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MARKT AND THE NUOVO MERCATO

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**VENTURE CAPITAL, STOCK EXCHANGES FOR HIGH-GROWTH
FIRMS AND BUSINESS CREATION: A STUDY OF IPOs
ON THE NEUER MARKT AND THE NUOVO MERCATO**

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Abstract

Since 1996, in Europe new market venues have added to existing stock exchanges. The so-called “new markets”, focused on innovative companies in high-growth industries, had a remarkable success in terms of number of IPOs and funds raised: more than 900 companies went public from 1996 to 2001, and total funds raised amounted to about 32 billion euro. However, due to the unfavourable evolution of financial markets over the last one and half year, most of the gains accumulated by these stock exchanges, since their inception, have been “burnt”. As supported by the European Commission in many documents about risk capital, these markets could help the development of high growth sectors, due to complementarities between stock exchanges and venture capital in providing additional funds to innovative firms. The main object of this paper is therefore to study the role of venture capital and the characteristics of listed firms, particularly in two new markets: the Neuer Markt (Germany) and the Nuovo Mercato (Italy).

A first analysis of data shows a strong correlation between the size of the venture capital industry and that of national stock exchanges (European and U.S.). Moreover, European VC industry remarkably grew after the inception of the new markets, but this growth was lower than that of U.S. venture capital industry in the same period. With regard to Germany and Italy, until 2001 VC investments and funds raised have been strongly accelerated by the creation of the Neuer Markt and the Nuovo Mercato. Accounting data of new listed firms in the two Stock Exchanges show a remarkable growth of sales, especially in the year of the IPO. These companies go public essentially to collect new funds (the share of the IPO coming from the increase of capital is very high) and they “use” the IPO to “reequilibrate” their financial structure and increase their financial debt after the quotation. Institutional investors in risk capital own stakes in a high share of companies analysed (about 51% in the Neuer Markt and 44% in the Nuovo Mercato) and, like other shareholders, they keep most of their ownership after the offering. Companies which are financed by venture capitalists, especially in Germany, seem to be bigger and more profitable than other companies, while no significant differences appear as to the rate of growth and the pace of investments.

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Many conclusions can be drawn from this evidence: first, the aforementioned complementarity hypothesis seems plausible in the experience of both Italian and German VC markets; second, innovative companies have largely resorted to IPOs to finance their growth; finally, venture capital, by providing funds in the earlier phases of the life of companies, seems to help them in “maturing” before entering the stock exchange.

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I. Introduction

One of the most innovative aspects of the European financial market in the last seven years was the creation and the development of various national stock exchanges which focused on innovative companies in high-growth industries. These new equity markets – the Nouveau Marché in France, the Alternative Investment Market (AIM) and subsequently the TechMARK in the U.K., the Neuer Markt in Germany, the Nieuwe Markt in the Netherlands, the Easdaq and the Euro.Nm Bruxelles in Belgium and finally, the most recent, the Nuovo Mercato in Italy and the Nuevo Mercado in Spain – were created with characteristics and goals similar to those of the U.S. Nasdaq: to provide sources of financing to firms in their earlier phases of development¹.

This process was in some way approved and stimulated by the European authorities in various documents². The European Commission cited some data concerning the United States, where the presence of the Nasdaq, together with the strong contribution to the provision of funds to young firms coming from venture capital, determined a large part of the economic growth of the last few years. In the U.S., between 1991 and 1995, about 3% of the firm's population, called "gazelles" – high-growth and technological firms – accounted for 80% of job growth, that is 6 million out of an additional 7.7 million jobs³. In this process, venture capital played a very important role: a comparison between U.S. companies financed by venture capital and the 500 largest U.S. companies, in the period 1989-93, revealed that the former created new employment at an annual growth rate of 25%, whereas for the latter the level of employment decreased at an annual rate of 3%.

In Europe, a similar tendency occurred, even if less "marked": during the period 1991-95, employment increased by 15% per annum in companies which benefited by venture capital financing, whereas it grew only by 2% for the 500 largest European companies.

The significance of these data contributed to determine the position of the European authorities in favour of incentives to the development of risk capital in Europe and to the creation of a pan-European stock exchange for high-growth firm.

After 1997, a first step towards the goal of creating a unique European stock exchange with these characteristics was reached with the alliance between the "new markets" of Amsterdam,

¹ The characteristics and regulation of the Neuer Markt and the Nuovo Mercato will be described in Section II.

² The Luxembourg European Council on Employment (20/21 November 1997) acknowledged "... the importance of the role that large pan-European risk-capital markets can play in job creation and asks the Commission to report to the Council on barriers to the development of such markets in the Union..." (paragraph 30). The European Commission, in its document on "Risk Capital: A key to job creation in the European Union", asserted that "Developing risk capital in the European Union, leading towards the development of pan-European risk-capital markets, is essential for major job creation in the EU", but added that "there remain a number of pernicious barriers – regulatory, economic, fiscal, cultural – that need to be addressed as a matter of urgency.... The real political challenge is to provide the tools, enabling technologies and financial instruments for a new generation of European entrepreneurs to start up and succeed".

³ See European Commission (1998). Moreover, a study (Cognetics, Who's Creating Jobs) showed that the companies quoted on Nasdaq from January 1990 to June 1994 created more than 16% of all new jobs in the U.S. in this period.

Brussels, Frankfurt and Paris Stock Exchanges. This alliance, which was also joined by the Italian “Nuovo Mercato” in 1999, was called “Euro.nm” (where “nm” stands for “new (stock) markets”) and determined the adoption of uniform admission and trading requirements and the possibility for intermediaries to access all of its markets through a common interface. In this way, a common platform was offered to both companies and investors⁴.

The European New Markets had a remarkable success in terms of number of IPOs and funds raised: on the whole, more than 900 companies went public from 1996 to 2001 and the raised capital amounts to about 32 billion euro. These results, although positive, are still far from those achieved by the Nasdaq (in the same period, nearly three times as many companies went public on the Nasdaq, raising nearly twice as much capital) but without doubt the New Markets determined a process of quotation of high-growth firms and favoured the influx of new funds to these firms.

However, due to the unfavourable evolution of financial markets over the last one and half year, all these stock exchanges lost most of the gains accumulated in the previous years. This evolution produced some consequences also in terms of regulations: the German authority - the Deutsche Borse Aktiengesellschaft, Frankfurt am Main (DBAG) - decided before to change the admission and working rules various times and afterwards, also following the various cases of crisis of listed companies, to close the Neuer Markt and to “transfer” all the companies still listed to the “ordinary” Stock Exchange. Other markets, like the Italian Nuovo Mercato, decided instead to adopt new rules aimed to improve liquidity and disclosure of listed companies, in a situation which seems anyway more positive than that of the Neuer Markt.

The creation and development of new markets in Europe also offers the opportunity to analyse an important and innovative factor in the field of the relationship between finance and economic growth: the existence of a complementarity between stock exchanges and risk capital in providing new funds to high-growth firms and in promoting technological innovation.

In fact a large literature, beginning with Schumpeter⁵, emphasized the presence of a positive relationship between the development of a country’s financial sector and the level of growth of its per capita income. This relationship depends on the fact that the financial sector provides some services – of reallocation of capital to the most profitable investment opportunities, with a reduction of the risk of loss originating from moral hazard, adverse selection or transaction costs – which are a fundamental catalyst of economic growth.

Therefore, stock exchanges could represent one of the connection channels between the financial and the real sector, also through venture capital. According to some recent theories⁶, the complementarity between these two components is due to the role of *recycling* played by

⁴ Euro.nm ceased to exist as an alliance in December 2000, also due to important changes in the organization of European stock markets (such as the creation of Euronext) and the competing interest of Euronext and the Deutsche Borse for a merger with the London Stock Exchange. The five members of Euro.nm have however continued operating their “new markets” independently.

⁵ Schumpeter (1912). The author defined the capital as the sum of cash and other forms of money, which is always available to be transferred to some “entrepreneurs”. Therefore, it is simply a question of functionality the way by which a company provides the needed funds, if by issuing new shares or by borrowing. All these kinds of financing have various intermediate forms, and all serve the purpose of collecting funds to purchase new fixed assets or to create “new combinations”.

⁶ See, for example, Black and Gilson (1998) and Michelacci and Suarez (2000).

stock exchanges – particularly those for high-growth firms: they facilitate the exit of venture capital from sufficiently mature firms and its “redirection” towards new start-ups. The basis of this explanation is that some categories of financial intermediaries provide to the financed firms a sort of *informed capital*, represented by a mix of financing, expertise and reputation⁷, which is particularly important for start-ups and firms in early stages of development, because of the strong presence, for this kind of firm, of asymmetrical information and their consequent difficulties in raising funds from the traditional credit or from the public.

The informed capital is however quite rare, and therefore can be addressed only to few projects at the same time, and the presence of efficient, liquid and well-developed stock exchanges, which allow the monitors a quick and profitable exit from the investment, generates a “virtuous circle” in the circulation of risk capital and produces positive effects in terms of development of new businesses and economic growth⁸.

Another element relevant for this analysis is represented by mechanisms and rules which characterize these newly introduced Stock Exchanges. Normally, this regulation must satisfy two different requirements: on the one hand, it must be sufficiently tight in terms of disclosure concerning the listing firms, by allowing the investors (private and institutional) to provide their funds having a quite clear idea of what they are financing; on the other hand, the rules must be flexible in terms of requirements to the firms which are going public, to take their specific characteristics (like lack of profitability for a certain period) into account. With regard to these aspects, a study⁹ found a positive correlation between the opening of tight-disclosure markets and the number of IPOs, and between the tightness of listing requirements and the decision to list by R&D intensive companies.

The object of this paper is therefore to analyse the relationship between the venture capital market and stock exchanges for high-growth firms, with particular attention paid to Germany and Italy, and the characteristics of listed companies on the Neuer Markt and the Nuovo Mercato, to try to detect which factors (and how) can influence the process of creation of new businesses.

The structure of the paper is as follows: in Section II, the institutional aspects concerning the Neuer Markt and the Nuovo Mercato will be analysed, and particularly the regulation of these markets (admission requirements and rules, trading rules) and the attributions of functions to different decisions making authorities (National Securities and Exchange Commissions, Stock Exchanges, etc.). Moreover, recent changes in the regulation (and proposals of changes) will be considered, and these rules will subsequently be compared with those which discipline the “ordinary” stock exchanges in the two countries. This kind of analysis on the one hand will give an idea on the “institutional framework” of the new markets, and on the other will help to clarify what the regulatory aspects which could influence the propensity of firms for becoming public are.

⁷ The monitoring role of special classes of financiers has been emphasized by many authors, including Diamond (1991), Rajan (1992) and Holmstrom and Tirole (1997).

⁸ These aspects will be further deepened in Section III.

⁹ See Kukies (2000).

Section III deals with the main concepts of the existing literature concerning the role of venture capital, the reasons behind the possible complementarity between “informed capital” and stock exchanges for high-growth firms, and the role of institutional investors in promoting technological innovation. It also refers to the empirical results of studies on these subjects and on new markets.

In Section IV, an empirical analysis concerning some of the aspects previously described will be developed. In particular, the first part of the empirical section concerns the analysis of the size of venture capital market¹⁰ and of stock exchanges for high-growth firms in Europe and in the U.S., with particular attention paid to Germany and Italy. Moreover, the analysis concerns the presence of institutional investors in the capital of listing firms on the Neuer Markt and on the Nuovo Mercato, the existence of different ownership structures depending on the presence of this kind of investors and the proportion of exit at the moment of the IPO¹¹. Other elements under study concern some financial and strategic variables (like Revenues, Financial Debt, Capital Expenditures) of the listed firms in the years before and after the IPO. The goal of this subsection is to give a general description of the characteristics of the firms which became public in the two markets and to verify if there are some differences, in terms of growth, propensity to the investment, financial structure, size and profitability, between firms financed by institutional investors in risk capital and others which use different internal or external sources of financing¹².

Finally, Section V contains the main conclusions.

II. Main characteristics of the New Markets and institutional profiles of the Neuer Markt and the Nuovo Mercato

Some summary statistics concerning the biggest Stock Exchanges which constituted the Euro.nm (Neuer Markt, Nuovo Mercato and Nouveau Marché) are reported in Table 1: in these three stock markets almost 600 companies went public between the beginning of 1996 and the end of 2001, with a market capitalisation which accounts, at the end of 2001, for almost 80 billion euro and a total amount of funds raised equal to 29 billion euro. The median capital raised for IPO varies between 11 million euro (Nouveau Marché) and 41 million euro (Nuovo Mercato), and the percentage of the total IPOs which comes from an increase of capital is higher than 80%. The median age of companies at the time of the IPO varies between 7 years and 13 years; this indicates that the quotations in these markets do not involve only start-ups. The Stock Exchange with the “oldest” firms is the Nuovo Mercato, where IPO firms have a median age almost double those of the Nouveau Marché. Finally, the number of dual listings and cross listings is quite limited and concerns especially the Neuer Markt.

Another important aspect concerns the regulation of these markets, in terms of admission requirements, working rules and attribution of functions to different authorities. These elements were analysed with regard to the Neuer Markt and the Nuovo Mercato, which are

¹⁰ Source: European Venture Capital Association (EVCA) and Aifi.

¹¹ Data concerning these aspects are taken from the databases of the two stock exchanges or, if necessary, from the prospectuses of admission.

¹² These data are taken from the database Worldscope.

also object of the analysis concerning financial and strategic characteristics of listed companies¹³. The admission requirements of the two markets are quite similar: in fact, the requirements of each Stock Exchange participating in the Euro.nm had to comply with rules and regulations established by a Market Harmonization Agreement signed by Euro.nm members. This agreement defined the minimum standards to be adopted by each member of the grouping, and it concerns listing requirements for issuers, membership, and market rules. The requirements for the two New Markets appear relatively strict, also compared to those established for the correspondent “traditional” markets in Germany and in Italy. For both the Neuer Markt and the Nuovo Mercato some minimum requirements have to be met, in terms of level of equity before the IPO (equal to 1.5 million euro and recently increased to 3 million euro), amount of the offering (at least 5 million euro), number of publicly traded shares (100,000) and percentage of equity offered to the public (25% advised for the Neuer Markt and recently increased to 30% - from 20% - for the Nuovo Mercato), whereas these elements are not always indicated for the correspondent traditional stock markets¹⁴. Moreover, in the two new markets a minimum percentage of the IPO has to come from the increase of capital (50% in both cases); whereas this indication is absent in the correspondent ordinary markets (this requirement is determined by the purpose to favour quotations finalised to provide new funds and not to sell shares by existing shareholders). Also the requirement of a “lock-up period” (period after IPO during which the existing shareholders cannot sell their shares) is a characteristic only of the new markets: it is established for 6 months and for 100% of the shares owned by each shareholders in the Neuer Markt and for 1 year and 80% of the shares owned by some categories of shareholders in the Nuovo Mercato.

Table 1

SUMMARY STATISTICS OF MAIN EURO.NM STOCK EXCHANGES AND OF THE NASDAQ⁽¹⁾
(End of 2001)

	Nasdaq	Neuer Markt	Nuovo Mercato	Nouveau Marche'
Number of IPOs	4.876	356	45	176
Listed firms	4.109	326	45	164
Market capitalisation	3.289.459	49.933	14.801	15.011
Market capitalisation/GDP	24,5%	2,4%	1,2%	1,0%
Total funds raised ⁽²⁾	332.876	21.611	4.042	2.966
Capital raised at IPO ⁽³⁾	na	34,4	41,4	10,6
Proportion of IPO from capital increase	na	80,5%	92,8%	85,1%
Age at IPO (months)	na	103	157	81
Number of dual listings	na	24	2	12
Number of cross listings	na	45	0	6

Source: Statistics of different Stock Exchanges. ⁽¹⁾ Financial indicators expressed in million of euro. Reported statistics are median values.

⁽²⁾ Since 1990 for Nasdaq and since the opening of the market for other Stock Exchanges. ⁽³⁾ Median values referring to a single IPO.

¹³ See Section IV.

¹⁴ The requirements of the Regulated Market within the Frankfurt Stock Exchange only indicate a minimum level of equity (730,000 euros) and a minimum number of publicly traded shares (10,000), both less strict than the correspondent requirements of the Neuer Markt. The admission requirements of the MTA (Mercato Telematico Azionario) in Italy only establish a minimum amount of the IPO (the same as for the Nuovo Mercato) and a minimum percentage of equity sold to the public (25% instead of the 30% which refers to the Nuovo Mercato).

In both of the new markets the sponsor was introduced: this figure - present also in the correspondent ordinary Stock Exchanges of the two countries - is represented by a financial intermediary (normally an investment bank or a security firm), which has the function of analysing the firm before flotation, elaborating the prospectus, transmitting to the public and to the regulatory authorities information concerning the company and guaranteeing the “quality” of this information. In the Nuovo Mercato all the listed firms have to indicate at least one sponsor, in the Neuer Markt at least two¹⁵.

The new markets have instead quite flexible requirements in terms of profitability and “history” of firms: in both cases, no minimum level of revenues, total assets and operative income are required, but only a generic ability to generate revenues in a situation of “autonomy” of management. Moreover, only a minimum life of 3 years is required (in both markets) but the firm could be exonerated from this condition in some particular cases. Also for ordinary German and Italian Stock Exchanges no minimum level of income or assets are required for the previous years¹⁶, and they must indicate simply a generic ability to produce revenues. The Neuer Markt and the Nuovo Mercato have less requirements than the traditional markets in terms of number of annual financial statements published and eventually certified: in both cases only the last annual financial statement is required (in the Italian market it also has to be certified), whereas in the respective ordinary markets the listed firms have to provide the annual financial statements (published and certified) of the previous three years. Differences with the ordinary Stock Exchanges with regard to these aspects, in Italy, also concern the possibility for a company listing on the Nuovo Mercato to produce a financial statement for a period lower than one year, in case of start-ups.

Finally, in the two new markets there is a tight disclosure after the IPO: quarterly reports, whereas in the traditional markets semi-annual reports are required.

The admission requirements of the Neuer Markt and the Nuovo Mercato seem, in synthesis, relatively tight compared with those which characterize the German and Italian ordinary Stock Exchanges, with the exception of requirements and disclosure “ex-ante” concerning, in particular, the life of the firm and the number (and the length of the reference period) of financial statements required. Moreover, the regulation of the Neuer Markt appears stricter than that of the Nuovo Mercato with references to some aspects: the presence of two sponsors instead of one, the limitation of the IPOs to the ordinary shares and the compliance with International Accounting Standards (or U.S. GAAP).

In terms of attribution of functions concerning these Stock Exchanges to different regulatory authorities, whereas in Germany the decisions regarding the admission, the suspension and the revocation of listing and those related to the approbation of the prospectus are attributed to the same institution (the Executive Board of the DBAG), in Italy they are the responsibility of different institutions: Borsa Italiana spa decides on admission and revocation of listed firms as well as on organization and management of the Stock Exchange, whereas CONSOB (the Italian Securities and Exchange Commission) has the responsibility of approving the

¹⁵ The requirement in both the “ordinary” markets in Germany and Italy is to have at least one sponsor.

¹⁶ The Italian Stock Exchange eliminated this requirement some years ago, where previously a positive level of net income and operating income in the 3 years before the IPO was required.

prospectus and establishing the secondary regulation concerning organised markets, intermediaries and listed firms.

III. The complementarity between the “informed” risk capital and stock exchanges for high-growth firms: theoretical issues

The New Markets essentially play the role of providing high-growth firms with the funds which they need to finance their activity. The problem of obtaining new capital is particularly important for start-ups or firms in their earlier stages of development because they are normally characterized by a low (or absent) level of profitability and a high level of informational asymmetries. In fact, because of these firms being normally very young and innovative, it is very difficult for investors to distinguish between those of good and poor quality, and therefore the costs of going public could become very high.

In this situation, the existence of a long-term relationship with a venture capitalist or another financial intermediary, able to provide its informed capital, could have special value¹⁷. Some evidence of the existence of this informed capital is given by the role of certification played by venture capitalists in Initial Public Offerings: a comparison of venture capital-backed IPOs¹⁸ with a control sample of non venture capital-backed IPOs from 1983 to 1987, matched by industry and offering size, found that the presence of venture capitalists significantly reduces the mean and median degree of underpricing and the underwriting spread charged by the investment banker handling the issue¹⁹. The same analysis shows that venture capitalists maintain most of their stakes in the listed company after the IPO, consistently with their function of certification. It seems plausible that this kind of role, highlighted for venture capitalists, could be played also by other financial intermediaries, like investment banks or closed-end funds or investment companies, characterized by a tight relationship with the financed firm and therefore having the same goals as venture capitalists.

Another aspect connected to the role of venture capital as provider of informed capital concerns the relationship between venture capital financing and the level of technological innovation: a study referring to the twenty industries of the U.S. manufacturing sector over the period 1965-95 found that venture capital funding has a strong impact on the number of patented innovations²⁰: a dollar of Research and Development financed by venture capital appears to be about three times more potent in stimulating patenting than a dollar of traditional corporate R&D²¹. There are two possible explanations regarding this evidence: the first is an ex-ante factor, connected to the efficiency of the process by which venture

¹⁷ See Kortum and Lerner (2000) and Petersen and Rajan (1994) for an analysis respectively on the role of venture capitalists and of banks.

¹⁸ Initial Public Offerings concerning companies in which venture capitalists participate.

¹⁹ Megginson and Weiss (1991).

²⁰ See Kortum and Lerner (2000).

²¹ On the basis of these estimates, venture capital, even if it accounted for less than 3% of corporate R&D from 1983 to 1992, determined a much larger percentage - about 8% - of U.S. industrial innovation in that decade. Moreover, given the rapid increase of venture funding since 1992, and assuming that this positive effect of venture capital has remained constant, by 1998 VC would have accounted for about 14% of U.S. innovative activity.

capitalists choose the projects to finance; the second is ex-post, and concerns the function of monitoring and control played by venture capitalists after the investment is made.

The informed capital, provided by venture capitalists or by other financial intermediaries, is however in limited supply, particularly for two reasons:

- monitoring skills of intermediaries are scarce, since they relate to experience which is hard to accumulate;
- the intermediary could find some difficulties to provide new funds²².

For these reasons, the existence of mechanisms, which allow the intermediary to exit from the investment, would determine the possibility of recycling the informed capital and to redirect it towards new investment opportunities. In this way, a sort of *multiplier* of informed capital is created²³. The mechanism of exit serves two different functions²⁴:

- the combination of services offered by informed capital loses its efficiency advantages when the financed company matures. Therefore, the possibility of exit is jointly efficient for both the entrepreneur and the venture capitalist.
- exit facilitates the determination of an implicit contract between venture capital managers and providers of capital to the former, under which the latter could use the disinvestment price as a reliable measure of the venture capital manager's skills and reinvest the funds they obtain in the future limited partnership of most successful venture capital managers.

Among the different mechanisms of exit, an IPO is particularly efficient because it also allows the creation of an implicit contract between the entrepreneur and the venture capital fund, in which the venture capitalist agrees to return control to a successful entrepreneur by exiting through the IPO. This kind of contract cannot be easily replicated in a market where the stock exchange is not sufficiently developed²⁵. On the basis of these factors, the presence of a well-developed stock exchange for high-growth firms would represent a decisive element for the creation of a wide venture capital market. This complementary role would therefore be based on the existence of two couples of explicit and implicit contracts, the first between the outside investors and the venture capitalist and the second between the venture capitalist and the entrepreneur²⁶, and on the mechanism of recycling of informed capital which makes funds available for the financing of new investment opportunities.

At a certain point in its activity, a venture-backed firm has to decide if to continue to stay private, paying some rents to the informed capital, or do an IPO paying the cost of going public. It was found that when the sharing of the surplus of the relationship between the two parties is near to the level of efficiency, the rental price of informed capital increases and so

²² Gompers and Lerner (1998) found that past performance and reputation are the most important determinants of venture capital fundraising, whereas for Holmstrom and Tirole (1997) monitors' limited supply of funds stems from wealth constraints.

²³ See Michelacci and Suarez (2000). They argue that there are two channels by which changes in fundamentals affect the multiplier and hence the rate of business creation. The first is profitability, which acts through the entrepreneurs' incentives to develop new projects and accelerates the matching between entrepreneurs and informed capital. The second is recycling.

²⁴ See Black and Gilson (1998).

²⁵ *Ibidem*.

²⁶ Where the explicit contracts are represented, respectively, by the investment of providers of capital in venture capital funds and by the investment of venture capital in the financed firm.

too does the incentive for the company to become public²⁷. Moreover, this rental price is positively related to the number of entrepreneurs which seek financial support. Therefore, when the environment is more favourable to entrepreneurship, the rental price will increase and so too the incentives to go public. As a consequence of this, in phases of economic growth the size of the stock markets for young and fast growing companies endogenously increases.

These elements have different implications: in the first place, the size of a stock market for high-growth firms can become an indicator of the level of efficiency of an economy; moreover, in presence of technological and liquidity externalities there is the rationale for a public intervention of promotion of stock markets for high-growth firms. In particular, this intervention would be appropriate for industries in which the scarcity of informed capital could produce the presence of “bottle necks” and for market segments where the lack of a critical mass of similar listed firm could determine an increase of the costs of the flotation.

On the basis of the above described factors, a new relationship emerges between finance and growth based on the complementarity between venture capital and stock exchanges for young growing firms. In a situation of high rate of technological progress, this mechanism would determine an incentive for start-ups to go public and then the emergence of a stock market for young companies. In turn, the development of this market would stimulate the business creation by accelerating the recycling process. This mechanism would determine a virtuous circle able to produce an increase in technological innovation and economic growth.

Some evidence of the complementarity between exit by initial public offering and venture capital are found in the U.S. market²⁸: by analysing the venture capital-backed IPOs and the parallel development of venture capital from 1978 to 1996, a graphical correlation between the availability of exit through IPO and investor willingness to invest in venture capital (measured by new capital commitments with a one-year lag with regard to the IPO) is noticed. This correlation²⁹ is consistent with the theory regarding the link between the stock market and the venture capital market.

Another study analysed the role of venture capital in Europe in the financing of innovative companies³⁰, where companies listed on the Stock Exchanges belonging to Euro.nm are considered. It found that VC does help European innovative companies by providing them with financing crucial in their phase of growth. However, companies financed by venture capitalists don't seem to grow more than non venture-backed companies, in terms of sales, new employment and stock performances. This last evidence is due, according to the authors, to the “immaturity” of European venture capital, i.e. to its partial inability to choose the most dynamic, growing and profitable firms.

The last but not least important issue related to the presence of equity markets for high growth firms concerns the determinants of the choice of becoming public and consequently the role of these Stock Exchanges. A study of the listed firms on the three biggest Stock Exchanges

²⁷ See Michelacci and Suarez (2000).

²⁸ See Black and Gilson (1998).

²⁹ The graphical correlation is confirmed by a simple regression of capital contributions in year X+1 (as a dependent variable) against the number of venture-capital-backed IPOs in year X. *Ibidem*.

³⁰ See Bottazzi and Da Rin (2002a).

participating in Euro.nm³¹, from the start of each market until the end of 2001, found that these firms after the quotation considerably increased (although at a different rate within each market) their size – measured by Total assets and Net sales –, their level of debt (but reduced the Leverage ratio) and the amount of Investment (as measured by Capital expenditures in fixed assets and by the charges for research and development)³². Moreover, it noticed the existence of differences between markets, in terms of characteristics of the listed firms and evolution after the quotation. In particular, the firms listed on the Neuer Markt and on the Nuovo Mercato appear larger than the companies present in the Nouveau Marché, and they grow more after the quotation. Moreover, after the first 2 years of life of the Neuer Markt the quotations have concerned companies smaller and nearer to a phase of start-up, whereas the characteristics of the listed companies on the Nouveau Marché did not change very much during the years.

IV. Analysis of the cases of the Neuer Markt and the Nuovo Mercato

The object of this section is to analyse, with regard to the U.S. and Europe and with particular attention paid to Germany and Italy, the role of venture capital and the relationship between its level of development in a country and the existence of a well-developed equity market for high-growing firms. Moreover, some financial and strategic indicators of the listed firms on the Neuer Markt and the Nuovo Mercato are considered; this evidence allows one to identify the main characteristics of the companies going public and the eventual differences between companies listed in the two markets, and within each market, between venture capital-backed and non venture capital-backed companies.

IV.1 Size of venture capital markets in Europe and in the U.S. and their relationships with the size of Stock Exchanges

Table 2 reports, for Europe and the U.S., the amount of investments of venture capital from 1996 to 2001. The VC investments are split into “pure” VC investments, which concern the financing of the firm growth (at an early stage or at a later stage) and investments in buy-out and replacement capital, aimed to acquire the majority (or the totality) of a firm or to carry out the reorganisation of the ownership structure³³.

With references to the first category of investment, which is the most important for the object of this study, in Europe since the inception of the so-called new markets a remarkable growth occurred: VC investments increased of almost three times from the end of 1996 to the end of 2001, and the growth rate was even of 450% at the end of 2000. Despite this remarkable growth rate, European venture capital market grew less than the U.S. market in the same period: VC investments in the United States increased of more than 400% (1250% at the end

³¹ Neuer Markt, Nouveau Marché and Nuovo Mercato.

³² See Bottazzi and Da Rin (2002b). The authors compared the median of some financial and strategic variables in the 3 years before the quotation and after the quotation.

³³ This distinction is particularly important because of the different definition of venture capital in Europe and in the U.S.: in fact, whereas in Europe statistics on VC investments also comprehend those in buy-out, in the U.S. these two categories of investments are separated.

of 2000). This evidence seems to show that there is still a big potential for growth in the European venture capital market.

In table 3 the different sources of new VC funds in the two geographical areas are represented: the most important sources of funds for the European VC industry are banks and insurance companies, whereas in the U.S. are pension funds. Moreover, in the U.S. the share of funds coming from banks and insurances strongly increased from 1996 to 2001, contributing to the huge growth of the market in 1999 and 2000, whereas in Europe the weight of pension funds was almost stable during the period, varying between 20% and 25%. By comparing the data referring to the two areas, it seems that one of the most important reasons of the lower size and of the slower development of European VC market can just consist in the smaller contribution of pension funds. Also the share of private investors and endowments and foundations is relevant in the U.S., and higher than in Europe.

Table 2

**DISTRIBUTION OF VC INVESTMENTS
IN EUROPE AND IN THE U.S. BY STAGE (1996-2001)**

	1996	1997	1998	1999	2000	2001
Europe						
Early stage	12,1%	14,8%	23,3%	27,0%	32,3%	31,3%
Expansion	74,6%	70,0%	61,3%	64,0%	63,1%	59,7%
Later stage	13,2%	15,2%	15,3%	9,0%	4,6%	9,0%
<i>Total of "pure" VC Investment</i> ⁽¹⁾	3.638	4.828	7.071	12.371	20.351	13.400
<i>Investment in Buy-out</i> ⁽¹⁾	3.150	4.838	7.404	12.745	14.259	10.900
United States						
Early stage	38,0%	26,0%	31,1%	24,0%	23,7%	21,8%
Expansion	37,0%	47,0%	62,2%	53,0%	55,7%	55,2%
Later stage	25,0%	27,0%	6,7%	23,0%	20,6%	23,0%
<i>Total of "pure" VC Investment</i> ⁽¹⁾	7.932	10.718	13.407	54.012	106.931	41.857
<i>Investment in Buy-out</i> ⁽¹⁾⁽²⁾	31.558	54.237	65.294	77.821	93.090	64.129

Source: Aifi, EVCA and NVCA.⁽¹⁾ Million of euro. ⁽²⁾ Funds raised by buy-out and mezzanine funds.

Table 3

**SOURCES OF NEW FUNDS RAISED FOR VENTURE CAPITAL
IN EUROPE AND IN THE U.S. (1996-2001)**
(percentage of total funds raised)

	1996	1997	1998	1999	2000	2001
Europe						
- Pension funds	22,7%	25,0%	24,0%	20,1%	24,2%	25,6%
- Corporations	3,5%	11,3%	9,8%	10,3%	10,9%	5,6%
- Banks and insurance companies	41,1%	42,2%	36,7%	45,6%	34,6%	34,9%
- Government agencies	2,3%	2,2%	5,1%	5,1%	5,6%	5,7%
- Private investors	7,4%	4,0%	7,6%	6,6%	7,4%	6,4%
- Funds of funds	na	na	na	4,3%	11,4%	11,2%
- Realized capital gains	15,8%	6,9%	8,8%	na	na	4,7%
- Others	7,2%	8,4%	8,0%	8,0%	5,9%	5,9%
United States						
- Pension funds	54,8%	38,0%	60,0%	45,0%	40,0%	na
- Corporations	18,9%	24,0%	12,0%	14,2%	4,0%	na
- Banks and insurances	2,9%	6,0%	10,0%	15,5%	23,0%	na
- Private investors	6,5%	12,0%	11,0%	8,8%	12,0%	na
- Endowments and foundations	11,3%	16,0%	6,0%	16,0%	21,0%	na
- Others	5,6%	4,0%	1,0%	0,5%	0,0%	na

Source: Aifi and NVCA.

Table 4 reports, for different European countries and for the U.S., the weight on the GDP on the one hand of new VC funds raised and of VC investments, and on the other hand of the market capitalization of stock exchanges existing in that country. The correlation between the first two variables and the third one is positive and quite high, to indicate that there is a strong relationship between the presence of a big stock exchange and a developed venture capital industry. With regard to the country data, the U.K. is the one with the highest weight of venture capital investments and funds raised on GDP; the United States show very similar data, especially thanks to the growth of 1999 and 2000, whereas in Europe also Sweden presents high ratios (and a relevant growth between 1998 and 2000). Germany and Italy have very similar data: in both these countries the weight of the venture capital market on GDP grew from 1998 to 2000, but it is still very low if compared with that of the U.K. or the U.S.

Table 4

NEW FUNDS RAISED, INVESTMENTS OF VENTURE CAPITAL AND MARKET CAPITALIZATION
IN PERCENTAGE OF GDP (EUROPE AND THE U.S., 1998-2000)

Country	New VC funds raised/GDP (1)			Investments of VC/GDP (2)			Market Capitalization ⁽¹⁾ /GDP (3)		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
United States	0,3%	0,6%	0,9%	0,2%	0,6%	1,0%	148,6%	180,8%	152,7%
United Kingdom	0,7%	0,7%	1,2%	0,6%	0,8%	0,9%	171,0%	198,3%	184,3%
Germany	0,1%	0,2%	0,3%	0,1%	0,2%	0,2%	50,9%	72,1%	67,8%
France	0,3%	0,3%	0,5%	0,1%	0,2%	0,4%	67,8%	111,1%	111,7%
Italy	0,1%	0,2%	0,3%	0,1%	0,2%	0,3%	48,3%	66,1%	71,5%
Sweden	0,5%	0,4%	1,5%	0,1%	0,5%	1,0%	123,1%	156,4%	144,5%
Netherlands	0,3%	0,3%	0,7%	0,3%	0,5%	0,5%	158,7%	187,7%	173,5%
Spain	0,1%	0,1%	0,3%	0,1%	0,1%	0,2%	72,3%	77,0%	90,3%
Norway	0,3%	0,1%	0,3%	0,1%	0,2%	0,2%	31,7%	41,6%	41,3%
Belgium	0,2%	0,3%	0,3%	0,1%	0,3%	0,2%	97,7%	78,8%	80,5%
Finland	0,3%	0,5%	0,4%	0,2%	0,2%	0,3%	121,6%	288,7%	242,1%
Switzerland	0,1%	0,2%	0,4%	0,1%	0,2%	0,2%	265,3%	267,5%	328,4%
Ireland	0,2%	0,4%	0,2%	0,1%	0,1%	0,2%	67,4%	58,1%	85,9%
Austria	0,1%	0,1%	0,1%	0,0%	0,0%	0,1%	16,8%	16,9%	15,8%
Greece	0,1%	0,1%	0,3%	0,0%	0,1%	0,2%	66,4%	157,4%	96,0%
Portugal	0,0%	0,1%	0,1%	0,1%	0,1%	0,2%	58,5%	58,5%	57,8%
Danmark	0,0%	0,1%	0,5%	0,0%	0,1%	0,2%	56,8%	60,5%	68,9%
<i>Correlation coefficient between (1) and (3)</i>			<i>Correlation coefficient between (2) and (3)</i>						
1998	<i>0,40</i>		1998	<i>0,49</i>					
1999	<i>0,59</i>		1999	<i>0,47</i>					
2000	<i>0,39</i>		2000	<i>0,37</i>					

Source: EVCA, Venture Economics and Aifi. ⁽¹⁾ Main and parallel markets.

IV.2 Venture capital and stock exchanges for high-growth firms in Germany and Italy

As previously described, venture capital and stock exchanges for high-growth firms could be complementary through the existence of a mechanism of recycling of capital according to which the capital freed by the IPO could be redirected towards new investment opportunities. This aspect could be examined by looking at the parallel evolution of the IPOs and of venture capital in Germany and Italy. The analysis relative to the German market is contained in Table 5 and in Graph 1: from the beginning of 1997, the year of birth of the Neuer Markt, to

2001 the new VC funds raised increased at an annual rate of 62%, whereas they decreased at a rate of 21% per annum from 1992 to 1996. Also the venture capital investment remarkably grew in the same period, at an annual rate of 45% (6% on average for the previous four years). The evolution of the VC market is therefore consistent with the presence of a “virtuous circle” between VC and IPOs, previously described: in this regard, about the half of IPOs on the Neuer Markt in the period 1997-2000 concerned firms in which venture capitalists or other institutional investors in risk capital owned stakes³⁴.

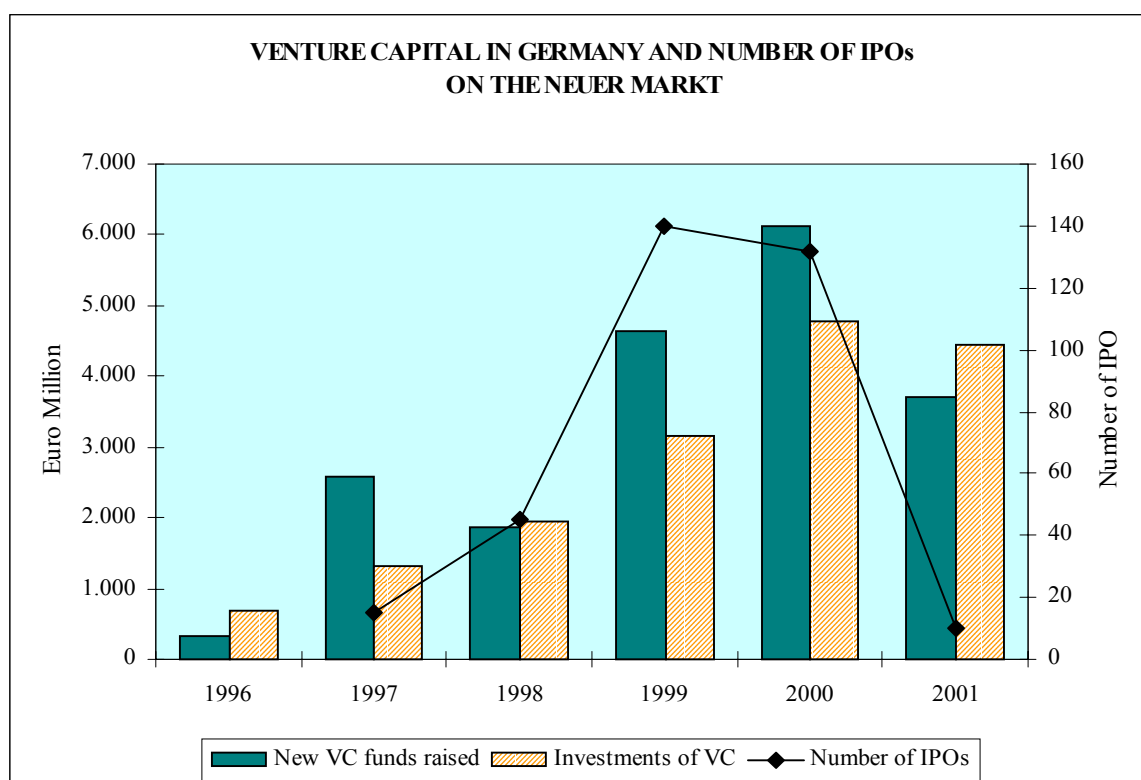
Table 5

VENTURE CAPITAL MARKET IN GERMANY AND IPOs ON THE NEUER MARKT

	1996	1997	1998	1999	2000	2001
Portfolio of VC at cost⁽¹⁾	3.373	3.941	na	na	11.478	15.844
New VC funds raised⁽¹⁾	330	2.573	1.875	4.630	6114	3713
- Annual growth rate	65,0%	679,7%	-27,1%	146,9%	32,1%	-39,3%
- Annual avg. growth rate (1992-1996) ⁽²⁾	-21,2%					
- Annual avg. growth rate (1997-2001) ⁽²⁾	62,3%					
Investments of VC⁽¹⁾	695	1.326	1.948	3.159	4769	4435
- Annual growth rate	9,6%	90,8%	46,9%	62,2%	51,0%	-7,0%
- Annual avg. growth rate (1992-1996) ⁽²⁾	6,0%					
- Annual avg. growth rate (1997-2001) ⁽²⁾	44,9%					
Number of IPOs on the Neuer Markt		15	45	140	132	10

Source: Aifi and EVCA⁽¹⁾ Million of euro⁽²⁾ Geometrical mean

Graph 1



³⁴ See Section IV.3.

Moreover, Table 6 shows the distribution of VC investment by stages of life of the firm: since 1996, investments in the earlier phases of development increased from 13% to 26% of the total investments (35% at the end of 2000), whereas investments in expansion decreased and those in buyout and replacement capital increased to 39% (after a fall in 1999 and 2000). Therefore, after the introduction of the Neuer Markt there was an increase of the proportion of venture capital funds destined to finance the earlier phases of development.

Table 6

DISTRIBUTION OF VC INVESTMENTS IN GERMANY BY STAGE (1996-2001)

	1996	1997	1998	1999	2000	2001
Seed	5,0%	4,6%	6,2%	6,1%	8,2%	3,9%
Start-up	8,3%	10,5%	17,7%	25,6%	26,5%	22,1%
Expansion	65,6%	49,0%	43,4%	50,1%	44,9%	35,1%
Buyout and replacement capital	21,1%	35,9%	32,7%	18,2%	20,4%	39,0%
<i>Total</i> ⁽¹⁾	695	1326	1948	3159	4769	4435

Source: Aifi and EVCA. ⁽¹⁾ Million of euro.

A similar evolution – although less relevant, also because of the more recent date of birth of the Nuovo Mercato – occurred in the Italian market: the Nuovo Mercato was introduced in 1999, and in that year new raised funds and investments respectively increased by 110% and 91%, when compared to the previous year (compared to an average annual growth rate respectively of 19% and 14% in the previous 6 years), continuing their growth also in 2000 (Table 7 and Graph 2). Moreover, by comparing the annual growth rates before and after the introduction of the Nuovo Mercato, the growth of new VC funds raised is quite stable (essentially because of the fall in 2001), whereas that of VC investments increased (from 14% to 33%).

Table 7

VENTURE CAPITAL MARKET IN ITALY AND IPOs ON THE NUOVO MERCATO

	1996	1997	1998	1999	2000	2001
Portfolio of VC at cost ⁽¹⁾	1.405	1.813	2.415	3.618	6.122	na
New VC funds raised ⁽¹⁾	738	1.072	1.052	2.207	2.925	1.875
- Annual growth rate	153,6%	45,3%	-1,9%	109,9%	32,5%	-35,9%
- Annual avg. growth rate (1992-1998) ⁽²⁾	19,2%					
- Annual avg. growth rate (1999-2001) ⁽²⁾	21,3%					
Investments of VC ⁽¹⁾	517	603	933	1.779	2.969	2.185
- Annual growth rate	85,3%	16,6%	54,7%	90,7%	66,9%	-26,4%
- Annual avg. growth rate (1992-1998) ⁽²⁾	14,2%					
- Annual avg. growth rate (1999-2001) ⁽²⁾	32,8%					
Number of IPOs on the Nuovo Mercato				6	34	5

Source: Aifi. ⁽¹⁾ Million of euro. ⁽²⁾ Geometrical mean.

Also in Italy, but still less strongly than in the German market, there was a rebalance of VC investments towards the earlier phases of development of firms: the share of total investments destined to seed and start-up financing increased from 9% to 13% in the period 1996-2001 (Table 8). Moreover, the evolution of VC investments in high-tech firms (on the total VC investments) is described in Table 9: it increased, in the period 1996-2001, from 2% to 46% in terms of invested amount and from 6% to 51% in terms of number of operations.

Graph 2

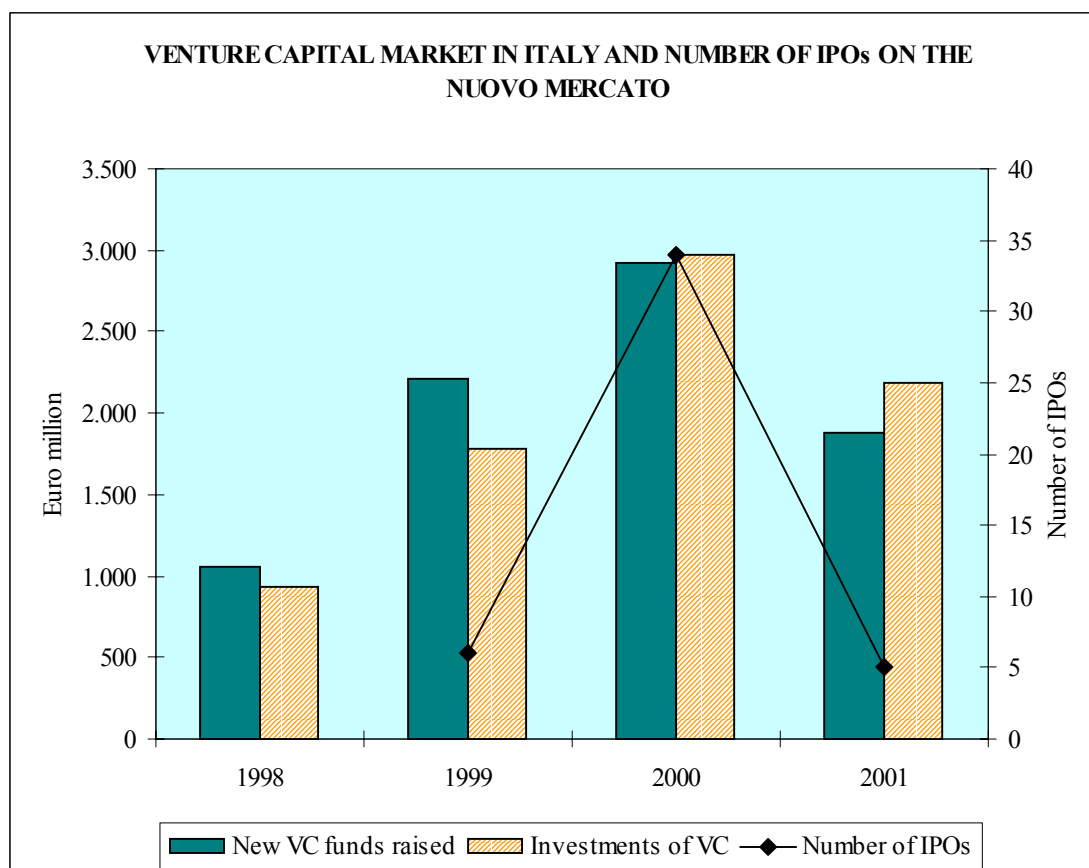


Table 8

DISTRIBUTION OF VC INVESTMENTS IN ITALY BY STAGE (1996-2001)

	1996	1997	1998	1999	2000	2001
Seed/Start-up	8,9%	12,3%	11,1%	8,3%	18,2%	13,2%
Expansion	43,4%	26,4%	32,1%	20,3%	32,6%	34,3%
Buyout and replacem. capital	47,7%	61,4%	41,5%	56,0%	49,3%	52,5%
Other ⁽¹⁾	na	na	15,3%	15,4%	na	na
<i>Total</i> ⁽²⁾	517	603	933	1.779	2.969	2.185

Source: Aifi. ⁽¹⁾ Venture and other purchase of quoted shares. ⁽²⁾ Million of euro.

Table 9

VC INVESTMENTS IN HIGH-TECH FIRMS IN ITALY
(on total VC investments)

	1996	1997	1998	1999	2000	2001
Amount	2%	7%	11%	18%	23%	46%
Number of operations	6%	9%	15%	30%	51%	51%

Source: Aifi.

IV.3 Ownership structure of listed companies before and after the IPO

The analysis contained in this section concerns the ownership structure of listed companies on the Neuer Markt and on the Nuovo Mercato before and after the IPO, in particular with regard to the presence and the role of institutional investors in risk capital. The decision to consider in a single category all these kinds of investors (venture capitalists, private equity firms, investment companies) and not only the venture capitalists, depends on the consideration that the goals of all these financial investors are similar: to put their money in the capital of the company to finance its growth and obtain after some years (normally 4 or 5) a high return from the investment. Therefore, in the category Institutional investors all the investments of financial intermediaries realized with goals different from the strategic ones (i.e. to participate in the management of the company) are included.

Graphs 3 and 4 show the ownership structure of the companies listed on the Neuer Markt before and after the IPO³⁵. The most important category of shareholders is constituted by the founders of the company, with an average stake of about 34% before the quotation and 25% after. The management and the employees of the company³⁶ account for about 23% and 17% respectively, whereas the other shareholders (normally constituted by individuals or companies which have an important stake in the listed firm and often control it alone or together with the founders) own 20% and 15% before and after the IPO. The stake of institutional investors is the fourth in size: they account on average for about 16% and 10% of the capital before and after the quotation.

No one of these shareholders sell a big part of their stake at the moment of the IPO: if the dilution generated by the increase of capital is taken into account (the free float after the IPO is on average 32% and it is largely constituted by the increase of capital, see table 1) it appears that variations depending on the sale of shares are really marginal. These data seem to reveal, in particular for institutional investors but also for other categories of shareholders³⁷, a role of “certification” of the quality of the firm: in fact, by maintaining the most part of their

³⁵ The analysis concerned 310 companies. See also tables A.1 and A.2 in the Appendix.

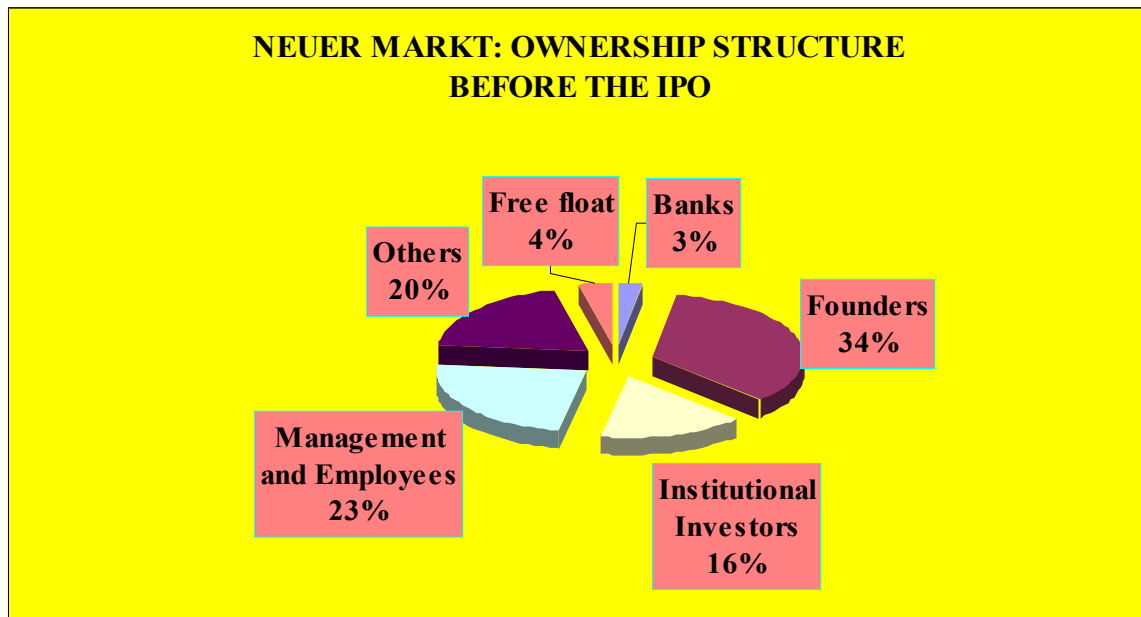
³⁶ This category also comprehends the members of the Supervisory Board.

³⁷ In fact, the goal of institutional investors is to disinvest their participation after a few years, so as to obtain a capital gain, and the IPO is probably the ideal moment to do it. However, even if institutional investors are the category of shareholders which sell most (together with banks in Germany), they retain in any case about 80% of their stake before the IPO.

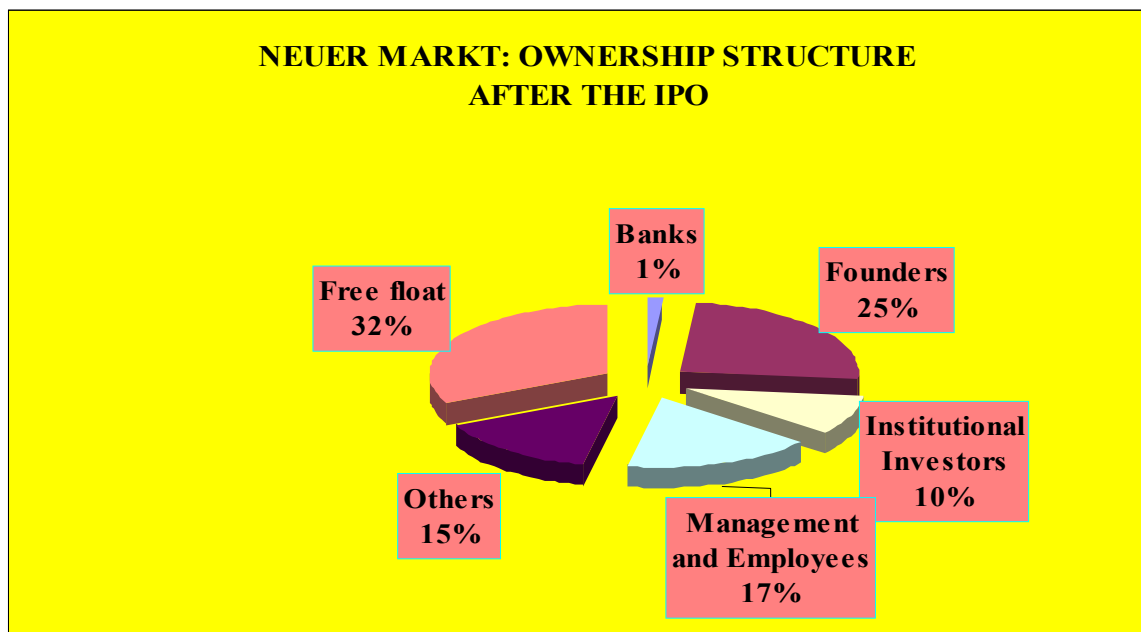
stake, the shareholders signal to the market that their perception about the future evolution of firm profitability and market value is positive³⁸.

In any case, institutional investors sell about one fifth of their share at the time of the IPO, more than institutional investors had sold in the IPOs on the U.S. market in the '80s. Moreover, Founders and Managers sell less than other categories of shareholders, so that they also “use” the IPO as a way of consolidating control, thanks to the presence of more “small” shareholders after the offering³⁹.

Graph 3



Graph 4



³⁸ Another reason is that venture capitalists believe their reputation will benefit from a positive evolution – after the IPO – of the market price of the financed firm.

³⁹ A similar evidence is found in another study concerning companies listed on the Neuer Markt. See Fischer (2000).

The companies with institutional investors as shareholders (before the IPO) are 154, equal to the 51% of the companies analysed (see table A.2 in the Appendix); the average number of institutional investors is slightly more than 2, and their average stake is 30% before the IPO and 19% after. In table 10, the ownership structures (before and after the IPO) of companies with and without institutional investors as shareholders are compared: an interesting aspect is that, whereas for the companies without institutional investors in the capital the most important category of shareholders is constituted by the founders, who maintain an important share also after the IPO and often control the company together with other shareholders (normally individuals); for the companies with institutional investors the second most important category (after the institutional investors themselves) is represented by managers and employees, who have an higher percentage of stakes in this second kind of company, whereas the other two relevant categories (Founders and Others) own a lower share, in comparison with the other group of firms. Obviously, it would be interesting to analyse the evolution of the ownership structure later on, to check when institutional investors and other types of shareholders sell their share.

Table 10

OWNERSHIP STRUCTURE IN THE NEUER MARKT: COMPARISON BETWEEN VENTURE-BACKED AND NON VENTURE-BACKED IPOs (1997-2000)⁽¹⁾

	Ante IPO		Post IPO	
	Venture-backed companies	Non venture-backed companies	Venture-backed companies	Non venture-backed companies
Banks	2,8	2,5	1,2	1,5
Founders ⁽²⁾	24,9	45,2	18,1	32,1
Institutional investors ⁽³⁾	30,4	0,0	18,7	0,0
Management and employees	25,3	21,6	18,6	15,9
Others ⁽⁴⁾	14,3	26,0	11,0	19,1
Free float	2,3	5,1	32,5	31,5

Source: Neuer Markt statistics. ⁽¹⁾ Stakes of different subjects, in percentage. ⁽²⁾ Individual and companies. ⁽³⁾ Venture capitalists, private equity firms and investment firms. ⁽⁴⁾ Individuals and companies not included in the previous categories.

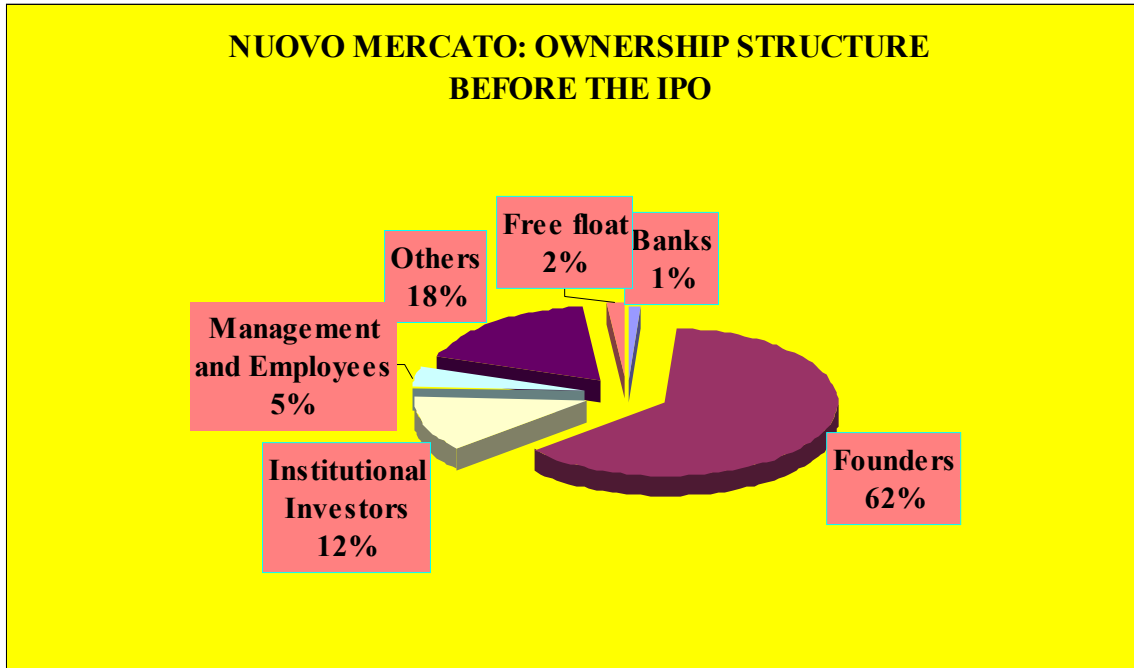
Graphs 5 and 6 describe the evolution of the ownership structure of the firms listed on the Nuovo Mercato⁴⁰: in comparison with the German market, the stake of the founders is higher, whereas that of management and employees is lower.

This seems to indicate a stronger propensity of the Italian entrepreneurs to have (and maintain) a stake sufficient to easily control the company also after the IPO. Before the IPO, institutional investors are present in the capital of 14 of the companies analysed (44% of the total); the average number of institutional investors is 3.1, higher than for German companies (see table A.4)⁴¹.

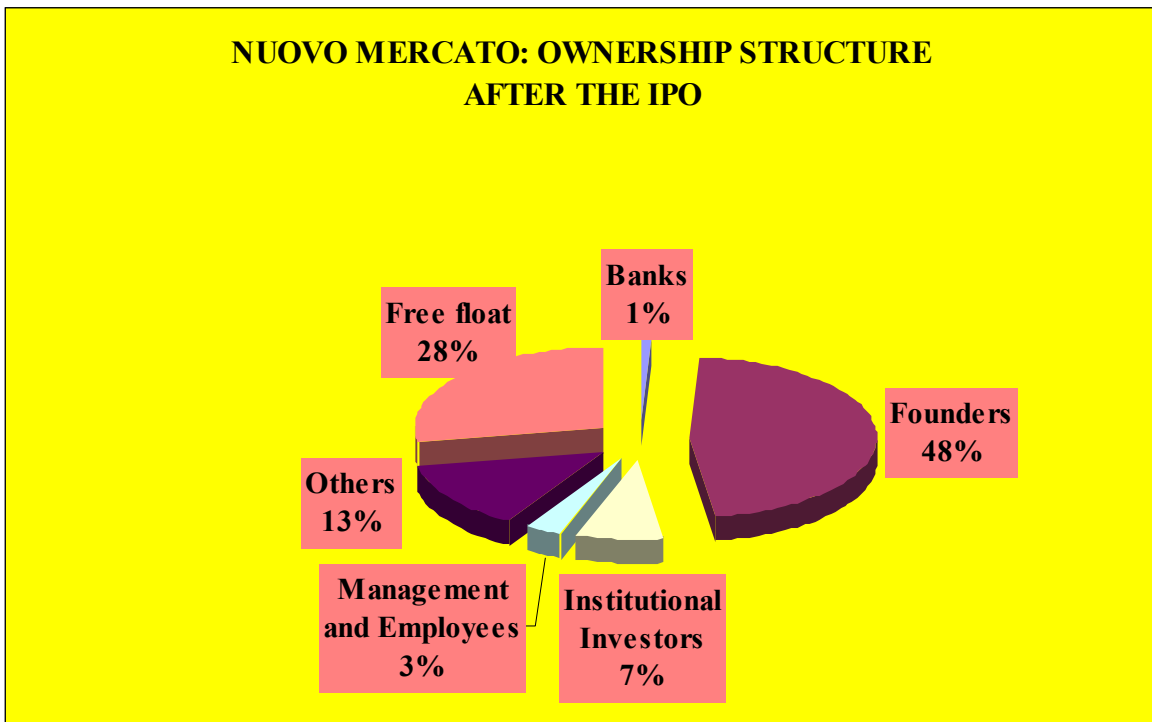
⁴⁰ The analysis concerned 32 companies. See also table A.3.

⁴¹ This number is referred to the only companies having institutional investors as shareholders before the IPO.

Graph 5



Graph 6



By comparing the ownership structure of companies with and without institutional investors in the capital (table 11), it appears that the stake of management in the first group of company is not so important as in the German case, and the stake of founders is larger (but in Italy, like

in Germany, companies with institutional investors in the capital are characterized by a remarkably lower percentage owned by founders, in comparison with the other group of companies). Also for Italy, the share of free float is near to 30% (and higher for companies with institutional investors in the capital).

Table 11

OWNERSHIP STRUCTURE IN THE NUOVO MERCATO: COMPARISON BETWEEN VENTURE-BACKED AND NON VENTURE-BACKED IPOs (1999-2000)⁽¹⁾

	Ante IPO		Post IPO	
	Venture-backed companies	Non venture-backed companies	Venture-backed companies	Non venture-backed companies
Banks	2,4	0	1,8	0,0
Founders ⁽²⁾	47,5	74,5	36,7	55,2
Institutional investors ⁽³⁾	27,4	0,0	17,0	0,0
Management and employees	3,1	5,7	2,2	3,8
Others ⁽⁴⁾	16,0	19,9	10,7	15,5
Free float	3,7	0,0	31,6	25,5

Source: Consob. ⁽¹⁾ Stakes of different subjects, in percentage. ⁽²⁾ Individuals and companies. ⁽³⁾ Venture capitalists, private equity firms and investment firms. ⁽⁴⁾ Individuals and companies not included in the previous categories

In the Nuovo Mercato, as in the Neuer Markt, if we take into account the dilution effect coming from the increase of capital, shareholders maintain the most part of their stake. This behaviour could imply the presence - already highlighted for the Neuer Markt - of a role of certification played by shareholders, particularly institutional investors.

IV.4 Analysis of the financial structure, growth and profitability of listed firms on the Neuer Markt and the Nuovo Mercato

Tables 12 and 13 contain some financial and strategic indicators, referring to the listed companies respectively on the Neuer Markt and on the Nuovo Mercato⁴². In the year before the quotation, companies listed on the Italian market are bigger (in terms of net sales), less profitable and more “levered” than companies listed on the Neuer Markt.

The evolution of data from Year -2 to Year +1 shows a remarkable rate of growth, higher for companies listed on the Neuer Markt, and an increase of investments (especially in the year of the IPO). Moreover, in both the markets companies strongly increase the financial debt in the year after the IPO.

⁴² The indicated data have to be considered with regard to the year of the IPO: Year 0 is the year of the IPO, Year -1 is the year preceding the IPO, and so on.

Table 12

**FINANCIAL AND STRATEGIC INDICATORS OF COMPANIES
LISTED ON THE NEUER MARKT (1997 - 2000) ⁽¹⁾**

	Number of observations	Year -2 ⁽²⁾	Year -1 ⁽²⁾	Year 0 ⁽²⁾	Year +1 ⁽²⁾
Net sales	136	32,8	45,6	74,2	109,8
Total assets	136	38,0	55,3	174,3	201,0
Shareholders Equity	135	7,1	11,6	116,6	122,3
Shareholders Equity/Total assets	135	17,6%	30,9%	70,6%	60,8%
Financial debt ⁽³⁾	136	6,1	7,4	8,3	14,6
Leverage ⁽⁴⁾	135	49,7%	39,3%	9,2%	13,5%
EBITDA ⁽⁵⁾	85	4,6	7,2	10,1	13,8
ROA ⁽⁶⁾	85	12,9%	17,0%	7,9%	5,3%
Growth rate of sales	131		73,8%	108,9%	90,2%
Capex ⁽⁷⁾	132		5,4	18,1	29,4
Capex / Net sales	132		21,4%	44,5%	36,7%

Source: Worldscope. ⁽¹⁾ Absolute indicators are in million of euro, ratios are in percentage. Mean values. ⁽²⁾ Indicates the number of years before the quotation. ⁽³⁾ Borrowing at short term and at medium and long term plus bonds. ⁽⁴⁾ Financial debt divided by financial debt plus shareholders equity. ⁽⁵⁾ Earnings before interest, taxes and depreciation allowances. ⁽⁶⁾ EBITDA on Total assets. ⁽⁷⁾ Capital expenditure in intangible and tangible assets.

Table 13

**FINANCIAL AND STRATEGIC INDICATORS OF COMPANIES
LISTED ON THE NUOVO MERCATO (1999-2000) ⁽¹⁾**

	Number of observations	Year -2 ⁽²⁾	Year -1 ⁽²⁾	Year 0 ⁽²⁾	Year +1 ⁽²⁾
Net sales	28	51,8	63,4	78,1	92,6
Total assets	28	32,8	42,3	99,6	112,5
Shareholders Equity	28	4,4	6,0	60,5	59,3
Shareholders Equity/Total assets	28	18,0%	19,6%	61,8%	54,4%
Financial debt	28	10,8	12,8	8,7	17,0
Leverage	28	60,6%	57,3%	14,7%	25,1%
EBITDA	26	3,4	4,8	4,6	1,7
ROA	26	12,4%	16,1%	7,2%	4,9%
Growth rate of sales	28		42,9%	62,3%	34,0%
Capex	28		3,2	13,4	14,5
Capex / Net sales	28		20,0%	45,4%	31,8%

Source: Worldscope. ⁽¹⁾ Absolute indicators are in millions of Euro, ratios are in percentage. Mean values. For the definition of the variables, see Table 12. ⁽²⁾ Indicates the number of years before the quotation.

Within each market, the sample of companies was also split in two subsamples, based on the presence (or not) of institutional investors in the capital before the IPO. Table 14 shows this comparison for companies listed on the Neuer Markt. Companies with institutional investors as shareholders before the IPO are bigger in terms of sales and more profitable than the other group of companies⁴³. A possible interpretation of these data is that venture capitalists, being able to provide funds in the earlier phases of the life of companies, allow them to go public when they are more mature and profitable. There are instead no significant differences in the growth rate of sales and in the pace of investments between the two groups of companies⁴⁴.

Table 14

IPOs ON THE NEUER MARKT: COMPARISON BETWEEN VENTURE-BACKED AND NON VENTURE-BACKED COMPANIES⁽¹⁾

	Venture-backed companies					Non venture-backed companies				
	Year -2 ⁽²⁾	Year -1	Year 0	Year +1	Average of the 4 years ⁽³⁾	Year -2	Year -1	Year 0	Year +1	Average of the 4 years ⁽³⁾
Net sales	40,7*	58,5*	95,0**	138,7**	83,2**	21,3	26,7	43,5	67,4	39,7
Total assets	31,5	46,4	208,0	235,7	130,4	47,6	68,5	124,7	149,8	97,6
Shareholders Equity	8,7	13,5	151,9	154,6	82,2	4,7	8,8	63,7	74,0	37,8
Sharehold. Equity/Tot. assets	20,9%	30,8%	70,0%	59,2%	45,2%	12,7%	30,9%	71,6%	63,3%	44,6%
Financial debt	5,7	7,6	7,8	15,2	9,1	6,8	7,0	9,1	13,6	9,1
Leverage	48,2%	37,6%	7,3%*	11,1%*	26,1%	51,7%	41,8%	11,9%	17,1%	30,6%
EBITDA	5,9*	9,2*	13,3**	17,8*	11,6**	2,6	4,2	5,3	7,6	4,9
ROA	14,5%	18,6%	10,2%**	7,4%*	12,7%*	10,4%	14,5%	4,5%	2,2%	7,9%
Growth rate of sales		79,2%	110,8%	92,3%	94,1%		65,4%	106,0%	86,8%	86,1%
Capex		6,1	19,9	35,6	20,5		4,5	15,4	20,3	13,4
Capex / Net sales		17,5%*	35,0%**	42,3%	31,6%		27,3%	58,6%	28,3%	38,1%

Source: Worldscope. ⁽¹⁾ Absolute indicators are in million of euro, ratios are in percentage. Mean values. For the definition of the variables, see table 12. * and ** indicate variables for which the difference between the means of the two subsamples is statistically different from 0 with a probability, respectively, of 90% and 95%. The analysis concerned 136 companies (of which 81 venture-backed). ⁽²⁾ Indicates the number of years before the quotation (Year 0 is the year of the IPO). ⁽³⁾ It is obtained by calculating the average of the 4 years for each company, and subsequently by calculating the arithmetical mean of the obtained values.

With regards to companies listed on the Nuovo Mercato (table 15), the data show similar results – but less strong – to those found for the Neuer Markt⁴⁵: companies with institutional investors in the capital are bigger in terms of sales and more profitable; moreover, they seem to grow substantially less (but these differences seem to largely depend on higher growth rates of the smallest companies of the second subsample). Therefore, the observations already formulated for companies listed on the Neuer Markt are valid also for the Nuovo Mercato, though with some more *caveats*.

⁴³ In table 14, * and ** indicate that the means of the two subsamples are statistically different with a probability, respectively, of 90% and 95%.

⁴⁴ Other variables for which the values are statistically different in some years are Leverage and the ratio Capex/Net sales (it expresses the level of investment): both are lower for companies financed by institutional investors, but these differences are not statistically significant in all the considered years, nor with reference to average values for the four years.

⁴⁵ Because of the small number of listed companies, it is not possible to determine if the values are statistically significant.

Table 15

**IPOs ON THE NUOVO MERCATO: COMPARISON BETWEEN
VENTURE-BACKED AND NON VENTURE-BACKED COMPANIES⁽¹⁾**

	<i>Venture-backed companies</i>					<i>Non venture-backed companies</i>				
	Year -2 ⁽²⁾	Year -1	Year 0	Year +1	Average of the 4 years ⁽³⁾	Year -2	Year -1	Year 0	Year +1	Average of the 4 years ⁽³⁾
Net sales	44,5	51,4	66,3	74,6	59,2	31,2	38,5	47,6	62,7	45,0
Total assets	33,3	44,7	104,4	108,1	72,6	32,5	41,3	97,7	114,3	71,5
Shareholders Equity	6,1	9,5	66,4	64,5	36,6	3,7	4,7	58,1	57,2	30,9
Sharehold. Equity/Total assets	15,4%	21,7%	60,8%	55,4%	38,3%	19,1%	18,8%	62,2%	54,0%	38,6%
Financial debt ⁽²⁾	10,6	10,5	10,2	13,5	11,2	10,9	13,7	8,0	18,5	12,8
Leverage ⁽⁴⁾	71,2%	58,4%	19,3%	27,2%	44,0%	56,3%	56,9%	12,9%	24,2%	37,6%
EBITDA	5,4	6,7	4,6	8,0	6,2	2,7	4,0	4,6	-0,9	2,6
ROA ⁽⁵⁾	17,3%	18,5%	8,5%	10,4%	13,7%	12,0%	17,2%	8,1%	4,7%	10,5%
Growth rate of sales		19,4%	28,8%	13,8%	20,7%	0,0%	54,8%	81,9%	44,9%	60,5%
Capex ⁽³⁾		3,2	11,2	5,6	6,7	0,0	2,5	14,5	16,6	8,4
Capex / Net sales		6,1%	39,7%	12,6%	19,5%	0,0%	8,8%	46,3%	33,3%	22,1%

Source: Worldscope. ⁽¹⁾ Absolute indicators are in million of euro, ratios are in percentage. Mean values. For the definition of the variables, see Table 12. The analysis concerned 28 companies (of which 8 venture-backed). ⁽²⁾ Indicates the number of years before the quotation (Year 0 is the year of the IPO). ⁽³⁾ It is obtained by calculating the average of the 4 years for each company, and subsequently by calculating the arithmetical mean of the obtained values.

V. Conclusions

The object of this paper is to analyse the role of venture capital and stock exchanges for high-growth firms in promoting the creation and development of new businesses. This role depends on the presence of a sort of complementarity between the so-called *informed capital* – represented by a mix of venture financing, expertise and reputation provided by institutional investors in risk capital – and stock exchanges for innovative companies. In fact, these stock exchanges represent an important opportunity of “exit” for venture capitalists, allowing them to redirect their capital toward new investments. The importance of these aspects was also recognized by the European Commission, which supported the development of venture capital in Europe and the creation of a pan-European stock exchange for high-growth firms. Since 1996, many “new markets” for high-growth firms were created in Europe, and after 1997 the markets of four countries established Euro.nm, an alliance to create a common platform with uniform admission and trading requirements and the possibility for intermediaries to access all of its markets through a common interface.

This paper addresses the analysis of the presence of a complementarity between venture capital and stock exchanges in three ways.

First, the evolution of the venture capital market and of stock exchanges in the U.S. and in Europe is considered, with a particular attention paid to Germany and Italy. Data show the existence of a strong correlation between the size of the venture capital industry and that of national stock exchanges. Moreover, in Germany and Italy VC investments and funds raised have been strongly accelerated by the creation of the Neuer Markt and the Nuovo Mercato and there was an increase of the proportion of venture capital funds invested in projects in earlier phases of development and in high-tech sectors. However, European VC market grew

less than U.S. VC industry in the same period. This last evidence seems to indicate that there is still a potential for growth for VC in Europe.

Second, the presence of institutional investors in risk capital as shareholders of companies listed on the Neuer Markt and the Nuovo Mercato is analysed. They owned participations in about 51% of the companies listed on the Neuer Markt and 44% of the companies present in the Nuovo Mercato; moreover, they maintain, like all the other shareholders, the most part of their stakes at the time of the IPO. This evidence highlights two aspects: the goal of the quotation on the new markets doesn't seem to consist in the disinvestment of the participation (at least in phase of IPO); there is probably also a role of certification of the quality of the offering, played by institutional investors: this role could be particularly precious for young and high-growing firms. Moreover, keeping a high proportion of their own stakes doesn't seem in contrast with the presence of a mechanism of recycling for venture capital, because it is plausible to infer that these stakes will be sold subsequently to the IPO⁴⁶.

Third, some financial and strategic indicators of the companies which went public on the Neuer Markt and on the Nuovo Mercato are analysed, to verify the existence of different characteristics of listed firms in the two markets, and within each market, of differences between venture-backed and non venture-backed companies. Firms listed on these markets show a remarkable growth of sales, especially in the year of the IPO; these companies go public to collect new funds (the share of the IPO coming from the increase of capital is very high) and they "use" the IPO to "reequilibrate" their financial structure: in fact, they strongly increase the financial debt the year after the IPO. At the time of the offering, Italian listed firms are bigger in terms of sales, but they have a lower shareholders equity and are more "levered" than companies listed on the Neuer Markt. An interesting evidence concerns differences between VC-backed and non VC-backed companies: the former, especially in Germany, are bigger (in terms of sales) and more profitable than the other group of companies, while no significant differences appear as to the rate of growth and the pace of investments.

Some conclusions can be drawn from this evidence. In the first place, the positive correlation between the size of venture capital markets and that of stock exchanges (European and U.S.) as well as the evolution of the VC market in Germany and Italy after the inception of new markets seem consistent with the complementarity hypothesis before described. Moreover, venture capital seems to be able to provide capital in the earlier phases of the life of companies and help them in "maturing" and becoming more profitable before entering the stock exchange.

This last evidence could have some remarkable implications. In fact, one of the most important characteristics of firms deciding to quote on the new markets is represented by their young age and by the larger "uncertainty" on their future development. With regard to these aspects, if venture capitalists or other institutional investors in risk capital are able to play a monitoring and supporting role, as it appears from the evidence above described, their presence as shareholders could "signal" the "good quality" of the listing firm.

⁴⁶ A study comparing the European and the U.S. venture capital market found that the average duration of VC investments is 3,7 years in Europe (3 years in the U.S.), whereas the average time for a complete exit after an IPO is 13 months (14 months in the U.S.). See Schwienbacher (2002).

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APPENDIX

Table A.1

OWNERSHIP STRUCTURE OF IPOs ON THE NEUER MARKT (1997-2000)⁽¹⁾

	ANTE IPO			POST IPO		
	Mean	Median	Standard deviation	Mean	Median	Standard deviation
Banks	2,6	0,0	10,0	1,4	0,0	6,4
Founders ⁽²⁾	34,8	23,7	36,4	24,9	17,2	25,9
Institutional Investors ⁽³⁾	15,5	2,0	22,5	9,5	0,1	14,4
Management and Employees	23,5	9,8	28,8	17,3	7,3	21,3
Others ⁽⁴⁾	20,0	7,5	27,7	14,9	5,2	20,7
Free float	3,7	0,0	13,4	32,0	28,3	11,7

Source: Neuer Markt Statistics. ⁽¹⁾ Ownership of different subjects, in percentage. ⁽²⁾ Individual and companies. ⁽³⁾ Venture capitalists, private equity firms and investment firms. ⁽⁴⁾ Individual and companies not included in the previous categories.

Table A.2

PRESENCE OF INSTITUTIONAL INVESTORS AS SHAREHOLDERS OF THE COMPANIES LISTED ON THE NEUER MARKT (1997-2000)

Companies with instit. investors as shareholders	154
On the total of companies analyzed ⁽¹⁾	51,2
Average number of Inst. investors ⁽²⁾	1,1
Average number of Inst. investors ⁽³⁾	2,1
Share of institutional investors before the Ipo ⁽⁴⁾	30,4
Share of institutional investors after the Ipo ⁽⁴⁾	18,6

Source: Neuer Markt Statistics. ⁽¹⁾ In percentage. ⁽²⁾ All the companies. ⁽³⁾ Only companies with institutional investors as shareholders. ⁽⁴⁾ Mean values, in percentage, referring to the only companies with institutional investors as shareholders.

Table A.3**OWNERSHIP STRUCTURE OF IPOs ON THE NUOVO MERCATO (1999-2000)⁽¹⁾**

	ANTE IPO			POST IPO		
	Mean	Median	Standard deviation	Mean	Median	Standard deviation
Banks	1,0	0,0	3,2	0,8	0,0	2,4
Founders ⁽²⁾	62,7	70,5	33,0	47,1	51,4	24,5
Institutional Investors ⁽³⁾	12,0	0,0	20,2	7,4	0,0	12,2
Management and Employees	4,6	0,0	7,7	3,1	0,0	5,8
Others ⁽⁴⁾	18,2	2,5	27,4	13,4	2,9	20,3
Free float	1,6	0,0	9,1	28,2	25,2	9,9

Source: Prospectuses of listed firms. ⁽¹⁾ Ownership of different subjects, in percentage. ⁽²⁾ Individual and companies. ⁽³⁾ Venture capitalists, private equity firms and investment firms. ⁽⁴⁾ Individual and companies not included in the previous categories.

Table A.4**PRESENCE OF INSTITUTIONAL INVESTORS AS SHAREHOLDERS OF THE COMPANIES LISTED ON THE NUOVO MERCATO (1999-2000)**

Companies with instit. investors as shareholders	14
On the total of companies analyzed ⁽¹⁾	43,8
Average number of Inst. investors ⁽²⁾	1,4
Average number of Inst. investors ⁽³⁾	3,1
Share of institutional investors before the Ipo ⁽⁴⁾	27,4
Share of institutional investors after the Ipo ⁽⁴⁾	17,0

Source: Prospectuses of listed firms. ⁽¹⁾ In percentage. ⁽²⁾ All the companies. ⁽³⁾ Only companies with institutional investors as shareholders. ⁽⁴⁾ Mean values, in percentage, referring to the only companies with institutional investors as shareholders.

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