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The Impact of Initial Public Offerings on the External Growth Strategies of Entrepreneurial Firms

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The goal of this paper is to examine the impact of Initial Public Offerings (IPO) on the investment strategies of young entrepreneurial firms. Hypotheses are developed from the finance, strategy and top management team literature. These are then tested using multivariate methods in order to study post-IPO investment behavior of a global sample of young Internet firms.

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Introduction

Growth is considered to be one of the most important objectives of entrepreneurial firms¹ (e.g. McGee, Dowling and Megginson (1995); Shrader and Shelton (2001)). In order to achieve its growth objectives, a firm has to leverage existing and invest in new financial resources in order to gain access to productive resources or resource combinations (Chatterjee (1990); Hahn (1970); Küting (1980)). In this context, we assume that the Initial Public Offering (IPO) is an important milestone in the new venture life cycle. Typically, entrepreneurial firms are characterized by resource constraints and a liability of newness (Lechner (2001); Stinchcombe (1965)) which hinders the development of the company compared to capital-rich established firms. Through an IPO in the early stage of the life cycle a young firm can overcome this resource scarcity. Furthermore, the abundance of financial resources post-IPO opens a broader array of possible investment strategies. According to the conventional entrepreneurship literature, the investment behavior of new ventures is commonly reduced to the internal development of resources and activities (Dowling and Drumm (2002); Shrader and Shelton (2001)) mainly due to their capital limitations. However, other researchers argue that acquisitions and cooperative arrangements can also be used by younger firms as effective external sources of growth (Lechner (2001); McCann (1991); McGee et al. (1995); Schultz and Zaman (2001); Shrader and Shelton (2001)). So far, little is known about the impact of an IPO on the investment strategies of entrepreneurial firm's post-IPO through acquisition and cooperation. Due to this knowledge gap, our two central research questions are:

1. What influence does an IPO have on the acquisition and cooperative strategies of an entrepreneurial firm?
2. What are the key drivers behind post-IPO investment behavior?

I. Theoretical Development and Hypotheses

A. From resource constraints to investment options

There is a lack of theoretical and empirical research addressing the impact of an IPO on the investment strategies of entrepreneurial firms. However, some prior research was useful in developing our hypotheses. For example, in a study of newly listed companies' growth and investment behavior, Schultz and Zaman (2001) tested the hypothesis that young Internet firms go public in order to rapidly increase their market share and to gain a competitive advantage through first mover effects. They expected Internet firms to acquire other companies quickly using some of their IPO proceeds, therefore showing a higher number of mergers and acquisitions post-IPO than a control sample of public technology firms without Internet related business models. The empirical results showed that Internet firms made significantly more and larger acquisitions than non-Internet firms.

Mergers and acquisitions (M&A) as well as cooperative arrangements can be seen as external growth strategies (Lechner (2001); McCann (1991); McGee et al. (1995); Schultz and Zaman (2001); Shrader and Shelton (2001)). While some firms might have a stronger focus on M&A-activities or on cooperation arrangements, these strategies are not mutually exclusive (Lechner 2001). Firms can therefore pursue both at the same time.

¹ By entrepreneurial firms we mean new ventures that plan from the start to grow quickly and become significantly larger, in contrast to "small businesses" that remain small (Plaschka (1990)).

Shrader and Shelton (2001) conducted a study regarding the different expansion modes of new ventures. Following the traditional diversification literature (e.g. Chatterjee (1990); Chatterjee and Singh (1999); Yip (1982)), the authors examined internal development and the acquisition of other firms as two important alternative strategies for growth, and tested several hypotheses on the factors influencing the firm's choice of strategy and the performance implications. The sample was classified into two sub-groups: "acquirer" and "internal developer" with every third new venture growing through acquisitions. A logistic regression analysis showed that acquirers consistently outperformed internal developers on different performance measures. These findings strongly indicated that growth through acquisitions could be a viable strategy for young new ventures. In addition, other research has suggested that cooperative relationships also provide an important means for promoting firm growth (e.g. McGee, Dowling and Megginson (1995)).

Given that entrepreneurial firms pre-IPO are often considered to be internal developers, and the resource constraints of these young firms, we expect IPOs to have a significant impact on the investment strategies of young high-growth firms, i.e. the firms will pursue external growth strategies through acquisitions and cooperative arrangements.

Hypothesis 1. Initial Public Offerings lead to a significant increase in the propensity for young firms to engage in mergers, acquisitions, and cooperative arrangements as a source for external growth.

B. Cash-richness and acquisitions

In order to study the investment behavior and the subsequent growth of firms post-IPO, we identified from the literature a variety of characteristics as possible drivers. The most obvious characteristic of the newly listed firm is its financial profile, which is the basis for access to productive growth resources (Chatterjee (1990)). Through the inflow of the IPO proceeds, a radical improvement in the financial situation of entrepreneurial firms usually occurs (Lechner (2001); Timmons (1994)). This relative cash richness post-IPO is likely to influence both the investment behavior and growth of the firms. Due to the increased financial strength post-IPO, the realization of more capital intensive investment strategies like acquisitions becomes more feasible (Dowling and Drumm (2002)). On the other hand, the abundance of financial resources is also likely to reduce the firms' need to invest in less capital intensive growth strategies such as cooperative arrangements (Hammes (1994); Padberg (2000)).

Hypothesis 2. The greater the liquidity (cash-richness) of young firms post-IPO, the greater the propensity to make acquisitions and the less the propensity to invest in cooperative arrangements.

C. Ownership structure: Strategic partners versus financial investors

Another firm characteristic that should have an impact on the post-IPO investment strategy is the ownership structure of the firm. Regarding the possible influence of other ownership groups, Allen and Phillips (2000) found a positive relation between the firm performance and the presence of strategic partners with block holdings greater than 5%. While financial investors are primarily exit oriented and provide short-term capital for expansion, strategic partners follow a long-term cooperation strategy and allow access to a broad array of

growth resources (Das and Teng (2000); Gulati (1998); Hellmann (2002); Jarillo (1989)). Due to better resource access, we expect young IPO firms with a high number of strategic partners to show a reduced need for external growth through acquisitions. Furthermore, we predict that strategic partners have a positive effect on the future propensity of young firms to invest in cooperative arrangements in order to expand their corporate networks. We expect financial investors to have a positive influence on the IPO firm's propensity to grow externally through acquisition due to a greater interest in short-term growth rather than through quick results that would allow a value maximizing exit for these investors. Consistent with these considerations, we expect to find a negative relationship between the level of financial investor ownership post-IPO and the firm's propensity to invest in cooperative arrangements.

Hypothesis 3a. The higher the degree of ownership by strategic partners post-IPO, the less the young firm's propensity to invest in acquisitions and, the greater the young firm's propensity to invest in cooperative arrangements.

Hypothesis 3b. The higher the degree of ownership by financial investors post-IPO, the greater the young firm's propensity to invest in acquisitions, and, the less the young firm's propensity to invest in cooperative arrangements.

D. Top management experience and investment strategies

Another critical factor in a young firm's development is the experience of the top management team (TMT). By definition, an entrepreneurial firm suffers from its liability of newness (Shrader and Shelton (2001); Stinchcombe (1965)). However, current research on TMT issues showed that the experience of management team members can compensate for this disadvantage (Eisenhardt and Schoonhoven (1990); Goll, Sambharya and Tucci (2001)). Research also suggests that experienced management teams are able to handle organizational complexity better than inexperienced teams (Carpenter and Fredrickson (2001); Hambrick and Mason (1984)). Thus, management experience increases the ability of the entrepreneurial firm to engage in more M&A and cooperative arrangements. Regarding the quality of corporate investment decisions, Weinzimmer (1997) argues that management teams with functional experience in the finance area especially are better able to allocate financial resources efficiently, leading to superior firm performance. The increased ability to manage complexity should also affect a firm's propensity to acquire and cooperate. Reuber and Fischer (1997) find a positive relation between the TMT experience and the propensity to join strategic alliances. McGee et al. (1995) confirm the positive influence of TMT experience on the success of cooperative arrangements. We therefore expect the TMT's management experience, in particular financial experience, will allow for the management of more M&A's and cooperative arrangements.

Hypothesis 4. The greater the financial experience of a young firm's TMT post-IPO, the greater its propensity to invest in cooperative arrangements.

E. Strategic consistency and investment strategies

Additionally, we expect the investment strategies pre-IPO to have a positive impact on the chosen investment strategies post-IPO. In particular, those firms that have already grown

externally through acquisitions pre-IPO will continue with this strategy post-IPO. Young firms with intensive cooperative experience in the period before they went public are also likely to show a higher propensity to invest in cooperative arrangements post-IPO. These arguments are based on the research of Parnell (1994) and Kim and McIntosh (1996), who showed that strategic consistency has a positive influence on a firm's performance. The IPO allows entrepreneurial firms to pursue the same growth logic with higher intensity.

Hypothesis 5. The greater a young firm's propensity to invest in acquisitions and cooperative arrangements pre-IPO, the greater is its propensity to invest in acquisitions and cooperative arrangements post-IPO.

II. METHODOLOGY

A. The Sample

We developed a new database for this study of young high-growth firms in the Internet industry that were listed for the first time in the US, Germany, Italy, France, UK or Asia between January 1996 and December 2000. Internet firms were chosen because they were the driving force behind the "New Economy" IPO rush and a good example of firms going public very early in their life cycle. To identify individual firms for the sample, a comprehensive list of companies which conducted their IPO during this time period was compiled from various sources, including Bloomberg, Hoovers and Reuters Business Briefing databases. The firms were chosen according to five main criteria. They had to have gone public by December 31, 2000, and had to be internet firms dealing in content, commerce, context or connection (Wirtz (2000)). Their activities were limited to business to consumer interactions. In addition, only those firms with a global focus on Internet sales were selected. The final criterion was that the issue prospectus, the post-IPO annual reports and the websites had to be in English, German or Spanish. As a consequence, we have a sample with basically no industry biases (internet base business-to-consumer-business) that operate a global scale therefore also reducing possible country bias.

Consistent with recent entrepreneurship research, firms were classified as "young" if they were younger than eight years old (McCann (1991); McGee et al. (1995); Mulzer (1999)) at the time of their IPO. Furthermore, a company had to show pre-IPO compound annual growth rates of at least 30% in sales, total assets, or employees. Of our starting sample of 196 companies, 132 firms met these criteria. The sample size provided variable-to-observation ratios of 13 : 1 and 6 : 1 for our regression models, fulfilling the most conservative multiple regression requirements (Backhaus, Erichson, Plinke and Weiber (2000); McGee et al. (1995)).

Information on IPOs was obtained from the Securities Data Corporation (SDC), the NASDAQ, the Deutsche Börse AG and Reuters Business Briefing. For each IPO we collected the IPO date, total number of shares sold, offering price and first-day opening price. The company data on liquidity, ownership structure, top management team experience, operating performance and the acquisition and cooperation transactions pre-IPO were either drawn directly or via content analysis from the IPO prospectuses and the annual reports available. Acquisition and cooperation data post-IPO were derived from Bloomberg and cross-checked with the information in the annual reports. Overall, 1,013 transactions were identified in this way.

Summary statistics for our sample are provided in Table I. Median values have been highlighted due to the higher sensitivity of the mean value to outliers (Degeorge and

Zeckhauser (1993); Jain and Kini (1994)). Year t-1 is the fiscal year preceding the year in which the firm went public. The mean (median) age of the firms at IPO was 3.4 (3.3) years. The mean (median) net IPO proceeds raised by these firms is € 110.7 (€ 34.2) million.

B. Measures

We measured the variable liquidity post-IPO as the sum of a firm's cash, cash equivalents and short-term investments divided by total assets at the end of the fiscal year t=0 (IPO year). The IPO liquidity effect was calculated as a percentage by dividing the IPO net proceeds by the total assets of the fiscal year prior to IPO (t-1).

Ownership was calculated as a percentage of the number of shares held by a certain owner group post-IPO divided by the number of total shares outstanding post-IPO. The ownership data were derived directly from the IPO prospectus. Three different owner groups were used in this study. Founding and management team members were classified as "Founder and Management". Venture capitalists, business angels and other financial institutions (e.g. banks, insurance companies) were classified as "financial investors". Industrial partners and corporate venture capitalists were classified as "strategic investors" due to their long-term strategic interest in the investment (Hellmann (2002)).

We used two measures of top management team experience in our study (McGee et al. (1995)). "Overall management experience" measures the total number of years of management experience of all members of the TMT at the time of the firm's IPO, independent of any functional areas. Overall management experience should have a positive influence on both M&A and cooperative arrangement propensity. The second measure focuses on prior experience in the area of finance and was measured by the sum of years of the firm's TMT members in former finance-related management functions (e.g. CFO, vice president finance, managing director of an investment bank, partner in an accounting firm). The data on TMT experience were collected via content analysis of the TMT biographical sketches in the IPO prospectuses.

We employed M&A propensity and cooperation propensity as measures of the corporate investment strategy. Investments to achieve internal growth are considered a young firm's basic strategy, that is realized independently of other growth modes (Küting (1980); McCann (1991)). We measured a firm's propensity to acquire other companies pre- and post-IPO by dividing the number of completed M&A transactions (majority investments >50%, strategic investments >25.1%, asset purchases) pre- and post-IPO by the length of time it was private (age at IPO) and the length of time it had been public. Minority investments were considered as a form of cooperative investments which guarantees to the partner firm strategic and economic independence while strengthening the relationship (Richardson 1972). Consistently, we measured the cooperation propensity of a firm pre- and post-IPO by dividing the number of cooperative arrangements with equity investments (strategic alliances with minority investment <25.1%, joint ventures) by the firm's age at IPO and the length of time it had been public. The data on the investment strategies were collected until December 31 (2001 and for a maximum duration of three periods after going public (t+3) because these years are arguably affected by the IPO. An average measure was chosen in order to correct for different numbers of periods pre- and post-IPO depending on the firm.

We chose a firm's age at IPO and total assets in t=0 as controls for age and size effects which could influence a firm's investment strategies and performance.

C. Statistical Analyses

We tested our base Hypothesis 1 regarding the expected IPO effect on a young firm's investment behavior by using paired T-test statistics. This method allows for the comparison of one variable in pairs in order to analyze differences in the mean values between two observation points (Brosius (1998)). We compared each M&A propensity, cooperation propensity and overall deal propensity pre- and post-IPO to find significant differences in investment behavior before and after going public. Due to our sample size $N > 50$, the normal distribution requirements of the parametric T-test procedure can be neglected (Eckstein (2000)).

Two multiple regression models were used to test the remaining hypotheses simultaneously. The dependent variables in the alternative models are M&A propensity (Model 1) and cooperation propensity post-IPO (Model 2). Tests for each hypothesis were determined by the individual regression equation for each of the independent variables. All models were controlled for homoskedasticity, auto-correlation and normal distribution of residuals and multicollinearity of the independent variables to ensure that the data were appropriate for multiple regression analysis (Brosius (1998); Backhaus et al. (2000)).

III. RESULTS

A. Test of Hypothesis 1

Table II provides the key statistics from the paired T-test. Hypothesis 1 predicted that IPOs will lead to a significant change in the former investment strategies of young firms. Results of the T-test procedures regarding the differences between the investment propensities before and after going public strongly support our view that IPOs have a significant impact on a young firm's investment strategy. As the above statistics clearly show, all T-tests reveal highly significant differences in the mean values of the different investment propensities. This IPO effect becomes most obvious concerning the firms' M&A propensity, which is over four times higher post-IPO than pre-IPO. Despite the significant increase in the cooperation post-IPO, the relative importance of cooperative investments decreases. While the ratio of the mean M&A to the mean cooperation propensity pre-IPO is at 2.8, this ratio increases to 4.8 post-IPO, showing a clear rise in the importance of M&A transactions as an investment alternative post-IPO. Overall, the results from the T-test statistics support our Hypothesis 1 that IPOs lead to a significant change in the investment strategies of young firms.

B. Tests of Hypotheses 2 to 5

Table III presents the results of the multiple regression model 1 with M&A propensity post-IPO as the dependent variable. Table IV provides the regression results used to test the hypotheses regarding the factors influencing the cooperation propensity of the firms post-IPO (Model 2). Both models were significant at the 0.1% level. Results of Model 1 indicated that, as hypothesized, the M&A propensity pre-IPO was positively related to M&A propensity post-IPO (hypothesis 5). With a standardized coefficient of 0.430, M&A propensity pre-IPO had the greatest influence in our model to explain the firms' propensity to acquire after going public. In addition, as argued, the ownership degree of strategic investors was negatively related to M&A propensity post-IPO (hypothesis 3a). Contrary to Hypothesis 3b, however, the ownership degree by financial investors was also negatively related ($p < 0.05$) to the young firms' M&A propensity post-IPO. No statistically significant relationships were found regarding the remaining variables on liquidity and financial experience. Thus, there was no

support for these hypotheses. Overall, the analysis did not show any significant age, size effects or management experience effects.

The results of regression model 2 supported Hypotheses 2, 3b, 4 and 5. Thus, young firms' cash richness and the ownership degree by financial investors were negatively related to cooperation propensity post-IPO. Additionally, cooperation propensity post-IPO was positively related to the financial experience, and the cooperation propensity pre-IPO was positively related to cooperation propensity post-IPO. Surprisingly, and opposite our Hypothesis 3a, these results show a significant negative influence of the degree of ownership by strategic investors on the young firms' cooperation propensity. Again, the control variables did not have any significant influence.

IV. DISCUSSION

Overall, the results of this study support our central argument that IPOs of young high-growth firms lead to significant changes in the former investment strategies. In particular, we observed a significant increase in the firms' propensity for M&A activities post-IPO in the form of acquisitions, strategic investments and asset purchases. The significant increase in M&A activities during the three years after going public also supports the research of Schultz and Zaman (2001) that Internet firms go public to gain market shares and acquire economies of scale quickly.

Our regression analysis provided important indications regarding the factors related to the two different types of investment strategies. Firms with a high M&A propensity pre-IPO also showed a higher M&A propensity post-IPO. This positive relation might be due to important learning effects (e.g. better identification of target firms, process understanding, negotiation experience, consultancy network) from former M&A transactions that help firms to execute future M&A projects faster. As we hypothesized (H3a), strategic investors seem to have a restrictive influence on the young firms' propensity to acquire other companies. We argued that this is due to a reduced need for a young firm to grow externally because of the access to the strategic partners' resource pool. Another explanation could be the increased control rights and the long-term interest of a strategic partner that might hinder the process for a young firm's strategic investment decisions. Finally, we found no support for a relationship between liquidity and M&A propensity (H2). The confirmation of hypothesis 1 shows that the IPO has a strong impact on the intensification of external growth strategies. The relative cash-richness seems to make an additional difference for what concerns M&A-strategies. Concerning, cooperative strategies, we found only weak support (H2) for a negative relationship between a firm's liquidity position post-IPO and the cooperation propensity. We found support for our hypothesis (4) that the financial experience positively influences the young firms' propensity to invest in cooperative arrangements like strategic alliances and joint ventures. We argued that this effect is due to the greater ability of financially experienced managers to handle the resources of a young firm and to find less capital intensive investment alternatives. Hypothesis 3b was also supported, in that firms with a high number of financial investors show less propensity for cooperation post-IPO. Our argument was that financial investors are exit-oriented and more interested in short-term successes. The role of financial investors in both models is, however, intriguing. Our analysis suggests that financial investors in general put the brakes on external growth strategies, i.e. they seem to favor the internal development of the firms, i.e. firm-specific value creation. In contrary to what the literature

assumes, for this sample financial investors were less interested in fast exit than in firm-specific value creation (Shrader and Shelton 2001).

As hypothesized (H5), we found the cooperation propensity post-IPO to be positively influenced by the firms' cooperation propensity pre-IPO. Overall, we find the pre-IPO investment behavior of the firms to be the most important factor influencing the investment strategies post-IPO. This can be interpreted as young firms' positive experience of more externally oriented growth strategies and therefore partly contradicts the conventional view of young companies merely following a strategy of internal development pre-IPO. Therefore, firms remain strategically consistent but use the IPO as an accelerator of its previous growth logic even if cash-richness tempts those firms that had a cooperative propensity pre-IPO.

Some results, however, contradict the predictions of our hypotheses. In Model 2, ownership by strategic investors was negatively related to the firms' propensity to invest in cooperative arrangements post-IPO. This result may be due to the increased controlling rights and the long-term interests of strategic investors that obviously reduce the young firms' independence regarding the realization of strategic alliances and/or joint ventures.

V. CONCLUSIONS

Our results clearly demonstrate that IPO's have a significant effect on the intensity and type of investment strategy chosen by young firms. Our study contributes to the fields of entrepreneurship, strategic management and corporate finance by examining the nexus between a young firm's decision to go public and its investment behavior. Future research should focus on the identification and in-depth analysis of additional factors influencing a young firm's investment strategy at the time of the IPO and its longer-term operating performance post-IPO.

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Table I**Sample Summary Statistics**

Variable	Mean	Median	N
Age at IPO	3.4 years	3.3 years	132
Net sales t-1	€21.9m	€3.5m	131
CAGR sales Pre-IPO	768%	284%	113
Total assets t-1	€27.3m	€7.7m	131
Employees t-1	163	68	128
Liquidity t-1	€11.1m	€2.9m	131
Operating Cash Flow t-	€ (6.1m)	€ (2.8m)	129
EBIT t-1	€ (11.3m)	€ (5.1m)	131
Net profit t-1	€ (11.6m)	€ (5.0m)	131
IPO issue volume	€125.5m	€62.8m	132
IPO net proceeds	€110.7m	€54.2m	131

Table II**T-test Statistics (Hypothesis 1)**

	Overall deal propensity (N=132)		M&A propensity (N=132)		Cooperation propensity (N=132)	
	pre-IPO	post-IPO	pre-IPO	post-IPO	pre-IPO	post-IPO
Mean	0.64	2.61	0.47	2.16	0.17	0.45
Correlation r	0.532***		0.513***		0.422***	
T-value	-7.933***		-8.165***		-3.753***	

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table III

Regression Results Model 1
Factors Influencing M&A Propensity Post-IPO

N = 115	Coefficient	Standardized	T-value
1 Intercept	3.018		3.723***
2 Liquidity t=0 (H2)	-0.449	-0.055	-0.649
3 Strategic investors (H3a)	-0.040	-0.222	-2.593**
4 Financial investors (H3b)	-0.026	-0.174	-2.047**
5 Financial experience (H4)	-0.004	-0.007	-0.080
6. M&A propensity pre-IPO	1.106	0.430	4.967***
CONTROLS			
7. Management experience	-0.002	-0.016	-0.175
8 Age at IPO	-0.076	-0.047	-0.566
9 Total assets t=0	0.000	0.023	0.272
R ²	0.303***	* p < 0.1; ** p < 0.05; *** p < 0.01	
Adjusted R ²	0.244	F= 5.01***	

Table IV
Regression Results Model 2
Factors Influencing Cooperation Propensity Post-IPO

N = 115	Coefficient	Standardized	T-value
1 Intercept	0.426		1.880*
2 Liquidity t=0 (H2)	-0.301	-0.146	-1.671*
3 Strategic investors (H3a)	-0.009	-0.200	-2.260**
4 Financial investors (H3b)	-0.008	-0.195	-2.234**
5 Financial experience (H4)	0.049	0.348	3.823***
6. Coop. propensity pre-IPO	0.465	0.190	2.057**
CONTROLS			
7. Management experience	-0.002	-0.057	-0.057
8 Age at IPO	0.017	0.039	0.451
9 Total assets t=0	0.000	0.113	1.236
R ²	0.259***	* p < 0.1; ** p < 0.05; *** p < 0.01	
Adjusted R ²	0.196	F= 4,01***	