4.37***	0.0236	1.85*
UAI	0.0090	1.66*	0.0022	0.61	0.0015	0.36
LN of Number of Employees	-0.0142	-0.87	-0.0020	-0.22	-0.0123	-0.70
Year Effects	Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes	
Number of Observations	265		235		204	
Pseudo R2	0.2867		0.4654		0.1336	

Table 4.6. Probit Models for Successful Exits - Financial Crisis Impacts

This table presents clustered PROBIT model results of the determinants of successful exit outcomes and we report the associated marginal effects of those determinants and discuss the impacts from the recent financial crisis. The dependent variables across Model (1) to (6) are different exits dummy variable to capture all successful exits, all IPO exits and all acquisition exits, all other variables are as defined in Table 4.2. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: All Sample Tests						
	(1) Successful Exits		(2) IPO Exits		(3) Acquisition Exits	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
Financial Crisis Period Dummy	-0.0594	-1.16	-0.1272	-2.57**	-0.0079	-0.32
Corruption Perceptions Index (CPI)	0.0548	0.46	0.0587	0.51	0.1631	1.91*
Ease of Doing Business Rankings	-0.0042	-1.99**	-0.0034	-2.01**	-0.0008	-0.32
Common Law Dummy	0.5015	2.14**	0.8970	5.26***	-0.2029	-0.92
LN of GDP per capita	-0.3304	-0.83	-0.6156	-2.68***	0.1053	0.47
MSCI Returns	0.0928	0.64	0.0188	0.22	0.0789	1.15
LN of Domestic Market Capitalization	0.2002	1.15	0.3775	3.36***	-0.0891	-0.77
LN of Deal Size	0.0897	6.79***	0.0675	4.73***	0.0356	2.49**
UAI	0.0384	0.87	0.0108	0.35	0.0582	1.34
LN of Number of Employees	-0.0167	-1.13	0.0087	0.92	-0.0189	-1.39
Year Effects	Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes	
Number of Observations	358		317		321	
Pseudo R2	0.2756		0.4568		0.2348	
Panel B: BRICS Sub-Sample Tests						
	(4) Successful Exits		(5) IPO Exits		(6) Acquisition Exits	
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score
Financial Crisis Period Dummy	-0.0811	-1.26	-0.0315	-0.35	0.0148	0.43
Corruption Perceptions Index (CPI)	0.2112	2.29**	-0.2164	-0.85	0.1359	1.93*
Ease of Doing Business Rankings	-0.0011	-0.36	-0.0049	-1.70*	-0.0003	-0.08
Common Law Dummy	-0.6303	-1.04	-0.3380	-0.70	0.2394	0.63
LN of GDP per capita	-0.4565	-1.08	-0.3490	-1.07	0.1915	0.75
MSCI Returns	0.0949	0.56	0.1019	1.11	0.1045	1.25
LN of Domestic Market Capitalization	0.2124	1.20	0.2575	1.69*	-0.1368	-1.32
LN of Deal Size	0.0915	5.12***	0.0958	4.53***	0.0230	1.81*
UAI	0.0158	1.76*	0.0048	0.52	0.0002	0.04
LN of Number of Employees	-0.0141	-0.88	-0.0020	-0.21	-0.0123	-0.70
Year Effects	Yes		Yes		Yes	
Country Effects	Yes		Yes		Yes	
Industry Effects	Yes		Yes		Yes	
Number of Observations	265		235		204	
Pseudo R2	0.2905		0.4661		0.1339	

Table 4.7. Probit Models for Successful Exits - Dot Com Bubble and Financial Crisis Impacts

This table presents clustered PROBIT model results of the determinants of successful exit outcomes and we report the associated marginal effects of those determinants and discuss the impacts from both the dot com bubble and the recent financial crisis. The dependent variables across Model (1) to (6) are different exits dummy variable to capture all successful exits, all IPO exits and all acquisition exits, all other variables are as defined in Table 4.2. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

Panel A: All Sample Tests							
	(1) Successful Exits		(2) IPO Exits		(3) Acquisition Exits		
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	
Financial Crisis Period Dummy	-0.0594	-1.16	-0.1272	-2.57**	-0.0079	-0.32	
Dot-com Crisis Period Dummy	0.0000	Omitted	0.0000	Omitted	0.0000	Omitted	
Corruption Perceptions Index (CPI)	0.0548	0.46	0.0587	0.51	0.1631	2.42**	
Ease of Doing Business Rankings	-0.0042	-1.99**	-0.0034	-2.01**	-0.0008	-0.32	
Common Law Dummy	0.5015	2.14**	0.8970	5.25***	-0.2029	-0.96	
LN of GDP per capita	-0.3304	-0.83	-0.6156	-2.68***	0.1053	0.47	
MSCI Returns	0.0928	0.64	0.0188	0.22	0.0789	1.24	
LN of Domestic Market Capitalization	0.2002	1.15	0.3775	3.35***	-0.0891	-0.80	
LN of Deal Size	0.0897	6.79***	0.0675	4.72***	0.0356	4.19***	
UAI	0.0384	0.87	0.0108	0.35	0.0582	1.48	
LN of Number of Employees	-0.0167	-1.13	0.0087	0.92	-0.0189	-1.56	
Year Effects	Yes		Yes		Yes		
Country Effects	Yes		Yes		Yes		
Industry Effects	Yes		Yes		Yes		
Number of Observations	358		317		321		
Pseudo R2	0.2756		0.4568		0.2348		
Panel B: BRICS Sub-Sample Tests							
	(4) Successful Exits		(5) IPO Exits		(6) Acquisition Exits		
	Marginal Effects	z score	Marginal Effects	z score	Marginal Effects	z score	
Financial Crisis Period Dummy	-0.0811	-1.26	-0.0315	-0.35	0.0148	0.43	
Dot-com Crisis Period Dummy	0.0000	Omitted	0.0000	Omitted	0.0000	Omitted	
Corruption Perceptions Index (CPI)	0.2112	2.29**	-0.2164	-0.85	0.1359	1.93*	
Ease of Doing Business Rankings	-0.0011	-0.36	-0.0049	-1.70*	-0.0003	-0.08	
Common Law Dummy	-0.6303	-1.04	-0.3380	-0.70	0.2394	0.63	
LN of GDP per capita	-0.4565	-1.08	-0.3490	-1.07	0.1915	0.75	
MSCI Returns	0.0949	0.56	0.1019	1.11	0.1045	1.25	
LN of Domestic Market Capitalization	0.2124	1.20	0.2575	1.69*	-0.1368	-1.32	
LN of Deal Size	0.0915	5.12***	0.0958	4.53***	0.0230	1.81*	
UAI	0.0158	1.76*	0.0048	0.52	0.0002	0.04	
LN of Number of Employees	-0.0141	-0.88	-0.0020	-0.21	-0.0123	-0.70	
Year Effects	Yes		Yes		Yes		
Country Effects	Yes		Yes		Yes		
Industry Effects	Yes		Yes		Yes		
Number of Observations	265		235		204		
Pseudo R2	0.2905		0.4661		0.1339		

Table A4.1. Mean Descriptive Statistics Comparisons between IPO and Acquisition Exits

This table provides the main mean financial data descriptive statistics across different main characteristics by IPO and Acquisition exits. The table also provides the two-sample means test results between major characteristics groups in our data. The means test is a two-sample t-test with equal variance. *, **, *** Significant at the 10%, 5% and 1% levels, respectively.

	Investee Company Revenue	Investee Company Gross Profit	Investee Company Net Income	Investee Company ebitda	Investee Company ebitda Margin	Number of Investee Company Employees
IPO Exits	326.575	138.682	55.372	62.224	0.268	16437.250
Acquisition Exits	446.702	163.602	-147.073	153.694	0.192	5283.630
Difference	-120.127	-24.921	202.445***	-91.470***	0.076	11153.620**

Chapter 5

Concluding Remarks

Entrepreneurial finance is the study of valuation and resource allocation in new business ventures and it has played a more and more important role in the development of the economy and financial markets. This dissertation contributes to the literature of both entrepreneurship and finance by providing insights about the economic impact of entrepreneurship, the angel investors' investment behaviors and performances as compared with PE/VC funds around the world as well as the divestment strategies of PE investors in the emerging markets.

In the first essay, we tested the hypothesis that the economic activity that results from entrepreneurial activity is relatively more pronounced in newly established firms, and therefore new business entry has a positive impact on GDP/capita, exports/GDP, and patents per population, and a negative impact on unemployment. Our findings point to institutional and cultural impediments to the effectiveness of entrepreneurship. Most notably, the impact of entrepreneurship is significantly mitigated by excessively strong creditor rights that limit entrepreneurial risk taking. Furthermore, the data indicate cultural attitudes that are associated with low risk taking limit the effectiveness of entrepreneurship. By contrast, the impact of entrepreneurship on exports/GDP does not appear to be directly tied to costs of exporting, which is perhaps best explained by the new economy goods and services created by entrepreneurs that depend less on such costs. For some subsets of the data we find evidence consistent with the view that top tier venture capital funds enhance the impact of entrepreneurship on GDP/capita. Finally, our

results show how different definitions of new business entry matter for empirical analysis of entrepreneurship across countries.

The second essay proposed new theory that examined for the first time whether or not institutions had a more pronounced impact on individuals versus organizations. We specifically examined the case of individuals versus PE/VC funds. Theoretical arguments suggested that institutions, including law and culture, would have a more pronounced impact on individuals relative to organizations. We find that, relative to PE/VC funds, angels prefer investing in active smaller entrepreneurial firms in wealthier countries with better stock market conditions, worse legal environments, and having cultures favored in higher levels of individualism and lower levels of risk-taking. Such behaviors are robust both for the first round deals and deals at all other stages. We also find that, relative to PE/VC funds, those investee firms funded by angels have a lower probability of having successful exits, in either IPO or acquisition; but, better legal environments can help mitigate the negative effects on IPO exits. Moreover, in our subsample tests, the "stepping stone" logic of angels still cannot be proven, because we find that firms who have received angel investments in the first round will have lower probabilities to successfully divest in later rounds. At a country/market level, we also find significant determinants, which can work together to build a well-rounded environment and spawn both angels and PE/VC funds activities. In addition to these results, we also performed difference-in-differences tests to confirm that more stringent disclosure regulations and more forgiving bankruptcy law changes can also spawn the entrepreneurial activities induced by angels and PE/VC funds.

The third essay investigated the success of PE investment in emerging markets by analyzing successful PE exits. We find that better business and legal environments in emerging markets increases the probability for PE investors to exit successfully. We also find that PE investors are better able to mitigate the potential costs associated with inefficient and corrupt business environments to increase the probability of exits by IPOs in countries with higher levels of corruption. However, such "greasing the wheels" proposition cannot be applied to acquisition exits and the competing views of corruption will still be a debate in the literature. Moreover, we document that the recent global financial crisis as a market shock decreases the PE exits probabilities in emerging markets, especially for the strategy to divest by IPOs. All impacts are relatively persistent after controlling for the macroeconomic and security market conditions, cultural dimensions, deals and investee firms' characteristics in addition to controlling for the fixed effects of industries, countries and years.

BIBLIOGRAPHIES

[1]   Acemoglu, D., and Johnson, S., 2005. Unbundling institutions. Journal of Political Economy. 115, 949–95.

[2]   Acharya, V., Yakov, A. and Litov, L., 2011. Creditor rights and corporate risk-taking. Journal of Financial Economics. 102, 150-166.

[3]   Acs, Z.J., Desai, S., and Hessels, J. 2008. Entrepreneurship, economic development and institutions. Small Business Economics. 31, 219-234.

[4]   Aernoudt, R., 1999. Business Angels: Should they fly on their own wings? Journal of Venture Capital. 1(2), 187-195.

[5]   Ahlstrom, D., and Bruton, G. D., 2006. Venture capital in emerging economies: Networks and institutional change. Entrepreneurship Theory and Practice. 30, 299–320.

[6]   Aizenman, J., and Kendall, J., 2012. The internationalization of venture capital. Journal of Economic Studies. 39(5), 488-511.

[7]   Alder, B., Polak, B. and Schwartz, A., 2000. Regulating Consumer Bankruptcy: A Theoretical Inquiry. Journal of Legal Studies. 29, 585–613.

[8]   Almus, M., and Nerlinger, E.A., 2000. Testing "Gibrat's Law" for Young Firms – Empirical Results for West Germany. Small Business Economics. 15, 1-12.

[9]   ARI Halo Report. 2015. The Angel Resource Institute (ARI) at Willamette University 2015 Annual ARI Halo Report, a national survey of angel group investment activity sponsored by PitchBook. Available at: http://www.angelresourceinstitute.org/research/halo-report/halo-report.aspx.

[10]   Armour, J., and Cumming, D., 2006. The Legislative Road to Silicon Valley. Oxford Economic Papers. 58, 596–635.

[11]   Armour, J., and Cumming, D., 2008. Bankruptcy Law and Entrepreneurship. American Law and Economics Review. 10(2), 303–350.

[12]   Audretsch, D., 2007a. The Entrepreneurial Society. Oxford University Press.

[13]   Audretsch, D., 2007b. Entrepreneurship Capital and Economic Growth. Oxford Review of Economic Policy. 23, 63-78.

[14]   Audretsch, D., Acs, Z., and Strom, R., 2009. Entrepreneurship, Growth and Public Policy. Cambridge University Press.

[15]   Audretsch, D., and Acs, Z., 1988. Innovation in Large and Small Firms: An Empirical Analysis. American Economic Review. 78, 678-690.

[16]   Audretsch, D., and Keilbach, M., 2004. Does Entrepreneurship Capital Matter? Entrepreneurship Theory and Practice. 28, 419-430.

[17]   Audretsch, D., and Keilbach, M., 2007. The Localization of Entrepreneurship Capital: Evidence from Germany. Regional Science. 86, 351-365.

[18]   Avdeitchikova, S., Landstorom, H., and Mansson, N., 2008. What do we mean when we talk about business angels? Some reflections on definitions and sampling. Journal of Venture Capital. 10 (4), 371-349.

[19]   Ayotte, K., 2007. Bankruptcy and Entrepreneurship: The Value of a Fresh Start. Journal of Law, Economics, and Organization. 23, 161–85.

[20]   Baird, D. and Morrison, E., 2005. Serial Entrepreneurs and Small Business Bankruptcies. Columbia Law Review. 105, 2310–68.

[21]   Batjargal, B., 2007. Network triads: transitivity, referral and venture capital decisions in China and Russia. Journal of International Business Studies. 38(6), 998–1012.

[22]   Baumol, W., 1990. Entrepreneurship: Productive, Unproductive and Destructive. Journal of Political Economy. 98, 893–921.

[23]   Berkowitz, J. and White, M., 2004. Bankruptcy and Small Firms' Access to Credit. RAND Journal of Economics. 35, 69–84.

[24]   Black, B. and Gilson, R., 1998. Venture capital and the structure of capital markets: Banks versus stock markets. Journal of Financial Economics. 47(3), 243–277.

[25]   Bonini, S., Alkan S., and Salvi, A., 2012. The effects of venture capitalists on the governance of firms. Corporate Governance: An International Review. 20, 21–45.

[26]   Bottazzi, L., Da Rin, M., and Hellmann, T., 2009. What is the role of legal systems in financial intermediation? Theory and evidence. Journal of Financial Intermediation. 18(4), 559-598.

[27]   Bruton, G., Ahlstrom, D., and Singh, K., 2002. The impact of the institutional environment on the venture capital industry in Singapore. Venture Capital: An International Journal of Entrepreneurial Finance. 4, 197–218.

[28]   Bruton, G., Ahlstrom, D., and Yeh, K., 2004. Understanding venture capital in East Asia: The impact of institutions on the industry today and tomorrow. Journal of World Business. 39, 72–88.

[29]   Bruton, G., and Ahlstrom, D., 2003. An institutional view of China's venture capital industry: Explaining the difference between China and the West. Journal of Business Venturing. 18, 233–259.

[30]   Bruton, G., Dattani, M., Fung, M., Chow, C., and Ahlstrom, D., 1999. Private equity in China: Differences and similarities with the Western model. Journal of Private Equity. 2(2) Winter, 7–14.

[31]   Bygrave, W. and Hunt S., 2008. For love or money? A study of financial returns on informal investments in businesses owned by relatives, friends, and strangers. Babson College Entrepreneurship Research Paper Number. 2008-09. Also published in Gillin, L. M. (ed.) Regional Frontiers of Entrepreneurship Research 2007.

[32]   Cao, J. and Lerner, J., 2009. The Performance of Reverse Leveraged Buyouts. Journal of Financial Economics. 91(2), 139–157.

[33]   Chavis, L., Klapper, L., and Love, I., 2009. The impact of the business environment on young firm financing. World Bank Economic Review. 25, 486-507.

[34]   Chemmanur, T. and Chen Z., 2014. VCs versus angels: the dynamics of private firm financing contracts. Review of Corporate Finance Studies. 3(1-2), 39-86.

[35]   Chua, J. and Wu., Z., 2012. Value added by angel investors through post-investment involvement: Exploratory evidence and ownership implications. The Oxford Handbook of Venture Capital. Oxford University Press, ISBN: 978-0195391596.

[36]   Cochrane, J., 2005. The Risk and Return of Venture Capital. Journal of Financial Economics. 75(1), 3-52.

[37]   Cressy, R., Munari, F., and Malipiero, A., 2007. Playing to their Strengths? Evidence that Specialization in the Private Equity Industry Confers Competitive Advantage. Journal of Corporate Finance. 13, 647-669.

[38]   Cuervo-Cazurra, A., 2006. Who Cares About Corruption? Journal of International Business Studies. 37(6), 807–822.

[39]   Cumming, D., and Fischer, E., 2012. Publicly Funded Business Advisory Services and Entrepreneurial Outcomes. Research Policy. 41, 467-481.

[40]   Cumming, D., and Johan, S., 2007. Advice and monitoring in venture finance. Financial Markets and Portfolio Management. 21, 3-43.

[41]   Cumming, D., and Johan, S., 2007. Regulatory harmonization and the development of private equity markets. Journal of Banking and Finance. 31, 3218-3250.

[42]   Cumming, D., and Johan, S., 2008. Preplanned exit strategies in venture capital. European Economic Review. 52, 1209-1241.

[43]   Cumming, D., and Johan, S., 2013. Venture Capital and Private Equity Contracting: An International Perspective, Elsevier Science Academic Press.

[44]   Cumming, D., and Johan, S., 2013. Venture Capital and Private Equity Contracting: An International Perspective. Second Edition (Elsevier Science Academic Press, Waltham).

[45]   Cumming, D., and Knill, A., 2012. Disclosure, venture capital and entrepreneurial spawning. Journal of International Business Studies. 43, 563–590.

[46]   Cumming, D., and MacIntosh, J., 2003a. Venture capital exits in Canada and the United States. University of Toronto Law Journal. 55, 101-200.

[47]   Cumming, D., and MacIntosh, J., 2003b. A cross-country comparison of full and partial venture capital exits. Journal of Banking and Finance. 27, 511-548.

[48]   Cumming, D., and MacIntosh, J., 2006. Crowding out private equity: Canadian evidence. Journal of Business Venturing. 21, 569-609.

[49]   Cumming, D., and Walz, U., 2010. Private equity returns and disclosure around the world. Journal of International Business Studies. 41(4), 727–754.

[50]   Cumming, D., and Zambelli, S., 2013. Private equity performance under extreme regulation. Journal of Banking and Finance. 37(5), 1508–1523.

[51]   Cumming, D., Fleming, G., and Schwienbacher, A., 2006. Legality and Venture Capital Exits. Journal of Corporate Finance. 12, 214-245.

[52]   Cumming, D., Fleming, G., and Schwienbacher, A., 2009. Style drift in private equity. Journal of Business, Finance, and Accounting. 36, 645-678.

[53]   Cumming, D., Fleming, G., Johan, S., and Takeuchi, M., 2010. Legal Protection, Corruption and Private Equity Returns in Asia. Journal of Business Ethics. 95(2), 173-193.

[54]   Cumming, D., Johan, S., and Zhang, M., 2014. The Economic Impact of Entrepreneurship: Comparing International Datasets. Corporate Governance: An International Review. 22(2), 162-178.

[55]   Cumming, D., Schmidt, D., and Walz, U., 2010. Legality and venture capital governance around the world. Journal of Business Venturing. 25(1), 54–72.

[56]   Dai, N., and Nahata, R., 2016. Cultural differences and cross-border venture capital syndication. Journal of International Business Studies. 47(2), 140–169.

[57]   de vaal, A., and Ebben, W., 2011. Institutions and the Relation between Corruption and Economic Growth. Review of Development Economics. 15, 108–123.

[58]   DeGennaro, R., and Dwyer, G., 2014. Expected Returns to Stock Investments by Angel Investors in Groups. European Financial Management. 20, 739–755.

[59]   DeGennaro, R., 2010. Angel Investors and their Investments. The Oxford Handbook of Entrepreneurial Finance.

[60]   Ding, Z., Sun, L. and Au, K., 2014. Angel investors' selection criteria: A comparative institutional perspective. Asia Pacific Journal of Management. 31(3), 705-731.

[61]   Dutta, S. and Folta, T., 2016. A comparison of the effect of angels and venture capitalists on innovation and value creation. Journal of Business Venturing. 31, 39–54.

[62]   Egger, P., and Winner, H., 2005. Evidence on Corruption as an Incentive for Foreign Direct Investment. European Journal of Political Economy. 21(4), 932–952.

[63]   Ehrlich, S., De Noble, A., Moore, T., and Weaver, R., 1994. After the Cash Arrives: A Comparative Study of Venture Capital and Private Investor Involvement in Entrepreneurial Firms. Journal of Business Venturing. 9, 67-82.

[64]   Fairlie, R., and Chatterji, A., 2013. High tech entrepreneurship in Silicon Valley: Opportunities and opportunity costs. Journal of Economics and Management Strategy. 22, forthcoming.

[65]   Fan, W. and White, M., 2003. Personal Bankruptcy and the Level of Entrepreneurial Activity. Journal of Law and Economics. 46, 543–68.

[66]   Ferran, E., 2011. After the Crisis: The Regulation of Hedge Funds and Private Equity in the EU. European Business Organization Law Review. 12(3), 379-414.

[67]   Fisman, R., and Miguel, E., 2007. Corruption, norms and legal enforcement: Evidence from diplomatic parking tickets. Journal of Political Economy. 115(6), 1020-1048.

[68]   Fisman, R., and Wei, S., 2004. Tax Rates and Tax Evasion: Evidence from Missing Imports in China. Journal of Political Economy. 112(2), 471-500.

[69]   Fisman, R., Moustakerski, P., and Wei, S., 2008. Outsourcing Tariff Evasion: A new explanation for entrepot trade. The Review of Economics and Statistics. 90(3), 587–592

[70]   Fisman, R., and Svensson, J., 2007. Are corruption and taxation really harmful to growth? Firm level evidence. Journal of Development Economics. 83(1), 63-75.

[71]   Fleming, G., 2004. Exit strategies in venture capital: Australia evidence. Venture Capital: An International Journal of Entrepreneurial Finance. 6, 23-45.

[72]   Fossen, F., 2011. The private equity premium puzzle revisited – New evidence on the role of heterogeneous risk attitudes. Economica. 78, 656-675.

[73]   Freear, J., and Sohl, J., 2001. The Characteristics and Value-Added Contributions of Private Investors to Entrepreneurial Software Ventures. Journal of Entrepreneurial Finance. 6, 84-103.

[74]   Freear, J., Sohl, J., and Wetzel, W., 1994. Angels and Non-Angels: Are There Differences? Journal of Business Venturing. 9, 109-123.

[75]   Fritsch, M., 2013. New Business Formation and Regional Development: A Survey and Assessment of the Evidence. Foundations and Trends in Entrepreneurship. 9, 249-364.

[76]   Georgakopoulos, N., 2002. Bankruptcy Law for Productivity. Wake Forest Law Review. 37, 51–95.

[77]   Glaeser, E., La Porta, R., Lopez-de-Silanes, F., and Shleifer, A., 2004. Do institutions cause growth? Journal of Economic Growth. 9, 271-303.

[78]   Goldfarb, B., Hoberg, G., Kirsch, D., and Triantis, A., 2007. Are Angels Preferred Series A Investors? Unpublished Working Paper, University of Maryland.

[79]   Goldfarb, B., Hoberg, G., Kirsch, D., and Triantis, A., 2012. Does angel participation matter? An analysis of early venture financing. Unpublished working paper.

[80]   Gompers, P., and Lerner, J., 1999. An Analysis of Compensation in the US Venture Capital Partnership. Journal of Financial Economics. 51(1), 3–44.

[81]   Gompers, P., Kovner, A., Lerner, J., and Scharfstein, D., 2008. Venture capital investment cycles: The impact of public markets. Journal of Financial Economics. 87(1), 1–23.

[82]   Gompers, P., 1996. Grandstanding in the venture capital industry. Journal of Financial Economics. 42, 133–156.

[83]   Gompers, P., and Lerner, J., 1999. The Venture Capital Cycle (MIT Press, Cambridge).

[84]   Groh, A., von Liechtenstein, H., and Lieser, K., 2010. The European Venture Capital and Private Equity country attractiveness indices. Journal of Corporate Finance. 16, 205–224.

[85]   Groh, A., von Liechtenstein, H., and Lieser, K., 2009. How attractive is central Eastern Europe for risk capital investors? Journal of International Money and Finance. 28(4), 625–647.

[86]   Groh, A., and von Liechtenstein, H., 2011. The First Step of the Capital Flow from Institutions to Entrepreneurs: The Criteria for Sorting Venture Capital Funds. European Financial Management. 17, 532-559.

[87]   Grossman, G., and Helpman, E., 1991. Innovation and Growth in the Global Economy. Cambridge, MA, MIT Press.

[88]   Guillén, M., and Capron L., 2015. State Capacity, Minority Shareholder Protections, and Stock Market Development. Administrative Science Quarterly. XX, 1-36.

[89]   Habib, M., and Zurawicki, L., 2001. Country-level investments and the effect of corruption—some empirical evidence. International Business Review. 10(6), 687-700.

[90]   Habib, M., and Zurawicki, L., 2002. Corruption and foreign direct investment. Journal of International Business Studies. 33, 291–307.

[91]   Hakkala, K., Norbäck, P., and Svaleryd, H., 2008. Asymmetric Effects of Corruption on FDI: Evidence from Swedish Multinational Firms. Review of Economics and Statistics. 90(4), 627–642.

[92]   Hayton, J., George, G., and Zahra, S., 2002. National culture and entrepreneurship: A review of behavioral research. Entrepreneurship Theory and Practice. 26(4), 33-52.

[93]   Hellmann, T., Schure, P. and Vo, D., 2015. Angels and Venture Capitalists: Substitutes or Complements? Saïd Business School WP 2015-2. Available at SSRN: http://ssrn.com/abstract=2602739 or http://dx.doi.org/10.2139/ssrn.2602739.

[94]   Hellmann, T., and Thiele, V., 2015. Friends or foes? The interrelationship between angel and venture capital markets. Journal of Financial Economics. 115(3), 639–653.

[95]   Henry, S., and Gregoriou, G., 2013. IPO Firm Characteristics Pre- and Post-Financial Crisis. Available at SSRN: http://ssrn.com/abstract=2292307.

[96]   Ho, Y., and Wong, P., 2007. Financing, regulatory costs and entrepreneurial propensity. Small Business Economics. 28, 187-204.

[97]   Hochberg, Y., Ljungqvist, A. and Lu. Y., 2007. Whom you know matters: venture capital networks and investment performance. Journal of Finance. 62(1), 251-301.

[98]   Hsu, D., 2004. What do entrepreneurs pay for venture capital affiliation? Journal of Finance. 59(4), 1805-1844.

[99]   Huntington, S., 1968. Political Order in Changing Societies. Yale University Press.

[100]   Ibrahim, D., 2008. The (not so) puzzling behavior of angel investors. Vanderbilt Law Review. 61, 1405–1452.

[101]   International Monetary Fund, 2014. World Economic Outlook— Recovery Strengthens. Remains Uneven (Washington, April).

[102]   Ippolito, R., 2007. Private equity in China and India. The Journal of Private Equity. 10(4), 36-41.

[103]   Iriyama, A., Li, Y., and Madhaven, R., 2010. Spikey globalization of venture capital investments: the influence of prior human networks. Strategic Entrepreneurship Journal. 4(2), 128-145.

[104]   Jääskeläinen, M., and Maula, M., 2014. Do Networks of Financial Intermediaries Help Reduce Local Bias? Evidence from Cross-Border Venture Capital. Journal of Business Venturing. 29(5), 704-721.

[105]   Jackson, T., 1985. The Fresh-Start Policy in Bankruptcy Law. Harvard Law Review. 98, 1393–1448.

[106]   Javorcik, B., and Wei, S., 2009. Corruption and cross-border investment in emerging markets: Firm-level evidence. Journal of International Money and Finance. 28(4), 605-624.

[107]   Lerner, J., 1994. Venture capitalists and the decision to go public. Journal of Financial Economics. 35, 293–316.

[108]   Judge, W., Liu-Thompkins, Y., and Brown, J., 2013. The Impact of Home Country Institutions on Corporate Technological Entrepreneurship via R&D Investments and Virtual World Presence. Entrepreneurship Theory and Practice. forthcoming.

[109]   Kerr, W., Lerner, J., and Schoar, A., 2014. The consequences of entrepreneurial finance: a regression discontinuity analysis. Review of Financial Studies. 27(1), 20-55.

[110]   Keuschnigg, C., and Nielsen, S., 2003. Tax Policy, Venture Capital, and Entrepreneurship. Journal of Public Economics. 87, 175-203.

[111]   Keuschnigg, C., and Nielsen, S., 2004. Progressive Taxation, Moral Hazard, and Entrepreneurship. Journal of Public Economic Theory. 6, 471-490.

[112]   Klapper, L., and Love, I., 2011. Entrepreneurship and development: The role of information asymmetries. World Bank Economic Review. 25, 448-453.

[113]   Klapper, L., Laeven, L., and Rajan, R., 2006. Barriers to entrepreneurship. Journal of Financial Economics. 82, 591-629.

[114]   Klonowski, D., 2012. Private Equity in Emerging Markets. New York: Palgrave Macmillan.

[115]   Klonowski, D., 2013. Private Equity in Emerging Markets: The New Frontiers of International Finance. The Journal of Private Equity. 16(2), 20-37.

[116]   Knight, G., and Cavusgil, S., 2004. Innovation, organizational capabilities, and the born-global firm. Journal of International Business Studies. 35, 124-141.

[117]   Kortum, S., and Lerner, J., 2000. Assessing the Contribution of Venture Capital to Innovation. RAND Journal of Economics. 31, 674–92.

[118]   Kuchimov, U., 2010. Asian Emerging Markets Private Equity – Challenging Multifold Risks. Available at SSRN: http://ssrn.com/abstract=1878045.

[119]   La Porta, R., Lopes-de-Silanes, F., Shleifer, A., and Vishny, R., 1997. Legal determinants of external finance. Journal of Finance. 52, 1131-1150.

[120]   La Porta, R., Lopes-de-Silanes, F., Shleifer, A., and Vishny, R., 1998. Law and finance. Journal of Political Economy. 106, 1113-1155.

[121]   La Porta, R., Lopes-de-Silanes, F., Shleifer, A., and Vishny, R., 2006. What works in securities laws? Journal of Finance. 61, 1-32.

[122]   Lamoreaux, N., Levenstein, M., and Sokoloff, K., 2004. Financing Invention During the Second Industrial Revolution: Cleveland, Ohio, 1870–1920. Working Paper Series No. 10923, National Bureau of Economic Research.

[123]   Landier, A., 2004. Entrepreneurship and the Stigma of Failure. Working Paper, NYU Stern School of Business.

[124]   Landström, H., 1995. A pilot study on the investment decision-making behavior of informal investors in Sweden. Journal of Small Business Management. 33(3), 67–76.

[125]   Lee, P. and Wahal, S., 2004. Grandstanding, certification and the underpricing of venture capital backed IPOs. Journal of Financial Economics. 73, 375-407.

[126]   Lee, S., Peng, M., and Barney, J., 2007. Bankruptcy Law and Entrepreneurship Development: A Real Options Perspective. Academy of Management Review. 32, 257–72.

[127]   Leeds, R., and Sunderland, J., 2003. Private equity investing in emerging markets. Journal of Applied Corporate Finance. 15, 111–119.

[128]   Leff, N., 1964. Economic development through bureaucratic corruption. American Behavioral Scientist. 8(3), 8–14.

[129]   Lele, P., and Siems, M., 2007. Shareholder Protection: A Leximetric Approach. Journal of Corporate Law Studies. 7(1), 17-50.

[130]   Lerner, J., and Schoar, A., 2005. Does Legal Enforcement Affect Financial Transactions? The Contractual Channel in Private Equity. Quarterly Journal of Economics. 120, 223-246.

[131]   Lerner, J., Schoar, A., Sokolinski, S., and Wilson, K., 2015. The Globalization of Angel Investments: Evidence across Countries. Harvard Business School Working Paper 16-072.

[132]   Lerner, J., and Schoar, A. 2004. The illiquidity puzzle: Theory and evidence from private equity. Journal of Financial Economics. 72, 3-40.

[133]   Lerner, J., and Schoar, A., 2005. Does legal enforcement affect financial transactions? The contractual channel in private equity. Quarterly Journal of Economics. 120, 223-246.

[134]   Levy, D., 2007. Price Adjustment under the table: evidence on efficiency-enhancing corruption. European Journal of Political Economy. 23(2), 423–447.

[135]   Li, C., Shi, Y., Wu, C., Wu, Z., and Zheng, L., 2015. Policies of Promoting Entrepreneurship and Angel Investment: Evidence from China. Unpublished working paper.

[136]   Lien, D., 1990. Corruption and allocation efficiency. Journal of Development Economics. 33(1), 153–164.

[137]   Liu, Y., and Maula, M., 2016. Local Partnering in Foreign Ventures: Uncertainty, Experiential Learning, and Syndication in Cross-Border Venture Capital Investments. Academy of Management Journal. 59(4), 1407-1429.

[138]   Madhavan, R., and Iriyama, A., 2009. Understanding global flows of venture capital: Human networks as the "carrier wave" of globalization. Journal of International Business Studies. 40(8), 1241–1259.

[139]   Makhene, M., 2009. Alternative Growth: The Impact of Emerging Market Private Equity on Economic Development. Neumann Business Review. Spring, 17-47.

[140]   Marcotte, C., 2012. Measuring entrepreneurship at the country level: A review and research agenda. Entrepreneurship and Regional Development. 25, 174-194.

[141]   Mason, C., and Harrison, R., 1995. Closing the regional equity capita gap: The role of informal venture capital. Small Business Economics. 7, 153–72.

[142]   Mason, C., and Harrison, R., 2002. Barriers to investment in the informal VC sector. Entrepreneurship and Regional Development. 14 , 271-287.

[143]   Mason, C., and Harrison, R., 2002. Is it worth it? The rates of return from informal venture capital investments. Journal of Business Venturing. 17, 211–236.

[144]   Mauro, P., 1995. Corruption and Growth. The Quarterly Journal of Economics. 110(3), 681–712.

[145]   Maxwell, A., Jeffrey, S., and Lévesque, M., 2011. Business angel early stage decision making. Journal of Business Venturing. 26, 212–225.

[146]   McMullen, J., 2011. Delineating the domain of development entrepreneurship: A market-based approach to facilitating inclusive economic growth. Entrepreneurship Theory and Practice. 35, 185-193.

[147]   Megginson, W., and Weiss, K., 1991. Venture capital certification in initial public offerings. Journal of Finance. 46, 879-903.

[148]   Méon, P., and Weill, L., 2010. Is corruption an efficient grease? World Development. 38(3), 244–259.

[149]   Morrissette, S., 2007. A Profile of Angel Investors. Journal of Private Equity Summer. 1, 52–67.

[150]   Nahata, R., 2008. Venture capital reputation and investment performance. Journal of Financial Economics. 90(2), 127-151.

[151]   Nahata, R., Hazaruka, S., and Tandon, K., 2014. Success in Global Venture Capital Investing: Do Institutional and Cultural Differences Matter? Journal of Financial and Quantitative Analysis. 49(4), 1039-1070.

[152]   Naude, W., 2010. Entrepreneurship, developing countries, and development economics: new approaches and insights. Small Business Economics. 34, 1-12.

[153]   Neus, W., and Walz, U., 2005. Exit timing of venture capitalists in the course of an initial public offering. Journal of Financial Intermediation. 14, 253-277.

[154]   Nielsen, K., 2008. Institutional Investors and Private Equity. Review of Finance. 12(1), 185-219.

[155]   OECD. 2011. Financing high-growth firms: The role of angel investors. OECD Publishing, http://dx.doi.org/10.1787/9789264118782-en.

[156]   Petersen, M., 2009. Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. Review of Financial Studies. 22(1), 435-480.

[157]   Prahl, M., Zeisberger, C., and Cannarsi, A., 2011. Private Equity Exits in China and India. INSEAD Working Paper No. 2011/75/DS. Available at SSRN: http://ssrn.com/abstract=1874037.

[158]   Rauh, J., 2006. Investment and Financing Constraints: Evidence from the Funding of Corporate Pension Plans. Journal of Finance. 61, 31–71.

[159]   Ritter, J., 1998. Initial Public Offerings. Contemporary Finance Digest. 2(1), 5-30.

[160]   Ritter, J., 2003. Differences between European and American IPO Markets. European Financial Management. 9(4), 421-434.

[161]   Rodriguez, P., Uhlenbruck, K., and Eden, L., 2005. Government Corruption and the Entry Strategies of Multinationals. Academy of Management Review. 30(2), 383–396.

[162]   Rosenbaum, P., and Rubin, D., 1983. The central role of the propensity score in observational studies for causal effects. Biometrika. 70(1), 41-55.

[163]   Schertler, A., and Tykvová, T., 2006. Rivals or partners? Evidence from Europe's international private equity deals. ZEW Discussion Papers 06-91, ZEW-Zentrum für Europäische Wirtschaftsforschung/Center for European Economic Research.

[164]   Schumpeter, J., 1939. Business Cycles: a theoretical, historical, and statistical analysis of the capitalist process. New York: McGraw-Hill.

[165]   Schumpeter, J., 1942. Capitalism, Socialism and Democracy. New York: Harper and Row.

[166]   Schumpeter, J., 1911/1934. Theorie der wirtschaftlichen Entwicklung. Leipzig: Duncker and Humblot; revised English edition The Theory of Economic Development. Cambridge, MA: Cambridge University Press.

[167]   Schwienbacher, A., 2008. An empirical analysis of venture capital exits in Europe and the United States. Financial Markets and Portfolio Management. 22, 195–217.

[168]   Schwienbacher, A., 2009. Financing commitments and investors incentives in entrepreneurial firms. Unpublished working paper.

[169]   Shane, S., 1993. Cultural influences on national rates of innovation. Journal of Business Venturing. 8(1), 59–73.

[170]   Shane, S., 2005. Angel Investing: A Report Prepared for the Federal Reserve Banks of Atlanta, Cleveland, Kansas City, Philadelphia and Richmond. Available at SSRN: http://ssrn.com/abstract=1142687.

[171]   Shane, S., 2009. Fool's Gold? The Truth Behind Angel Investing in America. Oxford University Press. New York.

[172]   Shane, S., 2012. The Importance of Angel Investing in Financing the Growth of Entrepreneurial Ventures. Quarterly Journal of Finance. 2(2).

[173]   Shleifer, A., and Vishny, R., 1993. Corruption. The Quarterly Journal of Economics. 108(3), 599–617.

[174]   Siems, M., 2008. Shareholder protection around the world. Delaware Journal of Corporate Law. 33, 111-148.

[175]   Sohl, J., 2003. The U.S. angel and VC Market: Recent trends and developments. The Journal of Private Equity. 6(2), 7-18.

[176]   Solow, R., 1956. A Contribution to the Theory of Economic Growth. Quarterly Journal of Economics. 70, 65–94.

[177]   Solow, R., 1957. Technical Change and the Aggregate Production Function. Review of Economics and Statistics. 39, 312–320.

[178]   Stam, E., and Wennberg, K., 2009. The Roles of R&D in New Firm Growth. Small Business Economics. 33, 77-89.

[179] Stam, E., Audretsch, D., and Meijaard, J., 2008. Renascent Entrepreneurship: Entrepreneurial Preferences Subsequent to Firm Exit. Journal of Evolutionary Economics. 18(3), 493-507.

[180] Stuart, T., Hoang, H., and Hybels, R., 1999. Interorganizational endorsements and the performance of entrepreneurial ventures. Administrative Science Quarterly. 44, 315-349.

[181] Sudek, R., 2006. Angel investment criteria. Journal of Small Business Strategy. 17, 89–103.

[182] Sudek, R., Mitteness, C., and Baucus, M., 2008. Betting on the Horse or the Jockey: The Impact of Expertise on Angel Investing. Academy of Management Best Paper Proceedings.

[183] Thurik, A., Carree, M., van Stel, A., and Audretsch, D., 2008. Does Self-Employment Reduce unemployment? Journal of Business Venturing. 23, 673-686.

[184] Timmons, J., and Bygrave, W., 1986. Venture capital's role in financing innovation for economic growth. Journal of Business Venturing. 1(2), 161-176.

[185] Wang, L., and Wang, S., 2012. Economic Freedom and Cross-Border Venture Capital Performance. Journal of Empirical Finance. forthcoming.

[186] Wei, S., 2000. How taxing is corruption on international investors? Review of Economics and Statistics. 82(1), 1-11.

[187] Wetzel, W., 1983. Angels and Informal Risk Capital. Sloan Management Review. 24(4), 23-34.

[188] Wetzel, W., 1987. The informal venture capital market: aspects of scale and market efficiency. Journal of Business Venturing. 2, 299-313.

[189]   White, M., 2005. A General Model of Personal Bankruptcy: Insurance, Work Effort, and Opportunism. Working Paper Presented at 2005 ALEA Meeting.

[190]   Wiltbank, R. and Boeker, W., 2007. Returns to Angel Investors in Groups. Ewing Marion Kauffman Foundation and Angel Capital Education Foundation. 16 pages.

[191]   Wiltbank, R., 2005. Investment Practices and Outcomes of Informal Venture Investors. Venture Capital: An International Journal of Entrepreneurial Finance. 7(4), 343–357.

[192]   Wong, A., 2010. Angel Capital: The other Venture Capital. In Venture Capital: Investment Strategies, Structures, and Policies. Wiley, 71-110.

[193]   Wong, A., Bhatia, M., and Freeman, Z., 2009. Angel finance: the other venture capital. Strategic Change. 18, 221-230.

[194]   Wong, M., Davis, T., and Austin, K., 2013. The Private Equity Trap: How Global Anticorruption Can Ensnare the Unwary Private Equity Professional. The Journal of Private Equity. 17(1), 50-63.

[195]   World Bank, 2004. World Bank Group Support for Small Business. Washington, DC, World Bank.

[196]   Zacharakis, A., McMullen, J., and Shepherd, D., 2007. Venture capitalists' decision policies across three countries: an institutional theory perspective. Journal of International Business Studies. 38(5), 691–708.