 doi:10.20944/preprints201607.0016.v1

Article

Initial Public Offerings, Underpricing and Performance: The Case of Top International Brands

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Abstract: The present study aims at investigating the relationship between Initial Public Offerings (IPOs) variables mainly underpricing on one hand, and the brand value measures on the other. Our final data set is 104 international brand companies. We implement empirical approach using hierarchical OLS regression and descriptive statistics. We show that underpricing is positively related to brand value which emphasizes the marketing role of going public and underpricing in enhancing brand equity through the product market, which additionally confirms some information asymmetry models. We also find that on average brand companies had not been recognized as brands at the IPO time. Moreover, we show the positive role of private equity in enhancing brand value, additionally, the non-linear association between underpricing and brand value is not evident. Finally, we draw some policy implication and suggestions for future research.

Keywords: initial public offering; underpricing; private equity; brand value

JEL Classifications: G24, M370

1. Introduction

According to (Ritter, 1998), even the simple question of why do companies go public has various answers and could be an opportunity for research and debate. One of the most dominant answers is the desire to raise equity capital for the firm and to create a public market in which the founders and other shareholders can convert some of their wealth into cash at a future date. Another reason is a nonfinancial consideration, such as increased publicity; this explanation played only a minor role for most firms in the past, but after the tech. bubble, it has become hot again. Besides, others scholars argue that liquidity considerations are more important for the issuer than the raised capital itself which have an influence on the cost of capital of the issuer. Researchers consider different motivations for going public. This still leaves the question of why initial public offerings "IPOs" are the best way for entrepreneurs to raise capital, and why the motivation to do an IPO is stronger in some situations or times than in others.

More importantly, going public is associated with various phenomena, and perhaps the best-known phenomenon is the regular occurrence of large initial returns or underpricing. From an academic point of view, Underpricing is defined as the difference between the aftermarket price (first-day closing price) and the offer price at the IPO, (Logue, 1973) and Ibbotson and Jeffery (1975). Large initial return is commonly perceived as a contradiction to capital market efficiency. However, it is a common anomaly that has been documented almost in all countries around the world that have stock offerings, Loughran et al. (1994). Since the 1960s, this 'underpricing discount' has averaged around 19% in the United States. Underpricing has been fluctuating a great deal with an average of 21% in the last decade.

Going public, underpricing, and long-run performance of IPOs have been subjects of research for finance scholars. Researchers have introduced various models and theories trying to explain each of the phenomena during the last four decades starting from information asymmetry models, ownership dispersion hypotheses, institutional explanations to behavioral models, however, the time dynamics and the evolution of markets prevails some explanations over the others or sometimes lead to introducing new explanations. Perhaps the explanation that took the least attention is that going public and underpricing are used as marketing tools to enhance the firm's product market.

Due to the importance of going public for market agents and researchers, and due to the increasing impact of building strong brands from firms' perspective; this study comes with a principle objective to investigate the relationship between IPO variables, especially underpricing, on one hand and brand value measure on the other to assess whether going public enhances brand value?.

In this study, we test the old-new explanation for going public and underpricing which states going public and underpricing create firm's publicity, which, in essence, enhance the firm's position in the product market. This premise was tested from different perspectives; Habib and Ljungqvist (2001) argue that underpricing is a substitute for costly marketing expenditures; this result is further supported by the findings of DuCharme et al. (2001), Demers and Lewellen (2003), Krigman et al. (1999), Rajgopal et al. (2000), and Stoughton et al.(2001) who investigated other explanations for the extreme underpricing during the internet bubble late 1990s. They find that high levels of underpricing during the internet bubble were mainly to create a strong brand value post-IPO.

Brand value or sometimes referred to as brand equity is defined as the future profits attributed to a certain brand name, estimated by financial markets and discounted in present terms, Simon and Sullivan (1993).

The contribution of this research is that we go further by investigating the impact of underpricing and going public of the firm's brand value by linking directly IPO variables to brand value metrics for the top international brand companies.

The motives for this research are placed under three main principles.

1. Previous studies (e.g. Loughran et al, 1994) show that large and known companies are less risky in terms of information asymmetry during their IPOs, thus, they experience lower levels of underpricing. Brand companies are a good example for large and known companies; therefore, based on the previous premise we expect them to experience low levels of underpricing. However, testing the IPO variables in the context of top brand companies gives a verification for information asymmetry models and a premise test.
2. The explanation that IPOs and underpricing as financial market-based tools- to enhance brand values ex-ante through the product market has been almost ignored, and there are no previous studies targeted IPOs from brands perspective, hence, this study adds to the body of literature of both finance and branding.
3. Brand value appears to be taken into account by investors while making investment decisions (Barth et al. 1998), testing this argument in the context of brand companies gives a support that investors not only discount cash flows when investing, but they also discount cash flows attributed to future brands.

We developed the research hypotheses based on the related literature. After testing for the regression assumptions (no serial correlation, homoscedasticity, no multicollinearity, and normally distributed errors) and variables transformation is applied, a hierarchical OLS regression is used to test the hypotheses developed. The regression models are applied to brand and IPO related data gathered from Thomson Investment Banker. We find that underpricing is positively related to brand value, we also find that on average brand companies had not been recognized as brands at the IPO time. Moreover, we show the positive role of private equity in enhancing brand value.

The rest of the present paper is structured as follows, section 2 concerns the review of the related literature, sections 3 for data and methods, sections 4 is dedicated to the results and hypotheses testing, and in section 5 we show conclusions.

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2. Literature Review

After the extreme levels of underpricing during the internet bubble late 1990s, researchers have started to look for other explanations for why do companies go public?, and especially why they leave large amounts of money on table in terms of initial return on the first day of trading in the secondary market?.

The access to finance and financial markets as the traditional explanation for why do companies go public struggles in explaining the precise nature of the timing of public offerings as issuers have large amounts of cash prior going public. Pagano, Panetta and (Zingales, 1998) study the motives for going public on the Italian case; they find that the need to finance investments has little power in explaining the motive of going public.

Initial public offerings have occupied a large space in the finance literature. But the interaction between the IPO decision and the product market has been neglected. Existing IPO research can fall in one of the three main categories:

First, a group of work that analyzes IPOs assuming the need to go public is given. This work derives the equilibrium price and equity issuance decisions given different kinds of informational asymmetries.

The second category of work indigenizes the decision of whether to go public. Generally private equity issue is considered the alternative for IPO and the reason why firms choose IPO rather than the private issue is because of capital market frictions. The IPO may minimize the transaction costs while financing a project but has no direct influence on firm fundamentals.

The third category of research endogenously explains the IPOs by their potential direct effect on firm fundamentals. An IPO may result in optimal monitoring by shareholders or may allow improved incentive contracts between the firm and the manager.

Moreover, scholars started to investigate another frequent explanation for the decision of going public, specifically, the enhancement company's image and publicity. Perhaps the basic notion of this discussion comes from Habib and Ljungqvist (2001) who find the evidence to support the above argument in which marketing expenses and underpricing are substitute costs. Frieder and Subrahmanyam (2005) find that investors retain highly visible firms, where visibility is an outcome of investments in the marketing of IPO. Besides, Cook et al. (2006) suggest that investment bankers invest in marketing to promote IPOs amongst the retail investors for the issuers to retain and attract clients. Some studies have additionally found evidence that in case of insufficient pre-offer publicity by the investment banker, issuers change investment bankers.

According to (Fleischer, 2006), the concept of branding rarely appears in academic research in corporate finance and corporate governance. Finance scholars focus their attention on the relationship between the firm and its investors and creditors who supply financial capital, and its managers who supply human capital. IPO contracts are efficient when they properly align incentives; a good contract design is one that allows managers to raise capital cheaply and deploy it effectively. Consumers enter the discussion only as the emotionless buyers who make up the product markets, which serve as a potential indirect check against agency costs. Additionally, from a traditional corporate finance perspective, the goal of a properly-structured IPO is to manage the information asymmetry between the issuer and potential buyers in order to raise the most amount of money possible per share of stock sold.

In a related work, finance scholars studied the link between advertising expenses and intangible assets from one side and stock return for publicly traded companies on the other. Thus, investigating the properties of different types of intangible capital is useful to better understand the impact of intangible capital on asset prices. For example, both the firm's stock of human capital skills and brand name contribute to the firm's total stock of intangible capital, however, these two assets are likely to have different risk properties. Human capital skills are partially embodied in the firm's labor force and since this stock of human capital is not fully owned by the firm, shareholders are exposed to the risk that a worker may leave a firm, and hence decrease the firm's stock of human capital skills. In contrast, a firm's brand name is firm-specific because the firm fully owns the property rights to its brands.

Gourio and Rudanko (2014) study the implications of customer capital for firm value and investment dynamics. Similar to our study; they emphasize the importance of adjustment costs in creating customer capital. Brand capital and customer capital are related because both measures capture the effect of customer loyalty on firms' performance. In the same regard, Belo et al. (2013) investigate the impact of brand capital on asset returns through a structural estimation; they consider a fully specified economy in which prices and quantities are endogenously determined. Through calibration and simulation, their focus is thus understanding the economic determinants of the endogenous risk premiums associated with brand capital stock. More importantly, empirical evidence on product market implications of going public has been the subject of several studies; Slovin et al. (1995) document an average negative announcement effect on the rival firms; they find that rivals' stock price reaction for conventional IPOs is statistically negative. By contrast, (Ward, 1997) finds that the average effect of IPO announcements on rival firms depends on the motive stated in the prospectus. The product market explanation can also be extended internationally by explaining foreign shares listing, Pagano et al. (2001) find that the propensity of firms to cross-list their shares on foreign markets increases with the percentage of export sales.

Almost all studies relating IPOs and underpricing to product market and publicity were applied on the internet and tech. companies that went public in the 1990s. These companies raised about $26 Billion from the mid-1990s to 2000, but they left about $27 billion in terms of initial return according to Loughran and Ritter (2002). In an attempt to answer why they left these amounts as a free lunch for secondary market investors, Krigman et al. (1999) claim that startups seem to ignore pricing and select their underwriters based on their ability to attract media attention; selling off a part of their firm is as much a "branding" event as it is a source of equity financing. Branding is a means of establishing a start-up Internet firm's identity, name recognition, and even customer loyalty by making the company name an everyday household word. Further, if these Internet firms intend to return to the capital markets at a later date, they can make up this offering shortfall (by issuing more shares to their loyal institutional investors at a higher price in a secondary offering). Confounding this mispricing phenomenon is another stylized fact reported in Krigman et al. (1999); they claim that for stocks launched between 1988 and 1995, those that increased more than 60% (initial return) on the first day were actually the worst performers over time. In this respect, Stoughton et al. (2001) relate directly IPO characteristics to product market of the issuer; they explore the product market motive for going public by developing a model where consumers distinguish product quality from the stock price.

Furthermore, Du Charme et al. (2001) investigate three main explanations for the hyper underpricing level of the internet firms during the 1990s: (1) media hype drives underpricing; (2) Internet firms leave money on the table to be able to follow up underpriced IPOs with follow-on financing offers, and (3) underpricing is a branding event designed to increase consumer awareness of the Internet company. They show that the media hype and the desire to return to the capital market are strongly associated with Internet IPO underpricing. Notwithstanding underpricing is higher for B2C firms, sales increase post-IPO is not significantly related to the extent of underpricing. In the same context, Demers and Lewellen (2003) investigate the potential marketing benefits of going public and IPO underpricing; they examine the impact of IPO underpricing on website traffic which is a direct measure of product market performance for internet firms. They find that web traffic growth in the month after the IPO is positively and significantly associated with initial returns, and the effect is economically significant. Additionally, they investigate media reaction to initial returns for a broader sample of IPOs. Their results suggest that the marketing benefits of underpricing extend beyond the internet sector and the ''hot issues'' market of the late 1990s. On the other side, some law scholars have started to investigate the role of IPO contract design and process in enhancing the brand value ex-ante. Some case studies by Fleischer (2006, 2007) on Google and MasterCard exploring the IPO branding effect on both companies.

Through investigating the relationship between brand value and IPO variables, we answer the following questions:

1. Is there a relationship between underpricing and brand value measures?
2. Whether recruiting higher ranked underwriters enhances brand value ex-ante?
3. Does retaining more shares at the IPO enhance brand value post-IPO?
4. Whether there is a relationship between price range and brand value?
5. Does the performance post-IPO enhance brand value 2-year following the IPO?
6. Is there an effective role of private equity at the IPO to enhance brand value ex-ante?
7. Whether the relationship between brand value and underpricing remains linear?

3. Data, Methods & Research Design

Regarding data collection and samples, brand related data was collected from Brand Finance Limited, available at www.brandfinance.com. We gathered the data for the top 500 international brand companies in different countries and industries. For the purpose of our study we only select the publicly traded brand companies that conducted initial public offering from the 1980s to 2012, we end up with 370 public brand companies while the rest are either private brands or inter-brands.

Brand value is measured as the dollar amount of brand value estimated by various brand consulting companies including Brand Finance two years after going public. The rationale is to let the IPO and underpricing to take the lead time in influencing brand value. For those companies that did not have brand value measures at the IPO time, when the measures of brand value had not been evolved, we use the value of non-tangible assets as a proxy for brand value. Furthermore, to remove the time-value effect, we estimated all brand values at 2012 dollar value.

IPO related data was gathered from Thomson Investment Banker available at Bocconi University. We searched the 370 brand companies; however, we end up with 104 companies that have available IPO data on Thomson database. The final data set is 104 companies that conducted an IPO from the 1980s to 2012. As in almost all previous studies in IPOs, we exclude all offers of Closed-end Funds, American Depositary Receipts (ADRs), Real Investment Trust (REITs), and Unit Offerings. However, similar to Hansen (2001), and Fernando et al. (2005), we do not exclude penny stocks from our analysis for two reasons. Firstly, according to (Hansen, 2001), and Fernando et al. (2005), both high and low reputation underwriters are allowed to compete for such low offer price offerings. Secondly, for the purpose of our study and because we use top international brands from different countries, there are brand companies (especially the Chinese) offer at a low price but very a large quantity of shares. Nonetheless, our results are verified through studying different samples (US companies) to make sure that this consideration makes no bias. We do not observe any significant change in the results.

The classification of industries is taken as published by Brand Finance Limited[1], and after we verify them according to Standard Industrial Classification (SIC), we find that their classification complies with (SIC).

For the purpose of verifying our findings and provide more credibility for the results, we divide the data into three samples, of which sample one is considered the basic sample whereas the other two samples are used to control the robustness of results obtained of the first sample. The data sets are as follows:

[1] Founded in 1996, and is the world's leading independent brand valuation and strategy consultancy. Headquartered in the City of London, and is presented in over 20 countries. it is considered a relaible source of brand related data accoriding to Forbes.

1. Sample one: includes the 104 brand companies in 19 countries[2] scattered in world's continents except Africa and 23 industries[3].
2. Sample two: is a subsample after excluding technological, banking, and telecommunication sectors. We drop the technological since it has the highest level of IR and the highest brand value, thus we don't want the relationship between IR and BV to be driven by this sector (they are 17 companies out of 104). Additionally, we drop the banking sector because it includes some international underwriters that may bring some bias. Telecommunication sector has also a negative IR, and the highest net proceeds per company and according to Reuters and other financial news sources, some big telecom companies had abuses in their IPOs.
3. Sample three: is a subsample that includes only US companies since they comprise about 52% of all companies. This classification intends to overcome country differences by studying "only-US" sample.

A hierarchical OLS regression is used to test the hypotheses developed. Hierarchical multiple regression or "multilevel model" is a practice of building successive linear regression models, each adding more predictors, it is a series of regular OLS regression models in a simple way. It is used when we control for other contaminating variables, the regression results are separated into different models, in which model 1 represents the relationship with the control variables only, whereas model 2 considers the addition of the predictor, Bryk and Raudenbush (2002). To perform the regressions, the fundamental assumptions of the OLS regression have to be met as follows:

1 Error independence (no serial correlation): is ensured by Durbin Watson (D-W) statistics provided in each regression table, it is also verified by the plot of standardized predicted residual values provided in the appendix (dots must not be clustered nor following a pattern).

2 Hemoscedasticity: is ensured by looking at the same plot of standardized predicted and residuals, it shows that the variance of residuals is constant.

3 No multicollinearity: is initially ensured by looking at the correlation matrix, correlations among independent variables must be less than 0.7, it can also be verified by the VIF and tolerance statistics provided in each regression table (VIF has to be less than 10 and the average of all VIFs must not significantly be greater than 1.

4 Normally distributed errors: is ensured by the three plots provided in the appendix.

Before we proceed to the analysis part, we state the assumptions that some relations are based on:

1. The value of intangible assets is used as a proxy for brand value for companies that went public before the theme of brand value measures had been evolved.
2. Private Equity and venture capitalist are considered the same and are used as proxies for institutional investors.
3. Retail investor variable is used as a proxy for brand consumers.
4. Primary shares and percentage shares offered are used as proxies for ownership retention in the IPOs.

Table 3 shows the description of the related variables.

4. Results

2 Austrialia, Brazil, Canada, China, France, Germany, Hong kong, Italy, Japan, Netherlands, Norway, Portugal, Russia, South korea, Sweden, Switzerland, Taiwan, UK, and USA.

3 Defense, airlines, apparel, automobil, banks, beverages, commercial service, cosmetics, financial service, engineering, health care, fashion, insurance, machinary, media, manufacture, oil/gas, resurants, retail, technology, telecom, trasport, and utilities.

For the purpose of being more indicative, we show in detail only the results of sample one, which represents the basic sample that includes 104 international brand companies.

4.1. Descriptive Statistics and Correlations

Table 1 shows the descriptive statistics for the main continuous variables. It reveals that underpricing has very extreme values but on average the IPOs are underpriced by 21.5% which is consistent to the mean IR found in other studies. Offer price has also very extreme points; this is because our data includes two extreme cases (Dai life insurance and Swisscom) companies and after we remove them, data become smoother with a max value of 85 (Google), with a mean value of 16.9 and standard deviation of 13.97. Age also varies from 1 to 150 years. Percentage shares offered can be 100% of total shares, but from our data, non-US companies are more likely to offer a higher percentage (e.g China life, 100%). The average proceeds raised by each brand company is $4.32 Billion, as of 2012 focal year, which is higher than average proceeds found in other studies. The table points that companies recruit, on average, 9 co-manager underwriters that are enough to make IPO publicity by producing reports on the issue. Lock-up return and first-anniversary returns vary as well and associated with very high standard deviations.

Table 1. Descriptive statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Underpricing	104	-.89	4.18	.215	.612
Offer price	104	.2	1549	33.9	152
Age	100	1	150	38.44	43.8
% shares offered	78	.01	1.00	.192	.164
Proceeds ($ millions)	103	12	161,676	4,312	16,266
%Primary shares	104	.00	1.00	.681	.400
Number of co-managers	101	0	54	9	10.9
Brand value ($ millions)	79	2,351	44,294	8,318	8,517
Lock-up return	69	-.90	23.18	.681	2.843
First-year return	70	-1.03	23.12	.962	2.921

Table 2 demonstrates the frequencies for variables with dichotomous, ordinal and nominal nature. It shows that the high frequency of high ranked underwriters is evident. Regarding private equity, only 36% of our sample has one or more private equity investors. Meanwhile, 36% of companies consider retail investors in their IPOs, either in the same tranche collectively with institutional investors or in a separate one. Furthermore, majority of US IPOs are directed to institutional investors, while non-US IPOs consider institutional investors in their international offers, whereas retail investors are mainly considered in national offers. As regards the offer price range, it is evident that the offering within the price range is dominant. Additionally, majority of the IPOs took place after 1990.

Table 2. Frequency table

Variable	Value	Frequency	Percent	Valid Percent
Ritter Rank	7.1	15	14.4	16.0
	8.1	15	14.4	16.0
	9.1	60	57.7	63.8
Private Equity	without PE	67	64.4	64.4
	with PE	37	35.6	35.6
	Total	104	100.0	100.0
Offer Price Range	below	9	8.7	11.4
	within	51	49.0	64.6
	above	19	18.3	24.1

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Offers After 1990s	before	21	20.2	20.2
	after	83	79.8	79.8
% Retail investors	otherwise	67	64.4	64.4
	with retail	37	35.6	35.6

In the same regard, table 4 shows the distribution of variables by sector and by country. Our data belongs to 23 industries. Regarding the number of firms in each industry; technology sector is dominant, it consists 17 companies (about 17%), followed by telecommunications and the financial sector (banks, insurance and other). Telecommunication companies experience the highest average offer price. Again technological companies experience on average the highest initial return. The -1.2% initial return of telecommunication companies is skewed because of the extreme value of Swisscom Company that experienced -89% of underpricing, but after excluding this value, the average becomes moderate 6.3%. Telecommunication companies have on average the highest net proceeds raised per company. Regarding private equity investments, technological companies again took the lion stake. Banks and telecommunication companies are more likely to recruit a larger number of co-manager underwriters. Moreover, technological companies are on the top in terms of abnormal returns on the lock-up and the first anniversary. Finally, the positive relationship between underpricing and brand value is evident not only at the industry level but also at country level as shown in the power part of table 4.

Table 5 shows Pearson correlation coefficients among the main variables. Here we focus on the most relevant correlation only. First, preliminary correlations show that underpricing is positively correlated with both brand value measures Ln(BV) and the ratio BV/Ent. Ln(IR) and Ln(prcds) are negatively correlated, prior research consider proceeds as a proxy for risk; the higher the proceeds, the lower is the risk of the IPO, and hence a lower underpricing. Underpricing and Ln(age) are negatively correlated which reveals that the longer record a company has, the lower is the level of underpricing. Furthermore, IR is strongly positively correlated with both lock-up return, and first-year return, this reveals how underpriced offers over-perform other offers. . Finally, Ln(prcds) is negatively correlated with BV/Ent which indicates that higher brand value does not mean larger proceeds at the IPO, in other words, brand companies now had, on average, not strongly been recognized as brands when they went public, this simple test may overcome the endogeneity problem by claiming that the relationship between IR and brand value is mainly driven by IR. A preliminary multicollinearity test is also revealed in the above matrix since the correlation coefficients are generally below 0.7.

Normality Test: In order to perform a multiple regression, the normality has to be ensured for dependent variables.

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Table 3. Variables' definitions

Variable	Definition	Theoretical background
Ln (BV)	The natural logarithm of the brand value in dollars estimated by Brand Finance Limited in 2011.	Big and known companies experience lower underpricing due to less information asymmetry, Loughran et al. (1994).
(BV/Ent)	The ratio of brand value to the enterprise value in 2011 estimated by Brand Finance Limited.	
(IR)	Percentage difference between first-day trading price and offer price.	Underpricing can be a substitute for marketing to enhance brand value through product market, Stoughton et al. (2001), Habib & Ljungqvist (2001) and others. $\text{Ln(BV)} = \alpha_0 + \alpha_1(After90) + \alpha_2(\%sh) + \alpha_3(Co - mngr) + \alpha_4(IR) + \varepsilon$
(Rank)	The scale of the reputation of underwriters, the values range from 1 to 9, with 9 is the highest.	Recruiting higher ranked underwriters may enhance publicity, Fernando et al. (2005) and others. $\text{Ln(BV/Ent)} = \alpha_0 + \alpha_1(After90) + \alpha_2(IR) + \alpha_3(Rank) + \varepsilon$
% shares	The percentage of shares offered at the IPO from the outstanding shares.	Managers may retain more shares at the IPO to benefit from other follow-on offers when they are confident of firm's fundamentals, Ritter (1984) and Bradley and Jordan (2002). $\text{Ln(BV/Ent)} = \alpha_0 + \alpha_1(PE) + \alpha_2(Co - mngr) - \alpha_3(\%sh) + \alpha_4(\%prim) + \varepsilon$
% primary	The percentage of shares offered that are considered new shares offered to new investors.	
(Within)	A dummy variable, 1 if the offer price is within the price range and 0 otherwise.	Companies attempt to adjust the offer price positively as more information is revealed and this may create more attraction Bradley and Jordan (2002) and Booth and Booth (2003). $\text{Ln(BV/Ent)} = \alpha_0 + \alpha_1(\%sh) + \alpha_2(PE) + \alpha_3(within) + \varepsilon$
(Ret 1)	The abnormal return of the stock with respect to S&P 500 at the lock-up period.	Underpriced offers may over-perform other overvalued offers post IPO, Ritter (1991) and Purnanandam & Swaminath (2004).
(Ret 2)	The abnormal return of the stock with respect to S&P 500 at the first anniversary of the stock.	$\text{Ln(BV)} = \alpha_0 + \alpha_1(PE) + \alpha_2(LnPrcds) + \alpha_3(RET1) + \varepsilon$ $\text{Ln(BV)} = \alpha_0 + \alpha_1(PE) + \alpha_2(LnPrcds) + \alpha_3(RET2) + \varepsilon$
(PE)	A binomial variable, 1 if PE is involved in the IPO and 0 otherwise.	Private equity may have an impact on firm's performance post IPO, Bradley & Jordan (2002). $\text{Ln(BV)} = \alpha_0 + \alpha_1(After90) + \alpha_2(Co - mngr) + \alpha_3(PE) + \varepsilon$
Ln(prcd)	The natural logarithm of the dollar proceeds raised at the IPO on 2012 dollar value.	Larger proceeds, lower risk, hence lower underpricing, Loughran & Ritter (2002), and Booth & Booth (2003).
Age	The number of years since the incorporation of the firm until it goes public.	Another proxy for maturity and risk, Loughran & Ritter (2002).
(OP)	The price of the share when offered at the IPO translated into US dollar at the IPO date.	Can be used as a proxy for risk but no clear direction, Benveniste & Spindt (1989).
After90	A binary variable, 1 if the IPO took place after the year 1990, and 0 otherwise.	IPOs during the 1990s experienced more underpricing, Lee et al. (1999).
(Co-mngr)	The number of co-manager underwriters in the IPO.	A proxy for offer size or information spill-over, Michaely & Womack (1999).
(%Retail)	The percentage of companies that considered retail investors in their IPOs.	A test for divergence of opinion, Aggarwal et al. (2002).
(F-Size)	The value of all assets of the firm on 2012.	Measures the maturity of the brand, Belo et al. (2013).

Note: *1- models presented are author's concept and presentation based on the mentioned theoretical framework. 2- We choose to use 1990 threshold because this decade witnessed the following, the wave of internet IPOs, the emergence of book-building approach, the wave of IPOs driven by privatization, and the emergence of brand value as a concept.*

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Table 4. Variables by industry.

	No.of Firms	Age	OP	IR	%sh	Proceed	%prim	PE	co-mngr	Ret 1	Ret 2	BV
							By Indusrty					
Technology	17	5.5	20.8	82.6	13	1,206	82	0.89	4.8	223	296	15,700
Telecom.	13	34.8	34.13	-1.2	16.3	16,562	40	0.23	16	5.7	28.5	7,000
Banks	12	51	12.6	6.2	12.4	4,824	86	0.25	17.3	30	29.5	8,400
Retail	12	33	16	6.5	8.4	262	70	0.75	4.8	38	86	6,500
Insurance	10	72	168	13.5	31	3,290	70	0.2	10	1.7	10.5	4,100
Lux. Fash.	4	101	12.4	7.4	23	1,031	54	0.25	2.75	-5.7	9	3,600
Oil&Gas	4	22	13.8	4.7	10.8	5,794	17	0	9.5	18.5	21	5,860
Transport.	4	49	27.5	26.5	22.5	2,940	43	0.25	5.3	9.9	8.4	8,700
Other	28	31	18.3	14.8	21.8	2031	80	0.15	6.3	21.8	33.3	6,490
	104						By Country					
USA	55	37	22.5	30.5	14.5	4,929	78	0.56	6.6	95	137	10,220
China	19	31	6.5	30	24	3,890	91	0.32	15	37	46	8,233
Other	30	41	72	-1	22.6	3,469	35	0	9.7	7.8	13.8	5,160
	104											

This table shows the classification of variables by industry and by country. OP is the offer price, IR is the percentage of underpricing, %sh is the of shares offered at the IPO, % prim, is the primary shares offered to new investors, proceed is the total IPO proceeds in $million, PE is the is the private equity existence, co-mngr is the number of co-manager underwriters, RET1 and RET2 are the abnormal stock return at the lock-up and the first year, and BV is the brand value in $million.

Table 5. Pearson correlation matrix.

		IR	Ln(BV)	BV/Ent	Ln(Prcd)	Ln(OP)	ln(Age)	Co-Mngr	RET1	RET2	%sh	%Prim
IR	Correl.	1	.214	.226	-.193	-.036	-.193	-.136	.328	.357	.058	.159
	Sig.		.058	.047	.050	.715	.055	.174	.006	.002	.614	.107
Ln(BV)	Correl.		1	.054	-.012	.078	-.184	.143	.118	.155	-.068	.026
	Sig.			.638	.915	.494	.114	.219	.423	.286	.618	.823
BV/Ent	Correl.			1	-.279	-.001	-.227	-.179	.237	.220	-.034	.030
	Sig.				.014	.992	.052	.125	.109	.132	.807	.793
Ln(Prcd)	Correl.				1	.103	.262	.564	-.172	-.276	.203	-.286
	Sig.					.302	.009	.000	.157	.021	.074	.003
Ln (OP)	Correl.					1	.139	.063	-.050	-.063	.363	-.186
	Sig.						.167	.530	.684	.605	.001	.058
ln(Age)	Correl.						1	.010	-.224	-.262	.017	-.005
	Sig.							.922	.070	.032	.887	.957
Co-Mngr	Correl.							1	-.087	-.130	.002	-.103
	Sig.								.479	.285	.984	.305
RET1	Correl.								1	.975	-.070	.126
	Sig.									.000	.607	.303
RET2	Correl.									1	-.093	.166
	Sig.										.492	.169

%sh	Correl.	1	-.062
	Sig.		.587
%Prim	Correl.		1
	Sig.		

This table presents the person correlation coefficients, Correl is the 2-tailed Pearson correlation coefficient, Sig is the p-value. IR is the percentage of underpricing, Ln(BV) is the natural logarithm of brand value, BV/Ent is the ratio of brand value to enterprise value, Ln(prcd) is the natural logarithm of IPO proceeds, OP is the offer price, Ln(Age) is the natural logarithm of Age, Co-Mngr is the number of co-manager underwriters, RET1 and RET2 are the abnormal stock returns on the lock-up and the first year, %sh is the percentage of shares offered out of total shares, and %Prim is the primary shares offered to new investors.

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As table 6 demonstrates, a natural logarithm transformation to the selected variables was executed. As for Kolmogorov-Smirnov and Shapiro-Wilk tests, null hypothesis of non-normality of variables is rejected since the significance is above 5% level. And as for Skewness and Kurtosis, null hypothesis is also rejected as the value of statistics of both tests lie between -1 and 1.

Table 6. Normality test.

	Kolmogorov-Smirnov[a]			Shapiro-Wilk			Skewness		Kurtosis	
	Statistic	df	Sig.	Statistic	df	Sig.	Statistic	Std. Error	Statistic	Std. Error
ln(IR)	.169	21	.121	.950	21	.338	.052	.501	1.032	.972
Ln(BV)	.137	21	.200*	.893	21	.075	.973	.501	.640	.972
ln(BV/Ent)	.124	21	.200*	.949	21	.321	-.642	.501	.640	.972

*a. Lilliefors Significance Correction *. This is a lower bound of the true significance. Ln(IR) is the natural logarithm of underpricing, Ln(BV) is the natural logarithm of brand value, and Ln(Bv/Ent) is the natural logarithm of of BV/Ent. Df is the degree of freedom, Sig is the level of significance, and Std. error is the standard error.*

4.2. Results of Hypotheses Testing

Hypothesis one, H_1: Underpricing and brand value measures are negatively correlated.

In the following two regressions, we use underpricing as a determinant of brand value measures derived from the fact that companies had not been strongly recognized as strong brands at the time of their IPOs.

In the regression shown in table 7, we controlled for some variables that we perceive as determinants of brand value like the period of the IPO, the number of co-manager underwriters and the percentage shares offered at the IPO. Model 2, after adding the predictor variable (underpricing), R^2 jumped from 27.2% to 32.8% making 5.6% R^2 change and is significant at 5% level, therefore, underpricing has a significant explanatory power for brand value. This result supports the findings of DuCharme et al. (2001), Demers and Lewellen (2003) in which they find similar conclusions. We rewrite the model as follows:

$$Ln(BV) = 9.175 - .98\,(after90) + .022\,(co-mngr) + .48\,(IR) + \varepsilon$$

Table 7. Underpricing and Ln(BV)

Model	R^2	Adj. R^2	Std. Error. Estimate	Change Statistics					D-W
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	.272	.230	.615721	.272	6.490	3	52	.001	0.744
2	.328	.276	.597394	.056	4.239	1	51	.045	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	9.302	.232		40.171	.000			0.001
	After90	-1.015	.250	-.511	-4.061	.000	.885	1.130	
	%sh	-.184	.547	-.040	-.336	.738	.989	1.012	
	Co-mngr	.020	.007	.359	2.860	.006	.890	1.123	
2	(Constant)	9.175	.233		39.373	.000			0.000
	After90	-.983	.243	-.495	-4.046	.000	.881	1.135	
	%sh	-.148	.531	-.032	-.278	.782	.988	1.013	
	Co-mngr	.022	.007	.382	3.130	.003	.882	1.133	
	IR	.480	.233	.239	2.059	.045	.979	1021	

Dependent Variable: Ln(BV). In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variable (IR). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the collinearity statistics. (after90) is the dummy for IPOs after 1990, (%sh) is the % of shares offered, (co-mngr) is the number of co-manager underwriters, and (IR) is the % of underpricing.

This can be interpreted as for each 10% increase in underpricing, keep other factors unchanged, there is a 4.8% increase in brand value two years following the IPO which is consistent with Habib and Ljungqvist marketing expense substitution approach.

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In the second regression of the first hypothesis, we used underpricing as a determinant of Ln(BV/Ent) ratio. We controlled for the time period of the IPO, the rank of the underwriter and the firm size. Moreover, in model 2, we add underpricing as a predictor variable, R^2 improved from 24.2% to 30.6% adding 6.4% explanatory power, as the values are statistically significant; these findings support the previous regression which is consistent with prior studies. We can rewrite the model as follows:

$$Ln\left(\frac{BV}{Ent}\right) = .029 - .55(After90) + .18(Rank) - .28(F - Size) + .57(IR) + \varepsilon$$

Table 8. Underpricing and BV/Ent

Model	R^2	Adj. R^2	Std. Error. Estimate	Change Statistics					D-W
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	.242	.208	.64479	.242	7.229	3	68	.000	1.947
2	.306	.264	.62153	.064	6.184	1	67	.015	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	.008	1109		.007	.995			0.000
	After90	-.523	.181	-.309	-2.896	.005	.980	1.020	
	Rank	.175	.073	.254	2394	.019	.993	1.007	
	F-Size	-.265	.083	-.340	-3.196	.002	.987	1.014	
2	(Constant)	.029	1069		.027	.979			0.000
	After90	-.550	.175	-.325	-3.153	.002	.976	1.024	
	Rank	.180	.071	.260	2544	.013	.992	1.008	
	F-Size	-.276	.080	-.354	-3.445	.001	.984	1.017	
	IR	.569	.229	.254	2.487	.015	.994	1007	

Dependent Variable: Ln(BV/Ent). In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variable (IR). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the collinearity statistics. (after90) is the dummy for IPOs after 1990, (Rank) is the underwriter's rank, (F-size) is the value of assets, and (IR) is the % of underpricing.

In the following part, we discuss these results in accordance to some firm and underpricing theories. First of all, some researchers like Habib and Ljungqvist (2001), DuCharme et al. (2001), Krigman et al. (1999), and Demers and Lewellen (2003) argue that companies use underpricing to increase their marketability post-IPO, here we come up with the controversial question, which comes first? Do higher brand value companies underprice more? Or does a higher underpricing lead to a higher brand value ex-ante?

On the one hand, if higher brand value companies tend to underprice more, this indicates three rational explanations. First, here I argue, for brand companies, that the value of the firm (offer price) equals to the present value of future cash flow plus the present value of brand equity. Issuers and underwriters set the offer price at discount (or partly at discount) of brand equity value to compensate institutional investors for their premium valuation, information discovery and involvement in the IPO, this is consistent with (Lane and Jacobson 1995).

The second explanation is the divergence of opinions between informed and uninformed investors which may produce a conflict of interest between short-term and long-term investors' interest. Here I call it *"customers as potential investors"* in brand companies; I refer to customers as uninformed investors who base their investment in the IPO on their perception of the brand name and quality, while informed investors base their investment decisions on short-term profit maximization. Based on our descriptive data, (assuming retail investor is a proxy for consumers), there are 36% of companies consider retail investors in their IPOs, 64% of companies offer only to institutional investors, meanwhile, only 4% of our sample offer only to retail investors, these statistics shed the light on the relative importance of retail investors in the IPOs, therefore, this process results in a divergence of opinions that leads to some bias in the IPO since informed investor are rationed and favored in good offers while uninformed are not. Moreover, there is a statistically strong positive

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correlation between IR and private equity, previous studies argue that the existence of private equity investors should reduce underpricing, but Bradley and Jordan (2002) and (Ivanov, 2004) and others show that IPOs with private equity experience higher levels of underpricing. On the contrary, % of retail investors' involvement is negatively correlated to the level of IR, which gives a glimpse that retail investors are less considered in hot issues (winner's curse). This explanation is consistent with the winner's curse explanation. We show the existence of winner's curse in the following test.

As is shown in table 9, there is a significant negative relationship between IR and the % involvement of retail investors. In the same context, if -as we assume- that brand value is a proxy for firm quality; this proves that retail investors are allowed to engage in less quality firms.

Rational theories can also play a role in explaining this relationship. The results are consistent with Prospect theory proposed by Loughran and Ritter (2002), other related papers used the same behavioral rationale as well like Ljungqvist, Jenkinson and Wihhelm (2003), Liu and Ritter (2010) and others. It states that issuers (executives) not only want to maximize the proceeds of the IPO but also the proceeds from future sales in addition to the side payments paid to the executives, therefore executives choose high ranked underwriters with a history of underpricing because they can boost the valuation easier than low ranked underwriters, and executives who are spun shares will seek underwriters that are able to allocate underpriced IPOs to the executives, or to maximize the proceed in the follow-on offering.

Table 9. Retail investors and underpricing

Model	R^2	Adj. R^2	Std. Error. Estimate	Change Statistics					D-W
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	.180	.146	114671	.180	5.267	3	72	.002	2.139
2	.226	.183	112172	.046	4.244	1	71	.043	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	-2.179	.565		-3.858	.000			0.002
	After90	.583	.407	.178	1.432	.157	.735	1.361	
	PE	1005	.296	.399	3401	.001	.829	1.207	
	Ln Prcds	-.092	.079	-.146	-1.165	.248	.726	1.378	
2	(Constant)	-1.983	.561		-3.537	.001			0.001
	After90	.559	.399	.171	1.403	.165	.734	1.362	
	PE	.948	.291	.376	3263	.002	.821	1.218	
	Ln Prcds	-.087	.077	-.138	-1.125	.264	.725	1.380	
	% Retail	-.568	.276	-.216	-2.060	.043	.987	1013	

Dependent Variable: Ln(IR). In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variable (% retail). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the collinearity statistics. (after90) is the dummy for IPOs after 1990, (PE) is the presence of private equity, (Ln prcds) is the natural logarithm of proceeds value, and (%Retail) is the presence of retail investors.

On the other hand, if higher levels of underpricing lead to higher brand values ex-ante, it means that issuing companies use underpricing as a strong marketing tool to improve their marketability, consequently an improvement in corporate fundamentals like sales and earnings per share, this argument was partially tested by Purnanandam and Swaminath (2004) in which they find that on average undervalued IPOs over-perform overvalued IPOs in some fundamentals. In accordance, Habib and Ljungqvist (2001) also argue that underpricing is a substitute for costly marketing expenditures. It additionally complements the findings of DuCharme et al. (2001), Demers and Lewellen (2002), Krigman et al. (1999), Rajgopal et al. (2000), Stoughton et al. (2001), and Fleischer (2006) who have started to investigate other explanations for underpricing during the internet bubble late 1990s, they find that high levels of underpricing during the internet bubble were mainly to create a strong brand value post-IPO.

At the end we are sure that there exists a relationship between brand value measures and underpricing, but we can't strongly say that higher underpricing leads to higher brand value, neither higher brand value companies underprice more, thus, it is a correlational rather than a causality

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relationship, but we can partially overcome this endogeneity problem by partially supporting the first premise that underpricing enhances brand value ex-ante since we find a positive association between underpricing and brand value, and brand values are negatively correlated with proceeds. Furthermore, the descriptive statistics show that brand companies had not been recognized as strong brands when they went public; consequently, we support the second explanation that underpricing enhances to brand value ex-ante.

Hypothesis Two, H_1: Higher brand values are positively associated with higher ranked underwriters.

Based on the concept and the model of Fernando et al. (2005), they argue that underwriter ability and issuer quality are complementary and the relation is decided by a mutual choice based on positive assortative behavior.

In the following regression, we consider firm quality, measured by BV/Ent ratio as the dependent variable while the rank of the underwriter as the predictor variable. In the regression shown in table 10, we controlled for the period of the IPO and the level of underpricing. Model 1 with control variables explains only 11.4% of Ln(BV/Ent), and is statistically significant.

Table 10. Underwriter's rank and brand value

Model	R^2	Adj. R^2	Std. Error. Estimate	Change Statistics					D-W
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	.114	.088	.69205	.114	4.428	2	69	.016	1.943
2	.183	.147	.66937	.069	5.755	1	68	.019	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	-1.496	.170		-8.796	.000			0.016
	After90	-.442	.192	-.261	-2.299	.025	.997	1.003	
	IR	.512	.254	.228	2.011	.048	.997	1.003	
2	(Constant)	-3.008	.651		-4.617	.000			0.003
	After90	-.480	.187	-.283	-2.572	.012	.990	1.010	
	IR	.527	.246	.235	2.139	.036	.996	1.004	
	Rank	.183	.076	.264	2.399	.019	.992	1.008	

Dependent Variable: Ln(BV/Ent). In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variable (Rank). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the collinearity statistics. (after90) is the dummy for IPOs after 1990, (IR) is the % of underpricing, (Rank) is the underwriters rank.

When adding underwriter's rank in model 2 as the predictor, R^2 improved by 6.9% with a statistical positive significance at 5% level; means that, on average, high ranked underwriters select companies with potential brand values to deliver them public and create a sort of business relations for follow-on offers, it can also be that underwriters anticipate the increase in brand value before the IPO and they search for these kind of companies. Thus, these findings are consistent with the findings of Fernando et al. (2005). Therefore, the null hypothesis is rejected; we rewrite the model as follows:

$$Ln\left(\frac{BV}{Ent}\right) = -3.0 - .48(After90) + .53(IR) + .18(Rank) + \varepsilon$$

Hypothesis three, H_1: There is a statistical positive relationship between brand value measures and retention measures.

To perform this analysis, we use two proxies for retention measures, the first is the percentage of shares offered, a higher percentage indicates a lower retention, and the second is the percentage of primary shares out of total shares offered, a higher percentage indicates more new shares offered and retaining more by insiders.

In the regression presented in table 11, model 1 with the control variables explains 30.7% of brand value and statistically significant at 1% level. In model 2 we added both predictors (%sh and %prim), the explanatory power has not improved significantly. In the end, we are not sure that

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higher retention measures enhances brand value post-IPO, and thus we do not reject the null hypothesis.

Table 11. Retention measures and brand value

Model	R2	Adj. R2	Std. Error. Estimate	Change Statistics					D-W
				R2 Change	F Change	df1	df2	Sig. F Change	
1	.307	.281	.595054	.307	11.760	2	53	.000	0.636
2	.323	.270	.599670	.016	.594	2	51	.556	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	(Constant)	8.201	.128		64.105	.000			0.000
	PE	.774	.170	.527	4.564	.000	.982	1.019	
	Co-mngr	.015	.007	.259	2.243	.029	.982	1.019	
2	(Constant)	8.188	.212		38.609	.000			0.000
	PE	.761	.174	.518	4.382	.000	.951	1.052	
	Co-mngr	.015	.007	.269	2.307	.025	.975	1.025	
	%sh	-.457	.531	-.099	-.860	.394	.993	1.007	
	%Prim	.134	.211	.075	.635	.528	.965	1.037	

Dependent Variable: Ln(BV). In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variables (%sh and %prim). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the collinearity statistics. (PE) is the presence of private equity, (Co-mngr) is the number of co-manager underqriters, (%sh) is the % shares offered, and (%prim) is % of primary shares to new investors.

Hypothesis four, H_1: Offering within the range is positively associated to brand value post-IPO.

Here we try to answer whether offering shares at the IPO within the price range enhances brand value ex-ante? Brand value is used as a dependent variable while (within) is used as a predictor variable.

Table 12. Brand value and offer price range

Model	R^2	Adj. R^2	Std. Error. Estimate	Change Statistics					D-W
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	.257	.195	.61466	.257	4.142	3	36	.013	1.614
2	.271	.188	.61711	.015	.715	1	35	.403	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	Constant	-4.209	1.217		-3.460	.001			0.013
	%sh	-1.161	.600	-.286	-1.935	.061	.948	1.055	
	Rank	.297	.136	.325	2.186	.035	.933	1.071	
	PE	.380	.210	.263	1.805	.080	.972	1.029	
2	Constant	-3.888	1.279		-3.040	.004			0.023
	%sh	-1.386	.658	-.341	-2.105	.043	.793	1.261	
	Rank	.279	.138	.306	2.023	.051	.912	1.097	
	PE	.388	.212	.269	1.834	.075	.970	1.031	
	within	-.193	.228	-.134	-.846	.403	.834	1.200	

Dependent Variable: ln(BVEnt). In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variable (within). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the collinearity statistics. (%sh) is the % shares offered, (Rank) is the underwriters rank, (PE) is the presence of private equity, and (within) is a dummy if the offer price is within price range.

In the regression summarized in table 12 and after controlling for the percentage shares offered, the rank of the underwriter and private equity investment, we notice that R^2 has not improved significantly after adding the predicator variable (within). Therefore, we can't reject the null hypothesis that brand value and offering the shares "within" are not associated.

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Hypothesis five, H_1: Over-performing post-IPO and brand value ex-ante are positively associated.

In this hypothesis, we investigate the relationship between brand value from one side and the stock performance post-IPO on the other side. RET1 and RET2 are the abnormal returns of the IPO over the S&P 500 on the lock-up period and on the first anniversary of the IPO respectively.

In the regression presented in table 13, in model 1 we controlled for the private equity and the proceeds raised at the IPO, these variables are traditionally used by finance scholars to explain the stock performance post-IPO (medium and long term) Bradley et al. (2001), Brav and Gompers (2003), however, here we use them as control variables for the brand value post-IPO.

Table 13. Brand value and lock-up return

Model	R^2	Adj. R^2	Std. Error. Estimate	Change Statistics					D-W
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	.261	.228	.626923	.261	7.950	2	45	.001	0.678
2	.264	.214	.632883	.003	.156	1	44	.694	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	Constant	7.448	.421		17.696	.000			0.001
	PE	.813	.208	.543	3.907	.000	.851	1.176	
	Ln (Prcds)	.126	.056	.312	2.244	.030	.851	1.176	
2	Constant	7.424	.429		17.297	.000			0.003
	PE	.797	.214	.532	3.728	.001	.821	1.218	
	Ln (Prcds)	.129	.057	.319	2.256	.029	.835	1.197	
	RET1	.011	.029	.053	.396	.694	.919	1.088	

Dependent Variable: LnBV . In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variable (RET1). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the collinearity statistics. (PE) is the presence of private equity, (Ln prcds) is the natural logarithm of the proceeds, and (RET1) is the abnormal stock return on the lock-up.

Table 13 shows that Model 1 with control variables explains 26.1% of the brand value and statistically significant at 1% level, but in model 2, when RET1 is introduced, R^2 has not significantly improved, therefore the performance of the stock at the lock-up is not related to brand value, and hence, null hypothesis is not rejected.

Similar to the previous test, Table 14 shows no significant relationship between brand value and first-year return; therefore, we cannot reject the null hypothesis that making extra return on their first year of the IPO enhances brand value.

Table 14. Brand value and year-return

Model	R^2	Adj. R^2	Std. Error. Estimate	Change Statistics					D-W
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	.261	.229	.620299	.261	8.135	2	46	.001	0.691
2	.268	.220	.624134	.007	.437	1	45	.512	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	Constant	7.454	.415		17.941	.000			0.001
	PE	.815	.206	.547	3.962	.000	.844	1.185	
	Ln Prcds	.125	.055	.312	2.262	.028	.844	1.185	
2	Constant	7.384	.431		17.120	.000			0.003
	PE	.782	.213	.524	3.674	.001	.798	1.254	
	Ln Prcds	.133	.057	.334	2.341	.024	.797	1.255	
	RET2	.019	.029	.092	.661	.512	.839	1.192	

Dependent Variable: LnBV. In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variable (RET2). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the

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collinearity statistics. (PE) is the presence of private equity, (Ln prcds) is the natural logarithm of the proceeds, and (RET2) is the abnormal stock return on the first anniversary.

Hypothesis six, H_1: Companies with more PE investment exhibit higher brand values post-IPO.

Table 15. Brand value and private equity

Model	R^2	Adj. R^2	Std. Error. Estimate	Change Statistics					D-W
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	.144	.120	.666307	.144	6.120	2	73	.003	0.724
2	.318	.290	.598517	.175	18.473	1	72	.000	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	Constant	8.964	.162		55.366	.000			0.003
	Co-mngr	.018	.007	.289	2.460	.016	.852	1.173	
	After90	-.644	.199	-.380	-3.242	.002	.852	1.173	
2	Constant	8.529	.177		48.131	.000			0.000
	Co-mngr	.017	.007	.273	2.589	.012	.851	1.175	
	After90	-.357	.190	-.211	-1.876	.065	.748	1.337	
	PE	.675	.157	.449	4.298	.000	.867	1.154	

Dependent Variable: LnBV. In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variable (PE). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the collinearity statistics. (co-mngr) is the number of co-manager underwriters, (after90) is the dummy for IPOs after 1990, and (PE) is the presence of private equity.

In the regression shown in table 15, PE is used as a predictor variable, while Ln(BV) as a dependent variable. Moving from model 1 to model 2, R^2 jumps from 14.4% to 31.8% making 17.5% R^2 change with zero p-value, making private equity as a strong predictor of higher brand values post-IPO and hence we reject the null hypothesis that there no relationship between private equity and brand value. We can rewrite the model as follows:

$$\mathrm{Ln(BV)} = 8.53 + .017(\mathrm{co-mngr}) - .36(\mathrm{After90}) + .68(\mathrm{PE}) + \varepsilon$$

This result complements the results of Liu and Ritter (2010) and Cliff and Denis (2004) in that IPOs with more private equity investments are more likely to be underpriced more and underpriced issues are more likely to have higher brand values otherwise private equities are not involved in cold issues.

It is important to mention that private equity is different from venture capitalists in which PEs invest in control (more strategic and long-term), while VCs seek short-run investments with no control percentage, this fact can partially explain that the existence of PE can enhance long term value by creating higher brand values.

Hypothesis seven, H_1: Brand value and underpricing are associated in a quadratic relationship.

Notwithstanding we show that there is a statistical positive relationship between brand value and the level of underpricing, we are not sure that this relationship is constantly increasing or there is a turning point for the direction of the relationship, thus it's logically and statistically important to test the non-linearity relationship between the brand value and underpricing. In this regard, we test if a higher level of underpricing is related to a higher brand value ex-ante, but up to a certain level of underpricing, because too much underpricing can be very costly and may destroy the value by revealing some IPO abuses and legal liabilities.

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Table 16. Linearity relationship

Model	R^2	Adj. R^2	Std. Error. Estimate	Change Statistics					D-W
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	.046	.033	.743075	.046	3.689	1	77	.058	.257
2	.062	.037	.741493	.016	1.329	1	76	.253	

Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics		Model Sig.
		B	Std. Error	Beta			Tolerance	VIF	
1	Constant	8.624	.091		94.994	.000			0.058
	IR	.516	.269	.214	1.921	.058	1.000	1.000	
2	Constant	8.624	.091		95.194	.000			0.087
	IR	.815	.373	.337	2.185	.032	.518	1.932	
	IR^2	-.343	.297	-.178	-1.153	.253	.518	1.932	

Dependent Variable. In the upper part of this hierarchical regression we show model summary, model 1 with control variables only, in model 2 we add the predictor variable (IR^2). R^2 change for model 2 is the incremented explanatory power of the predictor. D-W is the durbin Watson statistic for serial correlation. The lower part shows the statistical significance of independent variables and the collinearity statistics. (IR) is the % of underpricing, and (IR^2) is the squared IR.

The summary of this regression reveals that there is no quadratic relationship between IR and brand value, means that, companies may use underpricing up to extreme levels to show more quality, bring more publicity, or attain higher brand values ex-ante, and thus we can't reject the null hypothesis which states that the association between underpricing and brand value is not quadratic.

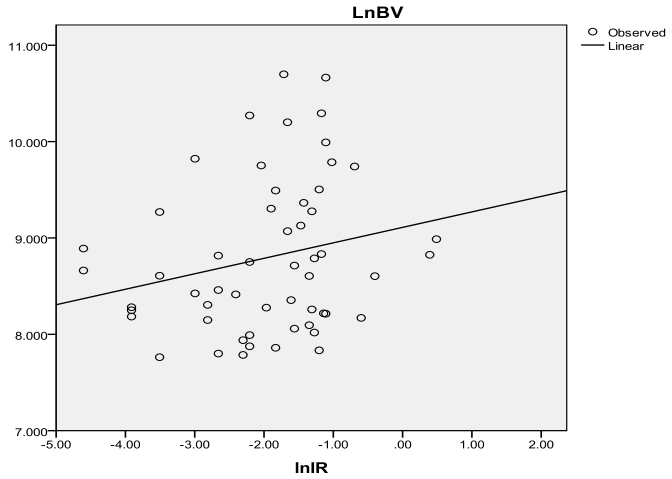

Figure 1. Linearity relationship

Additionally, figure 1 depicts a linear relationship between brand value and underpricing which support the findings of the linear regressions, whereas the non-linear relationship is not evident.

After completing the analysis of all samples, in table 17 we provide concluding remarks for the analysis in the empirical part through a summary table that compares the end results of the relationships between brand value and all IPO variables in the three samples.

The main sample includes all 104 companies in all industries and countries, while in sample 1 we dropped technological, banking, and telecommunication sectors from the main sample and sample 2 includes only US companies since they comprise the majority of the main sample (about 52%).

Table 17. summery of the analysis

	Main sample		Sample 1		Sample 2	
Relationship	**Sig**	**Sign**	**Sig**	**Sign**	**Sig**	**Sign**
Brand value and underpricing	Yes	Positive	Yes	Positive	Yes	Positive
Brand value and underwriter rank	Yes	Positive	Yes	Negative	Yes	Positive
Brand value and % shares offered	No	-	Yes	Positive	Yes	Negative
Brand value and % primary shares	No	-	No	-	Yes	Negative
Brand value and price range (within)	No	-	Yes	Negative	Yes	Negative
Brand value and Ret 1	No	-	No	-	No	-
Brand value and Ret 2	No	-	No	-	No	-
Brand value and private equity	Yes	Positive	No	-	Yes	Positive
Nonlinear relationship (BV and IR)	No	-	No	-	No	-

Main sample includes all the 104 companies, sample 1 includes only US companies, and sample 2 excludes banking, technological and telecommunication. (sig) is the significance of the relationship as indicated in each regression, and (sign) is the direction of the relationship.

Table 17 clearly shows some relations retained their signs in the three samples but with variations in the significance of the relationship. First, the relationship between brand value and underpricing remains significant and positive in all sections which makes it more robust. Brand value and price range (within) remains negative while the relation is significant in two samples. The relation between brand value and the stock performance on the first anniversary is insignificant in all sections. Moreover, in the three samples there is a significant relation between brand value and private equity investment making the relationship more rigorous. Finally, it is also obvious that the non-linear relationship between brand value and underpricing does not exist.

5. Conclusions

The relationship between underpricing and brand value seem to be the most established one in terms of significance and direction. In the three samples underpricing is positively and significantly related to brand value which supports the premise that companies use underpricing to enhance their brand value ex-ante through the product market.

Moreover, we show evidence that there exists a relationship between brand value underwriter's rank. The relationship is significant in all samples but positive only in two samples. It is not positive in all samples because we find that brand companies now had on average not been recognized as strong brands when they went public.

Regarding brand value and retention proxies (% shares offered and % of primary shares), we provide mixed results with no strong evidence of neither high nor low retention since the two proxies show no consistency in terms of direction and significance of the relationship.

In the same vein, the relation between brand value and offering the stock "within" the price range, we show a sort of consistency in which companies that offered within are least likely to exhibit higher brand values. Furthermore, brand value and post-IPO stock performance are not correlated; hence, we provide no evidence that over or under-performance is related to higher brands post-IPO.

We also test the relationship between brand value and private equity investment, we show a strong and positive relationship, which indicates that private equity is considered an important element in determining brand value ex-ante by discounting growth opportunities attributed to higher brand value.

Finally, by testing the non-linear relationship between brand value and underpricing, we show that the two variables are correlated in a linear rather than non-linear association; this indicates that companies may use extreme underpricing as a brand-enhancing tool.

More general conclusions can also be drawn. *First*, some information asymmetry models hold in explaining underpricing like the winners' curse and information revelation models. *Second*, higher brand value now does not mean higher proceeds when the company went public, thus, supports the idea that these companies had not been big and not strongly recognized brands, hence, they experienced uncertainty in terms of information asymmetry, and consequently higher private equity investment and higher underpricing. *Third*, initial public offerings and underpricing can be used as financial market-based tools to enhance brand value. *Fourth*, investors seem to discount brand values

 doi:10.20944/preprints201607.0016.v1

when investing in the IPOs which gives a support how brands affect firm's value through discounting future cash flows attributed to brands.

Few studies have investigated the relationship between going public and future brand value creation. They find evidence that going public and being underpriced at the IPO seem to be correlated with brand value. Our findings integrate with the previous studies and add to body of literature of both finance and IPOs on one side, and marketing and brands on the other. Therefore we draw some managerial implication related to our findings.

1. Based on the facts regarding the decline in the IPO activity after 2000, going public with strong fundamentals reveals the good side of the company and enhances its value, and might be in this case, running independently is better than being acquired by a bigger peer that can reenergize the IPO market again which is positively related to macro-economic activity.
2. Management should not be scared of leaving money on table since underpricing is more image enhancing than overpricing. Facebook Company was overpriced with respect to its peers; it started to be out of the top brands directly after it went public.
3. If the management is confident of the current corporate fundamentals and future prospects, they should not be reluctant to challenge the market. Google Company challenged the market by using auction rather than book-building approach that does not favor institutional investors, now it enjoys of the highest globally brand value.
4. Finance and brand marketing are not isolated from each other, companies should adopt a more holistic approach in drawing the long term strategy, and there should be no superiority for one department over the other.

Since this study is considered one of the exploring studies in this area, and almost the only one that directly connected IPO variables to brand value; future research is needed to complete the picture and draw more conclusive relation between going public and brand value. First, more research is needed to investigate that brand companies underprice more as a distinction, or companies deliberately underprice to create future brand values, in this regard research needed to distinguish between companies that had already been recognized brands at the time of the IPO and other non-brand companies. Furthermore, research is needed to support which companies underprice more, business to business "B2B" or business to consumer "B2C". Additionally, more case studies are very important to give a stronger insight on the relationship between IPOs and brand values. Finally, studying the companies that wanted to go public but didn't, and the companies that were acquired instead of going public.

Appendix

In this appendix we provide the assumptions' tests of the regressions provided in the analysis part. The ordinary regression assumptions are: independence of residuals (no serial correlation), residuals are normally distributed, constant variance of residuals (hemoscedasticity) and independent variables are not correlated (no multicollinearity). For each regression in the analysis part, three plots are provided that ensure that the four principle regression assumptions are not violated.

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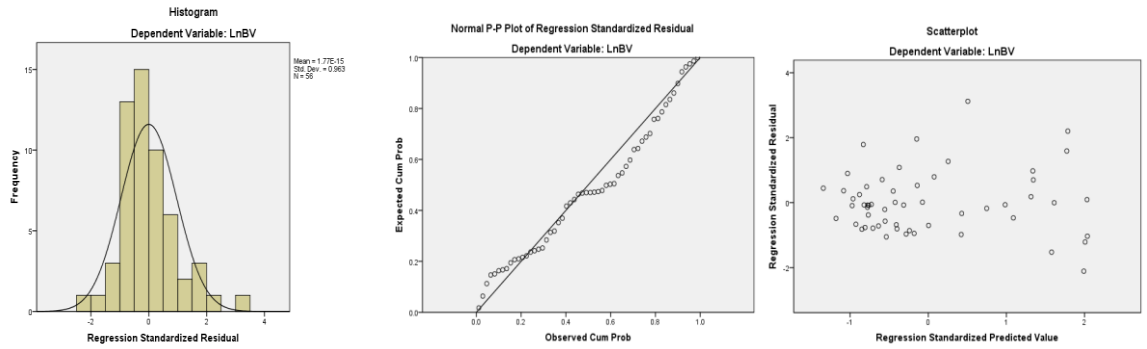
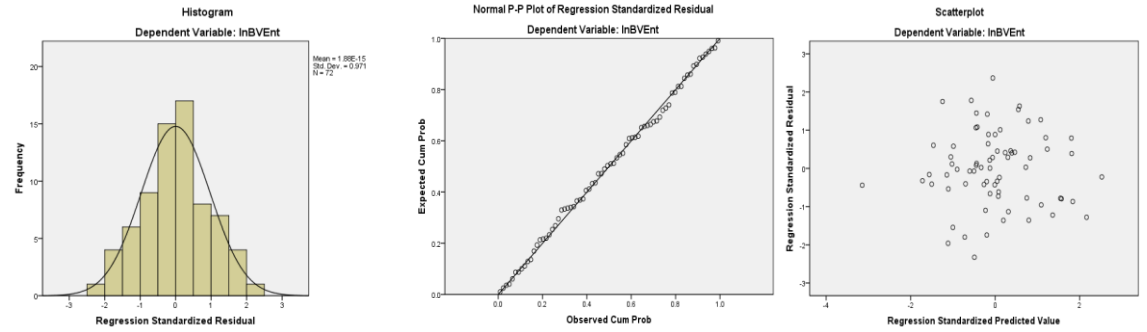
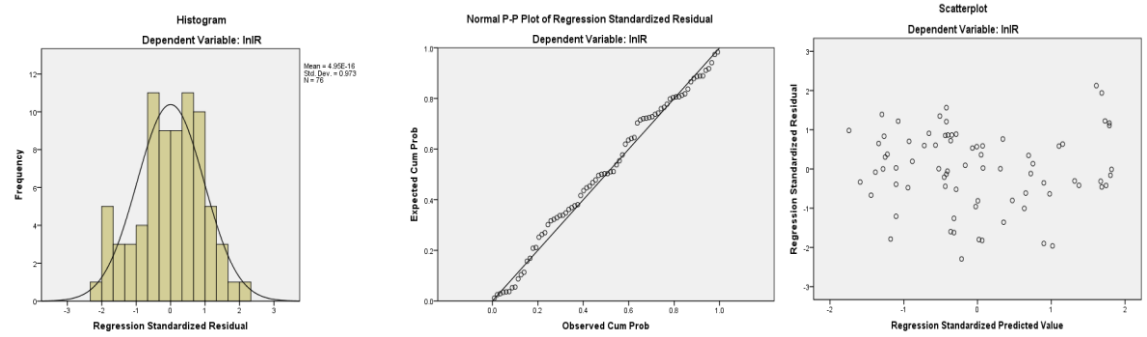
Underpricing and Ln(BV)



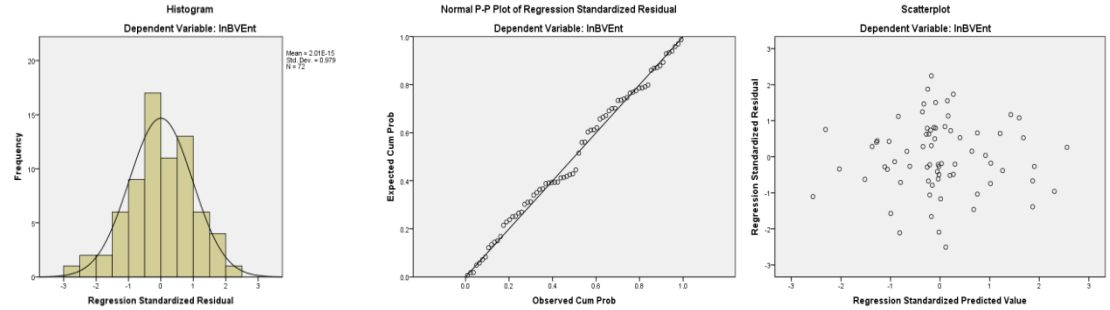
Underpricing and Ln(BV/Ent)



Underpricing and retail investors



Brand value and underwriter's rank



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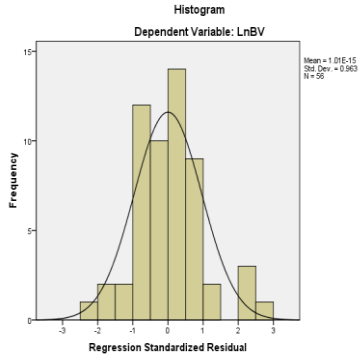
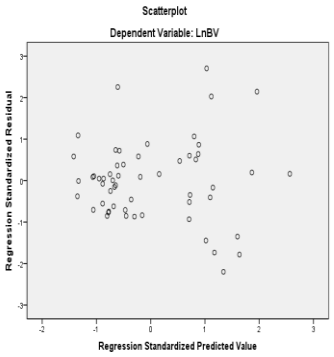
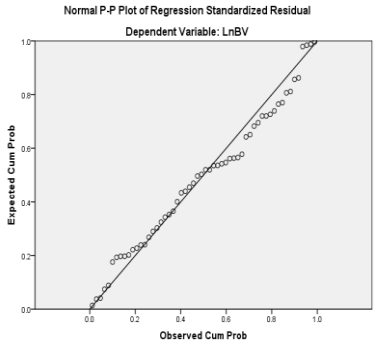
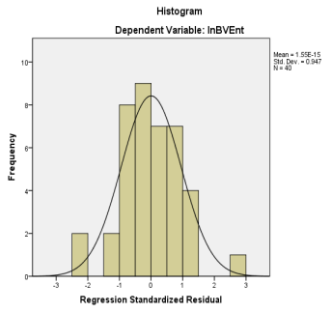
Brand value and retention measures

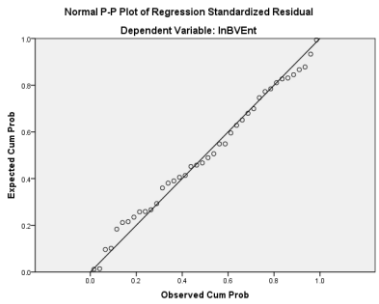


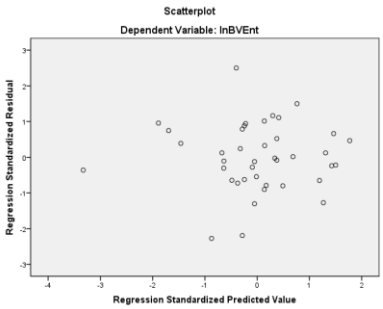




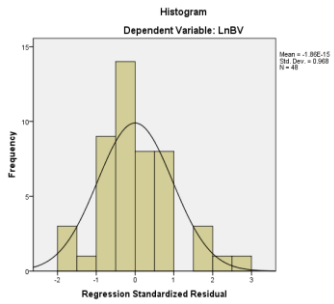
Brand value and offer price range

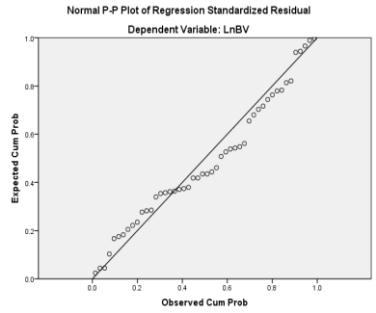


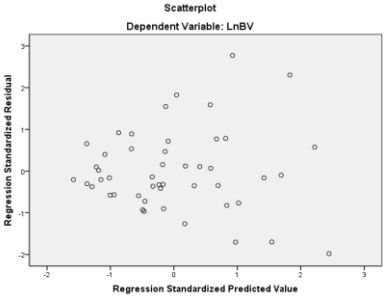




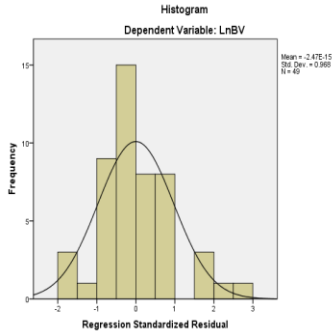
Brand value and lock-up return

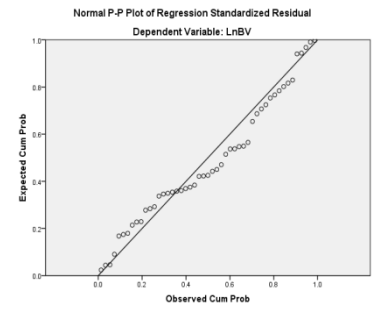


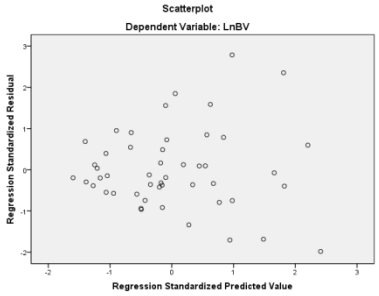




Brand value and first-year return







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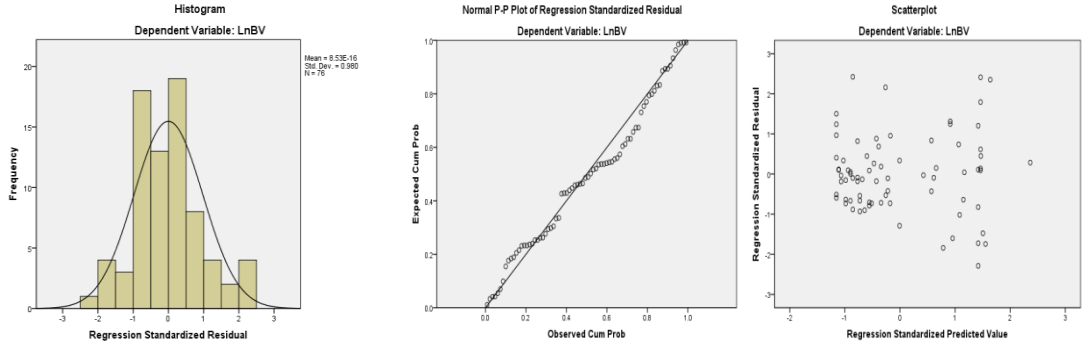
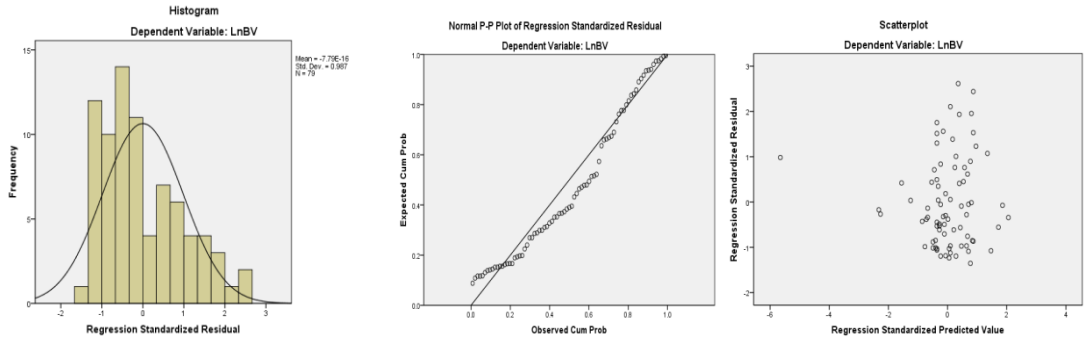
Brand value and private equity



Linearity test

In this particular regression, assumptions' tests are accepted with caution given that both independent variables IR and IR^2 are highly correlated. This correlation caused D-W value to be very low, makes residuals to be correlated or clustered, the values of VIFs to be high (collinearity) and residuals are not normally distributed.



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