Segmentation of the LBO market based on projects' risk and return characteristics

PRELIMINARY DRAFT

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Abstract

Several types of equity sponsors are active in the financing of young companies and business transfers. François and Hübner (2013) classify them into three categories - private, diversified and financial sponsors - based on their cost of equity and their cost of debt. This paper aims to study whether those different sponsor types can be related to the segmentation of the LBO market and to differences in LBO deal terms. We perform an empirical study on a sample of 3788 international leveraged buyout deals. We find out that each of the three sponsor types specializes in the business transfer financing of particular types of target companies depending mainly on the companies (projects)' size and risk. Moreover, the type of sponsor has an influence on the deal's loan spread. The risk aversion and bargaining power of deal participants also play a role on the type of equity sponsor involved in the deal as well as on the loan spread granted by the lender. Therefore, entrepreneurs and managers should be oriented towards the most suitable type of sponsor given their company's and own characteristics.

Key words: leveraged buyout, market segmentation, equity sponsor, target company, spread

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1. Introduction

This paper investigates the segmentation of the leveraged buyout (LBO) market and the structure of leveraged buyout deals. It targets objectives related to two important aspects of private equity deals: (1) equity sponsor types and (2) deal terms. We address the following questions: (1) what type of target companies have their business transfer (buyout) financed by the different types of sponsors (investors)? And in which circumstances (risk aversion, bargaining power)? (2) What is the impact of risk aversion, bargaining power and the type of equity sponsor on the terms of buyout deals, especially on the loan spread?

1.1. Private equity sponsor types

Several types of equity sponsors have been categorized in the financial literature As in François and Hübner (2013), private equity sponsors can be differentiated based on their cost of equity and cost of funding. Then, three categories can be obtained. Private investors have higher cost of equity than the other two categories. Diversified investors compose the intermediate category. Financial investors have lower cost of funding than the other two categories.

The first objective of this study is to determine how the optimal investor type in a leveraged buyout deal depends on the characteristics of the buying entrepreneur (manager or company) and the target company, and to test whether those relations are materialized in real leveraged buyout activity.

With those results, we aim to find solutions in order to attract the most suitable sponsor(s) for each deal as a function of the economic situation and the LBO market activity, the characteristics (size, expected return and risk) of the company in need of funding, the risk aversion and the bargaining power of LBO market participants.

1.2. LBO deal terms

The second objective of this study is to determine how the optimal deal terms in a leveraged buyout deal depend on the characteristics of the buying entrepreneur (manager or company), the target company and the investors (sponsors).

Among the buyout deal terms, we study mainly the loan spread. The debt proportion in the total LBO deal amount may be examined in a further version of the paper. Using those results, we aim to find solutions in order to optimize the LBO deal terms and the efficiency of deals for all LBO participants.

2. Literature review

2.1. Venture capital deals

2.1.1. Sponsor types

Several authors find that the investor (sponsor) type is related to the type of investments (stage, size, risk and region). Mayer, Schoors and Yafeh (2005) find that financial institutions (banks, insurance companies and pension funds)-backed funds, in particular banks, are focused on late-stage investments whereas corporate investors and individuals invest more in early-stage VC funds. Moreover, they find that banks and governmental investors invest more in domestically active VC funds whereas insurance companies, corporations and individuals invest in globally active VC funds.

Mayer et al. (2005) find that diversified and private VCs prefer to invest in early-stage projects, typically characterized by high risk and/or low size. Moreover, they find that funds whose funding comes from banks, insurance companies and pension funds favor late-stage projects.

Hellman et al. (2008) find that bank-dependent VCs invest less often in early rounds and that these bank-dependent VCs invest more in larger deals. Hirsch and Walz (2013) find that VC investors that are not backed by a bank tend to finance more innovative projects.

Other authors find that the investor (sponsor) type, the affiliation of the PE firm (independent vs. captive) or the identity of the limited partners, is related to the acquired firm's post-buyout performance. Buyouts by independent (more specialized) PE firms tend to have higher post-buyout profitability levels (Cressy, Malipiero & Munari, 2007). This can be explained by a higher required return (Manigart et al., 2002) and/or to a higher involvement (Bottazzi et al., 2008). Indeed, Manigart et al. (2002) finds that captive investors require a lower return from their investments than independent investors. Bottazzi et al. (2008) find that bank and public venture firms are less actively involved in their portfolio companies, compared to independent VC firms.

Moreover, some authors find that the investor/sponsor type is related to the PE fund's return. Lerner, Schoar and Wongsunwai (2007) identify a better investment selection ability for some sponsor types. The relation can also be explained by a greater access to top performing PE partnerships (Manninen, Jaaskelainen & Maula, 2011; Sensoy, Wang & Weisbach, 2014).

Finally, some authors find that the investor/sponsor type is related to the PE fund's portfolio size per manager. Cumming (2001) finds that the portfolio size per manager is much larger for labour-sponsored funds and government funds than for corporate and private funds (Cumming, 2001) and that, consequently, the value-added to entrepreneurial firms by both corporate and private funds is greater than that of labour-sponsored and government funds.

2.1.2. Bargaining power and LBO deal terms

Bargaining power has been studied under different forms in the private equity literature. Therefore, different measures of the bargaining power of entrepreneurs and sponsors have been identified: fundraising and market activity, sponsor investment region, sponsor size, reputation or entrepreneur's human and social capital. Inflows of capital into venture funds increase the valuation of these VC funds' new investments, by increasing the competition between VCs (Gompers & Lerner, 2000). Heughebaert and Manigart (2012) find that VC firm types with more bargaining power obtain higher equity stakes, or equivalently, value firms at a lower level compared with VC firm types with less bargaining power. Bargaining power is determined by the competitiveness in the investment sector.

A VC investing locally will have less bargaining power than a VC investing in another country (competition between local investors) (Heughebaert & Manigart, 2012). Cumming and Dai (2011) identify a convex relationship between fund size and valuations of ventures: as long as the VC size remains lower than a certain value, the relation between VC size and bargaining power is positive and it becomes negative when the size becomes too big due to limited attention from human capital limitations. Entrepreneurs are willing to accept a discount on the valuation of their start-up in order to access the capital of VCs with a better reputation (Hsu, 2007). Entrepreneur's human and social capital is positively related to venture valuation (Hsu, 2007).

2.2. Private equity (leveraged) deals

2.2.1. Sponsor types

Fang, Ivashina and Lerner (2010) find that the share of banks in the private equity market is substantial. Between 1983 and 2009, over one-quarter of all private equity investments involved bank-affiliated private equity groups. Also, the share of transactions affiliated with banks is pro-cyclical, peaking at times of big capital inflows into the private equity market. Moreover, prior to the transaction, targets of bank-affiliated investments have significantly better operating performance than other targets, though their size and other features are similar (Fang, Ivashina & Lerner, 2010).

2.2.2. Bargaining power and LBO deal terms

The reputation of the private equity sponsor involved in the buyout deal is positively related to LBO leverage (Demiroglu & James, 2007; Brinkhuis & De Maeseneire, 2009).

3. Empirical analysis

3.1. Scope and variables

We perform an empirical study on a sample of 3788 international leveraged buyout deals over the period 1986-2012. We test the impact of the determinants on our two main variables of interest (dependent variables): the type of private equity sponsor(s) involved in the LBO deals and the loan spread.

The dependent variables are regressed in function of several determinants which have been identified in the literature: the target company's characteristics (size, expected return and risk), risk aversion, the contractors (sponsor, bank)' bargaining power, as well as several control variables (loan maturity, loan seniority). Those determinants and their empirical estimators are given in the table below.

Theoretical variables	Empirical estimators
Deal/company risk	Adjusted loan spread
Deal/company expected return	Operating revenue/total assets Net income/total assets
Deal/company size	Deal debt amount Company total assets
Risk aversion (γ)	Risk aversion based on equity market returns and volatility
Sponsor bargaining power (η^i)	Is cross border (0 or 1) Sponsor reputation: past 5 year deals of the sponsor LBO activity (inverse): past 6 months number of deals
Lender bargaining power (η^b)	Lender reputation: past 5 year deals of the lender LBO activity (inverse)
Company bargaining power	LBO activity

3.2. Sample description

A) Sponsor types

Six main types of sponsors are involved in the database sample deals:

- Private equity firms
- Private equity advisors or funds of funds
- Corporate PE/ventures
- Investment management firms
- Bank affiliates
- Insurance firm affiliates.

Their numbers and proportions are described in the table below.

Sponsor type	Private Equity Firm	Private Equity Advisor or Fund of Funds	Corporate PE/Venture	Investment Management Firm	Bank Affiliated	Insurance Firm Affiliate
Number (%)	3135 (81.6%)	28 (0.73%)	26 (0.68%)	192 (5%)	440 (11.45%)	21 (0.55%)

A common categorization identifies two types of sponsors. Sponsors are categorized into financial sponsors, including bank-affiliated sponsors and insurance firm affiliates, and non-financial sponsors.

Sponsor type	Non-financial sponsors	Financial sponsors
Number (%)	3381 (88%)	461 (12%)

As explained in the introduction, François and Hübner (2013) propose a new categorization of sponsors based on the opportunity costs of equity and funding. They identify three types of sponsors: private investors, diversified investors and financial investors.

Private sponsors have a higher cost of equity than other sponsors and are composed of private equity firms. Financial sponsors have more favorable funding costs than other sponsors and include bank-affiliated sponsors and insurance firm affiliates. The intermediate category is called diversified sponsors and gathers investment management firms.

Sponsor type	Private sponsors	Diversified sponsors	Financial sponsors
Number (%)	3135 (82.76%)	192 (5.07%)	461 (12.17%)

B) Company country

Sponsor type	Private sponsors	Diversified sponsors	Financial sponsors
Total (%)	3135 (82.76%)	192 (5.07%)	461 (12.17%)
Belgium	18 (90%)	1 (5%)	1 (5%)
France	249 (75.45%)	13 (3.94%)	68 (20.61%)
Germany	185 (87.68%)	11 (5.21%)	15 (7.11%)
Netherlands	93 (85.32%)	5 (4.59%)	11 (10.09%)
United Kingdom	320 (79.21%)	22 (5.45%)	62 (15.35%)
United States	1781 (83.65%)	109 (5.12%)	239 (11.23%)

In France compared to other countries, the deal has a higher probability to involve a financial sponsor.

C) Domestic or cross-border deals

	Domestic deals	Cross-border deals	All deals
Private sponsors	2170	870	3040
Diversified sponsors	**81**	**103**	184
Financial sponsors	303	146	449
All sponsors	2554	1119	3673

D) Deal year

Deal year	Private sponsors	Diversified sponsors	Financial sponsors	Total
1986	2			2
1987	5		1	6
1988	19		12	31
1989	4	4	3	11
1990	1	1	2	4
1991		1		1
1992	1		3	4
1993	6			6
1994	22	5	10	37
1995	33	2	4	39
1996	23	1	7	31
1997	88	9	14	111
1998	107	11	23	141
1999	120	4	25	149
2000	131	9	25	165
2001	81	3	19	103
2002	98	5	11	114
2003	142	4	12	158
2004	245	20	27	292
2005	288	19	49	356
2006	344	26	63	433
2007	428	36	64	528
2008	288	11	37	336
2009	89	1	11	101
2010	222	7	13	242
2011	258	8	20	286
2012	90	5	6	101

3.3. Empirical model

We use the following regression model specifications:

$$PESpType = \alpha + \beta_1 * Risk + \beta_2 * ExpRet + \beta_3 * Size + \beta_4 * \gamma + \beta_5 * Barg + controls + \varepsilon$$

Expected return is excluded from the complete specification of the model due to a lack of data. It decreases the number of observations too much. Expected return is studied in Model 2 only (1 explanatory variable model). Bargaining power is proxied by three different variables: a cross-border dummy variable, lender reputation and buyout activity.

We run multinomial logistic regressions for the three sponsor types variable and logistic regressions for the two sponsor types variable. We obtain the following results.

Dependent variable: Sponsor type (1 = Private, 2 = Diversified, 3 = Financial)				
		Full model	**Model 2**	**Model 3**
Private	Constant	3.587 ***		
	Risk	0.002 **		
	Exp. Return		0.495 **	
	Size	-0.01		-0.01 **
	Risk aversion (γ)	-0.11		
	Is cross-border	-1.62 ***		
	Lender reputation	-0.01 ***		
	Buyout activity	0.001		
Base outcome: Diversified				
Financial	Constant	1.219*		
	Risk	-0.01		
	Exp. Return		0.585 **	
	Size	-0.01 ***		-0.01 ***
	Risk aversion	0.439		
	Is cross-border	-1.22 ***		
	Lender reputation	0.001		
	Buyout activity	-0.01		
N° observations		2464	572	3738
Pseudo R2		0.049	0.01	0.01

Dependent variable: Sponsor type (0 = Non-financial, 1 = Financial)				
		Full model	**Model 3**	**Model 4**
Financial	Constant	-2.39 ***		
	Risk	-0.01 ***		
	Exp. Return			
	Size	-0.01 **	-0.01 ***	
	Risk aversion	0.498		1.291 ***
	Is cross-border	0.27 *		
	Lender reputation	0.001 ***		
	Buyout activity	-0.01		
Base outcome: Non-financial				
N° observations		2505	3791	3253
Pseudo R2		0.022	0.01	0.01

4. Analysis

4.1. Findings

4.1.1. Sponsor types

A) Company risk

Riskier deals and companies have a higher probability to be sponsored by private sponsors (private equity firms) compared to diversified and financial investors. Moreover, riskier deals or companies have a lower probability to be sponsored by financial sponsors (bank or insurance firm affiliates) compared to the whole group of non-financial investors (private + diversified investors). Risk is measured first by the spread margin of the deal. This result may be obtained only because private sponsors obtain less advantageous credit conditions and financial sponsors obtain better credit conditions thanks to their affiliation with a bank or an insurance firm. Then, in order to obtain a better measure of the real risk of the target company, we adjust the spread margin to the amount, the maturity and the seniority of the loan by regressing first the spread margin on those three variables and taking the residuals (idiosyncratic risk) as the company risk measure. The relation between risk and the type of sponsor involved in the deal remain the same. Riskier companies have a higher probability to be financed by private sponsors (private equity firms) compared to diversified and financial investors and a lower probability to be sponsored by financial sponsors (bank or insurance firm affiliates) compared to the whole group of non-financial investors (private + diversified investors).

B) Company expected return

When the expected return of the target company (measured by the ratio Operating revenue/Total assets for the deal's year, the year before and the year after the deal) is lower, the deal has a higher probability to be sponsored by a diversified sponsor (investment management firm) compared to private and financial investors. This may be explained by the lower required return (cost of capital) of diversified investors. A similar relation (compared to the private sponsor only) is also observed when the expected return of the target company is measured by the P/L before tax/Total assets and the Net income/Total assets, but the results are not significant.

However, the expected return of the target company does not have any significant influence on the type of sponsor involved in the deal when considering the choice between financial and non-financial investors.

C) Company size

Larger deals and companies have a lower probability to be sponsored by financial sponsors (bank or insurance firm affiliates) compared to private and diversified sponsors and therefore

compared to the whole group of non-financial investors. Moreover, larger deals and companies have a higher probability to be financed by diversified sponsors compared to private and financial investors. Diversified sponsors finance larger deals, financial sponsors finance smaller deals and private sponsors finance middle-sized deals. The size of the deal is measured by the debt amount. Similar relations are obtained by measuring the size by the company's total assets (at the end of the year before the deal and at the end of the deal's year), but, with this second measure of size, the relations are not statistically significant.

Entrepreneurs/managers should be guided towards sponsors which suit the characteristics of their (target) company:

- Diversified sponsors for large buyouts and companies with lower return perspectives;
- Private sponsors for risky companies;
- Financial sponsors for smaller projects with reasonable risk.

According to the characteristics of most buyout companies in Belgium, the most suitable type of sponsor for those companies could be supported.

D) Buyer's risk aversion

When risk aversion is larger, the deal has a higher probability to be financed by financial sponsors (bank or insurance firm affiliates) compared to private sponsors and compared to the whole group of all non-financial sponsors. However, in model specifications including other factors, risk aversion does not have a significant influence on the type of sponsor involved in the deal.

When entrepreneurs, managers and investors are less disposed to create activity and develop companies (high risk aversion), deals with financial sponsors should be facilitated since those sponsors are the most active in a high risk aversion environment.

Financial sponsors should be supported: measures should facilitate their capacity to increase their investment volumes. Buying entrepreneurs/managers should be guided towards those sponsors when searching for funds.

E) Bargaining power

When the reputation of the lender is larger, the deal has a lower probability to be sponsored by a private sponsor (private equity firm) compared to diversified and financial sponsors. Moreover, when the reputation of the lender is better, the deal has a higher probability to be financed by financial sponsors compared to the whole group of non-financial investors (private + diversified investors).

The level of activity in the LBO market and the resulting inverse level of competition between sponsors and between lenders (higher competition when the activity is lower) do not have any significant impact on the type of sponsors involved in the deals.

Cross-border deals have a higher probability to be sponsored by a diversified sponsor (investment management firm) compared to private and financial sponsors.

Cross-border deals have a lower probability to be sponsored by a private sponsor (private equity firm) compared to diversified and less significantly to financial investors. Thus, domestic deals have a higher probability to be sponsored by private (private equity firms) or financial investors (bank or insurance firm affiliates).

4.1.2. Loan spread

A) Buyer's risk aversion

When risk aversion is larger, the spread margins of LBO deals are lower. A possible explanation may be that only less risky deals are financed when risk aversion is high. Investors/Sponsors may also be more demanding concerning the borrowing rate in periods of higher risk aversion since they would accept the deal only if their expected return is sufficient enough (they have a larger required return in periods of higher risk aversion). If fewer deals are supported by sponsors, the competition between lenders may also increase. That would reduce the lenders' bargaining power and would result in lower loan rates.

B) Bargaining power

When the lender reputation is larger, the spread margin of the LBO deal is lower. The lender reputation seems to have a negative influence on the spread margin. A possible explanation is that more reputational lenders are involved in less risky deals, their reputation give them the ability to select the least risky companies thanks to their higher bargaining power.

When the activity in the LBO market increases (the competition decreases), the spread margin decreases. Sponsors have more bargaining power and obtain better credit conditions. Lender have more bargaining power and select less risky deals. In contrary, in periods of low LBO market activity (high competition between sponsors and between lenders), sponsors have less bargaining power and have to accept higher borrowing rates. Moreover, lenders have less bargaining power and have to accept financing more risky deals resulting in higher lending rates.

C) Sponsor type

When the sponsor is in the private category, the spread margin of the LBO deal is larger compared to financial sponsors.

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