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The Certifying Role of Private Equity and Venture Capital Funds in the Quality of Companies Newcomers on BM&FBovespa

Abstract

This study verified, from the perspective of the signaling theory, the certifying role of Private Equity and Venture Capital funds in the quality of companies that are newcomers on BM&FBovespa (IPOs). Therefore, an event study was proposed to verify the existence of cumulative abnormal returns (proxy for IPO quality) in investments portfolios of stocks from the IPOs launched on BM&FBovespa between January 2004 and December 2007. The research hypotheses were verified by means of three distinct procedures: test of means, CAPM and CAR regressions. It was verified that companies that received contributions from Private Equity and Venture Capital showed statistically higher mean cumulative abnormal returns than companies without investments. The regression results indicate that, the greater the participation of PE/VC funds, the better the IPOs' long-term performance. The evidence found suggest that the presence of PE/VC funds in the companies that were newcomers on BM&FBovespa has a positive effect on the cumulative abnormal returns of the IPOs.

Key words: Investments; Private equity; Venture capital; Bovespa; Initial public offering.

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1. Introduction

In the last ten years, more than one hundred companies made their entry on the Brazilian stock exchange (IPOs), totaling more than R$130 billion of new funds raised. In that context, the increase in the number of individual investors in the stock exchange stands out, also known as small investors. Between 2004 and 2012, the number increased from about 117 thousand to 587 thousand, according to the balance of operations in December/2012, disseminated by the São Paulo Stock Exchange [BM&FBovespa] (2013). These investors' savings are invested in listed as well as new companies (IPOs), aiming to obtain gains through profit distribution (dividends and interests on own capital) or through the valuation of the invested capital.

Studies (Ritter & Welch, 2002; Silva & Famá, 2011) found evidence that the long-term return of newcomers on the stock exchange is inferior to that of similar previously listed companies. This anomaly, called long-run underperformance, is associated with variables like: earnings management in periods pre-IPO (Teoh, Welch, & Wong, 1998); excess confidence of investors in favorable economic periods (Ritter & Welch, 2002); opportunism of controllers and financial advisors to launch IPOs at times of market optimism (Daniel, Hirshleifer, & Subrahmanyam, 1998); and information asymmetry in IPO processes (Ritter, 2003).

Studies to explain the performance of IPOs from the perspective of the Signaling theory can contribute to the investigation of this phenomenon (Certo, 2003). According to Spence (1973), the Signaling theory deals with information asymmetry problems in the markets and attempts to evidence how this asymmetry can be reduced through the signaling of further information. Thus, in the context of IPOs, studies demonstrate that the underwriters and auditors' reputation (Carter, Dark, & Singh, 1998) and the presence of private equity and venture capital funds (Megginson & Weiss, 1991; Brav & Gompers, 1997; Minardi, Ferrari, & Tavares, 2013) serve as signals to certify the quality of the issuing company, thus improving the IPO performance.

In the IPOs launched on BM&FBovespa, an evolution is observed in the number of companies that received investments fron private equity and venture capital (PE/VC) funds. By providing resources, the PE/VC funds acquire shares in the invested companies, through (ordinary or preferential) stock, share quotas, convertible debt, options, subscription bonuses or warrants. The PE/VC fund managers start to monitor these companies. By actively participating in the boards of administrators and company operations, they solve or minimize some central problems, characterized by great information asymmetry and agency problems (Lerner, Hardymon, & Leamon, 2009).

Different studies (Barry, Muscarella, Peavy, & Vetsuypens, 1990; Megginson & Weiss, 1991; Brav & Gompers, 1997) have focused on PE/VC organizations' role and their signaling effect in companies' going public (IPO), finding evidence that, in this stage, the companies receiving investments from PE/VC positively stand out from the others.

In view of the importance of the theme and the increase in the number of small investors who apply their savings in newcomers on the Brazilian stock exchange, this research will verify, from the perspective of the Signaling theory, whether the presence of PE/VC funds can certify the quality of the IPOs. Therefore, the following hypotheses were formulated:

Ha: The presence of private equity and venture capital funds in the companies that are newcomers on BM&FBovespa certifies the quality of the IPOs.

Hb: The greater the share of the private equity and venture capital funds in the newcomers on BM&FBovespa, the better the quality of the IPOs.

2. Theoretical Framework

Studies evidence that, when investing in IPOs, investors who maintained the assets acquired during an IPO can incur losses in the long term (Ritter & Welch, 2002; Silva & Famá, 2011).

This phenomenon, called long-run underperformance, is characterized by inferior abnormal returns in the medium and long-terms, showing a relevant stock value loss of companies that launched IPOs and/or Seasoned Equity Offerings (SEOs), in economic terms as well as in the statistical significance level (Silva & Famá, 2011).

The long-run underperformance phenomenon can be attributed to factors like: information asymmetry in IPO processes (Ritter, 2003); excess confidence of investors in favorable economic periods (Ritter & Welch, 2002; Silva & Famá, 2011); earnings management in periods pre-IPO (Teoh *et al.*, 1998); and opportunism of controllers and financial advisors to launch IPOs at times of market optimism (Daniel *et al.*, 1998; Silva & Famá, 2011).

The Signaling theory deals with information asymmetry problems in the markets and attempts to evidence how this asymmetry can be reduced through the signaling of further information (Spence, 1973). Besides its important application in different disciplines, ranging from anthropology to zoology (Bird & Smith, 2005), the Signaling theory has frequently been used in the literature on entrepreneurism, in which researchers have investigated the value of the signals deriving from board characteristics (Certo, 2003), involvement of the founder and presence of private equity and venture capital funds (Megginson & Weiss, 1991; Brav & Gompers, 1997; Minardi *et al.*, 2013).

Megginson and Weiss (1991) found evidence that suggests that the PE/VC managers reduce the information asymmetry among the IPO participants (offering company, underwriter and investors), permitting IPOs with less underpricing and less marketing costs, maximizing the net funds the company obtained. In addition, the results indicate that the IPOs of companies funded by PE/VC involve younger companies and are capable of attracting more renowned underwriters and auditors, arousing greater interest in qualified investors.

Meggison and Weiss (1991) justify that the PE/VC 'certificate' or 'credibility' of IPOs is due: (i) to the commitment of the PE/VC funds to the companies invested after the IPO, maintaining a relevant share of their capital; (ii) the PE/VC managers' skill to construct and maintain good relationships with underwriters, auditors and investment managers; (iii) to the aspect of the PE/VC organizations' reputation in the market as, frequently, the managing organizations use IPOs as divestment mechanisms. Successful IPOs result in better performances for PE/VC funds (better track record and greater chances of PE/VC managers to structure new funds). In addition, through IPOs, the favorable reputation and good track record result in faster divestments and fairer values through IPOs (Neus & Walz, 2005).

In Brazil, few studies address the relation between PE/VC investments and the IPO performance on BM&FBovespa. Minardi *et al.* (2013) assessed the short-term performance of the IPOs of companies that received investments from PE/VC funds in the Brazilian market, between 2004 and 2008, and observed that, on average, the companies invested by PE/VC obtained less underpricing and significantly higher abnormal returns (first year after IPO) than the mean abnormal returns of non-invested companies. For the authors, the abnormal returns are positively correlated with the size of this type of investor's share. They observed that the companies invested by PE/VC funds are better prepared for the IPOs due to: more professional management; better corporate governance practices; existence of more independent boards of administrators; and to the alignment of interests between administrators and investors.

Through studies, based on a sample of IPOs launched in the Brazilian market, between 2004 and 2007, Gioelli (2008) concluded that the PE/VC organizations positively affect the corporate governance of the invested companies, thus reducing earnings management, mainly near the IPO date, when the companies' earnings management is more intense. The author highlights the relevance of an appropriate corporate governance structure to protect the health of the financial markets, investors and different stakeholders.

Sonoda (2008) did not find difference in the performance of the analyzed companies when compared according to the presence or not of PE/VC funds. Using a sample of IPOs on Bovespa, launched between 2004 and 2008, the author found that there was no statistically relevant evidence that the presence of PE/VC influences the underpricing in the IPOs. Nevertheless, the author observed that the explanatory variables related to the funding obtained during the offering and the company's age and its constitution through the IPO are positively significant for the underpricing phenomenon.

Under the paradigm of the Signaling theory, in this study, the objective is to demonstrate that the presence of investments from private equity and venture capital funds in companies that are newcomers on BM&FBovespa (IPOs) signals to the market that these IPOs can offer quality, that is, earnings, and represent good investment opportunities, besides communicating and guaranteeing its quality and information credibility to the stakeholders. The 'good companies' (with PE/VC) offer quality, while the 'other companies' (without PE/VC) don't offer that.

3. Method

Through empirical-analytic studies, the objective was to analyze the influence of the presence of private equity and venture capital funds, in the newcomers on BM&FBovespa (IPOs), on the quality of the IPOs.

Therefore, an event study was applied (Mackinley, 1997) to verify the existence of cumulative abnormal returns (proxy for IPO quality) in investment portfolios of stock deriving from IPOs launched on the São Paulo Stock Exchange (BM&FBovespa) between January/2004 and December/2007.

The period chosen is justified because it permits a long-term analysis (up to 5 years) of the IPO performance of companies invested and non-invested by PE/VC funds, covering distinct moments in the Brazilian stock market: an optimistic market between 2004 and 2007, when IPOs were performed in favorable conditions for the issuers; next, a scenario permeated by the subprime crisis and by uncertainties about the global economic performance, directly affecting the performance of the Brazilian stock market.

The event was defined as the date when the stock was first traded on BM&FBovespa (IPO). Hence, in line with Silva and Famá (2011), considering that these stocks are not quoted during periods before the IPO, as they are newcomers on the exchange, there are no conditions to establish the estimation window of normal returns. Therefore, the abnormal return will be determined by the difference between the return of the stock launched in the IPO, starting from the event date, and the performance of the Ibovespa index.

As from the selected event, the abnormal return of the IPOs will be observed for companies With_PE/VC as well as companies without_pe/vc. The abnormal returns will be verified for intervals of one, three and five years (252, 756 and 1260 workdays or business days), as from the date of the IPO, which makes this study unique when compared to earlier studies in the Brazilian market (Silva & Famá, 2011; Minardi *et al*., 2013).

The sampling universe of the research consists of companies who launched the initial public offering of their stocks on BM&FBovespa between January/2004 and December/2007 (106 companies). To compose the final sample of companies with sufficient quotes to calculate the abnormal return, for the period of up to five years (1260 workdays) after the stocks were first traded on BM&FBovespa, any IPOs that did not complete the fifth anniversary of their stocks' trade on the stock exchange were excluded, counted as from the date of the IPO.

Hence, the final sample in this study consists of 88 IPOs, corresponding to 72.375 of the total amount collected from investors and to 83.02% of the population of the IPOs held between Jan/2004 and Dec/2007.

Closing quotes were used, adjusted for corporate events. The data needed for the study were collected from the definitive public offering prospectuses, the tool Economática, the Brazilian Securities Commission (CVM) and BM&FBovespa.

To check for a possible signaling role of the PE/VC funds regarding the abnormal return of the IPOs, the investment funds were segmented between companies that received investments from PE/VC funds (With_PE/VC) in periods before the IPO and companies that did not receive contributions from PE/VC funds (without_pe/vc) in periods before the company went public. In addition, subgroups (quartiles) of the companies With_PE/VC were created, based on the PE/VC funds' share in the invested companies' capital immediately before the IPO (part_pevc_PRE-ipo). This procedure permits checking the extent of how the PE/VC funds' presence influences the quality of the IPOs (proxy abnormal returns).

Table 1
Number of IPOs in the final sample

Year	Total de IPOs	Companies with PE/VC	Volume captured (million R$)	Mean number of investors	Level 2 and New Market
2004	7	5	4,486	5,533	7
2005	7	3	4,021	3,940	7
2006	18	7	11,029	9,086	17
2007	56	16	39,056	10,018	43
Total	88	31	58,592	28,577	74

Table 1 presents consolidated information on the companies in the final sample. An evolution is observed in the number of IPOs in the course of the analysis period, highlighting 2007, which contains more than 60% of the IPOs analyzed, in number as well as in total volume captured, and the mean number of investors per IPO in the same year is almost twice the number for 2004.

Table 2 presents the descriptive statistics regarding accounting aspects, market data and information on the IPOs in the final sample. A statistical homogeneity is perceived between the groups of companies with and without investments from PE/VC funds, at least in mean terms. The t test for comparison of means between the two groups showed statistical significance for the variables Indebtedness, percentage of the offering that was initial and the dummy variable Corporate Governance only, indicating that the group of companies With_PE/VC, in relation to the group without_PE/VC showed: (i) a lower index of debt on net equity; (ii) former partners used the offering more intensely to sell their share (or part of it) in the company, which may suggest the moment of (complete or partial) departure of the PE/VC funds from the invested company; (iii) offerings in the superior Corporate Governance segments only (New Market or Level 2).

Table 2

Descriptive statistics IPOs – Accounting and offering aspects

	without_pe/vc			with_PE/VC			T statistics
	N = 57			N = 31			
	Mean	Median	Standard D.	Mean	Median	Standard D.	
Accounting data (million R$)							
Assets (AT)	1,712.75	772.75	2,346.10	1,015.63	415.32	2,185.58	-1.370
Net Equity (PL)	283.01	150.60	387.39	340.52	123.85	674.16	0.496
Net Income (LL)	57.51	37.58	73.16	23.56	17.75	116.14	-1.586
ROE (LL/PL) (%)	27.50	16.53	71.46	29.07	14.25	50.17	0.107
Indebtedness (%)	117.78	38.28	284.49	24.96	28.62	73.28	-1.957*
Market data (million R$)							
Market value	2,127.46	1,638.50	2,398.43	1,637.27	1,058.10	1,467.14	-1.029
Book-to-market (%)	14.45	9.25	16.55	20.35	11.70	29.48	1.031
Offering data (million R$)							
Funding volume	652.35	522.00	566.47	526.30	470.00	202.55	-1.485
Primary offering (%)	75.22	91.66	31.83	61.88	61.35	28.00	-1.956*
Corp. Govern. (binary)	0.75	1.00	0.43	1.00	1.00	0.00	4.270***
Underpricing (%)	3.92	1.92	7.58	6.68	5.38	9.51	1.394
Underwriter mkt (%)	25.69	29.00	14.23	28.09	29.00	15.98	0.721

Obs. The accounting data are annual values related to the year before the IPO. The market and offering data refer to information on the date of the IPO. Corporate Governance equals 1 for offering on the New Market or Level 2. Underwrite mkt corresponds to the market share of the leading coordinator of the offering in the year of the IPO, obtained in Almeida (2011) based on the Anbima ranking. T statistics refers to the t-test of comparison of means between companies with PE/VC investments and companies without investments

*,**,*** Statistical significance at 10%, 5% and 1%, respectively.

3.1. Performance measuring (cumulative abnormal returns)

In accordance with other studies (Gompers & Lerner, 2003; Silva & Famá, 2011; Minardi *et al*. 2013), in the post-event window, the abnormal return is determined by the difference between the return of the stock offered in the IPO and the performance of an index that represents the market return, in this case Ibovespa:

$$AR_Ipo_IBOV_{i,t} = R_ipo_{i,t} - R_{IBOV,t} \quad (1)$$

in which $AR_ipo_IBOV_{i,t}$ is the abnormal return of stock *i* present in the final sample of IPOs, in relation to the benchmark Ibovespa, in period *t*; $R_ipo_{i,t}$ is the logarithmic return of stock i in period *t* and $R_{IBOV,t}$ is the logarithmic return of Ibovespa in period *t*.

The cumulative abnormal returns (CAR) of the IPOs were calculated according to the following equations:

$$CAR_Ipo_IBOV_{i,T} = \sum_{t=1}^{T} AR_Ipo_IBOV_{i,t} \quad (2)$$

where $CAR_Ipo_IBOV_{i,T}$ is the cumulative abnormal return of stock i in relation to the benchmark Ibovespa from period *t* till period *T*.

In addition, for the results of group With_PE/VC, subgroups (quartiles) were created based on the percentage share the PE/VC funds held in the capital of the invested companies immediately before the IPO (part_pevc_PRE-ipo). This procedure permits checking the extent of how the PE/VC funds' presence influences the quality of the IPOs (proxy abnormal returns).

For each group or sample *j* (All IPOs, With_PE/VC, without_pe/vc and part_pevc_PRE-ipo) with n_j stocks, the mean simple CAR and CAR weighted by the market value of the IPO (VM), were calculated, according to the following equations:

$$\overline{CAR_{Ipo_{IBOV}\,J,T}} = \frac{\sum_{i=1}^{n_j} CAR_{Ipo_{IBOV}\,i,j,T}}{n_j} \tag{3}$$

$$\overline{vmCAR_Ipo_IBOV_{J,T}} = \frac{\sum_{i=1}^{n_j} CAR_Ipo_IBOV_{i,j,T}\ x\ VM_{i,j}}{\sum_{i=1}^{n_j} VM_{i,j}} \tag{4}$$

where $\overline{CAR_Ipo_IBOV_{J,T}}$ is the simple average and $\overline{vmCAR_Ipo_IBOV_{J,T}}$ the weighted average of the cumulate abnormal return of the stocks in sample j in relation to the benchmark Ibovespa in period *T*.

3.2. Test of means

To find statistically significant differences between the cumulative abnormal returns of groups With_PE/VC and without_pe/vc for CAR_Ipo_IBOV and vmCAR_Ipo_IBOV, the *t* test for two independent samples was applied (Anderson, Sweeney, & Williams, 2007; Minardi *et al.*, 2013):

$$T\ statistics = \frac{\overline{X_\alpha} - \overline{X_\beta}}{\left[\left(s^2_{X_\alpha}/n_\alpha + s^2_{X_\beta}/n_\beta\right)\right]^{1/2}} \tag{5}$$

where $\overline{X_\alpha}$ and $\overline{X_\beta}$ = mean of values of samples X_α and X_β respectively; $s^2_{X_\alpha}$ and $s^2_{X_\beta}$ = estimators of population variances of X_α and X_β respectively; and n_α and n_β = number of observations in sample X_α and X_β respectively.

For the IPOs With_PEVC segmented per quartile according to the share of the PE/VC funds (part_pevc_PRE-ipo), analysis of variance or ANOVA was applied to verify where the different percentage shares of the PE/VC funds present differences in the mean cumulative abnormal returns. Through ANOVA, the statistics of the test of equality of k population means –F statistics is calculated (Anderson *et al.*, 2007).

After the ANOVA tests, Tukey's post-hoc test of Significant Differences (Tukey) was applied, a statistical multiple comparison procedure used in combination with ANOVA to check what means between the groups tested present significant differences.

For some samples, the normality hypothesis was rejected (Kolmogorov-Smirnov test). Therefore, besides the t and ANOVA tests, the non-parametric Mann-Whitney's U-test for two independent samples and the Kruskal-Wallis H test for k independent samples were applied.

3.3. CAPM

As demonstrated in Kothari and Warner (1997) and Gompers and Lerner (2003), the capital asset pricing model (CAPM) developed by Sharpe (1964) and Lintner (1965) is commonly used to estimate the abnormal return of assets traded in the market.

In the Brazilian literature, a lack of studies is observed that apply the CAPM to verify the abnormal returns of companies that receive investments from PE/VC funds.

This study applies the CAPM adapted to the Brazilian scenario, according to the method proposed by the Center for Capital Market Studies [CEMEC] (2013), with a view to checking whether, even after controlling for risk (beta), the performance of the IPOs with the presence of PE/VC funds showed positive and significant results.

Therefore, the return of stock *i* present in sample *j* (All IPOs or IPOs With_PEVC or IPOs without_pevc), minus the return of a risk-free rate, is regressed against the market performance factor minus the return of a risk-free rate (premium for market risk) and the Brazilian sovereign risk factor:

$$R_ipo_{i,j,m} - TBOND_m = \alpha + \beta_1(S\&P500_m - TBOND_m) + \beta_2 EMBI_m + \varepsilon \qquad (6)$$

where: $R_ipo_{i,j,m}$ = monthly return in American dollars (USD) of stock *i* present in sample *j*, related to month *m*; $TBOND_m$ = monthly return in USD of the North American Treasury Bond 10 years in month *m*; $S\&P500_m$ = monthly return in USD of Standard & Poor's 500 in month *m*; $EMBI_m$ = monthly premium for Brazilian sovereign risk (*EMBI+ Brasil*) in month *m*; α, β_1 and β_2 = estimated parameters in the regression; ε = error term of the regression.

The parameter of interest in the regression is the alpha (α)coefficient. The positive and significant signal indicates that, after the control of the premium for the market risk and the Brazilian sovereign risks, the stocks in sample *j* presented a higher-than-expected return.

In the proposed model (6), a dummy variable dPEVC was added, permitting the regression with all IPOs from the final sample, controlling for the influence of the PE/VC funds.

3.4. CAR regressions

To check whether the presence of the PE/VC funds explains the abnormal returns of the IPOs in relation to the benchmark Ibovespa (CAR_Ipo_IBOV), ordinary least squares *(OLS)* regression models were used, according to the equations proposed below:

$$CAR_Ipo_IBOV_{i,T} = \alpha + \beta_n VAR_i + \varphi dPEVC_i + \varepsilon \qquad (7)$$

where: $CAR_Ipo_IBOV_{i,T}$ = cumulative abnormal return (CAR) of stock *i* in relation to the benchmark Ibovespa in period *T*; VAR_i = control variables of the proposed model; $dPEVC_i$ = corresponds to 1 if company *i* received investments from PE/VC funds in periods before the IPO (with PE/VC), and 0 if it did not (without pe/vc); α, βn and φ = estimated parameters in the regression; ε = error term of the regression.

Given the long-term range (5 years) of the analyses in this study, in the model proposed, the control variables (VAR) indicated in Figure 1 are used, as proposed in the international literature, with a view to controlling for differences and changes in other variables, which can influence the end results of the regressions.

Control variable (VAR)	Explanation	Authors who have used the variable
lnOFERi	Natural logarithm of offering value of IPO	Barry *et al*. (1990); Brav and Gompers (1997); Minardi *et al*. (2013)
lnVMi	Natural logarithm of company's market value at the moment of the IPO	Minardi *et al*. (2013)
BTMi	Book-to-market value	Brav and Gompers (1997); Minardi *et al*. (2013)
Endivi	Net debt on Net Equity (Indebtedness)	Minardi *et al*. (2013)
lnInvesti	Natural logarithm of investors who participated in the offering	Minardi *et al*. (2013)
PRIMi	Percentage of offering that was primary	Fortes, Silveira and Bacic (2012)
UnderWi	Market share of leading coordinator of offering in the year of the IPO, obtained from Almeida (2011) based on the Anbima ranking (underwriter_marketshare).	Megginson and Weiss (1991); Carter *et al*. (1998)
dummySETOR	Dummy variables according to the company's activity sector	

Figure 1. Control variables (VAR) used in the CAR regression against dPEVC

In the proposed regression, the parameter of interest is the φ (phi) coefficient. The positive and significant sign indicates that, after controlling for the selected variables (VAR), the presence of PE/VC funds explains a positive abnormal return of the IPOs for the period analyzed.

Like Barry *et al*. (1990) and Minardi *et al*. (2013), this study also presents a regression for the sample of IPOs that received PE/VC investments (With_PEVC):

$$CAR_Ipo_IBOV_{i,T} = \alpha + \beta_n VAR_i + \delta_m VAR2_i + \theta Part_PEVC_PREipo_i + \varepsilon \qquad (8)$$

Where: $CAR_Ipo_IBOV_{i,T}$ = cumulative abnormal returns (CAR) of stock *i* in relation to the benchmark Ibovespa, considering only those IPOs With_PEVC, in period *T*; VAR_i = control variables used in the previous model; $VAR2_i$ = control variables added in the proposed model; *Part_PEVC_PREipoi* = stockholder equity held by the PE/VC fund in company *i* at the moment immediately BEFORE the IPO; *α, βn, δm* and θ = estimated parameters in the regression; ε = error term of the regression.

Figure 2 presents the variables added in this second model (VAR2).

Control variable (VAR2)	Explanation	Authors who have used the variable
Temp_Invest	Length in months the PE/VC fund has invested in the company before the IPO	Barry *et al*. (1990) e Minardi *et al*. (2013)
Temp_Atuacao_Br	Approximate length (in months) the PE/VC fund has acted in Brazil before the IPO, that is, date of the first investment of the fund in companies in Brazil, according to GVcepe-Endeavor (2008).	Minardi *et al*. (2013)[1]
dOrigem_PE/VC	Origin of the PE/VC fund, equal to 0 for Brazilian funds and 1 for international funds	Minardi *et al*. (2013)

Obs. The information was obtained through the prospects and the guide GVcepe-Endeavor (2008).

[1] Minardi *et al*. (2013) use the age of the PE/VC fund/manager.

Figure 2. Control variables (VAR2) for CAR regression: Part_PEVC_PRE-ipo

The presence of outliers (influential observations) was verified through boxplot graphs. For the variables with a large number of outliers, the adjustment using the winsorization method was applied (National Institute of Standards and Technology/Semiconductor Manufacturing Technology [Nist/Sematech], 2013).

4. Results

Table 3 shows the mean cumulative abnormal returns of the IPOs in the final sample in relation to the benchmark Ibovespa and the test of differences of means between companies that received investments from PE/VC funds in periods before the IPO (With_PE/VC) and companies that did not (Without_pe/vc).

Table 3

Cumulative Abnormal Return – IPOs *versus* benchmark IBOV

Panel A – IPOs between 2004 and 2007					
Workdays after IPO	$\overline{CAR_Ipo_IBOV}$ (em %)				
	All IPOs	Without pe/vc	With_PE/VC	T statistics	Z statistics
252	(36.70)	(48.28)	(15.41)	20.038***	15.823***
756	(44.78)	(51.85)	(31.78)	28.797***	23.320***
1260	(39.46)	(46.24)	(26.98)	40.244***	34.162***
Panel B – IPOs between 2004 and 2007					
Workdays after IPO	$\overline{VM_car_ipo_ibov}$ (em %)				
	All IPOs	Without pe/vc	With_PE/VC	T statistics	Z statistics
252	(26.25)	(35.55)	(4.03)	22.436***	15.964***
756	(34.27)	(40.24)	(19.99)	42.843***	26.804***
1260	(21.42)	(20.67)	(23.21)	43.403***	34.544***

Obs. The t-statistics refer to the t-test of comparison of means. The Z-statistics refers to Mann-Whitney's non-parametric U-test.
*, **, *** Statistical significance at 10%, 5% and 1%, respectively.

According to Table 3, for the period analyzed, on average, the IPOs of companies with_PE/VC showed better performances than the companies without_pe/vc. For the periods analyzed, the results of the tests of means indicate that the returns between the groups with_PE/VC and without_pe/vc present significant differences at a 1% significance level. The mean performance of the companies that went public, including companies that received investments from PE/VC funds, was lower than the performance of the Ibovespa index.

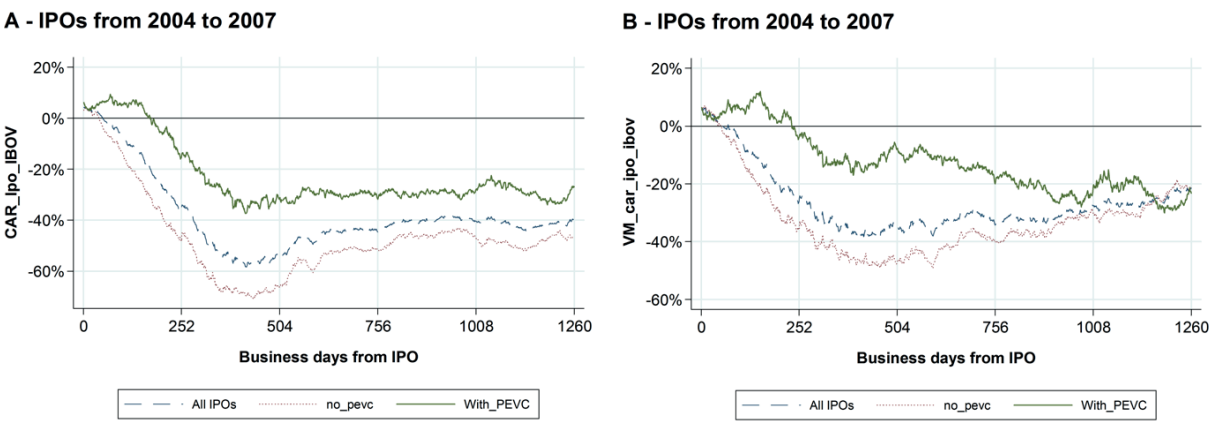

Figure 3. Graphs Cumulative Abnormal Returns - IPOs vs. benchmark IBOV

Figure 3 shows that the mean return of the samples analyzed was lower than the benchmark IBOV. This result may reflect the study period, as the performances after 2007 were strongly influenced by the subprime crises, and large investors in the IPOs needed to cover their positions in other markets and/or look for less volatile and/or more liquid assets, which more intensely influenced the performance of companies with a recent history on the stock exchange (IPOs) in relation to the blue chips on Ibovespa.

It is verified that, in the course of the analysis period, the mean cumulative abnormal returns of the IPOs with_PE/VC is superior to the performance of the IPOs without_pe/vc as well as that of all IPOs in the sample. As observed, the performance of the cumulative abnormal returns weighted by the market value of the IPO (Graph B, Figure 3) is higher than that of the non-weighted cumulative abnormal return (Graph A, Figure 3).

Table 4

Cumulative Abnormal Return (CAR_Ipo_IBOV): only IPOs Without_PEVC

PANEL C - IPOs between 2004 and 2007						
Workdays after IPO	**part_pevc_PRE-ipo: $\overline{CAR_Ipo_IBOV}$ (em %)**					
	1st Quartile	**2nd Quartile**	**3rd Quartile**	**4th Quartile**	**F statistics**	**χ²**
252	(18.65)	(16.99)	(33.73)	5.46	234.790***	511.235***
756	(29.49)	(68.27)	(34.39)	4.69	789.110***	1440.844***
1260	(42.94)	(42.97)	(8.83)	(10.94)	1854.415***	2666.393***
PANEL D - IPOs between 2004 and 2007						
Workdays after IPO	**part_pevc_PRE-ipo: $\overline{VM_car_ipo_ibov}$ (em %)**					
	1st Quartile	**2nd Quartile**	**3rd Quartile**	**4th Quartile**	**F statistics**	**χ²**
252	(1.53)	(7.47)	(36.10)	8.15	105.369***	362.589***
756	(17.92)	(52.21)	(26.36)	(0.59)	779.598***	1465.471***
1260	(50.98)	(21.25)	4.87	(10.20)	1054.121***	2336.706***

Obs. T-statistics refers to the t-test of comparison of means. Z-statistics refers to Mann-Whitney's non-parametric U-test.
*, **, *** Statistical significance at 10%, 5% and 1%, respectively.

Table 4 shows the mean cumulative abnormal returns in relation to the benchmark Ibovespa, only for IPOs that received investments from PE/VC funds, segmented per quartiles, according to the equity ownership the PE/VC fund held in the company immediately before the IPO (part_pevc_PRE-ipo). In addition, this table exhibits the results of the statistical tests that check for significant differences in the returns between the quartiles.

The results indicate that the mean abnormal returns between the quartiles, according to part_pevc_PRE-ipo, present statistically significant differences at 1%.

The results presented in Table 4 suggest that the superior quartiles of part_pevc_PRE-ipo present better performances when compared to the inferior quartiles. For the sake of a better analysis, graphs C and D in Figure 4 show the evolution in the mean abnormal returns, considering only the quartiles part_pevc_PRE-ipo of the extremities (1st and 4th quartile).

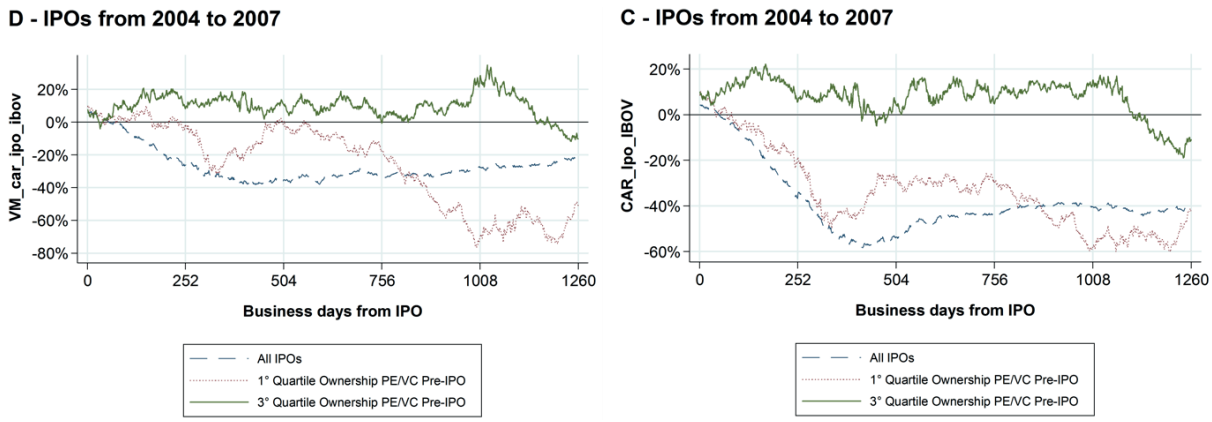

Figure 4. Graphs Cumulative Abnormal Return: only IPOs with_PEVC.

Graphs C and D, presented in Figure 4, demonstrate that the superior quartiles of part_pevc_PRE-ipo (4th quartile) exhibit the best performances, exceeding both the IPOs in the final sample (All IPOs) and the inferior quartile of the PE/VC funds' interest. It is important to highlight that, for certain analysis period, the superior quartile showed positive returns, that is, it exceeded Ibovespa.

Hence, like in the earlier analyses, it is observed that the performance of the mean returns in the 4th quartile, weighted by market values, is slightly better than the mean non-weighted returns. This pattern cannot be observed as easily for the results of the 1st quartile.

Table 5 and 6 display the application results of the CAPM, adapted to the Brazilian scenario, according to the method proposed by the Center for Capital Market Studies [CEMEC] (2013), with a view to verifying whether, even after the risk control, the performance of the IPOs with the presence of PE/VC funds showed positive and significant results.

Table 5

Correlation matrix: CAPM variables

	$(R_ipo_{i,m} - TBOND_m)$	Risk premium	EMBI+	Dummy PE/VC
$(R_ipo_{i,m} - TBOND_m)$		0.514***	(0.126)***	0.017
Risk premium	0.487***		(0.363)***	0
EMBI+	(0.087)***	(0.279)***		0.047***
Dummy PE/VC	0.013	(0.002)	0.036***	

Obs. The upper right side of the diagonal line presents Pearson's correlation matrix, the opposite lower side presents Spearman's correlation matrix. Negative values between parentheses.

*, **, *** Statistical significance at 10%, 5% and 1%, respectively.

According to the correlation matrix of the variables in the proposed model, a positive and significant linear relation is observed between: the IPO return and the risk premium (beta); the presence of PE/VC funds with the country risk (EMBI+). Significant negative relations are observed between the EMBI+ and the IPO return as well as the risk premium.

Table 6

CAPM regressions

VARIABLES	Variável dependente: $(R_ipo_{i,m} - TBOND_m)$			
	(1) All IPOs	(2) without pe/vc	(3) with PE/VC	(4) All IPOs
Constant	-0.0269***	-0.0287***	-0.0230**	-0.0280***
	(0.00595)	(0.00768)	(0.00942)	(0.00601)
Risk premium	1.366***	1.363***	1.368***	1.365***
	(0.0316)	(0.0393)	(0.0531)	(0.0316)
Country risk (EMBI+)	16.38***	16.56***	15.71***	16.23***
	(3.020)	(3.947)	(4.696)	(3.025)
Dummy PE/VC				0.00393
				(0.00333)
Observations	5,280	3,420	1,860	5,280
R Squared	0.269	0.266	0.277	0.270
Ramsey RESET (p-value)				
H0: model without omitted variables	0.005***	0.04**	0.016**	0.004***
Variance inflation factor (VIF)	1.14	1.14	1.14	1.1

Obs. Regression (1) refers to all IPOs in the final sample (88 IPOs); regressions (2) and (3) refer to the IPOs without_pe/vc (57 IPOs) and With_PEVC (31 IPOs) respectively; and regression (4) considers all IPOs in the final sample, using a dummy variable for IPOs With_PEVC. Returns refer to the period of the 1st month after the IPO until the 60th month after the IPO, totaling 60 observations per IPO. The t-statistics values robust to heteroscedasticity according to White's correction method (1980) are displayed between parentheses.

*, **, *** Statistical significance at 10%, 5% and 1%, respectively.

The regression results indicate that the signal of the intercept was negative and significant, suggesting that the observed return was lower than the expected return, given the risk level assumed. In regression (4) (Table 6), it is observed that the signal of the dummy variable PE/VC is positive but not significant. These results imply that the presence of PE/VC funds in the IPOs does not positively influence the return of the IPOs after controlling for the risk.

The negative and significant intercept support the argument that the global financial crisis influence the performance of companies with a recent history on the stock exchange (IPOs) more intensely than traditional and more liquid companies.

Tables 7, 8 and 9 display the results of the CAR regressions to verify whether the presence of the PE/VC funds explains the abnormal return of the IPOs.

Table 7

Correlation matrix: IPOs with and without PE/VC

	c252d	c756d	c1260d	dPEVC	lnOffer	lnVM	BTM	Endiv	lnInvest	PRIM	UnderW
c252d		0.505 ***	0.560 ***	0.236 ***	0.072	0.200 *	(0.007)	(0.125)	0.159	(0.325) ***	0.150
c756d	0.504 ***		0.763 ***	0.146	0.120	0.151	0.043	0.019	(0.031)	(0.246) ***	0.128
c1260d	0.385 ***	0.751 ***		0.077	0.022	0.149	0.044	(0.075)	0.105	(0.191) ***	0.036
dPEVC	0.232 ***	0.149	0.009		(0.083)	(0.130)	0.129	(0.111)	0.047	(0.206) **	0.077
lnOFER[1]	0.157	0.155	0.053	(0.085)		0.657 ***	(0.085)	0.313 ***	0.051	0.096	0.080
lnVM	0.202 *	0.189 *	0.179 *	(0.188) *	0.634 *		(0.092)	0.234 **	0.133	(0.114)	0.136
BTM[1]	(0.037)	0.162	0.119	0.093	(0.129)	(0.128)		(0.043)	0.056	(0.063)	0.084
Endiv	0.138	0.086	(0.002)	0.011	0.205[1]	0.148	0.112		(0.086)	0.048	0.045
lnInvest	0.080	(0.056)	0.026	0.042	0.156	0.123	0.048	0.055		(0.185) *	(0.187) *
PRIM	(0.353) ***	(0.247) **	(0.178) *	(0.260) **	0.040	(0.098)	(0.146)	(0.037)	(0.174)		(0.290) ***
UnderW	0.226 **	0.113	0.083	(0.010)	0.075	0.122	0.089	0.098	(0.156)	(0.272) **	

Obs. The upper right side of the diagonal line presents Pearson's correlation matrix; the lower opposite side displays Spearman's correlation matrix. c252d = Cumulative Abnormal return (CAR_Ipo_IBOV) on 252nd workday after IPO; c756d = CAR_Ipo_IBOV on 756th workday after IPO; c1260d = CAR_Ipo_IBOV on 1260th workday after IPO; dPEVC = dummy variable PEVC, corresponding to 1 for companies with_PE/VC and 0 for companies without_pe/vc; lnOFER = natural logarithm of offering value; lnVM = natural logarithm of market value of company at the moment of the IPO; BTM = book-to-market value; Endiv = net debt on net equity; lnInvest = natural logarithm of number of investors; PRIM = percentage of offering that was primary; UnderW = market share of leading coordinating bank of offering in the year of the IPO. Negative values between parentheses.

*, **, *** Statistical significance at 10%, 5% and 1%, respectively.

The correlation matrix of the variables (Table 7) indicates that there is a positive and significant linear relation between the presence of PE/VC funds in the IPOs (dummy PE/VC) and the percentage market share of the underwriter on the one hand and the cumulative abnormal returns (CAR) in the first year (252 workdays). As observed, there is a negatively relation between the dummy variable PE/VC and the market value of the IPO and the percentage of the offering that was primary. Nevertheless, there is a positive and significant relation between the market value of the IPOs and the total value of the offering, indebtedness, number of investors and cumulative abnormal returns. As to the percentage of the offering that is primary, an inverse relation is observed with the percentage market of the underwriter, as well as a negative relation with the cumulative returns.

Table 8

Regression of Cumulative Abnormal Return (CAR) against presence of PE/VC funds in IPO

Variables	without *dummy*SETOR			with *dummy*SETOR		
	(1)	(2)	(3)	(4)	(5)	(6)
	c252d	c756d	c1260d	c252d	c756d	c1260d
Constant	-3.231*	-3.102	-2.457	-2.515	-3.127	-2.067
	(1.887)	(2.439)	(3.708)	(2.147)	(2.822)	(4.392)
***Dummy* PEVC**	**0.276****	0.159	0.136	**0.270***	**0.278***	0.160
	(0.116)	(0.132)	(0.213)	**(0.139)**	**(0.164)**	(0.257)
Ln Offering	0.00929	0.173	-0.185	0.0365	0.217	-0.293
	(0.177)	(0.230)	(0.343)	(0.235)	(0.289)	(0.555)
Ln Market Value	0.182	0.0769	0.324**	0.0959	0.0238	0.294
	(0.111)	(0.102)	(0.163)	(0.137)	(0.158)	(0.354)
Book-to-market	-0.135	0.105	0.209	0.347	0.424	0.390
	(0.256)	(0.520)	(0.701)	(0.274)	(0.501)	(0.681)
Indebtedness	-0.0794	-0.0103	-0.0860	-0.156	-0.0592	-0.119
	(0.107)	(0.0799)	(0.136)	(0.111)	(0.0768)	(0.156)
Ln Investors	0.0438	-0.0509	0.0350	0.0910	-0.0102	0.123
	(0.0686)	(0.0552)	(0.126)	(0.0775)	(0.0653)	(0.153)
% Primary	-0.478***	-0.500**	-0.558	-0.493**	-0.632**	-0.824*
	(0.177)	(0.228)	(0.359)	(0.221)	(0.282)	(0.473)
Market UnderW	0.308	0.0401	-0.199	0.236	-0.231	-0.541
	(0.398)	(0.506)	(0.690)	(0.446)	(0.589)	(0.911)
Dummy Sector				♠	♠	♠
Observations	88	88	88	88	88	88
R Squared	0.202	0.107	0.072	0.362	0.265	0.216
Ramsey RESET (p-value)						
H0: model without omitted variables	0.773	0.372	0.614	0***	0.255	0***
Variance inflation factor (VIF)	1.35	1.35	1.35	5.07	5.07	5.07

Obs. OLS regression of dependent variables: c252d = Cumulative Abnormal return (CAR_Ipo_IBOV) on 252nd workday after IPO (1 and 4); c756d = CAR_Ipo_IBOV on 756th workday after IPO (2 and 5); c1260d = CAR_Ipo_IBOV on 1260th workday after IPO (3 and 6), related to 88 IPOs on BM&FBovespa between 2004 and 2007. Regressions (4), (5) and (6) include the control variable SECTORdummy. Variables: dPEVC = dummy variable PEVC, corresponding to 1 for companies that received investments from PE/VC funds in periods before the IPO (with PE/VC) and 0 for companies that did not receive these investments (without_pe/vc). Control variables: lnOFER = natural logarithm of offering value; lnVM = natural logarithm of market value of company at the moment of the IPO; BTM = book-to-market value; Endiv = net debt on net equity; lnInvest = natural logarithm of number of investors; PRIM = percentage of offering that was primary; UnderW = market share of leading coordinating bank of offering in the year of the IPO; SECTORdummy = 15 SECTORdummy variables according to company's activity segment. The symbol ♠ indicates that results of the SECTORdummy variables were omitted. The t-statistics coefficients robust to heteroscedasticity according to White's correction method (1980) are displayed between parentheses.

*, **, *** Statistical significance at 10%, 5% and 1%, respectively.

For the regressions (1), (4) and (5) in Table 8, the positive and significant signal of the dummy variable PE/VC indicates that the presence of PE/VC funds has a positive effect on the cumulative abnormal returns of the IPOs. For the five-year cumulative abnormal returns after the IPO, however (regressions 3 and 6 in Table 8), despite the positive coefficient of the dummy variable PE/VC, no conclusion can be reached about its effect on the performance of the IPOs, due to the lack of statistical significance.

Therefore, the results indicate that, for the sample under analysis, the presence of Private Equity and Venture Capital funds positively influenced the quality (cumulative abnormal returns) of the companies that went public, considering the performance levels within three years after the IPO.

Table 9

Regression Cumulative Abnormal Return (CAR): only IPOs with_PEVC

Variables	without dummySETOR			with dummySETOR		
	(1)	(2)	(3)	(4)	(5)	(6)
	c252d	c756d	c1260d	c252d	c756d	c1260d
Constant	-4.159	-8.132	-6.554	-12.98**	-12.61	-13.00
	(3.345)	(5.159)	(6.760)	(4.755)	(9.055)	(9.580)
Part_PEVC_PREipo	0.260	**0.735***	**1.034****	-0.169	1.259	1.671
	(0.304)	**(0.374)**	**(0.492)**	(0.756)	(1.361)	(1.760)
LnOFER	0.201	0.743	0.596	-0.479	0.774	0.671
	(0.354)	(0.496)	(0.604)	(0.536)	(0.875)	(1.166)
lnVM	0.0343	-0.130	-0.167	0.975**	0.0265	0.0811
	(0.188)	(0.203)	(0.333)	(0.401)	(0.773)	(1.174)
BTM	-0.397*	-0.605	-0.578	-0.0756	-0.253	-0.175
	(0.230)	(0.369)	(0.516)	(0.438)	(0.881)	(0.960)
Endiv	0.143	0.107	0.0370	-0.127	0.328	0.362
	(0.166)	(0.214)	(0.341)	(0.287)	(0.522)	(0.724)
lnInvest	0.0245	-0.0447	-0.0906	0.0189	-0.0604	-0.0905
	(0.0939)	(0.0931)	(0.129)	(0.146)	(0.224)	(0.309)
PRIM	-0.258	-0.634	-0.00110	-0.910**	-1.202	-0.675
	(0.438)	(0.405)	(0.732)	(0.390)	(0.790)	(1.215)
UnderW	1.125	0.631	0.521	2.478**	0.436	0.524
	(0.707)	(0.766)	(0.942)	(1.005)	(2.609)	(2.436)
Temp_Invest	0.001	-0.003	-0.004	-0.003	-0.011	-0.011
	(0.003)	(0.004)	(0.005)	(0.005)	(0.009)	(0.014)
Temp_Atuacao_Br	0.002	0.003	0.008**	0.014***	0.007	0.011
	(0.002)	(0.002)	(0.003)	(0.002)	(0.007)	(0.008)
dOrigem_PE/VC	0.226	0.193	0.794*	1.258***	0.920	1.540
	(0.260)	(0.316)	(0.413)	(0.305)	(1.117)	(1.250)
SECTORdummy				♠	♠	♠
Observations	31	31	31	31	31	31
R Squared	0.494	0.502	0.381	0.792	0.643	0.599
Ramsey RESET (p-value)						
H0: model without omitted variables	0.709	0.280	0.804	0.628	0.330	0.147
Variance inflation factor (VIF)	1.99	1.99	1.99	15.20	15.20	15.20

Obs. OLS regression of dependent variables: c252d = Cumulative Abnormal return (CAR_Ipo_IBOV) on 252nd workday after IPO (1 and 4); c756d = CAR_Ipo_IBOV on 756th workday after IPO (2 and 5); c1260d = CAR_Ipo_IBOV on 1260th workday after IPO (3 and 6), considering only IPOs With_PE/VC. Regressions (4), (5) and (6) include the control variable SECTORdummy. Variables: Part_PEVC_PREipo = share of PE/VC fund in the company at the moment immediately before the IPO. Control variables: lnOFER = natural logarithm of offering value; lnVM = natural logarithm of market value of company at the moment of the IPO; BTM = book-to-market value; Endiv = net debt on net equity; lnInvest = natural logarithm of number of investors; PRIM = percentage of offering that was primary; UnderW = market share of leading coordinating bank of offering in the year of the IPO; Temp_Invest = length in months the PE/VC fund invested in the company before the IPO: Temp_atuacao_Br = length in months the PE/VC was active in Brazil until the IPO. dOrigem_PE/VC = origin of the PE/VC fund, corresponding to 0 for Brazilian funds and 1 for international funds; SECTORdummy = 15 SECTORdummy variables according to company's activity segment. The symbol ♠ indicates that results of the SECTORdummy variables were omitted. The t-statistics coefficients robust to heteroscedasticity according to White's correction method (1980) are displayed between parentheses.

*, **, *** Statistical significance at 10%, 5% and 1%, respectively.

Table 9 shows the results for the regression model conceive to examine the extent of the PE/VC funds' influence on the quality of the IPOs. It checks whether a higher equity ownership of the PE/VC funds in the companies that were newcomers on BM&FBovespa implies a higher cumulative abnormal return of the IPOs.

In regressions 3 and 4 (Table 9), a positive and significant effect is observed between the origin of the PE/VC fund and the length in months of its activities in Brazil on the one hand and the abnormal returns from the 1st and 5th years after the IPO. The market share of the underwriter in the year of the IPO shows a positive and significant influence on the abnormal returns only in the first year after going public (regression 4 Table 9).

The results of regressions 2 and 3 (Table 9) indicate that the variable of interest Part_PEVC_PREipo showed a positive signal, with statistical significance. For the regressions 1, 5 and 6 (Table 9), however, although the coefficient of the variable is positive, no statistical significance was found.

The information in Table 9 permits checking the extent of the how the presence of PE/VC funds influences the quality of the IPOs (proxy abnormal returns), supporting the hypothesis that, the greater the equity ownership of fund PE/VC in the company, immediately before the IPO, the higher the cumulative abnormal return for the periods three and five years after the IPO.

5. Conclusion

This study aimed to investigate, from the perspective of the Signaling theory, the certifying role of Private Equity and Venture Capital (PE/VC) funds in the quality of companies that are newcomers on BM&FBovespa (IPOs).

Therefore, an event study was proposed to verify the existence of cumulative abnormal returns (proxy for IPO quality) in investment portfolios with IPO stocks from the São Paulo Stock Exchange (BM&FBovespa), between January/2004 and December/2007.

The abnormal returns were determined by the difference between the return of the IPO stock, as from the start of its trade on BM&FBovespa, and the performance of Ibovespa (CAR_Ipo_IBOV). In order to verify the signaling (certifying) role of the PE/VC funds in the IPOs' abnormal returns, the investment portfolios were segmented between companies that received investments from PE/VC funds (with_PE/VC) during periods before the IPO and companies that did not (without_pe/vc) in periods before going public. Subgroups (quartiles) were created of the companies with_PE/VC, based on the percentage ownership the PE/VC funds held in the capital of the invested companies immediately before the IPO (part_pevc_PRE-ipo). This procedure permitted checking the extent of how the PE/VC funds' presence influenced the quality of the IPOs (proxy abnormal returns).

The hypotheses were verified using three distinct procedures: test of means; CAPM (capital asset pricing model); and OLS (ordinary least square) regressions.

The results of the tests of means indicated that, on average, the IPOs of companies with_PE/VC showed higher and statistically significant performances when compared to companies without_pe/vc, for the mean cumulative abnormal returns in relation to Ibovespa ($\overline{CAR_Ipo_IBOV}$ and $\overline{VM_car_ipo_ibov}$). In addition, for the IPOs with_PE/VC segmented per quartile, according to the equity ownership of the PE/VC funds, the results demonstrated that the performance of the superior quartile of part_pevc_PRE-ipo was higher than that of the IPOs in the sample and of the IPOs in the inferior quartile of the PE/VC funds' equity ownership. It is important to highlight that, for certain analysis periods, the superior quartile showed positive returns, i.e. exceeded Ibovespa.

The results of the CAPM regressions showed negative and significant intercepts, suggesting that the observed returns were lower than the expected return, given the risk level assumed. For the model with the inclusion of a dummy variable PE/VC, however, the signal was positive but not significant. This result implied that the presence of PE/VC funds in the IPOs does not influence the IPO return after controlling for the market and country risks (EMBI+).

The CAR regressions showed a positive and significant signal for the dummy variable PE/VC, indicating that the presence of PE/VC positively influences the IPOs' cumulative abnormal returns. For the five-year cumulative abnormal returns after the IPO, however, although the coefficient of the dummy variable PE/VC is positive, no conclusions can be drawn about its effect on the performance of the IPOs due to the lack of statistical significance.

The results of the CAR regressions with the dummy variable PE/VC indicated that the presence of Private Equity and Venture Capital funds positively influenced the quality (cumulative abnormal return) of the companies that went public, considering the performance levels within three years after the IPO.

For the CAR regressions that verified the extent of the impact of the PE/VC funds' presence in the IPO performance, the results of the model for returns in the third and fifth years after the IPO indicated that the variable of interest, Part_PEVC_PRE-ipo, showed a positive signal and statistical significance, indicating that, the higher the equity ownership of the PE/VC fund in the company immediately before the IPO, the higher the cumulative abnormal return of the IPO.

In summary, the evidence found in this study shows that the presence of PE/VC funds in companies that were newcomers on BM&FBovespa certifies the quality of the IPOs and that, the greater the equity ownership of the PE/VC funds in the companies that were newcomers on BM&FBovespa, the higher the quality of the IPOs.

As opposed to the international literature, in which long-term analyses are observed about assets' performance in capital markets, the Brazilian literature lacks research with a long-term scope, given the limited data available.

Long-term analyses in financial markets are important to better understand phenomena and validate theoretical findings, so as to contribute to the evolution of the theoretical framework and of practical research tools.

In the Brazilian literature, studies that analyze the performance of the companies invested by PE/VC funds are limited to the temporal analysis of one-year periods. Therefore, this research contributes to the incipient literature about Private Equity and Venture Capital in Brazil, through an original study about the long-term performance of the IPOs launched on BM&FBovespa which received investments from PE/VC funds, considering multiple analysis techniques for the sake of more solid results, as suggested and proposed in the international literature (Megginson & Weiss, 1991; Brav & Gompers, 1997; Kothari & Warner, 1997; Gompers & Lerner, 2003).

The research adds up to other studies about the Private Equity and Venture Capital market in Brazil, which verified the positive influence of the presence of PE/VC funds in the invested companies: Gioielli (2008) found that companies with PE/VC investments possess better corporate governance and higher-quality financial information; Sasso (2012) verified the better-quality profits and lower indebtedness of companies with PE funds when compared to non-invested companies; Minardi *et al.* (2013) found that the performance of the short-term cumulative abnormal return of the companies with PE/VC investments is higher than that of other IPOs.

Further research should try to clarify and understand the possible factors that explain a higher performance of the IPOs that received investments from PE/VC funds. In line with the evolution and growth of Brazilian capital markets and the Private Equity and Venture Capital industry in Brazil, future studies can have access to broader, representative databases with a wider range, permitting the production of high-quality studies that better clarify the reality observed.

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