Empire Building in Firms Going Public: How Early Do We Discover the Problem?

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We test the ability of IPO process participants to perceive at early stages of corporate valuation the information regarding empire building problem within firms going public. Given the market efficiency is high enough, we expect to find that possible value destructive actions of CEOs are incorporated already into the indicative price range and bookbuilding process preceding IPO. The results on our sample confirm that the market participants are able to detect empire building problem already at the stage prior to IPO.

1   Introduction

In this paper, we conduct an empirical investigation on the efficiency of the market in detecting Empire Building managers of firms that go public, starting from the time a firm announces its decision to go public and until acquisitions by the firm management take place within a three year horizon. Over this time span, important periods of information sharing between the firm and market participants are evaluation of possible offer price range by the underwriter, bookbuilding process, first day of trading, and further trading at a stock exchange.

The key research question of this paper is to determine at what period(s) the market is able to recognize possible problems with firm management, and to detect the free cash flow problem. In other words, conducted econometric tests aimed to determine at which stage the firm's share price absorbs negative news about the empire building within the corporate management.

For the variable capturing the empire building as opposed to the value creation, we used the abnormal returns on dates of corporate acquisition announcements. We relate this measure of empire building to such variables as adjustment from initial indicative price range to the offer price, return on the public offering day, one year (abnormal) stock return, controlling for underwriter reputation and usual firm-specific characteristics. We expect to see regularities between abnormal returns on acquisitions days and particular stages of price adjustment. Market efficiency hypothesis suggests that the information regarding the problems with the firm management should be reflected in the stock price at the very early stage, i.e. in our setting the price settled during the bookbuilding process should be informative of the free cash flow problem. That is, the effect of empire building on company valuation is presumably stronger at earlier stages of stock price determination (such steps of IPO process as establishing initial price range and bookbuilding) in the case of high market efficiency. Conversely, if the stock price starts to incorporate the information about empire-building problems within firm management only in the long run, when value-destructive acquisitions actually take place, this would suggest of a low level of market efficiency.

The results demonstrate that the information on future empire-building problems is reflected in the stock price as early as during the process of setting the initial price range, and bookbuilding process. Thus, the results in this paper advocate high efficiency of corporate valuation during the process of going public.

2 Setup

This paper contributes to the immense volume of literature that analyzes reasons for the phenomenon of underpricing in IPO and the role of underwriting bank's reputation. The novelty of this work is to verify whether at the IPO stage, the price setting process incorporates potential empire building problem. In this section, we discuss possible effects of the Empire Building on the process of going public in the light of existing theories of underpricing. We also posit testable implications in the form of three hypotheses.

In one of the most established theories of underpricing in IPO, first day abnormal return was attributed to the information disadvantage of small market players who should be compensated with high overall underpricing to break through when participating in IPO (as Winner's curse in Rock, 1986). In our context, higher information asymmetry for small players particularly refers to the empire building problem, among other risk factors associated with expected stock performance.

Benveniste and Spindt (1989) model argues that major market players with information superiority should be rewarded by underpricing for truthful information revelation during the bookbuilding process. Along this vein, an important source of information regarding the free cash flow problem are evaluations of bookbuilding participants, typically investment divisions of large institutional investors. In our setting, if these investors have valuable information regarding the empire building characteristics of the management of a company going public, once this information is truthfully revealed, the underwriter can set the offer price based on it. Again, such information can be rewarded with higher underpricing.

The willingness of the underwriter to disclose such information depends on his motives, and this interlinks with the line of research that viewed underpricing as an outcome of a principal-agent conflict between an issuer and an underwriter. In Baron (1982) and Loughran and Ritter (2002), an investment bank as an issuer's agent can abuse market power and information superiority in order to extract additional rents from the issuer. That is, the underwriter and its network of valuable clients directly or indirectly benefit from underpricing, receiving a lion's chunk of the amount 'left on the table' during IPO. For an extreme example of the 'money left on the table' in IPO, we refer to Jay Ritter's leader, *UPS*, who 'abandoned' in IPO $ 1,597 mln (exclusive of international tranche) on November 10, 1999. In the setting of the current paper, besides possible conflicts between underwriters and issuers, the principal-agent conflict arises between empire-building managers and company's current and future shareholders. From this point of view, such a manager tolerates underwriter's unfair pricing simply because this CEO is not

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willing to maximize shareholders' value. On the other hand, and this is the innovation of the current work, the empire builder has interests that diverge from value-maximizing behavior and from interests of shareholders, which will affect both the way the CEO bargains over the offer price and the market valuation of the shares due to information revelation and market efficiency. Hence, the underpricing is affected because both the offer price will be influenced by the measures of empire building ambitions, and also the bookbuilding and first day price change will be influenced as well, because the market and underwriter can possibly detect manager's adverse incentives.

The empire builders may use various signals to hide their true motives. The signaling interpretation of underpricing is due to Welch (1989): high quality firms underprice because they can sustain the losses over longer period and break even at a later stage, for instance, via better placement of seasoned offerings. At the same time, low quality firms have little incentives to mimic this behavior as underpricing would be a threat to their sustainability and survival. Whence, underpricing as a signal of high firm quality. In the current setting, good quality firms (with value-maximizing managers) and bad quality firms (empire builders) can promote different levels of the offer price in order to signal to the market (or to the underwriter) of their quality. On the other hand, the market and the underwriter can detect the free cash flow problem with some precision. Thus, the Empire Building problem affects both the bookbuilding change and the level of underpricing.

As long as the underwriter's reputation is at stake, the conflict arises also regarding information sharing between CEO and underwriter: empire building managers mislead the underwriter concerning their expansion plans, creating additional risk for the investment bank certification quality. This problem overlaps with the line of literature explaining the underpricing as a tool that underwriters use to reduce legal responsibility in cases of unsatisfactory performance of stocks that they certify and lead to public trading. In our setting, empire building is an additional source of uncertainty that the investment bank is supposed to reduce, and whenever the asymmetry related to empire building remains, the underwriter may set the company valuation at a lower level, in order to decrease the risk of potential litigations.

Following these arguments, we set the first two hypotheses:

H.1 The Empire Building problem amplifies informational asymmetry, hence, the bookbuilding adjustments (in absolute value) and the level of underpricing increase.

H.2 Bookbuilding change and underpricing incorporate the Empire Building problem, whilst later price adjustments bring less additional information (given high efficiency of the bookbuilding process).

Another strand of the literature emphasizes the link between underwriter quality and the outcome of IPO. Particularly, the interdependence between underwriter prestige and the first day return has been studied extensively. For the period of 1980s, the dominating view was that better qualification of an underwriter reduced the uncertainty related to a new stock becoming public. The rationale was that a higher prestige underwriter provided more professional services and had valuable reputation to sustain, hence, the risk premium for a new company should have been smaller. In the 1990's, the sign of this causality has flipped, which caused new interpretations to appear. Particularly, findings in Biais, Bossaerts and Rochet (2002), Ljungqvist (2003) and Nimalendran, Ritter and Zhang (2006) suggest that larger banks, having accumulated high reputation capital, can abuse their market power creating benefits to their network of clients by keeping the offer price below the fundamental value. A different explanation of this phenomenon related to the endogeneity of underwriter choice was shown in Habib and Ljungqvist (2001). They found that those were, in fact, firms with the highest expected underpricing per se, who hired the most prestigious underwriters, thus decreasing their losses from underpricing. Hence, for such firms the observed underpricing is smaller than in the case if these same firms went public with lower prestige underwriters, but yet higher on average then the underpricing experienced by other firms (more mature firms with lower asymmetry of information, etc.). In the current paper, the emphasis is on the influence of the underwriter quality on the amount of information concerning empire building revealed at different stages of IPO.

Obviously, higher prestige underwriters have better professional qualification allowing them to detect the empire-building problems within firm management, and more market power to freely make such information public. At the same time, it is not straightforward to predict how the motives of big and small investment banks differ concerning their willingness to disclose evaluations of empire builders. The legal factor discussed above is likely to be also important here: both reputable and smaller types of banks are reluctant to have any litigations from the buyers of the stock they led public. Prestigious underwriters have bigger reputation capital and financial liability that can be challenged by dissatisfied market players, whilst for less reputable investment banks with smaller capital, even a moderate fine related to low performing issues would be a serious burden. Finally, bigger banks have huge reputation capital to maintain, but, on the other hand, a higher

temptation to 'cash-in' some of it whenever a hot deal is coming (e.g., to distribute a 'hot stock' to their most valuable clients in exchange for higher brokerage commissions and other deals). As for the smaller banks, although these do not have a big reputation to safeguard, they need to accumulate it over long horizon in order to enlarge the market share, and this can be a stringent motive in their evaluation policy.

An interesting finding related to the reputation as a discipline devise in the setting of venture capitalist is due to Baker and Gompers (2003). In their sample, the start-ups promoted by more reputable venture capitalists on average have more independent boards of directors, and higher probability of CEO replacement. This suggests that venture capitalists with bigger market power possess better control over firm management, and have more freedom to dismiss those CEOs who do not perform satisfactory. This, in turn, positively affects the reputation of bigger venture capitalists. Incentive mechanism of investment banks appears to be more convoluted than in the case of VCs. On the one hand, the similarity is that more reputable banks have solid market power, whence they can take strict policy regarding evaluating issuers' management and allowing them to complete the IPO. Furthermore, they possess a wide client base, and the marginal effect of losing any single issuer as a client due to overly strict policy regarding empire building problems, is small.

On the other hand, reputable banks, besides underwriting, also provide wider range of other services, hence, a scrutinizing certification policy at IPO can trigger an issuer to choose another bank for post-IPO services rather than to do business with various divisions of the underwriter (SEO and debt issues, brokerage and hedging services, etc.). In other words, the relationship between the issuer and underwriter is in the form of repeated interactions, and the internal conflict can be very substantial in case of larger banks. Hence, it is not straightforward that the findings for VCs (as in Baker and Gompers) also apply for the investment banking. We find that the underwriter prestige plays a very important role in the way investment banks incorporate empire building problem into the stock price, and these are, in fact, smaller banks that have a more conservative policy regarding evaluation of empire building problem.

Thus, the third hypothesis incorporates the influence of the underwriting bank's reputation:

H.3 Underwriter's quality affects the magnitude of relationship between the empire building and IPO price adjustments.

From the above discussion follow the differences of this paper from the existing literature on underpricing. Unlike in the theories on principal-agent conflict in underwriting, in this paper, cross-firm differences in underpricing come not due to the conflict with an outside agent (investment bank), but rather from the extent of internal corporate governance imperfections (management's interests diverge from value maximizing). In contrast with the signalling literature, in the current work the market information efficiency is crucial for the level of underpricing. It is not that underpricing comes solely from the choice of the offer price, but rather the outcome of bookbuilding process and market's evaluation of the company's quality that arises during the first trading day are important determinants of underpricing. Finally, the paper aims to contribute to such explanations of underpricing as adverse selection, Benveniste and Spindt's information sharing, legal reasons and underwriter quality, by investigating whether the empire building is an additional factor that is evaluated during the bookbuilding and accounted for in the stock price.

3   Information revelation

We argue that due to the market efficiency, the information regarding the empire building problem is detected early in the process of going public. For estimation purposes, we assume that the information about the firm quality and, particularly, potential empire building problem, can be revealed to the marker during the following periods.

1. A firm intended to go public negotiates with a potential underwriter conditions of IPO, the underwriter evaluates the company and sets an indicative price range for the stocks (captured as the midpoint of the initial price range).

2. The underwriter performs bookbuilding, advertising the stock to potential clients and gathering information regarding the firm quality from large investors. Variable that captures this stage is the increase from the midpoint of the price range to the offer price

3. The offer price usually is announced shortly preceding the offer, and during the first day of trading the stock price typically changes significantly.

4. Shares are traded on a stock exchange, we measure one year abnormal return of the stock following the IPO (net of first day return).

4 Data

The data on IPO issues have been taken from the SDC Global New Issues; the variables are the date of the offer, the range of the indicative filing price from the underwriter, the actual offer price, the closing price at the offer date, one year stock performance and corresponding change of market indices, underwriting bank of each IPO. These data were supplemented with statistics of acquisition activities of IPO firms within three years following IPO from SDC Mergers and Acquisitions database. The matching variables of firm characteristics and performance are from Compustat and CRSP databases. In particular, the stock prices within three trading days during the acquisition announcement (starting with the return on the day before the announcement) and the value- and equally weighted market return indexes are from the CRSP listings. Firm specific performance measures are taken from Compustat: total Assets, net Sales, Cash and Short term investments, Debt, total Common equity, Price (close calendar year) and Common shares outstanding.

The data sample includes firms that went public in 1992 - 1993, which gave, after excluding unit offerings and close end investment funds, a sample of 1176 companies. The choice of the time period is such that it allows to investigate stock reactions to acquisitions within three complete years following IPO, and yet to avoid including announcements during the period of the bubble. After excluding companies for which the data were missing in Compustat or no matches were determined in CRSP, the sample reduced to 685 companies. For these companies, there were 1759 acquisition announcements identified from the SDC MA database. These events comprised the sample for the test on abnormal returns due to acquisition announcements following IPO.

We calculated cumulative abnormal returns using the methodology as in Grullon, Michaely, and Swaminathan (2002): abnormal stock price reaction to acquisition announcement defined as the sum of differences between the stock return and weighted market return over a three days window.

$$CAR_i = \sum_{t=-1}^{1} (r_{i,t} - r_{m,t})$$

As the market return variable, we employed five alternatives: value-weighted and equally weighted NYSE/AMEX returns, with and without dividend payments, and the S&P 500. The regression results are very similar for all five specifications of the benchmark return. For the value-weighted NYSE/AMEX (with dividend payments) index, the cumulative three day abnormal return series has maximal value of 80.36%, minimum -73.70%, and the mean is 1.47%. Abnormal return

series have leptokurtic distribution with negative skewness.

The market to book ratio was defined as Assets Total, less Common Equity, plus the market value of all shares outstanding at the end of calendar year, divided by Assets Total. The variable used to evaluate price adjustment during bookbuilding was the revision variable as in Cornelli and Goldreich (2000). It is defined as

$$Revision = \frac{OfferPrice - IndicativeLow}{IndicativeHigh - IndicativeLow}$$

By definition it is 0.5 if the price is set at the middle of the price range, zero if the price is set at the lower bound of the indicative price range and one if the price is set at the upper bound. The variable takes values below zero and above one when the issue is priced outside the initial range. Upward revision dummy is one if Revision is greater than one, and zero otherwise. The underwriter reputation variable of Loughran and Ritter (as modified and updated in Carter and Manaster and Carter, Dark and Singh ratings) was obtained from Jay Ritter's web site. We adopt Internet and technology dummy specification as in Loughran and Ritter (2004). The descriptive statistics for main variables are presented in Table 1.

Table 1. Descriptive Statistics

Variable	*mean*	*median*	*st. deviation*
CAR	1.472	1.258	8.798
Age at IPO	16.9	9.0	21.2
Sales, mln $	207.5	61.4	1029.2
Underwriter Prestige	7.1	8.1	2.2
Revision	0.44	0.50	1.16
Underpricing	11.7	5.4	18.2
One year AR	17.29	2.86	83.66
Num of Acquisitions	3.1	2	2.89

The correlations of main variables is presented in Table 2. Firm age is positively associated with stock performance during first year following IPO, negatively with price revision and underpricing (that captures lower uncertainty associated with older firms), positively with the reputation of the investment bank, negatively with the number of acquisitions within three years following IPO and with the returns at dates of such announcements; older firms fall into the Tech category less often.

Table 2. Partial correlations of main variables.

	Age	1yr AR	Revis	UP	UW	CAR	#Acq	Tech
Age	1	0.03	-0.09	-0.15	0.19	-0.02	-0.06	-0.15
1 yr AR	0.03	1	-0.09	0.05	0.03	-0.08	0.09	-0.01
Revision	-0.09	-0.09	1	0.42	0.05	0.01	0.04	0.08
Underpricing	-0.15	0.05	0.42	1	-0.09	0.03	0.03	0.15
U'writer	0.19	0.03	0.05	-0.09	1	-0.09	0.01	0.04
CAR	-0.02	-0.08	0.01	0.03	-0.09	1	-0.02	0.03
# Acquisitions	-0.06	0.09	0.04	0.03	0.01	-0.02	1	-0.10
Tech	-0.15	-0.01	0.08	0.15	0.04	0.03	-0.10	1

The variable of interest, cumulative abnormal returns on acquisition dates, is negatively associated with firm age and with first year stock performance, positively with bookbuilding revision and underpricing, negatively with the underwriter prestige and with the number of acquisitions within three years post-IPO, and positively with the technology sector dummy. The Tech dummy correlations show that Tech companies are younger, have lower average first year return, experience more (upward) revision during bookbuilding and first day of trade, go public with more reputable investment banks, have higher abnormal returns on acquisitions, and acquire less often. Underwriter's quality is positively associated with age, sales, and assets, which seems to cause the multicollinearity observed when including these controls in the regressions.

5   Empirical Tests and Results

The ultimate goal of the conducted tests was to empirically determine the periods within which the existence of empire building ambitions of CEOs reflects in the pricing of firm's shares. The main hypothesis is that, due to market efficiency and due to the distinct motives of the empire builders, already at the IPO stage the pricing should reflect the agency problem of empire building.

We assume that, if corporate management has empire building ambitions then this fact will be revealed to the market, for instance, through particular characteristics of the acquired targets, and then there will be negative reaction to the announcements of large acquisitions initiated by this company. Thus, as the measure of empire building problem, we have employed cumulative abnormal return at acquisition announcements, which is a dependent variable in our main regressions. Hence, we investigate the interplay between the stock price adjustments before

and after the date IPO and the stock price reaction on corporate acquisition announcement within three years following IPO.

The first observation is that in our sample the well established phenomenon of partial adjustment (Hanley (1993)) is highly significant economically and statistically: the higher the offer price is raised relative to the indicative price range, the higher the first day price increase is. In Table 1 this corresponds to the Bookbuilding adjustment variable and the Dummy of offer price being above the initial range. Higher underwriter reputation and firm age are associated with lower underpricing (Table 3).

Table 3. Standard results on Underpricing in IPO
(Dependent variable: First Day Return)

Variable	Point estimate
Bookbuilding adjustment	0.335***
Underwriter Reputation	-0.858***
Company Age	-0.085***
Offer Price above Range	7.955**

(Hereinafter, one, two and three asterisks indicate significance at 5%, 1% and 0.1% or better, respectively, whilst † refers to 10% significance.)

To test the hypothesis of high market efficiency in revealing the empire building during IPO, as the dependent variable we use the cumulative abnormal returns over a three day window. In this regression, I tested whether the measures of stock price changes at such stages as bookbuilding, first day of trade and subsequent trading (one year abnormal returns, and also three and five year stock dynamics) are able to predict successive CAR on the days of acquisition announcement. Variables corresponding to Firm Age, Cash and Short-Term Investments, Net Sales were used as controls in various specifications of the regressions. The total number of acquisitions within three years following IPO, and insider ownership before and after the IPO date were also checked for explanatory power.

The regression we run in the general form includes the following variables (after dropping insignificant controls):

$$CAR = \alpha + \beta_1\ Rev + \beta_2\ Rev\ UW + \beta_3\ UP + \beta_4\ UP\ D_{TECH} + \beta_5\ AR_{1YR}$$
$$+\ \ \beta_6\ AR_{1YR}\ UW + \beta_7\ AR_{1YR}\ D_{TECH} + \gamma_1\ Age + \gamma_2\ Age\ D_{TECH} +$$
$$+\ \ \gamma_3\ D_{TECH} + \gamma_4\ UW + \gamma_5\ UW\ D_{TECH} + \gamma_6\ NumAcquis \qquad (1)$$

The following variables were found to be highly significant in explaining the ab-

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normal returns: revision of the price during bookbuilding, underwriter reputation, first year abnormal returns, as well as technology sector dummy and firm age (in interaction with other variables). At the same time, the relation between the first day underpricing and CAR is insignificant. Sales, assets and cash are insignificant and cause multicollinearity (not shown). The results are reported in Table 4.

Table 4. Determinants of Abnormal Returns at acquisition announcement dates

Variable	(1) CAR	(2) CAR	(3) CAR NonTECH	(4) Q
Intercept	4.28**	4.13***	3.73*	56.1*
Revision	-4.26*	-4.16*	-6.82***	-85.7*
Revision*UW	0.53*	0.52*	0.85***	9.03†
UP	0.0001	-0.002	0.03	0.1
UP*Tech	0.045	0.034		0.03
1 yr AR	-0.025*	-0.013**	$-0.0.17^\dagger$	-0.47*
1 yr AR* Tech	-0.023*			-0.64***
1 yr AR * UW	0.004**		0.003†	0.06†
1 yr AR * Age		0.0005†		
Tech	10.93***	10.59***		358.7***
Tech * Age	-0.32***	-0.30***		-2.75*
Tech* UW	-0.96*	-0.96**		-34.2***
UW	-0.46*	-0.39*	-0.57**	$-7.5^\dagger$
Age	0.019	-0.01	0.63	-0.17
R-squared	9.0%	8.0%	4.2%	13.0%

For the analysis of information efficiency regarding the empire building problem, let us note that price changes during bookbuilding and first year of trading at exchange have statistically significant predictive power, whilst underpricing is incapable to predict the abnormal returns. To evaluate economic effect of these two significant variables, it is important to distinguish between cases of high and low prestige underwriters (we employ lowest and top quartile values of the investment banks ranking for this purpose). For coefficients estimated, the price revision by low prestige underwriters has influence on CAR of about negative *five* percentage points in the case of significant upward price revision (evaluated for top quartile of Revision variable). The same values for highest quartile of underwriters are much smaller in magnitude (not exceeding 0.4%). Influence of changes in first year abnormal return has magnitude from 0.4% to 1.1%, where the last (more pronounced) effect again appears in the case of firms who went public with lowest prestige underwriters and who experience stock price increase during the first year.

At the same time, for intermediate values of the prestige score, the influence of these two price change variables is small.

Higher underwriter reputation is associated with lower abnormal returns at acquisitions (variable UW Reputation), which suggests that empire building problem appears more often in companies that went public with more reputable banks. This can be explained by the tendency of older and more established firms (larger sales, cash and assets) to go public with more reputable banks (recall positive correlations with underwriter rank). The surprising result is that lower prestige underwriters are in fact more strict in relation with the empire building syndrome, scrutinizing managers that might be potentially prone to this problem already at the bookbuilding stage. This follows from the analysis of the total effect of Revision variable and its interaction term with the UW Reputation. Low abnormal returns appear in the cases of companies that went public with low prestige underwriters who increased the offer price most substantially relatively to the initial price range. This suggests that low reputation underwriters set initial price range too conservatively (relatively to higher prestige underwriters), and then during bookbuilding, the institutional investors push the offer price higher, to the level of market consensus. And, as in our sample we do not find such a significant relation of abnormal returns with later price corrections, this means that the price is set quite adequately during the bookbuilding process, i.e., it reflects, amongst other aspects, the empire-building problem.

This leads to an interesting conclusion regarding the value of reputation: smaller and less prestigious underwriters are overly strict with firms whose management can have free cash flow problems, and initially set the indicative price well below the price that institutional investors consider to be fair for a given stock. This is possibly done due to precautionary motives: thus the risk of costly litigations with dissatisfied buyers of issued securities is lowered, as the 'objective' information from the market participants 'forces' the low prestige underwriter to raise the offer price above his own estimates. On the other hand, motives for accumulating reputation capital can be more important for smaller banks, while larger banks have greater conflict of interests between underwriting and trading divisions.

This interpretation is further supported by the relevance of high-tech dummies. Tech dummy is related to higher average CAR, but this effect is relevant only for young technology sector companies and those tech firms that went public with less prestigious underwriters. The importance of age is straightforward to interpret: young tech companies have more growth options that expire with age, hence, CAR become lower for older firms. The coefficient on Tech*UW has the

following interpretation: while Tech firms have more growth options and should acquire more, higher prestige banks are associated with management being more prone to build empires. Hence, for higher bank ranking, the empire building effect distorts, on average, the growth options motive for investing and expanding. Alternatively, the coefficient on Tech*UW can be analyzed along with that of UW: while higher bank ranking is associated with more negative stock price reaction at acquisitions for non-technology sector firms, this effect is more than triples for the tech companies. The interpretation of this fact is that technology firms are harder to evaluate (and to detect the empire building problem) in general. Hence, given that more reputable banks have a less strict policy for stock pricing when signals on potential empire builders reveal, the magnitude of the problem increased for technology sector firms. We refer to the Robustness section where we rerun the regression on a sample without technology and Internet firms to check that overall results are not driven by this sector only.

As has been shown above, besides the Revision variable, another important predicator of CAR at acquisition announcement days are first year abnormal performance series. In regression *(1)*, one year performance is negatively associated with CAR for firms went public with low prestige underwriters, and positively associated for the case of highly reputable banks. Similarly, in regression *(2)*, one year abnormal stock performance following IPO, is negatively associated with CAR for younger firms, and positively associated for older firms. The interaction coefficient for abnormal return and age is only marginally significant, but when the regression was modified to account separately for tech and non-technology companies (not shown), the effect turned out to be due to the tech firms: abnormal return variable lost any significance for non-tech corporations, while estimates for tech companies have significance better than 0.1%.

It is straightforward to conjecture that interchanging firm age and bank reputation leads to similar pattern because underwriter's reputation in the context of first year performance refers to information asymmetry regarding the company going public. In our sample, underwriter's rank is positively associated with age, sales, cash earnings, leverage, and negatively associated with the incidence of delisting and insider shareholding, clearly suggesting that firms that go public with prestigious banks, bear lower level of information asymmetry. Then, in the analysis of one year returns, the results in *(1)* and *(2)* have the following interpretation in the context of tech sector: when managers of younger firms (or firms with higher asymmetry) observe positive evaluation of their post-IPO performance (excellent stock dynamics, among other measures), they can gain overconfidence about own abilities and growth prospects. (This regularity holds also for the non-tech firms -

only regarding the interaction of one year return with the underwriter's quality.) This triggers corporate management to acquire and expand more actively - that is, over the optimal level. Hence, due to such overoptimism, they expand too much, causing negative returns following acquisition announcements. Such tendency declines with the firm age, as the management of mature firms already has had experience of other growth periods within their firms, and the increase in their optimism following good stock performance will be rather modest and adequate.

The effect can be two-fold: besides naive over-optimism regarding firm prospects and the desire to exploit the right momentum for perceived high NPV projects, management of young firms that perform well after IPO can interpret this success as solely their own achievement. Thus, they can demand more compensation for it, which, beyond bonus payments, can refer to expanding the scope of control, building 'empires' and, hence, related perquisite consumption. In other words, good first year performance may trigger the empire building problem within management of young firms.

6   Robustness Checks

For the purposes of robustness checks, and due to the high relevance of the Tech dummy in the above regressions, the tests were rerun on the sample excluding tech firms. This was done to make sure that the findings regarding information revelation of empire building problem are not driven by the tech sector. The results (regression *(3)*) have demonstrated identical pattern of influence of the revision variable (being now significant at more than 0.1% level), irrelevance of the first day return variable, and marginal significance of the first year returns in the same direction as before. Thus, the sample without the tech companies demonstrates high market efficiency with respect to the free cash flow problem, and, in fact, most of the relevant information is revealed exactly at the pre-IPO stage, while the first year performance has lower relevance for our measure of the empire building problem.

As an alternative to the empire building measure of CAR, we use the market to book ratio dynamics over five years following IPO (regression *(4)*). The intuition is that a corporation with empire building problem will experience deterioration of the market to book ratio compared to value-maximizing companies. This will be the case for managers who build empires rather than create value, as whenever the total asset measure will increase, the market valuation of the company will not increase as much as it would be the case for value maximizing managers.

Thus, in the long run the market to book ratio will deteriorate, as compared to value-maximizing companies. So, as an additional test, we relate the pricing during IPO to the dynamics of the market to book ratio over five years following the year a company went public. Clearly, the CAR measure has superior theoretical grounds to be a more reliable variable that captures the empire building problem, as the market to book ratio dynamics over five years incorporates influence of many other factors of corporate performance. Nonetheless, the market to book regression generally supports the results obtained with CAR, particularly, the influence of revision and one year abnormal return in their interaction with the underwriter's quality and firm age.

7   Conclusions

The results obtained on the current sample give grounds to conclude that the efficiency of detecting empire builders in firms that go public is fairly high. Information regarding the empire building problem is mostly revealed already at the initial IPO stage, namely, during the evaluation of the indicative price range by the underwriter, and also during the bookbuilding period. This efficiency seems to be lower in the case of high-tech young companies that go public with low prestige underwriters: in this case, first year abnormal return adds some more information on empire building.

Another interesting finding is the treatment of reputation capital by investment banks: the results suggest that higher prestige underwriters set indicative price range and offer price that account adequately for the empire building problems. Low prestige banks over-cautiously set the indicative price range for companies with potential free cash flow problem at a very conservative level. This can be done in order to either raise their own reputation or to avoid possible litigations in cases of unsuccessful performance of the firms they take public. Put it differently, less reputable banks have stricter policy with respect to empire building, whilst reputable banks, who are also motivated to provide services beyond underwriting, do not apply overly strict policy to potential empire builders.

The third important finding is that management of with larger information asymmetry (younger firms and firms that go public with less prestigious banks), is more prone to over-invest if first year performance was good, and this effect is especially significant for technology and Internet sector firms. Above-average performance during the first year post-IPO either creates managerial overconfidence or triggers empire building problem within executives of less mature firms.

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