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**STRUCTURING THE IPO: EMPIRICAL
EVIDENCE ON THE PRIMARY AND
SECONDARY PORTION**

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Empirical evidence on the primary and secondary portion

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Abstract

We empirically study the determinants of the size of the primary and secondary portion in IPOs. Simultaneously, the results provide additional information on the motives for going public. The data show that financing needs underlie the primary portion. Firms use combined offerings to enhance market liquidity, whereby information gathering by institutional investors is stimulated. Pre-allocation and post-IPO data on market liquidity and seasoned equity offerings support these findings. Somewhat surprisingly, the diversification motive does not seem to drive the size of the secondary portion; however, secondary offerings show relatively higher control turnover post-IPO.

JEL classification: G32, G24

Keywords: IPO structure; primary and secondary portion; motives

1. Introduction

The source of the shares sold in an initial public offering is an important but little studied feature. Specifically, when primary, i.e., newly created, shares are offered, the IPO selling proceeds accrue to the firm. Conversely, original owners are entitled to the proceeds from selling secondary shares, i.e., shares existing before the IPO. While Jegadeesh *et al.* (1993), Spiess and Pettway (1997), and others use the nature of the shares that are sold in the IPO as an explanatory variable in their research, we are not aware of any study that explicitly examines the size of the primary and secondary portion in IPOs. A potential explanation could be that in the U.S., IPOs traditionally include a notable primary portion whereas pure secondary offerings are scarcely observed. In contrast, in Continental Europe both primary and secondary offerings have been popular over time, and even offerings that combine a primary and secondary portion occur regularly. In the sample of Belgian IPOs that we study, primary, secondary and combined offerings have been widespread, but the relative importance of offer type has varied over time.¹ In this paper, we examine the determinants of the size of the primary and secondary portion in IPOs, with a special interest in the nature of trade-off between primary and secondary shares. Simultaneously, since the deal structure provides information on the underlying motives for becoming publicly quoted, our research also contributes to the literature on why companies go public.

Pagano *et al.* (1998) consider this question using data on Italian companies. From comparing publicly listed and privately held firms during 1982-1992, they conclude that the likelihood of an IPO is positively related to the firm's size and the market-to-book ratio prevailing in the industry. Also, they find that the limited new financing raised is used to reduce leverage rather than to finance growth. Furthermore, once introduced on the exchange, IPO firms show an abnormal reduction in profitability and a high turnover of the controlling shareholder(s). Similar results are obtained by

¹ In contrast to some other countries in Continental Europe, where reporting and marketing requirements are more stringent for IPOs that include primary shares, the Belgian regulation does not distinguish between primary and secondary shares.

Rydqvist and Högholm (1995) using Swedish data for the period 1970-1991, and by Goergen (1998) using data on UK and German firms that went public during 1970-1988. Overall, these findings offer a rather pessimistic view on the role played by European stock exchanges; they suggest that the stock market is not used as a mechanism to finance growth, but rather as a way for owners to reduce their firm's risk – what Pagano *et al.* (1998) have called a rebalancing of financial structure – and to cut back on their involvement in the company.

However, in Continental Europe several changes have taken place since the sample period(s) covered by these earlier studies. Cornelli and Goldreich (1999) and Sherman (2000), for instance, document the global trend towards using the bookbuilding method for selling shares in IPOs, which reduces asymmetric information problems. Also, in the second half of the nineties, new markets, such as EASDAQ and the alliance of European growth markets Euro.NM, were set up to meet the needs of an increasing number of young and high-growth companies. Simultaneously, consolidation in more traditional sectors enlarged the financing needs of the more established firms. From these observations, it is clear that other motives for going public may have become important.

Using a sample of 95 Belgian IPOs over the period 1984-2000, we find that younger, smaller firms with substantial growth opportunities, high pre-IPO investment activity and limited internal cash flow generation issue a larger fraction of new shares relative to the number of shares pre-IPO. Whereas the overall debt ratio is not significantly related to the primary portion, the fraction of bank debt has a positive impact. Market conditions, as reflected by the stock market return and issue activity in the pre-IPO year, do not seem to affect the size of the primary portion. Overall, these results indicate that the need for additional equity is the main force determining the size of the primary portion. In contrast, owners of larger, highly profitable firms divest a larger fraction of existing shares at IPO time. The hypothesis of diversification driving the size of the secondary portion is not supported. However, control considerations and avoidance of the cost of underpricing are important determinants of the secondary portion. We find some evidence that in secondary offerings, owners try to exploit windows of opportunity. In addition, the evidence suggests that

liquidity concerns – which are important when firms want to tap the stock market in the future – induce firms to add a secondary portion to the primary portion of their offering to achieve a sufficiently large free float. These firms also pre-allocate a fraction of the offering to institutional investors, who typically help to establish market liquidity and reduce information asymmetries. Overall, while the relative importance of different offering types varies over time, we find that the underlying relations between firm characteristics and deal structure remain largely unchanged. Finally, post-IPO data on market liquidity, seasoned equity offerings and control turnover support our arguments and findings.

The remainder of the paper is organized as follows. Section 2 surveys the main reasons of why companies go public, and the ensuing preference for issuing primary and/or secondary shares. Section 3 describes the sample of 95 Belgian IPOs over the period 1984-2000. Section 4 analyzes the determinants of the size of the primary, respectively secondary portion and investigates the pre-allocation of shares to institutional investors. Section 5 provides a link between deal structure and post-IPO market liquidity, seasoned equity offerings and control turnover. Section 6 concludes the paper.

2. Literature review

The theoretical literature on going public points out various benefits of listing. These include overcoming borrowing constraints (Allen and Gale, 1999), obtaining greater bargaining power vis-a-vis banks (Rajan, 1992), achieving portfolio diversification (Pagano, 1993; Stoughton and Zechner 1998; Chemmanur and Fulghieri, 1999), imposing stock market discipline (Holmström and Tirole, 1993; Stoughton *et al.* 1999), increasing share liquidity (Amihud and Mendelson, 1986; Bolton and von Thadden, 1998), improving investor recognition (Merton, 1987) and preparing a change in control (Zingales, 1995; Mello and Parsons, 1998).

Two main motives seem to underlie the above arguments: the desire to obtain external funds and the owners' wish to divest from their firm. For instance, having sufficient investor recognition is

important when firms aim to (further) tap the stock market or when firms are in need of stock market discipline because of initial owners' reduced involvement in the company. These goals are likely reflected in the way the IPO deal is structured. An important aspect of this design is the size of the primary and secondary portion. This issue is discussed below.

2.1. Financing needs as a determinant of the primary portion

Firms may use the IPO as a vehicle to obtain additional equity. Especially companies with valuable growth prospects are likely to issue a large fraction of new shares at IPO time. These firms often are financially constrained as entrepreneurs have limited personal wealth or dislike investing more of their own resources in the firm. Also, in high-growth companies internal cash flow generation may be insufficient to finance all available investment opportunities. Simultaneously, the profile of cash flow generation may not fit debt funding. For these reasons, we expect measures of growth opportunities to be positively related to the fraction of new shares offered relative to the number of shares pre-IPO (primary portion).

Pagano *et al.* (1998) find that firms with high pre-IPO investment activity are more likely to go public to rebalance financial structure. Therefore, we expect historical capital expenditures to be positively related to the size of the primary portion. Conversely, firms that generate substantial cash flows internally have a smaller demand for external funds and hence their primary portion is likely to be smaller, *ceteris paribus*. Highly levered firms, on the other hand, may have fully used their borrowing capacity. According to Myers and Majluf's (1984) pecking order theory, these firms will then raise equity. In addition to the debt level, also the composition of the debt may matter. Rajan (1992), for example, shows that firms whose debt largely consists of bank loans can be held up by their bank. These firms may therefore include a larger primary portion in their offering to reduce bank bargaining power.

The above patterns of financing constraints before the IPO are less likely to hold for carve-outs. For the parent may have filled the subsidiary's needs or the former's reputation and assets may

have backed the latter's financial operations. However, once the carved-out subsidiary becomes listed, these links generally are cut through. Nevertheless, past financing needs still may have an impact, which suggests the need to control for the fact that a newly listed firm may be a carve-out.

In addition to filling true financing needs, firms may also try to capitalize on the optimistic perceptions in the market at IPO time (e.g., De Long *et al.*, 1990; Ritter, 1991; Rajan and Servaes, 1997). During periods of high pre-IPO market returns, firms could increase the size of the primary portion. Also, the clustering of IPOs may induce information spillovers and hence lower information problems (e.g. Booth and Chua, 1996; Bayless and Chaplinsky, 1996; Hoffmann, 2001). When firms try to exploit reduced information asymmetries during periods of high IPO volume, they are likely to include a larger primary portion in the offering, *ceteris paribus*. Hence, market conditions may not only trigger an IPO but also influence the fraction of primary shares placed in public.

2.2. The desire to divest as a determinant of the secondary portion

Owners may use the IPO as a mechanism to divest shares, either to diversify their portfolio or to prepare for a transfer of control. If so, one would expect the IPO to include a secondary portion. Although selling shares to value enhancing block holders in a private sale rather than an IPO could drive up the transaction price, the remaining owners may dislike the monitoring by these new owners (e.g., Brennan and Franks, 1997). Also, Pagano and Röell (1995) argue that large block holders may even over-monitor the firm, which is not the case when selling to more dispersed shareholders in an IPO. Simultaneously, the liquidity discount applicable to the equity of a private company can be avoided when selling secondary shares in an IPO (e.g., Brau *et al.*, 2000).

If diversification of owner wealth is an important motive in the decision to go public, owners of high-risk firms are likely to divest a sizeable fraction of the shares outstanding pre-IPO (secondary portion). Meulbroek (2000), for instance, finds that in highly volatile Internet-based firms, many owner-managers sell a portion of their shares or even exercise their stock options with the objective to sell the acquired shares and diversify their portfolio. For firms that are relatively younger, with

considerable debt or limited internal cash flow generation, the owners feel the need to diversify to a larger extent. Such owners would therefore prefer to divest a larger fraction of their own shares at IPO time, which allows them to immediately reap the diversification benefits. Conversely, when the cost of IPO underpricing is relatively large, owners may only sell gradually over time, thereby forgoing immediate diversification benefits (e.g., Gomes, 2000). Equity holders are likely to worry more about underpricing when ownership is highly concentrated and firm size is relatively large.

Preparing for a turnover in corporate control may be another motivation for selling secondary shares at IPO time. Zingales (1995) points out that going public can maximize the proceeds from a later sale of the firm. By selling off a minority stake to a widely dispersed shareholder base, owners may be able to increase the surplus they can extract from the future buyer. Mello and Parsons (1998) similarly argue that an IPO is a mechanism to implement an efficient ownership structure since it helps to reveal the market's assessment of firm value. If the transfer of control – whether immediate or remote – is an important motive in the decision to go public, we expect the more established (i.e., larger, older) firms to go public through selling secondary shares. In these companies, the firm-specific investment of the initial owners is less essential, which makes divesting existing shares at IPO time attractive. However, it is not a priori clear how this motive affects the size of the secondary portion, except that owners may also worry about the cost of underpricing. The latter is likely to be most important in a large firm with highly concentrated ownership.

The literature suggests that financial rather than real factors inspire carve-out decisions: companies carve out their most profitable subsidiaries in industries that trade at high market-to-book ratios (e.g., Michaely and Shaw, 1995; Pagano *et al.*, 1998). The impact upon the secondary portion is not unambiguous, though. On the one hand, corporate owners are likely to be less risk averse. Hence, in comparison with initial underpricing, diversification should be less of a worry. On the other hand, information asymmetries and thus underpricing costs are likely to be smaller for carve-outs.

Finally, the decision to go public may be affected by perceived windows of opportunity. When owners wish to divest, the size of the secondary portion could be positively affected by pre-IPO stock market returns. Also, during periods of reduced information asymmetries, the cost of underpricing is lower and, hence, owners may sell more of their own shares at IPO time.

2.3. The nature of trade-off between the primary and secondary portion

A closer look at IPO data reveals that these transactions are not confined to pure primary and secondary offerings. Pagano *et al.* (1998), for instance, find that 11.76% of all IPOs in their sample are combined offerings while Spiess and Pettway (1997) report 48.84% in their data set. This observation begs the question about the nature of trade-off between the size of the primary and secondary portion. In fact, companies that only issue a primary (secondary) portion have opted for a limit case in a continuum whereby the secondary (primary) portion is set equal to zero. Below, we discuss possible reasons why firms may combine a positive primary and secondary portion.

When the financing needs of the firm are the main motive for the IPO, we expect the IPO to include a primary portion, as discussed previously in section 2.1. This motivation, however, does not need to exclude a positive secondary portion. In fact, conditional upon the IPO being used as a mechanism to raise funds for the firm, there are several reasons why owners may add a secondary portion to the primary one. One reason could be that these owners simply wish to combine raising equity with diversification. Another motive to add a secondary portion could be to improve market liquidity in order to attract institutional investors and reduce the cost of capital. Institutional investors value market liquidity, as they may have to rebalance their portfolio over time.² Simultaneously, institutional investors typically reduce information asymmetries through information collection, and thereby also contribute to liquidity (e.g., Benveniste and Wilhelm, 1990; Szewczyk *et al.*, 1992; Booth and Chua, 1996; Sherman, 2000; Eckbo and Norli, 2000). However, when firms

² Also, Maug (1998) shows that market liquidity mitigates the problem that small shareholders can free ride on the monitoring efforts of large investors, inducing a positive relation between liquidity and the likelihood of monitoring.

sell primary shares to the public to finance their current investment projects, the offering may be too small to create a liquid market. One possible solution is to raise more equity than actually needed and build up financial slack. But when investors thoroughly examine firm decisions, this action may be punished by a lower stock price. Furthermore, models by Easterbrook (1984) and Jensen (1986) stress that the need to regularly tap the stock market imposes discipline on firms and improves stock prices. Therefore, a better solution may be for the firm's owners to divest some of their own shares at IPO time. Particularly, when the size of the secondary portion is relatively small, owners convey only limited negative information concerning firm quality (Leland and Pyle, 1977) or incentive problems (Jensen and Meckling, 1976). We expect this motive of establishing market liquidity to be particularly important when IPO candidates intend to offer seasoned equity in the future.

On the other hand, when the main motive for the IPO is the need of the owners to divest, we expect the IPO to include a secondary portion, as explained previously in section 2.2. However, these owners may decide to add a primary portion to the offering to dress up their firm's prospects and maximize the offer price. Teoh *et al.* (1998), for instance, find evidence that firms engage in window dressing of their accounts before going public. Another way in which owners may attempt to increase the offer price is to add primary shares. Specifically, owners may hope that investors will interpret the primary portion as a signal of favorable growth prospects. In contrast to the earlier discussed motive of creating liquidity, owners are unlikely to prefer the involvement of institutional investors under the latter hypothesis of window dressing. For institutional investors collect more information and thus are more likely to see through the owners' objectives.

The above discussion implies that we can add several testable hypotheses to those mentioned in sections 2.1. and 2.2. Given the decision to go public, if the financing needs of the company primarily affect the structuring of the IPO, we expect the size of the primary portion to be chosen to fit those financing needs. Then, a secondary portion may be added only in a second step, either to allow owners some diversification or to fit the liquidity needs of the firm's stock. Specifically, if the secondary portion is chosen to satisfy owner diversification needs, the size of the primary portion

may influence the size of the secondary portion, but the latter may also be set independently. If, on the other hand, realizing stock market liquidity is important, the size of the primary portion is likely to drive the size of the secondary one. Furthermore, owners may take measures to attract institutional investors and improve market liquidity. By contrast, if the needs of the owners dominate the structuring decision, we expect the size of the secondary portion to be chosen first; only in a second step a primary portion may be added. Hence, the size of the secondary portion is likely to drive the size of the primary one.

3. Sample

Our sample covers the period 1984-2000 and includes all new listings of Belgian firms on the three main exchanges of the country, i.e. the main market of the Brussels Stock Exchange (now Euronext Brussels), Euro.NM Belgium, and EASDAQ (NASDAQ Europe).³ Our sample does not include unit offerings nor reverse LBOs. For all companies, we obtained the issue prospectus and the consolidated financial statements over the window two years before until one, two or three years after the introduction, depending on the year of the IPO. For the post-IPO analysis, we collected additional data as indicated in Section 5.

Figure 1 reveals a concentration of new listings in the periods 1986-1987 and 1996-2000. Other studies (e.g., Pagano *et al.*, 1998; Arosio *et al.*, 2001) show that in other European countries the issue volume is also peaking during these time periods. As expected, increased IPO activity coincides with periods in which the stock market indices BASI (Euronext) and EASI (EASDAQ) are booming. Also, the relative importance of primary, secondary and combined offerings varies over time, with primary and especially combined offerings representing a relatively large fraction of IPOs in the later sampling years.

Insert Figure 1

³ This approach seems justified as firms can choose where to list and as the listing requirements are not very different.

Table 1 shows the industry distribution of the 95 sample firms.⁴ Similar to Arosio *et al.* (2001) for Italy, financial IPOs are concentrated in the earlier years of the sampling period, while high-tech flotations mainly occurred during the later years. Despite the creation of new markets, an important fraction of the high-tech firms continued to opt for the main market of Euronext. In particular, of the 29 high-tech IPOs since 1996, 14 firms (48.28%) listed on the main market, while 9 and 6 firms listed on EASDAQ, respectively Euro-NM Belgium.

Insert Table 1

Table 2 contains some summary statistics on the IPO firms. Given the length of the sampling period and the high inflation rates during the late eighties and early nineties, all absolute statistics are corrected for inflation. The number of new shares offered in the IPO relative to the number of shares pre-IPO (i.e., the primary portion) in the median firm is 10.50%. The median of the ratio of secondary shares to the number of shares pre-IPO (i.e., the secondary portion) amounts to 15%. In total, the free float amounts to 25.79% of the shares outstanding post-IPO. The average amount collected as primary funds equals €31,609,018, which is very similar to the average amount of secondary funds collected (€31,924,896). On average, 24.68% of offered shares are pre-allocated to institutional investors, but the dispersion in this variable is substantial. Pre-assigning became increasingly popular during the second half of the nineties, with the spreading use of bookbuilding. Since the beginning of 1996, about 60% of IPOs opted for the bookbuilding procedure; before that time, it was rarely used. Median underpricing, after correcting for the market return, amounts to 5.31%. This figure is rather low compared to the underpricing reported for many other countries

⁴ As in Pagano *et al.* (1998), holding companies that concentrate 75% of their assets in a single industrial company are reclassified as belonging to the corresponding industrial sector. Financial firms are kept in the sample as in Belgium, and many other European countries, these firms represent a relatively important subgroup. However, as financial firms may differ from the other sample firms, we have tested the robustness of our results by removing them from the sample. These results, which show that our conclusions are unaffected, can be obtained upon request.

(e.g., Ritter, 1991; Leleux, 1993; Arosio *et al.*, 2001), but may reflect the fact that a large majority of the sample IPOs are firm-commitment offerings (see, e.g., Jegadeesh *et al.*, 1993).

Firm age at flotation varies between zero and 283 years, with a median of 18 years. Firm size in the year preceding the IPO is also dispersed, independent of whether it is measured by total assets, book value of equity, sales or number of employees. The median firm has a return on assets of 14.52% and a return on sales of 12.06%, but profitability again differs widely across firms. Companies are highly levered: on average, 67.16% of total assets are debt-financed, and bank loans represent 42.53% of total debt. Despite high leverage, an average coverage ratio of 22.05 seems to indicate that firms can easily meet debt obligations. The median coverage ratio, however, is much lower (3.09); and some firms have a leverage ratio above one and/or a negative coverage ratio. So, it can be concluded that not all firms are financially sound at IPO time. The average market-to-book ratio, calculated using the offer price, is 3.94. In the median firm, capital expenditures in the year before the offering amount to 49.99% of property, plant and equipment, demonstrating considerable pre-IPO investment activity. The growth rate in total assets and sales in the year before the offering shows a similar picture: the median firm experiences a 28.22% increase in total assets and a 21.43% growth in sales. This trend continues during the first post-IPO year as sales grow by 18.68%.

Ownership before and after the IPO is highly concentrated. On average, there are 2.46 block holders, i.e. owners who hold at least 5% of shares; together, they own 93.31% of the firm's shares before the IPO. Afterwards, their number and stake are reduced to 1.99, respectively 64.94%. In only 16% of the cases, initial ownership decreases below 50 percent, but this does not need to imply that initial block holders lose control once listed. Similar results have been found for Italy (Pagano *et al.*, 1998), Germany (Ljungqvist, 1997; Goergen, 1998) and other European countries.

Insert Table 2

Table 3 presents separate summary statistics by IPO type (primary, secondary or combined offering). Reporting separate statistics for combined offerings may give a first indication of whether

these IPOs resemble primary or secondary offerings. Table 4 shows the p -value corresponding to a non-parametric Wilcoxon rank sum test of difference in distribution across pairwise subsamples. The tables show that 24 of the IPOs are primary whereas 34 are secondary offerings and 37 are combined. The size of the primary and secondary portion is significantly different for every offering category. Interestingly, combined offerings have both a smaller primary and secondary portion. The amount of primary and secondary funds collected also differs across categories, except for the amount of primary funds collected by primary and combined offerings. Next, although the percentage of shares placed in public is similar, the total amount of funds collected is significantly higher for combined offerings. Especially as compared to secondary offerings, primary offering firms are younger, smaller and higher levered, but they do not differ significantly from combined offerings with respect to age, size (except when measured in sales) and leverage. Also, primary IPOs generate significantly less cash flow (ROA, ROS) when compared to secondary and combined offerings and have significantly worse coverage ratios. Furthermore, combined offerings have internal cash flow generation and coverage ratios similar to those of secondary offerings. Finally, primary and combined offerings do not have significantly different growth prospects; those of secondary offerings are significantly lower, especially when considering the market-to-book ratio and the growth rate of total assets one year before the IPO.

Insert Tables 3 and 4

4. Determinants of the flotation structure

In this section, we first try to identify variables that explain the size of the primary, respectively secondary portion in IPOs. Then, a two equations system is set up to determine the nature of trade-off between both variables. Finally, we investigate the role of institutional investors in a model that explains the likelihood of involving institutional investors through pre-allocating shares. To limit the

influence of outliers, all variables are winsorized at 5-95%. Also, we have checked for multicollinearity by regressing each explanatory variable on all the others.

4.1. Determinants of the size of the primary, respectively secondary portion

Table 5 presents the results – parameter estimates and *p*-values – from OLS regressions that explain the size of the primary, respectively secondary portion of the offering. In the first column of each Panel, we report unconditional regression results (i.e., for the total sample), and in the second column we present results that explain the size of the primary, respectively secondary portion conditional upon the offering having such a portion. The latter results, therefore, should help to separate the likelihood and size aspects of the IPO structuring decision.

We start by discussing the results in Panel A, which explains the size of the primary portion. As proxies for the demand for external equity, the following historical variables are used: the market-to-book ratio as a proxy for growth opportunities; the lagged level of capital expenditures relative to property, plant and equipment as a proxy for the recent use of financial resources; EBITD/total assets as a measure of internal cash flow generation; leverage, measured as debt to total assets. The debt mix is calculated as bank loans to total debt. To control for the fact that older and larger companies generate more stable cash flows and can absorb higher leverage, firm age and company size are included. Firm age is the logarithm of the firm's age at IPO time, whereas firm size is the log of total assets. In addition, we include a dummy variable that equals one when the IPO concerns a carve-out and zero otherwise; in our sample, 20 IPOs are carve-outs. Market conditions are measured by the stock market return (BASI) in the year preceding the IPO and the number of IPOs in that year scaled by the sample size. Finally, we include industry dummy variables using the classification by Ritter (1991); the parameter estimates corresponding to these dummy variables are not reported.

The hypothesis that companies with a larger need for external equity include a larger primary portion is confirmed in the total and conditional sample. Growth opportunities and historical capital expenditures are significantly positively related to the size of the primary portion. These results

suggest that firms with attractive investment prospects and high pre-IPO investment activity go public because they require additional equity. Conversely, internal cash flow generation significantly lowers the primary portion, in line with the pecking order argument of Myers and Majluf (1984). Leverage does not significantly influence the size of the primary portion, but for a given level of leverage, firms whose debt largely consists of bank loans issue a larger fraction of new shares. This result is supportive for the arguments of Rajan (1992). When firms worry about bank information monopolies, they may tap other financing sources, such as equity, to reduce bank bargaining power.

Older companies issue a significantly lower fraction of new shares at IPO time, but conditional upon raising at least some new equity, this variable is no longer statistically significant. A potential explanation for this observation is that, as shown by the univariate statistics, primary and combined offerings include the youngest sample firms, implying too little variation in this variable for firms with a primary portion. Next, firm size is significantly negatively related to the size of the primary portion. As expected, larger firms raise a smaller fraction of new equity. Finally, the carve-out dummy variable is not significantly related to the primary portion.

Neither the stock market return nor IPO volume in the year preceding the IPO does influence the size of the primary portion.⁵ These results, however, do not provide conclusive evidence that firms are not trying to benefit from windows of opportunity: when market returns or IPO clustering are high, firms may still collect a larger amount of new equity through a higher offer price in a buoyant market. Lowry and Schwert (2001), for instance, find that price updates during the IPO

⁵ The significantly negative relation between historical IPO volume and the primary portion in the subsample of firms that offer primary shares results from combined offerings being amply represented in the later years of the sampling period, when IPO volume is relatively high. Note that Tables 3 and 4 show that combined offerings have a significantly smaller primary portion. When a dummy variable that equals one when the IPO is a combined offering is included in the conditional regression model of Table 5, Panel A, the variable historical IPO volume is no longer significant whereas the other results are unaffected. The dummy variable itself is not significant; this result indicates that differences in the primary portion of primary and combined offerings are not determined by factors other than the variables already included in the model. These results are not reported, but can be obtained from the authors upon request.

registration period are positively related to market movements during this period. However, when using the log of primary funds collected as the dependent variable, the historical stock market return and preceding IPO volume are not significant either (not reported). Our results, therefore, do not support the idea that firms try to exploit windows of opportunity when raising new equity at IPO time. A similar conclusion is reached by Eckbo and Norli (2000), who no longer find evidence of IPO underperformance following hot issue periods once firms are matched on size as well as market-to-book ratio.

Panel B presents the results on the determinants of the size of the secondary portion. In this model, the variables growth opportunities and capital expenditures are not included as they merely refer to the firm's investment opportunities.⁶ Internal cash flow generation and leverage, however, are kept in the model as these variables may be related to the firm's risk and, thus, the owners' wish to diversify. The other variables of Panel A are also retained. In addition, we include ownership concentration and the interaction between ownership concentration and firm size to control for the fact that owners may worry about the cost of underpricing, as argued in Section 2.

Owners of firms that generate substantial cash flows internally sell a significantly larger fraction of existing shares at the IPO, a result that holds across both samples.⁷ This finding contradicts the diversification hypothesis. In contrast, the positive relation between firm size and the

⁶ We have re-estimated this model after including the market-to-book ratio and pre-IPO capital expenditures, but find that these variables are not significant. These results are not reported, but can be obtained from the authors. To save on degrees of freedom, what is valuable in the simultaneous equations model, and for comparability reasons, these variables are left out in Table 5, Panel B.

⁷ When owners time the IPO by selling more shares when cash flows are unexpectedly high or even dress up their firm's financial statements before going public (e.g., Teoh *et al.*, 1998), the same positive relation might be observed. To test this argument, the variable internal cash flow generation is split up into an expected part, which is based upon the historical value of EBITD/total assets, and an unexpected or potentially manipulated part. We find that only the expected part of internal cash flow generation is significant, which rejects this timing or manipulation hypothesis. These results are not reported, but can be obtained from the authors upon request.

secondary portion may either support (cut back on firm exposure) or reject (larger firms are more stable, *ceteris paribus*) this hypothesis. Next, the variables leverage and firm age are not significant, which again does not support the diversification motive. These results, therefore, suggest that diversification is not the main consideration driving the size of the secondary portion. In line with our findings, Pagano *et al.* (1998), Goergen (1998), and others report supportive evidence for the idea that European IPOs are mainly used to reorganize ownership structure. In larger, cash generating firms, the firm-specific investment of initial owners is less essential, which might provide an impetus to rearrange ownership.⁸

The carve-out dummy variable is significantly positive, which supports the argument that carve-outs are subject to smaller information asymmetries and therefore can divest a larger fraction of existing shares at IPO time. Ownership concentration is significantly positively related to the size of the secondary portion, but only in the overall sample. This result indicates that a highly concentrated ownership structure mainly induces owners to include a secondary portion. Interestingly, we find evidence suggesting that owners worry about underpricing when selling their shares as the interaction term between ownership concentration and firm size has a significantly negative coefficient. This finding supports the arguments of Gomes (2000), Habib and Ljungqvist (2001), among others. When underpricing imposes considerable costs, owners may try to maximize their overall proceeds from divesting shares by limiting the number of shares sold at the IPO itself;

⁸ As the nature of ownership might influence our conclusions, we have also re-estimated the model using the subsample of firms where a venture capitalist is involved in the ownership structure (25 firms), respectively the subsample of firms where no such investor owns shares. Our conclusion that the diversification motive does not drive the size of the secondary portion holds in both subsamples. This result is not surprising since the venture capitalist's equity stake at IPO time is relatively small. Also, when comparing firm and IPO characteristics, we find no significant differences between both subsamples, except that ownership concentration is lower in the subsample of firms that involve a venture capitalist. A further observation is that venture capital-backed IPOs are more likely to occur following periods of hot issue activity, which is also well documented in the literature.

afterwards, as more information becomes publicly available, they may continue to sell shares gradually.

Market conditions, as reflected by the stock market return and IPO clustering in the pre-IPO year, do not seem to influence the size of the secondary portion. However, when using the log of the amount of secondary funds collected rather than the percentage of shares offered as the dependent variable (not reported), the historical stock market return is significantly positively related to the amount owners cash in from selling their shares, suggesting some window of opportunity effect after all. Interestingly, this result is driven by the secondary offerings, which suggests that especially owners who merely wish to divest shares try to exploit windows of opportunity at IPO time.

Insert Table 5

4.2. The trade-off between the primary and secondary portion: a simultaneous equations model

Section 2 considered several hypotheses concerning the nature of trade-off between the primary and secondary portion in IPOs. One possible explanation assumes that firms raising equity may add a secondary portion to the offering to achieve diversification of owner wealth. A second explanation presumes that a secondary portion is added to increase market liquidity. A last hypothesis is that owners wishing to divest add a primary portion to falsely signal growth opportunities and increase the offer price. To take the potential simultaneity of the IPO structuring decision into account, we present the results from a simultaneous equations model in Table 6. Given the explanatory variables used in Table 5, the model is identified.

The results from the equation explaining the primary portion in Table 6 are in line with those of Table 5, Panel A. Even the findings concerning the secondary portion are largely comparable. Of special interest however is the fact that the size of the primary portion is not affected by the size of the secondary portion while the reverse holds for the secondary portion. In particular, the size of the primary portion significantly negatively affects the size of the secondary portion, which indicates that

when the primary portion of the offering is already large, owners divest only a small fraction of their own shares. As such, these results do not support the false signaling nor the diversification hypothesis. For if false signaling would underlie combined offerings, the secondary portion should drive the primary one. Furthermore, similarly to Table 5 panel B, Table 6 lends no support to the diversification hypothesis. In fact, Tables 3 and 4 showed that firms launching a combined offering are quite similar to primary offering firms. Both categories of firms do not differ in terms of risk profile, except that combined offerings generate higher internal cash flows. Hence, if anything, owners in combined offering IPOs are subject to lower risk and, thus, are less in need of diversification.

Overall, Tables 5 and 6 both show that the portion of new equity raised in the IPO is determined by the needs of the firm. In particular, growth opportunities and pre-IPO investment activity positively affect the size of the primary portion. Combined offerings, however, generate more internal cash flows and, thus, their need for additional equity at IPO time could be smaller when compared to primary offerings. The negative relation between internal cash flow generation and the primary portion supports this conjecture. However, the amount of primary funds collected is not significantly different across these offering categories, as shown in Table 4. Together, these findings suggest that – given that primary and combined offerings have similar size and growth prospects – combined offerings can establish a higher offer price, which would be due to their higher pre-IPO profitability. Then, a smaller fraction of new shares needs to be issued to raise a given amount of primary funds. As internal cash flow generation is not significantly related to the log of primary funds collected (not reported), the latter argument is supported by the data. Consequently, these firms have the opportunity to add a secondary portion while keeping the percentage of shares placed in public comparable to that of primary and secondary offerings. As discussed above, the data do not support the hypothesis that diversification is an important determinant of the secondary portion. Alternatively, a larger free float has a positive impact upon market liquidity. Hence if the latter is a concern, adding a secondary portion could be beneficial. In fact the evidence in subsequent

sections lends direct support to this hypothesis. Meanwhile, to check the robustness of our conclusions, the model in Table 6 has been re-estimated on the subsample of firms that do sell primary shares at IPO time. We find that our results continue to hold, implying that in the subsample of combined offerings, the secondary portion is not driven by diversification concerns.

Finally, the introduction section mentioned that changes occurred in the IPO market during the sampling period. To distinguish between changes in the values of the independent variables, that reflect changes in the characteristics of the firms going public, versus changes in the underlying structure of the IPO market, we checked for structural breaks. Specifically, we allowed the coefficient of each variable in Table 6 to show a break at the beginning of 1996.⁹ In a first model, which consumes more degrees of freedom, all variables are allowed to change at once, whereas in a second model, the coefficient of each variable – one by one – could differ before and as of 1996. Using a Chow test, the hypotheses of identical parameter estimates could not be rejected in the equation explaining the primary portion. However, in the secondary portion equation, some of the parameter estimates turned out to be significantly different across both subperiods. After including year dummy variables, these differences disappeared without affecting the significance of the other explanatory variables. These results indicate that the relations between firm characteristics and the primary, respectively secondary portion have remained stable over time, although institutional features (e.g., bookbuilding) and the mixture of firms engaging in an IPO have changed. Section 3, for instance, showed that most financial companies in the sample listed in the earlier years while the high-tech offerings mainly have taken place in the later years. As a last check, the simultaneous regression model of Table 6 has been re-estimated using only the subsample of IPOs that listed in the second half of the nineties. The earlier conclusions prove to be robust.

Insert Table 6

⁹ Using 1995 as the dividing year results in the same classification, whereas using 1997 leads to fewer differences in parameter estimates. The results of these robustness checks are not reported, but can be obtained from the authors.

4.3. Institutional share allocation and deal structure

We now further investigate the hypothesis that securing market liquidity is an important consideration for firms that use the stock market to obtain additional funding. In Section 2, we argued that such firms would benefit most from institutional interest through a reduction in information asymmetries and an increase in liquidity. Eckbo and Norli (2000) indeed find empirical support for the idea that liquidity reduces the cost of capital of IPO firms. Hence, if market liquidity is an issue for firms using the exchange as a source of financing, we expect these firms to pre-allocate a fraction of the offered shares to institutional investors. Simultaneously, for institutional investors to be interested in the offering, it should be possible that a sufficiently deep market in the firm's shares can develop. Therefore, by placing a larger amount of equity in public (i.e., increasing the free float), firms may be able to attract institutional investors' interest.

We examine the role of institutional investors using a logit regression model. This model explains the likelihood of pre-allocating shares to institutional investors at IPO time. Table 7 presents the results. In column one, the full sample is used and the model includes a dummy variable that equals one when the offering contains a primary portion. In column two, the model is estimated using the subsample of firms with a primary portion. To test for differences between primary and combined offerings, we include a dummy variable that equals one for combined offerings. To take into account that the amount of funds placed in public is endogenously determined, the log of total funds collected is instrumented on the variables that determine the size of the primary and secondary portion.

Table 7 shows that firms floating off a larger amount of funds at IPO time are more likely to pre-allocate shares to institutional investors, *ceteris paribus*. This result seems to confirm the hypothesis that firms using the stock exchange to obtain funding may add a secondary portion to their offering to increase free float and attract professional investors, who in turn can help to establish market liquidity and reduce the cost of capital. The negative sign of the variable *firm age*, which becomes significant in column two, suggests that firms that are less likely to tap the stock

market in the future benefit less from institutional interest and may even dislike the monitoring from these professionals (e.g., Brennan and Franks, 1997). On the other hand, the preceding finding is also consistent with the argument that older firms exhibit smaller information asymmetries and therefore are less in need of institutional investors. However, the positive sign of historical IPO volume, which can be considered as a proxy for periods of reduced information asymmetries, does not confirm this asymmetric information argument. Finally, firms that do raise new equity at IPO time are significantly more likely to pre-allocate shares. Column two shows that once controlled for the underlying differences between primary and combined offerings, both offering categories are as likely to pre-allocate shares to institutional investors. Together, our results are consistent with the hypothesis that firms using the stock exchange as a source of financing find it advantageous to pre-allocate shares to institutional investors. Simultaneously, a larger free float, which ensures that a liquid market can develop, increases institutional investors' interest in the offering. The evidence on reissuing activity post-IPO in the next section lends additional support to the preceding conjectures.

As pre-allocation to institutional investors – together with bookbuilding – mainly became a practice in the second half of the nineties, the models in Table 7 have been re-estimated on the subsample of IPOs during that period to check robustness. The conclusions of Table 7 are unaffected.

Insert Table 7

5. Post-IPO characteristics

In this section, we investigate whether post-IPO data confirm preceding arguments and findings. Specifically, we examine market liquidity, seasoned equity offerings and control turnover following the IPO. A major problem we encountered is that for many firms in the sample we do not have information that extends a long period beyond the IPO. For an examination of market liquidity, the problem is limited though. Listings with a history shorter than one, respectively two years are simply

disregarded, depending upon the horizon under consideration. In line with the literature, we use a window of three, respectively five years to analyze seasoned equity offerings and takeovers. Therefore, we especially consider our findings with respect to takeovers as preliminary evidence.

5.1. Market liquidity

To test the argument that firms that (regularly) need extra external financing once listed, structure their IPO to secure a sufficiently deep market in their stock, we collected data on post-IPO market liquidity. The latter is defined as the number of shares traded during a horizon of one, respectively two years starting one month after the IPO divided by the number of shares outstanding after the IPO (see also Eckbo and Norli, 2000). The first post-IPO month is disregarded to correct for the fact that early liquidity may be affected by the adopted distribution rules.

To determine whether the presence of institutional investors influences post-IPO market liquidity, we construct a dummy variable that equals one when a fraction of the offering is pre-allocated to such investors. Total funds collected, measured as the log of the number of shares placed in public times the offer price, is also added to test whether deal size affects post-IPO market liquidity. To control for firm age and size, the log of firm age at the IPO, respectively the log of total assets post-IPO are included. As in Brennan and Subrahmanyam (1995), Chordia *et al.* (2001) and others, we control for additional factors that may impact on market liquidity: investment opportunities, a dummy that equals one when the firm lists on a market for innovative growth companies (i.e., EASDAQ or Euro.NM Belgium), a dummy that equals one when at least one market maker is appointed, the historical stock market return and our measure for hot versus cold issue markets. Again, we include industry dummy variables using Ritter's (1991) classification. Table 8 contains the results.

Pre-allocating shares to institutional investors significantly improves post-IPO market liquidity, independent of the time horizon considered. This finding confirms that institutional investors help to establish market liquidity. Furthermore, total funds collected is significantly

positively related to post-IPO market liquidity, holding constant firm size. The positive sign is consistent with the idea that firms may complement a relatively small primary issue with a secondary portion to secure a sufficient free float and hence liquidity. However, firms that are larger in terms of total assets show lower share turnover rates during the one-year window, *ceteris paribus*.

Next, we find evidence of different levels of market liquidity depending upon the exchange on which the firm lists. Hence, as pointed out by Corwin and Harris (2001), the selection of the appropriate stock market is an important consideration for IPO candidates. Appointing a market maker also significantly increases market liquidity, especially over longer horizons. The latter result is not surprising as the task of a market maker mainly consists of guaranteeing market liquidity. Historical stock market performance affects market liquidity positively. Also, there is some evidence of reduced liquidity following periods of high IPO volume (during the two-year window). Finally, a comparison of the adjusted R^2 of the models in Table 8 indicates that it is easier to explain market liquidity over the longer horizon. The reason may be that the trade of shares in the first post-IPO year still is subject to some random factors, for instance distribution rules or support activities by the investment banker.

Insert Table 8

5.2. *Seasoned equity offerings*

In this section, we investigate what firms use the stock exchange to raise additional equity once listed. Given that the latest IPOs in our sample could only be followed during a limited post-listing period, this analysis might be subject to biases if we miss seasoned equity offerings outside the observation window. However, Spiess and Pettway (1997) find that the firms in their sample quickly return to the public equity market once listed: on average, this occurs after 1.3 years (median of 1.2 years). Following Jegadeesh *et al.* (1993), Levis (1995), and Spiess and Pettway (1997), we use a

three-year horizon to investigate the likelihood of a seasoned equity offering post-IPO. In our sample, 31 firms raise additional equity within this three-year horizon.

In Table 9, we present the results from a multivariate logit model based on Garfinkel (1993) and Jegadeesh *et al.* (1993). The variables included are the market-to-book ratio, historical capital expenditures, internal cash flow generation, leverage post-IPO, firm age, firm size post-IPO, the log of primary funds collected, unexplained underpricing,¹⁰ the percentage adjustment in the offer price relative to the mid-price of the initial price range, the cumulative return on the firm's equity, respectively the stock market, both measured in the year following the IPO,¹¹ and the industry dummy variables. In line with Table 7, the model is first estimated using the full sample and includes a dummy variable that equals one when the offering contains a primary portion (column one). Thereafter, the model is estimated using the offerings with a positive primary portion and includes a dummy variable that equals one for combined offerings (column two).

The results in Table 9 show that leverage post-IPO is positively related to the likelihood of a seasoned equity offering, but only significantly so in the overall sample. Hence, consistent with the pecking order hypothesis of Myers and Majluf (1984), firms with a relatively high post-IPO debt ratio are more likely to subsequently tap the stock market. Firms raising more equity at IPO time are significantly less likely to return to the equity market during the window under study, *ceteris paribus*. Similarly, older firms are less likely to reissue equity following their IPO.

¹⁰ Unexplained underpricing is the residual of the regression of underpricing on the adjustment in the offer price, growth opportunities, firm age, firm size, a dummy variable that equals one if a high-reputation foreign investment bank is part of the underwriting committee, and the historical stock market return and IPO volume (see Garfinkel, 1993). All variables have the expected sign and are significant at the 10% level, except for firm age and size. The adjusted R² of the regression amounts to 23.20%. These results can be obtained upon request.

¹¹ If IPO firms reissue before the first year had passed, the firm and stock market return are calculated until the day before the announcement of the seasoned offering and transformed to a one-year basis. A similar procedure is adopted by Garfinkel (1993).

Next, the coefficient of the firm's cumulative return on equity post-IPO is significantly positive. This relation is also documented by Garfinkel (1993), Spiess and Pettway (1997), among others. It may support the argument that when their stock is undervalued, firms wait to reissue until the share price increases to reflect its fair value. However, it is also consistent with the market feedback hypothesis, which states that after a price run-up firms adjust upward their marginal return estimates and reissue equity to finance additional projects (e.g., Jegadeesh *et al.*, 1993; Garfinkel, 1993).

Finally, firms that include a primary portion at their IPO are significantly more likely to reissue equity. Thereby primary and combined offerings are as likely to raise new equity within the three-year post-IPO window.

Insert Table 9

5.3. *Transfer of control*

Finally, we investigate which IPO firms are taken over subsequent to listing. For this purpose, we study takeovers during a period of five years following the IPO. In view of the length of this window, the results from this section should be considered as preliminary. Within the horizon under study 12 sample firms are taken over.

Following Palepu (1986), we set up a multivariate logit model to explain the likelihood of an IPO firm being taken over within five years following its initial listing. The variables included are the market-to-book ratio, internal cash flow generation, leverage post-IPO, firm age, firm size post-IPO, and the cumulative return on the firm's equity, respectively the stock market, both measured in the year following the IPO. To this model, we add a dummy variable that equals one when the IPO is a secondary offering. The results are presented in Table 10.

Only a few variables are significant at the 10% critical level. Firms with a higher debt ratio post-IPO are significantly less likely to be taken over, which is consistent with the literature. Also, firms with a higher return on equity post-IPO are less likely to be taken over, *ceteris paribus*.

Finally, the coefficient of the secondary offering dummy variable is significantly positive. In section 2.2., we argued that the firm-specific investment of owners in these firms may be relatively small as compared to primary and combined offerings. As a result, secondary offerings can be expected to be easier takeover candidates.

Insert Table 10

6. Conclusions

This paper empirically investigates the determinants of the size of the primary and secondary portion in IPOs, using a sample of Belgian IPOs. The data show that firm characteristics differ systematically according to structure choice, not only at IPO time, but also during various post-IPO windows. The main conclusion is that the choice of deal structure reveals information on the underlying motives for going public.

Firms launching a primary or combined offering have similar motives: they wish to obtain additional equity to finance available investment opportunities and reduce bank bargaining power. Also, these are the firms that plan to reissue new shares later on. Firms selling primary shares typically are the younger and smaller ones in the sample; they show high growth and often have a need to rebalance financial structure. To improve the conditions under which seasoned equity can be raised in the aftermarket, the data show that already at IPO time these firms try to decrease information asymmetries and improve liquidity. Pre-assigning a fraction of the offering to institutional investors turns out to be helpful for this purpose. The evidence also indicates that firms, if possible, complement their primary portion with a secondary one to increase the free float. Post-IPO data lend further support to these findings: the shares of firms that include a primary portion have higher liquidity. Also, the free float has a positive impact upon market liquidity post-IPO. Finally, we find no evidence that these firms try to exploit windows of opportunity.

Next, owners of larger, highly profitable firms divest a larger fraction of their own shares at the IPO. The results show that risk diversification is not a major underlying motive for including a secondary portion in the offering. Conversely, the size of the secondary portion reveals that owners are concerned about the cost of underpricing. In addition, we find some evidence that in secondary offerings owners try to exploit windows of opportunity by selling a larger fraction of their shares when the historical stock market return is high. The data also show that secondary offering IPOs are significantly less worried about establishing market liquidity and have little interest in attracting institutional investors. Finally, there is some evidence of higher ex-post control turnover within the group of secondary offerings.

Overall, this paper shows that firms have different motives for going public and that in evaluating IPOs, both at the time of the event and during the years afterwards, it is important to take these differences into account. As we demonstrate, the choice of deal structure proves to be particularly informative for this purpose.

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Figure 1: Number of IPOs versus Stock Market Returns over the period 1984-2000

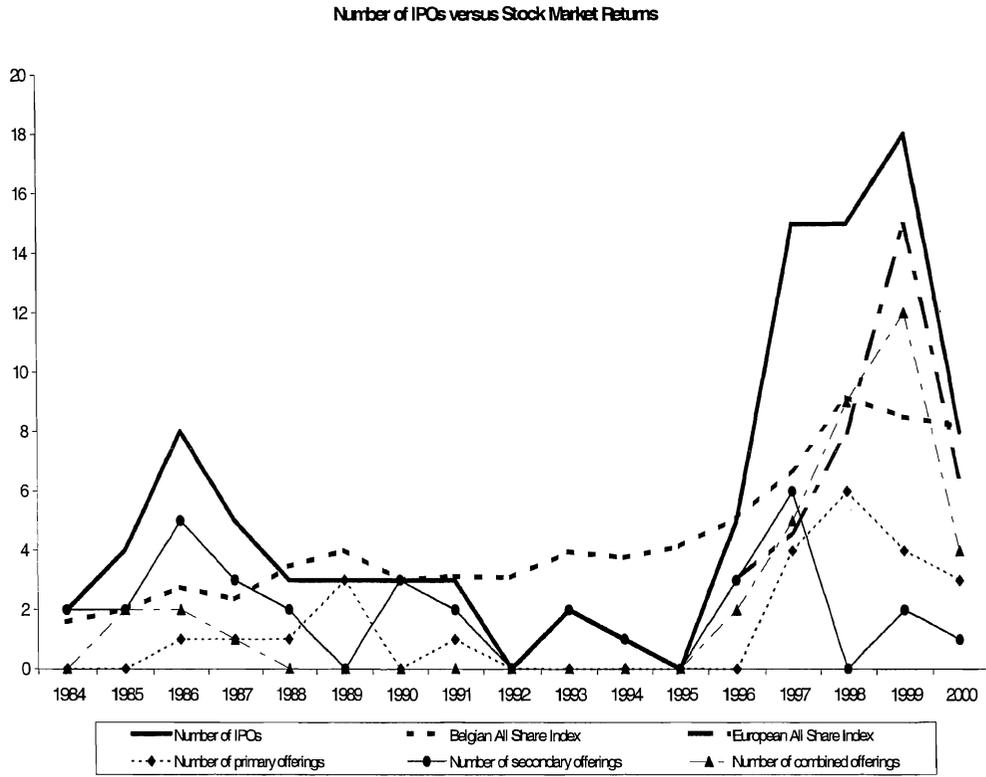


Table 1: Industry distribution of sample firms

NACE	Sector	Number of firms
16	Production and distribution of electricity, gas, steam and hot water	1 firm
22	Production and preliminary processing of metals	1 firm
24	Manufacture of non-metallic mineral products	3 firms
25	Chemical industry	4 firms
31	Manufacture of metal articles (except for mechanical, electrical and instrument engineering and vehicles)	1 firm
32	Mechanical engineering	1 firm
34	Electrical engineering	7 firms
41/42	Food, drink and tobacco industry	9 firms
43	Textile industry	2 firms
45	Footwear and clothing industry	2 firms
46	Timber and wooden furniture industry	1 firm
47	Manufacture of paper and paper products; printing and publishing	3 firms
48	Processing of rubber and plastics	3 firms
61	Wholesale distribution (except dealing in scrap and waste materials)	5 firms
64/65	Retail distribution	2 firms
66	Hotels and catering	3 firms
75	Air transport	1 firm
79	Communication	1 firm
81	Banking and finance	14 firms
82	Insurance, except for compulsory social insurance	3 firms
83	Activities auxiliary to banking and finance and insurance; business services	20 firms
84	Renting, leasing and hiring of movables	1 firm
85	Letting of real estate by the owner	2 firms
97	Recreational services and other cultural services	5 firms
TOTAL		95 FIRMS

Table 2: summary statistics for the total sample of N = 95 IPOs.

Primary (secondary) portion is the ratio of new (existing) shares sold to the public relative to shares outstanding before the IPO. Percentage of shares placed is measured as new and existing shares sold at the IPO relative to shares outstanding after the IPO. Primary (secondary) funds collected is the number of primary (secondary) shares times the offer price. Total funds collected is the sum of primary and secondary funds collected. Institutional stake is the percentage of shares sold that is pre-allocated to institutional investors. Underpricing is initial stock return minus the corresponding market return. The variables measuring firm characteristics are self contained. Number of block holders before the IPO is the number of shareholders whose ownership exceeds 5%. Number of block holders after the IPO equals the number of initial block holders that retain an ownership percentage above 5% after the IPO. Ownership concentration measures the percentage of shares that initial block holders hold before, respectively after the IPO.

Variable	Mean	Median	Std. Dev.	Min	Max
IPO TRANSACTION					
Primary portion	0.3004	0.1050	0.7790	0	6.7568
Secondary portion	0.1704	0.1500	0.1658	0	1
Percentage of shares placed	0.3080	0.2579	0.1629	0.0587	0.8711
Primary funds collected (€)	31,609,018	5,048,711	209,060,000	0	2,041,785,900
Secondary funds collected (€)	31,924,896	8,113,853	124,150,000	0	1,095,864,000
Total funds collected (€)	63,533,914	16,657,104	239,640,000	86,486	2,041,785,900
Institutional stake	0.2468	0	0.3089	0	0.9133
Underpricing	0.1395	0.0531	0.3429	-0.2153	2.7769
FIRM CHARACTERISTICS					
Age	39.4421	18	53.2401	0	283
Total assets (€)	1,348,613,382	44,407,221	9,575,200,000	422,260	92,360,483,771
Book value of equity (€)	106,708,008	11,548,860	306,170,000	-2,597,647	1,783,888,453
Sales (€)	281,596,118	44,588,670	919,420,000	0	6,194,926,469
Number of employees	1345.84	401	4276.96	1	33044
ROA (EBITD/total assets)	0.1235	0.1452	0.2103	-0.7205	1.1063
ROS (EBITD/sales)	-0.0079	0.1206	0.6423	-3.5983	1
Taxes/total assets	0.0318	0.0159	0.0565	-0.0001	0.4537
Leverage (debt/total assets)	0.6716	0.7256	0.3421	0.0319	2.8262
Bank debt/total debt	0.4253	0.4186	0.2923	0	1
Interest coverage	22.0540	3.0875	78.4790	-31.8377	461.3582
Market-to-book ratio	3.9366	1.8992	0.7403	4.8245	17.9444
Capital expenditures/PPE	0.9411	0.4999	1.5824	-0.5189	9.0636
Assets growth 1 year before IPO	0.5330	0.2822	0.7407	-0.1541	3.5668
Sales growth 1 year before IPO	5.1747	0.2143	36.2668	-0.7128	336.4444
Sales growth 1 year after IPO	0.6087	0.1868	1.3065	-0.7634	9.0503
OWNERSHIP STRUCTURE					
Numb. block holders before IPO	2.46	2	1.4718	1	7
Numb. block holders after IPO	1.99	2	1.1439	1	5
Ownership conc. before IPO	93.31	98.61	11.3780	33.43	100.00
Ownership conc. after IPO	64.94	69.10	15.9887	11.85	94.13

Table 3: summary statistics for primary, secondary and combined offerings – mean and median

Primary (secondary) portion is the ratio of new (existing) shares sold to the public relative to shares outstanding before the IPO. Percentage of shares placed is measured as new and existing shares sold at the IPO relative to shares outstanding after the IPO. Primary (secondary) funds collected is the number of primary (secondary) shares times the offer price. Total funds collected is the sum of primary and secondary funds collected. Institutional stake is the percentage of shares sold that is pre-allocated to institutional investors. Underpricing is initial stock return minus the corresponding market return. The variables measuring firm characteristics are self contained. Number of block holders before the IPO is the number of shareholders whose ownership exceeds 5%. Number of block holders after the IPO equals the number of initial block holders that retain an ownership percentage above 5% after the IPO. Ownership concentration measures the percentage of shares that initial block holders hold before, respectively after the IPO.

Variable	Primary offerings (N = 24)	Secondary offerings (N = 34)	Combined offerings (N = 37)
IPO TRANSACTION			
Primary portion	0.8714 0.3810	0 0	0.2061 0.1354
Secondary portion	0 0	0.2798 0.2500	0.1805 0.1499
Percentage of shares placed	0.3437 0.2627	0.2798 0.2500	0.3109 0.3163
Primary funds collected (€)	102,692,614 11,065,318	0 0	14,546,865 10,876,123
Secondary funds collected (€)	0 0	73,030,637 13,773,984	14,859,965 8,802,482
Total funds collected (€)	102,692,614 11,065,318	73,030,637 13,773,984	29,406,830 23,653,634
Institutional stake	0.2548 0	0.1034 0	0.3734 0.5000
Underpricing	0.0743 0.0531	0.0634 0.0378	0.2518 0.0848
FIRM CHARACTERISTICS			
Age	37.1250 10	49.4412 37	31.7568 12
Total assets (€)	339,150,279 20,550,405	3,385,768,557 79,250,338	104,069,047 32,190,883
Book value of equity (€)	80,260,671 4,671,654	217,943,996 34,971,944	20,964,959 8,554,172
Sales (€)	258,294,590 9,411,622	511,561,488 68,855,592	84,761,322 41,310,232
Number of employees	2036.90 128	1872.03 674	545.65 219
ROA (EBITD/total assets)	-0.0201 0.0365	0.1486 0.1552	0.1857 0.1594
ROS (EBITD/sales)	-0.2832 0.0525	0.0856 0.1380	0.0626 0.1309
Taxes/total assets	0.0102 0.0047	0.0306 0.0184	0.0463 0.0221
Leverage (debt/total assets)	0.7711 0.7358	0.5541 0.5999	0.7177 0.7786
Bank debt/total debt	0.4623 0.4270	0.4022 0.3810	0.4235 0.4470
Interest coverage	19.6128 1.5579	23.0920 3.7969	22.6690 3.5588
Market-to-book ratio	5.1406 2.1181	1.4433 1.1753	5.4794 2.9218
Capital expenditures/PPE	1.0370 0.5347	0.6495 0.4404	1.1675 0.6230
Assets growth 1 year before IPO	0.7319 0.3931	0.2394 0.1971	0.7114 0.4101
Sales growth 1 year before IPO	4.8023 0.2229	0.1642 0.1040	9.8247 0.3612
Sales growth 1 year after IPO	1.1088 0.3329	0.3234 0.1083	0.6062 0.3114
OWNERSHIP STRUCTURE			
Numb. block holders before IPO	2.75 2	1.9706 2	2.7297 3
Numb. block holders after IPO	2.2083 2	1.7059 1	2.1081 2
Ownership conc. before IPO	92.25 98.28	94.33 99.83	93.07 97.11
Ownership conc. after IPO	58.98 64.08	69.71 70.00	64.43 63.43

Table 4: univariate comparisons of summary statistics
(*p*-value corresponding to a non-parametric Wilcoxon rank sum test)

Primary (secondary) portion is the ratio of new (existing) shares sold to the public relative to shares outstanding before the IPO. Percentage of shares placed is measured as new and existing shares sold at the IPO relative to shares outstanding after the IPO. Primary (secondary) funds collected is the number of primary (secondary) shares times the offer price. Total funds collected is the sum of primary and secondary funds collected. Institutional stake is the percentage of shares sold that is pre-allocated to institutional investors. Underpricing is initial stock return minus the corresponding market return. The variables measuring firm characteristics are self contained. Number of block holders before the IPO is the number of shareholders whose ownership exceeds 5%. Number of block holders after the IPO equals the number of initial block holders that retain an ownership percentage above 5% after the IPO. Ownership concentration measures the percentage of shares that initial block holders hold before, respectively after the IPO.

Variable	Primary - Secondary	Primary - Combined	Combined - Secondary
IPO TRANSACTION			
Primary portion	0.0001	0.0001	0.0001
Secondary portion	0.0001	0.0001	0.0014
Percentage of shares placed	0.2974	0.9294	0.1518
Primary funds collected (€)	0.0001	0.7453	0.0001
Secondary funds collected (€)	0.0001	0.0001	0.0560
Total funds collected (€)	0.2974	0.0230	0.0822
Institutional stake	0.0741	0.1662	0.0002
Underpricing	0.9120	0.1321	0.1708
FIRM CHARACTERISTICS			
Age	0.0371	0.4827	0.0057
Total assets (€)	0.0017	0.2327	0.0030
Book value of equity (€)	0.0001	0.2770	0.0001
Sales (€)	0.0036	0.0249	0.0531
Number of employees	0.0095	0.3984	0.0012
ROA (EBITD/total assets)	0.0016	0.0001	0.5267
ROS (EBITD/sales)	0.0689	0.0552	0.9266
Taxes/total assets	0.0021	0.0102	0.8230
Leverage (debt/total assets)	0.0790	0.6428	0.0062
Bank debt/total debt	0.6197	0.8911	0.7126
Interest coverage	0.0012	0.0247	0.3257
Market-to-book ratio	0.0001	0.4701	0.0001
Capital expenditures/PPE	0.9834	0.2450	0.1781
Assets growth 1 year before IPO	0.0112	0.9036	0.0050
Sales growth 1 year before IPO	0.3441	0.2028	0.0013
Sales growth 1 year after IPO	0.3278	0.5494	0.0023
OWNERSHIP STRUCTURE			
Numb. block holders before IPO	0.0555	0.9578	0.0175
Numb. block holders after IPO	0.1209	0.8103	0.1468
Ownership conc. before IPO	0.2457	1.0000	0.2134
Ownership conc. after IPO	0.0659	0.4694	0.1391

Table 5: OLS regression results: determinants of the size of the primary, respectively secondary portion

The dependent variable in Panel A (B), i.e. primary (secondary) portion, is the ratio of new (existing) shares sold to the public relative to shares outstanding before the IPO. Growth opportunities are measured by the market-to-book ratio. Capital expenditures is the ratio of capital expenditures prior to the IPO relative to property, plant and equipment. To measure internal cash flow generation, EBITD/total assets is used. Leverage is debt to total assets. Debt mix is the ratio of bank loans to total debt. Firm age (size) is measured by the logarithm of firm age (total assets) at the IPO. The carve-out dummy is set to one when the offering is a carve-out and zero otherwise. Historical market return is the stock market return (BASI) in the year preceding the IPO, whereas historical IPO volume is the number of IPOs in the preceding year scaled by the total number of offerings in the sample. Ownership concentration measures the percentage of shares that initial block holders own before the IPO.

PANEL A: DETERMINANTS OF THE SIZE OF THE PRIMARY PORTION					
Variable	TOTAL SAMPLE		OFFERINGS WITH A PRIMARY PORTION		p-value
	Parameter estimate	p-value	Parameter estimate	p-value	
Intercept	2.6774	0.0076	4.2630	0.0070	
Growth opportunities	0.0393	0.0094	0.0320	0.0979	
Capital expenditures	0.1720	0.0364	0.2653	0.0385	
Internal cash flow generation	-1.4703	0.0001	-1.4775	0.0044	
Leverage	-0.1761	0.4118	-0.2722	0.3900	
Debt mix	0.5746	0.0145	1.0485	0.0092	
Firm age	-0.1239	0.0264	-0.0682	0.4664	
Firm size	-0.0922	0.0372	-0.1628	0.0245	
Carve-out dummy	-0.1180	0.4955	-0.0431	0.9036	
Historical market return	0.2680	0.4174	-0.0332	0.9444	
Historical IPO volume	-1.3491	0.2485	-3.2332	0.0837	
Number of observations	95		61		
Adjusted R ²	37.85%		39.30%		
PANEL B: DETERMINANTS OF THE SIZE OF THE SECONDARY PORTION					
Variable	TOTAL SAMPLE		OFFERINGS WITH A SECONDARY PORTION		p-value
	Parameter estimate	p-value	Parameter estimate	p-value	
Intercept	-0.4830	0.1502	-0.1536	0.7255	
Internal cash flow generation	0.3308	0.0002	0.2520	0.0240	
Leverage	0.0483	0.3513	0.0436	0.5640	
Firm age	0.0072	0.5573	0.0072	0.6535	
Firm size	0.0494	0.0022	0.0394	0.0462	
Carve-out dummy	0.1319	0.0017	0.0981	0.0294	
Ownership concentration	0.0064	0.0648	0.0046	0.2852	
Ownership concentration * Firm size	-0.0005	0.0007	-0.0005	0.0110	
Historical market return	0.0629	0.4312	0.0454	0.6484	
Historical IPO volume	-0.4706	0.0791	-0.4408	0.1788	
Number of observations	95		71		
Adjusted R ²	34.71%		22.23%		

Table 6: 2SLS regression results: determinants of the size of the primary, respectively secondary portion (N = 95)

The dependent variable in column one (two), i.e. primary (secondary) portion, is the ratio of new (existing) shares sold to the public relative to shares outstanding before the IPO. Growth opportunities are measured by the market-to-book ratio. Capital expenditures is the ratio of capital expenditures prior to the IPO relative to property, plant and equipment. To measure internal cash flow generation, EBITD/total assets is used. Leverage is debt to total assets. Debt mix is the ratio of bank loans to total debt. Firm age (size) is measured by the logarithm of firm age (total assets) at the IPO. The carve-out dummy is set to one when the offering is a carve-out and zero otherwise. Historical market return is the stock market return (BASI) in the year preceding the IPO, whereas historical IPO volume is the number of IPOs in the preceding year scaled by the total number of offerings in the sample. Ownership concentration measures the percentage of shares that initial block holders own before the IPO.

Variable	PRIMARY PORTION		SECONDARY PORTION	
	Parameter estimate	p-value	Parameter estimate	p-value
Intercept	2.6686	0.0088	0.0707	0.8668
Growth opportunities	0.0394	0.0102	0	
Capital expenditures	0.1724	0.0378	0	
Internal cash flow generation	-1.4837	0.0007	0.1344	0.2326
Leverage	-0.1760	0.4151	0.0326	0.5275
Debt mix	0.5739	0.0154	0	
Firm age	-0.1245	0.0289	-0.0132	0.4284
Firm size	-0.0933	0.0385	0.0322	0.0747
Carve-out dummy	-0.1255	0.5500	0.1144	0.0067
Ownership concentration	0		0.0051	0.1470
Ownership concentration * Firm size	0		-0.0005	0.0023
Historical market return	0.2712	0.4202	0.0881	0.2808
Historical IPO volume	-1.3400	0.2583	-0.5816	0.0340
Primary portion	0		-0.1318	0.0187
Secondary portion	0.0576	0.9493	0	
Adjusted R ²	37.04%		34.22%	

Table 7: logit regression results: determinants of the likelihood of an institutional stake

The dependent variable institutional portion dummy equals one when a fraction of the shares sold is pre-allocated to institutional investors and zero otherwise. Growth opportunities are measured by the market-to-book ratio. Capital expenditures is the ratio of capital expenditures prior to the IPO relative to property, plant and equipment. To measure internal cash flow generation, EBITD/total assets is used. Leverage is debt to total assets. Total funds collected is the log of the total number of shares placed in public times the offer price. To take the endogenous nature of total funds collected into account, this variable is instrumented on the variables that determine the size of the primary and secondary portion. Firm age (size) is measured by the logarithm of firm age (total assets) at the IPO. The carve-out dummy is set to one when the offering is a carve-out and zero otherwise. Historical market return is the stock market return (BASI) in the year preceding the IPO, whereas historical IPO volume is the number of IPOs in the preceding year scaled by the total number of offerings in the sample. In column one, the model is estimated using the full sample and a dummy variable that equals one when the offering contains a primary portion is added. In column two, the model is estimated using the offerings with a primary portion and a dummy variable that equals one when the offering is a combined offering is added.

Variable	TOTAL SAMPLE		OFFERINGS WITH A PRIMARY PORTION	
	Parameter estimate	p-value	Parameter estimate	p-value
Intercept	-31.8021	0.0042	-37.3885	0.0249
Growth opportunities	0.0100	0.9000	-0.0490	0.6568
Capital expenditures	-0.4335	0.2944	-0.9814	0.1703
Internal cash flow generation	0.5195	0.7874	0.4097	0.8792
Leverage	-0.3142	0.7836	1.0086	0.5705
Total funds collected (log) - instrumented	1.8311	0.0089	2.2898	0.0373
Firm age	-0.0475	0.8820	-1.0316	0.0641
Firm size	-0.3340	0.1972	-0.3307	0.3422
Carve-out dummy	-0.7326	0.4238	0.5889	0.7097
Historical market return	0.4038	0.8060	-3.2556	0.2127
Historical IPO volume	13.2244	0.0454	20.4110	0.0276
Primary portion dummy	1.7649	0.0537		
Combined offering dummy			0.4563	0.6891
Number of observations	95		71	
Log-likelihood	-37.6545		-20.4805	
AIC	107.3090		72.9610	
Pseudo-R ²	56.50%		66.27%	

Table 8: OLS regression results: determinants of one- and two-year post-IPO market liquidity

The dependent variable one- (two-) year market liquidity in column one (two) is the number of shares traded over a window of one (two) year(s) following the IPO divided by the number of shares outstanding post-IPO. The institutional portion dummy equals one when a fraction of the shares sold is pre-allocated to institutional investors and zero otherwise. Total funds collected is the log of the total number of shares placed in public times the offer price. Growth opportunities are measured by the market-to-book ratio. Capital expenditures is the ratio of capital expenditures prior to the IPO relative to property, plant and equipment. Firm age (size) is measured by the logarithm of firm age at the IPO (total assets post-IPO). Market is equal to one if the firm lists on a market for innovative growth firms and zero otherwise. Market maker equals one if at least one market maker is appointed and is zero otherwise. Historical market return is the stock market return (BASI) in the year preceding the IPO, whereas historical IPO volume is the number of IPOs in the preceding year scaled by the total number of offerings in the sample.

Variable	ONE-YEAR MARKET LIQUIDITY		TWO-YEAR MARKET LIQUIDITY	
	Parameter estimate	<i>p</i> -value	Parameter estimate	<i>p</i> -value
Intercept	0.0410	0.9335	-0.4417	0.1208
Institutional portion dummy	0.1488	0.0894	0.1145	0.0291
Total funds collected (log)	0.0744	0.0200	0.0413	0.0181
Growth opportunities	0.0019	0.8450	-0.0003	0.9545
Capital expenditures	-0.0411	0.2993	-0.0080	0.7057
Firm age	-0.0293	0.3106	0.0119	0.4605
Firm size post-IPO	-0.0564	0.0112	-0.0125	0.2974
Market	0.2797	0.0269	0.2069	0.0042
Market maker	0.0552	0.5082	0.0955	0.0533
Historical market return	0.4927	0.0036	0.2038	0.0366
Historical IPO volume	-0.7328	0.2705	-1.3337	0.0004
Number of observations	92		77	
Adjusted R ²	37.67%		52.02%	

Table 9: logit regression results: determinants of the likelihood of a seasoned equity offering within three years following the IPO

The dependent variable seasoned equity offering dummy equals one when the firm issues seasoned equity within three years following the IPO and zero otherwise. Growth opportunities are measured by the market-to-book ratio. Capital expenditures is the ratio of capital expenditures prior to the IPO relative to property, plant and equipment. To measure internal cash flow generation, EBITD/total assets is used. Leverage is debt to total assets, measured post-IPO. Firm age (size) is measured by the logarithm of firm age (total assets post-IPO). Primary funds collected is the log of the number of primary shares times the offer price. Unexplained underpricing is the residual of the regression of underpricing on the adjustment in the offer price, market-to-book ratio, firm age, firm size, a dummy that equals one if a high-reputation foreign investment bank is part of the underwriting committee, the historical market return and the measure for hot versus cold issue markets. Percentage adjustment in the offer price is measured relative to the mid-price of the initial price range. The cumulative return on the firm's equity, respectively the stock market are both measured in the year following the IPO. In column one, the model is estimated using the full sample and a dummy variable that equals one when the offering contains a primary portion is added. In column two, the model is estimated using the offerings with a primary portion and a dummy variable that equals one when the offering is a combined offering is added.

Variable	TOTAL SAMPLE		OFFERINGS WITH A PRIMARY PORTION	
	Parameter estimate	p-value	Parameter estimate	p-value
Intercept	-2.1242	0.6426	5.5131	0.4178
Growth opportunities	0.0286	0.7272	-0.0502	0.6458
Capital expenditures	-0.3976	0.3355	-0.8376	0.2362
Internal cash flow generation	0.4222	0.7857	-0.6499	0.7602
Leverage post-IPO	2.7564	0.0582	2.5428	0.2894
Firm age	-0.4291	0.1396	-1.0830	0.0709
Firm size post-IPO	-0.0546	0.7430	-0.1731	0.4620
Primary funds collected (log)	-1.6085	0.0276	-2.5544	0.0303
Unexplained underpricing	0.9909	0.5460	-0.4955	0.8098
%Adjustment in offer price	-2.4950	0.4863	-6.3394	0.1979
Firm return on equity post-IPO	1.5213	0.0142	2.0421	0.0168
Market return post-IPO	0.6574	0.6869	0.9509	0.6691
Primary portion dummy	2.5348	0.0064		
Combined offering dummy			1.2565	0.2039
Number of observations	95		71	
Log-likelihood	-37.4290		-22.9815	
AIC	108.8580		79.9630	
Pseudo-R ²	34.89%		42.59%	

Table 10: logit regression results: determinants of the likelihood of a takeover within five years following the IPO

The dependent variable takeover dummy equals one when the firm is taken over within five years following its IPO and zero otherwise. Growth opportunities are measured by the market-to-book ratio. To measure internal cash flow generation, EBITD/total assets is used. Leverage is debt to total assets, measured post-IPO. Firm age (size) is measured by the logarithm of firm age (total assets post-IPO). The cumulative return on the firm's equity, respectively the stock market are both measured in the year following the IPO. Finally, a dummy variable that equals one when the offering is a secondary one is added.

Variable	Parameter estimate	p-value
Intercept	-8.4254	0.1123
Growth opportunities	-0.0399	0.8032
Internal cash flow generation	-1.3138	0.6303
Leverage post-IPO	-2.5515	0.0922
Firm age	0.1320	0.6189
Firm size post-IPO	0.3022	0.1514
Firm return on equity post-IPO	-2.2675	0.0880
Market return post-IPO	1.1907	0.6028
Secondary offering dummy	1.7743	0.0742
Number of observations	95	
Log-likelihood	-25.5955	
AIC	69.191	
Pseudo-R ²	23.71%	