

Euro.NM and the Financing of European Innovative Firms

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Abstract

Since its creation in 1997, more than 400 European firms have been listed on Euro.NM, the circuit of stock exchanges targeted at the financing of innovative firms in high-tech industries. We collect a unique database from the listing prospectuses and annual reports of these firms. We characterize their ownership and financial structures, and their economic activity. We show the existence of significative heterogeneity across firms and across the national segment of the Euro.NM circuit. Such differences persist also when we study the relationship between venture capital and the going-public process. We conclude that Euro.NM is far from providing a pan-European stock market for innovative, high-growth companies.

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The ability to encourage and sustain innovation is the one of the main sources of economic growth. In the last decade, the increasingly rapid pace of innovation has substantially contributed to the strong competitiveness of the U.S. economy. Many economists, business leaders, and policy-makers have pointed to the role of the stock market and of venture capital as key elements of the U.S. success (see for example Black and Gilson (1998)). Michelacci and Suarez (2000) offer an elegant formalization of the link between business creation and the stock market, and emphasize the complementary role of stock exchanges and venture capital. In this view, venture capital is not simply a source of finance, but also an institution able to select and support valiant entrepreneurs and promising projects. Europe is often considered as a polar case to that of the U.S., with its immature venture capital industry and its stock exchanges hostile to innovative firms with high growth potential but a short history (see European Commission (1994, 1998)). Pagano, Röell, and Zechner (1999), for instance, find that American stock exchanges attract many more listings from firms already listed abroad than European stock exchanges.

The opening of a European circuit of stock exchanges aimed at attracting innovative companies in high-growth industries is dramatically changing the picture. The circuit has been named Euro.NM, where NM stands for 'new markets' for equity capital. Euro.NM opened in 1997, when Frankfurt's *Neuer Markt* and the Euro.NM markets of Bruxelles and Amsterdam started their activity and joined Paris' *Nouveau Marché*, which had opened in 1996. In 1999 Milan's *Nuovo Mercato* completed the circuit. Since its inception to February 2000 the Euro.NM circuit has allowed 368 firms to list and raise 14 billion euros. At the same time the flow of money from venture capital funds into European firms has mushroomed, reaching 25 billion euros in 1999—a fivefold increase over the early 1990s.

In this paper, we provide the first comprehensive analysis, to the best of our knowledge, of the effects of the opening of Euro.NM on the financing of European innovative start-ups. We start from the consideration that innovative, entrepreneurial firms are typically credit constrained. They do not possess collateralizable assets, since they mainly rely on intangibles. They do not have an ability to self-finance themselves, since they often need years of costly research and development before becoming able to generate significant revenues. Nor are they able to bank on their reputation, being young and not yet established. Even when they can access bank credit, entrepreneurial start-ups end up paying extremely high interest rates. Hence financing constraints constitute a powerful barrier to entrepreneurship.

The possibility to raise risk capital directly from the stock market may then offer a viable solution to the problem. Firms which manage to convince investors of possessing a substantial growth potential may raise equity finance and thus overcome credit constraints

or obtain finance more cheaply than through the credit channel.

We focus our analysis on the effects of the opening of the Euro.NM circuit on the financing of innovative firms, and on the role of venture capitalists in financing firms listed on Euro.NM. We ask four questions: (1) How do these firms use the proceeds they raise from selling equity to the public? (2) What determines the likelihood of receiving venture capital financing? (3) Do venture-backed firms behave differently from other firms? (4) How does listing affect firms' ownership structure?

Our results are quite surprising. We start by documenting a significant heterogeneity among firms listed on the different branches of the Euro.NM circuit—in particular between those listed on the two largest markets, the Nouveau Marché and the *Neuer Markt*. More mature and technologically less innovative industries are more represented on the French market, while 80% of the firms listed on the German market belong to only five high-tech industries. Firms listed on the German market are smaller, younger, and less leveraged. The role of venture capital financing also differs between the two markets. Among the firms listed on the German market, those which export more—which we take as proxy for being outward oriented and strategically aggressive—increase their likelihood of receiving venture capital. On the contrary, the presence of a venture capitalists does not seem to affect the financial structure of French firms. For these, venture capital influences the most important strategic decision: when to get listed.

The remainder of the study is as follows. Section 1 relates our analysis to the existing literature on the going-public decision by innovative firms and on how venture capital affects the behavior of innovative start-ups which eventually get listed. Section 2 describes the Euro.NM circuit of stock exchanges, and discusses our dataset. Section 3 presents our results, and Section 4 concludes.

1 Innovative companies, venture capital, and the decision to go public

There are two strands of literature which our study relates to. The first concerns the decision to go public by innovative, entrepreneurial firms, the second the effect of venture capital financing on firms' strategic choices.

The going-public process is a crucial issue in corporate finance. The ability to raise money directly from the market represents an important opportunity for a firm, and the consequences of opening up its ownership to dispersed shareholders are manifold. The

interest of financial economists in the process of Initial Public Offering (IPO) and on its causes and consequences has greatly developed only over the last decade, following the increasing relevance of IPOs. The wave of privatizations started during the 1980s in the UK has continued through the 1990s, turning public many large companies. Over the 1990s several factors have favored an increase of the number of listed firms in most countries.

At the same time, the success of the Nasdaq in the U.S. has made equity financing possible to many innovative start-ups.

Despite its empirical relevance, relatively little theoretical research has explored the economics of the going-public process. The existing papers focus on the costs and benefits of an IPO from the perspective of controlling shareholders.¹

One approach is based on the incompleteness of contracts and its consequences on corporate control. For instance, Zingales (1995) justifies IPOs on the ground that they raise the bargaining power of incumbent managers *vis-à-vis* potential investors when the former derive private benefits from control over the company. If specific investments are important to make a firm competitive, then an IPO may play a beneficial function, by protecting managerial discretion and enhancing incentives. Bolton and von Thadden (1998) stress instead the trade-off between portfolio diversification and ownership dispersion caused by an IPO.

An alternative approach is based on the effects of the disclosure of information to the markets. Chemmanur and Fulghieri (1999), for instance, ask at what stage of its life should a company go public. The optimal timing is determined as the result of a trade-off between selling to a risk-averse investor—thus paying a risk premium—or to the public—duplicating the cost of producing information but gathering more of it. They predict that firms in high-tech industries should go public at a relatively later stage since information about them is more costly to organize than for firms in more mature industries. Pagano and Röell (1998) examine the effects of IPOs on product markets, considering the effects on managerial incentives and product markets spillovers of the decision to go public.

Only recently the peculiar features of the going-public decision by fast-growing, innovative start-ups have been taken into account. Allen and Gale (1999) focus on the extreme uncertainty that characterizes such firms, which is reflected by a substantial diversity of opinions about firms' financial prospects. Such diversity is typical in economies where the rapid pace of technological progress makes it difficult to form a consensus on which technology, standard, or strategic approach will eventually succeed. Since in a market there

¹For a survey see Röell (1996).

are indeed always some investors willing to finance (risky) innovative firms, a bank takes a single view on the future of an industry, and will attract only the deposits of those savers who agree with it. As a result, in bank based economies, some firms will experience credit rationing, making markets more effective at financing innovative firms in such a scenario.²

Subrahmanyam and Titman (1999) consider how the costs and benefits of gathering information affect firms' decision to go public. They show that when investors can gather information which is useful for taking strategic decisions at a sufficiently low cost, firms have an incentive to go public since they can use information conveyed by the stock price to take strategic decisions. IPOs thus give rise to a positive externality, since the size of the stock market lowers the cost of gathering information, in a fashion similar to the model of Pagano (1993).

Maksimovic and Pichler (2000) study instead the costs of information disclosure. An IPO is costly for an entrepreneurial firm since it implies releasing to the market strategic information which may benefit rivals. On the other hand, an IPO may provide enough financial muscle to accelerate investments and expand market share quickly enough to establish itself as market leader. This trade-off, which depends on the features of both the financial and product markets, determines if and when an entrepreneurial firm will choose to go public.

These papers show that the possibility to tap equity markets may greatly enhance the growth prospects of entrepreneurial firms in technological industries, and identify the informational and technological features which should affect the going-public decision. On the empirical side few studies have dealt with the determinants of IPOs and with the consequences of going-public on firm behavior. The most notable exception is Pagano, Panetta and Zingales (1998). They find that Italian companies which went public in the 1980s did so more to raise cheap equity finance and to rebalance their capital structure after a period of intense growth than to finance future growth. Blass and Yafeh (2000) look more closely at the IPO decisions of (Israeli and Dutch) high-tech firms, and find that the costs of listing on Nasdaq are more than offset by its benefits, which consist of publicity and a ramp to US product markets.

Many of the entrepreneurial firms which go public rely on venture capital financing in the initial stages of their life. It is then natural to ask what effects the backing of venture capital may have on both the decision to go public and the strategy of venture-backed firms

²A literature has developed on how information disclosure affects the ability of banks and markets to finance new technologies, see Bhattacharya and Chiesa (1995) and Yosha (1995), and Thakor (1996) for a survey.

which get listed. An empirical literature on these issues has been developing.

Lerner (1994) analyzes how venture capital affects firms' going-public decisions, showing that venture capitalists take firms public when equity valuations are at their peaks. Gompers (1996) shows that young venture capitalists take companies public earlier and at lower prices than established venture capitalists in order to establish a reputation and successfully raise capital for new funds. Megginson and Weiss (1991) show that venture-backed firms experience a lower underpricing than other firms, a result confirmed by Brav and Gompers (1997).

A different, and more recent, strand of this literature looks at the effect of venture capital financing on firms' product market strategy. Kortum and Lerner (1998) find that venture capital has been particularly successful in the U.S. in sustaining the innovation rate of start-ups. Hellmann and Puri (2000a,b) use survey data on Silicon Valley start-ups to explore differences in the strategy of (public and private) firms which receive or not venture capital financing. They find that innovator firms are more likely to attract venture capital, and that venture-backed firms are faster to bring their products to the market, especially if they are innovators. Moreover, they find that venture-backed firms replace their founders as CEOs more often and more quickly than other start-ups, especially when they are experiencing difficult times.

The opening in Europe of new stock exchanges targeted at firms with high-growth potential in high-tech, innovative sectors thus creates a new and unexplored topic to study. Our study offers the first comprehensive analysis of the effects of the opening of the Euro.NM circuit, and contributes both to the literature on the going-public decision of innovative, entrepreneurial firms and to the literature on the effects of venture capital financing on firm strategy.

We focus on three key issues. The first is whether the opening of stock exchanges targeted at innovative, entrepreneurial firms creates a new financing channel able to overcome credit constraints. The second is whether venture capital plays a role in bringing innovative companies to the stock market, and in affecting their behavior. The third issue is how do IPOs affect the evolution of the ownership structure of technological firms.

Two recent studies are closely related to our own, since they look at the effect of the opening of the *Neuer Markt* on the going-public process. Kukies (2000) asks whether the adoption of tight disclosure requirements affects the going-public decision. In a cross section of 42 countries, he finds a positive correlation between the opening of tight-disclosure markets, such as the *Neuer Markt*, and the number of IPOs. He then uses data from the listing prospectuses and from the *Hoppenstedt* database of German industrial firms to study

whether listing requirements have an effect on the decision of innovative, R&D intensive, firms to go public. He finds a positive correlation, but without identifying a clear causal relationship effect. Fischer (2000) develops a prospectus-based database of firms gone public on the *Neuer Markt* and analyzes the determinants of their IPOs using a control sample from the *Hoppenstedt* database. He finds that firms go public on the *Neuer Markt* after having invested heavily in R&D and capital equipment. He then analyzes the post-IPO evolution of ownership, finding that entrepreneurs and venture capitalist retain control after the company has gone public—and even strengthen their relative power on the board.

Our study differs from these two in a number of respects. First, none of these studies uses *ex post* information on firms, while we collect information not only from prospectuses but also from firms' annual reports for all years after the IPO. This gives us the ability to check how the going-public process affects firms' strategies. Second, we provide the first comprehensive study of the Euro.NM circuit, including in our sample IPOs from four of the five exchanges members of the circuit. This allows us to draw more general conclusions on the effects of the opening of Euro.NM, and also to detect intriguing differences across its national components. Third, we choose not to study the determinants of Euro.NM IPOs based on available databases of European manufacturing firms, because we do not consider them representative of the type of firms which could aim at a listing on Euro.NM. For example, the *Hoppenstedt* database is strongly biased towards large and established firms, not certainly the type which would potentially list on Euro.NM. We are currently in the process of identifying a reliable control sample which we plan to use in an extension of this paper.

2 The Euro.NM Circuit

The Euro.NM (<http://www.euronm.com>) circuit of stock exchanges targeted at 'young, innovative companies with high-growth potential' was created in April 1997 with the opening of three new markets at the stock exchanges of Frankfurt (*Neuer Markt*), Bruxelles (Euro.NM Bruxelles) and Amsterdam (Euro.NM Amsterdam), which joined the Nouveau Marché of the Paris Bourse, open since March 1996. In June 1999 the Nuovo Mercato of the Milan Borsa completed the ranks of the circuit. While each market is regulated by the local stock exchange, coordination among the circuit members has ensured a rather homogeneous regulatory framework. Table 1 summarizes the main regulations for each of the five markets.

These rules are quite different from those of traditional stock exchanges, and are devised

so as to allow listing by firms which have good growth prospects, but are not yet established: An age of at least three years is required but each stock exchange has the discretionary power to admit younger firms if their profitability prospects are good enough. Moreover, no minimum size—measured by assets—is required, nor a proven track record in terms of revenues or profits. At least one sponsor (or market maker), which must be a regulated investment banker, must introduce the firm to the market, guiding it through the admission process. At least a fifth of the shareholders capital must be floated at IPO, and at least half of it must consist of newly issued shares, so as to ensure that the IPO is not a 'sell-off' by the owners but effectively contributes to financing the company. Moreover, a lock-in rule bars incumbent shareholders to sell shares after the IPO for a period of at least six months. In order to ensure liquidity, firms listed on Euro.NM are required to issue equity worth at least 5 million euro. Since the minimum pre-IPO shareholders' equity must at least reach 1.5 million euro, it means that companies are expected to substantially raise their equity base by going-public.

Table 1 also shows that the *Neuer Markt* has somewhat more stringent rules than the other markets, since it requires not only publications of a detailed listing prospectus, but also mandates it to be in English, and requires publication of quarterly reports and an annual conference with financial analysts. To Euro.NM has more than 400 companies listed in June 2000, which have raised more than 22 billion euros through their IPOs. Most of the companies listed in each market are domestic, though a few cross-border listings have also occurred, as shown in Table 2, which gives summary statistics for the circuit.

3 The Dataset

We develop a unique database which consists of information from firms' listing prospectuses relative to the IPOs which took place until February 2000. We obtained the listing prospectuses in several ways. For companies listed on the Nouveau Marché and of the *Neuer Markt* we downloaded the prospectus from the web site of the exchange or of the company.³ We then contacted by phone, fax, and e-mail all the companies whose prospectus was not available in electronic form. For the firms listed on the Amsterdam Euro.NM we obtained the prospectuses by directly contacting the companies, and for the firms listed on the Nuovo Mercato we photocopied the prospectus at the Milan Stock Exchange. Overall, we collected

³The prospectuses of 30 companies listed on the Nouveau Marché were photocopied at the COB (Commission des Opérations de Bourse).

315 prospectuses out of 335 IPOs which took place in the sample period. With the same procedure we used for prospectuses, we also obtained from most firms their annual reports for the years following the IPO. Despite our efforts, we have been able to obtain only one prospectus from firms listed on Euro.NM Bruxelles, hence we decided to (temporarily) drop this market from the sample until we obtain most of them.⁴

For each prospectus we codified many variables. They relate to a firm's financial performance, its ownership and financial structure, and its sectoral specialization. We also codified data on firms' intellectual property strategy, as reflected in such measures as reliance on patents, licenses, and trademarks, or the number of patent applications, and on pre- and post-IPO product market strategy, as reflected in the business lines and products before and after the IPO, or the share of foreign sales. We intended to use these variables to characterize each firm's strategy and relate it to the going-public decision. However, the nature of the data makes it difficult to use them sensibly for at least three reasons. First, patent applications take about 18 months to be released by the European Patent Office, so we are only starting to get patent data for the post-IPO period. Second, while the pre-IPO strategy is reasonably well illustrated in the listing prospectus, the post-IPO strategy—which would be of crucial interest to us—cannot be meaningfully derived from the annual reports. Third, we lack homogeneity of data for crucial variables like R&D intensity: Some companies report the R&D employment, while others report R&D expenditure, but no company reports both measures and many do not report either. Therefore we conclude that we should augment our database with a survey which we hope to be able to implement in the near future. Finally, we also codified each company's history and the evolution of its ownership structure, in particular in relation to the presence of venture capitalists.

The variables we are going to use in our analysis are the following:

SAMPLE AGE is the age of the firm (in months) at the time of sampling (June 2000) measured from the date of birth of the firm. We employ as a firm's relevant date the birth not its date of incorporation, but the earliest date recorded in the financial prospectus which shows evidence of business activity.

AGEIPO is the age of a firm measured from its date of birth to the date of its listing on the stock market.

TIME-TO-LISTING (TTL) is the time elapsed from the opening of the segment of the Euro.NM circuit on which a firm is listed to its IPO. Hence, two firms born in the same

⁴A move to new headquarters by the Bruxelles Stock Exchange has vanished our efforts to obtain copies of the prospectuses by photocopying them directly there. We plan to do in the near future.

months but listed in different markets have two different TTL. Since all the firms in our sample go public, the strategic decision we study is not about whether going public, but when to do so.

VC is a dummy variable that takes the value 1 if a firm has received venture Capital financing, and 0 otherwise. When the prospectus does not specify the identity of founders and other shareholders which financed the firm prior to the IPO we contacted the firm's investor relations department to obtain such information. In case of doubt on the identity of venture capital firms, we consulted the directories of the European Venture Capital Association and of national venture capital associations.

BIOTECHNOLOGY, FINANCIAL SERVICES, INDUSTRIALS, INTERNET, IT SERVICES, MANUFACTURING, MEDIA & ENTERTAINMENT, MEDTECH, SERVICES, SOFTWARE, TECHNOLOGY, TELECOMMUNICATIONS, and TRADE are all dummy variables which take the value 1 if the firm is the related industry respectively; 0 otherwise. The division by sector has been attributed to each firm by the *Neuer Markt* for the firms listed on that market. For the Neuvieu Marché we have mapped the APE/NAF Code to the sector division of the Neuvieu Market.

VC is a dummy tha takes the value 1 if a firm has receveid venture capital; 0 otherwise. We have identified these two classes of firms from their prospectuses and by directly interviewing the firms when necessary.

The suffix (IPO) indicates that a variable is measured at the date of the IPO.

ASSETS is current total asset.

DEBT is the sum of commercial and financial debt.

DEBT to BANKS is (short- and long-term) debt vis-à-vis banks.

EQUITY is total shareholder equity.

EBIT is earning before interest and taxes.

CAPEX is capital expenditure, i.e. investment in tangible and intangible fixed assets.

ROA is EBIT over ASSETS.

D/A is DEBT divided by ASSET.

E/A is EQUITY divided by ASSET.

D/E id DEBT divided by EQUITY.

4 Euro.NM and the Financing of European Innovative Firms

The opening of the Euro.NM circuit has allowed several hundred European companies to access equity markets. At the same time the European venture capital industry has grown very fast. A first step in appraising how these phenomena have interacted in the context of the changing structure of the European economy is to look at how venture capital has supported these companies in the steps towards going public. Table 4 shows that European venture capitalists raised just over 25 billion euros in 1999, and have invested a similar amount, which almost doubled between 1998 and 1999. This compares with nearly 48 billion dollars invested by US venture capitalists in their domestic economy. However, one should cautiously note that nearly half of the venture investments in Europe go into Management Buy-outs (MBOs), while the figures for the US refer exclusively to seed, start-up and expansion of new ventures⁵.

The acceleration of venture fundraising and investment in Europe has greatly reduced the gap between the two continents, which remains nonetheless substantial. For the four countries whose Euro.NM branches we look at, we notice that, from 1998 to 1999, fundraising has doubled in Germany and Italy, increased by about 10% in France and remained unchanged in the Netherlands. Investments have doubled in Italy, increased by about 50% in Germany and France, and remained unchanged in the Netherlands. Heterogeneity characterizes also the uses of funds. In particular, in 1998 only German venture capitalists devoted funds to seed financing; in France, by contrast, nearly half of the funds were channeled to MBOs, against about a third in Italy and Germany, and a quarter in the Netherlands. Finally, it is worth noticing that the funding structure of the venture capital industry also varies substantially across the four economies. Germany and Italy receive nearly half of the funds from banks. Pension funds, which are a major contributor of funds in the US, play a minor role in Europe. In Italy, individuals are still major contributors, a sign of the lack of sophistication of the country's financial system. These patterns make one wonder what role does venture capital play in Europe, since Hellmann, Lindsey and Puri (1999) show that in the US the investment behavior of bank-financed venture funds differs markedly from funds financed by non-banks investors. The lack of data on the portfolios of individual venture funds prevents us from such an analysis at the moment, but hope to be able to carry it out in the future.

⁵Unfortunately, the quality of European national statistics for venture capital falls much behind that of US statistics. The European Venture Capital Association does not publish a EU wide or national breakdowns with statistics on the sectoral composition of non MBO-type investments. This makes a sensible comparison of the structure of the US and EU venture capital industries very difficult.

4.1 The structure of the Euro.NM circuit

In this section we explore more in detail the structure of the different branches of the Euro.NM circuit. We develop an analysis of the firms listed on the Euro.NM circuit and of the role of venture capital on their choices of financial and product market strategy.

Table 2 shows that the *Neuer Markt* accounts for 70% of the companies in our sample, and the Nouveau Marché for 26%, while the Nuovo Mercato and the Euro.NM Amsterdam account for 2%. In terms of market capitalization the *Neuer Markt* (79%) and the Nuovo Mercato (9%) are larger, while the Nouveau Marché (10%) and the Euro.NM Amsterdam (1%) smaller. The mean amount of funds raised by a firm gone public varies widely across markets, with the largest IPOs found in the *Neuer Markt*.⁶ It is also clear that the funds raised through IPOs substantially increased the equity based of listed firms. Interestingly, the mean age at IPO is between 8 and 12 years—these companies are not newborns. This is all the more surprising since the Euro.NM circuit has been created with the purpose of becoming a listing outlet for companies without an established track record. The *Neuer Markt*, which is touted as the most successful member of Euro.NM is also the market which lists, on average, the older firms. Not surprisingly, these are also the largest in terms of employment. The *Neuer Markt* stands out also in terms of its ability to attract foreign firms. It attracts about 80% of the firms which list from abroad ('cross-listed') in the whole Euro.NM circuit, and about two thirds of the firms which are listed also on another exchange ('dual-listed').⁷

The sectoral composition of our sample is also quite telling. We assigned each firm to a sector in the following way. First, we took the sectoral partition of its firms decided by the *Neuer Markt* in May 2000, partition which is based on the share of earnings reported by each company in its annual accounts. Then we took the coding provided by the Nouveau Marché for its firms, which reflects the standard 'Nomenclature d'Activité Française' (NAF). We then assigned each of the French activity code to one of the ten German sectors.⁸ We also assigned each of the 14 French companies which do not belong to any of these ten sectors to one of three sectors which reflect their main activity: services (other than IT), trade,

⁶The large mean value for IPOs on the Nuovo Mercato is largely due to the listing of Tiscali, one of Europe's largest Internet providers.

⁷The 41 firms cross-listed on the *Neuer Markt* come from 10 countries, including EU members, the US, Israel, Canada, Hungary, and Switzerland, while the 7 firms cross listed on the Nouveau Marché come from 5 countries. The *Neuer Markt* has attracted 12 firms listed on the Nasdaq, versus the 6 attracted by the Nouveau Marché. No cross-listing has as yet occurred between France and Germany.

⁸These ten sectors are: Biotechnology, Financial Services, Industrials, Internet, IT services, Media & Entertainment, Medtech & Health Care, Software, Technology, Telecommunications.

and manufacturing of traditional goods, like food or fashion. Table 3 shows that the firms listed on the Nouveau Marché are evenly distributed across these 13 sectors, while 80% of the firms listed on the *Neuer Markt* concentrate on just five sectors: Internet, IT services, Media & Entertainment, Software and Technology. The paucity of firms on the Dutch and Italian markets makes any sectoral comparison meaningless for them. These results clearly point to the existence of differences in the nature of the firms listed in different branches of Euro.NM.

We start analyzing such differences by looking at the financial structure of firms which went public on each market, and at its evolution over time. Table 5 provides the mean, standard deviation and median values for several variables. To characterize a firm's size, we use the number of employees, the amount of sales, and that of assets. We then take a look at firms' financial structure using assets, capital expenditure, indebtedness (total and to banks), and equity. We use earnings (EBIT) as an indicator of a firm's profitability, and the share of foreign sales as an indicator of its strategic aggressiveness.

We find that firms listed on the *Neuer Markt* are larger than firms listed on the Nouveau Marché and on the Euro.NM Amsterdam, in terms of both employees and sales. This ranking is confirmed in terms of the median value of assets, for which the extreme volatility of French data makes the use of means meaningless. Depending on the measure of size, whether we take the mean or median values, firms listed in Frankfurt are two to three times larger than firms listed in Paris and two to five times larger than firms listed in Amsterdam.

Capital expenditure, which is an indicator of a firm's future expansion, is more than four times larger for firms listed on the German market—both mean- and median-wise. The median value of debt, whether total or to banks, is much higher for *Neuer Markt* firms than for all the others, though firms listed on the Nouveau Marché exhibit larger mean values, due to a few firms with very large values. The same pattern obtains for shareholders' equity, whose median value is largest for firms listed in Germany, while its average value is larger for firms listed in France, again give to the presence of extremely large values for a few companies. The standard deviation of both debt and equity is indeed much larger in Germany than in France. Capital structure, measured by the debt-to-equity ratio, is more evenly distributed, and its median values largest for firms listed on the Nouveau Marché. German firms are then larger but more indebted than French firms, yet they show a less leveraged capital structure. This is consistent with the common view that the *Neuer Markt* lists firms that are more concentrated in technologically advanced sectors than in other segments of Euro.NM, and therefore experience tougher credit constraints.

Performance measures in terms of EBIT is more favourable to firms listed in Germany,

but when we normalize income by assets, and compute ROA, the median value is slightly lower for firms on the *Neuer Markt* than elsewhere.

We then turn to the reliance on foreign sale in the IPO year, as a first indication of the aggressiveness of these firms on the product market. If we take mean values, there is little difference between firms listed on the Nouveau Marché and on the *Neuer Markt*. Median values, however show that the former export more intensely than the latter, which suggests that some of the most export oriented firms are to be found in France. Obviously, it would be crucial to see how reliance on foreign sales changes *after* a firm has gone public, and we are currently in the process of updating our database with data from 1999 annual reports in this direction.

The overall message we can draw from Table 5 is that the cross sectional variation is quite marked, with very high values for the standard deviation of most variables. This is consistent with the nature of the sample: We have more data for firms which listed before 1999 and more than half of the firms in the sample were listed in 1999. All this makes the mean values of variables poor indicators of the 'typical' values of each variable. Hence, we will employ median values in the remaining analysis.

Table 6 reports median values for each of the variable we have just considered, and show how these have evolved through time. Data refer to firms which went public each year.⁹ We delve into this exercise because we expect the nature of the firms which access the Euro.NM to change over time. The possibility to access equity markets is likely to have spurred entrepreneurship, but clearly this effect should unfold only over the medium term. We thus expect older and more established companies to list first, the number of total listings to rise with time, and the average age at IPO to decrease. Table 6 confirms an acceleration in the number of IPOs, and shows interesting patterns over time.¹⁰

On the Nouveau Marché the firms which listed over the three years do not show any remarkable change in their structure, whatever variable we consider. Except for increased profitability, this is true also for firms listed on Euro.NM Amsterdam. On the contrary, the size (at IPO) of the firms listed on the *Neuer Markt* has become smaller under all measures—employment, assets, and sales. These firms have decreased their indebtedness and increased capital expenditure, and show a marked decrease in profitability. We interpret this as evidence that, over time, the *Neuer Markt* has succeeded in attracting more entrepreneurial

⁹Notice that we do not report data for the Nouveau Marché in 1999, since no French firm has so far release an annual report.

¹⁰In the first half of 2000, 104 firms listed on Euro.NM, 72 of which on the *Neuer Markt*. Italy's Nuovo Mercato is also showing a strong growth, and has more than doubled the number of listed companies.

and less established firms. However, we would expect this to be accompanied by a decrease in the average age at IPO of listing firms. Tables 7 and 8 show that this is not the case. Table 7 reveals that, employing both means and medians, the age of firms at IPO shows no clear trend other than a certain reduction in the case of the Nouveau Marché. From Table 8 we learn that the number of firms which went public on Euro.NM and were founded *after* the opening of each of its branches is extremely low.

4.2 Euro.NM and the Role of Venture Capital

Venture capital is the typical source of financial muscle for American entrepreneurial firms. We now consider whether this is the case in Europe, and whether differences exist across the different markets which constitute the Euro.NM circuit. There are three main questions we address: (1) Does the use of the IPO proceeds depend on the firm receiving venture capital finance? (2) What determines the likelihood of receiving venture capital finance? (3) Does venture capital financing speed or slow down the 'time-to-listing,' i.e. the time before going public on Euro.NM? While at present our data do not allow us to identify causality links in all cases, we are able to move some steps in this direction.

To answer the first two questions we focus on the two largest markets, the Nouveau Marché and the *Neuer Market*. The small size of the sample for the other national markets of the Euro.NM circuit makes it sensible to drop them at this point. Table 9 compares the median values of balance sheets data at two points in time, the year before the IPO (-1) and the year after (+1). For a firm which listed in 1998 this would mean taking balance sheet data for 1997 (-1) and 1999 (+1). We perform a Wilcoxon rank sum test to assess the significance of the difference in medians for the two dates, (-1) and (+1). Bold figures indicate those median values which are significantly different between periods, *within each market*.

The comparison between the two markets is quite telling. The results concerning company size show that firms significantly increase employment after the IPO. This phenomenon is stronger for firms listed on the German market, which triple their dimension. We believe that these results hides a sectoral dimension that we can not infer directly here. A finer breakdown of the behavior of these variables by market and sectors (not reported) shows that in Germany the fastest growing sectors in terms of employees have been Biotechnology and Internet, two sectors which are poorly represented in our French sample. A similar results holds also for the other two measures of firm size, assets and sales.

As an indicator of the aggressiveness of firms' strategy, we use again to the proportion of

foreign sales. Surprisingly, the growth of this variable is significantly larger for firms in the French sample. Moreover, the difference in medians is not statistically significant for firms in the German sample. We do not take this as a sign that firms listed on the *Neuer Markt* as less willing to expand beyond their national market, since we expect that a dynamic effect can be observed only over a longer time span—certainly not only one year after the IPO.

The view that Euro.NM has succeeded in attracting fast growing firms is confirmed by looking at capital expenditure, that measure investment in tangible and intangible assets. However, this variable significantly increases after the IPO for the firms listed on the *Neuer Markt*, but not for those listed on the Nouveau Marché—for which the increase in capex is also much smaller. Hence a difference between the two markets exists also in this respect. A difference between the firms listed on the two markets is clearly shown also by sales, which remain virtually unchanged for firms in the French sample but (significantly) increase eight-fold for firms in the German sample.

We then look at how firms finance their growth. Although leverage, measured by the DEBT/EQUITY ratio, diminishes slightly more for firms in the French sample than for those in the German sample, in the latter case debt (significantly) increases five-fold after the IPO, while in the former it only doubles. We interpret this as evidence of the existence of credit constraints for unlisted firms. Moreover, a very similar result holds for shareholder equity. We interpret these two findings as preliminary evidence of a positive degree of complementarity between debt and equity finance.

We are now ready to tackle our central question: What is the role of venture capital in the going-public process of firms which get listed on Euro.NM. Table 10 shows that the majority of the firms listed on Euro.NM are not venture-backed. Nearly a third of all the firms are venture backed, and they are evenly distributed across the national markets. What pops up into one's eyes is that when a firm receives venture capital finance, this mostly happens *after* the opening of the Euro.NM circuit. In other words, venture capitalists became more often involved with companies which eventually go public *after* the creation of the Euro.NM circuit. We interpret this as evidence that Euro.NM succeeded in mobilizing the venture capital industry, offering an outlet for both the realization of capital gains and the provision of incentives for entrepreneurs to take the risk of engaging in a start-up.

In Table 11 we repeat the exercise reported in Table 9 separating the sample for venture-backed and non venture-backed firms. We also add a further time dimension: time (0) indicates time at IPO. Therefore the values in this table measure the median values of the variables at the pre-, post- and at-IPO dates, separately for venture-backed and non venture-backed firms. We perform a Wilcoxon test of the difference in median values in each

point in time. For example, the first two rows in Table 11 give the number of employees at each of the three dates for both venture-backed and non venture-backed firms in each of the two markets. The results of this exercise are quite strong. Financing from a venture capitalist is not relevant for any strategic and financial decisions of firms which are listed on the Nouveau Marché. On the contrary, for firms listed on the *Neuer Markt* venture capital financing significantly affects the level of indebtedness until the IPO: total debt and debt to bank are significantly lower for venture-backed firms. Venture-backed firms are also smaller in terms of assets, employment and sales. They are also significantly less profitable. Interestingly, the effect of venture capital financing disappears in the year after the IPO. We interpret this as strong evidence that venture capitalists perform an important role of selection and support of the most innovative firms, and back the smaller and faster growing firms.

These findings suggest that not only are there differences in the type of firms listed on the different markets which constitute the Euro.NM circuit, but also that, for firms listed on the German market, there are differences due to the backing of venture capital. The descriptive statistics we discussed in the previous section provide some exploratory evidence concerning the role of the venture capitalist. However to filter out spurious correlations, we turn to regression analysis and estimate the likelihood of receiving venture capital as a function of firm characteristics.

Table 12 reports our estimates. The return on assets (ROA) appears to be an important variable that significantly lowers the probability of venture capital, while debt does not appear to be significant. The same results remain when we control for other financial variable and for sectors. Although it may seem puzzling, this result can be explained in the light of the results reported in Table 9: for German firms venture capitalist select more promising and innovative firms that might incur lower earnings at the early stages of their life. Unfortunately, we do not have a measure of degree of innovativeness of firms. However we take the percentage of foreign sales as a measure of the degree of internationalization of firm and of potential growth and strategic aggressiveness. Although controlling for this variable reduces the dimension of our sample considerably, we re-run our probit estimation, which we report in Table 12 (B). Not surprisingly, the explicative power of ROA diminishes while the percentage of past foreign sales significantly affect the likelihood of the firm receiving venture capital.

Table 12 (C) reports the probit regression for firms listed on the Nouveau Marché. Our results totally confirm the conclusions we drew from Table 11: A firm's financial structure does not appear to differ between venture-backed and not venture-backed firms. Conversely,

financial variables do not seem to affect the likelihood of venture capital financing. The lack in our dataset of a variable which can measure the market and product strategy of the firms limits our analysis. We are working on deriving such a variable.

The last question we want to answer is whether the presence of venture capital influences the time-to-listing, i.e. whether venture capital speeds up or slows down the time before going public on Euro.NM. To explore this issue we use a standard tool for the analysis of the timing of that decision. A standard procedure for dealing with duration data is to employ a Cox proportional hazard model. Formally we can write the model as:

$$h(t) = h_0(t) \exp \{ \beta' X \} \quad (1)$$

The Cox proportional hazard model has the notable advantage of not imposing any restriction on the baseline hazard $h_0(t)$ in providing estimates of the coefficients. Suppose the time-to-listing ('durations') of all firms in the dataset are in increasing order: $t_1 < t_2 \dots < t_n$. At any moment in time we define the 'risk set' as the set of firms which have not yet gone public. The conditional probability that firm i goes public at time t_i , given that all firms might be public at t_i is then:

$$\frac{\exp \{ \beta' X_i \}}{\sum_j \exp \{ \beta' X_j \}} \quad (2)$$

If a unit increase of an independent variable affects the hazard ratio by reducing its value below one, we infer that the effect of the variable is to increase the probability, or risk, of the event "going public" and be listed on Euro.NM.

Table 13 (A) reports the hazard ratio estimated for the firms on the *Neuer Markt*. The dependent variable is TIME-TO-LISTING (TTL). We first notice that TTL is on average similar for all sectors apart from Industrial Services. Therefore we control for the effect of this particular industry. Venture capital financing does not significantly influence the hazard ratio, which is most affected by AGEIPO and ROA, the latter computed at IPO. Both these variables increase the hazard ratio, i.e. they increase the probability of IPO shortening the time-to-listing. Our estimates then show that older and more profitable firms have a shorter time-to-listing, conditionally on all the firms in the sample going public on the Euro.NM circuit.

Table 13(B) shows the same Cox regression for the firms listed on the *Nouveau Marché*. Here we control for two sectors: Media & Entertainment and Trade (Commercial Services), both of which significantly, and negatively, affect the hazard ratio. Controlling for firm size,

financing from a venture capitalist lowers the probability of going public, i.e. it lowers TTL. Therefore, while venture capital financing does not affect the financial decision of firms listed on the French market, has an important influence on their decisions to go public.

5 The Ownership structure of firms listed on Euro.NM

Finally, we turn to an analysis of ownership structure, which is analyzed in Tables 14 to 16.

The main results which arises from these tables is that ownership remains concentrated—in all markets—after the IPO, which is therefore more a way to to finance companies than to allow divestment by founders and financiers. Table 16 confirms that most of the shares sold to the public at IPO bring new cash to corporate coffers: From 77% (Germany) to 89% (Italy). Table 14 shows that firms listed on the *Neuer Markt* are those where the entrepreneurial element is most important, both before and after the IPO. This is true even if German founders sell more than founders of firms listed in any other market. The German situation stands in stark contrast with that of the Dutch market, where the predominant shareholders are managers and venture capitalists. Firms listed on the *Neuer Markt* are also those which most increase their free float (except for Italy, where we have only six firms listed).

Interestingly, venture capitalists have a stronger presence on firms listed in Paris or Amsterdam than in Frankfurt, and hardly a noticeable presence on Italian firms. For firms listed on the Nouveau Marché, venture capitalists are also patient investors, in the sense that they sell only a quarter of their stake (on average), against about a third for venture capitalists involved with firms listed in Germany and The Netherlands. Managers are also more important and more stable shareholders for French companies. It is conceivable, and we are at present checking this hypothesis, that the relevance of 'other' shareholders for firms listed on the *Neuer Markt* reflects investments from corporate venture capitalists, or from corporate investors. This would be consistent with a stronger technological orientation by firms listed in Frankfurt—and is confirmed by the numbers in Table 15.

Table 15 shows a high control retention rate of the founders. In France they retain control after an IPO less often than in Germany, where venture capitalists and incumbent managers retain control of the company in a good third of the cases. It is striking how seldom do French pre-IPO dominant shareholders relinquish control compared to the German case. This confirms our finding of table 14, and makes one wonder what drives the different behavior of venture capitalists on the opposed banks of the Rhein.

It is also interesting to note that on the *Neuer Markt* listed firms become public, i.e. controlled by the market, in nearly a quarter of the cases, in stark contrast with the French market. In all markets both the median and the mean controlling stake decrease at IPO, and there are no significant differences in national patterns.

6 Conclusion

The opening of Euro.NM, a European circuit of stock exchanges aimed at attracting innovative entrepreneurial companies in high-growth industries is widely held as a turning point in overcoming the credit constraints imposed by credit markets on highly risky European firms. In turn, this is expected to boost technological innovation and the creation of stable employment. Our study confirms the validity of that intuition: We show that highly innovative firms that go public on the Euro.NM circuit substantially increase their size and capital expenditure and use the proceeds from the IPO to finance their growth. This picture stands in stark contrast with the one offered by Pagano, Panetta and Zingales (1998) in their study of characteristics of firms which went public on the Italian stock Exchange in the 1980s—For these firms the IPO proceeds are mostly used to decrease leverage.

Our study also documents important differences between the type of firms listed on the *Neuer Markt* and on the Nouveau Marché, differences we believe to depend on the sectoral composition of the two markets. More mature and technologically less innovative sectors are more represented on the French market, while 80% of the firms listed on the Neuer Markt concentrate in just five sectors: Internet, IT Services, Media&Entertainments, Software and Technology. These are arguably the most innovative sectors, highly dependent on external finance to finance the high R&D expenditure they require. German firms listed on the Neuer Markt, in fact, are more indebted than the French firms, yet show a less leveraged capital structure.

As for the influence of venture capital on firms' behavior and strategy, theory is divided. The knowledge and experience of venture capitalists might allow them to better identify promising companies and support, even push, them in their quest to go fast to the market. Alternatively, it could be the case that venture capitalists are patient investors that support more innovative firms with long product development cycles.

Again we document a striking difference between firms listed on the *Neuer Markt* and on the Nouveau Marché. The former show a lower debt and a lower return on assets (ROA). Among the firms listed on the German market, those which export more—which we take as proxy for being outward oriented and strategically aggressive—increase their likelihood

of receiving venture capital. On the contrary, the presence of a venture capitalists does not seem to affect the financial structure of French firms. For these, venture capital influences the most important strategic decision: when to get listed. Venture capitalists does not seem to affect this strategic choice of firms on the German market.

Our results raise a number of interesting issues for future research. For instance, it would be interesting to compare our findings with the role played by venture capitalists in the firms listed on the Nasdaq. A more challenging research entails enlarging our sample to highly innovative but not listed firms and to understand the determinants of the going public decisions of European innovative firms.

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Tables

Table 1: Euro.NM listing requirements

Requirements	
Capital	≥ 1.5 million euro
Age	
Accounting Standards	
Profitability	
Prospectus	Yes
IPO Volume	≥ 5 million euro. $\geq 100,000$ shares to be issued
Free Float	$\geq 20\%$ of the capital $\geq 50\%$ of free float must come from capital increase
Type of Shares	No restrictions to free negotiability
Sponsor	At least one <i>greenshoe</i> mandatory
Lock-up Period	To be chosen by the Company (may be exempted) Sales by managing shareholders made public
Take-Over Rules	
Foreign Companies	Admissible

Table 1(A) - NOUVEAU MARCHÉ

Requirements	
Capital	\geq 1.5 million euro
Age	\geq 3 years
Accounting Standards	Quarterly Reports Annual Financial Analysts Conference US-GAAP or IAS
Profitability	
Prospectus	Yes. Must be published also in English
IPO Volume	\geq 5 million euro. Total par value \geq 500.000 DM \geq 100,000 shares to be issued
Free Float	\geq 20% of the capital \geq 25% recommended not to be closely held \geq 50% of free float must come from a capital increase
Type of Shares	Only ordinary shares (for the first issue) No restrictions to free negotiability
Sponsor	At least two
Lock-up Period	To be chosen by the Company, but \geq 6 months
Take-Over Rules	Must comply with the German Take Over Code
Foreign Companies	Admissible; Their home rules and regulations apply

Table 1(B) - NEUER MARKT

Requirements	
Capital	\geq 1.5 million euro
Age	\geq 3 years
Accounting Standards	Quarterly Reports
Profitability	Must be able to generate profits
Prospectus	Yes
IPO Volume	\geq 5 million euro.
Free Float	
Type of Shares	
Sponsor	At least one
Lock-up Period	To be chosen by the company or mandated by AEX
Take-Over Rules	
Foreign Companies	

Table 1(C) - EURO.NM AMSTERDAM

Requirements	
Capital	\geq 1.5 million euro of net worth
Age	At least one balance sheet published (may be exempted)
Accounting Standards	
Profitability	Must be able to generate profits
Prospectus	Yes
IPO Volume	\geq 5 million euro. \geq 100,000 shares to be issued
Free Float	\geq 20% of the capital \geq 50% of free float must come from a capital increase
Type of Shares	
Sponsor	At least one
Lock-up Period	\geq 12 months (on 80% of holdings)
Take-Over Rules	
Foreign Companies	

Table 1(D) - NUOVO MERCATO

Table 2: Euro.NM summary statistics

	Nouveau Marché	Neuer Markt	Euro.NM Amsterdam	Nuovo Mercato
No. of IPOs	113	222	14	6
No. of IPOs in dataset	108	194	7	6
Funds raised (mean) (millions of euros)	15,3 (108)	57,1 (188)	10,7 (5)	43,6 (5)
Pre-IPO equity (mean) (millions of euros)	2.3	2.7	1.1	1.5
Age at IPO (mean, months)	100 (108)	147 (189)	125 (7)	112 (6)
Employees at IPO (mean)	150 (53)	310 (146)	96 (5)	196 (1)
No. of dual listings	8	20	2	0
No. of cross listings	7	41	2	0

Source: our elaborations from Euro.NM data and from our dataset. Data for IPOs to February 2000. In brackets the number of observations for each variable.

Table 3: Euro.NM sectoral composition

	Nouveau Marché	Neuer Markt	Euro.NM Amsterdam	Nuovo Mercato
Biotechnology	3	9	0	0
Financial Services	7	4	0	0
Industrials	4	9	0	0
Internet	1	38	0	1
IT Services	6	22	0	1
Manufacturing	3	0	0	0
Media & Entert.	2	20	0	0
Medtech & Health Care	4	7	1	0
Services	6	0	1	1
Software	16	35	3	0
Technology	9	41	2	2
Telecommunications	8	9	0	0
Trade	5	0	0	1
Total	74	194	7	6

Table 4: The Structure of Venture Capital in Europe

	France	Germany	Italy	Netherlands
Pension Funds	13	14	7	1
Banks	28	51	42	26
Insur. Comp.	11	14	2	27
Companies	11	8	10	3
Individuals	4	8	28	7
Government	1	3	1	0
Realized Earnings	31	0	5	15
Others	1	2	5	21

Sources of Funds (percentage shares), 1998 Source: our elaborations from EVCA data.

	France	Germany	Italy	Netherlands
Buy Out	46	29	23	34
Seed	0	6	0	0
Start Up	14	18	15	16
Expansion	33	43	37	36
Other	7	7	25	14

Uses of Funds (percentage shares), 1998 Source: our elaborations from EVCA data.

	France	Germany	Italy	Netherlands
1999	4.3	3.8	1.1	1.8
1998	3.8	1.8	1.1	0.9

Sources of Funds (millions of euros), 1998 and 1999 Source: our elaborations from EVCA data.

	France	Germany	Italy	Netherlands
1999	2.8	3.2	1.0	1.8
1998	1.7	1.9	1.0	0.9

Uses of Funds (millions of euros), 1998 and 1999 Source: our elaborations from EVCA data.

	1995	1996	1997	1998	1999
Funds Raised	4.3	7.9	20.0	20.3	25.4
Investments	5.5	6.8	9.6	14.5	25.1

European Venture Capital: Evolution (data in millions of euros) Source: our elaborations from EVCA data.

Table 5: Firms on Euro.NM: summary financial statistics

	Mean	St. Deviation	Median
Employees	157	172	105
Foreign Sales	.49	.33	.54
Assets	445	2350	14.7
Capex	1.67	3.08	.55
Debt	156	765	5.48
Debt to banks	47	245	.99
Equity	322	1460	6.81
EBIT	44.3	253	.66
Debt/Equity	3.76	14.89	.56
Equity/Assets	1.88	6.41	.62
Debt/Assets	.81	1.22	.41
ROA	.006	.17	.04
Sales	390	2080	11.4

Table 5(A) - Nouveau Marché

For the financial variables amounts in million of euros. Employees in numbers. Ratios in percentage terms. Foreign sales indicates the percent share of foreign sales. Capex = capital expenditure, ROA = return on assets, EBIT = earning before interests and taxes.

	Mean	St. Deviation	Median
Employees	309	382	147
Foreign Sales	.41	.49	.30
Assets	116	426	43.5
Capex	8.99	15.3	3.18
Debt	65	399	9.10
Debt to banks	12.5	46.5	1.45
Equity	47.3	90.1	29.1
EBIT	5.04	33.4	1.06
Debt/Equity	4.13	35.58	.36
Equity/Assets	.67	.26	.71
Debt/Assets	.30	.26	.24
ROA	.16	1.90	.026
Sales	182	1660	23.6

Table 5(B) - Neuer Markt

For the financial variables amounts in million of euros. Employees in numbers. Ratios in percentage terms. Foreign sales indicates the percent share of foreign sales. Capex = capital expenditure, ROA = return on assets, EBIT = earning before interests and taxes.

	Mean	St. Deviation	Median
Employees	96	96	68
Foreign Sales	0.77		0.77
Assets	11.28	3.84	10.75
Capex	.73	.57	.81
Debt	5.53	4.36	3.60
Debt to banks	.69	1.12	.029
Equity	6.58	2.57	5.89
EBIT	.25	3.91	.92
Debt/Equity	.97	1.08	.67
Equity/Assets	.62	.20	.65
Debt/Assets	.43	.23	.40
ROA	-0.03	.38	.09
Sales	11.06	11.13	4.31

Table 5(C) - Euro.NM Amsterdam

For the financial variables amounts in million of euros. Employees in numbers. Ratios in percentage terms. Foreign sales indicates the percent share of foreign sales. Capex = capital expenditure, ROA = return on assets, EBIT = earning before interests and taxes.

	Mean	St. Deviation	Median
Employees	196		196
Foreign Sales			
Assets	103.77	111.14	103.77
Capex			
Debt	24.50	21.00	24.50
Debt to banks	1.40	1.98	1.40
Equity	75.62	88.12	75.62
EBIT	-4.16	8.05	-4.16
Debt/Equity	.51	.31	.51
Equity/Assets	.53		.53
Debt/Assets	.30	.12	.30
ROA	.003	.081	.003
Sales	29.23	4.94	29.23

Table 5(D) - Nuovo Mercato

For the financial variables amounts in million of euros. Employees in numbers. Ratios in percentage terms. Foreign sales indicates the percent share of foreign sales. Capex = capital expenditure, ROA = return on assets, EBIT = earning before interests and taxes.

**Table 6: The financial structure of firms going public on Euro.NM–
evolution**

	1996	1997	1998
No of IPOs	6	10	30
Employees	81	108	92
Foreign Sales	.78	.42	.71
Assets	12.60	11.50	17.80
Capex	.40	.55	.21
Debt	5.18	3.91	7.26
Debt to banks	6.06	1.23	.83
Equity	6.25	6.62	7.22
EBIT	0	.60	.70
Debt/Equity	.82	.52	.61
Equity/Assets	.55	.63	.61
Debt/Assets	.45	.41	.38
ROA	.07	.07	.02
Sales	8.69	11.5	11.1

Table 6(A) - Nouveau Marché

Median values for the financial variables in million of euros. Employees in numbers. Ratios in percentage terms. Foreign sales indicates the percent share of foreign sales. Capex = capital expenditure, ROA = return on assets, EBIT = earning before interests and taxes.

	1997	1998	1999
No of IPOs	10	41	122
Employees	231	178	137
Foreign Sales	.36	.27	.32
Assets	55.4	54.5	41.8
Capex	1.28	3.43	2.98
Debt	17.00	13.10	6.96
Debt to banks	4.72	1.85	.99
Equity	31.50	26.30	29.60
EBIT	5.74	2.75	.035
Debt/Equity	.70	.44	.25
Equity/Assets	.58	.65	.76
Debt/Assets	.31	.28	.19
ROA	.09	.07	.01
Sales	65.90	33.10	19.30

Table 6(B) - Neuer Markt

Median values for the financial variables in million of euros. Employees in numbers. Ratios in percentage terms. Foreign sales indicates the percent share of foreign sales. Capex = capital expenditure, ROA = return on assets, EBIT = earning before interests and taxes.

	Euro.NM Amsterdam			Nuovo Mercato
	1997	1998	1999	1999
No of IPOs	2	4	1	6
Employees	14	88	0	196
Foreign Sales	0	.77	0	0
Assets	10.40	9.88	12.71	103.77
Capex	.001	.94	1.05	0
Debt	6.18	3.36	5.81	24.50
Debt to banks	1.33	.06	n.a.	1.40
Equity	4.22	6.94	6.90	75.62
EBIT	-2.16	1.40	6.31	-4.16
Debt/Equity	1.73	.60	.84	.51
Equity/Assets	.55	.67	.54	.53
Debt/Assets	.45	.37	.46	.30
ROA	.28	.12	.50	.003
Sales	2.21	9.18	29.79	29.23

Table 6(C) Euro.NM Amsterdam and Nuovo Mercato

Median values for the financial variables in million of euros. Employees in numbers. Ratios in percentage terms. Foreign sales indicates the percent share of foreign sales. Capex = capital expenditure, ROA = return on assets, EBIT = earning before interests and taxes.

Table 7: Age at IPO

	1996		1997		1998		1999	
	Med.	Mean	Med.	Mean	Med.	Mean	Med.	Mean
Nouveau Marché	107	113	118	111	80	91	76	100
Neuer Markt	–	–	80	206	165	181	107	130
Euro.NM Amsterdam	–	–	59	59	74	164	104	104

Age at IPO expressed in months from the firm's foundation.

Table 8: Cohorts of firms listed on Euro.NM

	Nouveau Marché	Neuer Markt	Euro.NM Amsterdam	Nuovo Mercato
Pre Euro.NM	64	177	7	6
Post Euro.NM	10	17	0	0
Total	74	194	7	6

Median age at IPO expressed in months from the firm's foundation. Pre and post Euro.NM refer to whether the firm was founded before or after the opening of the Euro.NM branch it is listed on.

Table 9: Nouveau Marché and Neuer Markt: comparison

	France		Germany	
	-1	+1	-1	+1
Employees	100	151	93	400
Foreign Sales	0.16	0.50	0.30	0.42
Assets	9.66	18.60	11.40	85.80
Capex	0.395	1.51	0.84	9.99
Debt	5.54	9.60	6.76	30.70
Debt to banks	1.20	1.47	1.36	4.44
Equity	2.27	8.67	2.72	37.7
EBIT	0.87	-0.007	1.01	2.94
Debt/Equity	2.08	.80	1.64	.66
Debt/Assets	.63	.45	.60	.33
ROA	.08	-0.01	.07	.05
Sales	11.50	11.40	10.50	84.60

Median values. Medians which differ at a level of confidence of at least 5% are in bold.

Table 10: IPOs and venture capital: structure.

	Nouveau Marché	Neuer Markt	Euro.NM Amsterdam	Nuovo Mercato
Without VC	44 (<i>73</i>)	116 (<i>193</i>)	5 (<i>6</i>)	4 (<i>6</i>)
With VC	21	72	1	1
<i>before</i> Euro.NM	4 (<i>73</i>)	19 (<i>193</i>)	1 (<i>6</i>)	1 (<i>1</i>)
<i>after</i> Euro.NM	17 (<i>73</i>)	53 (<i>193</i>)	0 (<i>6</i>)	1 (<i>6</i>)

Data on IPOs are to February 2000. In brackets the number of observations for each variable. Some firms do not indicated whether or not they have received venture capital financing.

Table 11: IPOs and venture capital: effects.

		France			Germany		
		-1	0	+1	-1	0	+1
Employees	no VC	80	91	155	107	157	371
	VC	118	112	143	80	141	477
Foreign Sales	no VC	.13	.54	.48	.26	.29	.43
	VC	.65	.50	.49	.09	.29	.39
Assets	no VC	8.80	11.10	17.00	14.20	53.80	87.10
	VC	10.30	16.70	18.60	8.75	37.8	73.6
Capex	no VC	.36	.35	13.80	1.07	3.27	9.40
	VC	.39	.63	.95	.60	3.08	4.56
Debt	no VC	4.48	3.78	5.90	10.40	11.80	31.00
	VC	5.61	7.56	9.95	4.54	6.07	28.70
Debt to banks	no VC	.85	1.26	2.11	2.00	2.38	4.84
	VC	1.42	.68	.80	.87	.37	4.39
Equity	no VC	2.29	6.62	10.30	2.54	29.80	39.40
	VC	2.00	9.75	8.67	2.78	28.20	32.20
EBIT	no VC	.73	.74	.36	1.58	1.97	2.94
	VC	.99	.56	-0.03	.39	-0.02	.14
Debt/Equity	no VC	2.57	.65	.94	2.33	.41	.66
	VC	1.95	.45	.60	.91	.25	.66
Debt/Assets	no VC	.63	.42	.47	.65	.26	.33
	VC	.63	.40	.44	.51	.20	.36
ROA	no VC	.08	.07	-0.01	.10	.05	.06
	VC	.07	.01	-0.01	.01	0.00	-0.04
Sales	no VC	8.20	10.70	13.60	18.80	28.90	82.00
	VC	11.60	12.30	9.10	10.70	15.70	88.4099

Median values. Medians which differ at a level of confidence of at least 5% are in bold.

Table 12: Probit regression—dependent variable venture capital.

Independent Variables	Coefficients	t-ratio	P-Value
ROA	-1.23	-2.011	.044
Debt(-1)	-4.62	-1.417	.156
Constant	-0.25	-2.122	0.034
Number of firms	175		
Pseudo R^2	.0455		
$\chi^2(2)$	10.51		
P-value	.0052		

Table 12 (A)

Independent Variables	Coefficients	t-ratio	P-Value
ROA	-2.59	-1.913	.056
Foreign Sales(-1)	1.11	2.21	.027
Constant	-0.63	-2.691	.007
Number of firms	70		
Pseudo R^2	.0760		
$\chi^2(2)$	7.16		
P-value	.0279		

Table 12 (B)

Independent Variables	Coefficients	t-ratio	P-Value
ROA(-2)	-2.51	-2.135	.033
Media & Entert.	-0.25	-0.271	.786
Software	.47	1.05	.294
Technology	.70	1.28	.199
Telecommunications	1.13	1.70	.089
Constant	.17	.72	.474
Number of firms	65		
Pseudo R^2	.124		
$\chi^2(5)$	10.87		
P-value	.054		

Table 12 (C)

Table 13: Cox regression—dependent variable time-to-listing.

	Hazard Ratio	t-ratio	P-Value
Venture Capitalists	1.07	.395	.693
AgeIPO	1.00	3.224	.001
Industrials	.93	-0.152	.879
ROA(IPO)	1.09	2.182	.029
Number of firms	157		
$\chi^2(4)$	10.97		
P-value	.027		

Table 13 (A)

	Ratio		
Venture Capitalists	.44	-2.085	.037
Media & Entert.	8.75	1.847	.065
Trade	5.66	2.153	.031
Employees(IPO)	.999	-0.722	.470
Number of firms	34		
$\chi^2(4)$	10.39		
P-value	.034		

Table 13 (B)

Table 14: Ownership structure: structure pre and post IPO.

	Pre IPO	Post IPO
Founders	.4044	.3088
Managers & Directors	.1454	.1168
Venture Capitalists	.2085	.1562
Other Financial Investors	.1219	.0954
Employees	.0110	.0092
Others	.0809	.0468
Free Float	.0279	.2655

Table 14 (A) - Stakeholders: France

	Pre IPO	Post IPO
Founders	.5571	.4040
Managers & Directors	.0623	.0435
Venture Capitalists	.1384	.0827
Other Financial Investors	.0602	.0355
Employees	.0199	.0140
Others	.1576	.0963
Free Float	.0044	.3241

Table 14 (B) - Stakeholders: Germany

	Pre IPO	Post IPO
Founders	.0987	.0502
Managers & Directors	.3244	.1748
Venture Capitalists	.3364	.2082
Other Financial Investors	.0288	.0278
Employees	.0058	.0051
Others	.1435	.1932
Free Float	.0624	.3406

Table 14 (C) - Stakeholders: Holland

	Pre IPO	Post IPO
Founders	.3852	.2353
Managers & Directors	.1546	.1133
Venture Capitalists	.0996	.0552
Other Financial Investors	.1946	.0879
Employees	0	0
Others	.1660	.0833
Free Float	0	.4250

Table 14 (D) - Stakeholders: Italy

Table 15: Ownership structure: controlling stake pre and post IPO.

	Share of Companies controlled by		Mean		St. Dev.		Median	
	Pre IPO	Post IPO	Pre IPO	Post IPO	Pre IPO	Post IPO	Pre IPO	Post IPO
Founders	.45	.42	.80	.64	.19	.16	.83	.65
Managers & Directors	.15	.14	.69	.57	.22	.17	.59	.54
Venture Capitalists	.25	.23	.64	.48	.21	.16	.60	.42
Other Fin. Investors	.10	.11	.71	.54	.23	.16	.72	.47
Employees	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0
Free Float	.01	.07	.72	.40	–	.20	.72	.31

Table 15 (A) - Stakeholders: France there is only one firm controlled by free float—Oxis International Inc., a firm listed on Nasdaq.

	Share of Companies controlled by		Mean		St. Dev.		Median	
	Pre IPO	Post IPO	Pre IPO	Post IPO	Pre IPO	Post IPO	Pre IPO	Post IPO
Founders	.69	.59	.77	.58	.20	.12	.79	.60
Managers & Directors	.06	.03	.67	.54	.23	.22	.66	.43
Venture Capitalists	.13	.08	.70	.51	.22	.19	.80	.56
Other Fin. Investors	.05	.03	.50	.33	.23	.11	.45	.34
Employees	.01	.01	.72	.55	.17	–	.72	.19
Others	.15	.12	.52	.44	.31	.19	.56	.46
Free Float	0	.24	0	.46	–	.14	0	.46

Table 15 (B) - Stakeholders: Germany

	Share of Companies controlled by		Mean	
	Pre IPO	Post IPO	Pre IPO	Post IPO
Founders	0	0	0	0
Managers & Directors	.40	.20	.81	.54
Venture Capitalists	.20	.20	.80	.63
Other Fin. Investors	0	0	0	0
Employees	0	0	0	0
Others	.20	.20	.54	.44
Free Float	.20	.40	.31	.43

Table 15 (C) - Stakeholders: the Netherlands

	Share of Companies controlled by		Mean	
	Pre IPO	Post IPO	Pre IPO	Post IPO
Founders	.50	.33	.77	.56
Managers & Directors	.17	.17	.80	.60
Venture Capitalists	.17	0	.66	0
Other Fin. Investors	.17	0	.51	0
Employees	0	0	0	0
Others	0	0	0	0
Free Float	0	.50	0	.50

Table 15 (D) - Stakeholders: Italy

Table 15: Ownership structure: controlling stake pre and post IPO.

	Nouveau Marché	Neuer Markt	Euro.NM Amsterdam	Nuovo Mercato
Shares from capital increase	85	77	78	89
Shares sold by pre-IPO shareholders	15	23	22	11