Shall we dance?: the rationale for leveraged buyout syndication

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Shall We Dance? The Rationale for Leveraged Buyout Syndication

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Abstract

Syndicated investments are common in the private equity industry. This paper examines how management team composition might influence LBO syndication decisions, and links both to performance. By using a unique hand-collected dataset of 947 LBO investments, we show that investment size, geographic distance, and investor experience increase syndication likelihood. Besides, management teams with engineers and MBA graduates are prone to syndication. More specifically, Harvard MBAs tend to work with each other while Columbia MBAs are more likely to syndicate with each other as well as with engineers. We find a non-linear relationship between syndication and performance, probably due to different inherent nature of deals. MBA graduates seem to affect performance in non-syndicated deals, but not in syndicated ones. It thus suggests that MBAs are good at pre-deal screening, and might further explain why they would seek outside expertise when needed. Finally, we find that the strongest syndication match that enhances value is the "Harvard MBA-and-Harvard MBA" pair. Hence, Harvard MBAs may syndicate with each other because a personal acquaintance enables a better match of skills. For other teams, syndication is likely for the purpose of diversification or future deal reciprocity.

Keywords: Leveraged Buyouts, Syndication, Top Management Teams

JEL Classification: G2

1 Introduction

Since the 1980s, the private equity (PE) industry[1] has been playing an active role in the M&A market. Stromberg (2007) estimates the total value of leveraged buyout (LBO) transactions to be approximately $3.6 trillion between 1970 and 2007, corresponding to roughly 14,000 companies under management worldwide in the early 2007, the peak of the most recent cycle.

To find promising deals, PE managers evaluate information that they collect. Other things being equal, it is natural to expect discrepancies among deals managed by different teams since managers coming from various backgrounds might interpret information and evaluate situations from different perspectives[2]. Moreover, the team composition might affect the decision through the interactions among managers within the team, which might be critical to final performance of the deals (e.g. Naranjo-Gil, Hartmann, and Maas, 2008; Certo et al., 2006).

Syndication, a form of joint underwriting among investment parties, is one common deal type of LBO transactions despite there is little literature on LBO syndicated investments. In this paper, we examine the rationale for LBO syndication, and in particular, we are interested in how management team characteristics, mainly measured by managerial education backgrounds, might influence syndication decisions. More specifically, our aim is three-fold, at first, to understand why LBO management teams decide to syndicate. Furthermore, based on the decision to syndicate the deal, whom do they syndicate with? Do they syndicate more with those who share similar backgrounds? Lastly, by linking both syndication and management team composition to performance, we attempt to know how these two factors might drive performance, if any. The answer to the last question would not only shed some light on what kind(s) of management team composition work better, but, more importantly, help verify the rationale for LBO syndication.

Due to the lack of theoretical and empirical foundation for LBO syndication, we formulate our testing hypotheses based on the venture capital (VC) literature. We argue that, since VC investments are sometimes labeled as private equity and can be regarded as the closest type of investments to their LBO counterparts, the VC literature is a good choice

[1] Hereafter private equity refers to (leveraged) buyout investments, not including venture capital, real estate, and any other asset class at times regarded as private equity as well.

[2] Educational psychology studies psychology that includes both methods of study and a resulting knowledge base. Among others, it analyzes how different educational settings might influence student behavior and cognitive perspectives that might form a long term memory (e.g. Huitt, 2001, 2003).

to start with. Apart from that, the literature on VC syndication is well-established, and we would use three of its determinants as controlled variables, i.e. geographic distance, investment size, and investor experience. In a nutshell, we hypothesize that geographic distance and investment size would increase, whereas investor experience decreases, the syndication likelihood. Firstly, for distance, syndication tends to diffuse information across industry boundaries and expand the spatial radius of transactions, and thus achieve diversification (e.g. Stuart and Sorensen, 2001). In addition, for size, syndication can address financial constraint issues (e.g. Gerasymenko and Gottschalg, 2008). As for investor experience, younger firms might seek syndication in order to pool relevant signals and improve deal-screening process that is under uncertainties and with asymmetric information (e.g. Hopp and Rieder, 2006). In other words, syndication might also provide a certification by having more investors in the deal.

Also pertinent to our study, a considerable body of literature focuses on how human capital and (social/educational) networks influence corporate policy and performance. Zarutskie (2007) argues that skill plays an important role in the heterogeneity and persistence of VC fund performance, and Hochberg, Ljungqvist, and Lu (2007) find that better networked VC firms show significant superior fund performance. In another asset class, Chevalier and Ellison (1999) find that mutual fund performance can be explained by the characteristics of fund managers which might indicate ability, knowledge, or effort. Alternatively, the top management team literature probes how the management team composition, either measured by homogeneous or heterogeneous skills, affects performance, if at all. Given the pros and cons in theory, not surprisingly, the evidence is ambivalent. In this paper, we hypothesize that homogeneous teams would increase the syndication likelihood because heterogeneous (or complementary) skills are necessary to achieve superior performance when non-routine decisions are involved and essential for the outcome (e.g. Hambrick and Mason, 1984).

We hand-collect a unique dataset which contains information regarding the characteristics of 947 LBO transactions mostly in the U.S. and Europe between 1991 and 2005, along with the biographies of managers in the corresponding investment firms. The uniqueness of our dataset is two-fold: for one thing, other than the details of these transactions when initiated, the final performance is also known; for the other, the (historical) biographies of the management team members are available, in which the conventional databases usually provide merely the current team information. Our empirical evidence shows that investment size, geographic distance, and investor experience are positively correlated with syndication propensity. Therefore, syndicating deals serves clearly for the purpose of diversification

ahead of exit and also to overcome financial constraint. However, certification is less needed in the BO industry, because the portfolio companies are mostly mature ones with established track records, in contrast with those in venture capital deals.

Regarding the management team composition, we find that teams consisting of engineers and MBA graduates (MBAs) are prone to syndication. In particular, Harvard and INSEAD MBAs are more likely to syndicate deals. Once managers decide to syndicate the deal, the alternative hypothesis is that the selection of the partner(s) is for the purpose of value enhancing. Otherwise, the selection is likely in anticipation of future reciprocity of deals. Other things being equal, those who the managers already know are more likely to be in the pool of potential candidates for selection. To test the hypothesis, we form a subsample of 134 syndicated deals co-invested by only two firms and use the McFadden conditional logit model to examine the selection process for MBAs (and the subgroups). We find that, on average, MBAs tend to work with other MBAs and engineers, but, to a lesser extent, not with top managers having regular Master degrees. Moreover, we find discrepancies among MBAs coming from different major schools. Harvard MBAs tend to work with each other, but not with regular Master graduates. Columbia MBAs are more likely to work with each other and with engineers. Other MBAs do not show specific preferences.

For teams consisting of high levels of MBAs (the subgroups), in general they tend to work with each other and with engineers. However, Harvard MBAs still prefer to work with each other only, and Chicago MBAs again do not show particular preferences. Also, having more Harvard MBA graduates in the team increases the number of syndication partners. These findings suggest that Harvard MBAs are more capable of syndication via their renowned alumni network. Once looking at all syndicated investments, syndication tends to reinforce the existing team attributes that have low ratios. In fact, syndication increases the skill heterogeneity of the team, which does affect the decision to syndicate. Namely, though not the first order concern, teams with homogeneous education backgrounds might seek syndication to complement skills or abilities that the team lacks.

When it comes to performance, we do not expect a linear relationship between syndication and performance to exist. At first glance, if firms are certain about the prospects of the deal (e.g. NPV>0) under consideration and the capability of conducting the deal alone, there seems no obvious reason to search for syndication partners to begin with. Hence, syndicated investments should yield lower returns. On the other hand, the opposite holds true if syndication renders value-adding services. Brander, Amit and Antweiler (2002) use data in Canada and show that syndicated VC investments outperform their counterparts, suggest-

ing that syndication enhances value. Nonetheless, since both factors can be simultaneously at play, there is no clear prediction how syndication should affect deal performance.

To illustrate, we build up a simple two-stage game, in which, based on the payoff structure[3], we would predict two performance patterns depending on these two transaction forms. That is, 1. non-syndicated > syndicated > non-syndicated ≅ syndicated; 2. syndicated > non-syndicated > non-syndicated ≅ syndicated. Our data shows that performance of syndicated investments clusters, compared with that of non-syndicated ones. It thus indicates that the best and the worst performers tend to be non-syndicated deals, and performance of syndicated ones would lie somewhere in between. In other words, the benefits derived from syndication are not large enough to make up for the "loss" as if the deal were a non-syndicated one. Due to the inherent inferior nature of syndicated deals, we can view syndication as a "treatment", and in that regard we still do not find a linear relationship between syndication and performance.

When simultaneously taking into account these three factors, i.e. syndication decisions, management team composition, and performance, we find that, investment size and geographic distance are detrimental to performance, which might explain why these two factors lead to the decision to syndicate deals in the beginning. In terms of deal types, MBAs enhance performance in non-syndicated ones, but not in syndicated ones. For deals syndicated by two investors, the only team combination that consistently enhances performance is having (more) Harvard MBAs in both firms. Another same-school combination which seems to generate synergies arises with Chicago MBAs. It thus suggests that, for (Harvard) MBAs, seeking to work with each other is not simply because they know each other (and their abilities), but also, more importantly, because by working together they can contribute to performance.

All in all, our study demonstrates that, the rationale for syndication is to make deals that otherwise might not be able to. It serves for the purpose of diversification and overcomes financial constraint, despite of less need for certification. When it comes to the selection of syndication partners, Harvard MBAs prefer to work with each other, and those from other major schools tend to work with each other and also with engineers, potentially aiming to attract complementary expertise. Moreover, for non-syndicated investments, MBAs enhance deal performance, despite they exert no significant influence on syndicated ones. It thus suggests that MBAs are good at pre-deal screening, and might further explain why they

[3]More specifically, whether the value added by syndicated partners is large enough to compensate for the value that does not make it a non-syndicated investment during the pre-deal screening stage.

would seek outside expertise, on top of the typical deal size and geography considerations for syndication, and those who they know are easier to be in the pool of candidates for syndication. Since the only syndication match that increases deal value is the "Harvard MBA-and-Harvard MBA" pair, it suggests that Harvard MBAs might choose to syndicate with each other because a personal acquaintance enables a better match of skills. For other teams, the choice of syndication partner(s) is more likely to reflect diversification needs and/or future deal reciprocity.

Our study contributes to the current literature mainly in the following four fronts. First of all, we provide evidence that management team matters for corporate policy. Unlike Bottazzi and Da Rin (2007) that use managerial characteristics to determine investor activism in the venture capital industry, we use LBO transactions to show the importance of human capital. Secondly, we find the rationale for cooperation among investment parties is to complement (substitute) some factors that are beneficial (detrimental) to final performance. Thirdly, we show that the considerations for LBO and VC syndication are similar, but discrepancies remain. That should attribute to their different inherent nature, along with the uncertainties and risks that both face. Lastly, we add to the top management team literature that simply looking at the homogeneity or heterogeneity of the team does not help to understand how the team performs, if any. Instead, our results suggest that different specific compositions of management team might be what really matters for performance.

The remainder of the paper proceeds as follows: Section 2 gives a brief literature review that relates to possible determinants of LBO syndication. Section 3 contains hypotheses to be tested. Section 4 describes the dataset and the sample formation used in the analyses. Section 5 shows the estimation methods and testing results. Section 6 concludes.

2 Literature Review

To our best knowledge, up to date there is still little study on LBO syndication, regardless of the fact that it is a common investment form in the private equity industry. On the other hand, the related literature on the VC industry, used to be categorized in the private equity domain as well, is rich. Meanwhile, the evidence for possible determinants of VC syndication is ample. Hence, we argue that, being the closest investment type, we can apply it in our settings and we will use some of those determinants as our controlled variables for the subsequent testing.

2.1 Determinants of Venture Capital Syndication

For practitioners, the motivations for syndication are straightforward: to get mutual consent on the deals, to secure follow-on financing, and to spread risks. The literature on venture capital provides two main reasons for syndication, i.e. screening for deal flow improvement and adding value to portfolio companies. For the latter, it facilitates the sharing of information, contacts, and resources among VCs. Bygrave (1988) finds that the top 21 high innovative venture capitalists (HIVCs) comprise a tightly coupled network because of the high uncertainty they encounter. By comparison, a group of the top 21 firms investing mainly in low innovative technology companies has a more loosely bound. Other value-adding possibilities are to expand the customer bases or strategic alliance partners for PCs. On the other hand, for the purpose of pre-deal screening, at least four considerations, described as follows, might be at play.

2.1.1 Future Reciprocity

VC firms (VCs) syndicate in anticipation of future reciprocity. Lerner (1994a) argues that early-round investors might do so, hoping that their partners will share investing opportunities in later rounds of their deals. Consequently, VCs should offer shares in the best deals to those most able to reciprocate, that is, the well-established venture firms.

2.1.2 Certification

Under severe uncertainty and asymmetric information regarding the investment prospects, syndication aims to pool correlated signals and select better investments. Sah and Stiglitz (1986) show that hierarchical organizations might be superior, or more efficient, in which investment decisions are made only if more than one independent observer agrees. That being said, having other VCs' willingness to co-invest might attribute to the decision of investing in a promising deal. Moreover, Hopp and Rieder (2006) show that, for VCs, the number of realized funds and the (subsequent) ability of deal evaluation are positively connected.

In this aspect, the issue regarding the uncertainty and asymmetric information facing BO investments is much less of a concern for BO firms because the portfolio companies involved are usually more established, concentrating in the mature industries.

2.1.3 Diversification

Syndication could diffuse information across sector boundaries and also expand the spatial radius of transactions, and thus achieve diversification. Stuart and Sorensen (2001) show that evolution of VC relationships appears to facilitate information sharing, eroding of geographic and industrial boundaries in the VC asset allocation. Therefore, VC syndication makes a promising deal that otherwise would not be possible. They also argue that, institutions supported by broad participation among market players must precede the expansion of the spatial range of exchange in markets that reply on private information or require a high degree of trust for transactions to occur. In this context, VC syndication indeed provides the institutional infrastructure needed.

2.1.4 Financial Constraint

Financial consideration might also contribute to VC syndication. Gerasymenko and Gottschalg (2008) find evidence supporting the argument that some deals require capital that is more than a single fund's capability or willingness due to its investment strategy. In addition, De Clerq and Dimov (2004) show that high financial requirement of late-stage deals is the main reason for syndication, compared to early-stage counterparts. However, Brander et al. (2002) find syndication occurs in small deals as well.

2.2 Networks, Human Capital, and Performance

In the private equity domain, the skills and networks of managers are regarded as important attributes, among others, to its recent seemingly out-performance, along with its persistence. For one thing, before investing, managers must be able to identify and evaluate prospective portfolio companies. After investing, they usually play an active role in both monitoring and advising their funds' portfolio companies, e.g. Kaplan and Stromberg (2001). One additional benefit from providing these value-adding services is that private equity firms might stand in a favorable position for the best deals, e.g. Gompers and Lerner (2001). Consequently, the skills and networks of managers matter for performance heterogeneity, and thus its persistence.

2.2.1 Networks and Performance

In financial markets, agents can gain informational advantages through their social networks. Cohen, Frazzini, and Malloy (2008) collect data on educational backgrounds of sell-side eq-

uity analysts and also that of senior officers and board members of companies, and show that analysts outperform on stock recommendations when they have an education link to the firms under analysis. They suggest two mechanisms which allow information transferred within the networks: cheaper access to firm-specific information and better access to managerial quality. After the passage of Regulation FD in 2000, which is designed to curb selective disclosure, this abnormal return pattern almost disappears. As a result, selective disclosure is regarded as the main information pathway along educational networks.

Due to the inherently high uncertainty and few tangible assets, syndication, the cooperation among financial institutions, is commonplace within the VC industry. It is believed to affect the two main drivers of its performance: the ability to screen for high-quality deal flows and that to nurture investments by providing value-adding services. Hochberg, Ljungqvist, and Lu (2007) investigate the association between the fund performance and network in the VC industry. They find that better networked VC firms show significant superior fund performance, measured by the portfolio company exit percentage, either through IPO or resale. Also, the portfolio companies of better networked VCs have a higher tendency to refinance and eventual exit.

2.2.2 Human Capital and Performance

Chevalier and Ellison (1999) use a sample of 492 mutual fund managers between 1988 and 1994, and examine the relationship between mutual fund performance and the characteristics of fund managers which might indicate ability, knowledge, or effort. After controlling for behavioral differences between managers and selection biases, the original significant performance heterogeneity is greatly reduced. Even so, some differences remain, and managers who attend higher SAT undergraduate institutions have systematically higher risk-adjusted excess returns.

By using the first-time VC fund data, Zarutskie (2007) argues that skill plays an important role in heterogeneity and persistence of fund performance and further shows which measures of skill matter and when. In particular, those VC teams equipped with venture investing and/or start-up management experiences enhance fund performance, in terms of higher percentages of portfolio company exits. More, the founding team features on performance indicate higher explanatory power in seed stage funds than that in later stage ones. Lastly, different team composition seems to affect how portfolio company exits, and the predictive ability of VC characteristics persists in follow-on investments.

2.3 Management Team Composition

As closely related to the topic of management team composition, the top management team (TMT) literature has been debating whether complementary skills or the heterogeneity within the management team are required for superior performance[4], especially when non-routine decisions are involved and crucial for the outcome (Hambrick and Mason, 1984). For example, heterogeneity can enhance performance via the following channels: multiple perspectives (Bantel and Jackson, 1989) and increased levels of information (Williams and O'Reilly, 1998). In addition, group heterogeneity serves a proxy for cognitive heterogeneity associated with task conflicts which can generate better decisions (Pelled et al., 1999, and Amason, 1996).

On the contrary, heterogeneity can jeopardize performance because of interpersonal conflicts which might hinder the group's ability to make effective decisions (Amason, 1996). The conflicts could come from different attitudes and values (Bantel and Jackson, 1989). Moreover, the use of categorization, e.g. (negative) stereotypes, which might result in emotional conflicts between group members (Pelled et al., 1999). Both reasoning might affect two main drivers of team performance, i.e. social integration and communication, either formal or informal (Smith et al., 1994, Williams and O'Reilly, 1998). Under this circumstance, homogeneous management teams are often associated with speedy and efficient coordination (Carpenter, 2002, and Hambrick et al., 1996), which would eventually lead to superior performance.

Weighing the pros and cons that the heterogeneity of the management team might bring to performance, it is not surprising that the empirical results are mixed. Even so, we tend to think that complementary skills are necessary for successful deals, and thus homogeneous management teams might be prone to syndication in order to supplement the skills lacked among the existing team members.

3 Hypotheses

As mentioned in the beginning, our primary research question is whether the management team characteristics, in terms of education backgrounds, are among the determinants of LBO syndication decisions? As a result, based on the theoretical implications in the VC literature, described in the previous section, our alternative hypotheses are the following,

[4]Lopez-de-Silanes and Phalippou (2008) show that, in the buyout transactions, the concentration of managerial background in the investment team might result in inferior performance.

H1: The managerial backgrounds (in education) play a role in syndication decisions

H1a: The syndication likelihood increases with the homogeneity level (in terms of skills) of the management team

Control variables:

1. geographic distance (to test the diversification hypothesis):

   H1: The syndication likelihood increases with the geographic distance between location of the portfolio company and that of the investor

2. investor experience (to test the certification hypothesis):

   H1: The syndication likelihood decreases with the (previous) experience of the investor

3. investment size (to test the financial constraint hypothesis):

   H1: The syndication likelihood increases with the investment size

4. fixed effects: PC location and industry, BO firm, and transaction year

4 Data and Sample

4.1 Institutional Background

LBO firms, managed by General Partners (GPs), make large acquisitions without committing all the capital required for the acquisition, mostly involving significant amount of debt financing for the purpose of tax benefits. Their investment funds, co-invested by Limited Partners (LPs), mainly institutional investors, who are not allowed to add or withdraw their capital during the funds' life, have a life cycle of approximately 10 to 14 years. Usually a new fund is initiated every 2 to 4 years, and there can be multiple funds simultaneously run by these firms.

4.2 Data

Our main data source comes from the hand-collected the Private Placement Mamoranda (PPMs)[5] of LBO firms mainly in the U.S. and Europe. In the PPMs, we observe the equity

[5] When LBO firms raise money to start a new fund, they would distribute fund raising prospectuses, the so-called Private Placement Mamoranda (PPMs), to the public. The PPMs outline the terms of securities to be offered in a private placement. In this case, they include the performance of all previous investments done by the firms.

invested, total amount distributed, and the valuation of any unsold stake, at the time when the PPM was compiled, for each investment. Its multiple, i.e. valuation divided by capital invested, as one of the performance measures, is always reported. Additionally, in most cases the following information is also available: month and year of acquisition and exit, internal rate of return (IRR), investment type and status (realized or unrealized), exit route, the industry and the country of the PCs, and the biography of senior managers, including those who already left the firm.

The original dataset consists of 6611 investments that can be traced back to as early as 1971. Then, we apply the following screening criteria, i.e. transactions occurred after 1990, buyout related, exit already, with identifiable fund and portfolio company information, and a sample of 1317 investments remains. Next, in order to gather information on syndication and also for the purpose of data correction, we match this sample with whatever is available in Capital IQ and VentureXpert that meets our needs. For instance, both databases provide, among others, a list of investors involved in the transactions. In the end, we verify 947 investments, which constitute the final sample in this paper.

As for the management team characteristics, we complement the data by using several other sources, such as Galante's Directory, zoominfo, linkedin, and the website of firms. In short, our dataset contains comprehensive information regarding LBO transactions and the biographies of senior managers[6] involved in those transactions. However, for those we cannot determine when they join (and leave) the firm, we would exclude them. Therefore, the uniqueness of our dataset is two-folds. For one thing, the final performance of these transactions is known. For the other, the historical management team characteristics are available. The conventional databases usually cover only current management teams.

4.3 Sample

Table 1 shows the sample statistics in terms of investments (value of capital invested in Panel A and year in Panel B), portfolio companies (geographic location in Panel C and industry orientation in Panel D), and LBO firms (geographic location in Panel E and firm

[6] Titles include: managing director, partner (but exclude operating, administrative, advisor, recruiting, technology, venture and special partner), principal (exclude finance principal), director (exact), executive director (exclude (independent or former) non-executive director), senior director, controller, senior manager, investment director, chief executive, chairman (exclude vice chairman), chief financial officer, founder, and some with discretions (e.g. Director in the syndicated team). Exclude titles related to: vice president, analyst, investment manager, investor relations, associate director, marketing, associate, assistant, account, and advisor.

type in Panel F). Firstly, by and large, more than three-quarters of the sample, syndicated or not, has investment size less than 50 million dollars, adjusted for inflation (deflated by CPI of December 2006). Compared with non-syndicated investments, syndicated ones tend to involve larger capital input, although there exist some outliers for non-syndicated investments. Except larger ones, for most of size category, the ratio between non-syndicated and syndicated investments remains roughly 2 to 1. As for the timing of the sample deals, more than half (57.06%) of the transactions occur between 1995 and 1999, which coincides the booming period of the buyout industry in the last decade. The patterns for syndicated and non-syndicated transactions are similar during the whole sample period, which also fits the time trend of the whole buyout industry described in Stromberg(2007).

In addition, the majority (54.59%) of the sample PCs is located in the U.S., and around 21% in the U.K. PCs in the U.S., the U.K., and France together comprise more than 80% of the sample, in which a similar pattern of geographic distribution holds for the LBO firms. The sample PCs concentrate in two industries, manufacturing (chemical/related and industrial) and services, around 28% and 24%, respectively. Lastly, at least 65% of the LBO firms are private investment firms, and around 13% belong to the financial service investment arm category.

On the other hand, Table 3 shows another set of sample statistics[7] in terms of management teams (team size in Panel A, managerial nationality in Panel B, education backgrounds in Panel C, and school of MBAs in Panel D). Taking all the transactions as a whole, approximately one-third of the sample is conducted by teams with 5 to 10 professionals. Management teams with up to 20 professionals conduct almost 90% of transactions in the sample. The syndicated and non-syndicated transactions share a similar pattern for size distribution, though there is long tail for non-syndicated transactions. On average, the syndicated deals are done by two more professionals than that for the non-syndicated ones. As for managerial nationality, it is not surprising to see that the majority of the professionals in the sample are from the U.S. (58.79%), and the U.K. (20.67%).

Panel C shows the team attributes[8] for the 1527 professionals (firm-personnel) involved in the sample transactions. Note that more than 70% and almost half of the professionals have business backgrounds[9] and own a MBA degree, respectively. Moreover, about 20%

[7] We consider only the sample LBO firms, excluding the syndicated partners in this part.

[8] These characteristics are not exclusive. For instance, a Harvard MBA graduate who qualifies as a CPA would be assigned to CFA/CPA/CA, MBA, Business, Harvard MBA, and Harvard Alumni at the same time.

[9] It includes specialization in Accountancy, Commerce, Economics, Business, Marketing, and Finance.

of the professionals are Harvard alumni, which suggests that being in the Harvard network might influence corporate policy. Panel D shows the school distribution of the MBAs. Among them, about 30% of the MBAs come from Harvard, followed by Wharton (8.56%), Stanford (7.88%), and Columbia (7.61%).

5 Estimation and Testing Results

5.1 Determinants of LBO Syndication

5.1.1 Univariate Analyses

Firstly, we conduct several univariate tests on the explanatory variables prior to the regression analyses. In general, the testing results for the control variables in Table 2 suggest that investment size, geographic factors, and investor experience might all affect syndication decisions. For one thing, capital invested size is significantly larger for syndicated investments. For another, geographic factors, measured by the geographic distance between the acquirer and the target, there exist significant discrepancies between investments made by single and multiple investors. In particular, the distance is shortened for syndicated investments when considering the whole investment partners. As for the investor experience, the test results of firm age, measured by the difference between the founding year of the LBO firm and the acquiring year of the portfolio company, show that more experienced firms tend to syndicate more. And therefore, it seems that the uncertainty and asymmetric information consideration is less severe in the buyout industry, contrary to the VC industry.

Syndication and Investment Size

Figure A.1 and A.2 demonstrate the three estimated relations between syndication propensity and investment size. When the size is small, less than approximately 7 million dollars, there exists a positive relationship, but the upward trend diminishes thereafter until the size reaches around 100 million dollars, in which the trend reverses and turns downward slopping, possibly due to the outliners. In sum, the evidence of positive linear relationship between syndication and investment size is consistent with Gerasymenko and Gottschalg (2008), despite the relationship is not obvious anymore once we relax the estimation methods.

Syndication and Geographic Distance

According to Figure A.3, the relationship between syndication and geographic distance is

not obvious, and a weak positive correlation might exist before some threshold, e.g. 6000 kilometers. However, Figure A.4 shows that this relationship is more likely non-linear, and more specifically, the syndication propensity has a spike when the geographic distance is small, and then increases gradually after it reaches around 2000 kilometers. This pattern is interesting and, in fact, more in line with our prior expectation since we do not know who initiate(s) the syndication in the first place. Figure A.5 and A.6 consider the entire syndicated partners, and the patterns are more prominent.

Compared with the findings of Stuart and Sorensen (2001) who argue that VC network enhances the probability to invest in distant target that otherwise might not be possible, we also find evidence that syndication propensity increases with geographic distance between the LBO firm and its target.

Syndication and Investor Experience

The estimated relationship between syndication and investor experience, as displayed in Figure A.7 and A.8, indicates that there is an upward trend between the two. Nevertheless, unlike the previous two factors, this relationship is relatively weak. It is not surprising since the targets are usually mature companies, and the consideration for certification is not pressing. Therefore, there is less need for syndication.

Syndication and Management Team Composition

Regarding the managerial characteristics, we primarily consider education backgrounds, at the same time controlling for two other features, whether qualifying as CFA/CPA/CA and/or being founder of the LBO firm. In terms of education, we categorize each professional with 5 various kinds of educational training, i.e. MBA, Law[10], Business, Engineering, and (general) Master[11] degrees. Due to the significant proportion of the Harvard graduates among the professionals, we add one variable, Harvard MBA, to see if it would also be influential in our analyses. Moreover, to test whether the concentration of backgrounds affects the decision to syndicate deals, we create a "skill concentration" variable which adopts the calculation similar to the Herfindahl Index, and it consists of three different skills, i.e. Law, Business, and Engineering.

To begin with, we are interested to know how different, if any, the management teams in syndicated and non-syndicated transactions are. The variables of interest are measured by

[10] Includes: J.D., L.L.M., and L.L.B. degrees.

[11] Excludes: MBA, J.D., and L.L.M. degrees.

density, which is the ratio of the number of professionals who have specific characteristics to the team size, with value between 0 and 1, except the skill concentration variable. The mean test in Table 4 shows that professionals being the founding partners of the firm favor syndication less. In contrast, professionals who are MBA, Engineering, and Harvard graduates are prone to syndication. Apart from that, in other aspects, there exist no significant differences between these two groups. Note that syndicated investments seem conducted by teams with higher homogeneous skills, insignificant though. On the other hand, the median test suggests a similar and, in some cases, even stronger relationship between syndication and management team composition.

5.1.2 Regression Analyses

Our purpose is to test the main null hypothesis that managerial backgrounds do not play a role in syndication decisions, controlling for other possible determinants such as geographic distance, investment size, and investor experience. Following the preceding univariate analyses, in this section we conduct two sets of regression analysis and investigate which factors might affect: 1. the decision to syndicate; 2. the selection of syndication partners.

Syndication Decision: Whether to Syndicate or Not?

By applying the linear probability estimation, we regress syndication, a binary variable, on factors that we intend to test. In other words, by incorporating these factors into one regression, we allow for the so-called "horse race" among several alternative hypotheses, and the outcome might shed some light on the importance of different aspects when it comes to syndication decisions. The specification is as follows,

Syndication Propensity =

f(Managerial Team Attributes, Investment Size, Geographic Distance, Investor Experience), while we control for: transaction year, LBO firm, and PC industry and location.

Table 5 reports the correlation matrix of the explanatory variables, and Table 6 shows the regression results in which the management team characteristics are quantified by the density variables introduced in the previous section. In Panel A (general models), Specification (1), (2), (3), and (4) are the basic models while Specification (5)-(8) control for transaction year and PC industry fixed effects. Specification (9) and (10) include all four fixed effects. In Panel B (restricted models with MBA team attributes only), Specification (1)-(7) do not control for fixed effects, while Specification (8)-(14) do.

On the face of it, we find that investment size, geographic distance, and investor experience do matter in syndication decisions, with unequal statistical significances[12]. All three factors are positively associated with syndication propensity, although only investor experience remains significant once we control for all four fixed effects. To illustrate, for instance, a 10 million increase of investment size would significantly increase roughly 5% of syndication propensity. Likewise, a 10 kilometer increase of geographic distance would have, on average, 2% more chance to syndicate. Lastly, the influence of investor experience is much less than the former two factors, merely 0.2%. That is to say, syndication occurs can be because the invested capital is too large (either capable to handle or not), and/or the firm considers to enter a new market (for diversification or expansion). On the other hand, it is less of a concern that young firms syndicate more to overcome the uncertainty and information asymmetry issues.

As for the team composition, what stands out is that teams with engineers and MBAs[13] tend to syndicate more. In particular, having one engineer in a 10-member team would raise the syndication propensity by approximately 3%. On the other hand, the concentration on skills within the team does not influence the decision to syndicate. So, we cannot reject the null hypothesis H1a, and syndication decisions is not associated with the homogeneity level (in skills) of management team.

Syndication Decision: Whom to Syndicate with?

Since there is evidence that different team educational attributes influence syndication propensity, the next question of interest is: if they are prone to syndication, whom they choose to syndicate with? To that end, we form a subsample with 134 deals co-invested by two firms only so that we can avoid factors that might affect deals conducted by more than 2 investors. Moreover, we assume that, for these deals, firms only attempt to seek one (best) syndication partner. In this setup, we use the McFadden conditional logit model for the syndication partner selection process, since that model works the best for the selection of one alternative among many (Kuhnen, 2009). Each investment firm(f) at time t can choose among all other investing firms(i) in the sample with available team attributes data at time t. The dependent variable is a dummy variable equal to one for the investing-candidate

[12] Panel A in Table 13 shows the alternative results from the binomial probit estimation. Both estimations result in very similar outcome, but on the whole the linear probability estimation gives slightly stronger estimates.

[13] Among the subgroups of MBA graduates, Harvard and INSEAD MBA graduates are more likely to syndicate deals.

pairs that co-invest with each other at time t.

Since we are interested in the mutual relations, we only consider interaction terms of the team attributes between firms. In other words, the attributes of the available team matches (choices), rather than the attributes of individual firms[14], are what matter in the selection process. (Individual) explanatory variables are measured in percentages (absolute levels of team attributes). In general, the specification is as follows,

Matching Propensity =
f(MBA(f)*MBA(i), MBA(f)*Engineer(i), MBA(f)*Law(i), MBA(f)*Master(i))

Table 7 shows the coefficient estimates of the predictors of syndication partner selection for MBAs. Specification (1) is the basic model for MBAs in general. Specification (2) to (7) provide estimates for different subgroups. Top MBAs include those who are graduated from Harvard, Wharton, Stanford, Columbia, Chicago, INSEAD, or MIT business schools. We find that, Harvard MBAs tend to work with each other, but not with regular Master graduates. Columbia MBAs are more likely to work with both each other and engineers. Other MBAs do not show specific preferences.

Alternatively, instead of percentages, we use dummy variables to estimate the predictors, as displayed in Panel A (B) in Table 14, in which the interaction terms are dummy variables that are assigned to 1 as long as the absolute values for both the investment firm and the syndicated partner exceed the median (third quartile) value among all sample firms at the time when the deal is initiated. The results show that, for teams consisting with high levels of MBAs (the subgroups), they tend to work with each other and engineers. However, Harvard MBAs still prefer to work with each other only, and Chicago MBAs again do not show particular preferences.

Robustness: Number of Syndication Partners

Alternatively, instead of two stage process, it is possible that the syndication decisions is contingent on the availability of syndication partners. By applying ordinary least square estimation, we regress the number of syndication partners, a discrete variable, on the same set of explanatory variables. Note that, for non-syndicated investments, the number of syndicated partners is zero. The specification is as follows,

Number of Syndication Partners =

[14] Econometrically, it is not feasible to add individual team attributes to the regressions due to the lack of variations for each investment.

g(Managerial Team Attributes, Investment Size, Geographic Distance, Investor Experience), while we control for: transaction year, LBO firm, and PC industry.

The estimation results in Table 13 (Panel B) suggest that, similar to the previous syndication determinants, geographic distance, and teams with engineers and Harvard MBAs solely determine how many syndication partners would be in the transactions. This is not surprising, since other than the predilection for syndication, engineers and Harvard MBAs are more capable of finding syndication partners via their renowned (alumni) networks. Similarly, the concentration on skills within the team does not affect the number of the partners for the syndicated investments.

To sum up, there is evidence supporting the three (controlling) alternative hypotheses that investment size, geographic distance, and investor experience are among the issues that managers might be pondering during the syndication decisions making process[15]. When considering the management team composition, teams with engineers and (Harvard) MBAs syndicate more. Meanwhile, teams with engineers and Harvard MBAs are more capable of finding and working with multiple syndicated partners. Nevertheless, the concentration of skills within the team, the proxy for the homogeneity level, does not influence the syndication propensity, and thus not the main consideration for syndication.

Discussions

Based on the findings, management team composition seems to play a role in syndication decisions. However, is it part of the consideration? More specifically, are deals syndicated for the purpose of adjusting the existing team composition that might be crucial to final performance? To that end, we check, for the syndicated investments, the change of the team composition before and after the syndication. The univariate test results in Table 8 suggest that, syndication reinforces some of the existing team composition, instead of reducing it. However, since the entire enhancement relates to characteristics which have low proportions to start with, syndication might in fact increase the heterogeneity of the team. Indeed, the concentration level of skills is reduced after syndication. Therefore, teams with homogeneous education backgrounds might complement skills or abilities that the team lacks by means of syndication. To simply put it, the adjustment of the team composition is more likely the byproduct, not the cause, of syndication itself.

[15] The deal can be contingent on the syndication decision.

5.2 Syndication, Management Team, and Performance

So far, we find that LBO firms syndicate deals to address issues such as financial constraint, diversification, and/or certification. But ultimately, the inevitable question is, does syndication really pay off? Moreover, since management team composition matters for syndication decisions, does it matter for performance as well, either through syndication or not?

5.2.1 Syndication and Performance

As mentioned before, syndication might happen for two main reasons, for superior deal selection and value-adding services. Brander, Amit and Antweiler (2002) argue that, if the former holds true, syndicated investments should have lower returns since firms have no obvious reasons to share deals that they regard as promising, less uncertain, and meanwhile capable of conducting alone. On the contrary, if the latter holds true, the reverse should hold, and we should expect syndication would result in higher returns. They use Canadian data and find that syndicated investments have higher returns, which supports the value-adding interpretation. Nonetheless, both considerations can be simultaneously at play, and if so, there is no clear prediction how syndication might affect deal performance. As a matter of fact, our data shows that the correlation between performance and syndication is slightly negative, without statistical significance.

Even though it can be eventually an empirical question, we believe that it is more likely that firms would not turn to syndication if they do not necessarily have to. We postulate a very simple two-stage game, as illustrated in Figure 1, that in the first stage, firms evaluate deals and if needed, they enter the second stage to search for outside assistance. In the first stage, there are three outcomes for a typical deal, NPV_1=A>0, NPV_1<0, and NPV_1=0. Firms would disregard ones with negative NPV, and invest deals with positive NPV, alone. For the rest, such as deals that need others' value-adding services or with uncertain NPV, syndication is more probable. In this game, three possible NPVs that the syndicated partner can generate are, NPV_{12}=B>0, NPV_{12}<0, and NPV_{12}=0, and we assume profits are shared equally between the two firms. The worst investments can be non-syndicated and syndicated. However, the best performers can be either one, depending on which of the following conditions holds,

$$\left\{ \begin{array}{c} \text{if } A \geqslant (1/2) * B \implies \text{non-syndicated} > \text{syndicated} > \text{non-syndicated} = \text{syndicated} \ldots (1) \\ \text{if } 0 < A < (1/2) * B \implies \text{syndicated} > \text{non-syndicated} > \text{non-syndicated} = \text{syndicated} \ldots (2) \end{array} \right\}$$

Table 9 shows the performance distribution (ranked by deciles) of the sample investments,

by two measures, multiple (Panel A) and gross internal rate of return (Panel B). In addition, Figure 2 and 3 display the corresponding histograms, winsorized at 5% level, for both the non-syndicated and the syndicated investments. Consistent with our priors, regardless of which proxy that we use, performance of non-syndicated investments is more dispersed whereas that of syndicated ones clusters in the middle, suggesting (1) holds in our data. That being said, the benefits reaped from syndication are not able to cover the inherent "loss" from being inferior in nature.

5.2.2 Syndication, MBA Team Attributes, and Performance

Since syndicated investments are more likely to be inherently inferior, we may regard the act of syndication itself as a "treatment". Therefore, to know how syndication and management team composition might influence performance, we apply the two-stage treatment effect estimation method, in which the results are presented in Table 10. As expected, syndication has no impact on performance, no matter which proxy in use. Teams with Harvard MBAs outperform teams with other characteristics. As for the control variables, the negative relations that geographic distance and investment size have with performance might be exactly why they determine syndication in the first place. The skill concentration variable has no impact on performance. In summary, syndication itself is not associated with performance, but management team composition does affect performance.

When separately considering these two types of investments, Table 11 shows that MBAs enhance performance of non-syndicated ones (except INSEAD MBAs), but in general exert no influences on syndicated ones. Furthermore, Table 12 shows that, for deals syndicated by only two co-investors, the only team combination that matters for performance is having (more) Harvard MBAs in both firms, and its effect is significantly positive, regardless which performance proxy in use[16]. It thus suggests that for Harvard MBAs, seeking to work with each other is not simply because they know each other, but also because by working together they can contribute to final performance. That being said, for other MBAs, syndication is more likely to anticipate future reciprocity (from each other).

5.2.3 Discussions

Since non-syndicated and syndicated investments seem to be different in nature, we expect management team in general would exert influence on performance in different ways,

[16] The "Stanford MBA-and-Stanford MBA" team combination is beneficial to performance when we use Gross IRR as the proxy.

if any. In this section, we use two criteria, syndication and performance[17], and form four sub-groups. By conducting uni-variate analyses, we attempt to understand whether management team composition varies between superior and inferior investments. And if yes, what kind(s) of composition are beneficial (detrimental) to performance, conditional on syndication decisions?

Table A.1 (Panel A and B) shows the mean and median test results for Multiple, while the results for IRR are exhibited in Panel C and D, respectively. Generally speaking, no matter which performance proxy in use, we find that, for non-syndicated deals, there indeed exist differences between the two groups. In terms of Multiple, founders, business skills, and Harvard MBAs are valuable. Similar to Zarutskie (2007), having entrepreneurship is constructive to performance. Furthermore, enhancing the homogeneity level of skills is beneficial to performance. On the other hand, regarding IRR, engineers and regular Master graduates are valuable. Meanwhile, the mean test results show that business skills and Harvard MBA are beneficial to performance, while lawyers appear to jeopardize performance.

As for syndicated investments, management team composition does not seem to matter. It is not surprising since we need to take into account the whole syndicated partners in order to understand the real team composition. Table A.2 shows how the change in team composition due to syndication might affect performance. On the whole, there is no obvious relationship between the change and performance, despite having more engineers through syndication is harmful. This finding might explain why even though management team composition might be among the issues considered during the syndication decisions making process, it does not have the first order importance.

6 Conclusion

Syndicating investments, possibly for the purpose of alleviating risks and uncertainties encountered during the pre-deal screening process and also providing post-deal value-adding services, are commonplace in the private equity industry. However, unlike VC syndication, the most similar type of investments, LBO syndication has drawn little attention in academia. In this paper, by examining 947 LBO transactions conducted mostly between 1990 and 2006, we investigate the rationale for syndication. There are four alternative hypotheses for testing, that is: whether investment size, geography, investor experience, and manage-

[17] More specifically, high (low) performance refers to deals having the highest (lowest) 25% performance, either with proxy IRR or Multiple.

ment team composition (in education) affect syndication decisions. The last hypothesis is what our focus is. We show that, concerns about investment size and geography lead to syndication decisions in order to overcome financial constraint limitation and to achieve diversification, respectively. Meanwhile, syndication might help alleviate issues regarding uncertainty and information asymmetry, though it is much less severe in the buyout industry.

When it comes to team attributes, teams with engineers and MBAs are prone to syndication. By using a subsample of 134 syndicated deals conducted by only two investors, we find that, on average, MBAs tend to work with other MBAs and engineers, but, to a lesser extent, not with top managers having regular Master degrees, despite discrepancies remain among MBAs coming from different major schools. For instance, Harvard MBAs tend to work with each other. Columbia MBAs are more likely to syndicate with both each other and engineers. For teams with high levels of MBAs from different schools, they tend to work with each other and engineers as well. Still, Harvard MBAs prefer to work with each other only, and Chicago MBAs do not show particular preferences. Since having more Harvard MBAs increases the number of syndication partners, it suggests that Harvard MBAs might be more capable of syndication (through their alumni network). More, syndication tends to reinforce the existing team attributes with low proportions, and thus increases the heterogeneity of the team. In other words, teams with homogeneous education backgrounds might conduct syndication to complement skills or abilities that the team lacks, which is not the primary consideration though.

With regard to performance, we find a non-linear relationship between syndication and performance. We postulate that, in theory, the worst performers can be both transaction forms, while the best can be either non-syndicated or syndicated, hinging on whether the benefits from syndication are large enough to make up for being inherently inferior. Our data shows that the best and the worst investments are non-syndicated, and the syndicated ones cluster in the middle. When simultaneously taking into account syndication decisions, management team composition, and performance, we find that, for non-syndicated investments, team composition matters for performance, but not so for syndicated ones, even after controlling for team attributes of the entire syndicated partners. We also show that investment size and geographic distance are detrimental to performance. In other words, that size and distance are the determinants of the decision to syndicate deals is not only because they overcome the financial constraint and achieve diversification, but also because both factors are, in substance, harmful to performance. Team wise, management teams with lawyers and Harvard MBAs are beneficial to performance. For deals syndicated by

two co-investors, the only team combination that matters for performance is having (more) Harvard MBAs in both firms, and its effect is significantly positive.

In sum, we argue that, the rationale for LBO syndication is to make deals that otherwise might not be able to. The considerations behind might be to overcome the financial constraint and to diversify the investment portfolios of the firm. When managers decide to syndicate, Harvard MBAs prefer to work with each other, and those from other major schools tend to work with engineers as well as each other. Since, for non-syndicated investments, MBAs enhance deal performance, but have no influences on syndicated ones, it suggests better pre-deal screening abilities and explains why they would need to seek outside expertise when needed. Other things being equal, those who they know are easier to be in the pool of candidates for syndication. Due to the fact that the only syndication match that increases deal value is the "Harvard MBA-and-Harvard MBA" pair, Harvard MBAs working with each other is not simply because they know each other (and their abilities), but also because working together contributes to the performance. That also suggests, for other MBAs, syndication is more likely to anticipate future deal reciprocity and/or to diversify.

There are two more general implications from our study. Firstly, to firms, their management teams are influential in, not only the decision making but also the performance. Hence, when considering corporate behaviour, assuming homogeneous managers either within the firm or across firms would run the risk of spurious relations and ramifications. Secondly and more vitally, when we analyze team composition, rather than evaluating merely the homogeneity or heterogeneity of the team, we should examine specific compositions and take into account the possible interactions between different attributes of the team. To conclude, our work shows that human capital does matter, and its roles should not be neglected.

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Table 1
Sample Statistics: LBO Investments

This table provides a summary of the sample LBO investments. The full sample consists of 947 identifiable investments that meet the following criteria: (1) acquiring year from 1991 (except 16 KKR and 1 Kelso & Company investments); (2) BO related; (3) already exited. Panel A and B show the size distribution and the time trend of sample investments, respectively. Panel C and D show the geographic distribution and industrial orientation, based on the SIC codes, of the portfolio companies of sample investments. Panel E and F show the geographic distribution and company type of the LBO firms of sample investments.

Panel A: Size

Value of Capital Invested (US$ million. deflated)	LBO Investments				
	Total	Non-Syndicated		Syndicated	
	Number	Number	Fraction in %	Number	Fraction in %
< 50	748	461	61.63	287	38.37
50 – 100	92	51	55.43	41	44.57
100 – 150	47	24	51.06	23	48.94
150 – 200	14	9	64.29	5	35.71
200 – 250	12	7	58.33	5	41.67
250 – 300	5	2	40.00	3	60.00
300 - 350	5	4	80.00	1	20.00
350 – 400	6	3	50.00	3	50.00
400 – 450	4	2	50.00	2	50.00
450 – 500	3	3	100.00	0	0.00
> 500	11	6	54.55	5	45.45
Mean	55.50	58.03		51.63	
Median	20.82	18.58		23.97	
Standard Deviation	224.43	278.43		94.97	
Maximum	6143.15	6143.15		905.58	
Minimum	0.01	0.01		0.06	
Sample Size	947	572	60.40	375	39.60

Panel B: Time Trend

Year	LBO Investments				
	Total	Non-Syndicated		Syndicated	
	Number	Number	Fraction in %	Number	Fraction in %
< 1990	17	17	100.00	0	0.00
1991	52	27	51.92	25	48.08
1992	56	32	57.14	24	42.86
1993	85	50	58.82	35	41.18
1994	83	53	63.86	30	36.14
1995	104	63	60.58	41	39.42
1996	137	75	54.74	62	45.26
1997	120	74	61.67	46	38.33
1998	103	74	71.84	29	28.16
1999	79	43	54.43	36	45.57
2000	40	27	67.50	13	32.50
2001	31	17	54.84	14	45.16
2002	19	7	36.84	12	63.16
2003	5	3	60.00	2	40.00
2004	11	7	63.64	4	36.36
2005	4	3	75.00	1	25.00
2006	1	0	0.00	1	100.00
Sample Size	947	572	60.40	375	39.60

Panel C: Geography (Portfolio Company)					
		LBO Investments			
Country	Total	Non-Syndicated		Syndicated	
	Number	Number	Fraction in %	Number	Fraction in %
United States	517	332	64.22	185	35.78
United Kingdom	206	115	55.83	91	44.17
France	51	23	45.10	28	54.90
Sweden	31	20	64.52	11	35.48
Germany	30	18	60.00	12	40.00
Canada	20	15	75.00	5	25.00
Switzerland	17	11	64.71	6	35.29
Netherlands	15	6	40.00	9	60.00
Spain	12	6	50.00	6	50.00
Italy	11	5	45.45	6	54.55
Denmark	7	6	85.71	1	14.29
Finland	6	2	33.33	4	66.67
Austria	5	2	40.00	3	60.00
Other Countries	19	11	57.89	8	42.11
Sample Size	947	572	60.40	375	39.60

Panel D: Industry (Portfolio Company)					
		LBO Investments			
Classification	Total	Non-Syndicated		Syndicated	
	Number	Number	Fraction in %	Number	Fraction in %
Agriculture & Food	65	41	63.08	24	36.92
Mining	5	3	60.00	2	40.00
Construction	8	7	87.50	1	12.50
Oil & Petroleum	10	7	70.00	3	30.00
Small Scale Manufacturing	20	7	35.00	13	65.00
Chemicals/related manufacturing	145	98	67.59	47	32.41
Industrial Manufacturing	115	75	65.22	40	34.78
Computers & Electronic Parts	48	22	45.83	26	54.17
Printing & Publishing	19	9	47.37	10	52.63
Transportation	30	16	53.33	14	46.67
Telecommunication	75	44	58.67	31	41.33
Utilities	14	11	78.57	3	21.43
Wholesale	52	37	71.15	15	28.85
Retail	32	19	59.38	13	40.63
Services	227	129	56.83	98	43.17
Financials	50	28	56.00	22	44.00
Software & Technology	19	10	52.63	9	47.37
Biotech	10	7	70.00	3	30.00
Sample Size	944	570	60.38	374	39.62

Panel E: Geography (LBO Firm)		
Country – The Headquarter	Number	Fraction in %
United States	234	60.78
United Kingdom	62	16.10
France	31	8.05
Italy	13	3.38
Canada	11	2.86
Netherlands	7	1.82
Sweden	6	1.56
Spain	5	1.30
Denmark	4	1.04
Germany	3	0.78
Switzerland	3	0.78
Austria	2	0.52
Belgium	1	0.26
Japan	1	0.26
Norway	1	0.26
Poland	1	0.26
Sample Size	385	100.00

Panel F: Type (LBO Firm)		
Company Type	Number	Fraction in %
Private Investment Firm	252	65.45
Financial Service Investment Arm	49	12.73
Private Company	35	9.09
Public Company	19	4.94
Corporate Investment Arm	13	3.38
Public Investment Firm	12	3.12
Public Fund	5	1.30
Sample Size	385	100.00

Table 2
Univariate Analysis of LBO Investments on Deal Types

This table shows the test results of univariate analysis of LBO Investments between two deal types. Investment size has a proxy of the deflated investment value in US million dollars. Geographic distance is measured by the distance between the capital city of the portfolio company and that of its corresponding investment firm. Geographic distance (Investment Team) is the equal-weighted average distance between the capital city of the portfolio company and that of each investor in the investment team. Firm experience is the difference between the founding year of the investment firm and the acquiring year of the portfolio company. Panel A shows the mean test, using t-test for equality. Panel B shows the median test, and, using Wilcoxon/Mann-Whitney (tie-adjusted) test for equality. P-values are reported in the parentheses, and the symbols *, **, and *** represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Mean Test			
	Non-Syndicated (N)	Syndicated (S)	Difference (N,S)
Investment Size	58.03	51.63	6.40 (0.6679)
Geographic Distance	524.49	775.25	250.76** (0.0268)
Geographic Distance (Investment Team)	524.49	755.85	231.36** (0.0224)
Firm Experience	13.08	15.12	2.04** (0.0188)
Sample Size	572	375	

Panel B: Median Test			
	Non-Syndicated (N)	Syndicated (S)	Difference (N,S)
Investment Size	18.58	23.97	5.39** (0.0174)
Geographic Distance	0	0	0** (0.0262)
Geographic Distance (Investment Team)	0	0	0*** (0)
Firm Experience	10	12	2*** (0.0021)
Sample Size	572	375	

Table 3
Sample Statistics: Management Teams

This table provides a summary of the managerial characteristics involved in the sample LBO investments. Panel A shows the size distribution of investment firm, in which size is measured by the number of professionals in the firm when one investment occurs. Panel B shows the nationality distribution of those professionals involved in the investments, in which Panel C shows other characteristics. Panel D provides the list of business schools where people received their MBA degrees.

Panel A: Size

Number of Professionals	LBO Investments				
	Total	Non-Syndicated		Syndicated	
	Number	Number	Fraction in %	Number	Fraction in %
< 5	136	86	63.24	50	36.76
5 – 10	319	220	68.97	99	31.03
10 – 15	197	119	60.41	78	39.59
15 – 20	154	90	58.44	64	41.56
20 – 25	31	11	35.48	20	64.52
25 – 30	36	13	36.11	23	63.89
30 – 35	33	10	30.30	23	69.70
35 – 40	12	4	33.33	8	66.67
≥ 40	11	9	81.82	2	18.18
Mean	12.02	11.00		13.59	
Median	10	9		11	
Standard Deviation	8.52	8.00		9.06	
Maximum	48	48		47	
Minimum	1	1		1	
Sample Size	914	562	61.49	367	40.15

Panel B: Nationality

Country	Number of Professionals	Fraction in %
United States	930	58.79
United Kingdom	327	20.67
France	77	4.87
Sweden	44	2.78
Germany	38	2.40
Canada	28	1.77
Netherlands	25	1.58
Italy	24	1.52
Denmark	14	0.88
Spain	12	0.76
Switzerland	12	0.76
Australia	7	0.44
Belgium	7	0.44
Other Countries	37	2.34
Sample Size (firm-person)	1582	100.00

Panel C: Characteristics		
Attributes	Number of Professionals	Fraction in %
CFA/CPA/CA	220	14.41
Founder of the Firm	211	13.82
MBA	744	48.72
Law	151	9.89
Business	1115	73.02
Engineering	154	10.09
Master	292	19.12
Harvard MBA	225	14.73
Harvard Alumni	306	20.04
Sample Size (firm-person)	1527	100.00

Panel D: MBA Schools		
Attributes	Number of Professionals	Fraction in %
Harvard	225	30.57
Wharton	63	8.56
Stanford	58	7.88
Columbia	56	7.61
University of Chicago	41	5.57
INSEAD	37	5.03
Dartmouth	24	3.26
NYU	18	2.45
Northwestern	16	2.17
London Business School	12	1.63
Darden	11	1.49
Others	175	23.78
Sample Size (firm-person)	736	100.00

Table 4
Univariate Analysis of Management Teams on Deal Types

This table shows the univariate test results of managerial team characteristics, in terms of density, between two deal types. The density is defined as the proportion of the professionals who have specific characteristics compared with the whole managerial team within a firm. The "Skill Concentration" variable adopts the calculation similar to the Herfindahl Index, and it consists of three different skills, i.e. Law, Business, and Engineering. Panel A shows the mean test, using t-test for equality. Panel B shows the median test, and, using Wilcoxon/Mann-Whitney (tie-adjusted) test for equality. P-values are reported in the parentheses, and the symbols *, **, and *** represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Mean Test

Characteristics	Non-Syndicated (N)	Syndicated (S)	Difference (N,S)
CFA/CPA/CA	0.1492	0.1513	0.0021 (0.8588)
Founder of the Firm	0.2368	0.1994	-0.0374** (0.0229)
MBA	0.4811	0.5207	0.0396** (0.0234)
Law	0.1174	0.1117	-0.0057 (0.5374)
Business	0.7304	0.7466	0.0162 (0.2069)
Engineering	0.0777	0.0962	0.0185** (0.0158)
Master	0.1648	0.1681	0.0033 (0.7966)
Harvard MBA	0.1507	0.1815	0.0308** (0.0189)
Skill Concentration	0.6226	0.6451	0.0225 (0.2128)
Sample Size	561	365	

Panel B: Median Test

Characteristics	Non-Syndicated (N)	Syndicated (S)	Difference (N,S)
CFA/CPA/CA	0.1	0.0833	-0.0167 (0.7846)
Founder of the Firm	0.1667	0.125	-0.0417** (0.0394)
MBA	0.5	0.5769	0.0769** (0.0150)
Law	0.0833	0.0909	0.0076 (0.8374)
Business	0.75	0.7778	0.0278 (0.1889)
Engineering	0	0.0435	0.0435** (0.0182)
Master	0.1111	0.12	0.0089 (0.4316)
Harvard MBA	0.0556	0.0909	0.0353** (0.0364)
Skill Concentration	0.6378	0.6406	0.0028 (0.2624)
Sample Size	561	365	

Table 5
Correlation Matrix of Explanatory Variables for LBO Syndication Likelihood

This table reports the correlation matrix of the explanatory variables for LBO syndication likelihood. Investment size has a proxy of (log of) the deflated investment value in US million dollars. Geographic distance is measured by (log of) the distance between the capital city of the portfolio company and that of the investing firm. Firm experience is the difference between the founding year of the investing firm and the acquiring year of the portfolio company. The investment team characteristics are proxied by using density variables, i.e. defined as the number of the professionals who have specific characteristics, scaled by the number of the whole investment team members within a firm. The "Skill Concentration" variable adopts the calculation similar to the Herfindahl Index, and it consists of three different skills, i.e. Law, Business, and Engineering.

	Law	Business	Engineering	Master	MBA	Harvard MBA	Skill Concentration	Geographic Distance	Investment Size	Firm Experience
Law	1									
Business	-0.093	1								
Engineering	-0.196	-0.051	1							
Master	-0.270	0.080	0.195	1						
MBA	0.148	0.578	-0.010	-0.182	1					
Harvard MBA	0.200	0.356	0.056	-0.151	0.617	1				
Skill Concentration	0.112	0.928	0.072	0.057	0.566	0.355	1			
Geographic Distance	-0.203	0.148	0.101	0.076	0.060	0.051	0.114	1		
Investment Size	0.192	0.089	-0.096	-0.185	0.181	0.176	0.081	-0.012	1	
Firm Experience	-0.148	-0.222	0.134	0.087	-0.160	-0.195	-0.286	0.022	0.136	1

Table 6
Determinants of LBO Syndication Likelihood

This table provides linear probability estimation of determinants of LBO syndication, in which investment team characteristics are quantified by density measurement. The dependent variable is assigned to 1 for LBO transactions by multiple investors and 0 for transactions by one investor only. For the explanatory variables, investment size has a proxy of (log of) the deflated investment value in US million dollars. Geographic distance is measured by (log of) the distance between the capital city of the portfolio company and that of the investing firm. Firm experience is the difference between the founding year of the investing firm and the acquiring year of the portfolio company. The investment team characteristics are proxied by using density variables, i.e. defined as the number of the professionals who have specific characteristics, scaled by the number of the whole investment team members within a firm. The "Skill Concentration" variable adopts the calculation similar to the Herfindahl Index, and it consists of three different skills, i.e. Law, Business, and Engineering. Panel A and B show the coefficient estimates for general team attributes and MBA specific attributes, respectively. Top MBA graduates include those who are graduated from Harvard, Wharton, Stanford, Columbia, Chicago, INSEAD, or MIT business schools. Standard deviations are reported in the parentheses and the symbols [a], [b], and [c] represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: General Models								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Team Attributes:								
Law	-0.018	-0.026			0.089	0.097		
	(0.131)	(0.131)			(0.143)	(0.145)		
Business	0.005	0.055			-0.024	0.057		
	(0.111)	(0.095)			(0.112)	(0.097)		
Engineering	0.295[b]	0.278[a]			0.336[b]	0.340[b]		
	(0.147)	(0.148)			(0.151)	(0.153)		
Master	0.019	0.006	0.049	0.039	-0.037	-0.060	-0.028	-0.047
	(0.093)	(0.092)	(0.091)	(0.089)	(0.095)	(0.094)	(0.093)	(0.091)
MBA	0.135[a]		0.135[a]		0.151[a]		0.149[a]	
	(0.081)		(0.078)		(0.082)		(0.079)	
Harvard MBA		0.171[a]		0.187[b]		0.113		0.143
		(0.094)		(0.09)		(0.097)		(0.093)
Skill Concentration			0.016	0.047			0.015	0.062
			(0.077)	(0.067)			(0.077)	(0.068)
Controls:								
Geographic Distance	0.022[a]	0.021[a]	0.024[b]	0.024[b]	0.021[a]	0.021	0.021[a]	0.021[a]
	(0.012)	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)	(0.012)	(0.012)
Investment Size	0.052[a]	0.050	0.046	0.042	0.063[a]	0.064[a]	0.059[a]	0.058[a]
	(0.031)	(0.031)	(0.031)	(0.031)	(0.033)	(0.033)	(0.033)	(0.033)
Firm Experience	0.002[a]	0.003[a]	0.003[b]	0.003[b]	0.002	0.002	0.002	0.002[a]
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
PC Industry FE	No	No	No	No	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	Yes	Yes	Yes	Yes
Adjusted R^2	0.0155	0.0161	0.0132	0.0145	0.0523	0.05	0.0486	0.0473
Sample Size	926	926	926	926	926	926	926	926

Panel B: Restricted Models with MBA Team Attributes										
Explanatory Variables	(1) General MBA	(2) Top MBA	(3) Harvard MBA	(4) Wharton MBA	(5) Stanford MBA	(6) Columbia MBA	(7) Chicago MBA	(8) INSEAD MBA	(9) General MBA	(10) Top MBA
MBA:										
MBA	0.138[b]	0.227[c]	0.201[b]	0.155	0.133	-0.067	0.023	0.692[c]	0.178	0.416[a]
	(0.064)	(0.07)	(0.085)	(0.212)	(0.179)	(0.224)	(0.25)	(0.255)	(0.197)	(0.239)
Controls:										
Geographic Distance	0.011[b]	0.011[b]	0.011[b]	0.012[b]	0.012[b]	0.012[b]	0.012[b]	0.010[a]	-0.004	-0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.008)	(0.008)
Investment Size	0.019	0.011	0.018	0.024[a]	0.022	0.025[a]	0.024[a]	0.025[b]	0.023	0.020
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.021)	(0.021)
Firm Experience	0.003[b]	0.003[b]	0.003[b]	0.002[a]	0.002[a]	0.002[a]	0.002[a]	0.002	0.171[a]	0.174[a]
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.095)	(0.095)
Firm FE	No	No	No	No	No	No	No	No	Yes	Yes
PC Industry FE	No	No	No	No	No	No	No	No	Yes	Yes
Year FE	No	No	No	No	No	No	No	No	Yes	Yes
PC Country FE	No	No	No	No	No	No	No	No	Yes	Yes
Adjusted R^2	0.0149	0.0209	0.0158	0.0104	0.0104	0.0099	0.0099	0.0177	0.1476	0.1502
Sample Size	926	926	926	926	926	926	926	926	926	926

Table 7
MBA Selection of LBO Syndication Partners

This table shows the coefficient estimates from the conditional logit model of syndication partner selection process for MBA graduates. Each investment firm(f) at time t can choose among all other investing firms(i) in the sample with available team attributes data at time t. The dependent variable is a dummy variable equal to one for the investment firm-candidate pairs that co-invest with each other at the time when the deal is initiated. (Individual) explanatory variables are measured in percentages (absolute levels of team attributes). Specification (1) is the basic model for MBA graduates in general. Specification (2) to (8) provide estimates for different subgroups. Top MBA graduates include those who are graduated from Harvard, Wharton, Stanford, Columbia, Chicago, INSEAD, or MIT business schools. Standard deviations are reported in the parentheses and the symbols [a], [b], and [c] represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

	(1) General MBA	(2) Top MBA	(3) Harvard MBA	(4) Wharton MBA	(5) Stanford MBA	(6) Columbia MBA	(7) Chicago MBA	(8) INSEAD MBA
MBA:								
MBA(f)*MBA(i)	2.567[b]	3.200[c]	6.085[c]	11.837	6.909	29.482[c]	23.496	1.098
	(1.05)	(1.070)	(1.754)	(9.053)	(5.145)	(11.087)	(14.366)	(6.064)
MBA(f)*Engineer(i)	5.399[c]	5.663[c]	3.696	18.642[b]	1.081	19.179[b]	7.372	5.307
	(1.769)	(2.036)	(2.971)	(7.362)	(4.907)	(8.535)	(8.009)	(4.935)
MBA(f)*Law(i)	2.576	2.183	3.183	-4.453	3.625	6.949	-22.383	-30.188
	(2.136)	(2.397)	(3.297)	(12.901)	(2.89)	(11.683)	(17.092)	(18.386)
MBA(f)*Master(i)	-2.737[a]	-3.871[b]	-5.400[b]	-5.701	-5.745	-4.333	-1.991	-1.376
	(1.431)	(1.687)	(2.51)	(6.318)	(4.065)	(7.082)	(6.445)	(4.194)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi^2	17.3	18.62	17.63	7.58	6.23	9.51	5.25	4.33
Probability > Chi^2	0.0017	0.0009	0.0015	0.1081	0.1823	0.0495	0.2629	0.3627
Investments	134	134	134	134	134	134	134	134
Observations	22,370	22,370	22,370	22,370	22,370	22,370	22,370	22,370

Table 8
Univariate Analysis of Management Teams for Syndicated LBO Investments

This table shows the univariate test results of managerial team attributes for syndicated investments. Geographic distance is measured by the distance between the capital city of the portfolio company and that of its corresponding investment firm. Firm experience is the difference between the founding year of the investment firm and the acquiring year of the portfolio company. The team attributes are measured by density, defined as the proportion of the professionals who have specific characteristics compared with the whole managerial team within a firm. The "Skill Concentration" variable adopts the calculation similar to the Herfindahl Index, consisting of three different skills, i.e. Law, Business, and Engineering. Panel A shows the mean test, using t-test for equality. Panel B shows the median test, and, using Wilcoxon/Mann-Whitney (tie-adjusted) test for equality. P-values are reported in the parentheses, and the symbols *, **, and *** represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Mean Test (Paired)			
Characteristics	Investment Firm (F)	Investment Team (T)	Difference (F,T)
CFA/CPA/CA	0.1513	0.1603	0.0090 (0.1425)
Founder of the Firm	0.1994	0.1793	-0.0202*** (0.0098)
MBA	0.5207	0.5242	0.0035 (0.7022)
Law	0.1117	0.1066	-0.0051 (0.2937)
Business	0.7467	0.7440	-0.0026 (0.6942)
Engineering	0.0963	0.1015	0.0053 (0.2569)
Master	0.1681	0.1721	0.0041 (0.5201)
Harvard MBA	0.1815	0.1866	0.0051 (0.3998)
Skill Concentration	0.6452	0.6156	-0.0296*** (0.003)
Sample Size	365	365	

Panel B: Median Test (Paired)			
Characteristics	Investment Firm (F)	Investment Team (T)	Difference (F,T)
CFA/CPA/CA	0.0833	0.125	0 (0.3995)
Founder of the Firm	0.125	0.1304	0 (0.8988)
MBA	0.5769	0.5692	0 (0.3577)
Law	0.0909	0.0923	0 (0.6944)
Business	0.7778	0.7727	0** (0.0221)
Engineering	0.0435	0.0909	0 (0.5178)
Master	0.12	0.15	0 (0.6165)
Harvard MBA	0.0909	0.1538	0 (1)
Skill Concentration	0.6406	0.6406	0 (0.1462)
Sample Size	365	365	

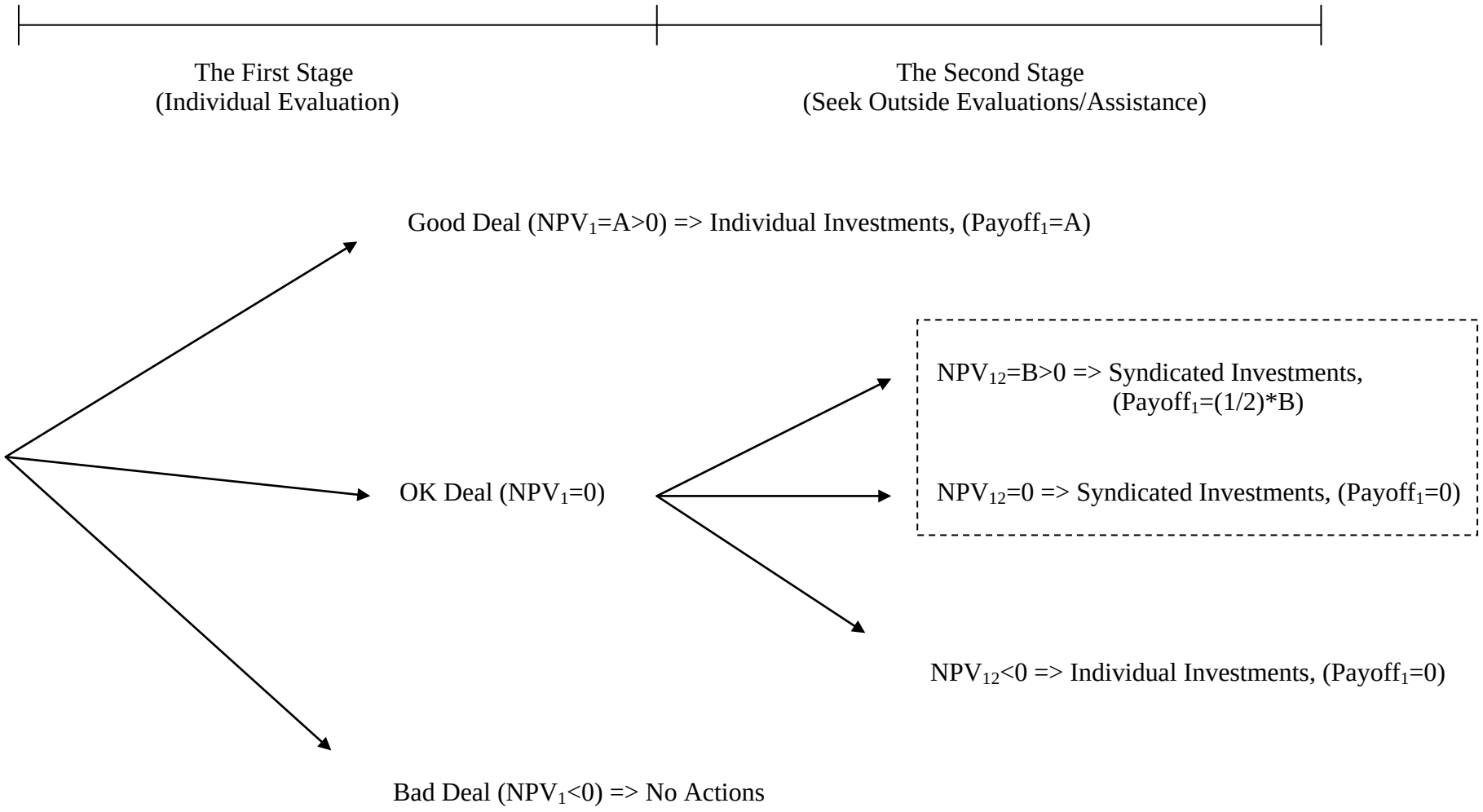

Figure 1 Illustration of the Relationship between Investment Type and Performance

Table 9
Sample Statistics: LBO Performance

This table shows a summary of the distribution of LBO investment performance. Panel A and B rank the performance by multiple and gross internal rate of return, in which Figure 10 and 11 provide their corresponding histograms, respectively.

Panel A: Multiple				
Ranking (%)	Non-Syndicated		Syndicated	
	Number	Fraction in %	Number	Fraction in %
<10	63	67.02	31	32.98
10-20	58	61.70	36	38.30
20-30	62	65.96	32	34.04
30-40	56	59.57	38	40.43
40-50	59	62.77	35	37.23
50-60	45	47.87	49	52.13
60-70	45	47.87	49	52.13
70-80	55	58.51	39	41.49
80-90	59	62.77	35	37.23
90-100	70	71.43	28	28.57
Mean	16.09		3.61	
Median	2.5		2.72	
Standard Deviation	251.20		4.76	
Maximum	6000		63.22	
Minimum	0		0	
Sample Size	572	60.59	372	39.41

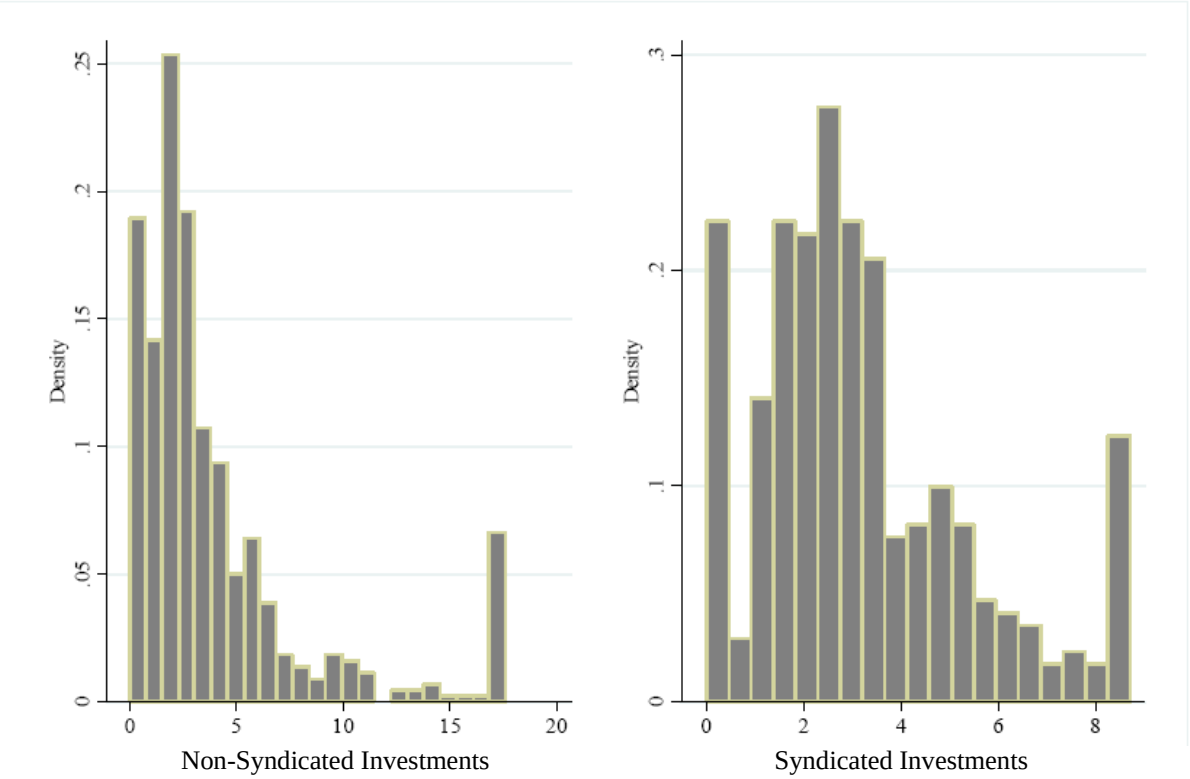

Figure 2 Histogram of Multiple of Investments (winsorized at 5% level)

Panel B: Gross Internal Rate of Return (Gross IRR)				
Ranking (%)	Non-Syndicated		Syndicated	
	Number	Fraction in %	Number	Fraction in %
<10	53	65.43	28	34.57
10-20	58	71.60	23	28.40
20-30	49	60.49	32	39.51
30-40	43	53.09	38	46.91
40-50	47	58.02	34	41.98
50-60	50	61.73	31	38.27
60-70	39	48.15	42	51.85
70-80	47	58.02	34	41.98
80-90	51	62.96	30	37.04
90-100	52	65.00	28	35.00
Mean	1.28		1.12	
Median	0.45		0.48	
Standard Deviation	4.70		4.73	
Maximum	50		66.36	
Minimum	-1		-1	
Sample Size	489	60.44	320	39.56

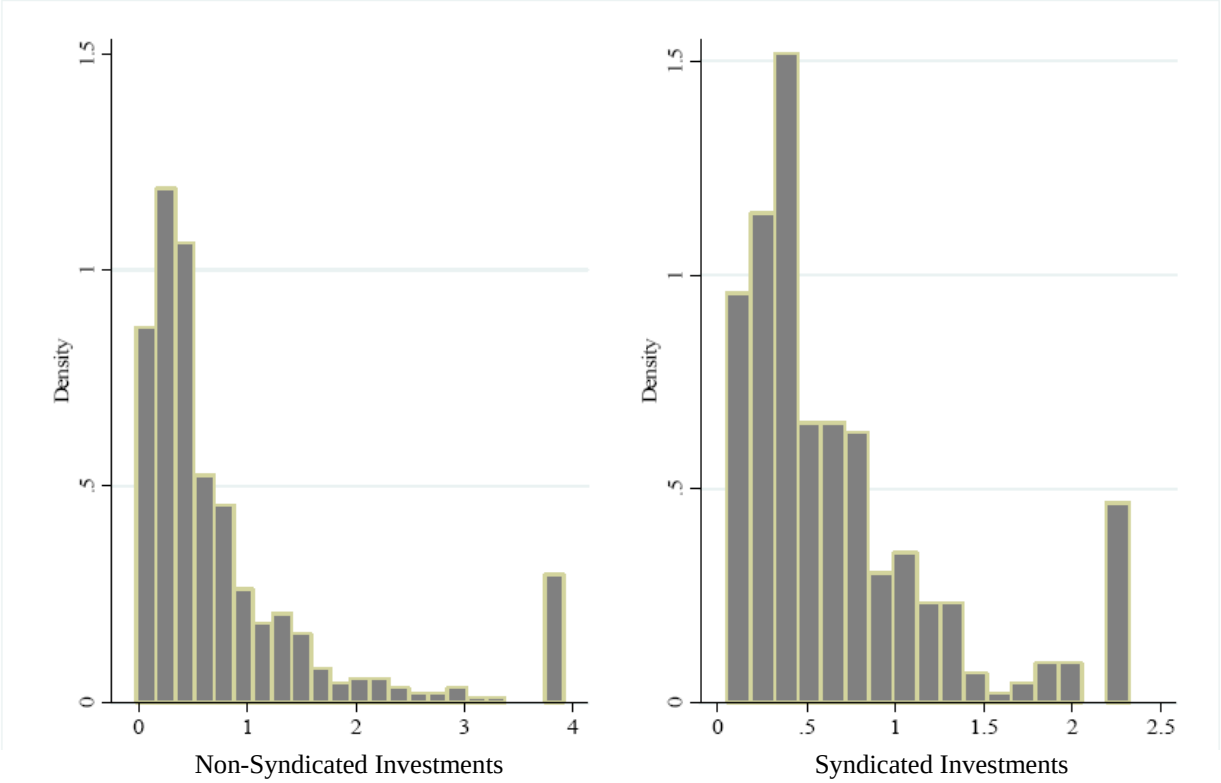

Figure 3 Histogram of Gross IRR of Investments (winsorized at 5% level)

Table 10
Syndication, Management Team, and Performance

This table shows the two-stage treatment effect estimation results on how managerial team characteristics, in terms of density, and syndication decision affect final investment performance. The investment team characteristics are proxied by using density variables, i.e. defined as the number of the professionals who have specific characteristics, scaled by the number of the whole investment team members within a firm. The "Skill Concentration" variable adopts the calculation similar to the Herfindahl Index, and it consists of three different skills, i.e. Law, Business, and Engineering. Geographic distance is measured by (log of) the distance between the capital city of the portfolio company and that of the investing firm. Investment size has a proxy of (log of) the deflated investment value in US million dollars. Firm experience is the difference between the founding year of the investing firm and the acquiring year of the portfolio company. Panel A and B adopt multiple and gross internal rate of return as proxy for performance, respectively, in which performance is winsorized at the 5% level. Standard deviations are reported in the parentheses and the symbols [a], [b], and [c] represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Multiple				
	(1)	(2)	(3)	(4)
Team Attributes:				
CFA/CPA/CA	-0.751	-0.950	-0.976	2.629
	(0.628)	(0.61)	(0.609)	(1.785)
Founder of the Firm	0.391	0.406	0.106	-2.324[a]
	(0.47)	(0.465)	(0.465)	(1.396)
Law	1.599[a]		0.955	-0.399
	(0.82)		(0.85)	(2.084)
Business	0.812		0.852	-1.036
	(0.591)		(0.569)	(1.587)
Engineering	-0.461		-1.015	0.205
	(1.474)		(1.533)	(4.659)
Master	0.736	0.530	1.173[b]	-3.762[b]
	(0.573)	(0.559)	(0.555)	(1.794)
Harvard MBA	1.643[a]	2.091[c]	1.301	1.670
	(0.893)	(0.721)	(0.905)	(3.438)
Skill Concentration		0.441		
		(0.407)		
Controls:				
Geographic Distance	-0.075	-0.067[a]	-0.093[a]	-0.036
	(0.051)	(0.04)	(0.052)	(0.161)
Investment Size	-0.541[c]	-0.485[c]	-0.525[c]	-0.360
	(0.111)	(0.083)	(0.116)	(0.296)
Syndication	1.310	-0.380	2.683	-7.121
	(3.765)	(2.3)	(3.842)	(14.437)
Selection Attributes:				
Engineering				0.767[b]
				(0.376)
Harvard MBA				0.494[b]
				(0.225)
Geographic Distance				0.027[a]
				(0.014)
Investment Size				0.050[a]
				(0.03)
Firm Experience				0.006[a]
				(0.003)
Hazard:				
Lambda	-0.992	0.051	-1.803	4.412
	(2.326)	(1.423)	(2.371)	(8.917)
Rho	-0.327	0.017	-0.589	1.000
Sigma	3.036	2.941	3.063	4.209
Firm FE	No	No	No	Yes

PC Industry FE	No	No	Yes	Yes
Year FE	No	No	Yes	Yes
PC Country FE	No	No	No	Yes
Wald Chi^2	99.95	95.79	251.48	428.59
Probability > Chi^2	0	0	0	0
Sample Size	923	923	923	923

Panel B: Gross Internal Rate of Return				
	(1)	(2)	(3)	(4)
Team Attributes:				
CFA/CPA/CA	-0.214	-0.242	-0.259	0.173
	(0.165)	(0.159)	(0.164)	(0.664)
Founder of the Firm	-0.103	-0.087	0.070	-0.103
	(0.124)	(0.122)	(0.127)	(0.517)
Law	0.082		0.185	1.155
	(0.214)		(0.228)	(0.774)
Business	-0.026		-0.059	-0.088
	(0.155)		(0.154)	(0.588)
Engineering	0.042		0.027	-2.048
	(0.47)		(0.47)	(1.858)
Master	0.348[b]	0.340[b]	0.331[b]	0.267
	(0.146)	(0.142)	(0.145)	(0.681)
Harvard MBA	0.507[b]	0.524[c]	0.413[a]	0.446
	(0.24)	(0.19)	(0.241)	(1.158)
Skill Concentration		-0.069		
		(0.107)		
Controls:				
Geographic Distance	-0.015	-0.016	-0.016	-0.030
	(0.014)	(0.011)	(0.014)	(0.054)
Investment Size	-0.124[c]	-0.125[c]	-0.127[c]	-0.151
	(0.038)	(0.025)	(0.039)	(0.137)
Syndicated	0.478	0.552	0.522	2.871
	(1.196)	(0.624)	(1.192)	(5.251)
Selection Attributes:				
Engineering				0.847[b]
				(0.396)
Harvard MBA				0.421[a]
				(0.245)
Geographic Distance				0.024
				(0.015)
Investment Size				0.067[b]
				(0.033)
Firm Experience				0.005
				(0.004)
Hazard:				
Lambda	-0.327	-0.371	-0.352	-1.737
	(0.739)	(0.386)	(0.736)	(3.242)
Rho	-0.429	-0.480	-0.479	-1.000
Sigma	0.761	0.774	0.735	1.481
Firm FE	No	No	No	Yes
PC Industry FE	No	No	Yes	Yes
Year FE	No	No	Yes	Yes
PC Country FE	No	No	No	Yes
Wald Chi^2	77.77	71.19	169.21	182.32
Probability > Chi^2	0	0	0	0.716
Sample Size	793	793	793	793

Table 11
MBA Team Attributes, Syndication, and Performance

This table shows how MBA team attributes affect final performance for non-syndicated and syndicated investments. The team attribute, MBA(f), is a density variable, defined as the number of the professionals who have (specific) MBA degrees, scaled by the number of the whole investment team members within the firm. Geographic distance is measured by (log of) the distance between the capital city of the portfolio company and that of the investing firm. Investment size has a proxy of (log of) the deflated investment value in US million dollars. Panel A and B adopt multiple and gross internal rate of return as proxy for performance, respectively, in which performance is winsorized at the 1% level. Each specification provides coefficient estimates for different subgroups of MBA graduates. Top MBA graduates include those who are graduated from Harvard, Wharton, Stanford, Columbia, Chicago, INSEAD, or MIT business schools. Standard deviations are reported in the parentheses and the symbols [a], [b], and [c] represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Multiple

	Non-Syndicated Investments							Syndicated Investments						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Explanatory Variables	General MBA	Top MBA	Harvard MBA	Stanford MBA	Columbia MBA	Chicago MBA	INSEAD MBA	General MBA	Top MBA	Harvard MBA	Stanford MBA	Columbia MBA	Chicago MBA	INSEAD MBA
MBA:														
MBA(f)	2.416[a]	5.700[c]	5.843[c]	9.628[c]	6.586	4.292	-14.238[b]	0.504	1.559[a]	1.920[a]	1.701	4.331	2.880	-3.791
	(1.233)	(1.354)	(1.664)	(3.635)	(4.069)	(4.581)	(6.964)	(0.854)	(0.899)	(1.091)	(2.271)	(3.377)	(3.718)	(2.92)
Controls:														
Investment	-1.569[c]	-1.778[c]	-1.609[c]	-1.710[c]	-1.493[c]	-1.460[c]	-1.456[c]	-0.728[c]	-0.781[c]	-0.778[c]	-0.740[c]	-0.740[c]	-0.717[c]	-0.739[c]
Size	(0.245)	(0.247)	(0.24)	(0.256)	(0.239)	(0.239)	(0.238)	(0.185)	(0.187)	(0.187)	(0.187)	(0.185)	(0.184)	(0.185)
Geographic	-0.140	-0.124	-0.140	-0.105	-0.130	-0.122	-0.105	-0.086	-0.090	-0.092	-0.077	-0.096	-0.078	-0.071
Distance	(0.105)	(0.103)	(0.104)	(0.105)	(0.105)	(0.105)	(0.105)	(0.068)	(0.068)	(0.068)	(0.069)	(0.069)	(0.068)	(0.069)
Adjusted R^2	0.0664	0.089	0.0804	0.0717	0.0644	0.0615	0.067	0.0366	0.0437	0.0439	0.0372	0.0401	0.0373	0.0402
Sample Size	561	561	561	561	561	561	561	362	362	362	362	362	362	362

Panel B: Gross Internal Rate of Return

	Non-Syndicated Investments							Syndicated Investments						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Explanatory Variables	General MBA	Top MBA	Harvard MBA	Stanford MBA	Columbia MBA	Chicago MBA	INSEAD MBA	General MBA	Top MBA	Harvard MBA	Stanford MBA	Columbia MBA	Chicago MBA	INSEAD MBA
MBA:														
MBA(f)	-0.474	0.519	0.478	1.959[b]	-0.904	1.011	-1.185	0.045	0.316	0.530	0.112	-2.213	0.251	0.581
	(0.305)	(0.344)	(0.423)	(0.87)	(0.996)	(1.11)	(1.789)	(0.295)	(0.313)	(0.382)	(0.767)	(1.356)	(1.274)	(0.968)
Controls:														
Investment	-0.332[c]	-0.378[c]	-0.361[c]	-0.400[c]	-0.345[c]	-0.351[c]	-0.349[c]	-0.075	-0.087	-0.088	-0.076	-0.052	-0.075	-0.071
Size	(0.062)	(0.064)	(0.062)	(0.065)	(0.061)	(0.061)	(0.061)	(0.067)	(0.068)	(0.067)	(0.067)	(0.068)	(0.067)	(0.067)
Geographic	-0.023	-0.024	-0.026	-0.020	-0.025	-0.023	-0.023	0.004	0.003	0.001	0.005	0.009	0.005	0.002
Distance	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Adjusted R^2	0.065	0.0648	0.0628	0.0702	0.0619	0.0619	0.0612	-0.0055	-0.002	0.0007	-0.0055	0.0031	-0.0054	-0.0044
Sample Size	482	482	482	482	482	482	482	311	311	311	311	311	311	311

Table 12
MBA Selection of Syndicated Partners and Performance

This table shows how MBA team attributes affect final performance for the subsample of investments co-invested by only two investors. The team attribute, MBA(f), is a density variable, defined as the number of the professionals who have (specific) MBA degrees, scaled by the number of the whole investment team members within the firm. The interaction terms are dummy variables that are assigned to 1 as long as the absolute values for both the investment firm and the syndicated partner exceed the third quartile value among all sample firms at the time when the deal is initiated. Geographic distance is measured by (log of) the distance between the capital city of the portfolio company and that of the investing firm. Investment size has a proxy of (log of) the deflated investment value in US million dollars. Panel A and B adopt multiple and gross internal rate of return as proxy for performance, respectively, in which performance is winsorized at the 1% level. Each specification provides coefficient estimates for different subgroups of MBA graduates. Top MBA graduates include those who are graduated from Harvard, Wharton, Stanford, Columbia, Chicago, INSEAD, or MIT business schools. Standard deviations are reported in the parentheses and the symbols [a], [b], and [c] represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Multiple														
Explanatory Variables	(1) General MBA	(2) Top MBA	(3) Harvard MBA	(4) Stanford MBA	(5) Columbia MBA	(6) Chicago MBA	(7) INSEAD MBA	(8) General MBA	(9) Top MBA	(10) Harvard MBA	(11) Stanford MBA	(12) Columbia MBA	(13) Chicago MBA	(14) INSEAD MBA
MBA:														
MBA(f)	0.205	1.196	2.463[b]	1.441	0.722	-0.194	-6.522[b]	0.692	1.655	0.680	0.634	0.968	-3.535	-4.765
	(0.932)	(0.958)	(1.216)	(1.726)	(4.056)	(4.039)	(2.894)	(1.057)	(1.144)	(1.472)	(1.953)	(4.828)	(4.409)	(3.323)
MBA(f)*MBA(i)								-0.287	-0.010	1.760[b]	1.039	-0.394	3.028[c]	-0.742
								(1.256)	(0.917)	(0.842)	(0.886)	(0.986)	(1.04)	(0.908)
MBA(f)*Engineer(i)								-1.328	-1.053		-0.277	0.425	-0.569	-0.708
								(1.195)	(1.131)		(0.904)	(0.984)	(1.047)	(0.858)
Controls:														
Investment Size	-0.195	-0.243	-0.269	-0.207	-0.195	-0.188	-0.221	-0.230	-0.270	-0.287	-0.308	-0.192	-0.164	-0.244
	(0.203)	(0.205)	(0.202)	(0.202)	(0.204)	(0.201)	(0.198)	(0.207)	(0.207)	(0.199)	(0.22)	(0.206)	(0.196)	(0.199)
Geographic	-0.076	-0.075	-0.069	-0.069	-0.079	-0.076	-0.042	-0.066	-0.064	-0.035	-0.063	-0.080	-0.050	-0.037
Distance	(0.078)	(0.078)	(0.077)	(0.078)	(0.081)	(0.078)	(0.078)	(0.079)	(0.081)	(0.078)	(0.079)	(0.083)	(0.077)	(0.079)
R^2	0.0142	0.0255	0.044	0.0191	0.0141	0.0139	0.0509	0.024	0.0326	0.0754	0.0295	0.0166	0.0751	0.0603
Sample Size	134	134	134	134	134	134	134	134	134	134	134	134	134	134

Panel B: Gross Internal Rate of Return

Explanatory Variables	(1) General MBA	(2) Top MBA	(3) Harvard MBA	(4) Stanford MBA	(5) Columbia MBA	(6) Chicago MBA	(7) INSEAD MBA	(8) General MBA	(9) Top MBA	(10) Harvard MBA	(11) Stanford MBA	(12) Columbia MBA	(13) Chicago MBA	(14) INSEAD MBA
MBA:														
MBA(f)	0.168	0.486	0.874	0.045	-2.631	-0.317	1.260	0.396	0.244	-0.445	-0.866	-1.631	-0.040	2.295
	(0.509)	(0.525)	(0.67)	(0.945)	(2.203)	(2.205)	(1.607)	(0.578)	(0.609)	(0.8)	(1.033)	(2.62)	(2.485)	(1.84)
MBA(f)*MBA(i)								-0.120	1.275[b]	1.302[c]	1.482[c]	-0.384	-0.092	-0.707
								(0.686)	(0.488)	(0.457)	(0.468)	(0.535)	(0.586)	(0.502)
MBA(f)*Engineer(i)								-0.635	-1.135[a]		-0.751	-0.093	-0.096	0.051
								(0.653)	(0.602)		(0.478)	(0.534)	(0.59)	(0.475)
Controls:														
Investment Size	0.091	0.074	0.068	0.096	0.121	0.096	0.103	0.075	0.054	0.054	-0.055	0.126	0.096	0.088
	(0.111)	(0.112)	(0.111)	(0.11)	(0.111)	(0.11)	(0.11)	(0.113)	(0.11)	(0.108)	(0.117)	(0.112)	(0.111)	(0.11)
Geographic	0.005	0.005	0.007	0.005	0.018	0.004	-0.001	0.009	0.037	0.032	0.015	0.024	0.003	-0.007
Distance	(0.043)	(0.042)	(0.042)	(0.043)	(0.044)	(0.043)	(0.043)	(0.043)	(0.043)	(0.042)	(0.042)	(0.045)	(0.043)	(0.044)
R^2	0.0069	0.0126	0.0189	0.0061	0.0168	0.0062	0.0107	0.0144	0.0734	0.0768	0.082	0.0211	0.0067	0.0261
Sample Size	134	134	134	134	134	134	134	134	134	134	134	134	134	134

Table 13
Robustness Checks: Determinants of LBO Syndication

This table provides two robustness checks regarding LBO syndication decisions. Panel A shows the binomial probit estimation of determinants of LBO syndication likelihood, and Panel B shows the ordinary least square estimation of determinants of the number of LBO syndication partners, in which investment team characteristics are quantified by density measurement. For the explanatory variables, investment size has a proxy of (log of) the deflated investment value in US million dollars. Geographic distance is measured by (log of) the distance between the capital city of the portfolio company and that of the investing firm. Firm experience is the difference between the founding year of the investing firm and the acquiring year of the portfolio company. The investment team characteristics are defined as the number of the professionals who have specific characteristics, scaled by the number of the whole investment team members within a firm. The "Skill Concentration" variable adopts the calculation similar to the Herfindahl Index, and it consists of three different skills, i.e. Law, Business, and Engineering. Standard deviations are reported in the parentheses and the symbols [a], [b], and [c] represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: LBO Syndication Likelihood										
Dependent Variable	indicator assigned to 1 for syndicated investments									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Team Attributes:										
Law	-0.014	-0.022			0.098	0.107			0.374	0.463
	(0.133)	(0.133)			(0.152)	(0.153)			(0.486)	(0.474)
Business	0.009	0.060			-0.022	0.069			0.806[b]	0.699[b]
	(0.114)	(0.097)			(0.121)	(0.104)			(0.409)	(0.339)
Engineering	0.299[b]	0.281[a]			0.351[b]	0.353[b]			1.162[b]	1.106[b]
	(0.148)	(0.149)			(0.159)	(0.16)			(0.48)	(0.473)
Master	0.016	0.003	0.047	0.038	-0.035	-0.062	-0.027	-0.047	-0.788[a]	-0.685[a]
	(0.096)	(0.094)	(0.092)	(0.09)	(0.102)	(0.1)	(0.098)	(0.096)	(0.415)	(0.405)
MBA	0.137[a]		0.135[a]		0.166[a]		0.159[a]		-0.189	
	(0.082)		(0.079)		(0.088)		(0.084)		(0.322)	
Harvard MBA		0.169[a]		0.185[b]		0.121		0.148		0.566
		(0.094)		(0.091)		(0.102)		(0.098)		(0.418)
Skill Concentration			0.018	0.051			0.020	0.071		
			(0.078)	(0.068)			(0.083)	(0.073)		
Controls:										
Geographic Distance	0.022[a]	0.021[a]	0.024[b]	0.024[a]	0.023[a]	0.023[a]	0.024[a]	0.023[a]	-0.014	-0.013
	(0.012)	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.024)	(0.024)
Investment Size	0.053[a]	0.051	0.047	0.043	0.072[b]	0.073[b]	0.068[a]	0.068[a]	0.070	0.068
	(0.031)	(0.032)	(0.031)	(0.031)	(0.036)	(0.036)	(0.035)	(0.035)	(0.062)	(0.063)
Firm Experience	0.002[a]	0.003[b]	0.003[b]	0.003[b]	0.002	0.002	0.002	0.003[a]	2.176[c]	2.124[c]
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.022)	(0.021)
Firm FE	No	No	No	No	No	No	No	No	Yes	Yes
PC Industry FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
PC Country FE	No	No	No	No	No	No	No	No	Yes	Yes
Adjusted R^2	0.018	0.0184	0.0146	0.0156	0.0929	0.091	0.0886	0.0876	0.2163	0.2177
LR Statistic	22.37	22.82	18.19	19.39	112.97	110.76	107.84	106.52	236.85	238.36
Probability > Chi^2	0.0043	0.0036	0.0058	0.0036	0.0001	0.0001	0.0001	0.0002	0	0

Sample Size	926	926	926	926	902	902	902	902	804	804

Panel B: Number of LBO Syndication Partners										
Dependent Variable	number of syndicated partners (0 for non-syndicated investments)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Team Attributes:										
Law	-0.037	-0.102			0.211	0.168			0.906	0.684
	(0.341)	(0.342)			(0.377)	(0.38)			(0.92)	(0.908)
Business	0.007	0.050			0.031	0.136			0.111	0.629
	(0.289)	(0.248)			(0.294)	(0.255)			(0.761)	(0.651)
Engineering	0.756[b]	0.673[a]			0.746[a]	0.700[a]			1.211	1.177
	(0.383)	(0.385)			(0.398)	(0.401)			(0.833)	(0.827)
Master	-0.060	-0.065	0.021	0.020	-0.161	-0.188	-0.135	-0.153	-2.393[c]	-2.489[c]
	(0.244)	(0.239)	(0.236)	(0.232)	(0.25)	(0.246)	(0.244)	(0.24)	(0.785)	(0.773)
MBA	0.284		0.296		0.324		0.338		0.802	
	(0.211)		(0.203)		(0.216)		(0.208)		(0.629)	
Harvard MBA		0.529[b]		0.566[b]		0.434[a]		0.498[b]		1.733[b]
		(0.244)		(0.235)		(0.255)		(0.245)		(0.808)
Skill Concentration			0.014	0.047			0.059	0.127		
			(0.2)	(0.174)			(0.203)	(0.179)		
Controls:										
Geographic Distance	0.076[b]	0.074[b]	0.082[b]	0.080[b]	0.072[b]	0.070[b]	0.073[b]	0.072[b]	0.006	0.000
	(0.032)	(0.032)	(0.031)	(0.031)	(0.033)	(0.033)	(0.033)	(0.033)	(0.05)	(0.05)
Investment Size	0.062	0.050	0.046	0.031	0.070	0.063	0.061	0.051	0.141	0.134
	(0.081)	(0.081)	(0.08)	(0.08)	(0.088)	(0.088)	(0.087)	(0.087)	(0.127)	(0.127)
Firm Experience	0.003	0.004	0.004	0.005	0.004	0.005	0.005	0.006	1.195[c]	1.226[c]
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.248)	(0.246)
Firm FE	No	No	No	No	No	No	No	No	Yes	Yes
PC Industry FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
PC Country FE	No	No	No	No	No	No	No	No	Yes	Yes
Adjusted R^2	0.0098	0.0129	0.0076	0.0115	0.0312	0.0319	0.0294	0.0311	0.1535	0.1569
Sample Size	926	926	926	926	926	926	926	926	926	926

Table 14
Robustness Checks: MBA Selection of LBO Syndication Partners

This table shows the coefficient estimates from the conditional logit model of syndication partner selection process for MBA graduates by using alternative proxies for team attributes. Each investment firm(f) at time t can choose among all other investing firms(i) in the sample with available team attributes data at time t. The dependent variable is a dummy variable equal to one for the investment firm-candidate pairs that co-invest with each other at the time when the deal is initiated. In Panel A (B The interaction terms are dummy variables that are assigned to 1 as long as the absolute values for both the investment firm and the syndicated partner exceed the median (third quartile) value among all sample firms at the time when the deal is initiated. Specification (1) is the basic model for MBA graduates in general. Specification (2) to (8) provide estimates for different subgroups. Top MBA graduates include those who are graduated from Harvard, Wharton, Stanford, Columbia, Chicago, INSEAD, or MIT business schools. Standard deviations are reported in the parentheses and the symbols [a], [b], and [c] represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Dummy Variable (Median)

	(1) General MBA	(2) Top MBA	(3) Harvard MBA	(4) Wharton MBA	(5) Stanford MBA	(6) Columbia MBA	(7) Chicago MBA	(8) INSEAD MBA
MBA:								
MBA(f)*MBA(i)	2.154[c]	1.207[c]	1.304[c]	1.253[c]	1.457[c]	1.366[c]	0.289	0.809[a]
	(0.401)	(0.343)	(0.361)	(0.461)	(0.423)	(0.45)	(0.46)	(0.455)
MBA(f)*Engineer(i)	0.828[b]	0.440	0.174	1.636[c]	-0.010	0.990[b]	-0.485	0.692[a]
	(0.373)	(0.347)	(0.348)	(0.514)	(0.386)	(0.452)	(0.407)	(0.42)
MBA(f)*Law(i)	0.380	0.419	0.701[b]	-0.423	0.397	-0.482	0.144	0.193
	(0.329)	(0.317)	(0.33)	(0.435)	(0.375)	(0.403)	(0.395)	(0.38)
MBA(f)*Master(i)	0.022	-0.240	-0.197	-0.740	-0.440	0.185	0.146	-0.210
	(0.34)	(0.324)	(0.334)	(0.454)	(0.371)	(0.431)	(0.409)	(0.407)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi^2	31	15.08	20.61	15.69	16.83	13.78	2.06	7.55
Probability > Chi^2	0	0.0045	0.0004	0.0035	0.0021	0.008	0.7251	0.1095
Investments	134	134	134	134	134	134	134	134
Observations	22,370	22,370	22,370	22,370	22,370	22,370	22,370	22,370

Panel B: Dummy Variable (P75)

	(1) General MBA	(2) Top MBA	(3) Harvard MBA	(4) Wharton MBA	(5) Stanford MBA	(6) Columbia MBA	(7) Chicago MBA	(8) INSEAD MBA
MBA:								
MBA(f)*MBA(i)	0.227	1.170[c]	1.365[c]	-12.762	1.531[c]	1.369[c]	0.307	0.913[b]
	(0.545)	(0.411)	(0.4)	(4292.527)	(0.431)	(0.448)	(0.45)	(0.435)
MBA(f)*Engineer(i)	0.771	0.427	0.139	-15.666	0.822[b]	0.822[a]	0.401	0.920[b]
	(0.516)	(0.451)	(0.46)	(4879.427)	(0.411)	(0.431)	(0.439)	(0.411)
MBA(f)*Law(i)	-1.584	-0.443	0.153	-15.811	-0.135	-0.948	-0.065	-0.146
	(1.049)	(0.526)	(0.447)	(5805.353)	(0.464)	(0.651)	(0.497)	(0.532)
MBA(f)*Master(i)	-0.563	-0.704	-0.674	-17.548	-0.680	0.561	-0.307	-0.138
	(0.563)	(0.481)	(0.46)	(8557.86)	(0.46)	(0.415)	(0.437)	(0.418)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi^2	5.53	11.98	15.17	0	18.94	14.99	1.74	9.61
Probability > Chi^2	0.237	0.0175	0.0044	1	0.0008	0.0047	0.7834	0.0475
Investments	134	134	134	134	134	134	134	134
Observations	22,370	22,370	22,370	22,370	22,370	22,370	22,370	22,370

Appendix: (Univariate Analyses)

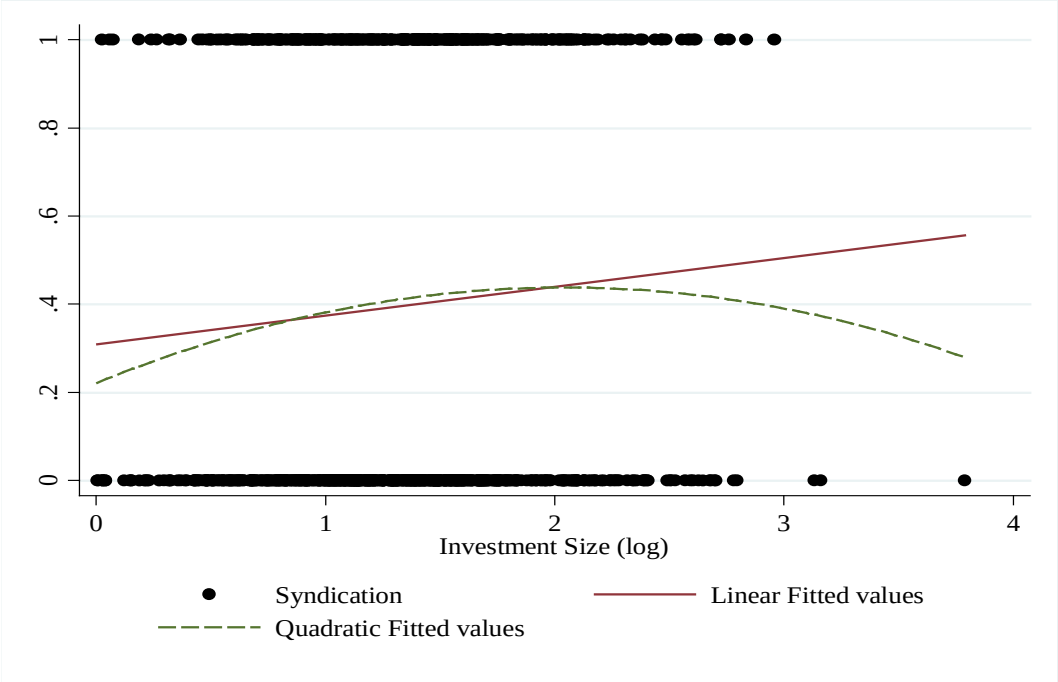

Figure A.1 Syndicated Likelihood and Investment Size

Figure1 shows the results of the linear estimation and the quadratic estimation of syndication likelihood on capital invested in LBO transactions (scaled by natural logarithm).

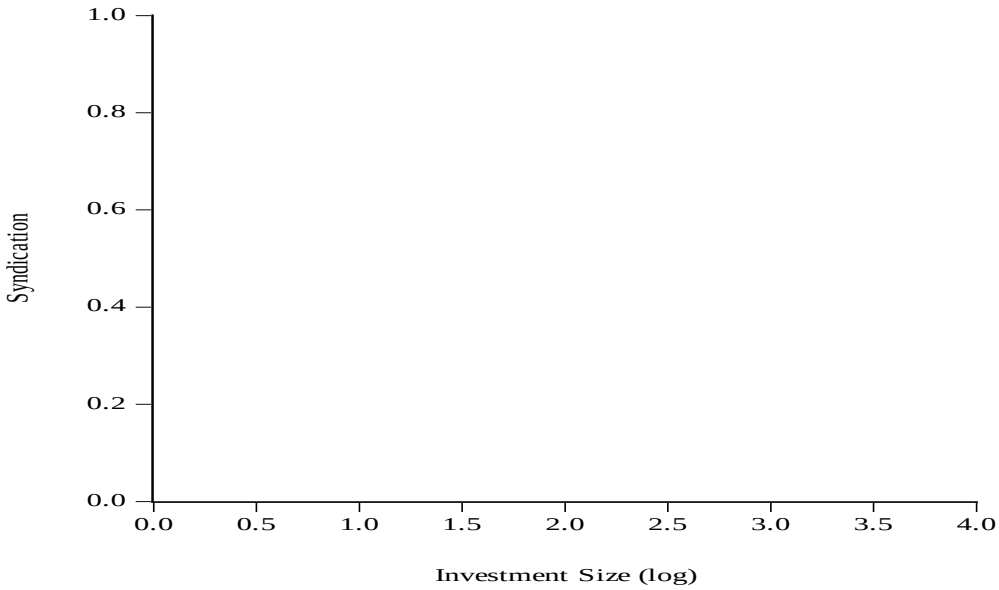

Figure A.2 Syndicated Likelihood and Investment Size

Figure2 shows the nearest neighbor estimation (degree=1, span=0.3) of syndication likelihood on invested in LBO transactions (scaled by natural logarithm).

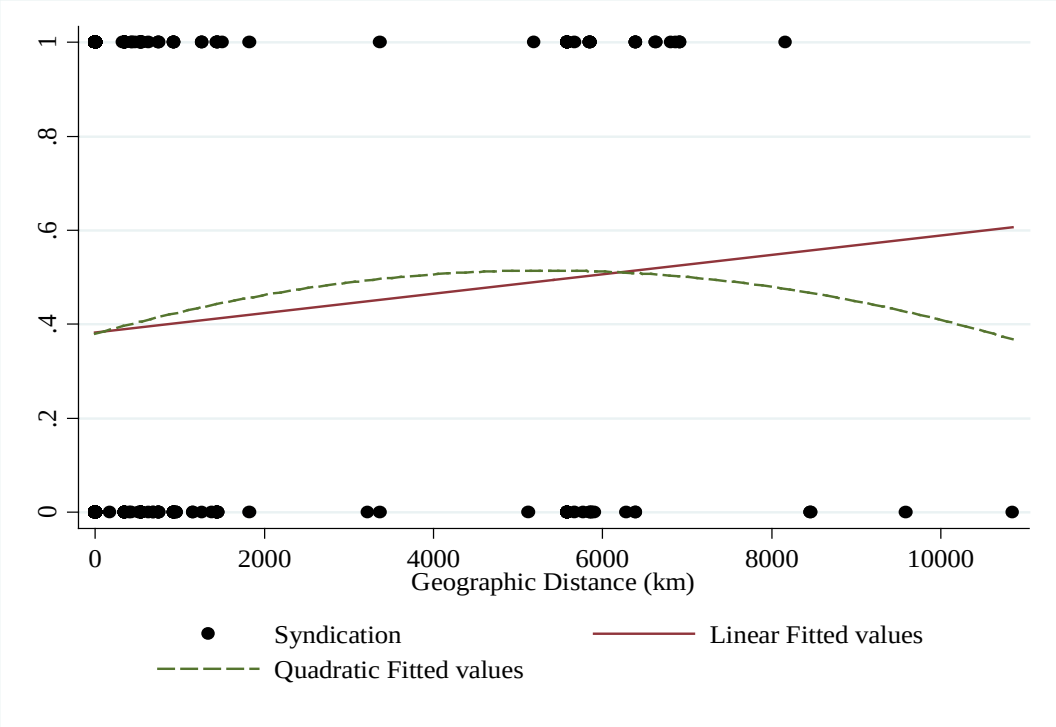

Figure A.3 Syndicated Likelihood and Geographic Distance (Sample)

Figure3 shows the results of the linear estimation and the quadratic estimation of syndication likelihood on geographic distance (in kilometer) between the portfolio company and its investment firm.

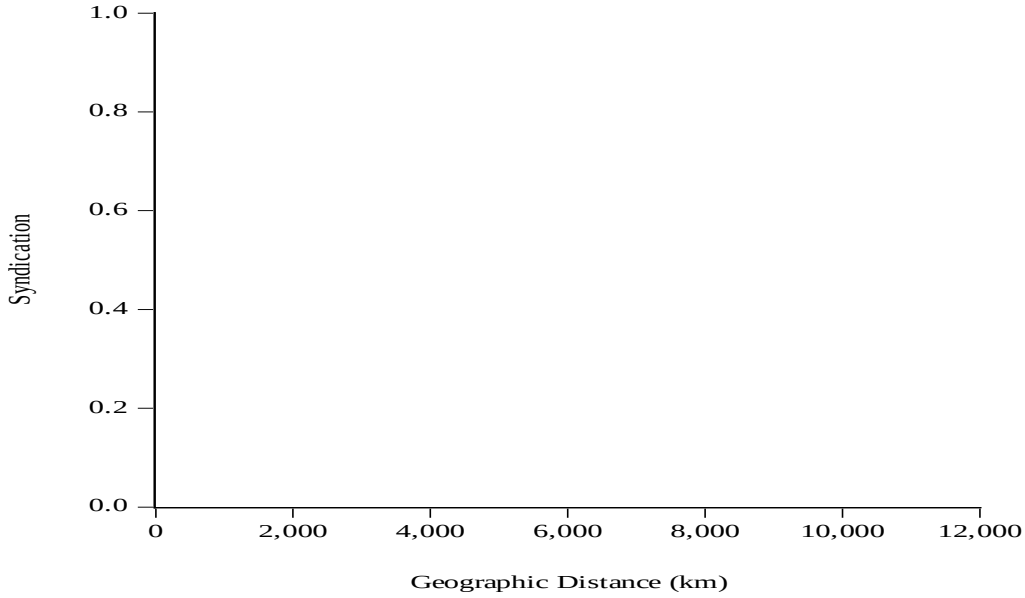

Figure A.4 Syndicated Likelihood and Geographic Distance (Sample)

Figure4 shows the nearest neighbor estimation (degree=1, span=0.3) of syndication likelihood on geographic difference (in kilometer) between the portfolio company and its investment firm.

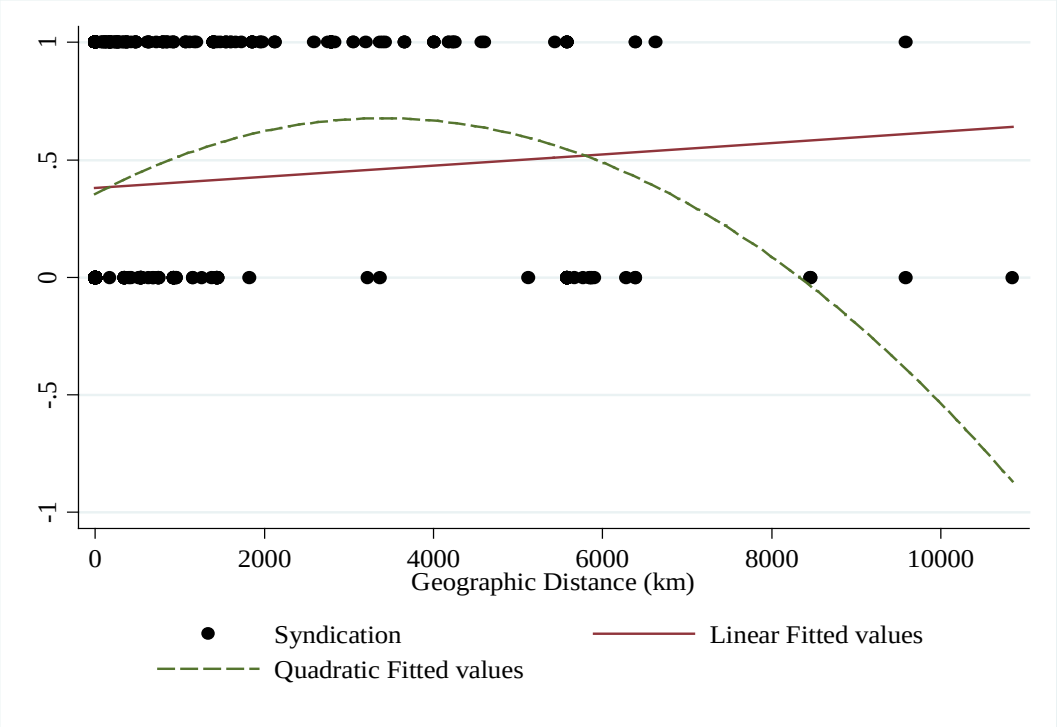

Figure A.5 Syndicated Likelihood and Geographic Distance (Team)

Figure5 shows the results of the linear estimation and the quadratic estimation of syndication likelihood on geographic distance (in kilometer) between the portfolio company and its investment firm(s).

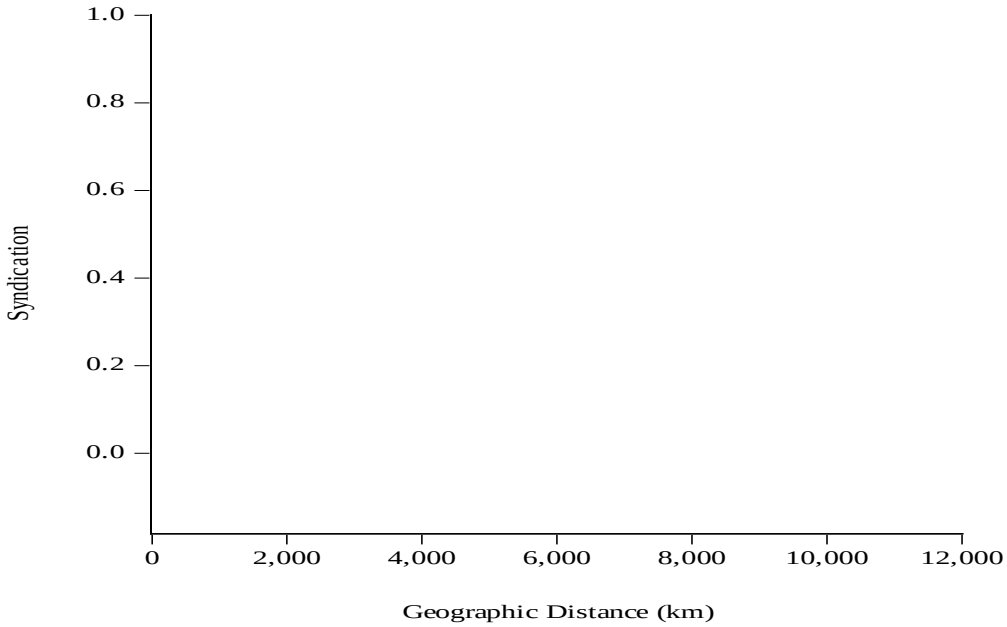

Figure A.6 Syndicated Likelihood and Geographic Distance (Team)

Figure6 shows the nearest neighbor estimation (degree=1, span=0.3) of syndication likelihood on geographic difference (in kilometer) between the portfolio company and its investment firm(s).

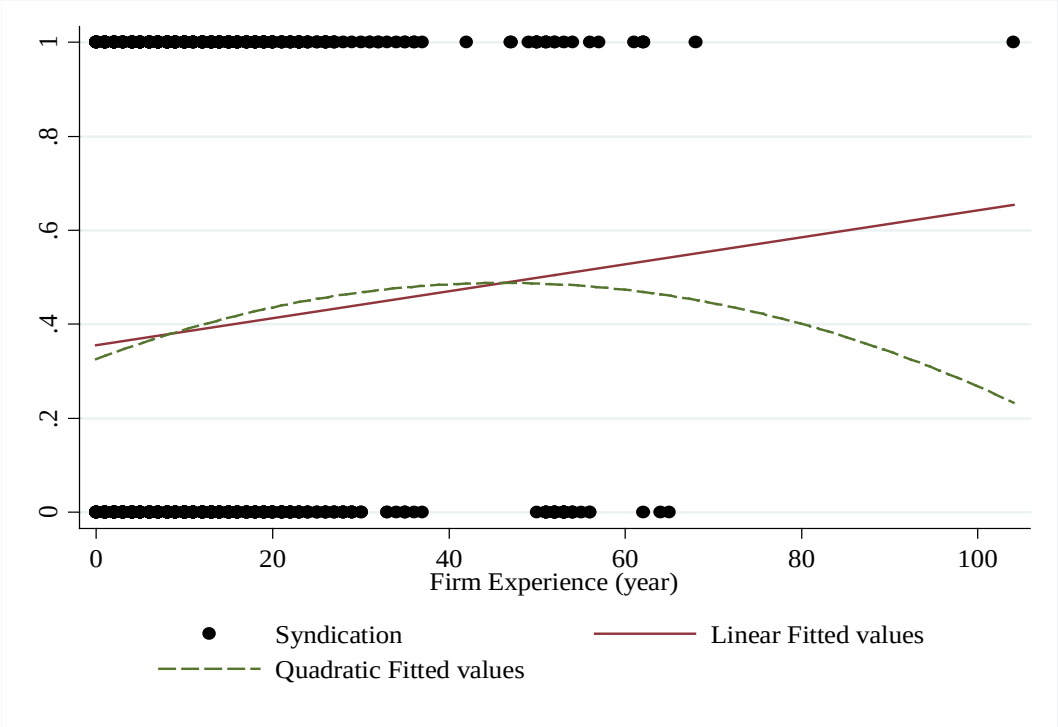

Figure A.7 Syndicated Likelihood and Firm Experience

Figure7 shows the results of the linear estimation and the quadratic estimation of syndication likelihood on firm experience (in year).

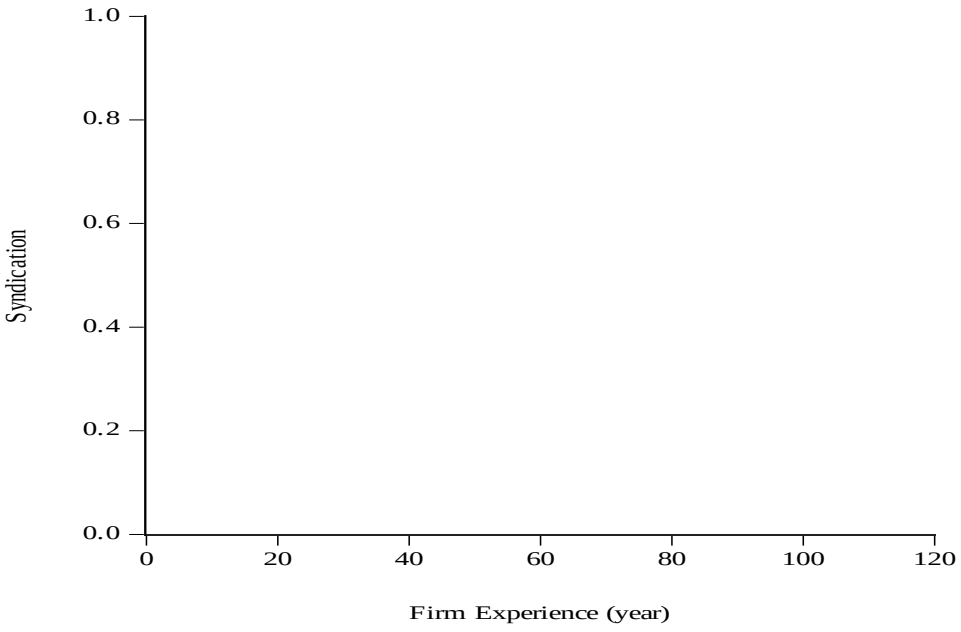

Figure A.8 Syndicated Likelihood and Firm Experience

Figure8 shows the nearest neighbor estimation (degree=1, span=0.3) of syndication likelihood on firm experience (in year).

Table A.1
Management Team on Syndication and Performance (firm-wise)

This table shows how managerial characteristics, in terms of density, differ based on syndication decision and final performance outcome. The investment team characteristics are proxied by using density variables, i.e. defined as the number of the professionals who have specific characteristics, scaled by the number of the whole investment team members within a firm. The "Skill Concentration" variable adopts the calculation similar to the Herfindahl Index, and it consists of three different skills, i.e. Law, Business, and Engineering. Low performance refers to the transactions constituting the lowest 25% performance (under the first quartile) in the sample. Similarly, high performance refers to those with the highest 25% performance (above the third quartile). Panel A and B adopt multiple as a proxy for performance, while Panel C and D adopt internal rate of return as an alternative proxy. Panel A and C show the mean test, using t-test for equality. Panel B and D show the median test, and, using Wilcoxon/Mann-Whitney (tie-adjusted) test for equality. P-values are reported in the parentheses, and the symbols *, **, and *** represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Mean Test (Multiple)				
	Characteristics	Low Performance (L)	High Performance (H)	Difference (L,H)
Non-Syndicated Investment	CFA/CPA/CA	0.1495	0.1212	-0.0282 (0.1572)
	Founder of the Firm	0.2283	0.2920	0.0637** (0.0378)
	MBA	0.4996	0.5220	0.0224 (0.4628)
	Law	0.1186	0.1361	0.0175 (0.3009)
	Business	0.7257	0.7676	0.0419** (0.0488)
	Engineering	0.0703	0.0774	0.0071 (0.5760)
	Master	0.1456	0.1737	0.0281 (0.1899)
	Harvard MBA	0.1513	0.1979	0.0466** (0.0462)
	Skill Concentration	0.6078	0.6831	0.0753** (0.0142)
	Sample Size	144	153	
Syndicated Investment	CFA/CPA/CA	0.1911	0.1276	-0.0635** (0.0253)
	Founder of the Firm	0.2023	0.2180	0.0158 (0.6643)
	MBA	0.5119	0.5128	0.0010 (0.9796)
	Law	0.1064	0.1182	0.0118 (0.5241)
	Business	0.7483	0.7530	0.0047 (0.8588)
	Engineering	0.0823	0.0893	0.0070 (0.6771)
	Master	0.1393	0.1704	0.0311 (0.1992)
	Harvard MBA	0.1774	0.2007	0.0233 (0.4780)
	Skill Concentration	0.6375	0.6356	-0.0019 (0.9607)
	Sample Size	82	81	

Panel B: Median Test (Multiple)				
	Characteristics	Low Performance (L)	High Performance (H)	Difference (L,H)
Non-Syndicated Investment	CFA/CPA/CA	0.1056	0.0714	-0.0342 (0.1619)
	Founder of the Firm	0.1429	0.2	0.0571*** (0.0045)
	MBA	0.5455	0.6	0.0545 (0.4026)
	Law	0.0909	0.1111	0.0202 (0.3855)
	Business	0.75	0.7895	0.0395** (0.0323)
	Engineering	0	0	0 (0.6908)
	Master	0.1	0.1364	0.0364 (0.3995)
	Harvard MBA	0.0278	0.1429	0.1151** (0.0427)
	Skill Concentration	0.6211	0.6777	0.0566*** (0.0083)
	Sample Size	144	153	
Syndicated Investment	CFA/CPA/CA	0.1333	0.1176	-0.0157 (0.1053)
	Founder of the Firm	0.1062	0.1579	0.0517 (0.1388)
	MBA	0.5779	0.5714	-0.0065 (0.9444)
	Law	0.0833	0.1154	0.0321 (0.2575)
	Business	0.7778	0.7778	0 (0.816)
	Engineering	0.0385	0.0526	0.0141 (0.5961)
	Master	0.1091	0.12	0.0109 (0.542)
	Harvard MBA	0.125	0.1111	-0.0139 (0.8193)
	Skill Concentration	0.65	0.64	-0.01 (0.8629)
	Sample Size	82	81	

Panel C: Mean Test (Gross Internal Rate of Return)				
	Characteristics	Low Performance (L)	High Performance (H)	Difference (L,H)
Non-Syndicated Investment	CFA/CPA/CA	0.1620	0.1304	-0.0315 (0.1757)
	Founder of the Firm	0.2418	0.2204	-0.0214 (0.4772)
	MBA	0.4882	0.4717	-0.0165 (0.6127)
	Law	0.1361	0.1039	-0.0322* (0.0646)
	Business	0.7071	0.7471	0.0400

				(0.1)
	Engineering	0.0658	0.1039	0.0381*** (0.005)
	Master	0.1365	0.2117	0.0753*** (0.0013)
	Harvard MBA	0.1359	0.1772	0.0413* (0.0883)
	Skill Concentration	0.5937	0.6465	0.0528 (0.1092)
	Sample Size	133	127	
Syndicated Investment	CFA/CPA/CA	0.1437	0.1485	0.0048 (0.868)
	Founder of the Firm	0.1897	0.1723	-0.0174 (0.6211)
	MBA	0.5326	0.5256	-0.0070 (0.8741)
	Law	0.1080	0.1133	0.0053 (0.7941)
	Business	0.7602	0.7461	-0.0141 (0.6377)
	Engineering	0.1007	0.0979	-0.0028 (0.8854)
	Master	0.1658	0.1993	0.0335 (0.2694)
	Harvard MBA	0.1910	0.2206	0.0296 (0.4417)
	Skill Concentration	0.6605	0.6285	-0.0320 (0.4677)
	Sample Size	62	70	

Panel D: Median Test (Gross Internal Rate of Return)

	Characteristics	Low Performance (L)	High Performance (H)	Difference (L,H)
Non-Syndicated Investment	CFA/CPA/CA	0.125	0	-0.125 (0.196)
	Founder of the Firm	0.1667	0.1667	0 (0.8616)
	MBA	0.5	0.5385	0.0385 (0.7682)
	Law	0.0909	0.0909	0 (0.5283)
	Business	0.7143	0.8	0.0857* (0.0617)
	Engineering	0	0.0556	0.0556** (0.0101)
	Master	0.1	0.1667	0.0667*** (0.0017)
	Harvard MBA	0	0.0909	0.0909 (0.1664)
	Skill Concentration	0.5972	0.6672	0.07 (0.128)
	Sample Size	133	127	
Syndicated Investment	CFA/CPA/CA	0.0729	0.129	0.0561 (0.4673)
	Founder of the Firm	0.1156	0.125	0.0094

			(0.8268)
MBA	0.5895	0.5885	-0.001
			(0.7843)
Law	0.0909	0.1026	0.0117
			(0.2883)
Business	0.8	0.7836	-0.0164
			(0.5869)
Engineering	0.0392	0.0871	0.0479
			(0.5634)
Master	0.1394	0.1603	0.0209
			(0.5588)
Harvard MBA	0.0955	0.1539	0.0584
			(0.4026)
Skill Concentration	0.6683	0.6556	-0.0127
			(0.5968)
Sample Size	62	70	

Table A.2
Management Team on Performance of Syndicated Investments

This table shows, for syndicated investments, how managerial characteristics, in terms of density of entire investment team, differ given the final performance. The investment team characteristics are proxied by using density variables, i.e. defined as the number of the professionals who have specific characteristics, scaled by the number of the whole investment team members across syndicated partners. Low (high) performance refers to the transactions constituting the lowest (highest) 25% performance in the sample. The set of "∂ (.)" variables refer to the differences of team characteristics before and after the syndication. Panel A and B adopt multiple as a proxy for performance, while Panel C and D adopt internal rate of return as an alternative proxy. Panel A and C show the mean test, using t-test for equality. Panel B and D show the median test, and, using Wilcoxon/Mann-Whitney (tie-adjusted) test for equality. P-values are reported in the parentheses, and the symbols *, **, and *** represent statistical significance at the 0.1, 0.05, 0.01 level, respectively.

Panel A: Mean Test (Multiple)			
Characteristics	Low Performance (L)	High Performance (H)	Difference (L,H)
∂(CFA/CPA/CA)	-0.0075	0.0031	0.0106 (0.5397)
∂ (Founder of the Firm)	-0.0176	-0.0066	0.0110 (0.6357)
∂ (MBA)	0.0050	0.0143	0.0093 (0.6873)
∂ (Law)	-0.0121	0.0115	0.0236* (0.0563)
∂ (Business)	-0.0069	0.0146	0.0214 (0.1668)
∂ (Engineering)	0.0269	-0.0039	-0.0308*** (0.009)
∂ (Master)	0.0247	0.0033	-0.0214 (0.1611)
∂ (Harvard MBA)	0.0005	0.0031	0.0026 (0.8844)
∂ (Skill Concentration)	-0.0227	0.0098	0.0325 (0.1749)
Sample Size	82	81	

Panel B: Median Test (Multiple)			
Characteristics	Low Performance (L)	High Performance (H)	Difference (L,H)
∂ (CFA/CPA/CA)	0	0	0 (0.5655)
∂ (Founder of the Firm)	0	0	0 (0.9502)
∂ (MBA)	0	0	0 (0.9329)
∂ (Law)	0	0	0 (0.8694)
∂ (Business)	0	0	0 (0.168)
∂ (Engineering)	0	0	0* (0.0815)
∂ (Master)	0	0	0 (0.2144)
∂ (Harvard MBA)	0	0	0 (0.82)
∂ (Skill Concentration)	0	0	0* (0.0950)
Sample Size	82	81	

Panel C: Mean Test (Gross Internal Rate of Return)			
Characteristics	Low Performance (L)	High Performance (H)	Difference (L,H)
∂ (CFA/CPA/CA)	0.0119	0.0167	0.0048 (0.8087)
∂ (Founder of the Firm)	-0.0067	-0.0024	0.0042 (0.8466)
∂ (MBA)	-0.0087	-0.0059	0.0028 (0.9136)
∂ (Law)	-0.0098	0.0075	0.0172 (0.1735)
∂ (Business)	-0.0104	0.0011	0.0115 (0.5182)
∂ (Engineering)	0.0187	0.0006	-0.0181* (0.0899)
∂ (Master)	0.0223	-0.0109	-0.0331* (0.0533)
∂ (Harvard MBA)	-0.0075	-0.0079	-0.0005 (0.9817)
∂ (Skill Concentration)	-0.0301	-0.0086	0.0216 (0.4360)
Sample Size	62	70	

Panel C: Median Test (Gross Internal Rate of Return)			
Characteristics	Low Performance (L)	High Performance (H)	Difference (L,H)
∂ (CFA/CPA/CA)	0	0	0 (0.3721)
∂ (Founder of the Firm)	0	0	0 (0.9298)
∂ (MBA)	0	0	0 (0.6722)
∂ (Law)	0	0	0 (0.7203)
∂ (Business)	0	0	0 (0.8189)
∂ (Engineering)	0	0	0 (0.1132)
∂ (Master)	0	0	0 (0.3726)
∂ (Harvard MBA)	0	0	0 (0.438)
∂ (Skill Concentration)	0	0	0 (0.7876)
Sample Size	62	70	