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IPO Characteristics of Index Firms*

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Abstract

I analyze the IPOs of the firms that are eventually included in one of the S&P 400, the S&P 500, or the S&P 600 Indices. The determinants of each IPO firm's odds of inclusion into an index are estimated. Other offer-related characteristics of these index firms are also investigated. IPOs associated with less uncertainty at the time of issuance have better inclusion odds into an index. The quality of index firms has a persistent component to it that can be detected even during the IPO process. I propose two new hypotheses related to inclusion into an S&P index.

Keywords: Initial Public Offerings, S&P 400, S&P 500, S&P 600.

JEL Classification: E32, G10, G24, G30.

1. Introduction

Inclusion into an S&P index, particularly into the S&P 500 index, is an important milestone in the life of a firm. The event itself is an important recognition by the selection committee of the worthiness of the firm,¹ and reportedly, such a recognition reflects positively in the stock price of the firm.^{2,3} But what do we know about the initial public offerings (IPO) of the special firms that end up being included in the prestigious indices, such as S&P 500 LargeCap, S&P 400 MidCap, or S&P 600 SmallCap? The current literature provides no answer to this question. Yet, such an analysis can be insightful.

This paper analyzes the IPO features of the firms populating the S&P indices. In doing so, I aim to achieve several goals. Firstly, I attempt to fill the above gap in the literature by reporting the IPO characteristics of the index firms. Secondly, I try to determine what kind of IPOs are more likely to end up in these indices. Thirdly, I use the findings from the above analyses to further our insights into the potentially opaque selection process employed by the Standard & Poor's Index Committee.

To achieve these goals, I begin by investigating the characteristics of the IPO firms that were subsequently included in one of the following indices: S&P 400, S&P 500, and S&P 600. I chose these three indices because their constituents are picked by the same group of people: the Standard & Poor's Index Committee. I find that the future index firms distinguish themselves from the other IPOs in that, on average, they are more strongly

¹The official disclaimer that Standard&Poor's, Co. makes is that "company additions to and deletions from the S&P equity indices do not in any way reflect an opinion on the investment merits of the company." However, the committee's choice of that particular firm among many alternative candidates implies certain acknowledgment and acceptance of the firm's visibility and worthiness (*certification role of the committee*).

²Studies that have shown such a price appreciation include, but are not limited to, Shleifer (1986), Harris and Guler (1986), Jain (1987), Dhillon and Johnson (1991), Beneish and Whaley (1996), Lynch and Mendenhall (1997), Wurgler and Zhuravskaya (2002), Kappou, Brooks, and Ward (2010), Gyax and Otchere (2010), and Green and Jame (2011). These studies differ in their sampling periods, in their methodology, and in their explanation for this price reaction, but all of them, with the exception of Harris and Guler (1986), report positive and permanent stock price reaction to S&P 500 inclusion announcement. Furthermore, the trading in the stock is elevated around the announcement of the event (see Elliott and Warr, 2003; Chen, et al., 2004; and Cai, 2007).

³Similar changes in equity values are reported for S&P Mid-Cap 400 index (Collins, et al., 1994). Shankar and Miller (2006) document changes in price, volume, and institutional ownership for the S&P 600 index. Becker-Blease and Paul (2009) investigate the sources of value gains during the S&P 400 and S&P 600 additions, and find that liquidity, capital investments, and investor recognition increases following index additions.

certified (issued by more reputable underwriters and are backed by venture capital), they have higher offer price, they are older and less underpriced, and they are more profitable in the year of the IPO event.

I also estimate which IPO features are significant predictors of the odds that any given IPO will eventually be included in one of the above indices. The practitioners and the academics alike would benefit from knowing what IPO factors are indicative of higher inclusion odds.⁴ The results from logistic estimations suggest that the IPO firms with lower uncertainty about their business have higher chances of being included into the S&P indices. Put differently, various asymmetric information variables measured around the IPO date – such as low underpricing, high underwriter reputation, presence of venture capital backing, high offer price, being a spinoff of a public company, and better asset efficiency – are good indicators of the odds of index inclusion.⁵ With the same logit equations, I also estimate that a median IPO firm has a 1.62% (4.65%, 10.52%) chance of being included in the S&P 500 (S&P 400, S&P 600) index.

These results can be interpreted as follows. The index firms have inherent quality component(s) detectable even during the IPO process. The primary market participants consider them low-risk issues; with less uncertainty surrounding their businesses. Their subsequent selection into an S&P index could be interpreted as a confirmation of their exceptionality in comparison to all the other IPOs, i.e., the S&P Index Committee just certifies this quality. Consistent with this, I document that the index IPOs are exceptional with regard to the post-issuance, pre-inclusion performance of their stocks and their business operations. This explanation can be named "the exceptionality hypothesis."

There is an alternative interpretation. The selection of a new index member is far from being an objective process. Achieving certain market capitalization does not guarantee inclusion into an S&P index, which implies that there is room for subjectivity in the selection

⁴Such events are important milestones in the life cycle of a firm, which makes them interesting and relevant for academics and practitioners. Kale, et al. (2011), for example, perform this type of analysis on the determinants of dividend initiation by recent IPO firms and the time it takes from IPO date until the initiation date.

⁵See the citations provided in the next section of this paper.

process. So, what – if anything – can the above results tell us about the S&P Index Committee’s preferences in choosing the constituents of these indices? This paper’s findings suggest a hypothesis, which I term *committee’s risk aversion hypothesis*. It essentially claims that the committee tends to pick “stable” firms,⁶ which leads to favoring IPOs that had distinguishably less asymmetric information at issuance. The long-term consequences of such choices can be non-trivial.⁷ The findings I report in this paper are consistent with such an explanation.

In an interesting auxiliary analysis, I find how long it takes for the IPOs to be included in one of the indices (henceforth, I will refer to this variable as “time-til-inclusion” or *TTI*; it measures the number of months that separate the index inclusion date from the IPO date.). On median, it takes about 99 months (or more than 8 years) of public trading to become a member of the S&P 500 index. As expected, time-til-inclusion for the other indices is shorter: 73 months for the MidCap S&P index, and 68 months for the SmallCap S&P index (all are median values). There are numerous IPO firms, however, that were included in these indices within a very short time following the offering. For example, within 6 months of their public exposure, firms like Delphi Corp., Santa Fe Pacific Gold Corp., and Dean Witter Discover & Co. were already included in the LargeCap S&P index, which is the most respected, and thus the most difficult to be included in, index.

A natural follow up question, then, is to ask “Which factors reduce the time-til-inclusion of an IPO into an S&P index?” To determine that, I consider the same IPO-related explanatory variables I use in the above logistic analyses. The significant variables reducing the time-til-inclusion across all three samples are size, underpricing, underwriter’s reputation, and venture capital (VC) support (with the exception of the S&P 500 index). The TTIs to the S&P 400 and the S&P 600 indices are significantly affected by the conditions of the IPO

⁶See their statements to this effect, presented in Bos and Ruotolo (2000).

⁷See Fernandez, et al. (2011) for more information on long-run post-inclusion performance of the S&P 500 Index firms.

market: being issued during hotter markets seem to prolong these TTIs.

In another analysis, I find that the top six underwriters most associated with the IPOs of S&P indices are: Morgan Stanley Dean Witter Inc., Goldman Sachs & Co., Merrill Lynch, CS First Boston, Bank of America Securities, and DeutscheBank Securities. I also find that the IPOs from the High Technology industries (shortly “hi-tech industries”) have consistently yielded the largest number of index IPOs, across all three indices. These sectors’ dominance is most likely due to the “boom” in the hi-tech industries during the sampling period: I document that about 46% to 54% of the sampled IPO firms that are added to the S&P indices belong to one of the hi-tech industries.

Aside from performing all of the above IPO analyses on the S&P index firms for the first time in the literature, and doing it for three different indices for comparison purposes,⁸ the paper also contributes to the literature dealing directly with the S&P 500 firms. Prior works have shown that the S&P 500 LargeCap firms are a special group of firms. They differ from others in their operational efficiency (Denis, et al., 2003), investment behavior (Becker-Blease and Paul, 2006), and acquisition patterns (Vijh and Yang, 2008). Their stocks and bonds trade at a premium (Dhillon and Johnson, 1991); their stocks are more liquid and have lower transaction costs (Hegde and McDermott, 2003); and their securities command higher investor awareness (Chen, et al., 2004). Also, the implied volatilities of the stocks in the S&P 500 Index (that are used in constructing the VIX) play an important role in the financial markets (see, for example, Chen and Clements, 2007). Furthermore, once a stock is included in the index, it appears that its performance is tied to the other index stocks’ performances: Vijh (1994) and Barberis, et al. (2005) report the presence of strong cross-correlation between index stock returns.

However, there is no study that specifically concentrates on the IPO features of the S&P

⁸According to the officially listed inclusion criteria, the firms included in each index differ in their size. Differences in size can often lead to further differences in various firm characteristics. Therefore, such a comparative analysis is warranted, and should provide valuable insights.

500 firms.⁹ Therefore, this paper fills the above gap by analyzing the IPOs of these firms in detail. In comparison to an average IPO firm, at the time of their issuance, the S&P 500 firms were much older (their mean age is around 21 years; about 6 years older than the mean age of the typical IPO) and substantially bigger in asset size (on average, about 26 times larger than a typical IPO). They were more efficiently priced (i.e. less underpriced) and their offer price was higher. They had the backing of more reputable underwriters, and a higher percentage of them received VC support. All of these findings suggest that the S&P 500 firms are special also with regard to their IPO features.

The remainder of the paper is structured as follows. The next section is the hypotheses development section. The section after that describes the IPO data sources, the index samples, and the construction of the variables used in the analysis. Section 4 presents the IPO characteristics of the firms in each index sample, as well as the results from an estimation model of the odds that an IPO firm will be included in one of these indices. The same section also reports on major factors shortening the time-til-inclusion in the indices, and the underwriters most associated with index IPOs. The conclusion of the paper is in Section 5.

2. Hypotheses Development

The hypotheses developed in this paper relate both to the IPO literature and the S&P Index literature. They synthesize certain aspects of both literatures, which is one of the strengths of this paper.

⁹An exception is the work by Colak and Gunay (2011), who concentrate mostly on the strategic waiting behavior of the IPO firms. The paper shows that the IPOs of the future S&P 500 companies are more inclined to delay their issuance until the favorable economic and/or market conditions are confirmed. So, in a typical expanding IPO cycle, there are several firms from the same industry that have issued ahead of the S&P 500 firms.

2.1. The Exceptionality Hypothesis

The IPO literature has shown that there are differences in quality and riskiness between low- vs. high-issue price IPOs (Fernando, et al., 2004), between venture- vs. non-venture backed IPOs (Brav and Gompers, 1997; and Megginson and Weiss, 1991), between highly-underpriced vs. not-so-underpriced IPOs (Lowry and Schwert, 2002; and Loughran and Ritter, 2004), and between IPOs issued by high- vs. low-prestige underwriters (Carter and Manaster, 1990; and Carter, et al., 1998). Providing further evidence, Boehme and Colak (2012) show that there is a close link between the primary market characteristics of the IPOs (such as market's heat, offer price, reputation of the lead underwriter, underpricing, and venture capital backing) and their secondary market trading features (such as idiosyncratic risk, information constraints, liquidity, and short-sale constraints). In short, the IPO literature has demonstrated that there are reliable signals in the primary markets indicating the quality of an IPO.

Also, the IPOs that will later end up in the S&P Indices are likely to possess inherently better business quality; to become large enough for an index inclusion they have to consistently deliver better stock returns and operating performance. Therefore, it is conceivable that these index firms are exceptional from the start, and the committee's choice to include them in an S&P index just confirms their exceptionality. From now on I will refer to this hypothesis as *the exceptionality hypothesis*.¹⁰

As suggested by the aforementioned IPO literature, various IPO features of these firms will likely capture the inherently better quality of these firms. Therefore, I formulate the following two sub-hypotheses related to the exceptionality hypothesis:

Hypothesis 1A: During the IPO process there will be signals indicating the index IPOs' quality. More specifically, the index IPOs will be substantially different than non-index IPOs

¹⁰This explanation is somewhat related to a well-known hypothesis in the S&P 500 literature: the *certification role of the committee*.

with regard to various IPO features, such as firm’s age, underpricing, offer price, underwriter reputation, VC backing, size, amount of proceeds raised, and net income and ROA at the time of the IPO date.

Hypothesis 1B: True to their quality, during the post-IPO period, the index IPOs will perform substantially better than the non-index IPOs. Specifically, they will have better long-run returns (such as BHAR and CAR), better basic operating performance (such as average CFs, ROA), and lower financial leverage.

2.2. S&P Committee’s Risk Aversion Hypothesis

The second dynamic that could explain the link between IPO features and S&P Index inclusion odds is possible preferences that the committee might have with regard to its choices of index replacements. The S&P committee openly states that they do not want high turnover in the index. So, their replacement picks tend to favor “stable” firms.¹¹ Since a business’s

¹¹After reading the criteria for inclusion into the S&P Indices (which are explained in Bos and Ruotolo (2000), Carty and Blank (2003), Hrazdil (2010), and in “S&P U.S. Indices, Index Methodology, August 2008” downloadable through www.standardandpoors.com), it is clear that there are no strict rules for inclusion or deletion from an S&P Index. Rather, there are general guidelines applied subjectively, which embeds certain subjectivity into the process of choosing the replacements. Furthermore, these guidelines have been changed occasionally. For example Bos and Ruotolo (2000) states that: “...These are the main five criteria used by the S&P Index Committee to identify Index candidates. Please keep in mind that a company meeting all of these criteria is not assured of being added to an S&P Index. Likewise, the fact that a company might not meet all of the above requirements does not mean that it cannot be added to an Index. Candidates are reviewed regularly, and eligible candidates are placed in a replacement pool. Upon an Index opening, an appropriate candidate is selected for Index inclusion. Remember, these are only guidelines and not rules, and on occasion Standard&Poor’s may go outside these guidelines in choosing Index candidates.” Similarly, Carty and Blank (2003) state that: “Before 1982, the committee’s primary function was to find replacements for companies that filed for bankruptcy protection or ceased to exist because of merger-related activity. Since then, the committee has tried to maintain ‘a flexible approach to maintaining the index... The Committee does not establish a rigid set of rules that must be followed without concern for impact on the marketplace... Maintaining stability of the population of companies within the S&P 500 Index is of primary consideration. Excess company turnover impacts the statistical validity of the index as a gauge of Market performance.’” The above papers, quotes, and explanations make it clear that there is a substantial amount of subjectivity embedded in the process of replacing an S&P Index firm with another. Furthermore, it could be claimed that the S&P Index Committee places a special importance on the “stability” of the index and the minimization of the turnover (“The Fact Sheet” about the S&P 500 Index from the official website states that: “The Index Committee strives to minimize unnecessary turnover in index membership and each removal is determined on a case-by-case basis.”) Thus, there is a preference toward stable and “less risky” firms, with proven past performance.

uncertainty inherently depends on the nature of the business, the Committee’s preference toward “stability” not only leads them to choose firms that are currently stable, but also toward firms that had less business uncertainty around the issuance date.¹² This result may seem somewhat intuitive; after all, the committee is expected to pick firms with profitable businesses, because those are the ones that have large market capitalization. However, the interesting aspect of this finding is the degree to which the low-risk, high-quality component of the index firms is detected and reflected in the IPO features of these firms by the primary market participants.¹³ This is an important new insight that improves our understanding of both the primary markets and the addition process into an S&P Index. I term this hypothesis the *S&P committee’s risk aversion hypothesis*.

I test this hypothesis by running logistic regressions estimating the IPO factors predicting the index inclusion odds of a firm, and by running an OLS regression that determines the variables predicting that *TTI* will be shorter. Theoretically, one would expect the firms that are older, larger, less indebted, and more profitable at the time of the IPO to continue to have a successful business model, and end up in an S&P Index. Thus, these variables are expected to have a positive (negative in the case of leverage) relationship to the index inclusion odds.

Also, as mentioned above, there is evidence in the IPO literature suggesting that if an IPO has solid certification through a reputable underwriter or through a venture capitalist, it is probably of higher quality. Thus, the expected relationship between underwriter’s reputation, VC, and the index inclusion likelihood is positive. Similarly, due to the findings in the IPO literature, one can hypothesize that underpricing will have a negative relation, and the IPO’s offer price will have a positive relation to the index inclusion odds.

The IPOs that are also a spinoff tend to be larger in size and are typically a well-

¹²Note that the paper does not claim that the committee looks at a firm’s IPO characteristics while making its selections. Rather, the committee’s choices at the time of selection inadvertently leads to such outcomes.

¹³Low-risk refers to low uncertainty about future cash flows.

performing subdivision of another company, thus they should have a better chance of being included in an S&P index. As explained by Yung, et al. (2008) and Boehme and Colak (2012), IPO market's hotness and industry's hotness can be indicative of poor IPO quality (on average, of course), but the strength of this quality indicator should not be as reliable since there are all kinds of firms going public in hot markets. During the last three decades, hi-tech firms may be favored for inclusion in certain S&P indices, since the share of their underlying industries in the overall U.S. GDP has been rapidly growing, and these firms' representation in the indices needed to be increased accordingly.¹⁴

Using the above observations, one can develop the following sub-hypotheses related to *the S&P committee's risk aversion hypothesis*:

Hypothesis 2A: Because they are inherently of a better quality, the Index IPOs should have lower asymmetric information risk and lower uncertainty about their business at the time of their issuance. Therefore, the IPO features that indicate lower asymmetric information about the firm should significantly increase the inclusion odds.

Hypothesis 2B: The same IPO features that indicate lower asymmetric risk (or better quality) should also shorten the period between the IPO date and the Index inclusion date.

Finally, the last hypothesis relates to the underwriters that are most closely associated with Index IPOs. This hypothesis is related to the finding of Carter, et al. (1998) that reputable underwriters are associated with higher quality IPOs.

Hypothesis 2C: Since high quality IPOs tend to be associated with more reputable underwriters: 1) the inclusion odds should be positively related to the underwriter's reputation, and 2) the Index IPOs should be more closely associated with the top (in prestige and in IPO volume) underwriters.

¹⁴See Bos and Ruotolo (2000).

3. Data and Variables

Next, I will provide some details about the selection procedures applied in obtaining the IPO sample and each of the index samples (S&P 400, S&P 500, S&P 600). Some details on the calculation of the variables used in the study are also provided.

3.1. The IPO Sample

The main sample of IPO firms is constructed by extracting all the IPO deals between 1970 and 2007 from the Securities Data Company (SDC)'s database, from Jay Ritter's hand collected data (as reported in his webpage), and from the Registered Offering Statistics (ROS) files. REITs, closed-end funds, ADRs, unit offers, and MLPs are eliminated from this raw sample. The IPOs that are also a spin-off or a carve-out are left in the sample. Any IPO that does not have data in CRSP daily, weekly, or monthly files is also dropped. This yields a total sample of 9,658 common stock IPOs, of which 361 are unique only to Ritter's data (i.e., not covered by SDC or ROS), and 59 are unique only to ROS (i.e., not covered by SDC or Ritter's data).

The data items retrieved from the above data files are: the CUSIP of the firm, the date of issuance, the offer price, the lead underwriter, the percentage change in the stock's price on the first trading day (i.e. the underpricing), whether there was venture capital backing, and the date of founding used in calculating the age (rounded to the nearest higher integer number) at the time of issuance.

The stock trading data for all firms are extracted from CRSP. Accounting data comes from COMPUSTAT. Matching with each of these data sources can further decrease the above samples' sizes.

3.2. The S&P 400 Sample

The S&P MidCap 400 Index is introduced in 1991, and it covers 400 mid-sized companies as identified by the Standard & Poor's Index Committee.

The S&P 400 sample contains all the firms that were included in the S&P 400 index between 1991 and 2007. I use the dataset available through WRDS that lists the historic S&P 400 Index constituents, which, in turn, was retrieved from the COMPUSTAT database. Using this data set, I identify 982 firms that have been or are part of this index between 1991 and 2007.¹⁵ When I match these firms (using CUSIP) with the IPO sample, I find 386 IPOs that ultimately ended up in the index.¹⁶

3.3. The S&P 500 Sample

To construct the S&P 500 sample, all the firms that were part of the S&P 500 index for each year between 1970 and 2007 are identified. Again, I use the dataset available through WRDS that lists the historic S&P 500 Index constituents. This data, in turn, are retrieved from the COMPUSTAT database. According to this dataset, in December of every year between 1973 and 2007 there are exactly 500 firms listed in S&P 500 index. For the years 1970, 1971, and 1972 there are fewer than 500 firms listed (489, 491, and 495, correspondingly).¹⁷ During 1970-2007 period, there are a total of 1,298 firms that were part of this index at one point or another. When these firms are matched with the above IPO sample, one can identify 244 IPO firms that ultimately became part of the S&P 500 index.

¹⁵For every calendar year in my sample there are exactly 400 firms in the index.

¹⁶Matching is done in two steps. First, I match the index sample with COMPUSTAT (using the GVKEY variable) to retrieve their CUSIPs. Then, I match with the IPO sample using these CUSIPs.

¹⁷In 1973 Standard & Poor's Co. started a practice requiring that at the same time a firm is dropped from the index, another firm replaces it, thus keeping the number of index firms at exactly 500 at all times. Before that year, they did not follow such a rule.

3.4. The S&P 600 Sample

In 1994 the S&P SmallCap 600 Index began coverage of 600 small-sized companies that also meet a few other inclusion criteria (as specified by the Standard & Poor’s Index Committee).

All the firms covered by the index between 1994 and 2007 constitute the S&P 600 sample. Again, the dataset from WRDS that lists the historic S&P 600 Index constituents is used. There are total of 1,419 firms that were or are included in this index in the sampled period.¹⁸ Matching with the IPO sample (using CUSIP), leaves a final S&P 600 sample of 664 IPOs.

There are some IPOs that were part of two or more indices. These IPOs were not simultaneously included into those indices. Instead, over time, they were included into an index, then removed from it and included into another. There are 92 IPO firms that were part of both the S&P 400 and S&P 500 indices at one point or another. Similarly, 115 IPOs became a member of S&P 400 and S&P 600 indices. There were 19 such IPOs for S&P 500 and S&P 600 indices. Finally, there were 14 IPOs that were included into all three S&P indices, although not at the same time.¹⁹

3.5. The Variables

Next, I will explain the construction of the variables I use in the analyses. Basic accounting data, such as sales, assets, return-on-assets (ROA), total debt, net income (NI) are obtained from the annual COMPUSTAT datafile. The definition of each variable is as follows:

Age

Age measures the number of years between the issue date and the founding date of the firm (rounded to the nearest higher integer number). To complement the SDC data on the

¹⁸For every calendar year during the sampling period, there are exactly 600 firms in the index.

¹⁹In the logistic regressions below each of the index-addition events of each of these firms are treated as separate observations for each index, because the dependent variable is a binary one (i.e., these events seem to be independent enough to be considered a separate observation in binary decision making (logistic regression)). The qualitative conclusions are unchanged if the firms that were added to more than one index are removed from the samples used in obtaining the results for each index.

founding dates of the firms, I also use the datafile from Jay Ritter’s website named “Founding dates for 8,464 IPOs from 1975-2007.” I rely on Ritter’s data when there are inconsistencies between his data and SDC data.

BHAR and CAR

These variables measure the buy-and-hold abnormal return (BHAR) and the cumulative abnormal return (CAR) of the IPO stock 12 months after issuance. They are calculated as follows: let R_{it} represent firm i ’s stock return (including dividends) for month t . Define the abnormal return as $AR_{it} = R_{it} - R_{mt}$, where R_{mt} is the contemporaneous return on the CRSP equally-weighted market index (including dividends). Firm i ’s CAR and BHAR across T periods are defined as

$$CAR_{it} = \sum_{t=1}^T AR_{it} \quad (1)$$

$$BHAR_{iT} = \prod_{t=1}^T (1 + R_{it}) - \prod_{t=1}^T (1 + R_{mt}). \quad (2)$$

If the monthly return for a particular firm is missing, I replace it with the return of the CRSP value-weighted index.

Cash Flows (CFs)

The cash flows (CFs) variable for each firm is defined as the *Income Before Extraordinary Items + Depreciation & Amortization - Dividends (Preferred + Common)* divided by *Assets*. All the accounting variables are annual observations.

Heat Degrees

Heat Degrees is a continuous variable measured as MA(4) of the quarterly number of IPOs series divided by its historic average going back until 1960. MA(4) is used to eliminate any seasonal patterns in IPO issuances (in our sample, there are 40% more IPO events in the fourth quarter than in the first quarter of the calendar year). The historic data on the monthly number of IPO events (starting with 1960) are obtained from Jay Ritter’s website.

HiTech

HiTech is a dummy variable that takes a value of 1 if the IPO firm is in a hi-tech industry and 0 if otherwise. Following the SDC’s official description and the definition provided by Benveniste, et al. (2003), I refer to hi-tech industries as those that operate in an industry with a three-digit SIC code in 283, 357, 366, 367, 381, 382, 383, 384, 737, 873, and 874. These SICs belong to sectors such as biotech, computing, computer equipment, electronics, medical equipment, pharmaceuticals, software, etc.

Hot-Cold Periods

Following Yung, et al. (2008), I grouped the quarters in the sampled period (1970-2007) into three categories – “hot”, “normal”, or “cold” – by comparing the moving average MA(4) of the quarterly number of IPO events with the historic average of the same variable going back to 1960. If this moving average is 50% above (below) the historical average, the quarter is classified as hot (cold). Remaining quarters are classified as normal. The 50% cutoff assures that there are a reasonable number of quarters in each heat classification. Using alternative cutoff points (such as 33% or 66% cutoffs) makes little difference in the qualitative results.

Industry’s Hotness

Industry’s Hotness is a dummy variable indicating whether or not the analyzed IPO’s industry was hot at the time of its issuance. To determine industry’s hotness, I ranked the industries (using 2-digit SICs) within each year according to the number of IPO events in them.^{20,21} If the industry is in the top tercile of the industries with most IPOs in them during a given year, it is considered a hot industry.

Leverage

Leverage is calculated as the total debt of the firm divided by total assets. Both total debt

²⁰I use annual number of IPOs to avoid the seasonality effects that exist in the monthly or the quarterly cohorts (see Helwege and Liang, 2004; Yung, et al., 2008; Colak and Gunay, 2011; and the references therein, for more details on the seasonality effects in the IPO time series.)

²¹To identify each IPO’s industry, I use the SIC codes provided in the SDC data files. If it is missing for a particular IPO, however, I use the SIC from CRSP files.

and total assets are for the first fiscal year of public trading.

NI

NI denotes the net income of the firm divided by its sales. Both net income and total sales are for the first fiscal year of public trading.

Offer Price

Offer price is just the issue price of the newly offered stock security.²²

Proceeds

Proceeds is the total dollar amount raised during the initial offering, converted to year 2000 dollars.

Reputation

Reputation shows the updated Carter and Manaster (1990) underwriter prestige rankings obtained from Jay Ritter's website. This data is not available for the 1970s, so I extrapolate an underwriter's reputation from the 1980-1984 period to be its reputation for the earlier periods.

Rise Dummy

Rise Dummy is a dummy variable that takes a value of 1 if the IPO cycle was on the rise at the time of the IPO's issuance, and 0 otherwise. Following Colak and Gunay (2011), a rising IPO cycle is defined as three or more back-to-back quarters of increasing IPO activity. The measure of the IPO activity is again the MA(4) of the quarterly number of IPO events (as reported in Jay Ritter's monthly IPO events data).

ROA

ROA is the return-on-assets during the first fiscal year of the new public firm retrieved directly from COMPUSTAT.

²²To check whether adjusting this variable for inflation may affect the results, I follow Boehme and Colak (2012)'s procedure. I find that scaling this variable by the median trading price of CRSP firms around the offering date of each IPO does not qualitatively change the main results of the paper. Results available upon request.

Size

Size is measured by the total assets of the firm at the end of the first post-issuance quarter, converted to year 2000 dollars.

Spinoff

Spinoff is a dummy variable that indicates whether the index IPO firm is also a spinoff from another company ($=1$) or not ($=0$). It is zero for all non-spinoff and for all non-index IPOs. I identify all the spinoffs between 1970 and 2007 using the SDC Mergers and Acquisitions Database. The matching with the S&P index IPOs is done using firm CUSIPs. There are 13 (17, 14) IPOs in the S&P 500 (S&P 400, S&P 600) samples that are also a spinoff.

VC

VC is a dummy variable that indicates whether a certain IPO was backed by one or more venture firms ($VC=1$) or not ($VC=0$). The information is obtained from the SDC datafile and Ritter's website.

Underpricing

Underpricing measures the percentage change in the IPO stock's price on the first trading day. If this variable is not available through SDC, Ritter, or ROS data, I use CRSP daily data to find the closing price for the first trading date of the firm. When the first trading date in CRSP is not the day of issuance as recorded in SDC, I check the dates that are at most three days separated from the issuing day, and use the earliest date for which price is available. If no price information is available within a three-day window of the issuing date, I assume the observation is missing.

4. Results

This section presents the results from several different analyses conducted on the three samples of index IPOs. Some of these analyses are conducted to test the hypotheses developed

in Section 2.

4.1. Basic IPO Features of the Index Firms

First, I will document the offer-related characteristics of the index firms. My goal is to answer a basic question: “Is there something special about the characteristics of these index IPOs?” This question is closely related to *the exceptionality hypothesis*. Table 1 provides information about the means and the medians of various characteristics, such as age, underpricing, offer price, presence of venture capital (VC) backing, size of the firm, proceeds raised during the offer, firm’s net income (NI) and return-on-assets (ROA), and the percentage of the firms with positive BHARs and CARs. All the accounting data are as of the end of the first year of public trading. The statistics about four different samples are provided for comparison purposes: the three index samples and the non-index IPOs sample (i.e., the full IPOs sample minus all the index IPOs, which leaves 8576 non-index IPOs).

Several findings emerge from the table. First, a comparison of each index sample with the full IPO sample suggests that: on average, the S&P 500 IPOs are older, less underpriced, more profitable, and much bigger in size. They raise about four and a half times more money than firms that do not get included. Their lead underwriter is, on average, more prestigious. They usually have higher offer prices and higher VC support percentage. Similar results are obtained from the comparison of S&P 400 and S&P 600 samples with the full IPO sample. As expected, the differences in the means and the medians between the S&P 600 and S&P 400 IPOs and the full IPO sample are much smaller than the same differences between S&P 500 firms and the full IPO sample. For example, the median Proceeds raised by the S&P 500 sample is 2.65 (60.22/22.73) times more than the Non-index IPO sample; for the S&P 400 (S&P 600) sample this ratio is only 2.08 times (1.60 times).

Second, there is a visible distinction between the IPOs in the S&P 500 index and the

other two S&P indices with regard to various offer characteristics. For example, even at the time of issuance, the firms included in the LargeCap index are larger in size and raise 3-4 times more capital. With regard to age, underwriter reputation, and offer price, the IPOs in the S&P 500 sample have slightly higher means than the other two S&P index samples.

To sum up, the index IPOs (particularly S&P 500 ones) are unlike the other IPOs in several dimensions: their offer price is visibly higher; their lead underwriter's reputation is better; a higher percentage of them are involved with venture capital; and their age, size, and proceeds at the time of issuance are much higher. These results suggest that there are some signals that can help the primary and the secondary market participants in recognizing the quality of these index firms during and shortly after the issuance. In short, I find evidence consistent with Hypothesis 1A.

4.2. After-Issuance Performance of the Index IPOs

In *Table 2*, I report the long-run performance of the index IPOs as measured by their stock returns (BHAR and CAR), average annual cash flows (CFs), Leverage, and return-on-assets (ROA). The performance results for four different post-issuance periods are reported: 3-year, 5-year, 7-year, and time-til-inclusion (TTI).²³ When calculating TTI performance measures, all the firms are included in the averages. However, when calculating the averages for 7-years or 5-years performances, any firm that is added to the index in the earlier periods (say added within 3-years of IPO) is excluded, because this firm simply did not have 7 years of performance prior to inclusion.

Judging from the results shown in the table, one can see that the index IPOs have done exceptionally well after issuance with regard to their stock market performance. On average, they easily beat the market (which is measured by the CRSP equally-weighted index): for all three S&P index samples the mean BHAR and CAR returns are positive. This outstanding

²³TTI essentially covers the period from the IPO date til inclusion date.

performance of the index IPOs is much more meaningful when contrasted with Ritter’s (1991) findings of substantial post-issuance underperformance in IPO stocks.

Furthermore, as shown in the table, the S&P 500 IPOs have higher returns in comparison to their counterparts in the S&P 400 and the S&P 600 indices. They have mean TTI returns of 2876% vs. 879% and 151%, respectively!²⁴ Similar patterns of results can be found for the CARs.

When it comes to CFs and Leverage (both measured as a percentage of the assets), one notices that the IPO firms in all three index samples are performing very well. They have high relative CFs and low relative leverage. The interesting result here is that the best performance (high CFs and low leverage) belongs to S&P 600 (SmallCap) IPOs, followed by S&P 400 (MidCap) IPOs, followed by S&P 500 (LargeCap) IPOs. This outcome is likely driven by the larger asset size – which is used as a scaling variable in the CFs and Leverage measures – of the S&P 500 firms. For the ROA (efficiency) measure, the performance ranking among the index samples is reversed. The best (the worst) sample is the Large Cap (the Small Cap) sample.

Most importantly, however, the index IPOs have clearly outperformed the typical firm in the full IPO sample, as suggested by Hypothesis 1B. For example, the results under the columns that belong to “All Non-Index IPOs” indicate that the full IPO sample has negative average returns vs. high positive returns for the S&P 500 sample. The results are for the other two S&P index samples.²⁵

²⁴It is important to note that these high mean returns are influenced by some firms performing extremely well and the remaining firms moderately well (i.e., these returns are highly positively skewed). Also, for some firms it took decades before they were included in the index, and thus for these firms the TTI returns would appear extremely high, which will drive the average TTI returns to such high levels.

²⁵To triangulate these results, I regressed the 3-year, 5-year, and 7-year CARs and BHARs of all the IPOs in my sample on various IPO and firm characteristics. The IPO characteristics that I considered are: age, offer price, underwriter’s reputation, underpricing, VC dummy, heat degrees, hot industry, and HiTech (see the previous section for the definition of these variables). The considered firm characteristics are: size, leverage, net income, ROA, and cash flows (all of these firm characteristics are measured as of the end of the first fiscal year after the IPO). Plus, I added three dummies indicating whether the IPO ended up in one of the S&P Indices. Of interest to me are the signs and significances of the coefficients of these three

4.3. What Factors Affect an IPO’s Index Inclusion Odds?

In this section, I will use logit regressions to determine which factors influence or indicate whether or not a given IPO firm will be included in one of the three Standard and Poor’s indices. At the end of the section, I will elaborate on an important robustness check on the the samples I use in the regressions.

4.3.1. Determinants of an IPO’s Index Inclusion Odds

The focus of this paper’s analysis is on estimating – during the IPO process– whether or not a firm will be included in an index, and which IPO features predict the inclusion odds. Naturally, the set of variables I analyze would be different than the set of variables usually considered by the S&P 500 literature when determining the inclusion odds of a typical seasoned firm.²⁶

Thus, the control variables I consider in the logit regression are typical variables that are well-known IPO features, or are well-known firm characteristics that indicate “quality” and are observable shortly before or shortly after the IPO date (see Section 2 for further details on the set of control variables). The calculations of these variables are already explained in detail in the previous section. To estimate the significant predictors of inclusion odds, I run

dummies. The dummies for S&P 500 and S&P 400 end up being significantly positive (at the 5% level) for all the regressions. The dummy for the S&P 600 is mostly significantly positive, but in a couple of regressions (depending on the length of the return period) it turned out to be significant only at the 10% level. The results from a specific regression are available upon request. Thus, even after one controls for the firm and IPO characteristics, the long-run post-IPO return performance of the index IPOs is significantly higher than the rest of the IPOs (i.e., they have performed exceptionally well after their IPO date).

²⁶Hrazdil (2010) reports the firm characteristics that the S&P Committee might be looking at during the index inclusion process. The important point to note here is that these are the characteristics of the firms during the year/quarter the decision of inclusion was made. A methaphor could help clarify the differences between my analysis and Hrazdil (2010)’s. Let’s consider a high-school student who wants to attend college. After analyzing certain characteristics (i.e., his/her tests, homeworks, etc.) one can determine whether or not this person is smart, and thus deserve to be in college. This question is the focus of Hrazdil (2010)’s paper. The current study aims to find certain characteristics that can signal the smartness of this individual while s/he is still in kindergarten. The analysis conducted in this study is important for the IPO literature, since it will tell us whether some IPO characteristics can be used as reliable indicators of future success of the firm (S&P 500 inclusion is one form of success). Therefore, since the essence of the question I am asking is somewhat different than Hrazdil (2010)’s, I do not include the same control variables in my regressions.

three logistic regressions²⁷ with the dependent variable indicating whether or not the IPO firm ended up in one of the three indices.

According to the results in *Table 3* several variables emerge as main factors associated with an IPO's index inclusion odds. Across all three index samples, both of the certification related variables (reputation and VC backing) do increase these odds. Offer price is a good indicator of the likelihood that an IPO will end up in one of these indices. Highly underpriced IPOs are less likely to be included in an index. A firm's asset productivity (ROA) in the first year of trading is a good indicator of its index inclusion odds. Its size is also a good predictor of its inclusion odds in the LargeCap and MediumCap indices. A firm's leverage significantly reduces index inclusion chances only in the S&P 600 index. If the IPO is also a spinoff, it has a better chance of being included in the S&P 500 and the S&P 600 indices. Hi-tech industry firms have higher chances of being included into the S&P 500 index.²⁸

None of the other variables have a significant influence on these odds. For instance, factors related to market conditions seem to have little effect on the index inclusion logit.

I also estimate each IPO's probability of inclusion in an index, which essentially is its predicted probability, calculated using the estimated coefficients shown in *Table 3* and the firm's own characteristics. Median inclusion probabilities for the LargeCap, MidCap, and SmallCap, indices are 1.62%, 4.65%, and 10.52%, correspondingly.²⁹

²⁷Running a multinomial logit regression with three index choices, instead of three separate logit regressions, makes little difference in the significances of the explanatory variables and in our qualitative conclusions.

²⁸In untabulated results, I find that about 54% of the IPOs in the S&P 500 Index sample belong to a hi-tech industry. The same statistics for the S&P 400 and S&P 600 samples are, respectively, 50% and 46%. The top five sectors that are represented in the S&P 500 Index's IPOs are ordered as follows: Electronic Equipment, Computer Software, Computer Hardware, Retail, and Insurance.

²⁹Note that the estimated odds of inclusion for a typical IPO firm would be different than the traditional odds of inclusion estimates conducted by prior studies that use a sample of all publicly trading firms at any point in time (the year estimation is conducted) for two main reasons. First, many IPO firms get delisted within 1 or 2 years after inclusion, which reduces the estimated odds of inclusion for a typical IPO from the IPOs sample. Also, there are many seasoned firms that have been public for more than four decades. That is, they had their IPO before 1970; the year our IPO sample starts covering the new issuances. Because of these two differences, the sample of publicly trading firms and the sample of all IPOs up to that year are different.

In short, across all three index samples, reputation, VC backing, offer price, underpricing, and ROA seem to be the most consistent determinants of the index inclusion odds. Spinoff dummy and the size measure seem to affect the inclusion odds for the two larger cap S&P indices. There are several other variables, such as age and industry, that are important only for one of the three index samples.

In a related robustness test, I included industry dummies in the above logit regressions to control for possible industry clustering of the index IPO firms. The signs and significances of the coefficients are not affected substantially, which leaves the above qualitative conclusions intact. Results available upon request.

The findings above can be explained as follows. Most of the factors that are significant predictors of inclusion odds are also reliable measures of asymmetric information associated with the IPO firm around the issuance (see Section 2 for more details and for some citations). Essentially, I find that if a new issue has lower asymmetric information about its prospects, it has a better chance of being included in one of the S&P indices. In short, these findings corroborate the claim in Hypothesis 2A.

4.3.2. Eliminating the IPOs that Engage in M&A Activities

As a robustness test, I eliminated any IPO firm that merged with another firm before its inclusion date into the index. One can argue that, in such cases, it is difficult to assert the quality of the original IPO firm; hence, one needs to control for such firms. For this purpose, I obtained Mergers&Acquisitions data from SDC, and I matched it with the corresponding sample of index IPOs. I then checked if and when they engaged in an M&A activity. If the activity occurred before the inclusion in the index, I dropped it from the index IPO sample. These restrictions leave us with 131 (219, 432) IPOs that are included in the S&P 500 (S&P 400, S&P 600) index on their own right (without merger). Using these sub-samples of index IPOs, I re-ran the three logit regressions to determine the significant variables

affecting the inclusion odds. A couple of previously-significant predictors (ROA and VC dummy) of inclusion odds became insignificant (but with the same signs as before) for the S&P 500 sub-sample. For the other two index sub-samples, only the spinoff and the size dummies lose their predictive power, but their estimated coefficients kept their signs. In each regression, the majority of the asymmetric measures kept their importance, however. So, my main conclusion, that asymmetric information variables are good indicators of inclusion probabilities, still holds. Results are available from the author.

4.4. Time Passed Until Inclusion In The Index

In this subsection, I document how long it takes (in months) for a typical S&P 500, S&P 400, or S&P 600 firm to be included in the index following its IPO. I also estimate what the significant determinants of the “speed to inclusion” are for each index sample.

First, *Table 4, Panel A* shows that, on median, it takes 99 months (or more than 8 years) of public trading before the firm becomes part of the most prestigious S&P 500 index. According to my records, there were three firms (Delphi Corp., Santa Fe Pacific Gold Corp., Dean Witter Discover & Co.) that were included in the index less than 6 months after their issuance. For reporting purposes, *Table 4, Panel B* lists the firms that were included in this index within 12 months of their issuance (they are ordered according to their speed-to-inclusion in the corresponding index; the IPOs that were also a spin-off are indicated for reference).³⁰ In unreported results, I found that there were 23 firms that were included in this index within 2 years of their public life.

Similarly, it takes 73 months (around 6 years) to be included in the S&P 400 (MidCap) index. Typical small cap (S&P 600) firms wait 68 months to be listed in the corresponding

³⁰Clearly, these firms are exceptions to the guidelines that the S&P Committee follows while selecting a replacement. According to these guidelines, IPO firms that were issued within the last 12 months are not eligible to be included in the pool of potential replacement candidates for an S&P 500 deletion. See Bos and Ruotolo (2000) for more details.

index. Naturally, it took a longer time before a typical large cap firm became part of the S&P 500 index than the MidCap (S&P 400) and SmallCap (S&P 600) firms became part of their corresponding indices. *Panels C and D of Table 4*, respectively, list the firms that were included in the S&P 400 and the S&P 600 indices within 12 months of their issuance. There were 10 and 14 such firms in the respective indices. Again, in unreported results, I found that within 2 years of public trading there were 32 and 85 firms, respectively, that were included in these same indices.

Second, *Table 5* shows the estimation results from the regression of time-til-inclusion (or *TTI*) on several of its possible determinants. The right hand side variables I consider for this purpose are the same variables that are included in the estimation of the inclusion odds.

The results from these regressions can be summarized as follows. 1) The significant (at the 10% level) indicators of *TTI* for S&P 500 index are HiTech dummy, reputation, size, VC backing, and underpricing. Hi-tech firms, larger firms, and more underpriced firms have shorter time-til-inclusion. IPOs with more reputable UWs have shorter *TTIs*, and surprisingly, the IPOs with VC backing have longer *TTIs*.³¹ 2) *TTI* of the S&P 400 is significantly positively affected (at the 10% level) by the IPO market’s heat and the IPO cycle’s direction, and negatively from industry’s hotness, underwriter’s prestige, size, spinoff dummy, underpricing, and VC backing. That is, firms issued in hot IPO markets and/or during expanding IPO cycles have a more difficult time getting into the index, but firms associated with reputable underwriters, firms in a hot industry, IPOs that are a spinoff and/or highly underpriced do have shorter *TTI*. 3) The results for the S&P 600 indicate that again underpricing, VC backing, reputation, size, and spinoff dummy speed up the index inclusion. The market’s hotness at the time of the IPO’s issuance extends it.

³¹It is known that the venture capitalists typically back young private firms, with a much “longer shot” of making it. Thus, there are two opposing effects at play here: VC support may signal higher chances of inclusion in the S&P 500 index, but the youth of the VC backed firms can imply longer waiting period before “making it” into the well-respected S&P 500 index.

As predicted by Hypothesis 2B, most of the variables found to decrease the *TTI* are also indicators of a higher IPO quality.

4.5. Underwriters Most Associated With Index IPOs

In the previous sub-section I found that the leading underwriter's reputation is one of the most important indicators of index inclusion odds and of *TTI*. Specifically, it is clear from the Table 3 results that, *ceteris paribus*, the higher the reputation of its underwriter, the more likely the IPO firm's inclusion into all three S&P Indices. This result is significant at the 5% level. This result is in direct support of Hypothesis 2C, part 1). Similar supportive results can be found in Table 5 regarding the speed of inclusion into an S&P index.

Next, I investigate which specific underwriters issued the most IPO firms that ended up in the three indices considered.

Using the data from the SDC files, I determine which IPO was issued by which leading underwriter (UW). The results are presented in *Table 6*. Over the years there was a great deal of M&A activity in the investment banking business. To facilitate exposition, I present the total (or consolidated) number of IPOs issued by the combined/merged investment bank, and the individual numbers each UW had up to the point the merger took place.³² If an independent UW had less than two S&P 500 IPOs, it is not included in the table.³³ For example, only 22 IPOs (or around 10% of the total S&P 500 sample) were issued by independent UWs who had only one index IPO (eg., AG Edwards & Sons Inc., Piper Jaffray Hopwood Inc., and Prudential Securities each had only one IPO that ended up in the S&P 500 index.).

The results in *Table 6* show that alongside the usual suspects, such as Goldman Sachs

³²To determine the merger activity between investment banks, I rely on the information presented in Figure 1 of Ljungqvist, Marston, and Wilhelm (2006)'s paper.

³³In some instance, I used my judgment to combine UWs like Merrill Lynch & Co., Merrill Lynch Capital Markets, Merrill Lynch White, and Merrill Lynch Pierce under one roof. However, for reference, I also present the numbers for each subsidiary branch.

& Co., Morgan Stanley & Co., and Merrill Lynch & Co., there were other investment banks that played a prominent role in underwriting future index firms. For example, before they merged with another investment bank, underwriters like Alex Brown & Sons Inc., Hambrecht & Quist Inc., and Robertson Stephens & Co. were very active in such IPO offerings. This is probably because of their specialization in certain hot industries (such as technology) that have produced many index firms over the years. On the other hand, well known investment banks, such as Bear Stearns & Co., (old) JP Morgan & Co., Lehman Brothers Inc., PaineWebber Inc., and Salomon Brothers Inc., are uncharacteristically detached from the underwriting market of such IPOs. Bear Stearns & Co., for example, has only six S&P 500 IPOs during the 1970–2007 period. This corresponds to only 15% of what Goldman Sachs & Co. had during the same period.³⁴

The table also reports the total number of IPOs issued by each underwriter (and its acquired underwriters), so that the top underwriters by volume are easily identifiable. The top six underwriters by total number of issued IPOs during my sampling period are: CS First Boston, Morgan Stanley, Goldman Sachs, Merrill Lynch, DeutscheBank Securities, and Bank of America Securities. Throughout the entire sampling period, all six of these UWs (or their sub-branch investment bank that they later on merged with), had a prestige ranking that would be considered top notch.³⁵

The results from this subsection indicate that index IPOs tend to choose (or tend to be chosen by) certain reputable underwriters, which is in support of Hypothesis 2C. For example, the top six underwriters (in volume and in prestige) identified above, account for

³⁴The ranking of the UWs with regard to the most S&P 500 index inclusions as percentage of total underwritten IPOs is different than the above ranking. The two investment banks most associated with S&P 500 IPOs (as percentage of total issued IPOs) are as follows: White Weld & Co. (with 26.32%) and Robertson, Colman, and Stephens, Inc. (with 17.24%). Similar rankings can be made for the S&P 400 and S&P 600 IPOs using the results listed in the table.

³⁵An underwriter can be classified as top notch if it has a prestige ranking of 8 and above (max possible ranking is 9 and minimum is 0) for each period. See Carter and Manaster (1990) and the data in Jay Ritter's website for more detailed information on this issue.

59%, 53%, and 38% of the S&P 500, S&P 400, and S&P 600 IPOs, respectively.

5. Conclusion

For the first time in the literature, this paper analyzes the offer-related characteristics of three special groups of IPOs; the ones that are later on included in the S&P 400, the S&P 500 or the S&P 600 indices. It looks into the Standard & Poors' Index firms from the perspective of the primary market participants. Its contributions lie 1) in reporting what the distinguishing IPO-features are of the firms included in each index; 2) in determining the factors affecting any IPO's odds of inclusion in one of these indices; 3) in unveiling a new hypothesis associated with the S&P Committee's choices when replacing firms in an index; and 4) in establishing the variables that are indicative of the index IPOs' speed-to-inclusion in each index.

The comparison of IPO features across any S&P index IPO sample and the full IPO sample indicates that there are several characteristics of the index IPOs, such as age, offer price, reputation, and VC backing, that distinguish them from the rest of the IPO universe. Furthermore, the results associated with the determinants of any IPO's inclusion odds into one of these indices show that the most important IPO variables improving these odds are factors indicating better certification, better pricing efficiency, better use of assets, and other variables that indicate less asymmetric information around the issue (like IPO's size and the spinoff dummy).

The above findings suggest an interesting conclusion. To the degree that inclusion in an S&P index is an indication of better quality in comparison to the rest of the firms, one can find the traces of this quality all the way back during the IPO process of the firm. So, the quality of index firms has a persistent component to it.

Furthermore, the Standard&Poor's Index committee's choice of these better-quality IPOs

can either be interpreted as a certification of this quality (*Certification Role of the Committee*), or as their preference for stable firms with proven past performance and lower business risk (*Committee's Risk Aversion Hypothesis*). Either interpretation has important implications about the predictability of the post-inclusion return performance of the index firms, which could be explored in detail in future works.

Further research can also be done to analyze whether the index IPOs are tapping into the seasoned equity market significantly earlier than the rest of the IPOs. Or do they get involved in the M&A and the restructuring activities earlier or later than the other IPOs? My belief is that such analyses will yield fruitful insights about the functioning of the primary markets – for instance their ability to detect and signal quality – about the life of a firm following its IPO, and about the type of firms that are more likely to be included in an index.

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Table 1: The IPO Features of the Index Firms

The table presents the offer-related characteristics of the IPOs in each index sample (S&P 500, S&P 400, and S&P 600). For the IPOs in each sample the mean and the median of the following variables are presented: *age* of the firm at the time of issuance (rounded to the nearest year), *underpricing* (in %), *offer price*, lead underwriter’s Carter-Manaster *reputation* ranking, percentage of firms with *venture capital (VC)* backing, *proceeds* raised (in year 2000 \$; in million \$), *size* (measured by the total assets at the end of the first post-issuance quarter; in year 2000 \$; in million \$), *net income* in the first quarter after issuance (scaled by sales), *return-on-assets (ROA)* in the first quarter after issuance, and the percentage of IPOs with positive 12-month returns (BHAR and CAR). The column named “*N*” under each sample shows the number of IPOs with nonmissing data for that variable. An “*” indicates that the mean (or median) for that S&P Index sample is *not* significantly different (at 5% level; using the Wilcoxon nonparametric rank tests) than the corresponding mean (or median) of the “Non-index IPOs” sample.

[illegible]

Table 2: Long-Run Performance From Issuance Until Inclusion

The table presents various long-run performance measures of the IPO firms in each index sample (S&P 500, S&P 400, and S&P 600) and of the firms in the entire IPO sample (excluding the index IPOs). The performances during four different time frames are presented: 3-years, 5-years, and 7-years after issuance, and time-til-inclusion period (TTI). An IPO's performance is included into the mean/median calculation for each time frame, only if it did not become a part of the index during that period. Otherwise, it is dropped from these calculations. All of the index IPOs are included into calculations of the mean/median for TTI. The performance measures are: the *BHAR* and *CAR* during the corresponding period, the averaged annual *cash flows (CFs)*, *return-on-assets (ROA)*, and *Leverage* for each firm, across each time period. For *BHAR* and *CAR* calculations, the missing returns are replaced by CRSP's value-weighted index return for the corresponding month. Further details on calculating each variable are provided in the text. An “*” indicates that the mean (or median) for that S&P Index sample is *not* significantly different (at 5% level; using the Wilcoxon nonparametric rank tests) than the corresponding mean (or median) of the “Non-index IPOs” sample.

Variables	S&P 500 Sample				S&P 400 Sample				S&P 600 Sample				Non-Index IPOs		
	3-year	5-year	7-year	TTI	3-year	5-year	7-year	TTI	3-year	5-year	7-year	TTI	3-year	5-year	7-year
BHAR															
mean	244.88%	311.84%	525.89%	2876.21%	88.58%	139.23%	167.24%	878.93%	56.40%	81.31%	53.94%	151.32%	-29.48%	-47.80%	-66.19%
median	63.39%	96.93%	157.17%	791.66%	33.92%	34.01%	34.67%	250.30%	-3.06%	-12.70%	-17.62%	33.36%	-57.77%	-84.10%	-101.10%
N	188	155	130	230	172	237	317	386	489	356	289	664	8476	8506	8522
CAR															
mean	90.89%	110.55%	145.74%	226.92%	58.51%	81.68%	88.34%	166.36%	39.00%	55.33%	67.13%	105.32%	-21.36%	-22.64%	-22.13%
median	68.07%	105.05%	126.63%	219.97%	52.16%	71.52%	78.14%	148.97%	31.84%	46.50%	66.14%	92.46%	-17.37%	-17.22%	-16.41%
N	188	155	130	230	172	237	317	386	489	356	289	664	8476	8506	8522
CFs															
mean	10.32%	9.45%	9.34%	11.05%	27.44%	21.33%	18.91%	22.09%	154.89%	185.78%	215.64%	47.22%	-11.60%	-12.65%	-15.11%
median	10.70%	10.51%	10.10%	11.52%	17.57%	17.01%	15.68%	16.64%	17.04%	15.16%	13.86%	15.14%	4.80%	3.45%	2.95%
N	170	140	118	215	300	222	162	372	462	331	269	640	5988	6077	6110
Leverage															
mean	33.34%	36.26%	39.47%	38.30%	28.39%	31.53%	35.26%	31.87%	20.75%	22.96%	24.63%	25.40%	136.87%	187.09%	185.69%
median	6.32%	10.11%*	11.76%	11.62%	9.61%*	12.03%	15.07%	12.02%	6.02%	7.25%	9.11%*	8.14%	8.43%	9.83%	10.42%
N	180	149	126	226	309	231	168	384	476	347	284	660	6186	6285	6323
ROA															
mean	6.13%	4.70%	4.43%	6.23%	5.68%	5.10%	4.68%	6.41%	3.86%	2.90%	2.69%	4.08%	-28.75%	-30.69%	-34.43%
median	5.81%	5.40%	5.09%	6.09%	6.95%	6.43%	6.08%	6.38%	6.62%	5.54%	5.03%	5.51%	1.07%	0.19%	-0.23%
N	181	149	126	227	309	231	168	384	477	348	285	661	6268	6359	6394

Table 3: Factors Affecting an IPO's Index Inclusion Odds

The table shows the results from the logistic regression, which estimates the factors affecting or indicating an IPO firm's probability of being included in the corresponding index (S&P 500, S&P 400, and S&P 600 Indices). The dependent variable for each logit regression is a dummy variable indicating whether or not an IPO firm is later on included in the corresponding index. The explanatory variables are: *Age* (number of years passed from a firm's founding date until its IPO date), *Heat Degrees* (a continuous variable measured as MA(4) of the quarterly number of IPOs series divided by its historic average), *HiTech* (a dummy variable which takes a value of 1 if the IPO firm is in a hi-tech industry; 0 otherwise), *Hot Industry* (a dummy variable which takes a value of 1 if the IPO firm is in an industry that was in the top tercile of the most issued IPOs during the year; 0 otherwise), *Leverage* (Total Debt divided by Total Assets), *NI* (is the Net Income of the firm divided by its first-year's Sales), *Offer Price* (the price the issue was offered to public), *Reputation* (underwriter's reputation ranking), *Rise Dummy* (a dummy variable which takes a value of 1 if the IPO cycle is on the rise; and 0 otherwise), *ROA* (is the Return-on-Assets of the firm, again in the first year of public trading), *Size* (is the logarithm of Sales in the first year of public trading as shown in COMPUSTAT), *Spinoff* (a dummy variable taking a value of 1 only if the index IPO is also a spinoff from another company), *Underpricing* (first day return), and *VC* (dummy variable indicating whether or not the issue is backed by venture capital). The coefficients are ML estimates from the logistic regression, and the numbers in parentheses below them are the *p*-values from Wald Chi-square test, which are calculated using Huber/White robust standard errors. At the bottom of the table some information about the number of index and non-index IPO firms with non-missing data, Nagelkerke R^2 , Akaike Information Criteria (AIC), and Hosmer-Lemeshow *p*-value is also provided. ***, **, *, indicate significance at 1%, 5%, 10% levels, respectively.

Variables	S&P 500	S&P 400	S&P 600
Intercept	-9.7512 (0.0001)***	-8.0597 (0.0001)***	-3.8354 (0.0001)***
Age	0.0057 (0.2685)	0.0007 (0.8361)	0.0034 (0.2373)
Heat Degrees	0.0336 (0.8052)	0.0737 (0.4131)	-0.0670 (0.3140)
HiTech	0.9094 (0.0005)***	0.2628 (0.1263)	0.1072 (0.3973)
Hot Industry	-0.1445 (0.6095)	-0.2848 (0.1660)	-0.1605 (0.2257)
Leverage	-0.0010 (0.8947)	-0.0207 (0.7535)	-0.1998 (0.0175)***
NI	0.0020 (0.7805)	0.0341 (0.5348)	-0.0033 (0.2836)
Offer Price	0.0942 (0.0001)***	0.0661 (0.0001)***	0.0273 (0.0300)**
Reputation	0.1513 (0.0425)**	0.2879 (0.0001)***	0.1220 (0.0003)***
Rise Dummy	-0.0091 (0.9663)	0.1483 (0.3038)	0.0698 (0.5073)
ROA	1.4916 (0.0308)**	2.1911 (0.0001)***	1.8778 (0.0001)***
Size	0.1656 (0.0545)*	0.1038 (0.0939)*	0.0312 (0.4760)
Spinoff	1.3204 (0.0025)***	1.1857 (0.0009)***	0.0253 (0.9492)
Underpricing	-0.0152 (0.0001)***	-0.0092 (0.0001)***	-0.0085 (0.0001)***
VC	0.5618 (0.0176)**	0.6214 (0.0001)***	0.4894 (0.0001)***
Index IPOs w/ avail. data	104	245	468
Non-index IPOs w/ avail. data	4,224	4,083	3,860
Nagelkerke R^2	0.1330	0.1442	0.0835
AIC	983.0020	1884.9470	2967.4960
Hosmer-Lemeshow(p-val)	0.1469	0.1029	0.5939

Table 4: The Speed of Inclusion in Each Index

The table shows various results related to speed of inclusion in each S&P Index. Panel A presents how long it takes (in months) for a typical S&P 500, S&P 400, or S&P 600 firm to be included in the index following its IPO. Panels B, C, and D display the list of the IPO firms that were included in the S&P 500, S&P 400, and S&P 600 Indices, respectively, within 12 months of their IPO date. The firms are ordered from lowest to highest according to their time-til-inclusions (TTIs). ^S at the end of the firm's name indicates that the IPO was a spin-off or a carve-out from another company.

Panel A: Time Til Inclusion (in Months):				
	S&P 500 Sample	S&P 400 Sample	S&P 600 Sample	
Mean	105.41	99.67	90.15	
Median	99	73	68	
Min	3	3	6	
Max	416	421	413	

Panel B: S&P 500 Sample (16 firms).

Delphi Corp.^S, Airtouch Communications Inc.^S, Conrail Inc., Palm Inc.^S, Santa Fe Pacific Gold Corp., Dean Witter Discover & Co.^S, Hughes Tool Co., Lucent Technologies Inc.^S, Washington Mutual Inc., Agilent Technologies Inc.^S, Prudential Financial Inc., Ahmanson & Co., Metlife Inc., Principal Financial Group, Inc., Molson Coors Brewing Co., Union Pacific Resources Group^S.

Panel C: S&P 400 Sample (10 firms).

Adesa Inc.^S, Convergys Corp.^S, Cabot Microelectronics Corp.^S, Coach Inc.^S, FMC Technologies Inc.^S, Sterling Commerce Inc., BJ Services Co., Retek Inc.^S, Transatlantic Holdings Inc., Xilinx Inc.

Panel D: S&P 600 Sample (14 firms).

Axcelis Technologies Inc., International Lottary & Totalizator Inc., Lennox International Inc., Halter Marine Group Inc.^S, Crocs Inc., Metro Networks Inc., Camco International Inc.^S, Careline Inc., Stratos International Inc., Amerigroup Corp., Newfield Exploration Co., Pac-West Telecomm Inc., Sola International Inc., Railtex Inc.

Table 5: Determinants of Time Til Inclusion

The table presents the OLS estimation results of the determinants of the “time til inclusion” (*TTI*). The dependent variable is *TTI* (time passed, in months, between the IPO date and the inclusion date). The explanatory variables are: *Age* (the age of the firm at the time of its IPO), *Heat Degrees* (a continuous variable measured as MA(4) of the quarterly number of IPOs series divided by its historic average), *HiTech* (a dummy variable which takes a value of 1 if the IPO firm is in a hi-tech industry; 0 otherwise), *Leverage* (Total Debt divided by Total Assets), *NI* (is the Net Income of the firm divided by its first-year’s Sales), *Offer Price* (the price the issue was offered to public), *Reputation* (underwriter’s reputation ranking), *Rise Dummy* (a dummy variable which takes a value of 1 if the IPO cycle is on the rise; and 0 otherwise), *ROA* (is the Return-on-Assets of the firm, again in the first year of public trading), *Size* (is the logarithm of Sales in the first year of public trading as shown in COMPUSTAT), *Spinoff* (a dummy variable taking a value of 1 if the IPO is also a spinoff), *Underpricing* (first day return), *VC* (dummy variable indicating whether or not the issue is backed by venture capital). The numbers in the parentheses below the coefficients are the *p*-values. Some information about the R^2 and the number of observations with non-missing data for the explanatory variables is also provided. ***, **, *, indicate significance at 1%, 5%, 10% levels, respectively.

Variables	S&P 500	S&P 400	S&P 600
Intercept	451.9110 (0.0001)***	369.8037 (0.0001)***	254.5761 (0.0001)***
Age	-0.1995 (0.4183)	-0.0909 (0.5950)	0.0832 (0.5308)
Heat Degrees	-5.7851 (0.3772)	7.2850 (0.0687)*	14.2070 (0.0001)***
HiTech	-33.2687 (0.0256)**	-1.8490 (0.8159)	-3.0529 (0.6079)
Hot Industry	-6.2085 (0.6835)	-17.9589 (0.0220)**	4.7159 (0.4342)
Leverage	0.4619 (0.9365)	-1.8609 (0.5923)	-4.3765 (0.1756)
NI	-0.0141 (0.9931)	9.3396 (0.1377)	0.2405 (0.1615)
Offer Price	-0.2331 (0.8087)	-0.0446 (0.9557)	0.6535 (0.2646)
Reputation	-8.8262 (0.0909)*	-7.5019 (0.0081)***	-3.0697 (0.0405)**
Rise Dummy	11.2186 (0.3299)	12.0245 (0.0746)*	6.0356 (0.2065)
ROA	-29.1203 (0.4967)	-12.5874 (0.6431)	35.3079 (0.0233)**
Size	-18.9605 (0.0001)***	-12.0074 (0.0001)***	-10.6993 (0.0001)***
Spinoff	-0.5774 (0.9804)	-26.3238 (0.0674)*	-31.9687 (0.0700)*
Underpricing	-0.4533 (0.0018)***	-0.2066 (0.0132)**	-0.1671 (0.0303)**
VC	36.9516 (0.0147)**	-13.1778 (0.0409)**	-7.5336 (0.0510)*
R^2	0.4171	36	0.1822
Obs w/ nonmissing data	100	245	468

Table 6: Underwriters Most Associated With The IPOs of Index Firms

The table shows the number of IPOs per lead underwriter (UW) for each index sample (S&P 500, S&P 400, and S&P 600) and the entire IPO sample. The UWs are sorted according to their number of S&P 500 offerings. The screening criteria required for being listed in this table is that the underwriter has to have two or more IPO offerings subsequently listed in the S&P 500. Since there were a lot of mergers between the investment banks over the years, I first show the consolidated total number of index IPOs underwritten by the combined firm. Then, I list how many index IPOs each subsidiary firm actually did underwrite while the subsidiary was still independent. Subsidiaries are shown with a little branch, “—”, under the parent underwriter.

Underwriter	S&P 500	S&P 400	S&P 600	All IPOs
Morgan Stanley Dean Witter (Total)	42	49	39	461
—Morgan Stanley & Co.	29	43	26	282
—Dean Witter Reynolds	6	6	9	75
—Morgan Stanley Dean Witter	7	0	4	104
Goldman Sachs & Co.	40	36	39	427
Merrill Lynch & Co. (Total)	28	36	26	415
—Merrill Lynch Capital Markets.	8	14	7	110
—Merrill Lynch White	4	4	3	23
—Merrill Lynch Pierce	1	0	0	9
—Merrill Lynch & Co.	15	18	16	273
CS First Boston (Total)	12	34	58	539
—First Boston Corp.	6	11	16	83
—CS First Boston	3	7	17	239
—Donaldson Lufkin & Jenrette	3	16	25	217
Bank of America Securities (Total)	12	27	44	378
—Robertson Stephens & Co.	7	15	20	132
—BancAmerica Robertson	2	1	1	22
—Montgomery Securities	3	11	23	161
—Other Subsidiaries	0	0	0	63
Salomon Smith Barney (Total)	11	18	35	313
—Salomon Brothers Inc.	6	8	17	106
—Smith Barney, Harris Upham	3	0	0	86
—Smith Barney Inc.	2	10	18	79
—Other Subsidiaries	0	0	0	42
DeutscheBank Securities (Total)	10	24	49	408
—Alex Brown & Sons Inc.	9	20	46	305
—DeutscheBank	1	2	1	67
—Banker Trust	0	2	2	36
JP Morgan Chase (Total)	9	17	35	275
—Hambrecht & Quist Inc.	7	15	34	190
—JP Morgan & Co.	1	0	0	79
—JP Morgan Securities	1	2	1	6
Lehman Brothers, Inc.	9	11	26	225
UBS Warburg (Total)	7	17	37	370
—Kidder Peabody & Co.	5	10	12	121
—PaineWebber Inc.	1	1	16	117
—Paine, Webber, Jacks	1	0	1	10
—Dillon, Reed & Co, Inc.	0	4	5	45
—Union Bank of Switzerland	0	2	3	72
—SG Warburg Securities	0	0	0	5
Bear Stearns & Co., Inc.	6	8	14	160
LF Rotschild Unterb Towbin	6	6	8	86
Robertson, Colman & Stephens	5	5	4	29
White Weld & Co., Inc.	5	2	1	19
Blyth Eastman Paine (Total)	4	2	0	29
—Blyth Eastman Paine	2	1	0	2
—Blyth Eastman Dillon	1	1	0	6
—Blyth & Co.	1	0	0	21
Shearson/American Express (Total)	4	11	9	88
—Shearson/American Express	2	11	4	26
—Shearson Lehman Brothers	1	0	2	51
—Shearson Lehman Hutton	1	0	3	11
CE Unterb Towbin	3	2	2	30
William Blair & Co.	3	6	11	100
Butcher & Sherrerd	2	1	0	12
Drexel Burnham Lambert	2	7	6	113
EF Hutton & Co., Inc.	2	1	6	73
The rest of the UWs	22	66	215	5,104
Total	372	386	664	9,654