Underwriter reputation: Does it matter?

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ABSTRACT

ENGLISH

We show that, between 1980 and 2011, IPOs underwritten by lead underwriters with a higher reputational level tend to have higher first-day returns and less negative market-adjusted long-run returns. Furthermore, we find evidence that the best measures for explaining the behaviour of the market-adjusted initial return and long-run return of the IPOs are the yearly market-share by gross proceeds and the Carter-Manaster (CM) rank, respectively. However, when considering the full sample divided into three periods, only the 80s present contrary results when it comes to the initial returns: IPOs underwritten by low prestige investment banking firms tend to have higher first-day returns. Moreover, the measures that best explain the changes in the first-day returns are the CM and the Gross Spread (GS) rankings.

PORTUGUÊS

Mostramos que, entre 1980 e 2011, as Ofertas Publicas Iniciais (OPI) subscritas por bancos de investimento com elevada reputação tendem a ter retornos de primeiro dia mais elevados e retornos de longo-prazo menos negativos quando comparados com os do mercado. Adicionalmente, encontramos evidência de que os melhores métodos para explicar a variação dos retornos iniciais e de longo-prazo ajustados pelo mercado são a quota anual de mercado por receitas brutas e o ranking Carter-Manaster (CM), respetivamente. Contudo, quando dividimos a nossa amostra em três períodos, apenas os anos 80 apresentam resultados contrários no que diz respeito aos retornos iniciais: OPI subscritas por bancos de investimentos de menor prestígio tendem a ter retornos de primeiro dia mais elevados. Além disso, as medidas que mais bem explicam as mudanças nos retornos de primeiro dia são os rankings de CM e de Spread.

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Contents

1 Introduction

An Initial Public Offering (IPO) is defined as the event where a private company sells its shares for the first time in the market, thus becoming publicly traded. This is a topic extensively discussed nowadays due to several aspects, such as the abnormal number of offers in some periods, the phenomenon of underpricing, and the market-adjusted long-run performance.

The average number of firms going public in the U.S., per year, decreased sharply after the technology bubble (1999-2000). Gao et al. (2013) show that the drop after the bubble burst might be explained not only by the Sarbanes Oxley Act (SOA)[1] of 2002, but also because firms tend to take advantage of selling out to bigger and more recognized organizations, which can improve a product and contribute to economies of scope, rather than simply acting as independent companies. However, before and during the bubble, there were periods marked by a considerable number of IPOs and an extreme underpricing, known as "hot-issue" periods (Ritter (1984), Günther and Rummer (2011), Helwege and Liang (2004)).

According to Loughran and Ritter (2004), underpricing reached values of 7% during 1980-1989, nearly 15% from 1990 to 1998, around 65% during the bubble period (1999-2000) and 12% from 2001 to 2003. Consequently, several previous studies, such as Ritter (2011), find out that the long-run market-adjusted returns of companies are negative. Periods of good market conditions, characterised by overoptimistic investors, can explain these effects (Bayless and Chaplinsky (1996)). As a matter of fact, these periods are marked by high underpricing and followed by an adjustment of prices, causing the long-run underperformance relative to the market.

In this study, we use different measures of lead underwriters' reputation to analyse how they influence both the initial and long-run IPO returns, and compare their explanatory power in the context of each of those returns. Carter et al. (1998) use three reputation measures: Carter-Manaster (CM), which is based on the underwriters' position and frequency in "Tombstone announcements", and varies between 0 and 9; Megginson and Weiss (1991), which represents the market share of the underwriters by their amount underwritten for the sample period of IPOs issued from 1979 to 1991; and Johnson and Miller (1988), which is a modification of the Carter-Manaster, dividing underwriters into categories from 0 to 3.

[1] Imposes strict regulation aiming to protect investors, and thus increasing enterprises' compliance costs.

Carter et al. (1998) find that IPOs underwritten by lower reputational banks have higher initial returns and more negative market-adjusted long-run returns. Additionally, they find that the Carter-Manaster rank is the most significant measure at explaining the first-day and long-run returns. Michaely and Shaw (1994) use banks' capital to measure their reputation and they find that IPOs underwritten by prestigious investment banking firms tend to have lower first-day returns and less negative long-run returns. Fang (2005) studies the influence of banks' reputation on the price and quality of bond services, and uses the Carter-Manaster rank and the market share by number of deals of the underwriters to measure their reputation. He finds that high prestige investment banks offer services of higher quality, and obtain lower yields, that is, higher prices for their issuers. Lastly, Loughran and Ritter (2004) use the CM rank to show that, before the 90s, IPOs supervised by prestigious investment banking firms tend to have lower first-day returns, and after that they tend to present higher underpricing. Additionally, they show results that are not significant for the post-bubble period (2001-2003).

In this dissertation, we follow an empirical model similar to the one used by Carter et al. (1998). This study has two main objectives. First we want to understand how the lead underwriters' reputation influences both the initial and long-run returns. For that, we use three different methods to assess underwriters' prestige: the Carter-Manaster rank, explained above; the Gross Spread rank, constructed on a scale of 0 to 4, in which the first group contains IPOs led by the banks that charged the lowest percentage gross spreads, and the fourth group contains IPOs with the highest spreads charged on IPOs; and, finally, the lead underwriters' yearly market-share by gross proceeds rank. Logically, our second objective is to analyse which is (are) the most significant measure(s) at explaining the variability of the returns, in the perspective, again, of the initial and long-run returns. Additionally, we analyse our sample as a whole, from 1980 to 2011, and also divided into three subperiods (1980-1989, 1990-2000 and 2001-2011) to better understand the IPOs tendency.

Our results show that during the 80s, IPOs supervised by investment banking firms with a higher reputational level tend to have lower first-day returns and less negative market-adjusted long-run returns. From the 90s onwards, we obtain contrary results when it comes to the initial returns. Therefore, IPOs underwritten by high prestige investment banks tend to have higher first-day returns. Furthermore, looking at the sample as a whole, the market-share

by gross proceeds and the Carter-Manaster rank are the best measures at explaining the behaviour of the market-adjusted initial and long-run returns of the IPOs, respectively.

As a final point, our study contributes to important progresses in the literature. We use a more recent and larger dataset than previous authors in order to analyse our two research issues, which are, the relationship between the investment banking firms and the first-day and long-run returns, and which are the best measures, between the three studied in this paper, at explaining the changes in the returns, using the sample as a whole. Furthermore, we also divide our sample into subperiods, as mentioned before, which has never been done to study these two topics simultaneously.

The remainder of the paper is structured as follows. Section 2 presents the methodology used in this study. In section 3, we describe the information gathered and important descriptive statistics. Section 4 presents the main results. Section 5 concludes and presents suggestions for further research.

2 Methodology

To study how the different measures of lead underwriters' reputation influence both initial and long-run IPO returns and compare their explanatory power, we build on Carter et al. (1998) and use the following model for the market-adjusted returns (MAR):

$$MARp_i = b0 + b1 * [\,Underwriter\ Prestige\ Measures] + b2 * LNSIZE + b3 * LNAGE + b4 * [STD\ RETURN] + b5 * HOT + Error \quad (1)$$

where p is either 0 or 3; i refers to the IPO stock; LNSIZE is the log of adjusted gross proceeds; LNAGE is the log of age plus 1; STD Returns is the standard deviation of daily holding period returns; and HOT is equal to 1 for an IPO on a "hot-market" period, and 0 otherwise.

In the context of the initial returns, the dependent variable is the market-adjusted initial IPO return (MAR0). First, we calculate the initial raw return of each IPO, known in the literature as first-day return, by taking the percentage difference between the first closing price and the offer price. Then we adjust the initial return by subtracting the CRSP value-weighted Index

return. As observable in equation 2, we assume that the opportunity cost for the investor is to invest in the market from the offer date until the first trading day, up to a maximum period of three trading days.

$$MAR0_i = \left[\frac{FCP_i}{OP_i} - \prod_{t=0}^{min[FT,3]} (1 + MKT_t)\right] * 100 \qquad (2)$$

where $MAR0_i$ is the market-adjusted initial IPO return for stock *i*; *t* is the difference between the first trading day and the offer day of the IPO, ranging from 0 to 3 trading days; FCP is the first closing price of the IPO reported in CRSP; OP is the offering price of the IPO; and MKT is the CRISP (NYSE/AMEX/Nasdaq) value-weighted daily market return Index on day *t*.

In the context of the long-run performance, we use the same control variables used in the analysis of the initial return. After deeply analysing the long-run returns, we conclude that they are significantly non-normal and right skewed. Following Carter et al. (1998), we transform MAR3 into LNMAR3, which is the log (1,000% + Market-adjusted long-run return (MAR3)), and use it as the dependent variable. We assume a buy-and-hold strategy where the holding period starts from the first trading day +5 through first trading day +764, (about three-years) or delisting date[2]. The percentage return of each IPO during three years is computed as follows:

$$MAR3_i = \left[\prod_{t=FT+5}^{min[T,delist]} (1 + R_{it}) - \prod_{t=FT+5}^{min[T,delist]} (1 + MKT_t)\right] * 100 \qquad (3)$$

where $MAR3_i$ is the market-adjusted long-run IPO return for stock *i*; R is the return on the IPO stock from the first trading day + 5 through the first trading day +764 or on its delisting date; and MKT is the CRISP (NYSE/AMEX/Nasdaq) value-weighted daily market return Index on day *t*.

We use three methods to analyse the underwriters' reputation: the Carter-Manaster rank (CM) and Gross Spread rank (GS), which are ordinal values, and the market share by Gross Proceeds rank (GP), which is a cardinal variable.

[2] We include in our sample IPOs delisted less than three years after the first trading day, but for which all other data are complete.

We use the Carter-Manaster rank, also used by Liu et al. (2014), Loughran and Ritter (2004), Ferris et al. (2013), Fang (2005), and Fernando et al. (2012). The measure is built on a scale of 0 (least prestigious) to 9 (most prestigious) by looking at the position and the frequency by which underwriters are mentioned in the "Tombstone announcements". Additionally, investment banking firms with a rank of 9 were not bested in the tombstone announcements, whereas firms with a rank of 0 never ranked above others.

To compute the Gross Spread rank we follow the idea of Beatty and Ritter (1986) and Carter and Manaster (1990), that high prestige underwriters charge high gross spreads. Clients prefer high prestige underwriters since they expect to have a closer relationship, a better service, and lower underpricing to protect their shareholders. In this sense they are willing to pay more. Then, we construct the GS rank in the following way. First, we compute the average percentage gross spread charged by each underwriter, each year. Second, we rank underwriters from 1 to the number of different underwriters, each year. Third, we split them into five equally sized groups (0 to 4), from lowest to highest average gross spread each year. Therefore our GS rank is constructed in a scale of 0 (20% least prestigious-lowest spreads) to 4 (20% most prestigious-highest spreads).

Lastly, we construct the Gross Proceeds rank following a similar methodology as the one used by Megginson and Weiss (1991). We start by summing, each year, the gross proceeds of each lead underwriter. In this way, since we do not have information about all the different underwriters involved in each offering, we give "full credit" to the leader. After, we simply divide the sum of the gross proceeds of each leader by the total amount of the gross proceeds in the year, obtaining the market share of each lead underwriter based on the gross proceeds. As in the GS rank, we go through this process every year, which means that for each lead underwriter is calculated a market share per year. Thus, we assume the higher the market share, the higher the prestige of the underwriter.

We use four control variables to better understand the relationship between the underwriter reputation measures and the returns (MAR0 and LNMAR3). Following the methodology of Carter et al. (1998), we control for the influence of the offering size on the returns of the IPOs by using the logarithm of the gross proceeds[3] (LNSIZE). Some authors, such as Guo et al. (2006), argue that larger IPOs tend to be associated with more established firms and thus tend

[3] The gross proceeds are adjusted by the annual inflation rate to the end of 2011.

to be less risky, leading to lower initial returns. On the other hand, more established firms tend to have higher stock market demand, and consequently higher initial returns. We use the logarithm of the age of the issuing company on the offering date plus one (LNAGE) also used by Loughran and Ritter (2004) and Hanley and Hoberg (2012). They show that older firms tend to be less risky. Hence, we expect the coefficient to be negative in the initial return regression and positive in the long-run regression. We also use the standard deviation of the daily holding period returns (STD return) for each firm, starting from the first trading day +5 through first trading day +259 (255 trading days). According Carter et al. (1998), this variable "… should reflect the riskiness of future cash flows. Therefore we anticipate a positive coefficient for STD Return.".

We add one control variable to the Carter et al. (1998) methodology. We use a dummy variable (HOT) to control for "hot markets". According to Günther and Rummer (2011), Ritter (1984), and Helwege and Liang (2004), these are periods characterised by an extreme underpricing and high volume of IPOs. Since in the context of initial returns we are measuring underpricing, HOT is equal to one if the number of IPOs in a certain year is higher than the median of the number of IPOs issued during our sample period, and zero ("cold issue" periods) otherwise.

Our estimation method is Ordinary Least Squares (OLS). We run cross-sectional regressions to mainly evaluate our two previously stated objectives. We test each one of the regressions for heteroscedasticity by using the White test (White (1980)). If the null hypothesis of homoscedasticity is rejected at a 5% significance level, we use robust standard errors (White's correction).

As a final point, we follow Carter et al. (1998) and use the t-test and the Kruskal-Wallis procedure to test for the differences in subsample means. The first one is a parametric test, whereas the second is a "rank-based" nonparametric test which does not require equal sample sizes and does not include the assumption of normality. The null hypothesis of the Kruskal-Wallis test states that the samples are from the same population. As we have a considerable large sample, by the Central Limit Theorem, the mean of the samples is normally distributed, and so if they have different means the null hypothesis will be rejected[4], allowing us to conclude that the difference between the means is different from zero.

[4] This nonparametric test does not detect differences between variances.

3 Data

We conduct tests of underwriter reputation measures using a sample of IPOs issued between January 1, 1980 and December 31, 2011 from Thomson Reuters Eikon. Our sample includes only U.S. IPOs. We only consider IPOs issued until the end of 2011 because we need the three year performance of IPOs.

We collect an initial sample of 8,131 initial public offerings according the following criteria, used by Loughran and Ritter (2004) and Carter et al. (1998): (1) an offer price equal or higher than $5.00 per share, (2) gross proceeds of at least $2,000,000, (3) firm commitment[5] technique, (4) an investment banking firm took the company public (our analysis is focused on the lead underwriter of each offering), and (5) only common stock offerings are included. Therefore, from the initial sample, we obtain information regarding each offering, including the lead underwriter, the name of the issuer company, the offer price, the gross proceeds, and the spread charged by each lead underwriter.

First closing prices, returns over three-years, and associated statistics for all companies in the sample are obtained using the daily prices and daily holding period returns (historical series are adjusted for stock splits) from CRSP. We use the CRSP (NYSE/AMEX/Nasdaq) value-weighted daily market returns Index (including dividends) in order to compute the market-adjusted initial and long-run returns (MAR0 and MAR3 respectively).

As in Loughran and Ritter (2004), the Carter-Manaster (CM) ranking (on a 0 to 9 scale) as well as the founding date of the firms, to determine their age, in years, on the offering date (Age) of the IPOs, are all retrieved from Jay Ritter's website[6].

To express the gross proceeds (SIZE) in December 2011 dollars, we use the Consumer Price Index (All Urban Consumers) from the U.S. Bureau of Labor Statistics.

Table 1 summarizes the sample screening process. Following Carter et al. (1998), we exclude observations with: more than three trading days after the offer date, insufficient data to

[5] Investment banking firms buy, directly, all the shares offered by the issuing firm to sell to the clients. So, they have entire responsibility and risk for unsold shares.
[6] Available at: http://bear.warrington.ufl.edu/ritter/ipodata.htm.

Table 1: Sample selection process

Initial sample of firm commitment U.S. IPOs	8,131
IPOs listed on CRSP more than three trading days after the offer date.	711
IPOs with insufficient data to compute the standard deviation of the daily holding period returns.	1,540
IPOs with missing information regarding the age of the company or the reputation measures of the lead underwriter	862
Final Sample	5,018

compute the standard deviation of returns, or insufficient data regarding the age of the company or the reputation measures of the lead underwriter. Our final sample size is composed by 5,018 IPOs.

3.1 Descriptive Statistics

In this subsection we present some descriptive statistics for each one of the variables described above, for the sample as a whole, as well as divided into three different subperiods. The first one includes IPOs that went public from January 1980 to December 1989. The second period is from January 1990 to December 2000. And the third is from January 2001 to December 2011. The sample is divided in this way to analyse, in detail, the evolution of the IPOs tendency through several variables. More specifically, the first period allows us to compare with the findings of Carter et al. (1998) and Loughran and Ritter (2004). Afterwards, we are interested in the 90s, including the internet bubble period, since it was a crucial moment in the lifecycle of the IPOs. Finally, the last period matches the post-bubble, which, according to several authors, is marked by an accentuated decrease in the IPOs' activity and also in underpricing, reaching their minima during the financial crisis (2007-2009). Therefore, our first subperiod is composed by 1,502 IPOs, the second is composed by 2,944, and the remaining 572 IPOs are included in the third subperiod.

Table 2 presents summarised statistics for each one of the variables described above, for the sample of IPOs from 1980 to 2011 and also for the three subsample periods.

Table 2: Summary statistics

This table presents the summary statistics for the Market-adjusted initial and long-run returns (MAR0 and MAR3 respectively), the three different measures of the underwriters' reputation and the control variables. MAR0 is the first-day return of each IPO, subtracted by the CRSP (NYSE/AMEX/Nasdaq) value-weighted daily market returns Index. MAR3 is the percentage return, from a buy-and-hold strategy, from the 6th trading day until the 764th trading day, or delisting date, and subtracted by the CRSP (NYSE/AMEX/Nasdaq) Index daily returns. STD Return of each IPO is calculated from a time series of the daily returns from the 6th trading day until the 260th trading day. SIZE is the gross proceeds of each IPO in dollars. Inflation adjusted SIZE is the gross proceeds expressed in December 2011 dollars. AGE is the number of years of the company existence on the offering date. HOT is equal to 1 for an IPO on a "hot market" year, and 0 otherwise. Carter-Manaster rank (CM), on a scale of 0 to 9, is obtained from the Ritter's website. It is based on the underwriters' position and frequency in "Tombstone announcements". The market-share by gross proceeds rank (GP) is constructed by summing the gross proceeds of each lead underwriter and then dividing by the total amount each year. The GS rank is constructed in a scale of 0 (20% least prestigious-lowest spreads) to 4 (20% most prestigious-highest spreads). Panel A presents the summary statistics of the U.S. IPOs issued from January 1980 to December 2011. Panel B presents the summary statistics of the 1,502 IPOs, issued from January 1980 to December 1989. Panel C presents the summary statistics of the 2,944 IPOs, issued from January 1990 to December 2000. Panel D presents the same statistics for the remaining 572 IPOs, issued from January 2001 to December 2011.

	MAR0 (%)	MAR3 (%)	SIZE ($M)	Inflation adjusted SIZE ($M)	Age (years)	STD Return (%)	HOT	CM	GP (%)	GS
Panel A: All sample										
Mean	17.04	-16.31	84.88	117.59	17.08	4.05	0.82	7.18	5.12	1.36
St. Deviation	38.91	189.49	440.68	495.67	22.58	1.93	0.38	2.12	8.33	1.34
Median	5.85	-57.86	30.98	49.63	8.00	3.68	1.00	8.00	2.28	1.00
Panel B: 1980-1989										
Mean	7.89	-22.49	30.00	63.01	19.36	3.19	0.76	6.89	3.78	1.47
St. Deviation	14.52	124.26	89.63	182.48	24.88	1.30	0.51	2.08	5.01	1.36
Median	2.63	-55.97	13.00	28.32	9.00	2.98	0.64	7.63	1.70	1.00
Panel C: 1990-2000										
Mean	22.98	-16.46	67.47	98.45	15.27	4.67	0.97	7.19	4.24	1.28
St. Deviation	48.35	225.58	167.58	232.09	20.10	2.03	0.17	2.19	5.75	1.33
Median	8.99	-62.05	35.67	53.46	8.00	4.26	1.00	8.00	2.21	1.00
Panel D: 2001-2011										
Mean	10.53	0.70	318.64	359.42	20.37	3.09	0.19	7.91	13.17	1.41
St. Deviation	15.79	110.56	1214.98	1313.48	27.03	1.45	0.39	1.68	17.28	1.35
Median	5.80	-21.59	123.42	138.97	10.00	2.91	0.00	8.50	5.08	1.00

Consistent with previous literature, mean Market-adjusted initial return is positive at 17.04%, with a median of 5.85%. This phenomenon happens again in the three subsample periods. In the first period (1980-1989), MAR0 is, on average, 7.89%, which is consistent with the 8.08% in Carter et al. (1998) and the 7% in Loughran and Ritter (2004). In the second period, we find an underpricing of 22.98%, almost three times higher than in the first period. This is mainly caused by the internet bubble period of 1999-2000, where the underpricing reached values of 81.61% and 62.34%, respectively, which is in line with Ljungqvist and Wilhelm (2003). Regarding the last period, we find a decrease in the mean of MAR0, but still a high and positive value of 10.53%. Since the bubble burst (2000), the first-day returns reached their minima because of the crisis, particularly in 2007 with 3.42%, on average. Actually, we can understand the phenomenon of the positive initial returns. In a way, there is an incentive by the issuing firms and underwriters to provide their clients a positive underpricing, on average, otherwise they would not have any incentive to buy the shares offered, especially the uninformed investors. Issuing firms want to guarantee that even if informed investors are not willing to buy shares, uninformed investors are. Otherwise, in some cases, there would not be enough demand. Thus, the role of uninformed investors is crucial (Malakhov (2007) and Rock (1986)).

Consistently with the findings in Ritter (2011), among others, our market-adjusted long-run returns over three years appear to be negative, with a mean of -16.31% and a median of -57.86%. There are several possible explanations for this. Periods of good market conditions are characterised by investors' optimism about growth opportunities of certain companies (Bayless and Chaplinsky (1996)). Consequently, firms tend to take full advantage of these available "windows of opportunity" to go public. The increase of the stock market demand, together with the high volume of IPOs, create the "hot issue" periods, marked by an extreme underpricing, which are followed by negative long-run performance relative to the market. According to Ritter (1991), this happens because initially investors are overoptimistic. In Table 2, we see an increase of the tendency in the MAR3 variable, across the three subperiods. However, by looking at the last one we cannot conclude that the market-adjusted returns over three-years is positive nowadays, since if we exclude the year of 2002 the MAR3 would also be negative.

For the sample as a whole, the mean of the Age is 17.08 and the median is significantly lower (8.00). For the 1,502 IPOs prior to 1990, the mean is 19.36, which is consistent with the

findings in Carter et al. (1998). The mean for the 2,944 IPOs in the second subperiod is 15.27, while the mean for the remaining 572 IPOs is 20.37.

The average of the Carter-Manaster ranking for the 5,018 IPOs is 7.18 and the median is 8.00. The mean values for the three subperiods are very similar when compared with the full sample period. The Gross Spread ranking is, on average, 1.36, and the median is 1.00. Again, the values in the three subperiods are not very different from the ones obtained taking the sample as a whole. Regarding the GP ranking, the mean is 5.12% in the whole sample period. By investigating the three subsample periods, we find that the mean is increasing, reaching values of 3.78%, 4.24%, and 13.17% for the first, second, and third periods respectively. With this, we can conclude that, nowadays, the IPO market is less fragmented than before, and so there are fewer investment banking firms controlling the industry.

Table 3 presents the Pearson correlation coefficients among the variables, for the sample of IPOs from 1980 to 2011. Table 9 in the Appendix contains the tables for the three subsample periods. The only significant difference from Table 3 is related with the impact of the underwriter prestige rankings on the MAR0 and LNMAR3 variables, in the period from 1980 to 1989, which will be discussed in the results section. In line with Carter et al. (1998), almost all the correlations are significantly different from zero at a 1% significance level.

Our findings, in Table 3, are compatible with numerous authors in the literature. The higher the first-day returns, the more negative are the market-adjusted long-run returns. Less risky firms have lower initial returns. There is a positive (negative) correlation between the HOT and the MAR0 (LNMAR3) variables, which leads us to conclude, as expected, that periods of "hot markets" tend to be associated with higher first-day returns and lower long-run returns. Furthermore, prestigious investment banking firms tend to conduct IPOs of older and more established companies. Additionally, more established firms tend to have higher market-adjusted initial returns.

As a final point, the Carter-Manaster (CM) and the market share by gross proceeds (GP) rankings are highly positively correlated, which makes sense since we are trying to measure the underwriters' reputation by different methods. However, contrary to our expectations, the Gross Spread ranking (GS) is negatively correlated with the other two measures. Thus, investment banking firms with a higher level of reputation tend to charge lower gross

Table 3: Correlation coefficients

This table presents the Pearson correlation coefficients among the variables studied in this paper, for the 5,018 IPOs issued from January 1980 to December 2011. MAR0 is the first-day return of each IPO, subtracted by the CRSP (NYSE/AMEX/Nasdaq) value-weighted daily market returns Index. LNMAR3 is the logarithm of 1000% plus the percentage return, from a buy-and-hold strategy, from the 6th trading day until the 764th trading day, or delisting date, and subtracted by the CRSP (NYSE/AMEX/Nasdaq) Index daily returns. STD Return of each IPO is calculated from a time series of the daily returns from the 6th trading day until the 260th trading day. LNSIZE is the logarithm of the gross proceeds of each IPO expressed in December 2011 dollars. LNAGE is the logarithm of 1 plus the number of years of the company existence on the offering date. HOT is equal to 1 for an IPO on a "hot market" year, and 0 otherwise. Carter-Manaster rank (CM), on a scale of 0 to 9, is obtained from the Ritter's website. It is based on the underwriters' position and frequency in "Tombstone announcements". The market-share by gross proceeds rank (GP) is constructed by summing the gross proceeds of each lead underwriter and then dividing by the total amount each year. The GS rank is constructed in a scale of 0 (20% least prestigious-lowest spreads) to 4 (20% most prestigious-highest spreads). The symbols ***, **, and *, indicate statistical significance at a 1%, 5%, and 10% levels, respectively.

All sample								
	LNMAR3	LNSIZE	LNAGE	STD Return	HOT	CM	GP	GS
MAR0	-0.03**	0.15***	-0.12***	0.36***	0.09***	0.10***	0.15***	-0.06***
LNMAR3		0.06***	0.06***	-0.13***	-0.05***	0.10***	0.06***	-0.07***
LNSIZE			0.14***	-0.10***	-0.13***	0.61***	0.50***	-0.54***
LNAGE				-0.20***	-0.01	0.15***	0.08***	-0.16***
STD Return					0.20***	-0.06***	-0.06***	0.14***
HOT						-0.07***	-0.27***	-0.08***
CM							0.42***	-0.70***
GP								-0.40***

spreads. An explanation for these results can come from the fact that underwriters have different ways to profit in an IPO process. They can profit from direct and indirect fees. Lead underwriters can charge lower gross spreads (direct fees) and, on the other hand, take advantage of the money left on the table (the difference between the first closing and offer prices times the number of shares offered). According to Loughran and Ritter (2002), "… underpricing is a form of indirect compensation to underwriters.". Investment banking firms can take advantage of this in two different ways: they spend less in marketing costs since it is effortless to find buyers (Baron (1982)), and also because they can obtain overpriced commissions from "rent-seeking buyers" by allocating them shares in "hot IPOs". In this way, the gain they can obtain from this last mechanism can more than exceed the profits lost from the lower gross spreads. Livingston and Miller (2000) find that "…higher prestige underwriters charge significantly lower underwriting fees.".

4 Results

Our aim is to understand how the underwriters' prestige influences both the initial and long-run IPO returns by using three different measures to assess underwriters' reputation, and also to provide a comparative analysis of them, in the perspective of the initial and long-run returns. We use four control variables that are carefully explained in the methodology section and, as shown in previous literature, affect the returns of the IPO firms. To do this, we use cross-sectional OLS regressions. First, we present results for the 5,018 IPOs, issued between 1980 and 2011. Then, we present results for the three subsample periods in order to evaluate the consistency of the full sample results when divided. All the regressions, both in the full sample and subsample periods, are tested for heteroscedasticity. In case of its presence, the standard errors are adjusted by the White's correction. As a final point, we present two tests (parametric and non-parametric) for the difference in subsample means and a graphical analysis.

4.1 Full sample

Panel A of Table 4 presents the results of the Market-adjusted initial IPO returns (MAR0) regressions for the full sample period of IPOs – ranging from 1980 to 2011. Univariate regressions for each one of the underwriters' prestige measures are presented in regressions from 1 to 3. In the remaining regressions, from 4 to 9, we find multivariate regressions of many combinations of the investment banks' reputation measures combined with the four control variables: LNSIZE, LNAGE, STD Return, and HOT.

The coefficients associated with the CM and GP rankings are positive in their univariate regressions. However, as would be expected based on the negative correlations between GS and the returns and also with CM and GP variables, the coefficient associated with the GS ranking is negative in regression 3. This leads us to conclude that IPOs managed by high prestige lead underwriters tend to have higher first-day returns (consistent with the findings in Loughran and Ritter (2004) on their full sample results).

Both Carter-Manaster and Gross Spread rankings are only significant in their univariate regressions, at a 1% significance level. When they are combined with the control variables and the other measures, they lose their significance. GP measure remains significant, at a 1% level, in all the regressions. Furthermore, GP is the only significant measure when they are all

Table 4: Cross-Sectional OLS regression analysis of the Market-adjusted initial returns (MAR0) and of the Log (10 + Market-adjusted long-run returns (MAR3)), for a sample of 5,018 IPOs issued from January 1980 to December 2011

Panel A presents the results of the regression analysis (Equation 1) of the MAR0 (dependent variable) on the three different measures of the underwriters' reputation and on the control variables, for a sample of 5,018 IPOs issued between January 1980 and December 2011. Panel B presents the results of the regression analysis (Equation 1) of the LNMAR3 (as the dependent variable) on the same regressors, for the same sample. MAR0 is the first-day return of each IPO, subtracted by the CRSP (NYSE/AMEX/Nasdaq) value-weighted daily market returns Index. LNMAR3 is the logarithm of 1000% plus the percentage return, from a buy-and-hold strategy, from the 6th trading day until the 764th trading day, or delisting date, and subtracted by the CRSP (NYSE/AMEX/Nasdaq) Index daily returns. Carter-Manaster rank (CM), on a scale of 0 to 9, is obtained from Ritter's website. It is based on the underwriters' position and frequency in "Tombstone announcements". The market-share by gross proceeds rank (GP) is constructed by summing the gross proceeds of each lead underwriter and then dividing by the total amount each year. The GS rank is constructed in a scale of 0 (20% least prestigious-lowest spreads) to 4 (20% most prestigious-highest spreads). LNSIZE is the logarithm of the gross proceeds of each IPO expressed in December 2011 million dollars, using the Consumer Price Index (CPI). LNAGE is the logarithm of 1 plus the number of years of the company existence on the offering date. STD Return of each IPO is calculated from a time series of the daily returns from the 6th trading day until the 260th trading day. HOT is equal to 1 for an IPO on a "hot market" year, and 0 otherwise. The symbols ***, **, and *, indicate statistical significance at a 1%, 5%, and 10% levels, respectively.

Panel A: Market-adjusted initial returns

Regression	Intercept	CM	GP	GS	LNSIZE	LNAGE	STD Return	HOT	F	Adj. R^2
(1)	4.12	1.80							60.63***	0.01
		(7.79)***								
(2)	13.42		0.71						46.73***	0.02
			(6.84)***							
(3)	19.42			-1.75					17.56***	0.00
				(-4.19)***						
(4)	-38.06	0.34			6.63	-2.67	7.25	4.15	45.68***	0.17
		(1.42)			(11.87)***	(-6.87)***	(13.39)***	(5.41)***		
(5)	-33.87		0.59		4.94	-2.68	7.18	6.89	45.93***	0.18
			(5.71)***		(9.36)***	(-6.99)***	(13.45)***	(7.37)***		
(6)	-35.38			-0.44	6.74	-2.66	7.29	3.90	51.17***	0.17
				(-0.94)	(12.96)***	(-6.76)***	(13.12)***	(4.96)***		
(7)	-33.64	-0.09	0.60		5.03	-2.67	7.18	6.91	39.04***	0.18
		(-0.37)	(5.67)***		(8.97)***	(-6.89)***	(13.45)***	(7.40)***		
(8)	-35.92		0.61	0.50	5.20	-2.65	7.14	7.28	43.90***	0.18
			(5.80)***	(1.08)	(9.66)***	(-6.75)***	(13.10)***	(7.57)***		
(9)	-36.62	0.12	0.61	0.60	5.14	-2.65	7.13	7.33	38.04***	0.18
		(0.43)	(5.77)***	(1.13)	(9.15)***	(-6.79)***	(13.03)***	(7.58)***		

Panel B: Log (10 + Market-adjusted long-run returns)

Regression	Intercept	CM	GP	GS	LNSIZE	LNAGE	STD Return	HOT	F	Adj. R^2
(1)	6.8800	0.0067			-0.0028	0.0025	-0.0086	-0.0094	28.16***	0.03
		(5.81)***			(-1.28)	(1.33)	(-8.24)***	(-1.83)*		
(2)	6.8982		0.0005		0.0030	0.0033	-0.0086	-0.0068	21.96***	0.02
			(1.86)*		(1.48)	(1.79)*	(-8.18)***	(-1.28)		
(3)	6.9127			-0.0040	0.0021	0.0030	-0.0082	-0.0116	22.33***	0.02
				(-2.29)**	(1.01)	(1.64)	(-7.77)***	(-2.20)**		
(4)	6.8677	0.0075	0.0003	0.0028	-0.0029	0.0025	-0.0089	-0.0064	20.47***	0.03
		(5.40)***	(1.08)	(1.32)	(-1.25)	(1.38)	(-8.37)***	(-1.15)		

combined with the control variables. Therefore, the market share by gross proceeds ranking (GP) is the measure with more explanatory power, when compared with the other two.

The coefficients of the four control variables, presented in Panel A of Table 4, are significant at a 1% level, in all of the performed regressions. The coefficients associated with the LNAGE variable are negative. This is in line with Loughran and Ritter (2004) and Hanley and Hoberg (2012) that conclude that older firms are associated with lower risks, and consequently lower initial returns. The results of the STD Return variable are consistent with our expectations (positive coefficients), which means that riskier firms lead to higher initial returns. The LNSIZE coefficients are positive. Thus, we can conclude that more established firms tend to have higher stock market demand and, consequently, higher first-day returns. Lastly, HOT coefficients are positive. Periods of "hot markets" are associated with higher initial returns due to the investors' overoptimism.

Therefore, our full sample results, in the context of the initial returns, are very conclusive regarding the two main research issues of this study. First, IPOs underwritten by high prestige investment banks have higher first-day returns. Second, the GP ranking is the best measure in the context of MAR0, that is, it is the measure with the best performance at explaining the behavior of the market-adjusted initial returns.

Panel B of Table 4 presents the results of the log of the Market-adjusted long-run returns (LNMAR3), for the 5,018 IPOs.

Previous studies argue that long-run market-adjusted returns of IPOs tend to be less negative when companies go public with higher rather than lower prestige lead underwriters. By looking at Panel B of Table 4, we can observe that the coefficients associated with the measures of lead underwriters' reputation are positive, except for the GS ranking as expected. The three measures are all significant, at, at least, a 10% significance level, when combined, each one separately, with the four control variables. However, in regression 4, we can see that, with the exception of the Carter-Manaster ranking, the other two rankings completely lose their significance. Thus, the CM ranking is the measure with the best performance at explaining the behaviour of the log of the adjusted long-run returns. Moreover, we conclude that, based on our sample of IPOs issued from January 1980 to December 2011, IPOs tend to have less negative market-adjusted long run returns when they are managed by high prestige investment banks.

Regarding the control variables, the coefficients associated with the standard deviation of returns variable are the only ones negative and statistically significant at a 1% level, in all the regressions. Thus, our results lead us to conclude that riskier firms tend to have more negative market-adjusted long-run returns.

Concluding the full sample analysis, IPOs managed by high prestige lead underwriters tend to have higher first-day returns and less negative adjusted long-run returns. Also, in the perspective of the initial returns, the most significant measure of lead underwriters' prestige is the Gross Proceeds (GP) ranking, and in the perspective of the long run returns, the most significant one is the Carter-Manaster (CM) ranking.

4.1.1 Robustness checks

In order to check the robustness of our results, we run regressions without the log transformation (MAR3); we use the White's correction in the presence of heteroscedasticity; and we eliminate the 5% highest and lowest IPO returns from our sample, and then we use the rank of the returns as the dependent variable. The results are consistent with the ones obtained, that is, the statistical significance of the variables remains unchanged.

4.2 Subsample periods

According to the literature, the way underwriters' reputation influences the returns has been changing over time. In this way, this is one of the reasons why we decided to divide our full sample into three different subsample periods. Carter et al. (1998) find that, in the 1980s, market-adjusted initial returns of the IPOs tend to be higher when managed by low prestige investment banks. This is consistent with the findings of Loughran and Ritter (2004) for the same period of time. However, the latter show that, during the 1990s, results are no longer in line with the past, that is, IPOs underwritten by high prestige investment banking firms tend to have higher initial returns.

4.2.1 1980-1989 subperiod

By looking at the univariate and multivariate regressions in Panel A of Table 5, only the CM and GS rankings are statistically significant at 1% level. With this, we can conclude that these are the two best measures (when comparing the three) of lead underwriters' prestige to explain the behavior of the IPOs initial returns. Particularly, Carter et al. (1998) find that CM

Table 5: Cross-Sectional OLS regression analysis of the Market-adjusted initial returns (MAR0) and of the Log (10 + Market-adjusted long-run returns (MAR3)), for a sample of 1,502 IPOs issued from January 1980 to December 1989

Panel A presents the results of the regression analysis (Equation 1) of the MAR0 (dependent variable) on the three different measures of the underwriters' reputation and on the control variables, for a sample of 1,502 IPOs issued between January 1980 and December 1989. Panel B presents the results of the regression analysis (Equation 1) of the LNMAR3 (as the dependent variable) on the same regressors, for the same sample. MAR0 is the first-day return of each IPO, subtracted by the CRSP (NYSE/AMEX/Nasdaq) value-weighted daily market returns Index. LNMAR3 is the logarithm of 1000% plus the percentage return, from a buy-and-hold strategy, from the 6th trading day until the 764th trading day, or delisting date, and subtracted by the CRSP (NYSE/AMEX/Nasdaq) Index daily returns. Carter-Manaster rank (CM), on a scale of 0 to 9, is obtained from the Ritter's website. It is based on the underwriters' position and frequency in "Tombstone announcements". The market-share by gross proceeds rank (GP) is constructed by summing the gross proceeds of each lead underwriter and then dividing by the total amount each year. The GS rank is constructed in a scale of 0 (20% least prestigious-lowest spreads) to 4 (20% most prestigious-highest spreads). LNSIZE is the logarithm of the gross proceeds of each IPO expressed in December 2011 million dollars, using the Consumer Price Index (CPI). LNAGE is the logarithm of 1 plus the number of years of the company existence on the offering date. STD Return of each IPO is calculated from a time series of the daily returns from the 6th trading day until the 260th trading day. HOT is equal to 1 for an IPO on a "hot market" year, and 0 otherwise. The symbols ***, **, and *, indicate statistical significance at a 1%, 5%, and 10% levels, respectively.

Panel A: Market-adjusted initial returns

Regression	Intercept	CM	GP	GS	LNSIZE	LNAGE	STD Return	HOT	F	Adj. R^2
(1)	15.52	-1.11							28.92***	0.03
		(-5.38)***								
(2)	8.34		-0.12						2.55	0.00
			(-1.60)							
(3)	5.40			1.69					27.37***	0.03
				(5.23)***						
(4)	14.73	-1.28			0.96	-0.76	0.41	-1.10	8.08***	0.03
		(-5.40)***			(2.44)**	(-2.58)**	(1.41)	(-1.32)		
(5)	11.96		-0.06		-0.44	-1.03	0.31	-1.24	4.84***	0.01
			(-0.68)		(-1.21)	(-3.36)***	(1.05)	(-1.44)		
(6)	2.86			2.02	1.09	-0.77	0.20	-0.66	8.06***	0.03
				(5.20)***	(2.81)***	(-2.55)**	(0.68)	(-0.77)		
(7)	15.19	-1.35	0.10		0.81	-0.76	0.43	-0.91	6.89***	0.04
		(-5.59)***	(1.13)		(2.04)**	(-2.58)***	(1.45)	(-1.07)		
(8)	8.22	-0.82		1.22	1.42	-0.69	0.30	-0.83	7.48***	0.04
		(-2.97)***		(2.65)***	(3.51)***	(-2.34)**	(1.05)	(-0.97)		
(9)	8.18	-0.89	0.15	1.35	1.25	-0.69	0.32	-0.52	6.78***	0.04
		(-3.18)***	(1.68)*	(2.94)***	(3.04)***	(-2.33)**	(1.09)	(-0.59)		

Panel B: Log (10 + Market-adjusted long-run returns)

Regression	Intercept	CM	GP	GS	LNSIZE	LNAGE	STD Return	HOT	F	Adj. R^2
(1)	6.8932	0.0062			-0.0042	0.0039	-0.0120	-0.0189	15.12***	0.04
		(3.60)***			(-1.38)	(1.70)*	(-6.14)***	(-2.46)**		
(2)	6.9075		0.0005		0.0020	0.0051	-0.0115	-0.0178	13.46***	0.03
			(0.86)		(0.60)	(2.28)**	(-5.83)***	(-2.25)**		
(3)	6.9198			-0.0030	0.0008	0.0048	-0.0113	-0.0195	13.31***	0.03
				(-1.11)	(0.24)	(2.15)**	(-5.75)***	(-2.49)**		
(4)	6.8680	0.0080	0.0000	0.0047	-0.0024	0.0041	-0.0124	-0.0179	11.22***	0.04
		(3.56)***	(-0.06)	(1.35)	(-0.69)	(1.82)*	(-6.30)***	(-2.28)**		

ranking is also the best measure during the same period. However, they do not include a similar method in their study, related with gross spreads, as the one constructed by us. Therefore, we find an additional measure, for the first subsample period, which is at the same level as the one found by Carter et al. (1998). Actually, our results show that not only the CM ranking but also the GS ranking are able to explain the changes in the market-adjusted initial-returns.

Consistently with previous studies, the coefficients associated with the CM ranking (one of the best measures in this sample) are negative, revealing that IPOs followed by the least prestigious lead underwriters tend to have higher first-day returns. However, the coefficients associated with the GS variable are positive. Therefore, against our expectations, underwriters with the highest level of reputation charge lower gross spreads. This is consistent with the findings of Livingston and Miller (2000). Actually, the gain they can obtain from the commissions received from "rent-seeking buyers" can more than surpass the profits lost from the lower gross spreads (Loughran and Ritter (2002)). Indeed, this might be explained by the fact that issuing firms give more importance to the direct fees rather than to the money left on the table (Thaler (1980)).

Thus, our results for the first subsample period are somewhat different from the ones obtained in the full sample. First, IPOs underwritten by lower prestige investment banks have higher first-day returns (consistent with the findings in Michaely and Shaw (1994)). Second, the CM and GS rankings are the most significant measures, that is, the most capable measures to explain the behavior of the Market-adjusted initial returns.

In line with our full sample results for the long-run perspective, Panel B of Table 5 shows that while the GP and GS rankings do not present any significance (at a 1% level) in any of the performed regressions, Carter-Manaster ranking does. Hence, it is considered the measure that best explains the behavior of the LNMAR3 variable (consistent with the findings in Carter et al. (1998)). The result that high prestige lead underwriters tend to have less negative adjusted long-run returns also remains in this subsample period, since the coefficients presented for the only statistically significant measure are positive. Regarding the control variables, except for the LNSIZE, all of them are significant at at least a 10% level.

4.2.2 1990-2000 subperiod

The second subsample period, ranging from January 1990 through December 2000, contains a substantial fraction of IPOs (2,944) from our full sample (5,018). Consistently, this period is also exhaustively researched by the literature due to its character of an abnormal number of IPOs issued, especially during the internet bubble period (1999-2000).

Panel A of Table 6 shows that the coefficients linked with the three measures of lead underwriters reputation, in their univariate and multivariate regressions with the control variables, are in line with our full sample results, particularly in the initial returns analysis. Also, consistently with our previous results, all of the three methods to measure lead underwriters prestige, when tested in univariate regressions, are significant at a 1% level. However, when they are combined with the four control variables, only the GP ranking remains significant at a 1% level. In this way, we can confirm that, in the 1990s, the higher the reputational level of the lead underwriters, the higher tend to be the first-day returns of those IPOs they underwrote.

Regarding the control variables, in all of the regressions, all of them are in line (both at the signs and significance level) with the findings in the full sample section. The LNSIZE, STD Return, and HOT variables have positive coefficients, which means, respectively, that: firms with higher gross proceeds, riskier, and that went public during "hot-market" periods tend to have higher initial returns. Instead, LNAGE variable presents negative coefficients, meaning that older firms are less risky, and so tend to have lower first-day returns.

To further analyse the internet bubble period, we run the same 9 regressions, with the same dependent variable (MAR0), for the 467 IPOs issued during the period 1999-2000. The results are very conclusive and consistent with the ones obtained from the full-sample period. In fact, the market-share by Gross Proceeds (GP) ranking outperforms the other 2 measures both in the univariate and multivariate regressions.

Again, consistently with our full sample results for the long-run perspective, Panel B of Table 6 shows that all of the three measures, when combined alone with the control variables, are statistically significant at at least 5%. On the other hand, when they are combined all together, only the coefficient of the Carter-Manaster ranking is statistically significant and

Table 6: Cross-Sectional OLS regression analysis of the Market-adjusted initial returns (MAR0) and of the Log (10 + Market-adjusted long-run returns (MAR3)), for a sample of 2,944 IPOs issued from January 1990 to December 2000

Panel A presents the results of the regression analysis (Equation 1) of the MAR0 (dependent variable) on the three different measures of the underwriters' reputation and on the control variables, for a sample of 2,944 IPOs issued between January 1990 and December 2000. Panel B presents the results of the regression analysis (Equation 1) of the LNMAR3 (as the dependent variable) on the same regressors, for the same sample. MAR0 is the first-day return of each IPO, subtracted by the CRSP (NYSE/AMEX/Nasdaq) value-weighted daily market returns Index. LNMAR3 is the logarithm of 1000% plus the percentage return, from a buy-and-hold strategy, from the 6th trading day until the 764th trading day, or delisting date, and subtracted by the CRSP (NYSE/AMEX/Nasdaq) Index daily returns. Carter-Manaster rank (CM), on a scale of 0 to 9, is obtained from the Ritter's website. It is based on the underwriters' position and frequency in "Tombstone announcements". The market-share by gross proceeds rank (GP) is constructed by summing the gross proceeds of each lead underwriter and then dividing by the total amount each year. The GS rank is constructed in a scale of 0 (20% least prestigious-lowest spreads) to 4 (20% most prestigious-highest spreads). LNSIZE is the logarithm of the gross proceeds of each IPO expressed in December 2011 million dollars, using the Consumer Price Index (CPI). LNAGE is the logarithm of 1 plus the number of years of the company existence on the offering date. STD Return of each IPO is calculated from a time series of the daily returns from the 6th trading day until the 260th trading day. HOT is equal to 1 for an IPO on a "hot market" year, and 0 otherwise. The symbols ***, **, and *, indicate statistical significance at a 1%, 5%, and 10% levels, respectively.

Panel A: Market-adjusted initial returns

Regression	Intercept	CM	GP	GS	LNSIZE	LNAGE	STD Return	HOT	F	Adj. R^2
(1)	-0.51	3.27							88.02***	0.02
		(9.38)***								
(2)	11.57		2.69						87.60***	0.10
			(9.36)***							
(3)	27.37			-3.43					26.41***	0.01
				(-5.14)***						
(4)	-62.33	0.53			12.01	-5.13	8.91	3.87	41.44***	0.21
		(1.38)			(10.44)***	(-7.12)***	(12.63)***	(1.80)*		
(5)	-48.32		1.99		6.60	-5.12	8.18	10.35	45.65***	0.25
			(6.83)***		(6.05)***	(-7.26)***	(12.07)***	(3.57)***		
(6)	-56.35			-1.12	11.92	-5.14	9.01	3.10	43.78***	0.21
				(-1.45)	(11.60)***	(-7.06)***	(12.46)***	(1.46)		
(7)	-45.92	-0.90	2.06		7.66	-5.04	8.18	9.72	38.13***	0.25
		(-2.09)**	(6.77)***		(6.50)***	(-7.15)***	(12.06)***	(3.29)***		
(8)	-55.77		2.12	1.91	7.66	-5.03	8.00	11.23	40.74***	0.25
			(6.90)***	(2.38)**	(6.91)***	(-7.08)***	(11.50)***	(3.77)***		
(9)	-53.45	-0.40	2.13	1.59	7.96	-5.01	8.03	10.80	36.62***	0.25
		(-0.89)	(6.86)***	(1.84)*	(6.73)***	(-7.06)***	(11.45)***	(3.58)***		

Panel B: Log (10 + Market-adjusted long-run returns)

Regression	Intercept	CM	GP	GS	LNSIZE	LNAGE	STD Return	HOT	F	Adj. R^2
(1)	6.8830	0.0091			-0.0103	-0.0005	-0.0099	0.0168	15.77***	0.02
		(5.30)***			(-2.73)***	(-0.16)	(-6.88)***	(0.98)		
(2)	6.9123		0.0015		-0.0021	0.0003	-0.0102	0.0132	11.43***	0.02
			(2.59)***		(-0.60)	(0.09)	(-6.99)***	(0.77)		
(3)	6.9288			-0.0061	-0.0020	-0.0000	-0.0092	0.0065	11.11***	0.02
				(-2.27)**	(-0.56)	(-0.00)	(-6.34)***	(0.38)		
(4)	6.8742	0.0095	0.0010	0.0033	-0.0115	-0.0004	-0.0105	0.0214	11.69***	0.02
		(4.67)***	(1.57)	(1.00)	(-2.84)***	(-0.12)	(-7.07)***	(1.24)		

positive, confirming that high prestige lead underwriters tend to have less negative market-adjusted long-run returns.

Concluding, this subsample period (1999-2000) is completely in accordance with the results obtained in the full sample period analysis, both in the initial and long run returns.

4.2.3 2001-2011 subperiod

Our third subsample period is marked by a substantial decrease in the number of IPOs issued, as well as in their first-day returns, especially during the financial crisis (2007-2009). Panel A of Table 7 presents the results of the MAR0 regressions for the sample of IPOs issued from January 2001 through December 2011.

The GP ranking is the only measure of underwriters' reputation statistically significant at at least a 10% level, both in the univariate and multivariate regressions. Thus, in line with our previous results, we can conclude that GP is the best measure at explaining the variability of the initial returns. Also in line with earlier results, the coefficients associated with the GP variable appear to be positive, revealing that IPOs underwritten by investment banking firms with a higher reputational level tend to have higher initial returns. Contrary to our expectations, the coefficients associated with the LNAGE are not negative anymore, meaning that, older firms tend to have higher initial returns when they go public.

Panel B of Table 7 shows somewhat inconclusive results. None of the three measures of underwriters' prestige evaluated in this study are significant. The sign also changes across specifications. Therefore, none of the CM, GP, and GS rankings are able to explain the variability of the adjusted long-run returns of the IPOs issued since 2001. This might be strongly related with factors, others than the reputation, that issuing firms take into account, nowadays, to select an investment bank to supervise the entire process of going public. The degree and the number of years of their relationship with specific banks can influence their choice. Furthermore, according to Brau and Fawcett (2006), the quality and the prestige of the research department, the industry know-how, and the connections underwriters have with third parties can also be some relevant factors.

Table 7: Cross-Sectional OLS regression analysis of the Market-adjusted initial returns (MAR0) and of the Log (10 + Market-adjusted long-run returns (MAR3)), for a sample of 572 IPOs issued from January 2001 to December 2011

Panel A presents the results of the regression analysis (Equation 1) of the MAR0 (dependent variable) on the three different measures of the underwriters' reputation and on the control variables, for a sample of 572 IPOs issued between January 2001 and December 2011. Panel B presents the results of the regression analysis (Equation 1) of the LNMAR3 (as the dependent variable) on the same regressors, for the same sample. MAR0 is the first-day return of each IPO, subtracted by the CRSP (NYSE/AMEX/Nasdaq) value-weighted daily market returns Index. LNMAR3 is the logarithm of 1000% plus the percentage return, from a buy-and-hold strategy, from the 6th trading day until the 764th trading day, or delisting date, and subtracted by the CRSP (NYSE/AMEX/Nasdaq) Index daily returns. Carter-Manaster rank (CM), on a scale of 0 to 9, is obtained from the Ritter's website. It is based on the underwriters' position and frequency in "Tombstone announcements". The market-share by gross proceeds rank (GP) is constructed by summing the gross proceeds of each lead underwriter and then dividing by the total amount each year. The GS rank is constructed in a scale of 0 (20% least prestigious-lowest spreads) to 4 (20% most prestigious-highest spreads). LNSIZE is the logarithm of the gross proceeds of each IPO expressed in December 2011 million dollars, using the Consumer Price Index (CPI). LNAGE is the logarithm of 1 plus the number of years of the company existence on the offering date. STD Return of each IPO is calculated from a time series of the daily returns from the 6th trading day until the 260th trading day. HOT is equal to 1 for an IPO on a "hot market" year, and 0 otherwise. The symbols ***, **, and *, indicate statistical significance at a 1%, 5%, and 10% levels, respectively.

Panel A: Market-adjusted initial returns

Regression	Intercept	CM	GP	GS	LNSIZE	LNAGE	STD Return	HOT	F	Adj. R^2
(1)	7.42	0.39							1.01	0.00
		(1.00)								
(2)	9.34		0.09						5.67**	0.01
			(2.38)**							
(3)	10.05			0.34					0.47	0.00
				(0.69)						
(4)	-3.29	0.19			1.13	1.23	1.16	0.38	2.57**	0.01
		(0.42)			(1.58)	(2.09)**	(2.32)**	(0.22)		
(5)	-0.62		0.08		0.70	1.20	1.14	0.70	4.26***	0.03
			(1.66)*		(1.09)	(2.77)***	(2.32)**	(0.39)		
(6)	-4.73			0.65	1.57	1.25	1.07	0.48	2.82**	0.02
				(1.18)	(2.22)**	(2.12)**	(2.13)**	(0.28)		
(7)	-0.48	-0.03	0.08		0.71	1.20	1.14	0.69	2.71**	0.02
		(-0.06)	(1.84)*		(0.95)	(2.05)**	(2.28)**	(0.39)		
(8)	-4.03		0.11	1.18	1.04	1.20	0.98	1.21	3.40***	0.02
			(2.49)**	(2.01)**	(1.42)	(2.05)**	(1.94)*	(0.69)		
(9)	-6.53	0.38	0.11	1.37	0.91	1.19	0.96	1.43	3.00***	0.02
		(0.77)	(2.38)**	(2.15)**	(1.20)	(2.03)**	(1.90)*	(0.81)		

Panel B: Log (10 + Market-adjusted long-run returns)

Regression	Intercept	CM	GP	GS	LNSIZE	LNAGE	STD Return	HOT	F	Adj. R^2
(1)	6.8542	0.0040			0.0028	0.0080	-0.0053	0.0014	3.14***	0.02
		(1.45)			(0.61)	(2.17)**	(-1.69)*	(0.13)		
(2)	6.8745		0.0001		0.0049	0.0081	-0.0054	-0.0000	2.73**	0.01
			(0.30)		(1.07)	(2.20)***	(-1.71)*	(-0.00)		
(3)	6.8870			-0.0041	0.0035	0.0081	-0.0049	-0.0017	2.99**	0.02
				(-1.17)	(0.78)	(2.20)**	(-1.53)	(-0.15)		
(4)	6.8650	0.0033	-0.0001	-0.0026	0.0025	0.0080	-0.0050	-0.0000	2.30**	0.02
		(1.06)	(-0.25)	(-0.64)	(0.52)	(2.18)*	(-1.56)	(-0.00)		

4.3 Tests for the differences in means and a graphical analysis

After a careful analysis of the results, we follow Carter et al. (1998) and we use the t-test and the Kruskal-Wallis procedure to test for the differences in subsample means, both in the context of the adjusted initial and long-run returns. Lastly, we present a graphical analysis for the Low and High reputation banks.

We segment our full sample, of 5,018 IPOs, into two groups, using the median value of the underwriters' prestige measure with more explanatory power. In the perspective of the initial returns, we use the median value of the GP reputation measure, which is 2.28%. We end up with two subsample groups: the "Low" contains IPOs managed by investment banks with a market-share by gross proceeds lower than 2.28% each year; and the remaining IPOs are included in the denominated "High" group (higher or equal to 2.28%). The same process is repeated for the perspective of the adjusted long-run returns. Since the CM ranking was shown to be the best measure at explaining the variability of the referred returns, then IPOs underwritten by investment banks with a CM rank lower than 8 are denominated as "Low", and those managed by banks with a rank higher or equal to 8 are designated as "High".

The results presented in Panel A of Table 12 are very clear and confirm our previous findings regarding our research issue based on the relationship between underwriters' reputation and the adjusted returns. According to the left hand side of the Panel, the average return of the IPOs included in the group "High" (22.08%) is almost two times higher than the corresponding value in group "Low" (11.99%). The right hand side presents an extremely low value for group "Low" (-30.99%), and a much higher, but still negative, value for group "High" (-6.63%). In this way, we can confirm, again, that for the full sample period analysis – ranging from 1980 to 2011-, IPOs managed by high prestige investment banking firms tend to have higher first-day returns and less negative adjusted long-run returns.

In Panel B of Table 12, we present results of the parametric (t-test) and non-parametric (Kruskal-Wallis) tests. For the initial returns and for the long-run returns, both tests are significant at a 1% level, which means that the difference between the average return of the two groups, in both scenarios, is statistically different from zero.

Table 8: Descriptive statistics for the "Low" and "High" groups in the initial and long-run returns

Displayed below are the summary statistics for the market-adjusted initial returns (MAR0) and for the market-adjusted long-run returns (MAR3), for the sample of 5,018 IPOs, issued between January 1980 and December 2011, divided in two groups (Low and High) according to the median value of the market-share by gross proceeds rank (GP) and the Carter-Manaster rank (CM), respectively. Presented are also the results of the t-test and the Kruskal-Wallis test for the difference between the two groups' average returns. MAR0 is the first-day return of each IPO, subtracted by the CRSP (NYSE/AMEX/Nasdaq) value-weighted daily market returns Index. MAR3 is the percentage return, from a buy-and-hold strategy, from the 6th trading day until the 764th trading day, or delisting date, and subtracted by the CRSP (NYSE/AMEX/Nasdaq) Index daily returns. The symbols ***, **, and *, indicate statistical significance at a 1%, 5%, and 10% levels, respectively.

Panel A: Market-adjusted returns

Market-Adjusted Initial Return (%)						Market-Adjusted Long-run Return (%)					
GP Reputation Measure (%)		N	Mean	Standard Deviation	Median	Carter-Manaster Reputation Measure		N	Mean	Standard Deviation	Median
x < 2.28	Low	2506	11.99	24.42	4.95	x < 8	Low	2021	-30.99	164.05	-69.12
x ≥ 2.28	High	2512	22.08	48.77	7.00	x ≥ 8	High	2996	-6.63	204.30	-51.20
Total		5018	17.04	38.91	5.85			5018	-16.31	189.49	-57.86

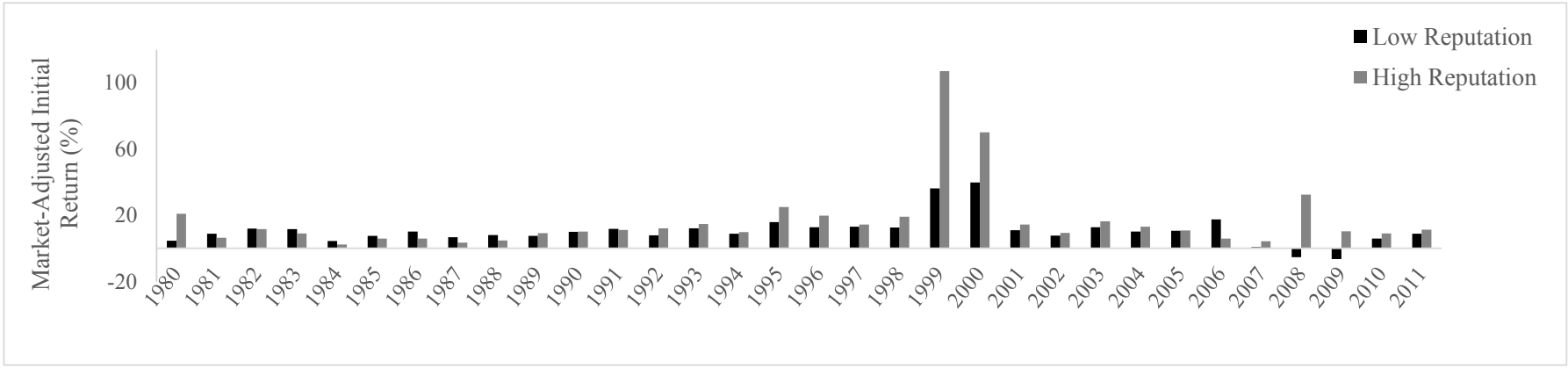
Panel B: Test Statistics for Differences in Subsamples

Reputation Groups	*t* -test (*t* -statistic)	Kruskal-Wallis (χ2 statistic)	*t* -test (*t* -statistic)	Kruskal-Wallis (χ2 statistic)
Low vs. High	9.263***	29.121***	4.708***	72.342***

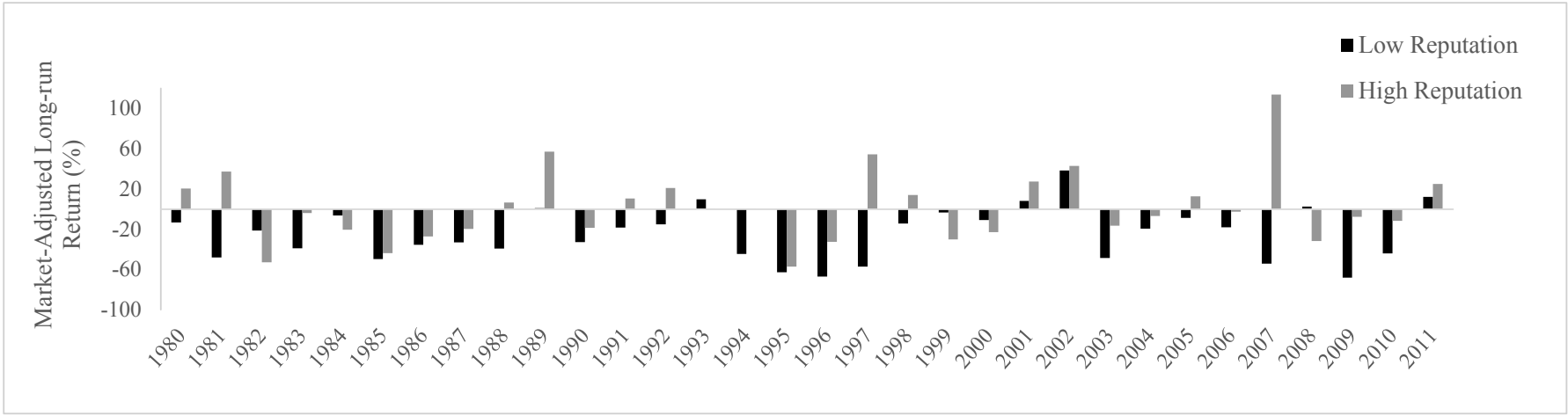
Figure 1: Market-Adjusted Returns

Panel A presents the market-adjusted initial returns of the IPOs managed by Low and High reputation investment banks, that is, with a market-share by gross proceeds rank (GP) lower than 2.28% (median) and higher or equal to 2.28%, respectively. Panel B presents the market-adjusted long-run returns of the IPOs managed by Low and High reputation investment banks, that is, with a Carter-Manaster rank (CM) lower than 8 (median) and higher or equal to 8, respectively.

Panel A: Market-adjusted initial returns (MAR0) for those IPOs underwritten by Low and High reputation Investment banks



Panel B: Market-adjusted long-run returns (MAR3) for those IPOs underwritten by Low and High reputation Investment banks



Panel A and B of Figure 1 are in line with our full sample and subsamples regression results. Contrary to the 1980s, since 1990, high prestige lead underwriters have, almost always, higher first-day returns than lower prestige underwriters (consistent with the findings in Loughran and Ritter (2004)). Furthermore, high prestige lead underwriters present, except in rare situations, less negative market-adjusted long-run returns.

5 Conclusions

This paper has two main goals. One is to analyse the influence of the lead underwriters' reputation on the initial and long-run IPO returns. In order to assess underwriters' prestige we use three different measures. Therefore, our second goal is to compare them in the perspective of the same returns, and see which is (are) the measure(s) that better explain the behavior of the returns.

By using a sample of more than 5,000 U.S. IPOs issued between January 1980 and December 2011 along with three methods to measure the lead underwriters' prestige and four control variables, we find evidence, that during the 80s, IPOs managed by investment banking firms with a higher reputational level tend to have lower first-day returns and less negative market-adjusted long-run returns. However, contrary to the 80s, in the perspective of the initial returns, from the 90s onwards, IPOs supervised by prestigious banks tend to have higher first-day returns.

Regarding the three measures analysed in this study, we conclude that the market-share by gross proceeds rank (GP) and the Carter-Manaster rank (CM) are the most significant ones at explaining the behaviour of the initial and long-run returns, respectively. Moreover, contrary to the findings in the full sample analysis, the best measures at explaining the changes in the first-day returns, during the 80s, are the CM and the Gross Spread (GS) rankings. Additionally, we find evidence that prestigious investment banking firms charge lower gross spreads. Consistently with Loughran and Ritter (2002), these institutions can obtain higher profits from commissions received from "rent-seeking buyers" than from gross spreads. As a final point, in our last subperiod (after the technology bubble burst, ranging from 2001 through 2011), none of the three measures are able to explain the variability of the market-adjusted long-run returns. This might be related with factors, others than the reputation, that issuing firms take into account, nowadays, to select an investment banking firm.

Finally, our suggestions for further research are the use of information on all of the underwriters instead of only the leader of each IPO, including their respective shares of the deal, as long as such information is made available. Moreover, the analysis can be expanded by assessing the impact of the issuing firms' industry on the success of the offerings.

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Appendix

Table 9: Subperiod correlation coefficients

Panels A, B, and C present the Pearson correlation coefficients among the variables studied in this paper, for the IPOs issued from January 1980 to December 1989, January 1990 to December 2000, and January 2001 to December 2011, respectively. MAR0 is the first-day return of each IPO, subtracted by the CRSP (NYSE/AMEX/Nasdaq) value-weighted daily market returns Index. LNMAR3 is the logarithm of 1000% plus the percentage return, from a buy-and-hold strategy, from the 6th trading day until the 764th trading day, or delisting date, and subtracted by the CRSP (NYSE/AMEX/Nasdaq) Index daily returns. STD Return of each IPO is calculated from a time series of the daily returns from the 6th trading day until the 260th trading day. LNSIZE is the logarithm of the gross proceeds of each IPO expressed in December 2011 dollars. LNAGE is the logarithm of 1 plus the number of years of the company existence on the offering date. HOT is equal to 1 for an IPO on a "hot market" period, and 0 otherwise. Carter-Manaster rank (CM), on a scale of 0 to 9, is obtained from the Ritter's website. It is based on the underwriters' position and frequency in "Tombstone announcements". The market-share by gross proceeds rank (GP) is constructed by summing the gross proceeds of each lead underwriter and then dividing by the total amount each year. The GS rank is constructed in a scale of 0 (20% least prestigious-lowest spreads) to 4 (20% most prestigious-highest spreads). The symbols ***, **, and *, indicate statistical significance at a 1%, 5%, and 10% levels, respectively.

Panel A: 1980-1989								
	LNMAR3	LNSIZE	LNAGE	STD Return	HOT	CM	GP	GS
MAR0	0.00	-0.05***	-0.10***	0.05***	-0.04**	-0.16***	-0.04***	0.16***
LNMAR3		0.05***	0.08***	-0.15***	-0.08***	0.10***	0.06***	-0.06***
LNSIZE			0.12***	-0.12***	0.04***	0.59***	0.48***	-0.63***
LNAGE				-0.19***	0.03**	0.18***	0.10***	-0.20***
STD Return					0.06***	-0.05***	-0.11***	0.15***
HOT						0.03**	-0.14***	-0.10***
CM							0.49***	-0.75***
GP								-0.51***
Panel B: 1990-2000								
	LNMAR3	LNSIZE	LNAGE	STD Return	HOT	CM	GP	GS
MAR0	-0.03**	0.20***	-0.15***	0.37***	0.05***	0.15***	0.32***	-0.09***
LNMAR3		0.03**	0.04**	-0.13***	0.00	0.10***	0.04***	-0.07***
LNSIZE			0.17***	-0.11***	0.04***	0.65***	0.52***	-0.59***
LNAGE				-0.25***	-0.04**	0.14***	0.07***	-0.16***
STD Return					0.05***	-0.06***	0.07***	0.18***
HOT						-0.05***	-0.07***	-0.04***
CM							0.50***	-0.71***
GP								-0.50***
Panel C: 2001-2011								
	LNMAR3	LNSIZE	LNAGE	STD Return	HOT	CM	GP	GS
MAR0	0.00	0.06***	0.10***	0.07***	0.01	0.04***	0.10**	0.03**
LNMAR3		0.10***	0.09***	-0.10***	0.03*	0.10***	0.05***	-0.10***
LNSIZE			0.12***	-0.38***	-0.01	0.44***	0.44***	-0.44***
LNAGE				0.00	0.17***	0.06***	0.06***	-0.07***
STD Return					-0.15***	-0.16***	-0.13***	0.30***
HOT						-0.11***	-0.12***	-0.10***
CM							0.41***	-0.53***
GP								-0.46***