The Geography of Angel Investment

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Abstract

This paper empirically studies the role of geographic distance on angel investment performance. I hypothesize four possible channels through which distance may play a role in determining the return to angel investment. The screening effect and the hurdle cost effect occur at the selection stage. Meanwhile, the advising effect and the network effect occur at the value-added stage. Using the British Columbia Venture Capital Program data, this paper shows that the return to angel investment is positively related to distance. Further examining this relationship across different categories of angel investors and across company's locations reveals that the returns to distance are largest for the smallest and least experienced angel investors and for companies located in a center. These findings suggest that the relationship between distance and return can be mostly explained at the selection stage where the hurdle cost effect dominates the screening effect.

1. INTRODUCTION.

Angel investment is the largest source of risk financing for high growth early stage entrepreneurial firms (Mason and Harrison, 1996; OECD 2011). Estimates suggest that angels supply an annual financing of two to five times more than that of the venture capitalists to early stage ventures in the UK and the US (Wetzel, 1987; Freear et al., 1996; Mason and Harrison, 1993). More recently, Wiltbank (2005a) reports that U.S. angels invest approximately $6 billion into early stage ventures in 2004. Comparing this amount to the $330 million invested by venture capitalist, as reported in the same study, gives a clear impression on the importance of the angel capital market.

In spite of its importance, many aspects of the angel capital market are understudied. In particular, although prior studies have documented the role of geography in the context of angel investment decision, i.e. the location of angel investments, little is known about the role of geographic distance in determining the return to angel investment. Using a unique dataset, this paper aims to shed light on this important aspect of angel financing.

The result shows that geographic distance has a positive and significant relationship with the return to angel investment. An increase in distance from the 25^{th} percentile to the 75^{th} percentile increases the return to angel investment by 6 percentage points. Furthermore, this positive relationship is strongest among the least experienced angels.

What can explain this relationship? I hypothesize four different channels through which distance can play a role in determining the return to angel investment.

First, the *screening effect* rests on the basis that local angels have the first pick of the potential ventures. This is the case because entrepreneurs tend to, and reasonably so, begin their search for financing by first exploring the local market (Wong 2009). As the result, one can argue that local angels are given the priority to a examine a larger set of potential ventures and are able to screen most of the better ventures leaving the rest, presumably lower quality ventures, to distant angels. Under this scenario, the screening effect predicts a negative relationship between distance and return.

Second, the *hurdle cost* effect implies that distant angels require a higher rate of return than local angels to compensate for hurdle costs associated with distant investment. It has been well documented that nonpecuniary benefit is one of the reason for angels to invest. This nonpecuniary benefit to the local angels comes in various forms including giving back to the local community (DeGennaro 2010). Since investing in a distant company reduces (increase) the nonpecuniary benefit (hurdle cost) via less direct contribution to the angel's local community, distant angels needs to be compensated for this loss with a higher return. If this is the case, the hurdle cost effect predicts a positive relationship between distance and return.

Third, the *advising effect* suggests that it is less costly and more effective for local angels to provide advice to the entrepreneurs that can help with the development and growth of the new venture. It is an established result in entrepreneurial finance literature that angel investors add value to the entrepreneurial companies they finance by providing consultancy in professionalizing the venture and/or bringing a product to market (Hellmann and Puri, 2002, Mason 2006, Kelly 2007). This consultancy can take various forms from formally participating in the board of director to informally providing strategic advice. In addition, the degree of involvement decreases in distance as it becomes more costly and less effective to advise when distance increases. Lerner (1995) found that shorter distance increases the likelihood that a venture capitalist will be joining in the board of director of the investee company. As the result, the advising effect conjectures a negative relationship between distance and return.

Fourth, the *network effect* implies that distant angels provide a better network than local angels, which can enhance a company's chance of attracting future funding. Entrepreneurs rely on their personal and professional network to disseminating timely and reliable information to potential investors in attracting external funding (Sorensen and Stuart 2001). Obviously not all networks are equally valuable. As Wong (2009) pointed out, distant angels may have a better network than local angels. One reason for this is that whist the local angels share most of their networks with the entrepreneurs, distant angel's network has little overlap with the entrepreneur's networks. Thus getting financing from distant angels allows the entrepreneur to expand his network that can be useful in attracting future financing. If this is the case, the network effect predicts a positive relationship between distance and return.

This paper uses a novel set of data derived from the British Columbia Venture Capital Program to examine the role of distance on the angel investment performance. This rare set of data contains detailed information of all investments, including angel investments, made into early-stage ventures registered under the British Columbia Venture Capital Program between 1999 and 2006.

This data allows me to compute the annualized internal rate of return (AIRR) for both exited and active angel investments. The AIRR is used as main performance measure for three reasons. First, the IRR is the most commonly used measure of return by academics and practitioners (Da Rin et al. 2013). In addition, the simplicity of the majority of angel investments in the sample lessens many of the disadvantages associated with the use of the IRR[2]. And finally, the inclusion of both realized (exited investment) and unrealized return (active investment) is necessary to reduce potential selection bias. As argued in Cochrane (2005) Korteweg and Sorensen (2010),

[2] One major criticism is that the IRR assumes the interim cash flows can be reinvested at the IRR itself. Consequently, the IRR overstates the effective rate of return when the IRR is high. The reverse is true when the IRR is low. In this case the IRR understates the effective rate of return. This is not so much a concern in our case because (i) interim positive cash flow rarely exists because dividend is uncommon when the company is at its early stage, and (ii) the most common stream of cash flow in this data has includes only one investment moment and one exit moment.

valuations of companies are observed only when the companies exited. These events are more frequent for either well-performing companies in case of IPOs and acquisitions or low-performing companies in case of failure. Thus the inclusion of active companies should help reducing this selection bias.

Regarding distance, this paper uses three groups of variables: (i) location indicators for the investors and the investee companies; (ii) travel distance in kilometers; and (iii) travel time in seconds. These measures are acquired by feeding each investor-investee pair's geocode to an open source routing software based on Open Street Map.

This paper reports several important findings. First there is a positive relationship between distance and angel investment performance, measured by the annualized internal rate of return. In particular, holding all else constant, an increase in distance from the 25th percentile to the 75th percentile increases (or from 9.34km to 124km) the return to angel investment by 6 percentage points. Second, the effect of distance varies across different categories of angels. This study reports that distance matters more to the less experienced angels, who invest in only one company in the entire dataset. Third, the effect of distance differs for companies located in a center and for companies located in the periphery. Specifically, this paper shows that distance matters more for companies located in Greater Vancouver Capital Region (GVRD) – the main financial and technology center in British Columbia. These two results suggest that the relationship between distance and return is determined mostly at the selection stage, where the hurdle cost effect dominates the screening effect. Finally, this study reports that the return to angel investment is highly skewed with 55% of all angel deals result in a break-even or loss and only 22% of all deals result in a positive return of 50% or more. This is consistent with the result reported in prior studies on the return of angel investment.

This paper contributes to two areas of the literature: (i) the literature on the role of distance in the angel capital market, and more generally in corporate finance, and (ii) the literature on the performance of angel investments.

The role of distance has been documented in many areas of the corporate finance literature. For example, Petersen and Rajan (2002), Berger et al. (2005) and Agarwal and Hauswald (2010) found that distance is an important factor of the bank's lending decision. In the context of venture capital investment, Lerner (1995) and Sorenson and Stuart (2001) found that distance is an important determinant of the propensity to invest and the propensity to join the board of director of the investee companies. More recently, Tian (2011) found that distance is a strong determinant of VC investment staging, which is viewed as an alternative monitoring mechanism. In addition, the author also found that, conditioned on getting funding from distant VC, VC staging positively affects the entrepreneurial firm's performance measured by the propensity to go public, operating performance in the initial public offering (IPO) year, and post-IPO survival rate.

Although being the main source of the external financing for high growth early-stage ventures, study on the role of distance in the angel capital market is underdeveloped. Prior work in this area mostly focused on the geographic location of angel investment. As shown in Freear et al. (1992a), 37% of angel investments in Connecticut and Massachusetts were made into ventures located over 80 km away from the angel's home or office. More interestingly, the authors also reported in the same study that angel investments made into ventures located over 480 km away from the angel's home or office constitute 36% of all angel investments. Some other studies have shown a greater portion of local angel investments ranging from 50% to 87% (Wetzel, 1981; Riding et al., 1993; Mason and Harrison, 1994).

This paper contributes to this literature by systematically examining the implication of geographic distance on the performance of angel investment. To my knowledge, this is the first paper to study this aspect in the angel financing literature.

The literature on the angel investment performance is relatively larger but still fairly limited. In fact, Bygrave and Hunt (2008) claimed that "knowledge about returns on informal investment is mainly folklore or is based on relatively small self-reported samples". However, it is still worth pointing out some studies that have been able to document the return to angel investment. Mason and Harrison (2002) are among the first to look into the return to angel investment using data acquired from a survey of 51 U.K. angels who made a total of 128 exits. The authors found that 34% of the investments resulted in complete loss, 13% broken-even, and 23% had an IRR of 50% or more among 51 angels who had made a total of 128 exits in U.K. Wiltbank (2005b) used 121 responses from 13 angel groups in the U.S. In total, these angel investors had exited from 414 investments from a total of 1,038 investments. The author found that 61.5% of the investment resulted in negative IRR, and only 23.5% had an IRR exceeding 50%. Similar result was found in his later joint work (Wiltbank and Boeker, 2007).

This paper makes an important contribution to this branch of the literature as the first study to systematically compute both the realized and unrealized return to the angel investments. The reported result aligns and thus lends further support to previous findings on the return to angel investment.

The endogeneity issue is obviously a concern with this study. It could be the case that entrepreneurs may choose to locate in a particular place (in Vancouver for example) that could give them the best access to the angel capital market. This decision may be based on unobservable company and entrepreneur characteristics. In addition, even if the company location were exogenous, a match between an angel and a company might still be determined by unobservable variables. For examples, a company managed by an established management team could be more prone to have an extensive network that makes it popular to distant investor while it is at the same time more likely to be successful. This example shows that a positive relationship between distance and return could possibly be driven by unobservable company or investor characteristics.

To address endogeneity issues, one would normally need to come up with a valid instrumental variable. In this context, the instrumental variable must be correlated with distance and must only be correlated with the return to angel investment only through its correlation with distance (exclusion restriction). Instruments that can satisfy both of these conditions are typically hard to find, especially in the area of entrepreneurial finance.

In this paper I take an alternative approach to distinguish selection effect from treatment effect. First, realizing that the four effects described above occur at different investment stages, I group them into effects that are associated with the selection effect and effects that are associated with the treatment effect. I then argue that these effects differ across different categories of angels and across company's location. This is the basis for me to disentangle the selection effect from the treatment effect of distance on the return to angel investment. However, although this paper makes an attempt to unravel the effect of distance into the selection effect and the treatment effect, this is not the main objective of this paper, it is important to note that both the selection and treatment effect are important ingredients of the resulting relationship between distance and return. Nevertheless, in the absence of a valid instrumental variable, one should interpret the result carefully.

The rest of the paper is organized as follows: Section 2 discusses the main effects. Section 3 provides detailed descriptions of the data and presents descriptive statistics. Section 4 reports the results on the role of distance. I conclude in Section 5.

2. HYPOTHESES

This section discusses in detailed the four effects highlighted previously in the introduction. Section 2.1 first discusses in detailed the main effects of distance on angel investment performance. Section 2.2 discusses how these effects differ across categories of angels and across company's and angel's locations.

2.1. Main effects of distance

This paper hypothesizes four different channels through which distance can play a role in determining the return to angel investment. This section gives detailed discussion about these four effects.

The screening effect: Entrepreneurs begin their search for external funding in the local capital market (Wong 2009). They use their networks to disseminate information about their ventures to potential investors (Sorensen and Stuart 2001). The dissemination of information is subject to distance decay where, as Wetzel (1983) pointed out, shorter distance increases the likelihood that an investor is made aware of an investment opportunity. Furthermore, in the absence of a proactive search for investment opportunities [3] and the lack of systematic channels of

[3] Indeed, rather than proactive searching for potential deals, angels seem to hide from entrepreneurs. Benjamin and Margulis (2001) suggested that "for good reason they (angels) make themselves extremely difficult to find".

communication between entrepreneurs and investors, angels tend to rely on informal local networks of trusted friends and business associates to derive information on potential ventures (Sorheim 2003). These arguments suggest that local angels are exposed to a larger distribution of potential ventures through which they select the better ones and leave the remaining unfunded ventures to the distant angels. Under this scenario, the screening effect conjectures a negative relationship between that the return to angel investment and distance.

The hurdle cost effect:

Nonpecuniary benefit has been reported as a determinant of angel's decision to invest. This nonpecuniary benefit comes in many different forms including giving back to the local community (DeGennaro 2010). This nonpecuniary benefit becomes a hurdle cost to angels who considers making investment in a venture located outside of their communities.

Another form of hurdle cost experienced by distant angels is the lack of trust (Bottazzi et. al. 2013). Angels have the tendency to invest locally because by doing so they can limit their investments to entrepreneurs whom they can trust. This point is illustrated by one angel quoted by Shane (2005: 22): "More of the people we trust are here…therefore we are more likely to come to some level of comfort or trust with investments that are closer".

All and all, investing in a distant company is associated with higher hurdle cost that is the result of less contribution to the local community and/or the lack of trust. Thus distant angels need to be compensated for this higher hurdle cost with a higher return in compared to local angel investors who make investments in the same deal. As the result, the hurdle cost effect predicts a positive relationship between distance and return to angel investment.

The advising effect:

It is an established result in the entrepreneurial finance literature that investors add value to the ventures. Hellmann and Puri (2002) suggested that angels can assist the entrepreneurs in professionalizing the firm, bringing a product to market and some other consultancy activities that are similar to those provided by venture capitalists. Angels providing productive inputs to their investee companies has also been acknowledged in later studies (Mason 2006, Kelly 2007).

At the same time, it has been documented that the degree of involvement and the quality of advice decrease in distance. In the venture capital context, Lerner (1995) found that shorter distance increases the likelihood of a venture capitalist joining the board of director. In the context of angel investment, Wong (2009) also suggested that entrepreneurs are more likely to receive assistance from angel investors who reside within 80 km away from their ventures. Furthermore, distance has an adverse effect on the quality of involvement. Harrison, Sussman

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Engineer et al. (2013) constructed a simple model to show that angels endogenously choose to hide in order to screen out the low productivity entrepreneurs.

and Zeira (1999) found that the value (and also quantity) of advice reduces as distance to the investee companies increases.

In short, effective advising becomes less likely and more costly with an increase in distance. As the result, the advising effect conjectures a negative relationship between distance and return to angel investment.

The network effect:

Entrepreneurs rely on their personal and professional network to disseminating timely and reliable information about their ventures to potential investors for the purpose of attracting external funding (Sorensen and Stuart 2001). In addition, Wong (2009) suggested that distant angels have a larger network that can be more useful for the entrepreneurs. This could be the case because entrepreneurs share similar network with his local angels (an overlap of networks). Putting it differently, distant angel's network is more valuable because it has little overlap with the entrepreneur's and/or local angel's network. Consequently, getting financing from a distant angel allows the entrepreneur to gain access to a much different network. This expansion in the entrepreneur's network is certainly useful for the venture to attract future financing. Under this view, the network effect predicts that the return to angel investment increases in distance.

Note that these four effects fall into two distinct investment stages: (i) selection stage where angels examine potential ventures and (ii) value-added stage where angels provide productive inputs to their investee companies. Whilst the screening effect and the hurdle cost effect happen in the selection stage, the advising effect and the network effect occur in the value-added stage. Table 1 summarizes these effects.

Table 1: Effects Distance on the Return to Angel Investment.

The sign of the effects are based on prior literature reviewed described in the main text. I score the effect of greater distance on the return as follows: + (positive effect), - (negative effect), ? (sign of the effect is ambiguous).		
Investment Stage	Effect	Expected Impact (on return as distance increases)
Selection Stage	Screening effect	-
Selection Stage	Hurdle cost effect	+
Value-added Stage	Advising effect	-
Value-added stage	Network effect	+
Expected overall impact of greater distance on return		?

2.2. Effects of distance across categories of angels.

In this section, I will look at how the effects described in Section 2.1 vary across different categories of angels and across different company's locations.

An unique strength of the data is that it allows me to sub-categorize angel investors into three groups: (i) individual angels who invest in just one company in the entire dataset (Angel – Single); individual angels who invest in more than one company in the entire dataset (Angel – Multiple); and coalitions of angels that invest together through a fund (Angel – Fund). Subcategorizing angels is helpful if distance can reasonably be assumed to have differential impacts among the different angel categories.

A stylized view on the three categories of angels is the following. First, single-company angel may be motivated to invest because of some personal connection to the company or its employees. By contrast, multiple-company angel reveals to have an interest in angel investing more broadly and may therefore exert more effort in learning about the market and advising companies. Consequently, multiple- company angels are more likely to possess greater expertise in selecting and advising companies. They will also reflect a broader network through the number of companies that they have invested in. And finally, angel funds can be expected to represent a great deal of expertise and valuable networks. This may be because they are managed by experienced, "active" angels, or because they consist of coalitions of angels who have gotten to know each other after operating in the angel market for a while.

Under this view, the single-company angel is relatively inexperienced. In an extreme case, a single-company angel is completely naïve about angel investing, in which case, he would provide either no advice or "white-noise" advice, and have network connections that are worth zero to the company. The advising and network effects of this totally naïve single-company angel are mostly absent. In this case, the observed relationship between distance and return is mostly driven by the effects occurred at the selection stage.

> *H1: In an extreme scenario, the relationship between distance and the return to single-company angel is mostly driven by the effects occurred at the selection stage. The resulted relationship depends on the relative size of the screening effect and the hurdle cost effect and captures the selection effect of distance on return.*

By contrast, I conjecture that the advising and network effect are strong for the Angel – Fund. More importantly, the screening and the hurdle cost effects are close to be absent due to the fact that angel funds typically consist of coalitions of angels that can utilize its expanded network to make themselves more visible to entrepreneurs and minimize the hurdle cost effect.

> *H2: The relationship between distance and the return to angel fund investment is mostly driven by the effects that happen in the value-added stage. The direction of the effect*

depends on the relative size of the advising effect and the network effect and captures the treatment effect of distance on return.

2.3. Effects of distance across investors and investee companies' locations.

I also distinguish the effect of distance across company's location. This is a valuable distinction because the network effect may vary across companies located in different regions. The data allows me to separate the companies into two groups: companies located in Greater Vancouver Regional District (GVRD) and companies located in the rest of BC - non-GVRD companies. This distinction is motivated by concepts of "center" versus "periphery" introduced by Prebisch (1959). In his work, the Prebisch divided the world into economic centers and peripheries based on the level of industrialization (economic development) of the countries. In this context, GVRD is the center due to the fact that it is the main financial and technological hub in BC. The rest of BC is viewed as the periphery. I also categorize angels into GVRD angels the rest of BC angels. The idea here is that GVRD angels possess a more valuable network than non-GVRD angels. Consequently, the network effect is stronger for companies that locate outside GVRD region than for GVRD companies. Table 2 presents the expected strengths of the network effects of distance across company's and investor's locations.

H3: Holding all other effects the same across all company-angel location pairs, the network effect must be stronger among the non-GVRD companies. Consequently, the effect of distance on return must be less negative (more positive) for non-GVRD companies than for GVRD companies. If this is the case, it is evidential that the network effect is at work and thus distance has a treatment effect on the return to angel investment.

Table 2: Strength of the network effect across company's and investor's locations pair.

Strength of the network effect ranges from 0 to +++, where +++ being the strongest and 0 implies an absence of the network effect.		
Company's Location.	Investor's Location.	
	GVRD	Non-GVRD
GVRD	0	+
Non-GVRD	+++	0

3. DATA.

3.1. The Venture Capital Program.

The Government of British Columbia (B.C.) launched the Venture Capital Tax Incentive Program (henceforth the VCP) in 1985. The main objective of the VCP is to encourage venture capital investment and angel capital investment to provide equity capital investments to B.C. small businesses by providing 30% tax credit to eligible investments made into qualified businesses in B.C. As of today, the VCP has two distinct models that target the venture capital investment and angel capital investment: the Venture Capital Corporation (VCC) model and the Eligible Business Corporation (EBC) model.

A VCC is a registered corporation under the VCP for the sole purpose of investing funds in a number of start-up, emerging and expanding eligible small businesses. There are two types of VCCs. The first type of VCC is formally organized and managed by professional fund managers, who often receive management fee and share of the investment profits. They attract capital from members of the general public, many of whom are not accredited investors, and invest the proceeds to a number of eligible companies. In this study, we refer them as "retail VCC". The second type of VCC, or non-retail VCC, is owned by a single or a group of accredited investors. These non-retail VCCs are not professionally managed and most importantly are authorized to raise capital from accredited investors only.

The EBC model was introduced later in 2003. It consists of tax credits for direct investments of eligible investors into an EBC. This model is administratively much simpler for angels than the VCC model since it does not require them to set up a VCC. Indeed, the EBC model was intended to reach out to a wider set of angels, including those for whom the volume of tax credits was too small to warrant the effort and costs of setting up a VCC. Eligible investors, including angels, can simply claim the 30% tax credit on the basis of an investment in an EBC.

Clearly, there are also requirements on the companies under the VCP. First, companies must be located in BC at the moment of registration. Second companies must not have more than 100 employees and pay at least 75% of the wages and salaries to BC employees. Finally, companies must operate in an eligible industry.[4]

3.2. Overview of the data sources.

The data for this paper comes from a variety of sources. Our primary source is the data from the VCP described above.

What makes the VCP data special is the availability of the share registry for a substantial subset of the registered companies. This is particularly important because the share registry contains

[4] Further information on the program can be found in Hellmann and Schure (2010), Lerner et al. (2012), and on the provincial government's website at http://www.jti.gov.bc.ca/ICP/VCP/.

detailed information about the investors and their investments. Typical information in the share registry includes investor location, investor identification, investment date, purchased price and volume. This information is particularly useful in measuring angel investment performance. In some cases, we are able to observe the history of companies' shareholders, often dating back to the date of incorporation because the registered companies that successfully attract capital are required to submit the investment records for tax credit eligibility assessment.

In addition, the BC Government requests detailed company information at the moment the companies register under the program through the registration applications. In some cases, we have their business plans. These documents enable us to learn about the registered companies on their locations, business activities, etc.

We augmented the VCP data using several additional data sources. First, we consulted several sources including ThomsonOne (VentureXpert) to learn more about the investors in our dataset, particularly their type. Investors do not only include angels and venture capitalists, but also other financial parties, corporations, and smaller groups such as societies, charitable organizations, etc. Secondly, we gathered additional data about the company's performance. The BC companies' registry and the commercial datasets of Capital IQ and SDC Global New Issues and SDC Mergers and Acquisitions) were used for data on survival of companies and possible exits (i.e. IPOs and M&As). Finally, we complemented our data through SEDAR (which contains the record of filings with the Canadian Securities Administrators of public companies and investment funds) as well as internet searches.

3.3. Company dataset.

I obtain the information for registered companies that received angel capital investments through the VCP program between 1999 and 2006. I choose this time frame for two reasons. First, it has a good cover pre- and post-introduction of the EBC model. Second, the 2006 cut-off allows enough time for the companies to exit.

I am able to secure systematic data for 213 companies or 62.3% of the 342 companies that falls under this sample definition. These companies are associated with 3,536 deals made by 3,352 unique investors. A deal is defined as a unique investor – investee company pair. That is all investments made by an angel into the same company are considered as one deal. This study uses deal as the unit of analysis.

I learn about the current status of the companies through a number of data sources. I use SDC Mergers and Acquisitions, SEDAR, CapitalIQ, LexisNexis and internet searches to check whether companies were involved in IPOs or acquisitions. I then use the BC and Canadian corporate registries to check for the status of the remaining companies. The corporate registries are quite reliable as companies are required to submit documentation annually. As shown in Table 3, 74% of the companies are still active, 19% of the companies have failed and the remaining 7% of the companies have exited through IPO or acquisition as of December 2012.

The research question requires me to obtain the exit share price and the most recent share price for active companies[5]. For the IPO companies, share price at exit is usually clearly stated in the company's prospectus, which is available in SEDAR. For acquired companies, I use SDC, SEDAR, CapitalIQ, LexisNexis and internet search to collect the exit valuation and, more importantly, share price at exit. I am able to get exit share prices for a few acquired companies using these sources. For the remaining acquired companies, I calculate the total number of share outstanding for acquired companies using the share registry. I do this only for companies that have the most recent recorded investment date on the share registry that falls within one year of the recorded exit date. As a company is less likely to raise another round of capital within twelve months[6], this gives me confidence on the computed share price among the acquired companies by dividing the exit value by the computed total number of share outstanding. I use internet search to get the exit share price for a few more acquired companies[7]. For failed companies, exit share price is set to zero. I use the most recent share price recorded in the share registry for active companies.

I classify the companies into industries by manually matching the company's business activity to an industry classification for innovative companies, which I based on the NAISC. For most of the companies in my sample, I obtain their business activities mainly from the business plans and registration applications. I use the internet search for the remaining companies. As shown in Panel B of Table 3, computer hardware and software industry together with the High-tech manufacturing and services industries account for almost 60% of the companies in the sample. When we group all technology-related industries together, these high-growth industries account for almost 77% of the companies in our data. 1 The other 23% of the companies in the sample is classified into tourism and other non high-tech industries. These companies are eligible under the VCP because they are also deemed to further the main objective of the VCP, namely to "enhance and diversify the provincial economy".

I divide companies into two groups: companies locate in Greater Vancouver Regional District (GVRD) including the "Lower Mainland", which is the valley extending inland from Vancouver; and companies located in the rest of BC. This distinction is motivated by the division of "center" and "periphery" introduced by Prebisch (1959). In his work, the author divides the world into economic centers and peripheries based on the level of industrialization (economic development) of the countries. In this context, GVRD is a center due to the fact that it is the main financial and technological hub in BC. The rest of BC is viewed as peripheries. Information on the location for a majority of the companies is taken from the business plans, the registration applications, and from other annual filings. I use internet search to find the location for the remaining companies.

[5] Having share price at exit is very important for the calculation of the angel investment return because the positive cash flow at time of exit for each individual investor is typically not available.

[6] According to Sherman (2012), the estimated time between rounds of financing is approximately twenty months in 2010.

[7] The availability of exit share price explains the high coverage for the IPO companies and the low coverage for the acquired companies in the sample.

One concern with the company's location is that companies relocate at times. Unfortunately, I am not able to observe such event. As shown in Panel C of Table 3, the BC economy is heavily concentrated in and around the GVRD region. I find that about 71% of the companies are located in the Greater Vancouver Regional District (GVRD).

I perform a variety of checks to assess how well the sample of companies represents the population of companies that it is drawn from[8]. Panels B and C of Table 3 show that the distribution of companies in the final sample are fairly similar to the distribution of companies in the population in term of industry and location. Regarding the company's status, the final sample is biased toward active companies. In fact, the coverage of the successful companies that have gone through M&A and IPO and failed companies are roughly 40% and 45% respectively as opposed to the 73.5% coverage of the active companies. The main implication for this is the measure of the angel investment performance might be slightly biased upward.

3.4. Angel's deal dataset

I discuss several important properties of the angel investors and angel deals in this section.

3.4.1. The classification of angel investors

The population of investors is derived mainly from the companies' share registries. This population of investors do not only include angel investors, venture capitalists, but also other financial parties, corporations, and smaller groups such as societies, charitable organizations, etc.

The focus of this study requires me to separate angels from the other investors. I adopt a two-stage approach to classify the population of investors. First, I separate the investors into two groups: humans and vehicles. Human investors are identified by their first and last name. "Vehicle investors" are the remaining ones. To ensure that no human investor is wrongly classified as a vehicle investor, I check on all vehicle investors to see whether there is some sort of corporate designation such as "Ltd.", "Corp.", etc. in their name.

In the second stage, I perform several name-based matches with other data sources to classify the human and vehicle investors into subgroups. With respect to the human investors, it is important to distinguish angels from founders, their family, and "key employees". To do this, I match the human investors in the share registry with the list of founders identified in the company's business plan, annual returns, and other documents and websites. I also identify non-founding managers and other key employees using the above sources. Furthermore, I assume investors are

[8] This however does not address the question whether my sample of companies registered under the VCP program are representative to companies that would attract angel investors and venture capitalists. To do this check properly, additional data on the general population of companies is required. However, a high percentage of non-high-tech manufacturing and services companies in our sample suggests that our sample can be different. This may have a downward bias on the measure of angel capital performance as investing in non high-tech companies on average gives a lower return.

key employees if they acquire shares at a deeply discounted price (10% or less of the maximum share price other investors pay in the same round) as shown in the share registries. Finally, I score investors as family members of founders if they invest in the same company and share the same last name as the founders. Naturally, such a separation cannot identify those family relationships where family members have different last names. Moreover, our methodology does not allow us to identify founders' friends, as there is no objective criterion for separating those out from angel investors. At the end of the procedure I am able to separate human investors into "angels" on the one hand and founders, family and key employees (henceforth "founders") on the other.

There are over 2,200 vehicle investors in our dataset. Subcategorizing them is rather an involved task because they can be of many different types of investors, including angel, which is the main group of interest. I first match the list of vehicles with the list of Venture Capital Corporations (VCCs) described in Section 3.1. [9] I classify all VCCs, except the retail VCC as angels. I use the VC datasets of Capital IQ and ThomsonOne (VentureXpert) and internet search to learn about the remaining "vehicle investors". These vehicle investors can be angel investors, founders, corporate investors, venture capital firms and financial investors. I identify angels among the vehicle by adopting the following logic: any corporations and trusts with names that clearly reveal names of single individuals, multiple individuals, or families are angel investors.

For some of the analysis, I further subdivide the "angels" into three types, distinguishing between those who invest in one company (possibly multiple times) throughout our entire database ("Angel - Single"); those who invest in more than one company ("Angel - Multiple"); and those who co-invest using the same investment vehicle ("Angel – Fund"). Most of the vehicles in the Angel – Fund category are the VCCs where I can observe the ownership structure.

There are 3,352 angel investors made in total 3,536 deals into 213 companies in the sample. As shown in panel E of Table 4A, Angel – Single represents the largest category. They constitute for 90% of the number of angels and 86% of all angel deals. Angel – Fund is the smallest category.

3.4.2. The measure of angel investment performance

I use the annualized internal rate of return (AIRR) as the main measure of angel investment performance in this study. This is the most commonly used measure of return by academics and practitioners (Da Rin et al. 2013). It is defined as a discount rate which makes the Net Present Value (NPV) of a stream of cash flows equal to zero. In this study, the stream of cash flow includes only an investment moment and an exit moment, both are captured by the share prices. I

[9] We matched primarily on the basis of the vehicle names we find in our data. However, note that vehicle names are not necessarily similar to the names of the VC firms in Capital IQ and ThomsonOne. VC firms sometimes manage funds with quite different names. In case of uncertain matches we consulted the internet for extra information and clues. Location of the investor, which we have, was used as an additional clue.

compute the AIRR for all angel deals in the sample. For deals that involve more than one investment, the computed AIRR is a weighted average by the investment amounts.

Note that, the majority of the companies are still active as of December 2012. As a result, the computed AIRR used in this study is a combination of both the realized return (for exited companies) and the unrealized return (for active companies). I use the recorded exit share price to compute the realized return for exited companies. For companies that are still active, I use the last observed share price to compute the unrealized return.

There are two advantages with using both the realized and unrealized returns. First, it reduces the selection bias due to the fact that market valuations of companies are observed only when the companies exited. These events are more frequent for either well-performing companies in case of IPOs and acquisitions or low-performing companies in case of failure, i.e. two ends of the quality spectrum (Cochrane 2005, Korteweg and Sorensen 2010). Second, it increases the sample size dramatically because exit events in private equity investment are rare (25% of companies in this sample have exited by December 2012). A large sample is essential in producing a better and more precise estimate.

Table 4B shows some interesting facts about the return to angel investment. First, the large difference between the average and the median returns seems to suggest that the return to angel investment varies quite dramatically. In fact, Figure 1 shows that almost 55% of all angel deals result in a break-even or loss and only 22% of all deals result in a positive return of 50% or more[10]. This is consistent with the results found in Mason and Harrison (2002), Wiltbank (2005b), Wiltbank and Boeker (2007) and Riding (2008) where they documented that the return to angel investment is highly skewed with more than 50% of angel investments result in negative IRR, and roughly 20% – 25% result in an IRR that exceeds 50% return.

Second, the return to angel investment varies across industries, investor's locations and categories of angels. In term of industry, angel deals made into life science industry yields the highest return of 28% on average. This is almost double the return figure of an investment made into non High-tech industry, which, surprisingly, has the second highest return among the four groups of industry. Angel investment in computer hardware and software industry seems to have the lowest return or loss at -1%.

With respect to investor's location, angels who locate in the GVRD region seem to outperform angels who reside outside of the GVRD region. Panel C of Table 4B reports that GVRD angels have a return that is 50% greater than the return of non-GVRD angels. This seems to be consistent with the belief that GVRD angels are on average more experienced and sophisticated due to the fact that they are exposed to a larger number of ventures than non-GVRD angels.

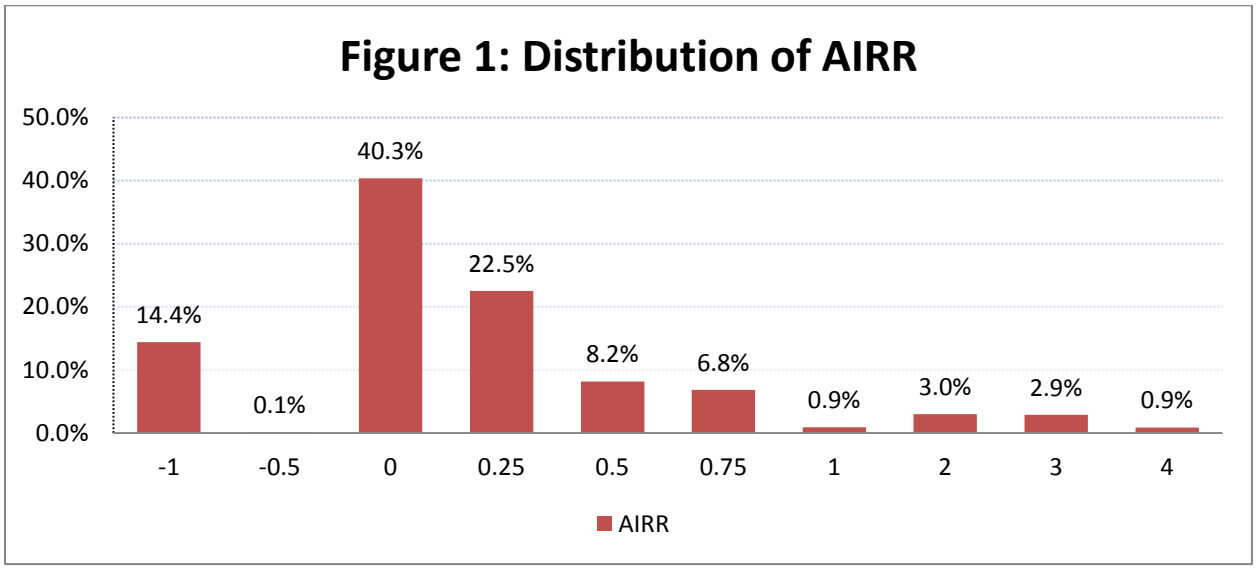
[10] The distribution of realized return is fairly similar with roughly 62% of deals result in a loss or break-even and 25% of deals give a return of 50% or more.

Panel E of Table 4B reports the average return across different categories of angels. On average, the Angel - Multiple category has the highest return of 18% as opposed to 10% and 6% for Angel – Single and Angel Fund categories. The lower return to the Angel – Fund categories are mostly due to the timing of the investment as most of the non-retail VCCs, which are classified into Angel – Fund, occurred before the introduction of the EBC program in 2003.

I also compute the public market equivalent (PME) popularized by Kaplan & Schoar (2005) as an alternative measure of the return to private equity investment[11]. The PME compares an angel investment with an investment of the same amount in a public market. A ratio higher than one means angel investment has returned a higher amount than a corresponding investment in the public market. In this paper, I use the TSX index and the NASDAQ index as the two benchmarks. Quarterly value of the TSX and the NASDAQ indices between 1999 and 2012 were downloaded from "Yahoo Finance" and "Google Finance". I compute the PME for all deals in the sample by discounting the exit/current share price by the quarterly return of the indices.

Table 4B shows that, on average, angel capital investment in B.C. outperformed a similar investment made into the NASDAQ index between 1999 and 2012 by a factor of 2. This is consistent with the fact that the U.S. economy experienced a recession in early and late 2000. The effect of these recessions on the Canadian economy was surprisingly mild in both cases.

Table 4B also shows that angel investment in B.C. is on par with investments made into the TSX index for the period between 1999 and 2012. This finding is consistent with Moskowitz and Jorgensen (2002). The authors find that the average return to all private equity is similar to that of the public market equity index.



[11] The calculation of the PME is for the purpose of providing a comparison between angel investments and investments made into the two popular indices. It is hard to use the PME as a performance measure in this study because an two investments made in two different period may have the same PME although one with a return of -10% and another with a return of 10%.

3.4.3. Measure of distance

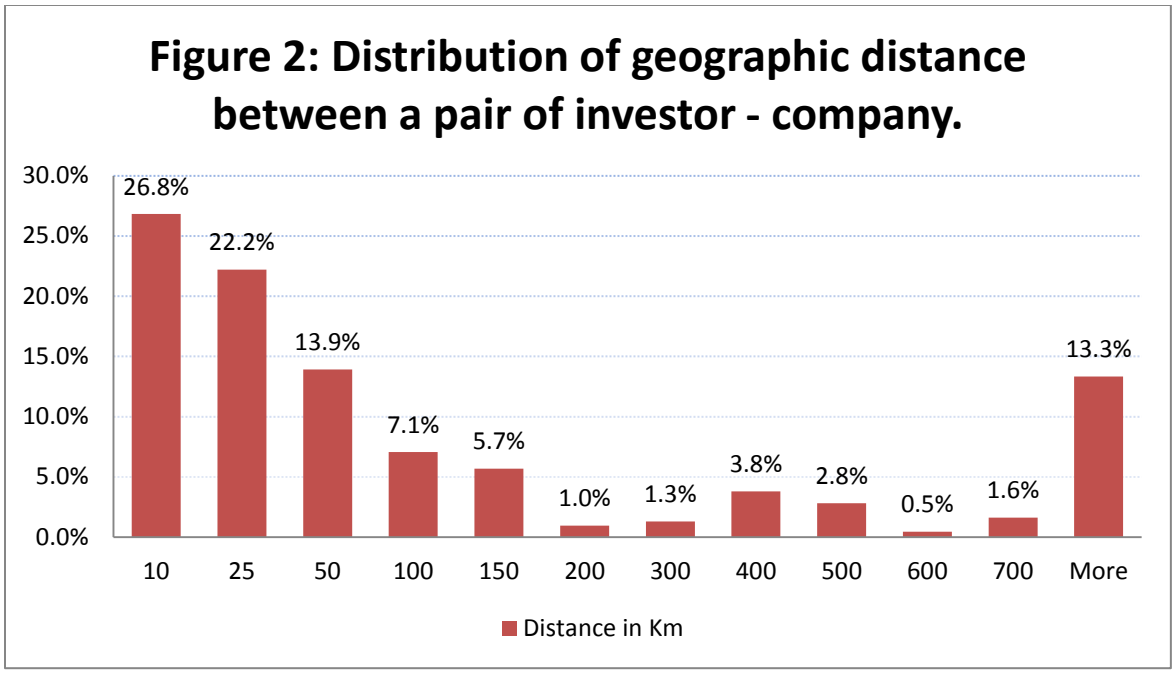
I take the following approach to compute the geographic distance for a deal – a unique investor – investee company pair. First, I collect investor's postal codes from the share registries. The postal codes allow me to divide angels into GVRD region and non – GVRD region. I then use the 2006 Postal Code Conversion File (PCCF) provided by Statistics Canada to find the longitude and latitude corresponding to all Canadian postal codes. For some Canadian postal codes that I am not able to match with the PCCF, I use a program that enables batch geocoding by sending requests to Google Maps API to retrieve the longitude and latitude. I also do this for all US zip codes to obtain their corresponding longitude and latitude. I then feed the resulting longitude and latitude investor – investee pairs to the API service of yournavigation.org, an open source routing software based on Open Street Map. yournavigation.org then returns the travel distance in kilometers of the fastest route and the travel time in second for a motor vehicle.

As shown in Table 4C, on average an investor is located almost 400km away from his investee company. The median is at around 26km, suggesting that distance is highly skewed. Figure 2 shows the distribution of distance. 76% of all deals are within 150 km of the investee companies. However, a significant share of all deals, 13.3%, are outside the 700km radius. These are international investors or investors located in other provinces of Canada. These figures seem to be in line with those reported in prior literature.

It is also interesting that investors who invest in non high-tech industry seem to locate the furthest away from the investee companies. The reverse applies to deals made into life science and high-tech manufacturing with an average distance of about half of distance of deals made into non high-tech industry. One explanation for this may rest on the fact that investing in high-tech industries in general requires the angels to actively learn, monitor and provide more hand-on support to the entrepreneurs than investing in non high-tech industries.

Moreover, deals made by Angel – Multiple and Angel - Fund categories on average have a distance of about one third of the deals made by Angel – Single. Together with the view that Angel-Single is a less experienced group of angels, this suggests the more experienced and sophisticated angels have a higher tendency to invest into close-by companies. This is consistent with the view that angels, especially more experienced and sophisticated angels, like to get involved with the company's day-to-day activities well-documented in the angel capital literature (Freear et al. 1992b; 1994). Nevertheless, the smallest average distance is at about 130km, which almost constitutes a day trip.

In addition, GVRD investors seem to be more local investors than non-GVRD investors. This is consistent with the fact that GVRD is the main financial hub of BC where angels are exposed to a greater number ventures.



Also, as shown in panel D of Table 4C, deals that in the 50% to 75% quantile of the distance distribution (deals that have distance between 27.1 km and 124 km) are reported to have the highest return. This seems to be the first evidence of positive relationship between distance and return.

There are also some interesting observations when looking at the investor-company location pairs. As shown in Table 5, non-GVRD company and GVRD investor is the best combination with the average AIRR at around 52%. This lends further support to the fact that GVRD investors are more sophisticated in selecting and providing value-added services to the investee companies. It can also mean that non-GVRD company must overcome a huge hurdle to be able to attract GVRD investor. Table 5 also shows that the worst combination seems to be the GVRD company and non-GVRD investor, which results in the lowest average AIRR. However, the difference in return between this location pair and the GVRD company and GVRD investor location pair is not obvious. This small difference might be due to the overall low performance of GVRD companies.

Table 6 reports the summary statistics of the variables used in the main analysis.

4. THE RELATIONSHIP BETWEEN DISTANCE AND ANGEL INVESTMENT PERFORMANCE

This section presents empirical results of the relationship between distance and the angel investment performance. Specifically, I will first examine the overall effect of distance on the angel's AIRR. In an attempt to separate the selection from the treatment effect, I will then

examine whether the effect of distance varies across categories of angel investors, across investor's locations and across company's locations.

4.1. Overall effect of distance

Table 7 shows the baseline OLS regression results, where the dependent variable is the computed AIRR. I control for the amount raised in previous rounds in log and time in quarters. Some interesting observations are shown in this table. First, GVRD companies underperform non-GVRD companies. One possible explanation for this observation is that the hurdle rate (to survive and acquire financing) for GVRD companies are much lower than for non-GVRD companies due to the availability of external financing in the GVRD region. In other words, non-GVRD companies need to show a much clearer potential in order to acquire external financing from the angels. Second, the return to investment varies across different industries, with the return to investment into life science industry yielding the highest return. This higher return may be due to the higher risk associated with investments made into life science industry.

Table 8 presents the effect of distance on the return to angel investment. Columns 1 and 2 include two measures of distances: Distance km - the natural logarithm of the travel distance measured in km plus one in column 1; and distance time – the natural logarithm of the travel time measured in second plus one in column 2. Notice that I exclude the company and investor's location controls in these regressions. Columns 3 and 4 report the results with the final model specification that includes investor and company's location controls in addition to the previous financing amount and time controls. This will be the main specification used to examine the relationship between distance and return to angel investment.

Column 3 of Table 8 shows that there is a positive and significant relationship between distance and return. This positive relationship implies an increase in distance is associated with higher return for angel investments. In particular, holding all else constant, an increase in distance from the 25th percentile to the 75th percentile (or from 9.34km to 124km) increases the return to angel investment by 6 percentage points. [12,13] This suggests that the hurdle cost effect and the network effect outweigh the screening effect and the advising effect. What this means is that distant angels require a higher return in compensating for the cost associated with not being able to contribute to the their local communities and not being able to secure a trustful relationship with the entrepreneurs. This outweighs the information advantage associated with local investments. This is a selection effect discussed in section 2. It can also mean that an angel who is distant to a

[12] In an un-tabulated result, when regressing AIRR on a series of dummy variables indicating various ranges of distance, I find that coefficients on these dummies are significantly different than each other. This suggests that the relationship between distance and return is a non-linear one. I also fit a quadratic function of distance and return. The positive coefficient for distance and a negative coefficient for distance square, although not statistically significant, hint that there possibly is an inverted U-curve relationship between distance and return.

[13] This finding is similar with Hochberg and Rauh's (2012) in the context of limited partner private equity investments. The authors find that public pension funds' performance on in-state investments is 2-4 percentage points lower than both their own similar out-of-state investments.

company can provide a different and better set of values, i.e. a different network, to the company in replacing the set of values that is only available for close-by angels, i.e. advising and hand-on supports, in the value-added stage. This is the treatment effect. Of course, it can also mean both. Consequently, it is interesting and important to pin down whether this relationship is associated with the selection and/or the treatment effect.

Column 3 and 4 of Table 8 report that GVRD angels outperform non – GVRD angels. Specifically, angels who locate in the GVRD region, on average, have a return that is greater than the return of angels who locate outside the GVRD region by 10 percentage points. For example, if a non-GVRD angel has a return of 5%, then a GVRD angel has a return of 15%. This finding lends further support to the expectation that a GVRD angel is more experienced and sophisticated than a non-GVRD angel. This is the case because the GVRD angels are exposed to a larger number of ventures.

Second, angel investments made into GVRD companies produce a lower return. On average, an investment made into a GVRD company has a return that is lower than the return of an investment made into a non-GVRD company by almost 25 percentage points. This finding seems to suggest that not only GVRD region has a large number of ventures, but also the quality of the companies vary quite dramatically. In other words, the hurdle rate of getting financing in the GVRD region is lower than that of the non-GVRD region because of the limited availability of risk capital in the non GVRD region. In other words, lower quality companies located in the GVRD region can still acquire risk capital, while the same non-GVRD company cannot. This observation can also be viewed as additional support for the argument that GVRD angels are more experienced and sophisticated than non-GVRD angels. It is so because GVRD angels are not only exposed to a large number of ventures, but are also exposed to a wide range of ventures that have very different qualities.

Third, the coefficients on Angel – Multiple and Angel - Fund are positive but insignificant. Nevertheless, this provides some support for the argument that Angel – Multiple and Angel – Fund are more experienced than Angel – Simple.

4.2 Effect of distance by categories of angel investors

As discussed in Section 4.1, the positive relationship between distance and return can be explained by the effects occurred at the selection stage (selection effect) and/or the effects that occurred at the value-added stage (treatment effect). In this section, I make an attempt to disentangle these effects.

To do this, I make use of the possibility that the effect of distance differ across different categories of angels. Specifically, the Angel – Single category is viewed as the most inexperienced and unsophisticated category of angels. In the extreme case, the treatment effect is absent. Under this scenario, there is hope to identify whether the effect of distance on return occurs at the selection stage at least among the Angel – Single category.

Furthermore, one can assume that all the effects occurred at the selection stage are absent among the Angel – Fund category. This assumption rests on the fact that Angel Fund consists of multiple angels and has an extensive network. Consequently, Angel Fund can utilize the available human resource and extensive network in not only making them visible to potential ventures but also in minimizing the hurdle cost effect. If this is the case, one would then expect that the selection effect is absent among the Angel Fund category. If this is the case, the resulting effect of distance on return for the Angel – Fund category is mainly driven by the treatment effect.

Table 9 reports the OLS regression results under different specifications. The dependent variable is the computed AIRR and the key independent variables are the interaction terms between measures of distance and categories of angels.

As shown in Table 9, there is evidence that the effect of distance varies across different categories of angels. Specifically, at the bottom of Table 9, I report the Wald test statistic, in which I compare the coefficients of the three interaction terms. I find that distance seems to matter more for Angel – Single as opposed to Angel – Multiple. The chi square value is at 3.97 for distance km and 3.7 for distance time. Although distance does not seem to have different impacts on return between Angel – Multiple and Angel – Fund, the chi square value is at 1.88 and 1.92 for the two specifications, suggesting that the difference is fairly close to significant.

Table 9 shows that distance has a positive relationship with the return for the Angel – Single category. In addition, the effect of distance on the return for Angel – Single is stronger than the effect of distance on the return for Angel – Multiple and Angel – Fund. Note that, since the treatment effect is absent, the observed relationship between distance and return is mostly driven by the selection effect where the hurdle cost effect dominates the screening effect among the Angel – Single category. This implies that the nonpecuniary benefit, which constitutes the hurdle cost effect), is very strong among Angel – Single. This finding makes sense as single-shot angel tends to invest for nonmonetary reasons. This can also mean that entrepreneurs are selective in choosing their external financing and Angel – Single may not be viewed as the best source of financing in term of signalling the venture quality. This notion of “better affiliation” has been documented in the venture capital literature as Hsu (2004) found that entrepreneurs take a lower offer from a more reputable venture capitalist.

Regarding the Angel – Fund, Table 9 shows that there is a positive relationship between distance and the return to angel investment. However, this relationship is not statistically significant. Therefore, there is not a clear evidence of a treatment effect between distance and return.

4.3 Relationship of distance by investor and company’s locations

In this section, I continue the search for additional evidence that would shed light on whether the relationship between distance and return are driven at the selection stage or at the value-added stage. To do this, I decompose the angels and the companies by their locations.

As discussed in Section 2, the relationship between distance and return can be different across companies located in the center and companies located in the periphery. In particular, the network effect should be larger for non-GVRD companies than for GVRD companies. This is the case because the GVRD angels, who are the distant investors to the non-GVRD companies, have more valuable networks.

To examine this, I adopt two different approaches: (i) the investor-company location dummy approach and (ii) the interaction term between distance and location approach.

Regarding the first approach, I construct four investor-company location dummies: GVRD Company and GVRD Angel dummy, GVRD Company and non-GVRD Angel dummy, non-GVRD Company and GVRD Angel dummy, and non-GVRD Company and non-GVRD Angel dummy. Table 10 regresses the AIRR on these dummies and the controls. The GVRD Company and non-GVRD Angel dummy is purposely omitted so that the network effect can be picked up by examining the coefficient on the non-GVRD Company and GVRD Angel dummy.

As shown in Table 10, the investment return for the non-GVRD Company and GVRD Angel pair is significantly greater than the return to the GVRD Company and non-GVRD Angel pair. Indeed, the Wald test shown at the bottom of Table 10 shows that this investor-company location pair has the greatest return in comparison to all other location pairs. Although this can be viewed this as an evidence supporting the dominance of the network effect, this could mainly be driven by the fact that GVRD companies do poorly in general. Note that, company and investor location controls are not included in this regression due to multicollinearity problem. Obviously, this may inflate the treatment effect.

I thus take a second approach. I construct interactions term between distance and company location dummies, and between distance and investor location dummies. Table 11 shows the OLS regression result for this approach.

If the network effect is the main determinant of the relationship between distance and the return to angel investment, one should expect to see that distance matters more for non-GVRD companies. In particular, the coefficient on the interaction term between distance and non-GVRD companies should be greater in value than the coefficient on the interaction term between distance and GVRD companies holding all other effects the same across the two groups of companies.

Columns 1 and 2 of Table 11 show the reverse. Only the coefficient on the interaction term between distance and GVRD companies is positive and statistically significant when controlling for company's and investor's own locations. More importantly, it is greater in value than the coefficient on the interaction term between distance and non-GVRD companies. This result suggests that the network effects that occurred at the value-added stage cannot explain the positive relationship between distance and return to angel investment found in previous sections.

In fact, the positive and significant effect of distance on the interaction term between distance and GVRD companies provides further support for the dominance of the hurdle cost effect as non-GVRD investors requires a greater return to compensate for their loss of not investing in their local ventures. Consequently, the positive relationship found in column 1 and 2 of Table 11 suggest that the relationship between distance and return is be mainly driven by the selection effect. This finding is further supported by the results found in Column 3 and 4 of Table 11 where the distance has a positive effect on GVRD angels instead of non-GVRD angels, who has a smaller network effect.

Finally, The Wald test reported at the bottom of Table 11 shows that there is a significant difference between the effect of distance on return for investments made into GVRD companies and investments made into non-GVRD companies. The chi square values for the distance in km and distance in time are 10.47 and 9.5 respectively.

5. CONCLUSION

The effect of distance on the return to angel investment can be explained by four distinct effects: the screening effect and the hurdle cost effect at the selection stage; the advising effect and the network effect at the value-added stage.

Using a unique dataset that contains detailed information on angel investments and the locations of the angels and the companies, this paper reports several interesting results. First there is a positive relationship between distance and angel investment performance, measured by the annualized internal rate of return. In particular, holding all else constant, an increase in distance from the 25^{th} percentile to the 75^{th} percentile increases the return to angel investment by 6 percentage points. Second, the effect of distance varies across different categories of angels and company's locations. Specifically, this study shows that distance matters more to the less experienced angels, who invest in only one company in the entire dataset, and to companies located in a center. These findings suggest that the relationship between distance and return seems to be determined mostly at the selection stage. Finally, this paper documents that the return to angel investment is highly skewed with 55% of all angel deals resulting in a break-even or loss and only 22% of all deals result in a positive return of 50% or more.

Although this paper takes an alternative approach to distinguish the selection effect from the treatment effect, a search for a proper instrumental variable is still desired. One possibility is to use the introduction of additional flight route as adopted by Giroud and Mueller (2013). Another possibility is the introduction of new communication channels such as icloud and skype etc. Future research should aim to collect additional data and test the validity of these instruments in a broader search for a better explanation of the effect of distance on return in the angel capital market.

REFERENCES.

Agarwal, S. and R. Hauswald, 2010. Distance and Private Information in Lending. *Review of Financial Studies*, Vol 23(7), 2757 – 2788.

Benjamin, G. A., & Margulis, J., 2001. *The Angel Investor's Handbooks. How to Profit From Early-Stage Investing*. Princeton, NJ: Bloomberg Press.

Berger, A., Miller N., Petersen, M. Rajan, R. and J. Stein, 2005. Does function follow organizational form? Evidence from the lending practices of large and small banks. *Journal of Financial Economics*, 76, 236-269.

Bottazzi, L., Da Rin, Marco and Thomas Hellmann 2013. The Importance of Trust for Investment: Evidence from Venture Capital. Working Paper.

Bygrave, William D. and Stephen Hunt 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.

Cochrane, John H., 2005. The Risk and Return of Venture Capital. *Journal of Financial Economics*, 27,1, 3 – 52.

Da Rin, Marco, Thomas Hellmann and Manju Puri, 2013. A survey of venture capital research. Forthcoming in George Constantinides, Milton Harris, and René Stulz (eds) *Handbook of the Economics of Finance*, 2, Amsterdam, North Holland.

DeGennaro, Ramon P., 2010. Angel Investors: Who They Are and What They Do; Can I Be One Too? *The Journal of Wealth Management*, 13 (2), 55 – 60.

Freear, J., Sohl, J. E. and W. E. Wetzel Jr., 1992a. The Informal Venture Capital Market in the 1990s. In *State of the Art of Entrepreneurship*, ed. D. L. Sextion and J. D. Karsada. PWS-Kent Publishing, MA: Boston.

Freear, J., Sohl, J. E. and W. E. Wetzel Jr., 1992b. The Investment Attitudes, Behavior And Characteristics of High Net Worth Individuals. In *Frontiers of Entrepreneurship Research*, ed. N.C. Churchill, S. Birley, W. D. Bygrave, D. F. Muzyka, C. Wahlbin and W. E. Wetzel, jr. Babson Park, MA: Babson College, pp. 374 - 387.

Freear, J., Sohl, J. E. and W. E. Wetzel Jr., 1994. Angels and Non-angels: Are There Differences? *Journal of Business Venturing*, 9, 109 – 123.

Freear, J., Sohl, J. E. and W. E. Wetzel Jr., 1996. The informal venture capital market: Milestones passed and the road ahead. *Presented at The 4th State of the Art in Entrepreneurship Research Conference*, May 9-11.

Giroud, Xavier and Holger M. Mueller, 2013. Capital and Labor Reallocation inside Firms. Working paper.

Harrison, P., Sussman, O. And J. Zeira, 1999. Finance and Growth: Theory and New Evidence. *Board of Governors of the Federal Reserve System*, Finance and Economics Discussion Series, no. 99 – 35.

Hellmann, Thomas F. and Manju Puri, 2002. Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence, *Journal of Finance*, 57-1, 169-197.

Hochberg, Yael and Joshua Rauh, 2012. Local Overweighting and Underperformance: Evidence from Limited Partner Private Equity Investments. Working paper.

Hsu, David, 2004. What Do Entrepreneurs Pay for Venture Capital Affiliation? *Journal of Finance*, 59 (4): 1805 – 1844.

Kaplan, Steven and Antoinette Schoar 2005. Private Equity, Performance: Returns, Persistence, and Capital Flows. *Journal of Finance*, 60 (4), 1791.

Kelly, P., 2007. Business Angel Research:The Road Travelled and the Journey Ahead. In *Handbook of Research on Venture Capital*, ed. H. Landstrom, 315 – 31. Cheltenham: Edward Elgar.

Korteweg, Arthur and Morten Sorensen, 2010. Risk and Return Characteristics of Venture-Backed Entrepreneurial Companies. *The Review of Financial Studies*, 23, 10, 3738 – 3772.

Lerner, J., 1995. Venture Capitalists and the Oversight of Private Firms. *Journal of Finance*, 50, 301 – 318.

Mason, C. M., 2006. Informal Sources of Venture Finance. In *The lifecycle of entrepreneurial ventures*, ed. S. Parker, 259 – 99. Berlin: Springer.

Mason, C. M. and R. T. Harrison, 1993. Strategies for expanding the informal venture capital market. *International Small Business Journal*, 11(4), 23-38.

Mason, C.M. and R. T. Harrison, 1994. The Informal Venture Capital Market in the UK. In *Financing Small Firms*, ed. A. Hughes and D. J. Storey, 64-111. London: Routledge.

Mason, C. M. and R. T. Harrison, R. T., 1996. Informal venture capital: A study of the investment process, the post-investment experience and investment performance. *Entrepreneurship and Regional Development*, 8, 105-125.

Mason, Colin M. and R. T. Harrison, 2002. Is it worth it? The rates of return from informal venture capital investments. *Journal of Business Venturing*, 17, 211–236

.

Motkovitz, Tobias J. and Annett Vissing-Jorgensen, 2002. The Returns to Entrepreneurial Investment: A Private Equity Premium Puzzle?. *American Economics Review*, 92, 4, 745 – 778.

OECD, 2011. Financing High-Growth Firms: The Role of Angel Investors, *OECD Publishing*, http://dx.doi.org/10.1787/9789264118782-en

Petersen, M. and R. Rajan, 2002. Does distance still matter? The Information Revolution in Small Business Lending. *Journal of Finance*, 57, 2533-2570.

Raúl Prebisch, 1959. Commercial Policy in the Underdeveloped Countries. *The American Economic Review*, 49, 2, 251 – 273.

Riding, A., Dal Cin P., Duxbury L., Haines. G. and R. Safrata, 1993. Informal Investors in Canada: The Identification of Salient Characteristics. *Ottawa: Carleton University*.

Riding, Allan L., 2008. Business angels and love money investors: segments of the informal market for risk capital. , *Venture Capital: An International Journal of Entrepreneurial Finance*, 10, 4, 355-369.

Shane, S. 2005. Angel Investing. *A Report for the Federal Reserve Banks of Atlanta*, Cleveland, Philadelphia, Kansas City and Richmond, Cleveland: Weatherhead School of Management, Case Western Reserve University.

Sherman, Andrew J., 2012. Raising Capital: Get the Money You Need to Grow Your Business. 3rd ed, AMACOM, New York.

Sorenson, Olav and Toby E. Stuart, 2001. Syndication Networks and the Spatial Distribution of Venture Capital Investments. *American Journal of Sociology*, 106, 6, 1546–1588.

Sorheim, R., 2003. The Pre-investment Behavirour of Business Angels: a Social Capital Approach. *Venture Capital: An International Journal of Entrepreneurial Finance*, 5: 337 – 364.

Tian, Xuan, 2011. The Causes and Consequences of Venture Capital Stage Financing. *Journal of Financial Economics*, 101 (1), 132 – 159.

Wetzel, W.E., 1981. Informal Risk Capital in New England. In *Frontiers of entrepreneurship research*, ed. K.H Vesper, Wellesley 217 – 245 MA: Babson College.

Wetzel, W.E., 1983. Angels and Informal Risk Capital. *Sloan Management Review*, 24 (4): 23 – 34.

Wetzel, W. E. Jr., 1987. The informal venture capital market: Aspects of scale and market efficiency. *Journal of Business Venturing*, 2:299-313.

Wiltbank, Robert, 2005a. At the Individual Level: Outlining Angel Investing in the United States. *Working Paper*.

Wiltbank, Robert, 2005b. Investment Practices and Outcomes of Informal Venture Investors. *Venture Capital*, 7, No. 4, 343 – 357.

Wiltbank, Robert and Warren Boeker, 2007. Returns to Angel Investors in Groups. *Ewing MarionKauffman Foundation and Angel Capital Education Foundation*.

Wong, Andrew, 2009. Angel Finance: The Other Venture Capital. In *Venture Capital: Investment Strategies, Structures, and Policies*, ed. Douglas Cumming, John Wiley & Sons, NJ: Hoboken.

Table 3: Properties of companies - sample vs. population.

This table compares our sample of companies to the overall population of companies that received angel investments through the VCP program between 1999 and 2006. Panel A presents the distribution of companies by company's status. Panel B presents the distribution of companies by company's industries. Panel C presents the distribution of companies by company's locations. Variables are defined in Table A1.

Panel A: Distribution of companies by company's status.

Status	Final Sample		Population	
	# Companies	%	# Companies	%
Acquired	10	4.7%	30	8.8%
IPO	4	1.9%	5	1.5%
Failed	41	19.2%	92	26.9%
Active	158	74.2%	215	62.9%
Total	**213**	**100.0%**	**342**	**100.0%**

Panel B: Distribution of companies by company's industries.

Industries	Final Sample		Population	
	# Companies	%	# Companies	%
Non High-tech Others	50	23.5%	86	25.1%
Life Science	37	17.4%	57	16.7%
Computer Hardware and Software	83	39.0%	115	33.6%
High-tech Manufacturing & Services	43	20.2%	84	24.6%
Total	**213**	**100.0%**	**342**	**100%**

Panel C: Distribution of companies by company's locations.

Locations	Final Sample		Population	
	# Companies	%	# Companies	%
GVRD	152	71.4%	228	66.7%
Non - GVRD	61	28.6%	114	33.3%
Total	**213**	**100.0%**	**342**	**100.0%**

Table 4A: Properties of angel deals - Overall Distributions.

This table reports the properties of angel deals included in the final sample of companies that received angel investments through the VCP program between 1999 and 2006. Panel A presents the properties of angel deals by company's status. Panel B presents the properties of angel deals by company's industries. Panel C presents the properties of angel deals by investor's locations. Panel D presents the properties of angel deals by the geographic proximity between an angel and an investee company. Panel E presents the properties of angel deals by angel investor's categories.

Panel A: Summary statistics of angel deals by company's status.

Status	**Investors**		**Deals**	
	Numbers	**%**	**Numbers**	**%**
Acquired	359	10%	364	10%
IPO	123	4%	126	4%
Failed	475	14%	480	14%
Active	2464	72%	2566	73%
All	3421	100%	3536	100%

Panel B: Summary statistics of angel deals by company's industries.

Industry	**Investors**		**Deals**	
	Numbers	%	Numbers	%
Non hi-tech other	624	18%	635	18%
Life science	941	27%	968	27%
Computer hardware and software	1159	34%	1210	34%
Hi-tech manufacturing & services	702	20%	723	20%
All	3426	100%	3536	100%

Panel C: Summary statistics of angel deals by angel investor's locations.

Location	**Investors**		**Deals**	
	Numbers	%	Numbers	%
GVRD	2058	61%	2213	63%
Non - GVRD	1294	39%	1323	37%
All	3352	100%	3536	100%

Panel D: Summary statistics of angel deals by angel investor's geographic proximity to the investee companies.

Geographic Proximity (km)	**Investors**		**Deals**	
	Numbers	%	Numbers	%
First 25% Quantile (< 9.34)	839	25%	887	25%
25% - 50% Quantile (9.34 - 27.1)	867	25%	898	25%
50% - 75% Quantile (27.1 - 124)	807	24%	836	24%
Last 25% Quantile (> 124)	903	26%	915	26%
All	3416	100%	3536	100%

Panel E: Summary statistics of angel deals by angel investor's categories.

Category	**Investors**		**Deals**	
	Numbers	%	Numbers	%
Angel - Single	3031	90%	3031	86%
Angel - Multiple	249	7%	377	11%
Angel - Fund	72	2%	128	4%
All	3352	100%	3536	100%

Table 4B: Properties of angel deals - Investment and return.

This table reports the properties of angel deals included in the final sample of companies that received angel investments through the VCP program between 1999 and 2006. Panel A presents the properties of angel deals by company's status. Panel B presents the properties of angel deals by company's industries. Panel C presents the properties of angel deals by investor's locations. Panel D presents the properties of angel deals by the geographic proximity between an angel and an investee company. Panel E presents the properties of angel deals by angel investor's categories.

Panel A: Summary statistics of angel deals by company's status.

Status	Invt. Amt (CAD)		Annualized IRR		PME - TSX		PME - NASDAQ	
	Average	Median	Average	Median	Average	Median	Average	Median
Acquired	38235	20000	39%	55%	2.42	1.56	3.31	2.73
IPO	58967	15000	97%	15%	1.29	1.59	1.39	0.89
Failed	28782	10000	-100%	-100%	0.00	0.00	0.00	0.00
Active	36268	13750	22%	0%	1.00	0.84	2.70	2.30
All	36338	12525	10%	0%	1.02	0.78	2.35	2.07

Panel B: Summary statistics of angel deals by company's industries.

Industry	Invt. Amt (CAD)		Annualized IRR		PME - TSX		PME - NASDAQ	
	Average	Median	Average	Median	Average	Median	Average	Median
Non hi-tech other	42593	10034	14%	0%	1.30	0.84	2.92	2.20
Life science	28781	12000	28%	0%	1.02	0.85	2.64	2.47
Computer hardware and software	39833	15000	-1%	0%	0.86	0.86	1.86	1.93
Hi-tech manufacturing & services	35231	15000	3%	0%	1.06	0.85	2.28	2.04
All	36338	12525	10%	0%	1.02	0.78	2.35	2.07

Panel C: Summary statistics of angel deals by angel investor's locations.

Location	Invt. Amt (CAD)		Annualized IRR		PME - TSX		PME - NASDAQ	
	Average	Median	Average	Median	Average	Median	Average	Median
GVRD	38675	15000	12%	0%	0.99	0.77	2.30	2.11
Non - GVRD	32439	12000	8%	0%	1.09	0.83	2.44	2.04
All	36338	12525	10%	0%	1.02	0.78	2.35	2.07

Table 4B (continued)

Panel D: Summary statistics of angel deals by angel investor's geographic proximity to the investee companies.

Geographic Proximity (km)	Invt. Amt (CAD)		Annualized IRR		PME - TSX		PME - NASDAQ	
	Average	Median	Average	Median	Average	Median	Average	Median
First 25% Quantile (< 9.34)	39145	12500	7%	0%	0.94	0.73	2.24	2.04
25% - 50% Quantile (9.34 - 27.1)	30988	12500	7%	0%	0.97	0.78	2.23	1.93
50% - 75% Quantile (27.1 - 124)	32937	12500	20%	0%	1.03	0.84	2.39	2.18
Last 25% Quantile (> 124)	41976	15000	8%	0%	1.14	0.84	2.54	2.04
All	36338	12525	10%	0%	1.02	0.78	2.35	2.07

Panel E: Summary statistics of angel deals by angel investor's categories.

Category	Invt. Amt (CAD)		Annualized IRR		PME - TSX		PME - NASDAQ	
	Average	Median	Average	Median	Average	Median	Average	Median
Angel - Single	27427	11166	10%	0%	1.01	0.77	2.35	2.06
Angel - Multiple	51325	25000	18%	0%	1.12	0.97	2.39	2.12
Angel - Fund	200000	86597	6%	0%	1.04	0.83	2.21	2.15
All	36338	12525	10%	0%	1.02	0.78	2.35	2.07

Table 4C: Properties of angel deals - Distance.

This table reports the properties of angel deals included in the final sample of companies that received angel investments through the VCP program between 1999 and 2006. Panel A presents the properties of angel deals by company's status. Panel B presents the properties of angel deals by company's industries. Panel C presents the properties of angel deals by investor's locations. Panel D presents the properties of angel deals by the geographic proximity between an angel and an investee company. Panel E presents the properties of angel deals by angel investor's categories.

Panel A: Summary statistics of angel deals by company's status.

Status	Distance Km		Distance Time	
	Average	Median	Average	Median
Acquired	798	28	25781	912
IPO	477	116	15581	3807
Failed	347	19	11244	640
Active	348	26	11274	851
All	399	26	12917	872

Panel B: Summary statistics of angel deals by company's industries.

Industry	Distance Km		Distance Time	
	Average	Median	Average	Median
Non hi-tech other	596	78	19384	2555
Life science	296	19	9475	630
Computer hardware and software	440	17	14258	553
Hi-tech manufacturing & services	295	36	9600	1176
All	399	26	12917	872

Panel C: Summary statistics of angel deals by angel investor's locations.

Location	Distance Km		Distance Time	
	Average	Median	Average	Median
GVRD	64	16	2099	538
Non - GVRD	959	207	31012	6791
All	399	26	12917	872

Panel D: Summary statistics of angel deals by angel investor's geographic proximity to the investee companies.

Geographic Proximity (km)	Distance Km		Distance Time	
	Average	Median	Average	Median
First 25% Quantile (< 9.34)	5	4	149	142
25% - 50% Quantile (9.34 - 27.1)	16	15	521	497
50% - 75% Quantile (27.1 - 124)	62	48	2013	1578
Last 25% Quantile (> 124)	1466	738	47422	24050
All	399	26	12917	872

Panel E: Summary statistics of angel deals by angel investor's categories.

Category	Distance Km		Distance Time	
	Average	Median	Average	Median
Angel - Single	443	29	14337	945
Angel - Multiple	129	16	4202	528
Angel - Fund	153	15	4970	480
All	399	26	12917	872

Table 5: AIRR for investor-company location pairs.
This table reports the average and the median AIRR for four distinct investor-company location pairs.

Company's Location	Investor's Location			
	GVRD		Non-GVRD	
	Average	Median	Average	Median
GVRD	4.7%	0.0%	4.3%	0.0%
Non-GVRD	52.3%	5.2%	14.2%	0.0%

Table 6: Descriptive statistics.
This table provides descriptive statistics for all dependent and independent variables. Variables are defined in Table A1. For dummy variables the Mean column reports the frequency of observations, and the 25%, Median, and 75% are omitted.

Variable	# Obs	Min	25%	Median	Mean	75%	Max	S.D.
AIRR	3536	-100%	-8%	0%	10%	21%	630%	83%
Distance km	3536	0.02	9	26	399	122	5482	991
Distance time	3536	0.00	304	872	12917	3997	140000	31910
Angel - Single	3536	0.00	-	-	0.85	-	1.00	0.35
Angel - Multiple	3536	0.00	-	-	0.11	-	1.00	0.31
Angel - Fund	3536	0.00	-	-	0.04	-	1.00	0.19
GVRD - Company	3536	0.00	-	-	0.78	-	1.00	0.42
GVRD - Angel	3536	0.00	-	-	0.63	-	1.00	0.48
Non High-tech Manufacturing and Services	3536	0.00	-	-	0.18	-	1.00	0.38
Life Science	3536	0.00	-	-	0.27	-	1.00	0.44
Computer Hardware and Software	3536	0.00	-	-	0.34	-	1.00	0.47
High-tech Manufacturing and Services	3536	0.00	-	-	0.20	-	1.00	0.40

Table 7: Baseline Model.

This table reports results from OLS regressions. The unit of analysis is at deal level. Dependent variable is AIRR. Independent variables are GVRD - COMPANY, GVRD - ANGEL, ANGEL - MULTIPLE, and ANGEL - FUND, and INDUSTRY dummies. The unreported control variables are age, capital-raised, and calendar time. All variables are defined in Table A1. Heteroskedasticity-robust standard errors are reported in the parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Independent variables	1
GVRD - Company	-0.250***
	(0.0387)
GVRD - Angel	0.0437
	(0.0303)
Angel - Multiple	0.0462
	(0.0492)
Angel - Fund	0.0392
	(0.0753)
Life Science	0.125**
	(0.0529)
Computer Hardware & Software	-0.0704
	(0.0476)
High-tech Manufacturing & Services	-0.0887*
	(0.0489)
Controls	YES
Constant	0.0701
	(0.180)
Observations	3,536
Number of companies	213
R-squared	0.142

Table 8: The Relationship between Distance and Angel Investment Performance.

This table reports results from OLS regressions. The unit of analysis is at deal level. Dependent variable is AIRR. Independent variables are DISTANCE - KM, DISTANCE - TIME, GVRD - COMPANY, GVRD - ANGEL, ANGEL - MULTIPLE, and ANGEL - FUND, and INDUSTRY dummies. The unreported control variables are age, capital-raised, and calendar time. All variables are defined in Table A1. Heteroskedasticity-robust standard errors are reported in the parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Independent variables	1	2	3	4
Distance - Km	0.0203***		0.0263***	
	(0.00666)		(0.00799)	
Distance - Time		0.0185***		0.0237***
		(0.00618)		(0.00728)
GVRD - Company			-0.247***	-0.248***
			(0.0386)	(0.0386)
GVRD - Angel			0.0965***	0.0923**
			(0.0365)	(0.0359)
Angel - Multiple	0.0766	0.0758	0.0546	0.0540
	(0.0486)	(0.0486)	(0.0495)	(0.0494)
Angel - Fund	0.0480	0.0496	0.0441	0.0471
	(0.0736)	(0.0736)	(0.0750)	(0.0751)
Life Science	0.120**	0.119**	0.139***	0.138***
	(0.0507)	(0.0507)	(0.0524)	(0.0524)
Computer Hardware & Software	-0.0931**	-0.0936**	-0.0570	-0.0569
	(0.0466)	(0.0467)	(0.0481)	(0.0482)
High-tech Manufacturing & Services	-0.0698	-0.0712	-0.0789	-0.0801
	(0.0488)	(0.0488)	(0.0487)	(0.0487)
Controls	YES	YES	YES	YES
Constant	-0.0675	-0.119	-0.0135	-0.0801
	(0.186)	(0.191)	(0.188)	(0.193)
Observations	3,536	3,536	3,536	3,536
Number of companies	213	213	213	213
R-squared	0.133	0.132	0.145	0.145

Table 9: The Relationship between Distance and Angel Investment Performance - Decomposition of Angel Investors.

This table reports results from OLS regressions. The unit of analysis is at deal level. The dependent variable is AIRR. Independent variables are SINGLE * KM, MULTIPLE * KM, FUND * KM, SINGLE * TIME, MULTIPLE * TIME, FUND * TIME, GVRD - COMPANY, GVRD - ANGEL, ANGEL - MULTIPLE, and ANGEL - FUND. The unreported control variables are age, capital-raised, industry dummies and calendar time. All variables are defined in Table A1. Heteroskedasticity-robust standard errors are reported in the parentheses. Chi-square values at one degree of freedom are reported in the parentheses for all hypothesis testing. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Independent variables	1	2	3	4
Single * Km	0.0227***		0.0303***	
	(0.00692)		(0.00816)	
Multiple * Km	-0.0201		-0.0276	
	(0.0280)		(0.0288)	
Fund * Km	0.0330		0.0324	
	(0.0332)		(0.0337)	
Single * TIME		0.0205***		0.0273***
		(0.00646)		(0.00750)
Multiple * TIME		-0.0170		-0.0237
		(0.0254)		(0.0262)
Fund * TIME		0.0307		0.0296
		(0.0283)		(0.0287)
GVRD - Company			-0.251***	-0.252***
			(0.0387)	(0.0387)
GVRD - Angel			0.101***	0.0964***
			(0.0364)	(0.0358)
Angel - Multiple	0.216**	0.324*	0.242**	0.392**
	(0.0994)	(0.173)	(0.0996)	(0.175)
Angel - Fund	0.0195	-0.0110	0.0409	0.0364
	(0.110)	(0.179)	(0.111)	(0.180)
Controls	YES	YES	YES	YES
Constant	-0.0788	-0.134	-0.0312	-0.107
	(0.185)	(0.190)	(0.188)	(0.193)
Distance * Single vs. Multiple	0.0428	0.0375	0.0579**	0.051*
	(2.21)	(2.06)	(3.97)	(3.70)
Distance * Single vs. Fund	-0.0103	-0.0102	-0.0021	-0.0023
	(0.09)	(0.13)	(0.00)	(0.01)
Distance * Multiple vs. Fund	-0.0531	-0.0477	-0.06	-0.0533
	(1.51)	(1.58)	(1.88)	(1.92)
Observations	3,536	3,536	3,536	3,536
Number of companies	213	213	213	213
R-squared	0.133	0.133	0.146	0.146

Table 10: Relationship between Distance and Angel Investment Performance - Decomposition of Company and Investor's Location.

This table reports results from OLS regressions. The unit of analysis is at deal level. The dependent variable is AIRR. Independent variables are investor-company location dummies. The omitted dummy is the GVRD Company - non-GVRD Angel. The unreported control variables are age, capital-raised, industry dummies and calendar time. All variables are defined in Table 4. Heteroskedasticity-robust standard errors are reported in the parentheses. Chi-square values at one degree of freedom are reported in the parentheses for all hypothesis testing. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	1
GVRD Com - GVRD Angel	-0.0466
	(0.0331)
Non-GVRD Com - GVRD Angel	0.402***
	(0.0597)
Non-GVRD Com - non-GVRD Angel	0.0897*
	(0.0485)
Angel - Multiple	0.0498
	(0.0497)
Angel - Group	0.00393
	(0.0727)
Controls	YES
Constant	-0.0837
	(0.121)
GVRD Com - GVRD Angel vs. Non-GVRD Com - GVRD Angel	-0.449***
	(58.98)
GVRD Com - GVRD Angel vs. Non-GVRD Com - Non-GVRD Angel	-0.136***
	(8.11)
Non-GVRD Com - GVRD Angel vs. Non-GVRD Com - Non-GVRD Angel	0.323
	(21.18)
Observations	3,536
Number of companies	213
R-squared	0.138

Table 11: Distance and Angel Investment Performance - Decomposition of Company's and Investor's Location.
This table reports results from OLS regressions. The unit of analysis is at deal level. The dependent variable is AIRR. Independent variables are GVRD - INVT * KM, NON - GVRD - INVT * KM, GVRD - INVT * TIME, NON - GVRD - INVT * TIME, GVRD - COM, GVRD - INVT, MULTIPLE - COM - ANGEL, ANGEL - FUND, GVRD - COM * KM, NON - GVRD - COM * KM, GVRD - COM * TIME, and NON - GVRD - COM * TIME, GVRD - COMPANY, GVRD - ANGEL, ANGEL - MULTIPLE, and ANGEL - FUND. The unreported control variables are age, capital-raised, industry dummies and calendar time. All variables are defined in Table A1. Heteroskedasticity-robust standard errors are reported in the parentheses. Chi-square values at one degree of freedom are reported in the parentheses for all hypothesis testing. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	1	2	3	4
GVRD - Com * Km	0.0426***			
	(0.00921)			
Non - GVRD - Com * Km	-0.0186			
	(0.0165)			
GVRD - Com * Time		0.0385***		
		(0.00845)		
Non - GVRD - Com * Time		-0.0136		
		(0.0146)		
GVRD - Invt * Km			0.0141	
			(0.0144)	
Non - GVRD - Invt * Km			0.0328***	
			(0.00977)	
GVRD - Invt * Time				0.0130
				(0.0121)
Non - GVRD - Invt * Time				0.0302***
				(0.00922)
GVRD – Company	-0.504***	-0.642***	-0.255***	-0.256***
	(0.0907)	(0.136)	(0.0400)	(0.0399)
GVRD - Angel	0.124***	0.119***	0.169**	0.219*
	(0.0391)	(0.0385)	(0.0752)	(0.116)
Angel – Multiple	0.0565	0.0560	0.0558	0.0552
	(0.0494)	(0.0494)	(0.0494)	(0.0494)
Angel – Fund	0.0525	0.0558	0.0422	0.0444
	(0.0753)	(0.0755)	(0.0752)	(0.0754)
Controls	YES	YES	YES	YES
Constant	0.131	0.164	-0.0325	-0.122
	(0.197)	(0.211)	(0.189)	(0.196)
Distance * GVRD - Com vs. Non - GVRD - Com	0.0612***	0.0521***	-0.0187	-0.0172
	(10.47)	(9.50)	(1.13)	(1.26)
Distance * GVRD - Invt vs. Non - GVRD - Invt			-0.0187	-0.0172
			(1.13)	(1.26)
Observations	3,536	3,536	3,536	3,536
Number of companies	213	213	213	213
R-squared	0.149	0.148	0.145	0.145

Table A1: Variable definitions.

Variable	Description
(a) Dependent variables	
AIRR	the annualized internal rate of return for an angel deal. In case of multiple investment deals, this variable is the weighted average of the annualized internal rate of return for all investments of the same deal by the investment amounts.
(b) Independent variables	
DISTANCE-KM	natural logarithm of one plus the actual travel distance between an angel investor and the corresponding investee company measured in kilometer.
DISTANCE-TIME	natural logarithm of one plus the actual travel time between an angel investor and the corresponding investee company measured in seconds
ANGEL - SINGLE	dummy variable that takes on value of 1 if an investor or an investment vehicle invests in only one companies; 0 otherwise.
ANGEL - MULTIPLE	dummy variable that takes on value of 1 if an investor or an investment vehicle invests in more than one company; 0 otherwise.
ANGEL - FUND	dummy variable that takes on value of 1 if an investment vehicle is owned by more than one angel investors; 0 otherwise.
GVRD - COMPANY	dummy variable that takes on value of 1 if the company is located in the Greater Vancouver region; 0 otherwise.
GVRD - ANGEL	dummy variable that takes on value of 1 if the angel investor is located in the Greater Vancouver region; 0 otherwise.
(c) Interaction terms	
SINGLE - KM	interaction between single - company - angel dummy and the natural logarithm of 1 plus the actual travel distance between an angel investor and the corresponding investee company measured in km.
MULTIPLE - KM	interaction between multiple - company - angel dummy and the natural logarithm of 1 plus the actual travel distance between an angel investor and the corresponding investee company measured in km.
FUND - KM	interaction between angel – fund dummy and the natural logarithm of 1 plus the actual travel distance between an angel investor and the corresponding investee company measured in km.
SINGLE - TIME	interaction between single - company - angel dummy and the natural logarithm of 1 plus the actual travel time between an angel investor and the corresponding investee company measured in second.
MULTIPLE - TIME	interaction between multiple - company - angel dummy and the natural logarithm of 1 plus the actual travel time between an angel investor and the corresponding investee company measured in second.

Table A1 (continued)	
FUND - TIME	interaction between angel – fund dummy and the natural logarithm of 1 plus the actual travel time between an angel investor and the corresponding investee company measured in second.
GVRD - COM * KM	interaction between GVRD company dummy and the natural logarithm of 1 plus the actual travel distance between an angel investor and the corresponding investee company measured in km.
NON - GVRD - COM * KM	interaction between one minus GVRD company dummy and the natural logarithm of 1 plus the actual travel distance between an angel investor and the corresponding investee company measured in km.
GVRD - COM * TIME	interaction between GVRD company dummy and the natural logarithm of 1 plus the actual travel time between an angel investor and the corresponding investee company measured in second.
NON - GVRD - COM * TIME	interaction between one minus GVRD company dummy and the natural logarithm of 1 plus the actual travel time between an angel investor and the corresponding investee company measured in second.
GVRD - INVT * KM	interaction between GVRD investor dummy and the natural logarithm of 1 plus the actual travel distance between an angel investor and the corresponding investee company measured in km.
NON - GVRD - INVT * KM	interaction between one minus GVRD investor dummy and the natural logarithm of 1 plus the actual travel distance between an angel investor and the corresponding investee company measured in km.
GVRD - INVT * TIME	interaction between GVRD investor dummy and the natural logarithm of 1 plus the actual travel time between an angel investor and the corresponding investee company measured in second.
NON - GVRD - INVT * TIME	interaction between one minus GVRD investor dummy and the natural logarithm of 1 plus the actual travel time between an angel investor and the corresponding investee company measured in second.
(d) Control variables	
AGE	natural logarithm of one plus the company age at time of investment measured in quarters. In case of multiple investment deals, company age is measured at time of the earliest investment.
CAPITAL-RAISED	natural logarithm of one plus the amount of cumulative capital raised at time of investment measured in CAD. In case of multiple investment deals, capital raised is measured at time of the earliest investment.
INDUSTRY	set of mutually exclusive dummy variables that take the value 1 if the company is reported to operate in one of the following industries; 0 otherwise. Our data gives the following options: *Life science; Computer hardware & software; High-tech manufacturing and services; Non High-tech others.*