Underpricing as compensation for the uncertainty surrounding the IPO share value

By

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About the author

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In 2014 he started a Master in Finance degree, in the same school and finished the curricular part of his Master in January of 2016, whose dissertation is now upon proposal.

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Abstract

Along the years, several authors have been trying to understand the IPO underpricing puzzle. This study tests the relation between uncertainty and underpricing.

This study try to understand whether the uncertainty is a possible justification for underpricing, using volatility of the shares' price in the first trading day after the IPO as a proxy for uncertainty.

Information about the intraday trading prices from the first day of trading after the IPO was collected for a sample of 614 IPOs, registered in the New York Stock Exchange (NYSE) occurred between 1st of January of 2000 and 31st of December of 2013 with gross proceed higher than 100 million dollars.

The results confirm that the average initial return is positive (11.4%) and supports the prediction of a positive relation between uncertainty and underpricing.

Key-words: Initial public offering; Underpricing; Ex ante uncertainty; Daily volatility

JEL-Codes: G11; G15; G24.

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1. Introduction

In the past few decades Initial Public Offerings (IPOs) has been study in every shape and size, addressing several problems and studying several possible justifications for it, not only in a daily basis in a professional environment but specially in the academic research environment. Among all these problems, consistently positive initial returns in the first day of trading, when compared to the offer price, i.e., underpricing, is the most studied problem regarding IPOs, however this puzzle is still a big mystery. One of the possible justifications to underpricing is the ex-ante uncertainty (Ritter, 1984)(Beatty and Ritter, 1986), i.e., the uncertainty around the future price of the shares about to be issued, or in other words, how hard it is to value the company.

As ex-ante uncertainty cannot be measured directly, it is necessary to find a proxy for it in order to test their relation. This study uses as proxy the standard deviation of the first day of trading after the IPO of the issued share. Similar choices were done in previous studies, but using the standard deviation of the first twenty days of trading (Ritter, 1984), first four days after the first day of trading (Miller & Reilly, 1987), fifty ninth days after the first day of trading (Clarkson, 1994) and first 100 days of trading (Yu & Tse, 2006). Other proxies were also uses, and some proved to be relevant, such as, the sales from the twelve months prior to the issue (Ritter, 1984), the inverse of the gross proceeds obtained in the issue ((Beatty & Ritter, 1986)(Miller & Reilly, 1987)), the age of the company and the number of risks presented in the prospectus (Clarkson, 1994).

Even though many authors have focus on this theme, this dissertation differentiate from previous studies by using a more recent sample of companies, and by using as a proxy for uncertainty the realized daily volatility[1] , giving more importance to the day that the share starts to be traded.

A linear regression model using a sample of 614 companies' IPOs from the NYSE occurred between 2000 and 2013 was estimated.

[1] The realized volatility is further explained based on Areal and Taylor (2002).

The rest of this report proceeds as follows. In section 2 the literature review of the topic is presented. Section 3 presents the sample while in section 4 the methodology is explained. The results are presented in section 5, and finally, section 6 concludes.

2. Literature Review

This sections starts with a brief description of some empirical literature regarding the IPO underpricing, in order to provide background to the following studies. Then, a revision of the main literature regarding the relation between underpricing and uncertainty is made, giving special attention to studies that had as a proxy the standard deviation of the aftermarket prices, but analysing all the proxies adopted by the authors.

2.1 The IPO underpricing

As previously mentioned, underpricing in IPOs is a problem with quite a long story. The perseverance of this problem, and consequently it vast literature, is mainly due to IPOs constant pricing problems.

A couple decades ago, Ibbotson (1975) studied the price performance of North-American IPOs from 1960 to 1969 randomly choosing one IPO from each month from all registered IPOs in the Securities and Exchange Commission (SEC). The author, using risk-adjusted returns concluded that, on average, the price at the end of the first trading day is 11.4% higher than the offer price. A few years later, Ibbotson upgrade his work using a sample of over 5,000 IPOs, occurred between 1960 and 1982, and found an average underpricing of 18.8%. Ritter (1984) using a sample of North-American IPOs occurred between 1977 and 1982, found on average an initial return equal to 26.5%. The sample included a hot issue period from January of 1980 to March of 1981, but even without accounting for this period, the author found an average underpricing of 16.3%.

Ibbotson, Sindelar and Ritter (1994) gathered data from several studies to confirm the presence of this phenomenon for 32 international IPO markets as Chinese, Australian, Portuguese, British, German, Japanese, among others.

When analysing the IPO process, there is a time lapse between the release of the offer price of the respective share and the beginning of trading on the market. This interval could be one of the justifications for underpricing, but, as stated by Ljungqvist (2004), in the US market “the offer price is set just days (or even more typically hours) before

trading on the stock market begins. This means that market movements between pricing and trading are negligible and so usually ignored" (Ljungqvist, 2004, pp. 6).

2.2 IPO underpricing: asymmetric information

In our study, we focused our attention in one of the most studied justification for IPO underpricing: asymmetric information. This justification explores the bias of information among the agents in the process of the IPO. Based on this justification we addressed four other that use asymmetric information as a groundwork.

2.2.1 The winner's curse

Ljungqvist (2004) found several explanations for underpricing, from behavioural, to asymmetric information models, passing through institutional or ownership and control, all can be play a role in justifying the underpricing. Our study will focus on asymmetric information models, more specific the winner's curse justification. The premise of this justification is the higher the uncertainty, the higher the underpricing, which will be further explained.

Ibbotson and Jaffe (1975) mentioned that is not unusual for underwriters to know beforehand that the possible demand is five times higher than the shares available. Rock (1986) using this information stated that uninformed investors (investors that do not spend any time and money to find out the value of a share, and that play a crucial role in IPOs, once they are the one who guarantee the success of the majority of them) "receives none of the underpriced issues due to the rationing brought on by the informed demand, and all of the overpriced issues" (Rock, 1986, pp. 188), what will lead the uninformed investors to revised downwards their valuation of new IPO shares, in order have a nonnegative expected return. Rock would published his work concluding that "the discount is a natural consequence of the present model, which incorporate asymmetric information and rationing" (Rock, 1986, pp. 188). This model was the groundwork for several others regarding this subject.

In the previous model, there was although a small hurdle as the rationing problem could not be tested in the North-American IPO market as in most of the markets, since the way the rationing is applied is not publicly disclosed. However, the same could not be said about the Singaporean IPO market. Koh and Walter (1989) did a direct test of Rock's (1986) model and state that "rationing occurs more often for 'good' shares than for 'bad' shares"(Koh and Walter, 1989, pp. 251). This study was unique since in the Singaporean market, whenever the demand surpasses the number of shares to be offered, it is public and "all applications of a particular size have an equal probability of being accepted" (Koh and Walter, 1989, pp. 252). The authors concluded that rationing of new issues explains the unseasoned new issues anomaly, that winner's curse is strongly evident and that there is a positive correlation between underpricing and oversubscription.

In the meanwhile, Ritter (1984) studied the 1980 "hot issues", trying to find a justification for it, by developing an implication of Rock's (1986) model. He starts by arguing that some IPOs are more underpriced than others, more precisely, IPOs with higher risk are generally more underpriced than low-risk IPOs. In order to test it, Ritter checked that "if high-risk offerings are an unusually large fraction of initial public offerings in some periods, these periods should also have unusually high average initial returns" (Ritter, 1984, pp. 216). Once risk is not something measurable, the author needed to use a proxy to risk, which he used the sales from the most recent 12 months, and the daily standard deviation of the first 20 daily initial returns of the aftermarket. Ritter concluded that there is a positive relation between risk and initial returns (and its heteroscedasticity), i.e., that the greater the uncertainty about the price of the new shares, the greater the advantage of the informed investors, hence, the deeper the underpricing.

When the demand for the shares of one IPOs is bigger than the shares available, which happens with the majority of IPOs, the issuing firm can no longer increase the number of shares, then it has to be implemented a quantity rationing. Beatty and Ritter (1986), when studying the IPO underpricing, argue that this rationing does not happen in a random way across issues. They also stated that offers which prices rises are much more commonly oversubscribed than the ones that prices fall and that an uninformed investor that subscribe to all offerings, "is allocated shares in the offerings that go up less frequently than in the offerings that decline in price" (Beatty and Ritter, 1986, pp. 215), what creates a "winner's curse" situation. The authors concluded that as the ex-ante uncertainty is

directly related to the degree of underpricing, and as it increases the "winner's curse" problem intensifies, "the greater the ex-ante uncertainty about the value of an issue, the greater is the expected underpricing" (Beatty & Ritter, 1986, pp. 231). They proved it using Rock's (1986) model, having the inverse of the gross proceeds as a proxy to ex ante uncertainty.

When analysing this problem, one important step is to find an appropriate proxy for risk, once as previously mentioned, it is not a measurable concept. Miller and Reilly (1987) on their study regarding mispricing, initial returns and uncertainty for IPOs assessed the relation between the level of underpricing and a couple of different proxies for risk, with a sample of IPO occurred between 1982 and 1983. The authors tested proxies already used by other authors, such as the inverse of the gross proceeds (Beatty and Ritter, 1986) reaching a value of 0.12, the standard deviation of returns (Ritter, 1984), but in this proxy they changed from the first 20 days to the first 4 days after the first day of trading, using in this case an ex-post measure and reaching a value of 0.32.

Miller and Reilly (1987) also analysed the difference between the standard deviation of the returns for days two through five for the underpriced part of their sample, versus the overpriced part of the sample, concluding that there is higher uncertainty for the underpriced one. The authors also tested additional variables, highlighting the trading volume, which also showed to be correlated to uncertainty.

The study of proxies for ex-ante uncertainty around IPOs was still not over. Clarkson (1994) did further research on the relation between underpricing and ex-ante uncertainty, stablishing a hierarchy among a group of 9 proxies, using a sample from 1976 until 1985, and once again, the assumptions of Rock's (1986) models.

After performing F-tests on all the proxies, the author highlighted 3 proxies: the age of the firm going public, the number of risk factors present on the prospectus and the standard deviation of daily returns measured over the first 59 days after the first day of trading. When testing these models, the author concluded that only the age of the company is statistically significant in all models, the number of risk factors is only in two of four, and the standard deviation of the daily returns it is not in all of the four.

More recently Lowry *et al.* (2010) studied the variability of IPOs initial returns, using a sample of IPOs occurred between 1965 and 2005. With a different approach from the

previously studies, the authors checked if when the initial returns were high, the dispersion of that same returns were also high, but using information from the first 21 trading days for both of the calculations. The authors assumed that if the dispersion of the initial returns is higher, then it is because the companies are harder to value. In their process, the authors highlighted the age of the firm, being from a high-tech industry and being quoted in NASDAQ instead of NYSE, as important variables to how hard it is to value a company. They also provide evidences backing the relation between underpricing and ex-ante uncertainty.

2.2.2 Information revelation theory

"If – as Rock assumes – some investors are better informed than either the company or other investors, eliciting their information before setting the price becomes one of the keys tasks for the investment bank taking the company public." (Ljungqvist, 2004, pp. 19).

Due to this bias of information regarding the companies, previously stated by Ljungqvist (2004), Bookbuilding started being more used as pricing mechanism to IPOs. In this mechanism some investors (specifically institutional investors) can give their opinion on the value of the share that is about to go public. However, is in the interest of the investors to give misrepresentation of positive information about the company as it decreases the issue price, and so they will further benefit from underpricing. It was then a challenge to adapt this mechanism, into one where the investors benefit from revealing their information truthfully.

Benveniste and Spindt (1989), Benveniste and Wilhelm (1990) and Spatt and Srivastava (1991) presented the necessary changes to make this mechanism work. They stated that not allocating any (or few) shares to the investors who bid conservatively would make the investors that have positive information to bid aggressively, not only for being assigned to the shares but also to do not miss the opportunity of keep on doing businesses with the investment bank.

In order to this mechanism to work, i.e., to investors revealing the information, the shares have to be underpriced, so it can ensure that their return is positive, and then keep their interest in the present IPO, but also in the forthcoming ones.

Even leaving money on the table, the issuing company still benefits from this mechanism, once it is able to set the higher issue price than if it did not have the positive information from the investors.

2.2.3 Principal – agents models

Investment banks (as underwriters) have several decisions to make in the IPO process that impacts the overall process. These decisions can sometimes create agency problems with the issuer.

These problems arise since the underwriters have the power to influence the offer price and to decide the shares allocation: to whom and how much share are allocated to each investor.

Regarding the price settlement, the underwriters are hired to help choosing the highest offer price that ensure the selling of all the shares. Even though, the banks face moral hazard problems, since they can benefit from a higher offer price as the underwriting fees are set as a percentage of the total proceeds. These should be an incentive to underwriters to behave in the best interest of the issuer (higher gross proceeds means higher fees), but it is conceivable that other benefits[1] from setting a lower offer price exceed the loss in underwriting fees.

Baron and Holmström (1980) and Baron (1982) presented screening models to analyse the benefits of the underwriters from the underpricing. In those, they stated that in order to the issuers to get the best of all the superior information possessed by the investment bank, the investment bank should choose the offer price from a range of prices selected by the issuers, which the bank will choose accordingly to the expected likely demand of the shares from the IPO.

[1] The benefits can arise from side-payments made by the investors to ensure they receive more (underpriced) shares or from allocating shares to executives in exchange of further investment banking business.

In this situation, in the presence of asymmetric information, the underwriter will a price other than the optimal price (from the issuer point of view) under symmetric information. The price chose by the underwriter, in equilibrium, will involve underpricing due to the information advantage of the underwriter. One important conclusion drawn from this mode is that the higher the uncertainty around the value of the company, the higher will be the asymmetry of information and so the higher the underpricing.

2.2.4 Underpricing as a signal of company quality

This explanation changes the approach to the problem by assuming that the issuer has the best information regarding it future cash-flows, and so, it value.

Allen and Faulhaber (1989) in their study concluded that good companies underprice in order to evidence the company's quality, once they know that they will be able to recover the loss suffered through future issuings. Ibbotson (1975) was the first to suggest that IPOs are underpriced to "'leave a good taste in investors' mouths'" (Ibbotson, 1975, pp. 264).

Allen and Faulhaber (1989) also mentioned that other signals could be used instead of underpricing, for highlighting the company's quality. However, underpricing, on the contrary of other signals, has no monitoring costs, and it also reduces the litigation risk and can even work as publicity, since there are several publications and news that highlight the IPO winners.

3. Data

In order to answer the questions raised by this dissertation a sample of IPO occurred between 2000 and 2013 was chosen and data collected from several sources. This process will be further fully explained.

3.1 Sample selection and data sources

We started by collecting all 806 IPOs occurred between the 2000 and 2013, in the New York Stock Exchange (NYSE) IPOs, a highly liquid IPO market. This will allow us to analyse more recent IPOs, in contrast with most of previous studies that analysed periods before the 2000. After remove all the trusts[1] we end up with 786 companies that went public in the NYSE between 2000 and 2013. Information about the intraday prices was only available for 754. Then, all IPOs that had a gross proceed lower than 100 million dollars were eliminated, to reduce the risk of having IPOs with misleading information due to their size, which left us with 633 companies. Finally, the age of the company that will be used as control variable, was only available to 614 companies that comprise our final sample.

The list of all the companies that went public during the sample period, as well as the issue price and the gross proceeds of each of the respective IPO were retrieved from the NASDAQ website[2]. The intraday prices of all the transactions recorded on the first day of trading, that allowed us to not only to calculate the underpricing but also, and more important, to calculate the daily volatility, were collected from the Trade and Quotes (TAQ) database[3] along with the volume of each transactions. In order to have the age of the each company we used the Capital IQ[4] database for most of the companies, and the Google website[5] for the remaining ones, since the database did not had information about all the companies.

[1] Trusts' value is dependent on the value of the assets that comprise the trust and so their price uncertainty is very different from a normal IPO as depend on the uncertainty regarding the price of its assets.
[2] www.nasdaq.com
[3] http://www.nyxdata.com/Data-Products/Daily-TAQ
[4] www.capitaliq.com
[5] www.google.com

3.2 Intraday data scrubbing

The most decisive data to this study is the intraday prices as it is used as proxy to the ex-ante uncertainty and the major factor that differentiate our dissertation from previous studies. After downloaded all the intraday transactions that occurred in the first day after the IPO for each share, it was needed to scrub all the data since the data auto-recorded (normally called as dirty data) by computers includes a lot of inaccurate data as it records dozens of hundreds of values for the same day. In order to clean the data, all extreme values (outliers) were deleted. So when a tick change (that can happen in a matter of seconds, or even during the same second) was higher than 5% or higher than 1€ that specify data point was deleted. This was an extremely time consuming process since it was necessary to assess the trend of the price, every time an outlier was found.

After removing all the dirty data, we were able to proceed with the treatment of the data, assembling all the transactions into 5-minutes transactions blocks. We assumed that for all offerings, the first transaction that occurred after the market opens would be the first value for the first 5-minutes block. Then, we used the transactions nearest to each 5-minutes block, finishing at the 16.00 block, or the last value available when the share was not traded until 16.00[6].

In the case of the volume of shares traded all transactions were considered since using only the 5-minutes blocks would ignore most of the transactions that happened that day

3.3 Variables' description

The model, which will be explained in the next Section, includes de following variables:

Underpricing (UND) measured as the percentage change from the issue price of an initial public offering and the closing price of the first day of trading in the secondary market, using the price of the last 5-minutes block.

[6]Companies that trade started after 12.00 or were not traded after 14.00, were classified as companies without proper data, and so were removed from our sample (this included a total of XXX companies).

Volatility (VOLA) measured as the standard deviation of the daily logarithmic returns measured in the first day of trading using prices from the 5-minutes blocks (Areal and Taylor, 2002)

Gross proceed (GROSS) measured as the total amount obtained from the IPO (gross proceeds) (Beatty and Ritter, 1986)

Volume (VOLU) measured as the percentage of the total shares issued in the public offering shares traded at the first day of trading (Miller and Reilly, 1987)

Age (AGE) as the number of years since the company was founded (Ritter, 1984)

The calculation of the realized daily volatility, based on Areal and Taylor (2002) as previously mentioned, followed the following formula:

$$\sigma^2 = \sum_{j=0}^{n} w_j * r_j^2 \qquad (3.1)$$

Where:

w_j is the weight of each 5-minutes return during the day. In this study is assumed to be equal for every return. Their sum is equal to 1;

r_j^2 is the square of the logarithmic returns for each of the 5-minutes.

From the values computed from the previous formula, we calculated their square root in order to reach the standard deviation, the proxy used for the ex-ante uncertainty.

For the purpose of this study, the variables GROSS and AGE were transformed. GROSS into the inverse of GROSS while AGE into the log (1+AGE). This transformation was done in the line of previous studies[7].

[7] The transformation done on GROSS was done by Beatty and Ritter (1986) and the one done on AGE was done by Ritter (1984).

3.4 Descriptive Statistics

As shown in Table 1 the average offer price was $18.47 (the median is $18) with a minimum value of $6 in the IPOs of both Agere Systems Inc. and Medialive International Inc., a maximum value of $70.41 in the IPO of Kinder Morgan Kansas Inc. and a standard deviation of $6.67. Relatively to the closing price of the first day of trading, the average (median) was $20.84 ($19.1), the standard deviation $10.06, and it ranged from $6 in the case of Medialive International Inc. to $132.7 in the case of NYMEX Holdings Inc..

The average (median) underpricing was 11.45% (5.66%) with a minimum of -26.79%, an overpriced IPO by Agria Corp., and a maximum of 165.94% in an IPO by Youku Tudou Inc.

In respect to the daily volatility of the first day of trading, the sample present an average (median) of 5.07% (4.09%) with the less volatile being the shares of Campus Crest Communities Inc with 0.41% and the most volatile the shares of Pandora Media Inc. with 29.59%.

The IPO raised on average (median) $520.27 million ($255.45million), being the largest one the VISA IPO with gross proceeds of $17,864 million.

Table 1 - Descriptive Statistics

	N	Mean	Median	Std. Deviation	Minimum	Maximum
Issue Price ($)	614	18.47	18.00	6.67	6.00	70.41
1st Day Closing Price ($)	614	20.84	19.10	10.06	6.00	132.70
Underpricing (%)	614	11.45	5.66	20.44	-26.79	165.94
1st Day Volatility (%)	614	5.07	4.09	3.49	0.41	29.59
Gross Proceeds (M$)	614	520.27	255.45	1189.45	100.10	17864.00
Volume of Trades/ Issued Shares (%)	614	65.18	58.01	37.85	0.27	384.15
Age (Years)	614	22	9	33	0	183

During the first day of trading after the IPO an average (median) of 65.18% (58.01%) of the shares offered in the IPI were traded. In the case of LinkedIn Corp. the number of shares traded were 3.84 times the total number of shares offered.

Finally, the companies that went public were founded, on average (median) 22 years (9 years) before. It's important to mention that 71 companies went public in the same year that they were founded and one of the companies (Bunge LTD) did its IPO 183 years after it was founded.

4. Methodology

Before we present our model, it is important to mention that when testing it we are facing a joint hypothesis problem as we are assuming that the daily volatility is a good proxy for uncertainty regarding the true value of the shares offered in the IPO.

Several justifications have been tested to try to solve the IPO underpricing puzzle and this study pretend to test the asymmetric information justification that, as first proposed by Beatty and Ritter (1986). According to these authors, the asymmetric information creates a winner's curse situation, which, as previously mentioned, happens due to uncertainty around the pricing of the company going public. As the offer price is partially supported in the fact that uninformed investor tend to evaluate the IPO shares downwards, what leads the company to apply a discount in the price of the share in order to guarantee the success of the offering.

In order to test this justification we propose the following linear regression model:

$$UND = \beta 1 + \beta 2 * VOLA + \beta 3 * \frac{1}{GROSS} + \beta 4 * VOLU + \beta 5 * \log(1 + AGE) \quad (4.1)$$

In this model, the underpricing (UND) is our dependent variable, the daily volatility (VOLA) is our explanatory variable, as previously mentioned, and the three remaining variables are control variables that were shown can influence the underpricing by previous studies, being: the inverse of the gross proceeds obtained from the offering, suggested by Beatty and Ritter (1986); the percentage of shares trade in the first day when compared to the total amount of shares issued in the offering, suggested by Miller and Reilly (1987); and finally the logarithmic of 1 plus the age of the company when it went public. We expected that the signal of VOLA, of VOLU and of AGE (and of it transformation) to be positive, expecting a positive relation between them and the underpricing (UND). Regarding the GROSS, once we transformed the variable into the inverse of GROSS, we expect the signal to be negative, but the relation between GROSS and underpricing (UND) to be positive.

5. Results

Since we checked that there is heteroscedasticity in the ordinary least squares (OLS) regression, we proceed to validate the statistical inference using the White's consistent estimators of the variance and covariance matrix from the OLS estimators of the regression coefficients.

In Table 2, we present the results of the OLS regression[1], where the underpricing is the dependent variable and the daily realized volatility is the explanatory variable. The volume, the gross proceeds and the age are control variables, from which the last two were transformed as previously mentioned.

Table 2 – Regressions for a Sample of 614 NYSE IPOs from the Period 2000 – 2013.[a)]

	Model			
Variables	#1	#2	#3	#4
intercept	-0.067248***	-0.124096***	-0.106721***	0.122955***
	(0.019833)	-0.023891	-0.022269	-0.021434
realized volatility	3.581183***	2.486719***	2.529504***	2.516272***
	-0.455086	-0.45262	-0.463038	-0.464039
volume	-	0.172426***	0.17713***	0.175515***
		-0.028794	-0.029206	-0.029141
1/gross	-	-	-5.380844**	-4.854058*
			-2.436459	-2.484502
log(1+age)	-	-	-	0.015908**
				-0.00799
R-squared	0.373704	0.440792	0.44496	0.447136
Adjusted R-squared	0.372681	0.438961	0.442231	0.443504
Observations	614	614	614	614

a) Adjusted t-values (White's consistent covariance and variance matrix is used to estimating standard errors)

*** Significant at 1% level

** Significant at 5% level

* Significant at 10% level

[1] Since we checked that there is heteroscedasticity in the ordinary least squares (OLS) regression, we proceed to validate the statistical inference using the White's consistent estimators of the variance and covariance matrix from the OLS estimators of the regression coefficients.

The positive coefficient on the realized volatility are consistent with Rock's (1986) prepositions, which predicted that the ex-ante uncertainty is positively correlated with the underpricing, being in this case the daily realized volatility the proxy for ex-ante uncertainty. Regarding the control variables, the volume and the age have a positive correlation with the dependent variable, and the inverse of the gross proceed has a negative correlation, what means that the gross proceeds itself has a positive correlation also.

Related to the statistical significance, the volatility and the volume are significant at 1% level in all models. Regarding the inverse of gross proceeds and the logarithm transformation of the age of the companies, the first is statistically significant at 5% and 10% level in model 3 and 4, respectively; while the second is statistically significant at 5% in model 4.

It is important to state that the adjusted R-squared is quite high (0.373), even for model 1, where it is only present the explanatory variable, the daily realized volatility. When comparing to other similar studies, namely Miller and Reilly (1987), we found higher explanatory power to the standard deviation, but we have calculated the volatility in the first day only, while Miller and Reilly used the first 4 days after the IPO. Clarkson (1994), conclude that the standard deviation had no statistical significance in his study, but again, he used the standard deviation during the first 60 days of trading after the IPO.

6. Conclusions

Although there is a vast number of studies regarding the IPO underpricing, the number of studies about the uncertainty, more specifically about the winner's curse, as a motive for the underpricing is relatively scarce. This study tries to fill this gap by using a different proxy for uncertainty, the volatility during the first day of trading after the IPO (daily standard deviation) and by using a more recent sample that starts in 2000 and ends in 2013.

The first result of our study is consistent with previous studies as it shows an average underpricing of 11.45%.

Regarding uncertainty as a justification for underpricing, our results, show a positive relationship between underpricing and uncertainty. This results is consistent with other studies (Ritter (1984); Miller and Reilly (1987)) that although using different periods of time to calculate the standard deviation (first twenty days after the IPO and from the second to fifth day after the IPO) found similar results. Clarkson (1994) using as a proxy for uncertainty the standard deviation from the second to the sixtieth day after the IPO found slightly different results which may be justified by the difference in the number of days used to calculate the standard deviation.

Although our sample was very large (614 companies) it is important to mention that only includes IPO occurred in NYSE and so misses a large number of offerings from two other very important stock exchanges: the NASDAQ and the AMEX. The inclusion of the IPOs occurred in theses stock exchanges would allow us to extend our conclusions to the entire north-American IPO market. Another limitation of our study is the joint hypothesis problem since we assume that the daily volatility is a good proxy for value uncertainty.

One possibility to extend the sample is to include earlier years and analyse the differences between different and more crucial periods, e.g., the dot-com bubble and even the recent economic crisis.

7. References

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Appendix

In this list are presented the name and the ticker of all the companies that went public during the period between 2000 and 2013 in the New York Stock Exchange, giving the final 614 companies selected for our sample. In order to reach the final sample we removed all the trusts from the initial sample, keeping only 786 companies from the initial 806. Then we had to remove the companies we were lacking information regarding the intraday prices, diminishing the sample to 754 companies. In order to eliminate possible outliers due to their sizer, we decided to keep only companies with gross proceeds equal or higher than 100 million dollars, keeping 633 companies. Finally, when collecting information regarding the age of the companies, we could not find information for all the companies, reaching the final number of 614 companies.

	Company	Ticker
1	3PAR INC.	PAR
2	58.COM INC.	WUBA
3	7 DAYS GROUP HOLDINGS LTD	SVN
4	AAMES INVESTMENT CORP	AIC
5	ACCENTURE PLC	ACN
6	ACORN INTERNATIONAL, INC.	ATV
7	ACTIVE NETWORK LLC	ACTV
8	ADESA INC	KAR
9	ADVANCE AMERICA, CASH ADVANCE CENTERS, INC.	AEA
10	AECOM	ACM
11	AEGEAN MARINE PETROLEUM NETWORK INC.	ANW
12	AERCAP HOLDINGS N.V.	AER
13	AEROFLEX HOLDING CORP.	ARX
14	AGERE SYSTEMS INC	AGR'A
15	AGRIA CORP	GRO
16	AIR LEASE CORP	AL
17	AIRCASTLE LTD	AYR
18	ALCON INC	ACL

19	ALLIANCE DATA SYSTEMS CORP	ADS
20	ALLIED WORLD ASSURANCE CO HOLDINGS, AG	AWH
21	ALLISON TRANSMISSION HOLDINGS INC	ALSN
22	ALON USA ENERGY, INC.	ALJ
23	ALON USA PARTNERS, LP	ALDW
24	ALPHA NATURAL RESOURCES, INC.	FCL
25	ALPHA NATURAL RESOURCES, INC./OLD	ANR
26	AMBOW EDUCATION HOLDING LTD.	AMBO
27	AMC ENTERTAINMENT HOLDINGS, INC.	AMC
28	AMERICAN CAMPUS COMMUNITIES INC	ACC
29	AMERICAN EQUITY INVESTMENT LIFE HOLDING CO	AEL
30	AMERICAN HOMES 4 RENT	AMH
31	AMERICAN RESIDENTIAL PROPERTIES, INC.	ARPI
32	AMERICAN WATER WORKS COMPANY, INC.	AWK
33	AMN HEALTHCARE SERVICES INC	AHS
34	ANTEON INTERNATIONAL CORP	ANT
35	ANTERO RESOURCES CORP	AR
36	ANTHEM, INC.	ATH
37	APOLLO COMMERCIAL REAL ESTATE FINANCE, INC.	ARI
38	APOLLO GLOBAL MANAGEMENT LLC	APO
39	APOLLO RESIDENTIAL MORTGAGE, INC.	AMTG
40	AQUILA MERCHANT SERVICE INC	ILA
41	ARAMARK	ARMK
42	ARAMARK CORP/DE	RMK
43	ARC DOCUMENT SOLUTIONS, INC.	ARP
44	ARC LOGISTICS PARTNERS LP	ARCX
45	ARCOS DORADOS HOLDINGS INC.	ARCO
46	ARDMORE SHIPPING CORP	ASC
47	ARES COMMERCIAL REAL ESTATE CORP	ACRE
48	ARLINGTON TANKERS LTD.	ATB
49	ARMADA HOFFLER PROPERTIES, INC.	AHH
50	ARTIO GLOBAL INVESTORS INC.	ART
51	ARTISAN PARTNERS ASSET MANAGEMENT INC.	APAM
52	ASBURY AUTOMOTIVE GROUP INC	ABG
53	ASPEN INSURANCE HOLDINGS LTD	AHL

54	ASSURANT INC	AIZ
55	ASSURED GUARANTY LTD	AGO
56	AT&T CORP	AWE
57	ATHLON ENERGY INC.	ATHL
58	ATLAS ENERGY RESOURCES, LLC	ATN
59	AUTOHOME INC.	ATHM
60	AVENTINE RENEWABLE ENERGY HOLDINGS INC	AVR
61	AVG TECHNOLOGIES N.V.	AVG
62	AVIANCA HOLDINGS S.A.	AVH
63	AXIS CAPITAL HOLDINGS LTD	AXS
64	BALTIC TRADING LTD	BALT
65	BANCO SANTANDER (BRASIL) S.A.	BSBR
66	BANKRATE, INC.	RATE
67	BANKUNITED, INC.	BKU
68	BASIC ENERGY SERVICES INC	BAS
69	BELMOND LTD.	OEH
70	BERRY PLASTICS GROUP INC	BERY
71	BILL BARRETT CORP	BBG
72	BITAUTO HOLDINGS LTD	BITA
73	BLACKSTONE GROUP L.P.	BX
74	BLUE CAPITAL REINSURANCE HOLDINGS LTD.	BCRH
75	BLUELINX HOLDINGS INC.	BXC
76	BOARDWALK PIPELINE PARTNERS, LP	BWP
77	BOIS D'ARC ENERGY, INC.	BDE
78	BOISE CASCADE CO	BCC
79	BONANZA CREEK ENERGY, INC.	BCEI
80	BOOZ ALLEN HAMILTON HOLDING CORP	BAH
81	BOX SHIPS INC.	TEU
82	BRIDGEPOINT EDUCATION INC	BPI
83	BRIGHT HORIZONS FAMILY SOLUTIONS INC.	BFAM
84	BRISTOL WEST HOLDINGS INC	BRW
85	BRITANNIA BULK HOLDINGS INC	DWT
86	BRIXMOR PROPERTY GROUP INC.	BRX
87	BROOKDALE SENIOR LIVING INC.	BKD
88	BUCKEYE GP HOLDINGS L.P.	BGH

89	BUILD A BEAR WORKSHOP INC	BBW
90	BUNGE LTD	BG
91	BURLINGTON STORES, INC.	BURL
92	BWAY HOLDING CO	BWY
93	C&J ENERGY SERVICES, INC.	CJES
94	CABELAS INC	CAB
95	CAL DIVE INTERNATIONAL, INC.	DVR
96	CAMELOT INFORMATION SYSTEMS INC.	CIS
97	CAMPUS CREST COMMUNITIES, INC.	CCG
98	CAPITALSOURCE INC	CSE
99	CARTERS INC	CRI
100	CASCAL N.V.	HOO
101	CBOT HOLDINGS INC	BOT
102	CBRE GROUP, INC.	CBG
103	CELANESE CORP	CE
104	CELLCOM ISRAEL LTD.	CEL
105	CELLU TISSUE HOLDINGS, INC.	CLU
106	CEMENTOS PACASMAYO SAA	CPAC
107	CENCOSUD S.A.	CNCO
108	CENTRO SATURN MERGERSUB LLC.	HTG
109	CF INDUSTRIES HOLDINGS, INC.	CF
110	CHANGE HEALTHCARE HOLDINGS, INC.	EM
111	CHARLES RIVER LABORATORIES INTERNATIONAL INC	CRL
112	CHEGG, INC	CHGG
113	CHERRY HILL MORTGAGE INVESTMENT CORP	CHMI
114	CHESAPEAKE ENERGY CORP	CHKR
115	CHIMERA INVESTMENT CORP	CIM
116	CHINA DIGITAL TV HOLDING CO., LTD.	STV
117	CHINA LIFE INSURANCE CO LTD	LFC
118	CHINA NEPSTAR CHAIN DRUGSTORE LTD.	NPD
119	CHINA NETCOM GROUP CORP (HONG KONG) LTD	CN
120	CHIPOTLE MEXICAN GRILL INC	CMG
121	CHUNGHWA TELECOM CO LTD	CHT
122	CINEMARK HOLDINGS, INC.	CNK
123	CIT GROUP INC	CIT

124	CITADEL BROADCASTING CORP	CDL
125	CLEAR CHANNEL OUTDOOR HOLDINGS, INC.	CCO
126	CLOUD PEAK ENERGY INC.	CLD
127	CLUBCORP HOLDINGS, INC.	MYCC
128	CNX GAS CORP	CXG
129	COACH INC	COH
130	COBALT INTERNATIONAL ENERGY, INC.	CIE
131	COLFAX CORP	CFX
132	COLONY CAPITAL, INC.	CLNY
133	COMMUNITY HEALTH SYSTEMS INC	CYH
134	COMPASS MINERALS INTERNATIONAL INC	CMP
135	CONCHO RESOURCES INC	CXO
136	CONCORD MEDICAL SERVICES HOLDINGS LTD	CCM
137	CONSTELLIUM N.V.	CSTM
138	CONTAINER STORE GROUP, INC.	TCS
139	CONTINENTAL RESOURCES, INC	CLR
140	CONTROLADORA VUELA COMPANIA DE AVIACION, S.A.B. DE C.V.	VLRS
141	COPA HOLDINGS, S.A.	CPA
142	CORESITE REALTY CORP	COR
143	COSAN LTD.	CZZ
144	COSTAMARE INC.	CMRE
145	COTY INC.	COTY
146	CPFL ENERGY INC	CPL
147	CRESTWOOD MIDSTREAM PARTNERS LP	NRGM
148	CRESTWOOD MIDSTREAM PARTNERS LP	KGS
149	CREXUS INVESTMENT CORP.	CXS
150	CROSSAMERICA PARTNERS LP	LGP
151	CRUDE CARRIERS CORP.	CRU
152	CRYSTAL RIVER CAPITAL, INC.	CRZ
153	CUBESMART	YSI
154	CV HOLDINGS, INC.	CBF
155	CVENT INC	CVT
156	CVR ENERGY INC	CVI
157	CVR PARTNERS, LP	UAN

158	CVR REFINING, LP	CVRR
159	CYS INVESTMENTS, INC.	CYS
160	DANAOS CORP	DAC
161	DCP MIDSTREAM PARTNERS, LP	DPM
162	DELEK LOGISTICS PARTNERS, LP	DKL
163	DELEK US HOLDINGS, INC.	DK
164	DELPHI AUTOMOTIVE PLC	DLPH
165	DEMAND MEDIA INC.	DMD
166	DEX MEDIA INC	DEX
167	DHI GROUP, INC.	DHX
168	DHT HOLDINGS, INC.	DHT
169	DIAMOND RESORTS INTERNATIONAL, INC.	DRII
170	DIAMONDROCK HOSPITALITY CO	DRH
171	DIANA SHIPPING INC.	DSX
172	DIGITALGLOBE, INC.	DGI
173	DJO OPCO HOLDINGS, INC.	DJO
174	DOLAN CO.	DM
175	DOLBY LABORATORIES, INC.	DLB
176	DOLE FOOD CO INC	DOLE
177	DOLLAR GENERAL CORP	DG
178	DOMINOS PIZZA INC	DPZ
179	DOUGLAS DYNAMICS, INC	PLOW
180	DOUGLAS EMMETT INC	DEI
181	DRESSER-RAND GROUP INC.	DRC
182	DSW INC.	DSW
183	DUFF & PHELPS CORP	DUF
184	DUNCAN ENERGY PARTNERS L.P.	DEP
185	DUPONT FABROS TECHNOLOGY, INC.	DFT
186	DYNCORP INTERNATIONAL INC.	DCP
187	ECC CAPITAL CORP	ECR
188	E-COMMERCE CHINA DANGDANG INC.	DANG
189	EDENOR	EDN
190	EDGEN GROUP INC.	EDG
191	E-HOUSE (CHINA) HOLDINGS LTD	EJ
192	EL PASO PIPELINE PARTNERS, L.P.	EPB

193	ELLINGTON FINANCIAL LLC	EFC
194	EMERGE ENERGY SERVICES LP	EMES
195	EMERGENCY MEDICAL SERVICES L.P.	EMS
196	EMERGENT CAPITAL, INC.	IFT
197	EMPLOYERS HOLDINGS, INC.	EIG
198	ENCORE ACQUISITION CO	EAC
199	ENCORE ENERGY PARTNERS LP	ENP
200	ENDURANCE SPECIALTY HOLDINGS LTD	ENH
201	ENERGY CORP OF AMERICA, INC	ECT
202	ENERGY TRANSFER EQUITY, L.P.	ETE
203	ENERGYSOLUTIONS, INC.	ES
204	ENERSYS	ENS
205	ENTERPRISE GP HOLDINGS L.P.	EPE
206	ENTRAVISION COMMUNICATIONS CORP	EVC
207	ENVISION HEALTHCARE HOLDINGS, INC.	EVHC
208	EQT MIDSTREAM PARTNERS, LP	EQM
209	ESH HOSPITALITY, INC.	STAY
210	ESSENT GROUP LTD.	ESNT
211	EVERBANK FINANCIAL CORP	EVER
212	EVERI HOLDINGS INC.	GCA
213	EVERTEC, INC.	EVTC
214	EXACTTARGET, INC.	ET
215	EXAMWORKS GROUP, INC.	EXAM
216	EXCO RESOURCES INC	XCO
217	EXPRESS, INC.	EXPR
218	EXPRESSJET HOLDINGS INC	XJT
219	EXTRA SPACE STORAGE INC.	EXR
220	FIDELITY & GUARANTY LIFE	FGL
221	FIRST MERCURY FINANCIAL CORP	FMR
222	FLAGSTONE REINSURANCE HOLDINGS, S.A.	FSR
223	FLEETCOR TECHNOLOGIES INC	FLT
224	FLEETMATICS GROUP PLC	FLTX
225	FLY LEASING LTD	FLY
226	FMC TECHNOLOGIES INC	FTI
227	FORTRESS INVESTMENT GROUP LLC	FIG

228	FORUM ENERGY TECHNOLOGIES, INC.	FET
229	FRANK'S INTERNATIONAL N.V.	FI
230	FREESCALE SEMICONDUCTOR INC	FSL
231	FREESCALE SEMICONDUCTOR, LTD.	FSL
232	FTD GROUP, INC.	FTD
233	FUSION-IO, INC.	FIO
234	FXCM INC.	FXCM
235	GAFISA S.A.	GFA
236	GAMESTOP HOLDINGS CORP	GME
237	GASLOG LTD.	GLOG
238	GATEHOUSE MEDIA, INC.	GHS
239	GENERAL MOTORS CO	GM
240	GENESIS HEALTHCARE, INC.	SKH
241	GENESIS LEASE LTD	GLS
242	GENON ENERGY, INC.	RRI
243	GENPACT LTD	G
244	GENWORTH FINANCIAL INC	GNW
245	GIANT INTERACTIVE GROUP INC.	GA
246	GIGAMON INC.	GIMO
247	GLOBAL PARTNERS LP	GLP
248	GLOBAL SIGNAL INC	GSL
249	GNC HOLDINGS, INC.	GNC
250	GOL INTELLIGENT AIRLINES INC.	GOL
251	GOODMAN GLOBAL INC	GGL
252	GRAHAM PACKAGING CO INC.	GRM
253	GRANA & MONTERO S.A.A.	GRAM
254	GREEN DOT CORP	GDOT
255	GUIDEWIRE SOFTWARE, INC.	GWRE
256	GUSHAN ENVIRONMENTAL ENERGY LTD	GU
257	HANCOCK JOHN FINANCIAL SERVICES INC	JHF
258	HANNON ARMSTRONG SUSTAINABLE INFRASTRUCTURE CAPITAL, INC.	HASI
259	HATTERAS FINANCIAL CORP	HTS
260	HCA HOLDINGS, INC.	HCA
261	HEALTHSPRING, INC.	HS

262	HEARTLAND PAYMENT SYSTEMS INC	HPY
263	HERBALIFE LTD.	HLF
264	HERTZ GLOBAL HOLDINGS INC	HTZ
265	HEWITT ASSOCIATES INC	HEW
266	HFF, INC.	HF
267	HHGREGG, INC.	HGG
268	HI-CRUSH PARTNERS LP	HCLP
269	HIGHER ONE HOLDINGS, INC.	ONE
270	HIGHLAND HOSPITALITY CORP	HIH
271	HILLTOP HOLDINGS INC.	ARC
272	HILTON WORLDWIDE HOLDINGS INC.	HLT
273	HOLLY ENERGY PARTNERS LP	HEP
274	HOMEBANC CORP	HMB
275	HOMEX DEVELOPMENT CORP.	HXM
276	HORIZON LINES, INC.	HRZ
277	HUDSON PACIFIC PROPERTIES, INC.	HPP
278	HUNTSMAN CORP	HUN
279	HUTCHISON TELECOMMUNICATIONS INTERNATIONAL LTD	HTX
280	HYATT HOTELS CORP	H
281	ICICI BANK LTD	IBN
282	IGATE COMPUTER SYSTEMS LTD	PTI
283	IHS INC.	IHS
284	INFOBLOX INC	BLOX
285	INFRASOURCE SERVICES INC	IFS
286	INTEGRATED DEFENSE TECHNOLOGIES INC	IDE
287	INTELSAT S.A.	I
288	INTERCONTINENTAL EXCHANGE HOLDINGS, INC.	ICE
289	INTERLINE BRANDS, INC./DE	IBI
290	INTERNATIONAL SECURITIES EXCHANGE HOLDINGS, INC.	ISE
291	INTERXION HOLDING N.V.	INXN
292	INTRALINKS HOLDINGS, INC.	IL
293	INTREPID POTASH, INC.	IPI
294	INTREXON CORP	XON
295	INVESCO MORTGAGE CAPITAL INC.	IVR
296	IOWA TELECOMMUNICATIONS SERVICES INC	IWA

297	ISOFTSTONE HOLDINGS LTD	ISS
298	ITC HOLDINGS CORP.	ITC
299	J CREW GROUP INC	JCG
300	JACKSON HEWITT TAX SERVICE INC	JTX
301	JAVELIN MORTGAGE INVESTMENT CORP.	JMI
302	JONES ENERGY, INC.	JONE
303	JORGENSEN EARLE M CO /DE/	JOR
304	JOURNAL COMMUNICATIONS INC	JRN
305	K12 INC	LRN
306	KAR AUCTION SERVICES, INC.	KAR
307	KBR, INC.	KBR
308	KBW, LLC.	KBW
309	KINDER MORGAN KANSAS, INC.	KMR
310	KINDER MORGAN, INC.	KMI
311	KINETIC CONCEPTS INC	KCI
312	KKR FINANCIAL CORP	KFN
313	KMG AMERICA CORP	KMA
314	KNOLL INC	KNL
315	KNOT OFFSHORE PARTNERS LP	KNOP
316	KOPPERS HOLDINGS INC.	KOP
317	KOSMOS ENERGY LTD.	KOS
318	KRATON PERFORMANCE POLYMERS, INC.	KRA
319	LAREDO PETROLEUM, INC.	LPI
320	LAS VEGAS SANDS CORP	LVS
321	LAZARD LTD	LAZ
322	LDK SOLAR CO., LTD.	LDK
323	LEAPFROG ENTERPRISES INC	LF
324	LEIDOS HOLDINGS, INC.	SAI
325	LG DISPLAY CO., LTD.	LPL
326	LIFE TIME FITNESS, INC.	LTM
327	LIFELOCK, INC.	LOCK
328	LIN TV CORP.	TVL
329	LINKEDIN CORP	LNKD
330	LOEWS CORP	CG
331	LONE PINE RESOURCES INC.	LPR

332	LONGTOP FINANCIAL TECHNOLOGIES LTD	LFT
333	LRR ENERGY, L.P.	LRE
334	LUMBER LIQUIDATORS HOLDINGS, INC.	LL
335	LUMINENT MORTGAGE CAPITAL INC	LUM
336	MACRO BANK INC.	BMA
337	MAGELLAN MIDSTREAM HOLDINGS LP	MGG
338	MAGNACHIP SEMICONDUCTOR CORP	MX
339	MAIDENFORM BRANDS LLC	MFB
340	MANCHESTER UNITED PLC	MANU
341	MANNING & NAPIER, INC.	MN
342	MANUFACTURERS SERVICES LTD	MSV
343	MARIN SOFTWARE INC	MRIN
344	MARINER ENERGY INC	ME
345	MASTERCARD INC	MA
346	MATADOR RESOURCES CO	MTDR
347	MAXCOM TELECOMMUNICATIONS INC	MXT
348	MEAD JOHNSON NUTRITION CO	MJN
349	MECHEL PAO	MTL
350	MEDIALIVE INTERNATIONAL INC	KME
351	MEDICAL STAFFING NETWORK HOLDINGS INC	MRN
352	METLIFE INC	MET
353	MF GLOBAL HOLDINGS LTD.	MF
354	MICHAEL KORS HOLDINGS LTD	KORS
355	MIDCOAST ENERGY PARTNERS, L.P.	MEP
356	MIDSTATES PETROLEUM COMPANY, INC.	MPO
357	MILLENNIAL MEDIA INC.	MM
358	MINDRAY MEDICAL INTERNATIONAL LTD	MR
359	MIRANT CORP	SOE
360	MISTRAS GROUP, INC.	MG
361	MITTAL STEEL USA INC.	ISG
362	MIX TELEMATICS LTD	MIXT
363	MODEL N, INC.	MODN
364	MOLYCORP, INC.	MCP
365	MONSANTO CO	MON
366	MONTPELIER RE HOLDINGS LTD	MRH

367	MORTGAGEIT HOLDINGS, INC.	MHL
368	MORTON'S RESTAURANT GROUP INC	MRT
369	MPLX LP	MPLX
370	MRC GLOBAL INC.	MRC
371	MSCI INC.	MXB
372	MUELLER WATER PRODUCTS, INC.	MWA
373	MYKROLIS CORP	MYK
374	NALCO HOLDING CO	NLC
375	NATIONAL BANK HOLDINGS CORP	NBHC
376	NATIONAL FINANCIAL PARTNERS CORP	NFP
377	NATIONSTAR MORTGAGE HOLDINGS INC.	NSM
378	NATURAL GROCERS BY VITAMIN COTTAGE, INC.	NGVC
379	NAVIGATOR HOLDINGS LTD.	NVGS
380	NAVIOS MARITIME ACQUISITION CORP	NNA.U
381	NAVIOS MARITIME PARTNERS L.P.	NMM
382	NAVTEQ CORP	NVT
383	NELNET INC	NNI
384	NETEZZA CORP	NZ
385	NETSUITE INC	N
386	NEUSTAR INC	NSR
387	NEW CENTURY FINANCIAL CORP	NEW
388	NEW ORIENTAL EDUCATION & TECHNOLOGY GROUP INC.	EDU
389	NEW SKIES SATELLITES HOLDINGS LTD.	NSE
390	NEW YORK & COMPANY, INC.	NWY
391	NEWPOWER HOLDINGS INC	NPW
392	NIELSEN HOLDINGS PLC	NLSN
393	NIMBLE STORAGE INC	NMBL
394	NISKA GAS STORAGE PARTNERS LLC	NKA
395	NOAH EDUCATION HOLDINGS LTD.	NED
396	NOAH HOLDINGS LTD	NOAH
397	NORCRAFT COMPANIES, INC.	NCFT
398	NORTHERN TIER ENERGY LP	NTI
399	NORTHSTAR REALTY FINANCE CORP.	NRF
400	NRG ENERGY, INC.	NRG
401	NRG YIELD, INC.	NYLD

402	NUSTAR GP HOLDINGS, LLC	VEH
403	NYMEX HOLDINGS INC	NMX
404	OAKTREE CAPITAL GROUP, LLC	OAK
405	OASIS PETROLEUM INC.	OAS
406	OCH-ZIFF CAPITAL MANAGEMENT GROUP LLC	OZM
407	OCI PARTNERS LP	OCIP
408	ODYSSEY RE HOLDINGS CORP	ORH
409	OILTANKING PARTNERS, L.P.	OILT
410	ONEBEACON INSURANCE GROUP, LTD.	OB
411	ONEMAIN HOLDINGS, INC.	LEAF
412	ORBITZ WORLDWIDE, INC.	OWW
413	ORION POWER HOLDINGS INC	ORN
414	OSG AMERICA L.P.	OSP
415	OWENS CORNING	OC
416	PAA NATURAL GAS STORAGE LP	PNG
417	PACIFIC AIRPORT GROUP	PAC
418	PANAMSAT HOLDING CORP	PA
419	PANDORA MEDIA, INC.	P
420	PBF ENERGY INC.	PBF
421	PENN VIRGINIA GP HOLDINGS, L.P.	PVG
422	PENNYMAC FINANCIAL SERVICES, INC.	PFSI
423	PETROLOGISTICS LP	PDH
424	PHILLIPS 66 PARTNERS LP	PSXP
425	PHOENIX NEW MEDIA LTD	FENG
426	PIKE CORP	PEC
427	PINNACLE FOODS INC.	PF
428	PIONEER SOUTHWEST ENERGY PARTNERS L.P.	PSE
429	PLAINS GP HOLDINGS LP	PAGP
430	PLATINUM UNDERWRITERS HOLDINGS LTD	PTP
431	PLY GEM HOLDINGS INC	PGEM
432	POLYPORE INTERNATIONAL, INC.	PPO
433	PREMCOR INC	PCO
434	PRESTIGE BRANDS HOLDINGS, INC.	PBH
435	PRIMERICA, INC.	PRI
436	PRINCIPAL FINANCIAL GROUP INC	PFG

437	PROVIDENT FINANCIAL SERVICES INC	PFS
438	PRUDENTIAL FINANCIAL INC	PRU
439	PZENA INVESTMENT MANAGEMENT, INC.	PZN
440	QEP MIDSTREAM PARTNERS, LP	QEPM
441	QIAO XING MOBILE COMMUNICATION CO., LTD.	QXM
442	QIHOO 360 TECHNOLOGY CO LTD	QIHU
443	QIMONDA AG	QI
444	QUINTILES TRANSNATIONAL HOLDINGS INC.	Q
445	RACKSPACE HOSTING, INC.	RAX
446	RAILAMERICA INC /DE	RA
447	RE/MAX HOLDINGS, INC.	RMAX
448	REALD INC.	RLD
449	REALOGY HOLDINGS CORP.	RLGY
450	REDDY ICE HOLDINGS INC	FRZ
451	REFCO INC.	RFX
452	REGAL ENTERTAINMENT GROUP	RGC
453	RENESOLA LTD	SOL
454	RENREN INC.	RENN
455	RENTECH NITROGEN PARTNERS, L.P.	RNF
456	RESTORATION HARDWARE HOLDINGS INC	RH
457	RETAIL PROPERTIES OF AMERICA, INC.	RPAI
458	REXFORD INDUSTRIAL REALTY, INC.	REXR
459	REXNORD CORP	RXN
460	RIBAPHARM INC	RNA
461	RISKMETRICS GROUP INC	RMG
462	ROADRUNNER TRANSPORTATION SYSTEMS, INC.	RRTS
463	ROCKWOOD HOLDINGS, INC.	ROC
464	ROSE ROCK MIDSTREAM, L.P.	RRMS
465	ROSETTA STONE INC	RST
466	ROUNDY'S, INC.	RNDY
467	RSC HOLDINGS INC.	RRR
468	RUCKUS WIRELESS INC	RKUS
469	SAFE BULKERS, INC.	SB
470	SALESFORCE.COM INC	CRM
471	SANCHEZ ENERGY CORP	SN

472	SCORPIO BULKERS INC.	SALT
473	SCORPIO TANKERS INC.	STNG
474	SEADRILL PARTNERS LLC	SDLP
475	SEALY CORP	ZZ
476	SEASPAN CORP	SSW
477	SEAWORLD ENTERTAINMENT, INC.	SEAS
478	SELECT MEDICAL HOLDINGS CORP	SEM
479	SEMICONDUCTOR MANUFACTURING INTERNATIONAL CORP	SMI
480	SENSATA TECHNOLOGIES HOLDING N.V.	ST
481	SERVICENOW, INC.	NOW
482	SILVERLINE TECHNOLOGIES LTD	SLT
483	SIMCERE PHARMACEUTICAL GROUP	SCR
484	SIRVA INC	SIR
485	SOLARWINDS, INC.	SWI
486	SOLERA HOLDINGS, INC	SLH
487	SOUFUN HOLDINGS LTD	SFUN
488	SOUTHCROSS ENERGY PARTNERS, L.P.	SXE
489	SPECTRA ENERGY PARTNERS, LP	SEP
490	SPIRIT AEROSYSTEMS HOLDINGS, INC.	SPR
491	SPIRIT FINANCE CORPORATION	SFC
492	SPIRIT REALTY CAPITAL, INC.	SRC
493	SPN FAIRWAY ACQUISITION, INC.	CPX
494	SPRAGUE RESOURCES LP	SRLP
495	STAG INDUSTRIAL, INC.	STIR
496	STEWART W P & CO LTD	WPL
497	STONEGATE MORTGAGE CORP	SGM
498	STR HOLDINGS, INC.	STRI
499	STRATEGIC HOTELS & RESORTS, INC	SLH
500	SUMMIT HOTEL PROPERTIES, INC.	INN
501	SUMMIT MIDSTREAM PARTNERS, LP	SMLP
502	SUNCOKE ENERGY PARTNERS, L.P.	SXCP
503	SUNCOKE ENERGY, INC.	SXC
504	SUNOCO LP	SUSP
505	SUNSTONE HOTEL INVESTORS, INC.	SHO
506	SUNTECH POWER HOLDINGS CO., LTD.	STP

507	SWIFT TRANSPORTATION CO	SWFT
508	SYMETRA FINANCIAL CORP	SYA
509	SYMMETRY MEDICAL INC.	SMA
510	SYNCORA HOLDINGS LTD	SCA
511	SYNIVERSE HOLDINGS INC	SVR
512	TABLEAU SOFTWARE INC	DATA
513	TAL EDUCATION GROUP	XRS
514	TAL INTERNATIONAL GROUP, INC.	TAL
515	TALLGRASS ENERGY PARTNERS, LP	TEP
516	TAM S.A.	TAM
517	TAMINCO CORP	TAM
518	TARGA RESOURCES CORP.	TRGP
519	TAYLOR MORRISON HOME CORP	TMHC
520	TEAM HEALTH HOLDINGS INC.	TMH
521	TEAVANA HOLDINGS INC	TEA
522	TEEKAY LNG PARTNERS L.P.	TGP
523	TEEKAY OFFSHORE PARTNERS L.P.	TOO
524	TEEKAY TANKERS LTD.	TNK
525	TELKOM SA LTD	TKG
526	TEMPUR SEALY INTERNATIONAL, INC.	TPX
527	TERNIUM S.A.	TX
528	TERRENO REALTY CORP	TRNO
529	TESORO LOGISTICS LP	TLLP
530	TEXTAINER GROUP HOLDINGS LTD	TGH
531	THE FIRST MARBLEHEAD CORP	FMD
532	THE HOWARD HUGHES CORP	HHC
533	THE PHOENIX COMPANIES INC/DE	PNX
534	THERMON GROUP HOLDINGS, INC.	THR
535	THIRD POINT REINSURANCE LTD.	TPRE
536	TILLY'S, INC.	TLYS
537	TIM HORTONS INC.	THI
538	TMS INTERNATIONAL CORP.	TMS
539	TODCO	THE
540	TRADE STREET RESIDENTIAL, INC.	FMP
541	TRANSDIGM GROUP INC	TDG

542	TRAVELERS PROPERTY CASUALTY CORP	TAP'A
543	TRI POINTE GROUP, INC.	TPH
544	TRIPLE-S MANAGEMENT CORP	GTS
545	TRONOX INC	TRX
546	TRULIA, INC.	TRLA
547	TUMI HOLDINGS, INC.	TUMI
548	TWITTER, INC.	TWTR
549	TYCOM LTD	TCM
550	U.S. SHIPPING PARTNERS L.P.	USS
551	U.S. SILICA HOLDINGS, INC.	SLCA
552	UCP, INC.	UCP
553	UNITED DEFENSE INDUSTRIES INC	UDI
554	UNIVERSAL COMPRESSION HOLDINGS INC	UCO
555	UNIVERSAL TECHNICAL INSTITUTE INC	UTI
556	USA COMPRESSION PARTNERS, LP	USAC
557	VALERO ENERGY PARTNERS LP	VLP
558	VALIDUS HOLDINGS LTD	VR
559	VANGUARD HEALTH SYSTEMS INC	VHS
560	VANTIV, INC.	VNTV
561	VEDANTA LTD	SLT
562	VEEVA SYSTEMS INC	VEEV
563	VENOCO, INC.	VQ
564	VERASUN ENERGY CORP	VSE
565	VERIDIAN CORP	VNX
566	VERIFONE SYSTEMS, INC.	PAY
567	VERSO CORP	VRS
568	VIASYSTEMS GROUP INC	VG
569	VINCE HOLDING CORP.	VNCE
570	VIOLIN MEMORY INC	VMEM
571	VIRGIN MOBILE USA, INC.	VM
572	VISA INC.	V
573	VISTEON CORP	VC
574	VITAMIN SHOPPE, INC.	VSI
575	VMWARE, INC.	VMW
576	VONAGE HOLDINGS CORP	VG

577	VOYA FINANCIAL, INC.	VOYA
578	W&T OFFSHORE INC	WTI
579	WARNER MUSIC GROUP CORP.	WMG
580	WCI COMMUNITIES INC	WCI
581	WCI COMMUNITIES, INC.	WCIC
582	WEIGHT WATCHERS INTERNATIONAL INC	WTW
583	WELLCARE HEALTH PLANS, INC.	WCG
584	WELLCHOICE INC	WC
585	WESCO AIRCRAFT HOLDINGS, INC	WAIR
586	WESTERN ASSET MORTGAGE CAPITAL CORP	WMC
587	WESTERN GAS EQUITY PARTNERS, LP	WGP
588	WESTERN GAS PARTNERS LP	WES
589	WESTERN UNION CO	WU
590	WESTLAKE CHEMICAL CORP	WLK
591	WESTMORELAND RESOURCE PARTNERS, LP	OXF
592	WESTPORT RESOURCES CORP	WRC
593	WEX INC.	WXS
594	WHITEWAVE FOODS CO	WWAV
595	WHITING PETROLEUM CORP	WHZ
596	WHITING PETROLEUM CORP	WLL
597	WILLIAM LYON HOMES	WLH
598	WILLIAMS PARTNERS L.P.	CHKM
599	WILLIAMS PARTNERS L.P.	WPZ
600	WILLIAMS PIPELINE PARTNERS L.P.	WMZ
601	WILLIS TOWERS WATSON PLC	WSH
602	WIPRO LTD	WIT
603	WNS (HOLDINGS) LTD	WNS
604	WORKDAY, INC.	WDAY
605	WSP HOLDINGS LTD	WH
606	WUXI PHARMATECH (CAYMAN) INC.	WX
607	XERIUM TECHNOLOGIES INC	XRM
608	XINYUAN REAL ESTATE CO., LTD.	XIN
609	YELP INC	YELP
610	YINGLI GREEN ENERGY HOLDING CO LTD	YGE
611	YOUKU TUDOU INC.	YOKU

612	ZAIS FINANCIAL CORP.	ZFC
613	ZF TRW AUTOMOTIVE HOLDINGS CORP	TRW
614	ZOETIS INC.	ZTS