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## **The importance of the acquisition process in Private Equity deals**

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## **Executive Summary**

The Private Equity industry have been growing in the last two decades (10.6% per year since 1995) reaching US\$ 257 billion of investment in 2016 and boosting the growth of merger and acquisition activity (6.1% per year since 1995). As a consequence of the increase in M&A activity (which includes PE deals), the competition to acquire a company increases and drives up the acquisition multiples.

The acquisition price is an important issue for PE firms: if the company pays too much for the target, even a successful process to increase company's EBITDA and an effective exit strategy should not be enough for a successful deal. So, while there are numerous Private Equity studies that focus on the value creation and the exit process, this article concentrates in the acquisition process as an important issue for the PE investments.

An analysis is made about whether Private Equity funds are capable of purchasing companies at a discount from strategic investors, expecting some skills and characteristics of PE firms to lead them to pay less in acquisitions such as: (i) track record from previous deals; (ii) Strategic investors should pay more due to potential synergies; (iii) investors requires a premium to compensate low liquidity of PE; and, (iv) potential bargain power of PE firms (investor should prefer the partnership with a PE). The article focuses on the emerging countries that compound the BRIC (Brazil, Russia, India and China).

In order to test the hypothesis, a multiple linear regression was used where the responsible variable is the multiple acquisition prices of deals (EV/EBITDA – Enterprise Value over EBITDA) and the main explanatory variable (PE) is a dummy which indicates whether at least one of the acquirers is a private equity company. Analyses were run to investigate if different acquisition

multiples have different results and I also ran the model with each country individually. As robustness check, a propensity score matching test was run as well.

In general, the findings of the research indicated a negative relative between multiple price (EV/EBITDA) and the presence of a PE firm as an acquirer, corroborating with the hypothesis that PE companies buy companies at lower multiple prices than non-PE firms. I expect that this study will contribute to Private Equity literature by focusing on the acquisition process and I foresee some opportunities for studies related to acquisition process.

## **Resumo**

O setor de Private Equity (PE) tem crescido nas últimas décadas, ajudando a aumentar o número de fusões e aquisições (M&A) e, conseqüentemente, impulsionando os preços de aquisições de empresas e a concorrência na indústria de M&A. As empresas de PE têm algumas características específicas (quando comparada com outros investidores) que podem influenciá-las a pagar menos em uma aquisição: Investidores de PE exigem maiores retornos para compensar à baixa liquidez do investimento; não há ganhos de sinergias nos negócios de PE; experiências passadas ajudam fundos de PE a desenvolverem habilidades no processo de aquisição; e, alguns empreendedores desejam receber investimento de fundos de PE para aproveitar seu conhecimento e credibilidade. Mesmo quando há um desenvolvimento bem-sucedido da empresa adquirida somada a uma boa estratégia de saída, pode resultar em um investimento de PE sem sucesso caso a aquisição tenha sido feita a múltiplos elevados. Por esta razão, este artigo se concentra em investigar se as empresas de Private Equity são mais eficientes no processo de aquisição do que outros investidores.

**Keywords: Private Equity, Processo de Aquisição, Múltiplo de Aquisição, Ponto de Entrada.**

## **Abstract**

The private equity (PE) industry has been growing in the last decades, helping to increase the number of merger and acquisition, therefore boosting the competition of industry and multiple prices in acquisition. PE firms present different features (compared to other investors) that might influence them to pay less for a target: PE investors requires greater returns due to illiquidity of the investment; there are no synergy gains in PE deals; the past experience of PE firms develops acquisition skills; and, some entrepreneurs want to receive investments from PE o make use of their know how and credibility. In a PE investment, even a successful development of a target with a good exit strategy should result in an unsuccessful deal if the PE firms pay high prices in the acquisition. For this reason, this article focuses on investigating if private equity companies have been more efficient in acquisition process than other investors.

**Keywords: Private Equity, Acquisition process, Multiple of acquisition, Entry point.**

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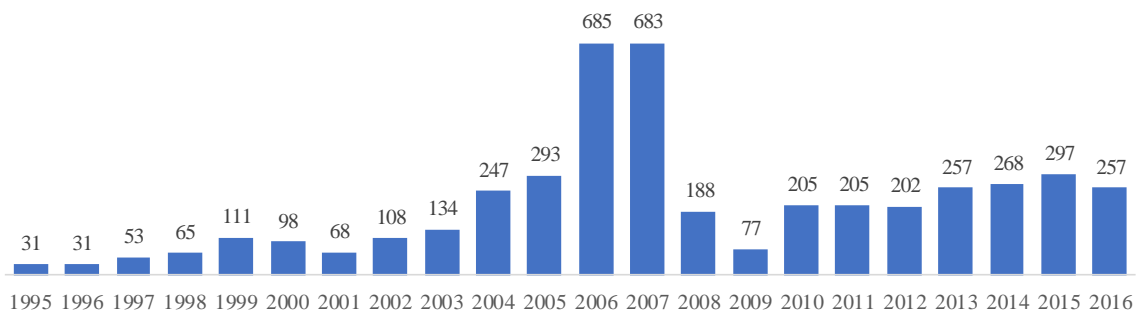
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## 1 Introduction

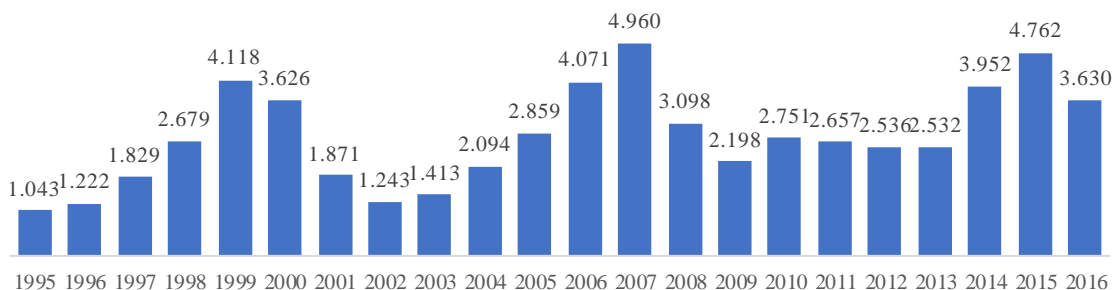
The merger and acquisition activity have been growing by 6.1% since 1995, reaching US\$ 3.6 trillion and 49,078 deals in 2016 (Figure 1). Part of this increase was driven by the Private Equity (PE) activity which increased more than 10.6% in the same period and reached US\$ 257 billion in 2016 – an increasingly participation from 3.0% in 1995 to 7.1% in 2016. According to Bain & Company, in 2016 the Private Equity investments around the world reached US\$ 257 billion (Figures 2), with a fund raising of US\$ 589 billion and total exit value of US\$ 328 billion (See figures in appendix).

**Figure 1: Global Private Equity total deal value (US\$ billion)**



Source: Bain and company

**Figure 2: Global M&A total deal value (US\$ billion)**



Source: Imma Institute

As a consequence of the increase in M&A activity (which includes PE deals), the competition to acquire a company increases and drives up the acquisition multiples. The acquisition price is an important issue for PE firms: if the company pays too much for the target, even a successful process to increase company's EBITDA and an effective exit strategy should not be enough for a successful deal. So, while there are numerous Private Equity studies that focus on the value creation and the exit process, this article concentrates in the acquisition process as an important issue for the PE investments. An analysis is made about whether Private Equity funds are capable of purchasing companies at a discount from strategic investors, expecting some skills and characteristics - as stated below - of PE firms to lead them to pay less than no PE firms.

Caselli (2010, p. 4) defines the aim of a Private Equity investment as “the provision of capital and management expertise to create value and, consequently, generate big capital gains after the deal”. In a simple way, a private equity fund buys a company, aiming to create value by developing the company and exits the company by selling it to other company or throughout an IPO. In a typical PE investment, the value creation comes from three main key drivers: (i) improvement in management and governance, which is reflected on the increase in operating revenues and the reduction of costs and expenses; (ii) the improvement in capital structure (cash generation and benefit of tax shield): PE firms use to be more intense in terms of debt leverage than strategic buyers, which are reflected in higher tax shields. Besides, the higher leverage drives to higher IRR (Internal rate of return) since it decreases the amount of equity invested; and, (iii) the Multiple Arbitrage, which is the difference between the exit multiple and the acquisition multiple (Duarte, 2017). – see figure in appendix.

PE firms performance, from the perspective of their investors (limited partners) is measured in terms of Internal Rate of Return (IRR), which is the total return of the investment considering the time effect of the cash flows. A representative portion of returns for the management of a PE

firms comes from the “carry” fee (carried interest), which is an alignment mechanism between limited partners and general partners linked with the performance of investments made by the firm. Therefore, the higher the IRR, the higher payments the management will receive (Duarte, 2017).

For this reason, in order to increase the IRR of the deal, PE firms should be able to pay lower acquisition multiples than strategic investors. There are some specific skills and features of private equity funds that should result in lower multiples. A relevant feature come from the potential synergies in non-PE deals that don't occur for PE firms. The greater the estimated value of synergy, the more the investor will be willing to pay on an acquisition and, consequently, the higher will be the acquisition multiple. On the other hand, PE companies do not have synergy gains in acquisitions reducing the potential gains. Hence, considering potential synergies it is expected that PE firms pay lower in acquisitions than strategic investors.

Another relevant factor that influences prices is the illiquidity profile of Private Equity investments. From the perspective of PE investors (limited partners), a PE investment has a lower liquidity than a large range of assets that they could invest (shares of listed companies, treasury bill, etc.). In order to compensate, investors require greater returns from Private Equity funds, pressuring PE firms to acquire companies as cheap as possible.

Moreover, the acquisition process of PE is recurrent and well structured, enhancing acquisition skills, which should be reflected in lower acquisition multiples – Track record theory. In addition, some entrepreneurs want to receive investments from private equity funds since they believe that PE resources and know-how should increase the likelihood of an IPO or the sale of the company. Thus, it creates a bargaining power for PEs that should be reflected in lower multiples.

The article studies the difference in acquisition multiple price of PE deals, when compared to non-PE deals (strategic investors) and I propose that the presence of a PE fund as an acquirer has a negative relation with the acquisition multiple price in a deal. There is a huge concentration

of PE studies in developed countries, mainly in the USA and European countries. So, I expect to contribute for literature by focusing this research on the emerging countries that compound the BRIC (Brazil, Russia, India and China).

In order to test the hypothesis, a multiple linear regression was used where the responsible variable is the multiple acquisition prices of deals (EV/EBITDA – Enterprise Value over EBITDA) and the main explanatory variable (PE) is a dummy which indicates whether at least one of the acquirers is a private equity company. I included the following control variables in the model: target's sector, a dummy that indicates whether the target company is a listed company, the log of the deal size and a variable to control the momentum of the markets. Analyses were run to investigate if different acquisition multiples have different results and I also ran the model with each country individually. As robustness check, a propensity score matching test was run as well.

The results corroborate with the expectations for the hypothesis, evidencing that PE funds buy companies at lower prices than strategic investors: according to the model, at an average discount of 2.0 in terms of EV/EBITDA. The models that consider other multiples also corroborate with the hypothesis, except for the Equity Value/Net Income, however this last multiple is affected by financial leverage. The Propensity score matching, confirm the findings, indicating a negative relation between the presence of PE as an acquirer and the multiple paid.

These findings contribute to the literature of Private Equity by focusing on the acquisition process and the ability of PE firms to buy companies at a discount. This study can derive two extensions for further research, namely the impact of the acquisition multiple in the return obtained in a deal (IRR) and the impact of to the proximity of investment period's deadline in the acquisition price.

## 2 Literature Review and Hypothesis Formulation

The industry of merger and acquisition has been growing at 6.1% per year since 1995, reaching US\$ 3.6 trillion in 2016. Despite being one of the most frequent strategies adopted by companies to grow, there are numerous studies showing evidence of a reduced success rate for M&A. A recent study in Harvard Business Review (Christensen, et al. 2013), pointed out that between 70% and 90% of M&A deals did not create value to shareholders. KPMG (1999) indicates a rate of 83% of deals that did not increase shareholder returns and Mckinsey (1990) study pointed out that only 23% of the deals got returns on capital higher than the cost of capital, while 60% obtained a lower return.

Bieshaar, Knight and van Wassenauer (2011) studied stock exchanges in America and Europe and found that more than 50% of mergers and acquisitions did not increase shareholder value. Another evidence from failure in M&A comes from studies that measure the rate of acquisitions that are reversed. According to Mitchell and Lehn (2000), 20.2% of the acquisitions made between 1982 and 1986 were divested by 1988, while Kaplan and Weisbach (1992) found that the reverse rate reached 44% of the mergers in their sample.

A relevant portion of the deals that does not create value to the shareholders is related to a high value paid by the acquirers (Kaplan and Weisbach, 1992). One of the main explanations for the high value paid is the overestimation of synergy gains by the acquirers. Synergy gains in a merge occur when the value of the companies combined are higher than the sum of the value of two companies alone. Some examples are the decrease of costs by merging departments of the two companies and the reduction of financial debt cost due to new debt structure. There is evidence that synergies are related to a positive abnormal return to a bidder in an M&A deal (Halpern, 1982)

and, as a result, synergies are among the most important reasons for companies when deciding to acquire another company. Bhide (1990) stated that operating synergies were the main motive in one-third of 77 acquisitions between 1985 and 1986.

The greater the estimated value of synergy, the more the investor will be willing to pay on an acquisition and, therefore, the higher the acquisition multiple will be. Besides, companies often overestimate the potential synergies, further increasing the purchase price. Sirower (1997) by studying the promises and failures of synergy, concludes that synergy is frequently promised but rarely completely (or partially) delivered.

Differently from mergers and acquisition of the strategic investors, Private Equity does not have synergy gains in the acquisition of a company – except for some special cases. Thus, potential gains in the investment are reduced, and it is expected that they pay lower acquisition multiple when compared to the strategic investors.

The illiquidity profile of Private Equity investments is another relevant issue to influence the difference of acquisition prices between PE and no-PE deals. From the viewpoint of Private Equity investors, a PE investment is more illiquid when compared to a large range of assets that they could invest – shares of listed companies, treasury bonds, money market funds, mutual funds, etc. – Since it is more difficult to sell the fund shares at a fair value. In order to compensate the lack of liquidity, investors require an illiquidity premium, reflecting higher required returns from Private Equity funds, and consequently, a pressure to acquire companies as cheap as possible.

Moreover, some authors found evidence that the experience and the repetition of PE investment cycle result in benefits for the next deals. Minardi, Bortoluzzo and Moreira (2017) found evidence that funds with more deals reduce their likelihood of having total loss, benefitted by learning how to select better deals and increase the network to access better deals. Also, Humphery-Jenner (2013) argues that PE funds benefits from knowledge sharing and learning from

its previous funds, by studying the diversification of funds. In the same way, since the acquisition is a recurrent and structured process in PE companies, I expect benefits from the previous acquisitions. The experience in closing deals results in higher negotiation skills and shorter period for the acquisition to be concluded – track record of acquisition process. As a consequence, it is expected to result in lower acquisition prices.

Additionally, some entrepreneurs wish to receive investment from PE funds to make use of their expertise and network, creating a bargain power for those funds. Being backed by a PE firm should represent a sign of quality to the market (Carter & Manaster, 1990; Stuart, Hoang, & Hybels, 1999) and it is expected to increase the likelihood of the entrepreneurial exit, through IPO (Initial Public Offer) or being acquired (Ragozzino and Blevins, 2016). Due to this bargain power theory, I expect that PE funds should be able to pay lower acquisition multiples than strategic investors.

Thus, considering the lack of potential gains with synergy, the pressure from investors to pay less (illiquidity profile), the track record in acquisition process, and the preference of companies to be acquired by PE firms, I expect a negative relation between the deals of PE firms and the acquisition multiple price.

**Hypothesis: The acquisition multiples paid by PE firms are lower than the multiples paid by other classes of acquirers.**

A relevant factor that could influence acquisition multiple is the momentum of the economy. According to Gompers and Lerner (2000) and Axelson, et al. (2013), in periods of expansion of economy, investments are often executed at high valuations (higher acquisition multiples). In order to control by this effect, I included in the model the price earnings from the country's stock market of the target company at the year that the deal happened.

As previously commented, the illiquidity of Private Equity investment makes the investor pressure the PE fund to pay less in acquisition. However, in some cases, PE firms buy companies that have already been listed in the stock market, which greatly increases the liquidity of investments, and therefore should increase the acquisition multiple. Thus, a control variable has been included, indicating whether the target company is listed on the stock exchange or not.

Besides that, there is evidence that the size of the deal might influence acquisition prices. According to Lopez-de-Silanes, et al. (2011), larger deals generally perform more poorly in comparison to smaller deals. A possible explanation is the higher bargain power of large companies in the acquisition process, which is expected to result in higher acquisition multiple. Therefore, the log of the size of the deal has been included as a control variable.

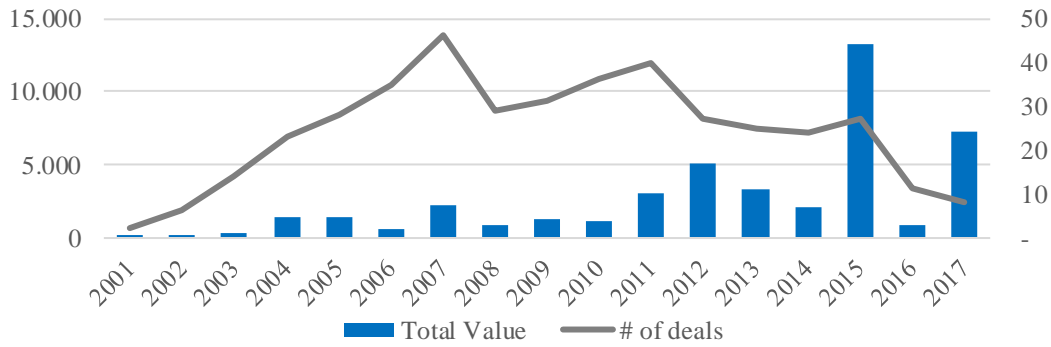
### **3 Database and descriptive analysis**

I collected the data from Bloomberg's M&A deals section. I found 51,365 M&A deals in BRIC (Brazil, Russia, India and China) countries between 1990 and 2017: 7,088 PE and 44,277 Non-PE. Excluding the deals without information of EV/EBITDA, outliers and the deals before 2000 since there are none or few PE deals, the final sample drops to a total of 1,881: 199 PE and 1,682 non-PE deals.

Figure 3 shows the number of deals and the total value per year of PE deals, while Figure 4 shows a comparison between the average ticket size per year between deals with and without PE funds. Private equity deals represent 11% of the sample, with an average ticket of 208 million dollars, lower than non-PE deals (396 million dollars), with statistically significant difference.

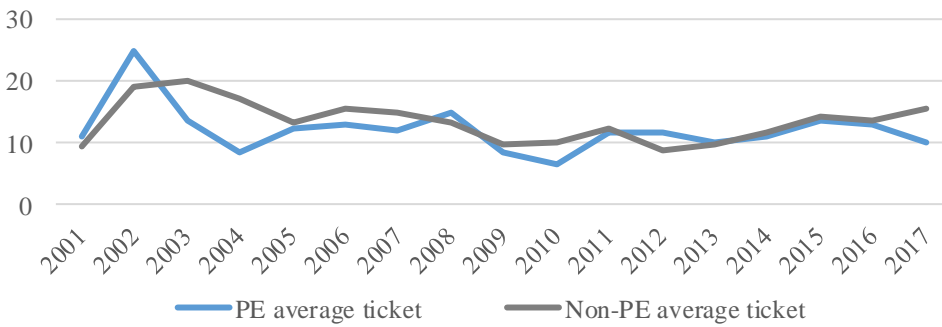
Tables 1 and 2 show the number of deals and the average ticket size split per year and country of the sample. The PE sample is compound by 110 deals in India, 76 in China, 11 in Brazil and only 2 in Russia.

**Figure 3: PE deals sample: Total Value (in US\$ millions) and number of deals**



Source: Bloomberg

**Figure 4: Average ticket of PE and Non-PE deals in the sample (in US\$ thousand)**



Source: Bloomberg

**Table 1: Number of deals**

	Total			Brazil			Russia			India			China		
	PE	Others	%*	PE	Others	%*	PE	Others	%*	PE	Others	%*	PE	Others	%*
2000	0	31	0%	0	17	0%	0	0	n.a	0	11	0%	0	3	0%
2001	1	45	2%	0	3	0%	0	1	0%	1	37	3%	0	4	0%
2002	1	88	1%	0	7	0%	0	0	n.a	1	39	3%	0	42	0%
2003	10	103	9%	0	12	0%	0	1	0%	6	19	24%	4	71	5%
2004	12	140	8%	1	19	5%	0	1	0%	9	27	25%	2	93	2%
2005	12	143	8%	0	13	0%	0	6	0%	7	42	14%	5	82	6%
2006	18	141	11%	0	10	0%	0	3	0%	10	33	23%	8	95	8%
2007	24	138	15%	0	10	0%	0	17	0%	16	52	24%	8	59	12%
2008	10	123	8%	2	19	10%	0	24	0%	6	47	11%	2	33	6%
2009	10	94	10%	0	26	0%	0	3	0%	4	37	10%	6	28	18%
2010	8	77	9%	2	17	11%	0	16	0%	6	26	19%	0	18	0%
2011	20	81	20%	1	7	13%	0	9	0%	9	32	22%	10	33	23%
2012	17	91	16%	0	6	0%	1	16	6%	10	35	22%	6	34	15%
2013	15	98	13%	1	9	10%	0	9	0%	7	40	15%	7	40	15%
2014	10	81	11%	1	19	5%	0	1	0%	4	34	11%	5	27	16%
2015	19	110	15%	3	15	17%	1	4	20%	7	26	21%	8	65	11%
2016	5	71	7%	0	4	0%	0	9	0%	2	11	15%	3	47	6%
2017	7	27	21%	0	0	n.a	0	1	0%	5	7	42%	2	19	10%
<b>Total</b>	<b>199</b>	<b>1,682</b>	<b>11%</b>	<b>11</b>	<b>213</b>	<b>5%</b>	<b>2</b>	<b>121</b>	<b>2%</b>	<b>110</b>	<b>555</b>	<b>17%</b>	<b>76</b>	<b>793</b>	<b>9%</b>

\* PE/Total

Source: Bloomberg

**Table 2: Average ticket size (in US\$ millions)**

	Total			Brazil			Russia			India			China		
	PE	Other	%*	PE	Other	%*	PE	Other	%*	PE	Other	%*	PE	Other	%*
2000	--	584	n.a	--	1015	n.a	--	--	n.a	--	75	n.a	--	11	n.a
2001	35	48	-28%	--	240	n.a	--	657	n.a	35	18	93%	--	27	n.a
2002	38	50	-24%	--	96	n.a	--	--	n.a	38	78	-51%	--	16	n.a
2003	27	137	-80%	--	123	n.a	--	10520	n.a	24	41	-41%	32	18	76%
2004	110	109	1%	84	347	142%	--	1988	n.a	50	53	-6%	14	56	-74%
2005	112	233	-52%	--	322	n.a	--	3591	n.a	11	90	27%	109	41	163
2006	28	195	-86%	--	1061	n.a	--	1047	n.a	24	156	-85%	33	90	-63%
2007	90	320	-72%	--	738	n.a	--	1497	n.a	10	80	26%	70	141	-50%
2008	84	531	-84%	13	496	-73%	--	522	n.a	55	167	-67%	122	1095	-89%
2009	123	360	-66%	--	851	n.a	--	498	n.a	75	53	43%	155	297	-48%
2010	139	681	-80%	46	829	-43%	--	1776	n.a	29	220	-87%	--	207	n.a
2011	147	702	-79%	49	4164	-88%	--	1742	n.a	66	142	-54%	187	212	-12%
2012	297	650	-54%	--	1866	n.a	62	1232	-49%	53	551	-90%	650	262	148
2013	218	365	-40%	16	708	-77%	--	1184	n.a	10	184	-43%	338	280	21%
2014	203	414	-51%	44	264	68%	--	220	n.a	8	199	-96%	310	790	-61%
2015	695	565	23%	57	683	-16%	15	2193	-93%	89	110	-19%	133	620	116
2016	160	760	-79%	--	1756	n.a	--	2376	n.a	19	63	216%	133	529	-75%
2017	102	429	140%	--	--	n.a	--	947	n.a	29	60	391%	286	538	433
<b>Total</b>	<b>208</b>	<b>396</b>	<b>-48%</b>	<b>44</b>	<b>915</b>	<b>-51%</b>	<b>38</b>	<b>1999</b>	<b>-81%</b>	<b>80</b>	<b>130</b>	<b>-38%</b>	<b>454</b>	<b>291</b>	<b>56%</b>

\* % Discount/Premium

Source: Bloomberg

For the hypothesis, the responsible variable will be the multiple acquisition price of the deals, and the analysis will consider **EV/EBITDA** (enterprise value over the target's earnings

before interest, taxes, depreciation and amortization) as a proxy since it is largely adopted to measure the price of deals. The multiple is calculated considering the enterprise value (equity plus net debt) of the date that the deal was completed divided by the EBITDA of the last 12 months released before the deal was completed. The average multiple for PE deals is 12.2x, a discount of 10% when compared to no-PE deals (13.5x). In the table 3, it is possible to see the average multiple of EV/EBITDA segment by PE and no-PE deal, year and country.

**Table 3: Average EV/EBITDA**

Year	Total			Brazil			Russia			India			China		
	PE	Others	%*	PE	Others	%*	PE	Others	%*	PE	Others	%*	PE	Others	%*
2000	--	8.5	n.a	--	6.6	n.a	--	--	n.a	--	11.2	n.a	--	9.8	n.a
2001	11.0	9.5	15%	--	4.6	n.a	--	1.7	n.a	11.0	8.7	25%	--	22.0	n.a
2002	24.8	19.1	30%	--	6.5	n.a	--	--	n.a	24.8	10.4	139%	--	29.2	n.a
2003	13.6	20.2	-32%	--	7.3	n.a	--	6.7	n.a	5.4	10.8	-50%	25.9	25.1	3%
2004	8.4	17.2	-51%	7.1	4.7	51%	--	3.9	n.a	7.1	10.4	-31%	14.8	21.9	-32%
2005	12.4	13.5	-8%	--	5.2	n.a	--	4.9	n.a	11.8	11.5	2%	13.2	16.4	-19%
2006	13.0	15.7	-17%	--	4.4	n.a	--	8.3	n.a	10.2	14.1	-28%	16.6	17.6	-6%
2007	12.1	14.9	-19%	--	8.8	n.a	--	18.3	n.a	13.1	10.8	21%	10.1	18.6	-46%
2008	14.8	13.3	11%	25.6	8.6	198%	--	13.9	n.a	12.2	11.3	8%	12.1	18.6	-35%
2009	8.4	9.9	-16%	--	10.1	n.a	--	3.0	n.a	8.9	9.8	-9%	8.0	10.6	-24%
2010	6.5	10.2	-36%	8.3	8.9	-7%	--	7.6	n.a	5.9	10.4	-43%	--	13.6	n.a
2011	11.6	12.4	-6%	21.6	8.6	151%	--	13.0	n.a	9.1	11.3	-20%	12.9	14.1	-8%
2012	11.6	8.7	34%	--	12.0	n.a	7.6	5.2	46%	10.9	8.5	27%	13.6	9.9	37%
2013	10.2	9.8	3%	4.0	12.6	-69%	--	8.7	n.a	6.5	10.2	-37%	14.8	9.1	62%
2014	11.2	11.6	-4%	14.8	8.6	72%	--	7.9	n.a	11.2	9.5	17%	10.5	16.6	-37%
2015	13.6	14.4	-6%	13.9	7.3	89%	2.3	6.7	-65%	10.0	14.9	-33%	18.0	16.3	11%
2016	13.0	13.6	-4%	--	8.9	n.a	--	8.1	n.a	12.2	14.2	-14%	13.6	14.9	-9%
2017	10.2	15.5	-34%	--	--	n.a	--	5.9	n.a	12.1	12.8	-6%	5.7	16.9	-66%
<b>Total</b>	<b>12.2</b>	<b>13.5</b>	<b>-10%</b>	<b>13.6</b>	<b>7.9</b>	<b>71%</b>	<b>5.0</b>	<b>7.7</b>	<b>-36%</b>	<b>10.7</b>	<b>11.2</b>	<b>-4%</b>	<b>13.6</b>	<b>17.1</b>	<b>-21%</b>

\* % Discount/Premium

Source: Bloomberg

I replicate the hypothesis using three different proxies for acquisition multiple: EV/EBIT, EV/Net Revenues, and Equity Value/Net Income, where EV is the enterprise value of the company. Table 4 summarizes data of the average of these multiples divided by PE and no-PE deals.

**Table 4: Average EV/EBIT, EV/Net Revenues, and Equity Value/Net Income**

	PE	Non-PE	Diference
<b>EV/EBIT</b>	14.6	17.4	-2.7***
<b>EV/Net Revenues</b>	3.0	4.4	-1.4***
<b>Equity Value/Net Income</b>	16.4	14.1	2.3

t test: \*p<0.1, \*\*p<0.05, \*\*\*p<0.01

Source: Bloomberg

The independent variable (or the interest variable) of the regression is **PE**, a dummy variable that indicates whether there is at least one PE firm between the acquirers of a deal (dummy =1), or not (dummy =0). Table 5 contain information of the number of deals, the average size of deals and the acquisition multiple segmented by the presence of PE or not.

**Table 5: Number of deals, average size of the deal (US\$ million) and acquisition multiple**

	PE	Non-PE	Diference
<b># deals</b>	199	1,682	n.a.
<b>Average ticket size</b>	208	396	-188*
<b>Acquisition multiple</b>	12.2	13.5	-1.3***

t test: \*p<0.1, \*\*p<0.05, \*\*\*p<0.01

Source: Bloomberg

The main control variables will be:

- **SECTOR DUMMIES** – a set of dummies variables to the following industrial sectors: Basic Materials, Communications, Consumer-Cyclical, Consumer-Non-cyclical, Financial, Industrial, UET (Utilities, Energy and Technology) and Others (as the base scenario).
- **LISTED** – a dummy variable that indicates if the target company was a public company at the moment of the acquisition (dummy =1), or not (dummy =0). Given the higher liquidity of listed companies, it is expected that they have higher acquisition multiples when compared to non-listed companies. I expect a positive relation between Listed companies and acquisition multiple.
- **LOG DEAL SIZE** – it represents the log of the size of the deal in terms of announced total value. It is expected that small companies are more susceptible to fail and have lower bargain

power, resulting in lower multiple of acquisition. Thus, I expect a positive relation between the log of deal size and the multiple of acquisition price.

- **MARKET PE** – the price earnings of the country stock market corresponding to the country of the target company. This variable controls the momentum of each country during the acquisition, using the stock market as a proxy. I consider the IBOVESPA index as the proxy for the Brazilian stock market, the RTS index for Russia, the NIFTY 50 index for India and SSE composite index for China. I expect a positive relation between the Market PE and the acquisition multiple, since in moments that the market is very active it is expected that the stock market and the acquisition multiple are higher and, when the market is in recession, both figures are expected to be lower.
- **COUNTRY** – a set of dummy variables to control prices for each country. Considering China as the base scenario, the dummy variable indicates whether the target company belongs (dummy =1), or not (dummy =0) to each of the other countries: Brazil, Russia and India. This variable will also be used in the alternative model, where it is expected that the negative relation between acquisition price and PE firms is sustained in each country.

Table 6 compares the control variables between PE deals and non-PE deals, individualized by country. In general, the acquisition multiples in China are higher than in other countries, while in Brazil, the average multiple for PE deals are higher than non-PE deals. In the other three countries, PE deals are lower than non-PE.

**Table 6: Average EV/EBITDA of control variables**

Variables	Total			Brazil			Russia			India			China		
	PE	Other	Var.	PE	Other	Var.	PE	Other	Var.	PE	Other	Var.	PE	Other	Var.
<b>Log Deal Size</b>	11.7	13.7	-2.0	14.3	7.9	6.4	5.0	10.2	-5.2	10.0	10.8	-0.7	13.8	17.8	-4.0
<b>Listed</b>	13.5	16.7	-3.2	20.9	10.0	11.0	n.a.	10.5	n.a.	10.5	12.0	-1.6	14.4	18.0	-3.7
<b>Non-Listed</b>	9.4	10.0	-0.6	6.3	7.1	-0.8	5.0	10.2	-5.2	9.9	10.6	-0.7	7.2	13.6	-6.4
<b>Basic Materials</b>	9.8	11.7	-1.9	n.a.	7.5	n.a.	n.a.	10.7	n.a.	8.4	8.8	-0.4	11.8	16.7	-4.9
<b>Communications</b>	14.3	7.9	6.4	14.3	7.9	6.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>Consumer</b>															
<b>(Cyclical)</b>	14.9	12.0	2.9	n.a.	5.1	n.a.	n.a.	7.4	n.a.	18.3	14.4	3.9	13.7	21.1	-7.4
<b>Consumer</b>															
<b>(No Cyclical)</b>	10.3	15.1	-4.8	11.8	11.6	0.2	n.a.	4.6	n.a.	9.0	11.5	-2.4	12.5	17.7	-5.2
<b>Others</b>	14.9	14.2	0.8	18.0	9.0	9.0	n.a.	9.9	n.a.	14.4	12.3	2.2	14.7	17.2	-2.5
<b>Financial</b>	12.3	24.8	-12.6	4.0	6.3	-2.4	n.a.	n.a.	n.a.	4.5	20.1	-15.6	28.3	26.1	2.3
<b>Industrial</b>	10.6	15.0	-4.3	25.9	14.1	11.8	n.a.	16.3	n.a.	9.0	9.6	-0.6	8.2	17.9	-9.8
<b>UET</b>	12.1	14.3	-2.2	n.a.	5.7	n.a.	n.a.	8.6	n.a.	10.2	10.6	-0.4	14.6	18.4	-3.9

Source: Bloomberg

## 4 Methodology

Equation (1) shows the multiple linear regression model adopted in the analysis.

$$EVEBITDA_i = \beta_0 + \beta_1 PE_i + \sum_{j=2}^n \beta_j x_{ji} + \varepsilon_i \quad (1)$$

Where:

$EVEBITDA_i$  is the acquisition multiple for the deal  $i$ ;

$PE_i$  indicates the presence (or not) of Private equity firm in the deal  $i$ ;

$x_{ij}$  is a set of control variables  $j$  for the deal  $i$ ;

$\varepsilon_i$  is the random error.

The null hypothesis ( $H_0: \beta_1 = 0$ ) implies in a statistically insignificant difference between the acquisition multiples of Private Equity deals and non-private equity deals; the alternative hypothesis ( $H_1: \beta_1 \neq 0$ ) implies that there is a statistical difference in acquisition of PE deals.

Model 1 shows the results of the regression that does not include any control variable; model 2 controls for sector dummies variables; model 3 includes the listed dummy; model 4 considers the ln (deal's size); model 5 includes country dummies, model 6 uses the momentum variable (Market PE); and, finally, model 7 includes all control variables simultaneously. In order to avoid the homoscedasticity error, I ran the regressions using robust standard errors.

## 5 Results

Table 7 shows the univariate linear regression results. I observe a negative relation between the acquisition prices of deals and the presence of PE firms as an investor. The results are statistically significant at 10% level and, in average, PE firms buy companies at 2.1 discount (in terms of EV/EBITDA) when compared to other investors.

**Table 7: Results of model 1**

EVEBITDA	Coef.	Robust Std. Err.	T	P>t	[95% Conf.	Interval]
PE	-2.06	0.63	-3.29	0.00	-3.29	-0.83
Cons	13.72	0.26	52.31	0.00	13.21	14.23

Source: Blomberg and Rodrigo Olivares

Table 8 contains the multiple regression models results considering the control variables. The models confirm the significant negative correlation between the PE dummy and EV/EBITDA in all models.

**Table 8: Results of Hypothesis using control variables**

	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
<b>PE</b>	-2.290*** (-3.58)	-2.061*** (-3.38)	-1.937** (-3.04)	-1.723** (-2.68)	-1.824** (-2.88)	-1.541* (-2.39)
<b>Basic Materials</b>	-12.23*** (-5.78)					-7.258*** (-3.63)
<b>Communications</b>	-11.36*** (-4.97)					-5.737** (-2.68)
<b>Consumer(Cyclical)</b>	-9.179*** (-4.33)					-6.287** (-3.17)
<b>Consumer(No Cyclic~)</b>	-9.480*** (-4.50)					-5.379** (-2.71)
<b>Financial</b>	-9.272*** (-4.19)					-5.986** (-2.89)
<b>Industrial</b>	-9.628*** (-4.55)					-6.212** (-3.12)
<b>UET</b>	-11.81*** (-5.55)					-6.857*** (-3.39)
<b>LISTED</b>		6.475*** (14,48)				2.073*** (3,52)
<b>Log Deal Size</b>			-0.773*** (-6.65)			-0.401** (-3.17)
<b>Brazil</b>				-9.331*** (-15.62)		-5.925*** (-7.27)
<b>Russia</b>				-7.471*** (-7.57)		-0,462 (-0.38)
<b>India</b>				-6.581*** (-13.01)		-3.737*** (-5.63)
<b>MARKET PE</b>					0.359*** (12,06)	0.223*** (6,84)
<b>Constant</b>	23.93*** (11,75)	10.11*** (34,51)	16.63*** (29,95)	17.61*** (44,16)	6.739*** (11,51)	17.93*** (8,18)
<b>Observations</b>	1881	1881	1872	1881	1881	1872
<b>R-squared</b>	0,034	0,097	0,028	0,129	0,093	0,185

t statistics in parentheses  
\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Source: Blomberg and Rodrigo Olivares

These results corroborate the hypothesis proposed: PE firms acquire companies at lower prices than other investors. This should be an evidence that the experience in older acquisition processes increases negotiation skills (track record theory), investor pressures PE firms due to the low liquidity, the lack of potential synergy influences PE to pay less and/or companies are more willing to receive investments from PE firms (bargain power theory).

I also found a positive relation between acquisition multiple with listed companies and the Market PE, as expected. On the other hand, the relation between multiple and log size is negative, likely reflecting higher potential growth of smaller companies that allows private equity funds to pay more in the acquisition.

Table 9 contains the results using other proxies for acquisition multiple: EV/EBIT, EV/Net Revenues and Equity Value/Net Income. Using the EV/EBIT (Model 8) and the EV/Net Revenues (Model 9), I found a negative and statistically significant relation between acquisition prices and the presence of PE funds as an acquirer, which corroborate with the hypothesis formulated. However, for Equity Value/Net Income (Model 10) the figures are not statistically significant and positive. Net Income is affected by the financial leverage, and once PE deals tend to have a higher leverage than other deals, this multiple is positively affected and more than compensates the lower price paid in the acquisition.

Overall, the results were satisfactory and corroborate with the hypothesis: PE firm performed acquisition at lower multiple prices than non-PE firms.

**Table 9: Results considering other variables**

	<b>Model 8</b> <b>EV/EBIT</b>	<b>Model 9</b> <b>EV/Net Revenues</b>	<b>Model 10</b> <b>Equity Value/Net Income</b>
<b>PE</b>	-2.480** (-3.25)	-1.131*** (-3.83)	0,264 (0,33)
<b>Basic Materials</b>	-8.108** (-3.05)	-2.844* (-2.45)	-2,559 (-1.43)
<b>Communications</b>	-6.499* (-2.35)	-2.331* (-1.99)	-0,302 (-0.15)
<b>Consumer(Cyclical)</b>	-4,811 (-1.82)	-2.856* (-2.44)	-0,105 (-0.06)
<b>Consumer(No Cyclic~)</b>	-5.482* (-2.07)	-1,922 (-1.65)	1,078 (0,61)
<b>Financial</b>	-5,245 (-1.89)	0,856 (0,68)	-2,674 (-1.45)
<b>Industrial</b>	-6.260* (-2.37)	-2.381* (-2.05)	-1,031 (-0.59)
<b>UET</b>	-7.795** (-2.93)	-1,911 (-1.63)	-1,387 (-0.77)
<b>LISTED</b>	2.229** (3,18)	1.392*** (4,00)	1.983* (2,52)
<b>Log Size</b>	0,00124 (0,01)	-0,0237 (-0.37)	1.402*** (11,08)
<b>Brazil</b>	-6.766*** (-7.82)	-2.296*** (-7.12)	0,717 (0,65)
<b>Russia</b>	-4.260*** (-3.42)	-0,746 (-1.49)	-3.597** (-2.67)
<b>India</b>	-5.705*** (-7.40)	-1.253** (-3.09)	2.253** (2,69)
<b>MARKET PE</b>	0.192*** (5,43)	0.0832*** (4,87)	0,0556 (1,79)
<b>Constant</b>	21.73*** (7,71)	4.573*** (3,65)	7.859*** (3,90)
<b>Observations</b>	1830	3068	2116
<b>R-squared</b>	0,191	0,101	0,075

t statistics in parentheses

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Source: Blomberg and Rodrigo Olivares

I run the analysis for each country individually: Brazil, Russia, India and China. Table 10 provides the results of hypothesis proposed for each country. The regression for Russia (Model 12) and China (Model 14) resulted in a negative as well as statistically significant relation between acquisition price (EV/EBITDA) and deals with the presence of PE firms, while the results for India (Model 13) indicate a negative relation however not statistically significant and, finally, the figures for Brazil (Model 11), present a positive coefficient without a statistically significant relation.

**Table 10: Results considering each country alone**

	<b>Model 11 Brazil</b>	<b>Model 12 Russia</b>	<b>Model 13 India</b>	<b>Model 14 China</b>
<b>PE</b>	6,389 (1.80)	-5.235* (-2.51)	-0,835 (-1.20)	-4.021*** (-3.58)
<b>Constant</b>	7.882*** (18.95)	10.20*** (11.03)	10.88*** (30.13)	17.81*** (42.97)
<b>Observations</b>	224	123	665	869
<b>R-squared</b>	0,044	0,004	0,001	0,01

t statistics in parentheses

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Source: Blomberg and Rodrigo Olivares

## 6 Robustness Check

In order to check the efficiency and consistency of the hypothesis results, a Propensity Score Matching (PSM) test was run as a robustness check. While the original model (multiple linear regression) compares deals with and without the presence of Private Equity as an acquirer considering all the sample, in the PSM test each deal in treatment group (deals with the presence of a PE as an acquirer) were matched with deals in control group (no presence of PE) with similar observable characteristics. PSM attempts to decrease potential bias that could exist in the simple comparison between the group that received investment from a PE and the others that did not. I consider as the observable characteristics some control variables of the original model: Log Size, Listed, and Sector Dummies.

In the analysis it is possible to obtain the average treatment effect on the treated (ATT), which corresponds to the difference between the deals that were acquired by a Private Equity in comparison to their correspondent matches (without the presence of PE). In the test, ATT points out to a 2.3 lower EV/EBITDA for deals of PE when comparing to non-PE with similar

characteristics, being the results statistically significant at 10% level. Thus, PSM reinforces the hypothesis proposed, meaning that PE firms use to buy companies at lower price than other investors. (see table 11)

**Table 11: Results of Propensity score matching**

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
EVEBITDA	Unmatched	11,660	13,733	-2,073	0,788	-2,630
	ATT	11,660	13,964	-2,304	1,014	-2,270

Source: Blomberg and Rodrigo Olivares

## 7 Conclusion

Being the acquisition process as important as the company development (increase in EBITDA) and the exit strategy in a PE deal, I examined the acquisition process in the universe of Private Equity funds. The hypothesis formulated analyzes whether PE funds buy companies at low acquisition multiples than other investors.

The results have pointed out a negative relative between multiple price (EV/EBITDA) and the presence of a PE firm as an acquirer, confirming the hypothesis that PE firms buy companies at lower multiple prices than non-PE firms. The outcomes hold even after including control variables and after running alternative models (using other type of multiples and analyzing the countries alone) and a propensity score matching as a robustness check. Consequently, the results indicate the existence of relevant characteristics of PE firms such as: (i) Since the acquisition process in a PE firm is recurrent and structured, it creates a track record to find good deals and improve negotiation skills, reflecting in lower acquisition prices; (ii) Investors require a premium to compensate the low liquidity, pressuring PE funds to buy as cheap as possible; (iii) Strategic

investors pay more for an acquisition since they consider the potential gains from synergies; and, (iv) There is evidence that some entrepreneurs want to receive investments from PE firms as a signal of quality to the market and increase the likelihood of a future exit (Carter & Manaster, 1990; Stuart, Hoang, & Hybels, 1999; Ragozzino and Blevins, 2016), which creates a bargain power for PE.

These findings contribute to the literature of Private Equity by focusing on the acquisition process and the ability of PE firms to buy companies at a discount. This study can derive two extensions for further research related to the acquisition process, such as: (i) The impact of the acquisition multiple in the return obtained in a deal (IRR) – how it influences the success of the deal and how paying less in the acquisition increase the return ; and, (ii) How the proximity of the investment period deadline (usually the third or the fourth year after the foundation of the fund) pressures the PE firms to do an acquisition, reflecting in higher acquisition multiple.

## 8 References

**Bain & Company, Inc.** 2017. Global Private Equity Report 2017. Available at <http://www.bain.com/publications/articles/global-private-equity-report-2017.aspx>

**Bhide, Amar.** 1990. “Reversing Corporate Diversification.” *Journal of Applied Corporate Finance*, 3(2): 70-81.

**Bieshaar, Hans, Jeremy Knight and Alexander Van Wassenauer.** 2011. “Deals that create value.” *McKinsey Quarterly*, No1, pp 64-73.

**Carter, Richard and Steven Manaster.** 1990. “Initial public offerings and underwriter reputation.” *Journal of Finance*, 45: 1045–1067.

**Caselli, Stefano.** 2010. “Private equity and venture capital in Europe: markets, techniques, and deals”. Amsterdam: Elsevier/Academic Press.

**Christensen, Clayton M., Richard Alton, Curtis Rising, and Andrew Waldeck.** 2011. “The Big Idea: The New M&A Playbook”. *Harvard Business Review*, March 2011.

**Duarte, Luís M.** 2017. “Private Equity classes”. Lecture presented at the Master Degree of Economics in Nova Lisboa University.

**Gompers, Paul and Josh Lerner.** 2000. “Money chasing deals? The impact of fund inflows on private equity valuations”. *Journal of Financial Economics*, 55: 281-325.

**Halpern, Paul.** 1982. “Corporate Acquisitions: A Theory of Special Cases?” *The Journal of Finance*, 37 (2): 297-317.

**Humphery-Jenner, Mark.** 2013. “Diversification in Private Equity Funds: On Knowledge Sharing, Risk Aversion, and Limited Attention”. *Journal of Financial and Quantitative Analysis*, 48 (5), 1545–1572.

**Institute of Mergers, Acquisitions and Alliances (IMAA).** 1995-2016. "M&A Statistics – Number and Value and Largest M&A Transactions by Region. Available at: <https://imaa-institute.org/mergers-and-acquisitions-statistics/> (accessed September 18, 2017).

**Kaplan, Steven N. and Michael S. Weisbach.** 1992. “The Success of Acquisitions: The Evidence from Divestitures.” *Journal of Finance*, 47: 107-138.

**KPMG.** 1999. “Unlocking Shareholder Value: The Keys to Success”. KPMG Global Research Report. <http://people.stern.nyu.edu/adamodar/pdfiles/eqnotes/KPMGM&A.pdf>

**Lopez-De-Silanes, Florencio, Ludovic Phalippou and Oliver Gottschalg.** 2011. “Giants at the gate: On the cross-section of private equity investment returns”. Discussion Paper no. 20000. Tinbergen Institute.

**Mckinsey.** 1990. Study cited by: NORTON, Leslie. .1988. “Merger Mayhem”. Barron’s, April 20,1998 (p.33).

**Minardi, Andrea M. A. F., Adriana B. Bortoluzzo and Lucas A. MOREIRA.** 2017. “The Impact of Private Equity and Venture Capital Growth on Performance”. Available at SSRN: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2894543](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2894543)

**Mitchell, Mark L. and Kenneth Lehn.** 1990. “Do Bad Bidders make Good Targets?” Journal of Applied Corporate Finance, 3: 60-69.

**Ragozzino, Roberto and Dane P. Blevins.** 2016. Venture-Backed Firms: How Does Venture Capital Involvement Affect Their Likelihood of Going Public or Being Acquired? Available at SSRN: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2422344](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2422344)

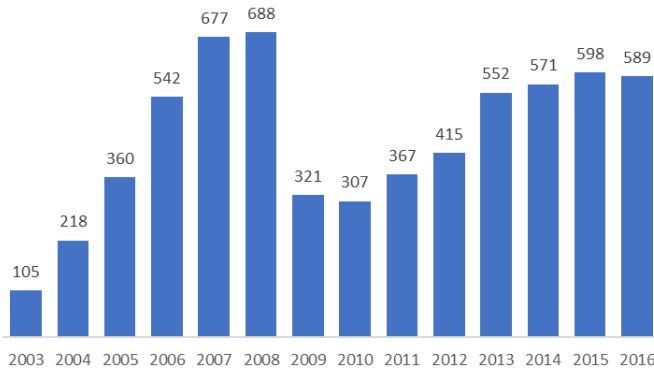
**Sirower, Mark L.** 1997. “The Synergy Trap: How companies lose the acquisition game.” New York: The Free Press.

**Stuart, Toby E., Ha Hoang and Ralph C. Hybels.** 1999. “Interorganizational endorsements and the performance of entrepreneurial ventures.” Administrative Science Quarterly, 44: 315–34.

**Strömberg, Per; Ulf Axelson, Tim Jenkinson, and Michael S. Weisbach.** 2013. “Borrow cheap, buy high? Determinants of leverage and pricing in buyouts”. The Journal of Finance, 68: 2223-2267.

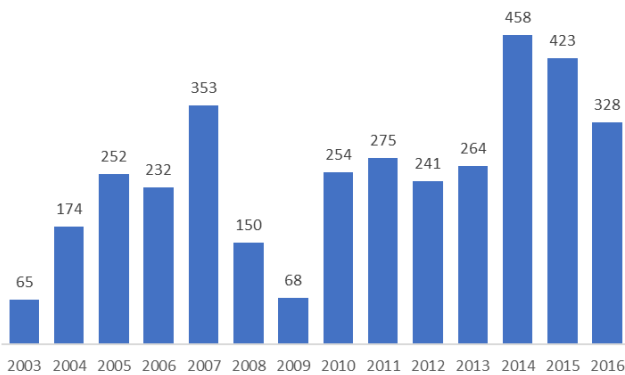
## APPENDIX

**Figure 5: Global Private Equity capital raised (US\$ billion)**



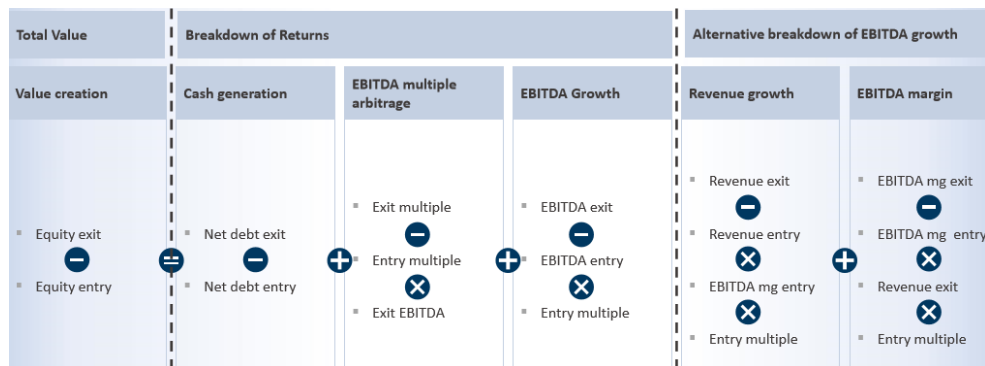
Source: Bain and company

**Figure 6: Value of global exits (US\$ billion)**



Source: Bain and company

**Figure 7: Value creation in a Private Equity deal**



Source: Duarte (2017) - Private Equity classes