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Venture Capital in Europe's Common Market:

A Quantitative Description

by
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Abstract:

This paper offers a quantitative description of European private equity markets and compares the recent development in these markets with the development of the US venture capital market. Moreover, the paper addresses the differences between private equity investors acting in a single national market by analysing micro data on French and German private equity investors.

European markets for private equity have experienced substantial growth at the end of the 1990s and so has the US venture capital market. However, in Europe, private equity investments in enterprises' early and expansion stages as well as in high-technology enterprises are, relative to GDP, significantly lower than in the US.

Keywords: venture capital, private equity, Europe, United States

JEL classification: G24, G00

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1 Introduction

In recent years, venture capital activity in Europe has experienced an extraordinary increase. In 1993, the investments in young enterprises amounted to 0.2 billion euros, while in 1999 more than 2.5 billion euros were invested in such enterprises.[1] This boost raises the question whether European markets for venture capital have developed along the same lines as the venture capital market in the US, which is often seen as the prototype of venture capital finance. This paper offers a comprehensive description of the developments in the European and US markets for venture capital which is the first step in determining whether European markets are similar to the US market in terms of their efficiency of providing for venture capital finance.

Venture capital is often referred to as a prerequisite for productivity and employment growth. In line with the American tradition, venture capital is understood as offering financial means to young high-technology enterprises in combination with management support for these enterprises by an experienced intermediary, the venture capitalist. The role of venture capital in facilitating employment and productivity growth has made venture capital a major target of financial market policies by European governments. They made a variety of attempts to ease the access to equity capital for young high-technology enterprises by improving the regulatory conditions venture capitalists face in the European markets and by granting rather generous subsidies.

The US venture capital market can serve as a benchmark for the discussion of the development in the European markets for private equity. In the US, venture capital is predominantly invested in relatively young, high-technology enterprises. During the 1990s, pension funds were the main capital provider to venture capital funds. These funds were managed by independ-

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[1] Unfortunately, only data on general private equity activity, which covers equity investments in all kinds of enterprises, and not data on venture capital more narrowly defined, are available for the European countries. However, private equity investments in enterprises' earliest development stages can be utilized as an approximation of venture capital activity.

ent venture capitalists who often specialized on particular stages of enterprises' development and/or particular technologies.

The various European markets for venture capital, by contrast, are relatively small compared with the US market. This follows from the comparisons of investments in young enterprises relative to GDP and from investments in particular high technology areas. Moreover, banks were the main capital provider in the 1990s. Only at the end of the 1990s, did the importance of pension funds increase. In Europe, venture capitalists are often dependent on their capital providers. Especially banks prefer to invest in their own subsidiaries and not in an independent venture capital fund.

Moreover, this paper asks whether private equity investors acting in a particular national market differ significantly with respect to investment strategies using publicly available micro data of German and French private equity investors. This is important because many European countries have introduced public policies to stimulate venture capital activity which cannot be identified in aggregated data on private equity activity in Europe.

The paper is organized as follows. Section 2 describes the stylised facts of the US venture capital market. In Section 3, the development, differences and similarities of 13 European private equity markets are examined with respect to the funds raised, investments, and divestments and compared with the US venture capital market. Conclusions solely based on the aggregate data utilized in Section 3 are to some extent misleading as the analysis of micro data for the German private equity market in Section 4 and for the French equity market in Section 5 will show. Section 6 summarizes.

2 The US Market of Venture Capital Finance

The venture capital market in the US is the oldest and most developed of the world and is therefore chosen as the benchmark for the analysis of the European markets. In the American tradition which is used here venture capital finance denotes the simultaneous offering of financial means and management support for a certain area of young high-technology firms.

Indeed, as the following section shows, venture capital investments in the US are almost solely used to finance young high-technology enterprises.

The following questions will be addressed in this section:

- What are the main agents in the venture capital market and what can be said about the organization structure, i.e., who invests money in venture capital funds, who invests this money in enterprises, and who these enterprises are?
- Which financial instruments utilize US venture capitalists when they invest money in young high-technology enterprises?
- Do US venture capitalists add value in their portfolio firms?

2.1 Development of Venture Capital Finance in the US

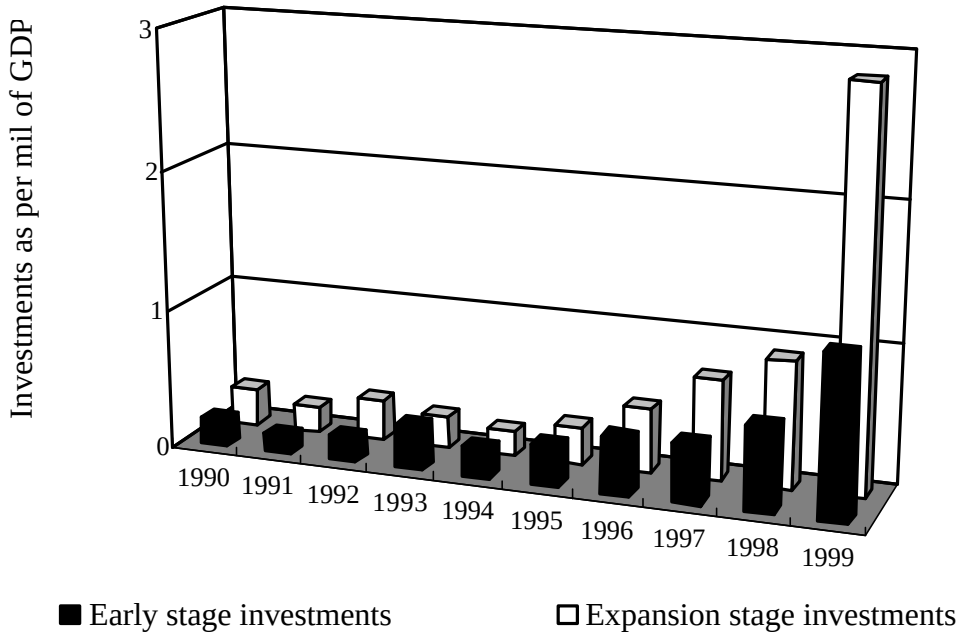
The US venture capital industry, which is about seventy years old, has experienced a considerable boom in recent years. While in 1989, only 387 companies investing venture capital were in existence, which managed 847 funds and employed 2,053 professional managers, in 1999, 620 companies employed more than three and a half thousand professionals managing 1,237 funds (NVCA 2000). Thus the average number of professional managers per company increased from 5.3 in 1989 to 5.9 in 1999, while the average number of funds in existence per company decreased from 2.2 in 1989 to 2.0 in 1999. These changes are considerably smaller than the change in the average volume of venture capital raised per professional manager. The latter increased from US$ 2.6 million in 1989 to US$ 12.6 million in 1999.

The development of the invested venture capital indicates that the recent upswing in venture capital activity started in 1996, in which the investments were almost twice as high as in the previous year (Table A3). However, this increase was rather moderate compared to the increase at the end of the 1990s. In 1998, US venture capitalists invested 16 billion euros while in 1999, venture capital investments exceeded 40 billion euros.

A large amount of the US venture capital has traditionally been used to finance enterprises' early and expansion stages (Table A4). Between 1990

and 1999, around 70 per cent of the annually invested venture capital went to these enterprises. In their early stage, which is the most risky stage, enterprises have not yet established their product markets. Enterprises in the expansion stage require large amounts of external funding, because the cash flow often does not yet generate enough liquidity for the internal financing of the firm's growth.

Figure 1 — Early and Expansion Stage Investments (per mil of GDP)



Source: NVCA (2000), OECD (2001).

The investments in enterprises' expansion stage relative to GDP show between 1998 and 1999 stronger growth than the comparable investments in early stages (Figure 1). The reason for this can be the significant increase in the total capital committed. Greater commitments of capital are in favour of the expansion or later development stages, because enterprises in these stages are more capable to use larger amounts of money while enterprises in the early stages are not (Gompers 1998). A boost in the committed capital leads to investments of larger size and not to a higher number of portfolio firms per venture capitalists, because each venture capitalist can only select, monitor and support a certain number of portfolio firms because his time is limited and because the supply of experienced venture capitalists is constant in the short-term (Gompers 1998).

US venture capital investments are highly concentrated in a small number of high-technology industries (Table A4). The share of venture capital invested in communications and computer-related enterprises was never below 45 per cent in the 1990s. After 1994, this share increased significantly and reached 78 per cent in 1999. Thus, venture capital invested in communications and computer-related enterprises increased in absolute as well as in relative terms. Venture capital investments in biotechnology and medical/health-related enterprises, however, increased only in absolute terms but not in relative ones. This share decreased from 26 per cent of the venture capital investments in 1994 to 7.5 per cent in 1999.

The upswing in venture capital activity can also be observed by the new funds raised for investments (Table A5). Between 1993 and 1994, the new funds raised increased from 3.6 to 6.2 billion euros. The next significant increase was between 1996 and 1997, in which the new funds raised increased from 8.1 to 13.1 billion euros. In 1998, US venture capitalists raised more than 23 billion euros, while the respective amount was more than 39 billion euros in 1999. Thus the increase between 1998 and 1999 with respect to the funding activity was lower than the increase in investment activity.[2]

Pension funds have been the main capital providers to venture capital funds (limited partnerships), while corporations, and financial and insurance have played a minor role (Table A6). Pension funds contributed between 35 and 60 per cent of the new funds raised between 1990 and 1998. In 1999, however, only 23 per cent of the capital was contributed by pension funds. The contribution of all other types of limited partners, such as financial and insurance and corporations, were in most cases not higher than 20 per cent.

This extraordinary boom during the 1990s is not the first significant change that the American market for venture capital has experienced since its humble beginnings in the 1930s. Two upswings of venture capital activity can be identified in the time series. The first upswing took place in the mid-1960s, the second at the beginning of the 1980s. Both upswings, however,

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[2] In the US, new funds raised for private equity grew at a lower rate than new funds raised for venture capital (Table A5).

are small compared to the increase in venture capital activity at the end of the 1990s. The first two upswings seemed to be influenced by public policies.

The Small Business Investment Company (SBIC) program, which was introduced in 1958, stimulated the establishment of SBICs which are privately owned and managed investment firms. The Small Business Administration (SBA) provided SBICs four dollars for each dollar invested at Treasury interest rates (Pfirrmann 1997). SBICs dominated the US market for venture capital in the mid-1960s. Nearly 700 SBICs were licensed at that time (Bygrave and Timmons 1992).

The capital provided by the SBA influenced the investment behaviour of the SBICs considerably. Due to debt service requirements and repayment of federal government loans, SBICs were more interested in infusing loans then equity and thus SBICs generally financed more established firms rather than young high-technology enterprises (Bygrave and Timmons 1992). The incentives of SBICs to support the management teams of their portfolio firms were rather weak, since they could not participate in profits because of their chosen financial strategies. The difficulties which arose due to the incentives structure under the SBIC Act resulted in tightened regulations intended to reduce the number of SBICs, and experience with the SBICs led to the evolution of the ten-year venture capital partnership structure which dominates the US venture capital industry of today (Bygrave and Timmons 1992).

In 1992, the SBIC program was rejuvenated and led to a new increase of venture capital activity. Between October 2000 and September 2001, SBICs invested US$ 4.5 billion (SBA 2001), while in 1999 they invested US$ 5.3 billion (NVCA 2000).[3] Of this investment volume, more than 40 per cent was invested in enterprises which were younger than two years, more than 50 per cent were invested in enterprises younger than three years. SBICs

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[3] Between October 2000 and September 2001, bank-owned SBICs invested the largest amount, namely US$ 2.3 billion. The reason for the dominance of banks is that until 1999, SBICs were the only possibility for banks to acquire significant equity stakes in non-financial firms (NVCA 2000).

have to some extent also focused on high-technologies. Between October 2000 and September 2001, they invested 1.2 billion US$ in communications and computer-related enterprises, i.e. 27 per cent of the total investment volume (SBA 2001).[4]

At the end of the 1970s, governments, venture capitalists, and entrepreneurs started a reinvigoration of the market because the recession of the 1970s had hampered the market significantly (Pfirrmann et al. 1997). Several laws sought to improve the climate for venture capital. As part of these laws, the Revenue Act from 1978, reduced the capital gain tax rate from 49.5 per cent to 28 per cent. In 1981, this rate was further reduced to 20 per cent (Economic Recovery Tax Act). In 1979, the revision of the Employee Retirement Income Security Act (ERISA) 'Prudent Man' Rule allowed US pension funds higher-risk investments. The 1980 ERISA 'Safe Harbor' Regulation further improved the conditions for venture capital committed by pension funds because it defined pension funds as limited partners, which reduced the risk exposure of venture capitalists. These acts had clearly a considerable impact for the upswing in venture capital activity at the beginning of the 1980s. Especially pension funds and their de-regulation seem to have played a significant role in the development of the US venture capital market (Pfirrmann et al. 1997).

But what are the reasons for the recent upswing? *Venture Economics* has identified two reasons for the extraordinary boom in the investments in enterprises' early and expansion stages at the end of the 1990s (BVK 2001). Venture capital funds brought their passive investors high returns, resulting in a considerable re-investment of money; especially institutional investors reinvested large amounts of their funds. And the development of stock markets resulted in a restructuring of institutional investors' portfolios so as to invest more money in venture capital funds.

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[4] These SBICs are often used by venture capitalists who are managing their first funds and wish to demonstrate their capabilities to passive investors (NVCA 2000). Thus, the US government also supports the creation of venture capital companies.

2.2 The Relationship between Venture Capitalists and Their Portfolio Firms

In the US, the relationship between venture capitalists and their portfolio firms can be described by four stylised facts. First, entrepreneurs or managers of venture capital-backed enterprises are compensated in a special way. Second, venture capitalists invest the required capital in stages and not all at once. Third, venture capitalists almost exclusively use convertible securities when financing high-technology enterprises. And fourth, US venture capitalists take on an active role in selecting, monitoring and supporting the enterprises they finance.

Entrepreneurs of venture-capital-backed enterprises receive modest salaries in combination with equity stakes which are typically tied to the performance of the firms (Barry 1994). The equity stakes of Chief Executive Officers (CEO) and their salaries are significantly lower than the CEOs' stakes and salaries of non-venture-capital-backed firms (Baker and Gompers 1999a).[5] However, the elasticity of CEOs' wealth to shareholder wealth, which is defined as the percentage change in CEOs' wealth for a percentage change in firm value, is higher for venture capital-backed firms than for their non-venture-capital-backed counterparts. Thus CEOs' compensation of venture capital-backed enterprises is more profit-sensitive than the compensation of their non-venture-capital-backed counterparts.

The form of entrepreneurs' compensation with basic salaries and profit participations is often interpreted as a mechanism that offers the entrepreneurs strong incentives to add their specific technological expertise in the development of the enterprises after the contract has been signed. Moreover, as Weimerskirch (1998) shows in his model, entrepreneurs' compensation can be interpreted as a mechanism with which venture capitalists can select the most promising enterprises, since entrepreneurs do not prefer venture capital finance when their enterprises have dismal growth prospects.

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[5] The sample of Baker and Gompers (1999a) consists of 1,036 venture and non-venture-capital-backed firms which went public between 1978 and 1987.

The second stylised fact of venture capital finance is the staging of capital analysed in the empirical study by Gompers (1995). According to this study, venture-capital-backed firms differ with respect to the size of each financing round, as well as with respect to the number of financing rounds. The more tangible the assets of the enterprises are, the higher the amount of money per financing round and the lower the number of financing rounds are. Moreover, enterprises that are in their early stages of development receive less capital per financing round than enterprises in later stages. And the number of financing rounds is higher for portfolio firms that went public than for those, stayed private.

The staging of the capital infusion is often explained as a consequence of incentive problems arising when information about the enterprises' characteristics are unequally distributed among venture capitalist and entrepreneur. Infusing capital in stages offers the venture capitalist the opportunity to abandon the project after each capital infusion, if contractually specified financial or non-financial criteria, so-called milestones, are not met (Sahlman 1990). This sets strong incentives to entrepreneurs to exert high effort and to avoid high risks. Generally, the staging of capital mitigates the hold-up behaviour of entrepreneurs (Neher 1999). But on the other hand, the infusion of capital in stages can also cause several disincentives as well. Cornelli and Yosha (1997) show that an entrepreneur has incentives to manipulate the short-term performance when capital is invested in stages. In the model they use convertible securities to solve this disincentive.

In order to finance enterprises, US venture capitalists organized as venture capital partnerships most often use convertible securities with the automatic conversion of the convertibles when specific milestones are reached. In 189 of 200 venture capital financing rounds analysed by Kaplan and Strömberg (2000), convertible preferred stocks are used. Only seven of the 200 venture capital financing rounds are without any convertibles. The sample by Gompers (1997), which contains 50 convertible preferred equity contracts, demonstrates the role of automatic conversion. In this sample, 92 per cent of the convertible preferred equity converts automatically at the time of the initial public offering (IPO).

In theoretical studies, the use of convertible securities is explained in terms of incentive problems. Under convertible securities, entrepreneurs have strong incentives to use their knowledge in the development of the enterprises' idea, since they all have residual claims, at least temporarily, so that entrepreneurs substantially participate in increasing profits but do not benefit from increasing risks (Gompers 1997). In addition, convertible securities offer the venture capitalists incentives to carefully monitor and support the management teams (Schmidt 1999). Thus, convertible securities might be used in venture capital finance in such a way that both contracting parties give the opposite party sufficient incentives to add value after the contract has been signed.

The last stylised fact to be discussed in this section is the involvement of venture capitalists in their portfolio firms. US venture capitalists are active investors, they actively select, monitor and support the enterprises they finance. In addition to offering financial means, they provide three critical services: they build the investor group, review and help to formulate the business strategies, and fill the management teams (Gorman and Sahlman 1989). Lead venture capitalists, who take on the support of the portfolio firms when several venture capitalists invest money, spend on average two hours per week in enterprises when they are in their early stages of development (Gorman and Sahlman 1989). Venture capitalists' involvement, however, is principally crisis- or project-oriented. They are not involve in the day-to-day management of the enterprises.

The effects of venture capitalists' involvement in their portfolio firms can also be observed empirically. Venture capitalists' involvement results in a reduced number of insiders on the boards of directors (Baker and Gompers 1999b). In their study, venture capitalists are classified as outsiders, while other financiers are quasi-outsiders. That venture capitalists' involvement is rather crisis-oriented is supported by the empirical study by Lerner (1995), who uses a sample of biotechnology firms. He finds that the number of venture capitalists on the board of directors increases significantly in situations where monitoring is most important, for example, around the time when the chief executive officer leaves the enterprise.

2.3 Venture Capitalists' Investment Strategies: Specialization and Syndication

Among the stylised facts of venture capital finance in the US, the specialization and syndication as an investment strategy of venture capitalists must be emphasized. US venture capitalists tend to specialize in enterprises of particular industries or in enterprises that are in a particular development stage (Sahlman 1990). Moreover, venture capitalists syndicate their investments, i.e., several venture capitalists finance a single enterprise and only one of them takes on the monitoring of the enterprise. This venture capitalist is called the lead venture capitalist. Both, specialization as well as syndication react rather sensitively to cyclical changes.

US venture capitalists build portfolios which are often concentrated on enterprises in specific stages or on enterprises in particular industries, so that the portfolios are not well-diversified, i.e., not all unsystematic risk is diversified away (Norton and Tennenbaum 1993). The degree of specialization appears to depend on the several factors. First, venture capitalists who invest money in the early stage of enterprises' development are on average more specialized on particular industries than venture capitalists who focus on late stages of enterprises' development (Norton and Tenenbaum 1993, Gupta and Sapienza 1992). Venture capitalists who manage large funds prefer greater industry diversity than venture capitalists managing small funds (Gupta and Sapienza 1992). The specialization pattern of venture capitalists is also affected by the relationship between them and their passive investors. Corporate venture capitalists have a higher degree of specialization on industries than non-corporate venture capitalists, while SBICs have no preference regarding industry diversity (Gupta and Sapienza 1992).

The degree of syndication seems to depend on uncertainty: the higher the uncertainty of an investment, the higher the degree of syndication is. For example, US venture capitalists prefer a higher degree of syndication when they finance enterprises' early stages of development although the investment amount per company is small compared to later-stage deals (Bygrave 1987). Spreading of financial risks does not seem to be the main reason for syndications (Bygrave 1987, Bygrave and Timmons 1992). Syndication of investments mainly serves to share information, as the empirical study by

Lerner (1994) suggests. In the first financing stage, venture capitalists syndicate their investments with venture capitalists who have similar expertise, while in later stages of enterprises' development venture capitalists also syndicate their investments with venture capitalists who have less expertise.

2.4 The Relationship between Venture Capitalists and Their Passive Investors

The relationship between venture capitalists and passive investors can be described in terms of four stylised facts. First, as mentioned above, pension funds invest the largest amounts of capital in venture capital funds. Second, as discussed in the last section, venture capitalists concentrate their investments on particular stages of enterprises' development and/or on particular industries. Third, US venture capitalists are most often organized as so-called limited partnerships. The general partner (the venture capitalist) is independent of his limited partners (his passive investors). Fourth, venture capitalists organized as limited partnership participate in profits of the venture capital fund and they receive a constant management fee.

US venture capitalists receive an annual management fee based on the amount of capital committed, usually around 2.5 per cent of capital. Moreover, they receive a part of any realized gains of the fund, the so-called carried interest, which typically is about 20 per cent (Sahlman 1990). This compensation system can be interpreted as being a mechanism which passive investors utilize to offer venture capitalists strong incentives to carefully monitor and support the enterprises after the contract between venture capitalists and their passive investors is signed. This seems necessary because passive investors cannot monitor whether venture capitalists fulfil their management support function in the enterprises or whether they waste their time.

In the US, 80 per cent of the organizations infusing venture capital are nowadays organized as venture capital partnerships (Lerner 1995a), an organizational form especially constructed for venture capital companies. The venture capital partnerships have crowded out other organizational forms, for example, the SBICs. Institutional investors find these limited partnerships attractive, since taxes are paid only by the (taxable) investors

but not by the limited partnership (Gompers and Lerner 1998a). Thus the organizational form of the relationship between venture capitalists and their passive investors is affected significantly by legal and tax rules. Limited partnerships have to fulfil several legal restraints. They must have a pre-determined, finite lifetime (usually ten years). Participation of limited partners in the active management is forbidden and the transfer of limited partnerships units is restricted (Sahlman 1990). At the end of the lifetime, the general partner (the venture capitalist) typically distributes the shares to his limited partners (his passive investors).

The American venture capital partnerships seem to have some advantages over other forms of organization. US venture capitalists are mostly independent of their passive investors, i.e., venture capitalists do not have to obey any restrictions imposed by their passive investors regarding their investment strategies. This independence seems to be important since the market conditions and the profit expectations of venture capitalists are solely driving forces for venture capitalists' specialization of investments on particular stages and/or particular technologies which change when market conditions change. Moreover, the organizational form, especially the limited and pre-specified lifetime of the funds, protects the limited partners from the possibility that the general partner could decide against their interests (Sahlman 1990). Furthermore, as Brouwer and Hendrix (1998) argue, the limited and pre-specified lifetime of funds makes it easier for venture capitalists to invest in start-up enterprises and they set venture capitalists strong incentives to exit from their investments in time.

However, the limited and pre-specified lifetime of the funds may also give venture capitalists incentives to abandon projects too early and to select only enterprises from which they can exit in time. Furthermore, it must be kept in mind that venture capitalists, when organized in a limited partnership, are not solely interested in the performance of their portfolio firms but also in the raising of new funds. Gifford (1997) shows in a theoretical model that venture capitalists spend less time on management support in the enterprise than would be optimal from the entrepreneurs' point of view, as well as from the passive investors' point of view, since venture capitalists need time to raise new funds. In dependent funds, venture capitalists can concentrate exclusively on supporting the management of their portfolio firms. Unfortunately, the theoretical literature has only addressed some partial

effects of different organizational forms. A comprehensive analysis of the efficient organizational structure of venture capital companies is not yet available.

The investment behaviour of US venture capitalists is affected by their organizational form. Evidence suggests that independent venture capital companies differ significantly from their dependent counterparts. Venture capital partnerships, which are independent, use relatively more preferred equity and invest proportionally more in enterprises' early stages than corporate venture capital funds (Norton 1994). The empirical study by Gompers and Lerner (1998b) likewise confirms that differences exist between corporates and venture capital partnerships. According to their study, corporate venture capital funds tend to invest slightly less frequently in start-up enterprises. They prefer investments in the later stages of enterprises' development and they prefer to invest larger amounts of money per investment deal than independent venture capital funds do.[6]

The organizational form of venture capital companies may also have an impact on how sensitive these companies react to a change in the intensity of competition. Venture capital companies which are independent of their sources of funds should be more affected by a change in supply and demand conditions than their dependent counterparts. The evidence found by Gompers and Lerner (1996) indicates that venture capital partnerships are indeed affected by the supply and demand conditions: the general partners (the venture capitalists) have more negotiation power when the supply of venture capital by limited partners (passive investors) increases. In their regression analysis, the growth rate of venture pool in the year of fund's closing negatively affects the number of covenant classes in the contracts between limited and general partners, since the supply of venture capital is fixed in the short-term.

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6 The group of corporate funds is not homogenous. Venture capital investments of corporate funds with a strategic focus on a particular technology are significantly more successful than investments of other funds (Gompers and Lerner 1998a).

2.5 Do Venture Capitalists Add Value to Their Portfolio Firms?

The question whether venture capitalists add value to their portfolio firms has generated a large body of empirical papers which differ with respect to the data sets used and with respect to the methodology employed. Some authors expect to find venture capitalists' value added when analysing the development of venture-capital-backed enterprises in comparison to non-venture capital-backed ones. Other authors suggest that the venture capital funds should receive a better risk-return relationship compared to other investment opportunities because of the special role venture capitalists take on in financing high-technology start-ups.

If venture capitalists indeed add value and thus create a surplus, there are three possible parties that might share this surplus:

- the venture capitalists, as a reward for the effort to select, monitor, and support the management teams of their portfolio firms,
- the venture capital-backed enterprises, as a reward for giving up their independence and subjecting themselves to monitoring and support through a specialized venture capitalist,
- the passive investors, as a reward for infusing capital in risky venture capital funds.

Do venture capitalists actually receive a part of the surplus? In order to determine the surplus received by the venture capitalist, we first need to determine what would be an appropriate income for the venture capitalist if he was employed somewhere else. This income should include compensation for the venture capitalist's experience and qualification, and would be, in theoretical terms, a measure of the value of his outside option. Thereafter, this income should be compared with the venture capitalist's current compensation, which may, for example, contain a management fee and a profit participation. Since venture capitalist's current compensation is affected by several determinants which do not likewise affect the value of his outside option, it is necessary to analyse his compensation over a longer time.

The most important determinants of venture capitalist's income are clearly the supply and demand conditions in the venture capital market.[7] Venture capitalist's ability to receive a part of the surplus which he will probably create in a particular enterprise depends positively on the number of entrepreneurs seeking financial means for their innovative product ideas, but also negatively on the number of venture capitalists who have accumulated a similar expertise in financing the respective innovative idea. Unfortunately, there is no empirical work that compares the income of venture capitalists with the income of high-ranking managers.

Do venture-capital-backed enterprises perform better in terms of profit, return on equity,[8] and/or employment than their non-venture-capital-backed counterparts? Enterprises' development can be analysed at the time in which the venture capitalists are involved as well as at the time in which the venture capitalists are no longer involved. An empirically observed positive impact of venture capitalists' involvement can have two reasons: (i) Venture capitalists add value to their portfolio firms by supporting and monitoring the management of firms and/or (ii) venture-capital-backed enterprises develop better than their non-venture-capital-backed counterparts because venture capitalists select the more promising enterprises.

Several empirical studies of the American market indicate that venture-capital-backing indeed has an impact on the development of enterprises. Brav and Gompers (1997) find that venture-capital-backed enterprises outperform non-venture-capital-backed ones even after the initial public offering. In their sample, venture-capital-backed enterprises earned 44.6 per cent after the initial public offering over five years, while non-venture-

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7 In the US, venture capitalists have been able to increase their compensation in response to a greater capital availability (Gompers 1998).

8 When analysing enterprises' return on equity, we have to keep in mind that venture capitalists of independent funds probably affect the debt-equity structure of the enterprises they finance. One might expect an impact on the debt-equity structure, because venture capitalists of independent funds are primarily interested in high returns on equity, while their dependent counterparts might be more interested in the overall return to capital, including equity and debt.

capital-backed ones earned only 22.5 per cent on average. Venture capitalists also affect the patenting behaviour of their portfolio firms: venture-capital-backed enterprises take out significantly more patents than other comparable enterprises (Kortum and Lerner 1998). This evidence in hand does not allows us to distinguish whether venture capitalists add value because they select the right start-up firms or because they effectively support the management. However, one indication that venture capitalists' support of management teams add value is the observation that venture-capital-backed enterprises hold more patents than comparable non-venture-capital-backed firms.

Do passive investors who invest money in venture capital funds enjoy a more favourable risk-return relationship than with alternative investments? There are two ways to analyse the risk–return relationship of venture capital investments. First, risk–return can be based on a single venture capital investments, and, second, risk–return can be based on venture capital funds. Cochrane (2001) analyses a sample of single venture capital investments and takes the selection bias into account which results because the data sample covers only winners but not losers. He finds that "an individual VC (venture capital) investment is not particularly attractive, despite the high average returns" (Cochrane 2001). Using maximum likelihood estimates, Cochrane (2001) calculated a mean arithmetic return of almost 57 per cent with a standard deviation of 119 per cent. This risk-return relationship seems unfavourable compared with other investment opportunities.

What about a well-diversified portfolio consisting of many venture capital investments? This could yield supernormal returns if all unsystematic risk could be diversified away. However, Cochrane (2001) argues that it is probably impossible to construct a portfolio free of unsystematic risks because the venture capital investments may have a common component, as indicated by the high business failure rate in fall of 2000. Especially because venture capital funds often focus on particular industries, portfolios of passive investors should not only contain venture capital, says Cochrane. Thus, it is rather hard to evaluate whether passive investors receive a part of the surplus probably created by venture capitalists, especially because the availability of venture capital funds can create diversification gains realized by passive investors. Certainly, risk-averse passive investors will not invest capital in venture capital funds, when the expected risk–return relationship

is less favourable than with other investment opportunities, i.e., when the venture capital investment is strictly dominated by another investment alternative.[9]

Summing up, three parties, the enterprises, the venture capitalists and the passive investors, can attract the surplus which is probably created by venture capitalists' involvement in their portfolio firms. This must be kept in mind when analysing and discussing the effects of venture capitalists' involvement. The fact that passive investors receive low returns on their venture capital investments or have an unfavourable risk–return relationship does not necessarily indicate that venture capital decreases efficiency and thus welfare as long as the risk-return profile of venture capital investments are not strictly dominated by other investment possibilities. In order to detect the change in efficiency caused by venture capital, the change in the surplus of all three parties must be analysed. In theoretical terms, this seems sensible; in empirical terms, however, this is almost impossible. However, for the US venture capital market, one can argue that venture capitalists add some value because venture-capital-backed enterprises outperform non-venture-capital-backed ones, and because it seems that passive investors have sufficient incentives to invest capital in venture capital funds even after the breakdown of the IPO market last year.

3 European Markets for Private Equity: Differences and Similarities

This section identifies the differences and similarities of the European private equity markets, with special focus on venture capital. The term *private equity* is used here instead of *venture capital* because the European data on capital invested and raised include non-venture capital activities such as management buy-outs. Private equity investments in enterprises that are in their early stages of development or which are classified as high-technology enterprises, can be used as an approximation of European venture capital activity.

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9 General partners of venture capital partnerships probably demand an additional premium because of the illiquidity of their shares in the venture capital funds.

Moreover, this section compares the European markets with the US market for venture capital. Note, that the comparison of stylised facts of the US venture capital market with European figures does not offer information on the efficiency of the European markets. Even if there is some evidence for a surplus created by venture capitalists in the US, we do not know whether the US model of venture capital finance, which might be an efficient solution under the specific economic conditions in the US, would also be efficient for the European markets.

The following questions will be addressed in this section:

- Did all European markets experience a considerable increase in early and expansion stage investments at the end of the 1990s?
- Are there any specialization or concentration patterns in European private equity markets regarding the industrial sectors or enterprises' development stages financed?
- Is there a private equity market which fits the stylised facts of the US market better than the other European markets?

3.1 How Large are the Venture Capital Markets in Europe's Common Market?

Before the mid-1990s, it seemed that venture capital, as a source for financing young enterprises, would never play a significant role in quantitative terms in the Europe's[10] private equity markets. However, in the mid-1990s, a substantial upswing took place in private equity as well as in more narrowly defined venture capital activity. The growth rates of investments in enterprises' early stage of development containing the seed and the start-up stage were particularly high. In the seed stage, the initial business concept is formed and prototypes of new products are developed and compared with competing products in the market. In the start-up stage, production is set up and an initial marketing campaign is launched, to which

[10] Figures include Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

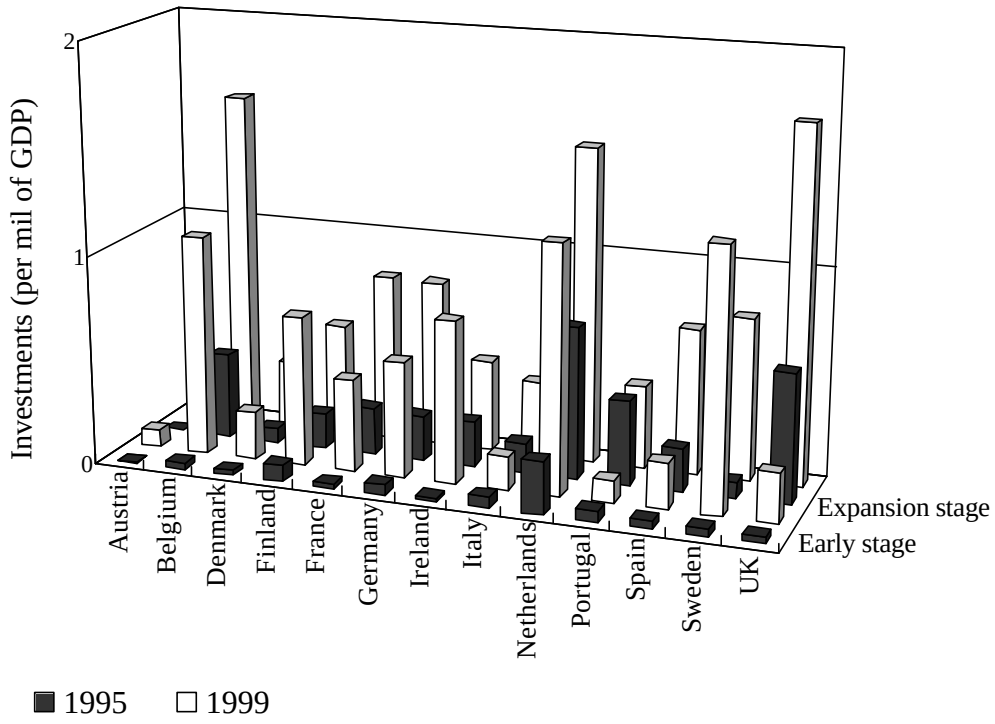
the market reaction is carefully analysed. Compared to other stages of development, the seed and start-up stage are the most risky stages. Between 1990 and 1999, these investments grew annually by 20 per cent, between 1995 and 1999 even by 46 per cent. In 1995, 0.27 billion euros went into enterprises' early stage, while in 1999 the respective amount was 2.7 billion euros.

Private equity investments in enterprises that are in their expansion stage also increased, but growth rates were lower than those of the early stage investments. Enterprises in the expansion stage often require very large amounts of external funding, because their cash flow does not generate enough liquidity for firm's growth to be financed internally. Investments in enterprises' expansion stage grew annually by 11.6 per cent per year between 1990 and 1999. The growth rate of investments was comparatively small because the upswing took place in the second half of the 1990s: between 1995 and 1999 the average annual growth rate was 22.4 per cent. Investments in the expansion stage increased from 2.0 billion euros in 1995 to 6.2 billion euros in 1999. Thus, expansion stage investments increased more strongly than early stage investments in absolute terms.

All of the countries considered here differ considerably with respect to investments in enterprises' early stages as per mil of GDP (Figure 2) even if all the countries experienced a positive development in investment volumes over the observation period. Relative to GDP, early stage investments are highest in Sweden, the Netherlands and Belgium, while in Austria, early stage investments hardly play a role. The importance of Swedish and Belgian early stage investments relative to GDP in comparison to the other European countries has emerged in recent years, whereas the Dutch market was already the leading country in terms of early stage investments relative to GDP in 1995.

European countries also differ with respect to the level of expansion stage investments relative to GDP. The United Kingdom, the Netherlands, and Belgium have the highest levels of investments relative to their GDPs, with more than 1.5 per mil in 1999. In 1995, these three countries were also the leading countries in terms of expansion stage investments relative to GDP. Austria's expansion stage investments, however, accounted for only 0.2 per mil of GDP followed by Italy and Denmark, with about 0.3 per mil of GDP.

Figure 2 — Early and Expansion Stage Investments in Europe (per mil of GDP)



Source: Investment volumes are from EVCA 1991–2000; GDPs are from International Financial Statistics CD ROM IFS (2000).

The Belgian and the Dutch venture capital markets seem to be the markets which are comparable to the US market in terms of investments in enterprises' early and expansion stages relative to GDP in 1999. Belgian investments in enterprises' early and expansion stages relative to GDP were not significant in 1995, while Dutch investments has already become somewhat significant in 1995. Dutch early stage investments accounted for 0.25 per mil of GDP in 1995, the expansion stage investments for more than 0.7 per mil of GDP. However, in order to determine which of Europe's private equity markets fits the US model best, it is not sufficient to look solely at investment volumes, because European governments play an active role in venture capital finance, as we will see in the next section (see also Table A11).

3.2 Passive Investors and Their Impact on Private Equity Investments

The US experience suggests that passive investors, such as banks and pension funds, can have a significant impact on the investment behaviour of private equity investors so what has been their impact in Europe. In the data offered by the EVCA, two sets of variables are available which can be used to analyse which types of passive investors are offering capital to European private equity investors. The first set of variables describes the types of passive investors, the so-called sources of funds, such as banks, insurances and pension funds, without considering the possibility of a legal connection between private equity investors and passive investors.[11] The second set of variables combines the investments of private equity investors with the legal connection between them and their passive investors, albeit without identifying the sources of funds.

The two most important sources of funds for the European private equity market are banks and pension funds (Figure 3). In the US, in contrast, pension funds play a significant role, while banks are almost not existent as capital providers for venture capital funds. In Europe, the significance of banks decreased over the period of observation, while the significance of pension funds increased. In 1990, banks provided more than 40 per cent of the new funds raised for private equity investments, pension funds, in contrast, made up only about 16 per cent of the new funds. Since the mid-1990s, the situation has changed significantly; since 1995 both types of passive investors have invested on average about a quarter of the new funds raised for private equity investments.

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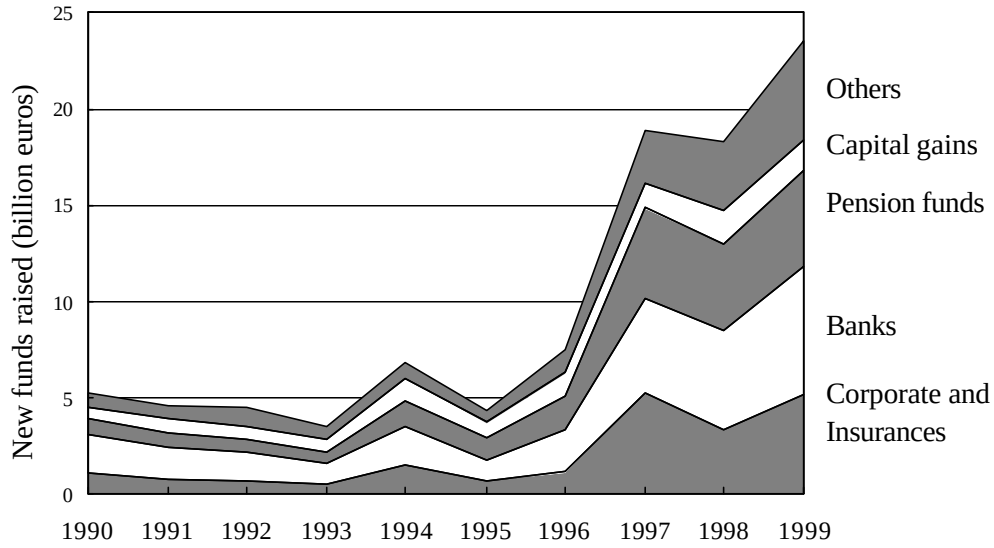
[11] The data on private equity in Europe published by the European Venture Capital Association (EVCA) also includes later stage financing such as Turnaround financing, management buy-outs (MBO), management buy-ins (MBI) and leveraged buy-outs (LBO). These are for firms in crisis, for the acquisition of an existing business by its own management and for the takeover of privately held firms.

Figure 3 — Sources of New Funds (billion euros)



Note: New fund volumes have been deflated using consumer price indices (1995=100) converted into euros using 12-month averages and then aggregated.

Source: New fund volumes and exchange rates are from EVCA 1991–2000; consumer price indices are from International Financial Statistics CD ROM IFS (2000).

The role of pension funds in Europe is a result of the importance of this source of funding in the British equity market. Since 1991, pension funds committed more capital for private equity investments than banks in the UK. In no other country in the sample, have pension funds dominated all other sources for the whole observation period. But the significance of pension funds increased in some countries in the last years. In Germany, pension funds provided only about eight per cent of the new funds in 1995, while in 1999 almost 23 per cent of the new funds stemmed from this source. Finland is another example that has attracted pension funds as a source of funding in the recent years, while Denmark is a counter example. Pension funds lost their interest in the Danish private equity market in the mid-1990s.

The distinction between banks and pension funds when analysing the sources of funds is important, since pension funds seem to affect the development of venture capital markets, while banks do not. Gompers and

Lerner (1998a) argue that the reform of the pension system in the US at the end of the 1970s (the prudent man rule) facilitated the high-growth rates of venture capital. Moreover, Jeng and Wells (2000), who use a time-series, cross-country sample, find evidence that capital provided by pension funds boost significantly the overall volume of new funds raised over time, while banks do not.[12]

Capital gains realized through via for example a trade sale or an initial public offering are another significant source of funding. For the French, the Belgian, the Irish, and the Dutch markets, realized capital gains are an important source of new funds. The high shares of realized capital gains as a percentage of total new funding activity are often interpreted as a signal for the maturity of private equity markets. However, since private equity investors in the European markets have different organizational forms, so that the use of the realized capital gains may differ significantly, they cannot directly indicate whether a private equity market is mature. Moreover, in France, realized capital gains as a source of new funding are affected considerably by tax incentives and regulations (Leopold and Frommann 1998) which will be discussed in Section 5.

Corporate equity investors are the last source of funding discussed here. The separation of new funds provided by corporate equity investors from other sources is important because corporate equity investors often establish private equity funds to keep an eye on new technological developments. The success story of the venture capital market in Israel has shown that corporate equity investors can have a significant impact on the development of private equity markets. In Europe, however, corporate equity investors raised slightly more than ten per cent of the new funds in only two years in the observation period. In all other years, corporate equity investors raised a significantly less. In Finland and Portugal, corporate equity investors played a significant role in providing funding for private equity investment at the beginning of the 1990s. At the end of the 1990s, they played a significant role in Sweden and Austria. In these countries, corporate equity investors offered about one-fifth of the new funds.

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[12] However, capital provided by pension funds for private equity cannot explain differences across countries (Jeng and Wells 2000).

The evidence for the US market in Section 2 suggests that the investment behaviour of private equity investors depends on whether another company (a parent company, for example) can influence the investment strategy. The EVCA statistics distinguish between four types of private equity investors (EVCA 2000). Private equity investors are independent when none of their passive investors owns more than 20 per cent. Private equity investors are called semi-dependent when a single passive investor owns between 20 and 50 per cent of the equity fund. Private equity investors are dependent when a single passive investor owns at least 50 per cent. The fourth group comprises public equity investors that are private equity investors acting on behalf of the government and local authorities.

The role of the four types varies considerably between Europe and the US. In Europe, investments by independent equity investors accounted for about 50 per cent of total private equity investments during 1990 to 1999. In the US, by contrast, venture capital partnerships were most often independent. In Europe, dependent and semi-dependent private equity investors invested between forty and fifty per cent of all private equity. These investors exist also in the US market but they are not included in the venture capital figures. Public equity investors cover a comparably small share of total investments, between two and six per cent in Europe, while data on the government's role in the US are not available.

The differences between the European countries are striking. The UK has a comparatively high share of independent equity investors, followed by the Netherlands.[13] The French market is dominated by dependent and semi-dependent investors that are often subsidiaries of banks. Independents do not play a considerable role in Belgium; the Belgian private equity market is dominated by the public sector. In other countries such as Finland (during the whole period of observation), Portugal and Sweden (at the beginning of the 1990s), the public sector had also a remarkable share in total private equity investments.

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[13] For Germany, these data are only available for 1999: Independent equity investors invested 33.8 per cent of the private equity, dependents 30.7 per cent, semi-dependents 3.2, and the public sector invested as much as 12.8 per cent of the German private equity investments (EVCA 2000).

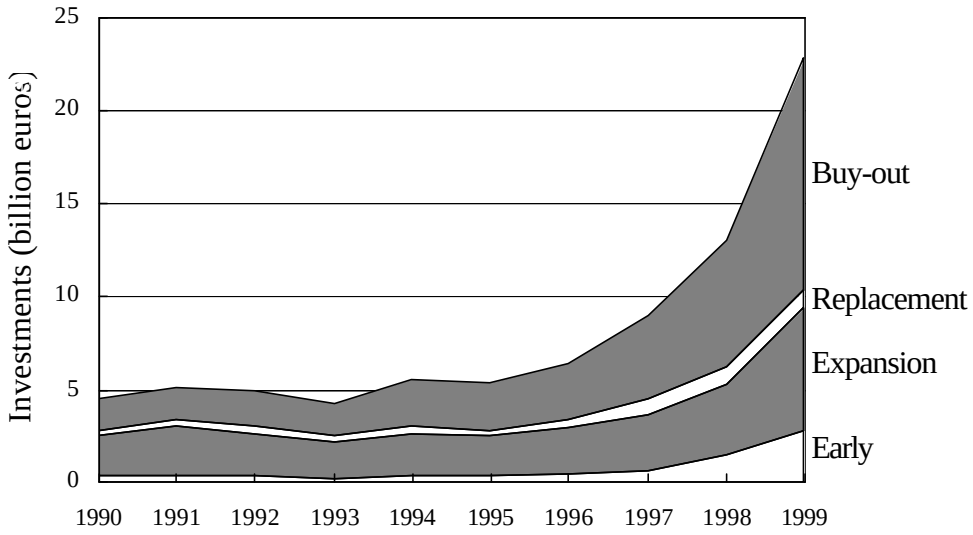
Because of the governments' role in financing investments in young high-technology enterprises, we have to rethink which European market is most similar to the US venture capital market (Table A11). The Dutch and Belgian markets have seemed to some extent similar since the investments in enterprises' early and expansion stages relative to GDP are in the neighbourhood of the US figures. However, in Belgium, the public sector invested 36.5 per cent of all private equity investments in 1999, and this is not in line with the US figures. In the Netherlands, in contrast, the public sector only invested 2.7 per cent of all private equity.

3.3 Private Equity Investments: Development Stages and Technologies

Europe's private equity is predominantly utilized for financing enterprises that are in the expansion stage and for buying out management teams (Figure 4). Up to 1995, European private equity investments stayed almost constant and so did the volumes for management buy-outs and expansion financing. Since 1996, investments have risen, and the investment volume of management buy-outs has risen even stronger than the volume invested in enterprises' expansion stage. Indeed, the share of expansion financing on the total equity investments dropped from more than 60 per cent at the beginning of the 1990s to less than 30 per cent at the end of the 1990s.

Capital invested in enterprises' early stages also increased significantly after 1997. While the ratio of investments in enterprises' seed and start-up stage to total equity investments varied between five and seven per cent before 1997, the ratio reached eleven per cent in 1998 and even twelve per cent in 1999. However, the ratio of investments in enterprises in the seed, start-up, and expansion stages to total investments dropped slightly over the observation period. In 1991, 58 per cent of private equity investments went to these enterprises, while in 1998 only 40 per cent did. This indicates that venture capital activities, defined as money spent in enterprises' early and expansion stages, have not boomed as much as the total private equity activity in Europe.

Figure 4 — Private Equity Investments and Stages of Enterprises' Development (billion euros)



Note: Investment volumes have been deflated using consumer price indices (1995=100), converted into euros using 12-month averages and then aggregated.

Source: Investment volumes and exchange rates are from EVCA 1991–2000; consumer price indices are from International Financial Statistics CD ROM IFS (2000).

European countries differ with respect to the stage distribution of investments. Early stage investments of the private equity investors in the British market play a minor role measured as percentage of private equity investments: the seed and start-up investments together accounted only for less than three per cent. For other European countries the shares are not only much higher but show also a divergent development over the observation period. In 1999, around one-fifth of the private equity went into the enterprises' early stages in France and the Netherlands; in Germany more than 30 per cent was invested in enterprises in the seed and start-up stage. Interestingly, some European countries considered here show a considerable upswing in the money invested in enterprises' early stages after 1997 while Britain does not.

In the British private equity market, management buy-outs have traditionally played a significant role and their share in total private equity investments

has even increased in recent years. In 1990, more than 50 per cent of the British equity investments were utilized for buy-outs, while in 1999, more than 75 per cent of such investments were utilized for such buy-outs. However, these figures are the result of a small number of very large management buy-outs, as the ratio of the number of management buy-outs to the total number of enterprises financed with private equity indicates. Almost 27 per cent of all enterprises receiving private equity were conducting a management buy-out in 1990; in 1999 the ratio was 35.

The comparison of national venture capital markets on the basis of investments in enterprises' early stages of growth as a percentage of the total private equity investments is to some extent misleading, because other sources of early stage funding may differ significantly between the markets and because national policies may affect the investments in enterprises' early stages of development. In the context of early stage financing, the so-called business angels, or informal venture capital, seem to be very important. Business angels are wealthy individuals who invest their own financial resources in enterprises' early stages of development. When discussing the volume of business angels' investments, several groups have to be distinguished. Most important is the distinction between virgin angels and active angels. While the former fulfil the necessary characteristics of an angel, such as having high income and high qualifications, they do not invest capital in start-ups, while the latter do invest money in start-ups.

Some of the informal venture capital markets in Europe have been analysed in the recent literature. However, estimates can only approximate the volumes of informal venture capital, since official statistics are not available. In the United Kingdom, the invested informal venture capital is estimated to be of a volume ten times as high as the early stage investments by formal private equity investors (EBAN 1998). In Finland, the number of informal investors is about 1,500, with the volume of invested capital at around 850 FIM (Lumme et al. 1998: 98). In the Netherlands, the informal venture capital is at least as large as the formal venture capital market. 2,000 to 3,500 business angels are thought to be active in the Dutch market (K+V 1996). In Germany, 27,000 business angels are thought to be active, with an annual investment volume of about 1.4 billion German marks. The potential size of the German informal venture capital market is about eight times as large as the current investment volume of active business angels (Just 2000).

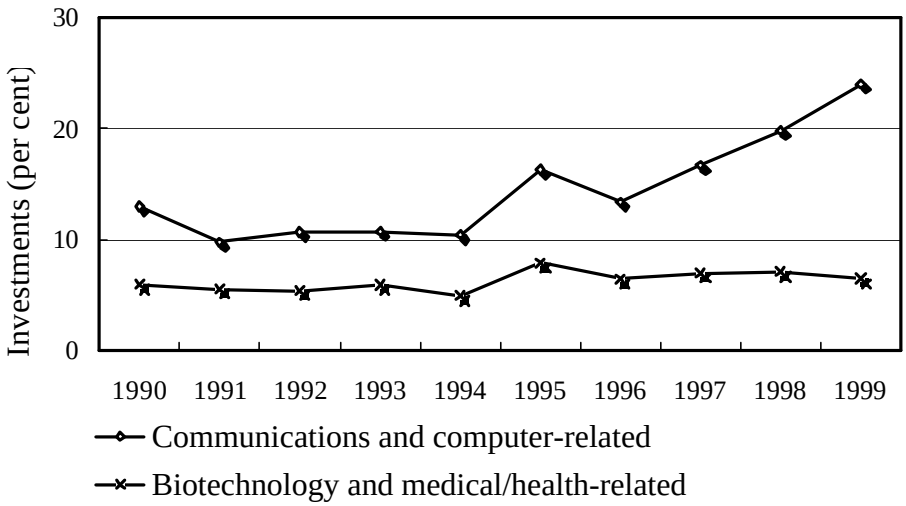
When comparing the volumes of venture capital in several countries, the informal markets must be kept in mind, since informal venture capital is a close substitute for formal venture capital investments in enterprises' early stages.

Almost all European governments utilize public policies to improve the capital supply for young, high-technology enterprises (OECD 1997). European governments try to boost private equity investments in high-technology start-ups by utilizing tax incentives for passive investors, by establishing state-owned funds that invest capital in young high-technology enterprises, and by offering capital at favourable conditions to independent and dependent private equity investors. When the government refinances private equity investors' participations in high-technology start-ups with loans at favourable interest rates, high-technology start-ups become more attractive for investors than other investment possibilities. Therefore, a considerable volume of early stage investments may be the result of government interventions.

What a kind of public policies have been used in particular countries? The British government only uses tax incentives, whereas other European governments often combine tax incentives and capital provision. Sweden's government offers tax incentives for early stage investments and grants loans to high-technology start-ups. The Belgian government uses tax incentives and guarantees. Under a guarantee scheme, the government covers a share of private equity investors' realized losses. In France and Germany, investments are supported using guarantees and co-investments. Under a co-investment, scheme a public equity investor invests funds which supplements those from private equity investors in start-up enterprises. In addition, however, French government offers tax incentives for private equity investors who invest a certain percentage of their funds in high-technology start-ups. In the Netherlands, offering credits at favourable conditions supports the establishment of funds solely financing high-technology start-ups. Since 1996, the Dutch government also supports the venture capital market by offering tax incentives for passive investors. Laan and Cornelius (2000) argue that the vibrant state of venture capital in the Netherlands is the result of a guarantee scheme which existed between 1981 and 1995.

European venture capital activity can approximated by the private equity investments in enterprises' development stages as well as by the private equity invested in enterprises in the high-technology sector. Communications and computer-related enterprises as well as biotechnology and medical/health-related enterprises received a considerable amount of the private equity during the observation period (Figure 5). However, while investments in biotechnology and medical/health-related enterprises only increased in absolute terms and showed a slight variation measured as a percentage of all private equity investments, the private equity investments in communications and computer-related enterprises increased even as a percentage of all equity investments over the period of observation.

Figure 5 — Investments in High-Technology Enterprises (per cent)



Note: Investment volumes have been deflated using consumer price indices (1995=100), converted into euros using 12-month averages, and then aggregated.

Source: Investment volumes and exchange rates are from EVCA 1991–2000; consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Compared to the US share of investments in communications and computer-related enterprises to total venture capital, European private equity investors have only invested a small share of private equity in these high-technology enterprises (Table A4). However, there is also a similarity: both the US and the European share of investments in communications and

computer-related enterprises increased significantly in the second half of the 1990s.

The investments in communications and computer-related and biotechnology and medical/ health-related enterprises differ significantly between the European countries. Germany's investment shares in communications and computer-related enterprises is considerably higher than the European average for all years after 1994. In Germany, moreover, biotechnology and medical/health-related enterprises received a higher share of the German private equity investments compared to the European average. The respective British and French shares, by contrast, do not differ considerably from the average values. Certainly, it is not astonishing that the values of the British market do not vary from the European averages, because the British volume dominates the European averages. However, the share of British investments in communications and computer-related enterprises and in biotechnology and medical/health-related ones show a rather low volatility over time.

Four other countries should be mentioned since they have been subject to an unusual development with respect to their technology focus. Investments in communications and computer-related enterprises have been significant and of similar magnitude in Denmark and Finland. Moreover, Danish private equity investors also invested significant amounts in biotechnology enterprises, while Finland's biotechnology enterprises has received a significant amount of private equity only in very recent years. The other two countries that should be mentioned are Belgium and Ireland, since their shares of investments in communications and computer-related enterprises increased significantly after 1995. In 1999, Belgium invested as much as 50 per cent of its equity investments in these enterprises, while Ireland invested more than two-thirds in these enterprises.

Using only investment figures from the various European countries to describe the level of activity in the national private equity markets is misleading to some extent, since the investments included in the national statistics are not necessarily made in the home country. A recent OECD study has analysed the importance of international private equity flows in 1999 (Baygan and Freudenberg 2000). According to this study, the United Kingdom was the biggest private equity exporter, followed by Belgium and

the Netherlands (Table 1). British private equity investors invested 33 per cent of the British equity investments in enterprises in other European and non-European countries. European private equity investors outside of the United Kingdom invested capital, in return, in British enterprises. This capital inflow accounted for five per cent of the British private equity investments. This led to net outflows of 28 per cent of the British investments. The highest net inflows were realized by Ireland and Denmark, whose markets are rather small compared to the British or the German market. However, larger markets had also a net inflow, since Germany's enterprises received more money from abroad than Germany's private equity investors invested in foreign enterprises.

Which European market is most similar to the US venture capital market (Table A11)? The Belgian market is to some extent similar to the US market. This market has early and expansion stage investments relative to GDP which are similar to in magnitude to the investments in US. Moreover, the Belgian market has a high concentration of investments in communications and computer-related enterprises. However, the public sector plays an important role and the Belgian market realizes an investment outflow. Thus, early and expansion stage investments are not entirely necessarily in Belgium.

The Dutch market also has some similarity with the US market for venture capital. Like the Belgian market, the early and expansion stage investments relative to GDP are similar in magnitude to the investments in the US. Moreover, the Dutch government does not play an important role in proving capital as the Belgian government does. However, Dutch investments are less concentrated on communications and computer-related enterprises and in the biotechnology and medical/ health-related enterprises. Like the Belgian market for private equity, the Dutch market realizes substantial capital outflows.

Table 1 — Cross-Border Private Equity Investment Flows in 1999 (per cent of Domestic Investments)

	Outflows (to other European or non-European countries)	Inflows (from other European countries)	Total flows (inflows plus outflows)	Net flows (inflows minus outflows)
Ireland	10	372	382	362
Denmark	3	351	353	348
Finland	16	76	92	60
Portugal	8	34	43	26
Spain	8	33	41	25
Austria	15	33	48	18
Italy	5	13	18	8
Germany	17	22	39	5
France	25	22	47	-3
Sweden	53	47	101	-6
Netherlands	50	38	87	-12
Belgium	54	41	94	-13
United Kingdom	33	5	38	-28

Source: Baygan and Freudenberg (2000).

3.4 Performance of Private Equity and the Role of Divestment Opportunities

The performance of private equity or venture capital investments in terms of economic efficiency, is not easy to determine because the relationships between private equity investors and their portfolio firms on the one hand and between private equity investors and their passive investors on the other hand are often very specific and indeed special (as discussed in Section 2). The analysis of the performance of venture-capital-backed enterprises compared to non-venture-capital-backed ones takes place exclusively in economic research, while the returns for passive investors'

investments in private equity are most often analysed by consultancies in order to offer passive investors incentives to commit capital in private equity funds. These analyses focus on returns of single investments or funds instead of analysing risk-return relationships.

The most common technique used to estimate returns is the internal rate of return (IRR). It is defined as the discounting rate for which the present value of all future outflows equals the present value of all future inflows which a private equity investor generates over time. Several measurement problems occur when calculating the IRR. For example, as long as the capital of the private equity funds is still invested, future flows of capital have to be estimated in order to calculate the IRR. Since 1996, *Venture Economics* has prepared an annual *Pan-European Investment Benchmarks Study* using the IRR technique and funds data in order to provide a comparison of the performance of European private equity with other asset classes.

According to this study, net cumulative annualised IRR of all European private equity funds in the sample has outperformed alternative asset classes (Table 2). The returns on European private equity has been compared to other asset classes on the basis of equivalent IRR. To calculate equivalent IRRs, the same pattern of private equity investments and divestments over time as in the private equity data set have been utilized to construct a portfolio of an alternative asset class. *Net* means that the often substantial management fees for private equity investors have already been deducted. European private equity funds have had a net cumulative annualised IRR of more than 15 per cent, while the equivalent IRRs of MSCI Equity has been only 13.7 per cent. The equivalent IRR of HSBC Small Cap has been also lower; it has accounted only for 11.8 per cent.

Table 2 — Net Cumulative Annualised IRR since Inception to 31 December 2000 (per cent)[14]

	Data Set Size	European Private Equity	MSCI Equity	HSBC Small Cap	JP Morgan Bond
Early stage	74	12.8	14.1	11.1	5.0
Development	69	11.1	14.3	11.5	5.1
Balanced venture capital	76	15.4	14.0	11.4	5.1
All venture capital	219	13.9	14.1	11.3	5.1
Buy-outs	144	19.3	12.8	12.5	3.1
Generalists	94	11.0	14.5	11.0	4.0
All private equity	457	15.6	13.7	11.8	4.0

Note: Morgan Stanley Capital International (MSCI) is an international (originally US American) investment bank. HSBC is a British bank. MSCI Equity contains larger and HSBC Small Cap contains smaller companies.

Source: EVCA (2001).

However, several subgroups of private equity funds have had a lower net cumulative annualised IRR than MSCI Equity, HSBC Small Cap, or JP Morgan Bond. One of the subgroups has been venture capital funds which contains funds that focus on the early stages of enterprises' development, funds that invest in the enterprises' development stage and so-called balanced venture capital that are funds which invest in enterprises' early stages as well as in enterprises' expansion stage. The balanced venture capital has outperformed HSBC Small Cap as well as MSCI Equity. But

[14] When discussing these IRRs, one has to keep in mind that the end of the 1990s was characterised by higher stock prices. Increasing stock prices first have an impact on the larger companies and only thereafter on the shares of smaller companies.

development funds has had a lower performance than both HSBC Small Cap and MSCI Equity while early stage and all venture capital have had only a lower return than MSCI Equity. The overall return of European private equity has largely reflected the success of buy-out funds; these have had a net cumulative annualised IRR of 19.3 per cent. By contrast, generalists that are not specialized on particular stages of enterprises' development have had the lowest return of all private equity subgroups.

Private equity investors who temporarily participate in privately held firms usually realize a significant part of their profits when exiting from their participations. Therefore, divestment opportunities, the so-called exit channels, such as trade sales, and initial public offerings, play an important role in the development of private equity markets in general and venture capital in particular. Black and Gilson (1998) argue that an initial public offering (IPO) is the best exit channel since the prospect of exiting through an IPO improves the entrepreneur's incentives by allowing the entrepreneur of the start-up and the venture capitalist to enter into a self-enforcing implicit contract over control. The trade sale to an informed outside investor, such as an established firm in the industry, is then the second-best exit opportunity.

A liquid secondary stock market should have a positive impact on private equity investments in enterprises' early and expansion stages, because private equity investors can build up a reputation for successfully financing high-technology start-ups more easily. The reputation of independent equity investors lowers the costs of raising new funds. Jeng and Wells (2000) indeed find evidence that IPOs (the total market value of IPOs) have a positive impact on the volume of expansion investments. However, they find no evidence that early stage investments are also affected.

In recent years, a multitude of secondary stock markets intended to attract fast-growing, innovate companies have been established in Europe (Table 3). The first market established was the Alternative Investment Market in London in June 1995, followed by EASDAQ, a pan-European stock market established in November 1996. Other secondary stock markets have been established in Germany, France and Belgium.

Table 3 — Number of Initial Public Offerings on Various Stock Markets

	1995	1996	1997	1998	1999	2000	2001	Average number per month
AIM, London	11	45	42	31	56	194	73	6.03
EASDAQ, Brussels	--	4	15	16	16	7	na	1.16
Le Nouveau Marché, Paris	--	18	20	43	55	26	na	2.75
Neuer Markt, Frankfurt	--	--	13	39	138	135	10	6.32
Euro. NM Belgium	--	--	2	6	6	3	na	0.38

Note: EASDAQ is the European Association of Securities Dealers Automated Quotation System. In March 2001, the NASDAQ stock market took over the majority ownership in EASDAQ. Since then the EASDAQ is also called NASDAQ Europe. AIM is the Alternative Investment Market.

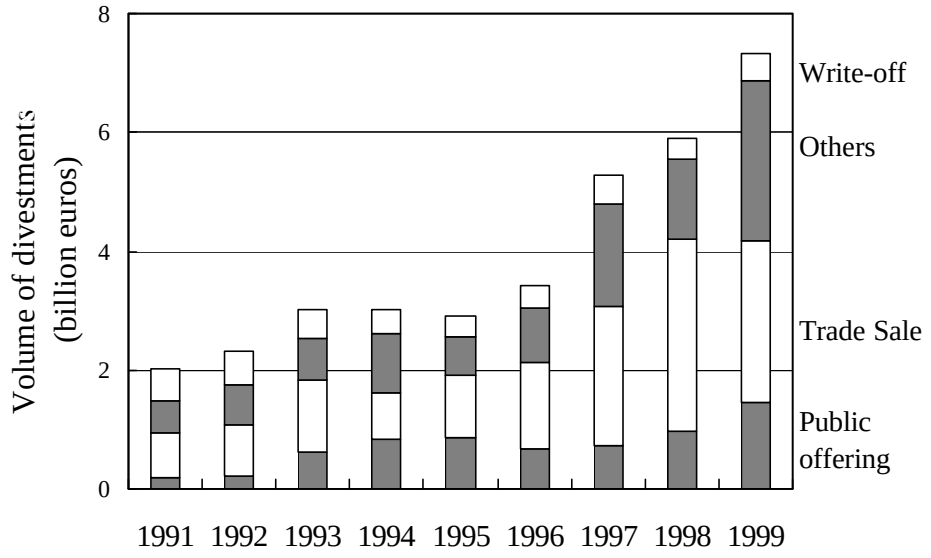
Source: London stock exchange (2001), EASDAQ (2001), Nouveau Marché (2001), Neuer Markt (2001), Euronext (2001).

The success of these secondary stock markets can be seen from the number of companies that initially offer their shares on these markets. The Neuer Markt in Frankfurt, established in March 1997, has had the highest number of initial public offerings per month with six companies on average. The Alternative Investment Market also has attracted a relatively high number of IPOs, while the Nouveau Marché is in an intermediate position among the markets considered here. The most unsuccessful markets are the EASDAQ and the Belgian EuroNM.

The expected positive effect of the establishment of a stock market on the going public activity by private equity investors depends on the liquidity of the stock market. Private equity investors are less likely to go for an IPO when the liquidity of the stock market is low. Therefore, the establishment of the Alternative Investment Market, the Nouveau Marché, and the Neuer Markt should have a positive impact on the number of private equity-backed IPOs. Indeed, the number of enterprises quoted on these markets and their capitalization are relatively high. However, it must be kept in mind

that some of these markets were preceded by earlier attempts to create stock market for young fast-growing companies. In the UK, for example, small and young enterprises went public on the Unlisted Securities Market, which was established in 1980 and closed in 1996 after the Alternative Investment Market was established. In Germany, the Regulierter Markt was also less successful than the Neuer Markt.

Figure 6 — Divestment Volumes by the Exit Channels Used (billion euros)



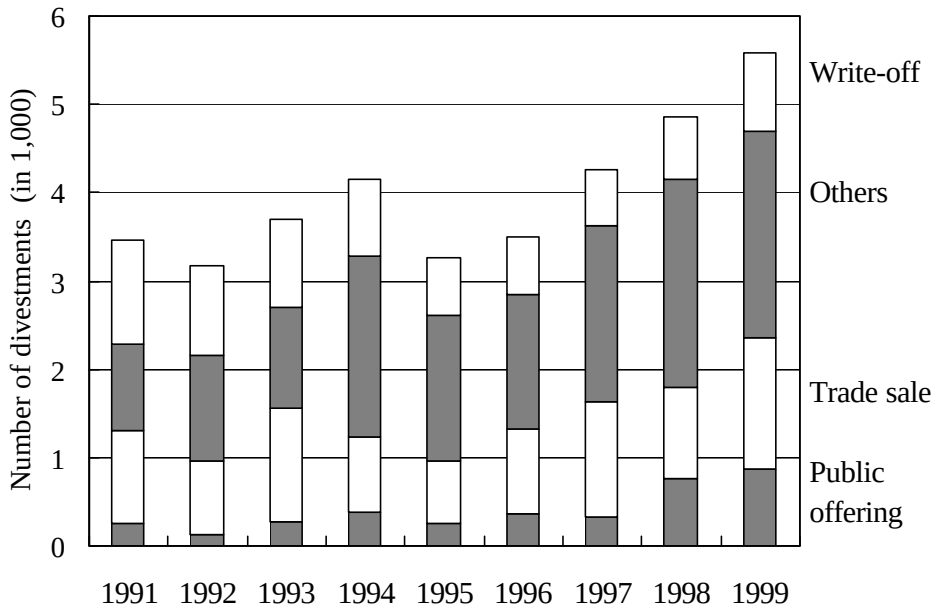
Note: Figures do not include German divestments. Divestment volumes have been deflated using consumer price indices (1995=100), converted into euros using 12-month averages and then aggregated.

Source: Divestment volumes and exchange rates are from EVCA 1991–2000, GDPs and consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Private equity investors' volume of divestments via IPOs do not show a significant upswing in relative and in absolute terms (Figure 6). Like investments, divestments by European's private equity investors show a considerable increase after 1996. However, the volume of divestments via IPOs increased only slightly, so that the relative importance of going public as an exit channel for private equity investors decreased. In 1995, the volume of divestments via IPOs accounted for almost 33 per cent of all

divestments. Thereafter, this share started to drop. In 1998, only 17.2 per cent of all divestments were realized via IPOs.

Figure 7 — Number of Divestments by Exit Channels (in 1,000)



Note: Figures do not include German divestments.

Source: EVCA 1991–2000.

The volume of divestments as a percentage of total divestments may be an inadequate measure, since it can be the result of a few large IPOs. A more adequate measure for the development of the going public exit channel could be the number of enterprises (Figure 7). Using the number of enterprises divested via an IPO to the total number of enterprises divested gives a somewhat different picture than the share of the divestment volume. In 1995 (1996), 7.9 (10.4) per cent of all private-equity-backed enterprises were divested via an IPO. In 1997, the share was as low as 7.6 per cent, while in the next two years the shares were almost 16 per cent annually. This development is more in line with the expected effects. However, the number of IPOs as a share in the total number of divestments does not differ considerably between the beginning and the end of the 1990s, which is to be expected, since secondary stock markets were established in the second half of the 1990s.

One reason for this might be national differences: secondary stock markets are generally attractive only for national firms so that the establishment of a specialized stock market segment only affects national private equity but does not affect divestments in Europe as a whole. France and Germany show an increase in the share of enterprises divested via an IPO in the second half of the 1990s. However, the increase does not seem to be correlated with the establishment of the national stock market segment for fast-growing firms. In France, for example, the number of enterprises divested via IPO to the total number of enterprises divested jumped from eight per cent in 1993 to 13.4 per cent in 1994 and the Nouveau Marché was established in 1996. The same applies for Germany. In 1996, 6.7 per cent of the enterprises were divested via an IPO, while in the year in which the Neuer Markt was founded 5.9 per cent were divested using this exit channel.[15] Obviously, the creation of a liquid secondary stock on divestment channels chosen by private equity investors is only observable after some time lag.

[15] These numbers are based on a small sample of German private equity investors taken from the BVK (various issues) which may not be representative.

4 Characteristics of German Private Equity Investors

This section focuses on venture capital as a source of funding for young high-technology enterprises in the German market, while the next section focuses on the French market. The differences between private equity investors acting in a single national market are of special interest, since their likely heterogeneity is important when interpreting aggregated data on investments or on new funds raised, because this heterogeneity may imply significant differences in the quality of capital offered.

The following questions will be addressed in this section:

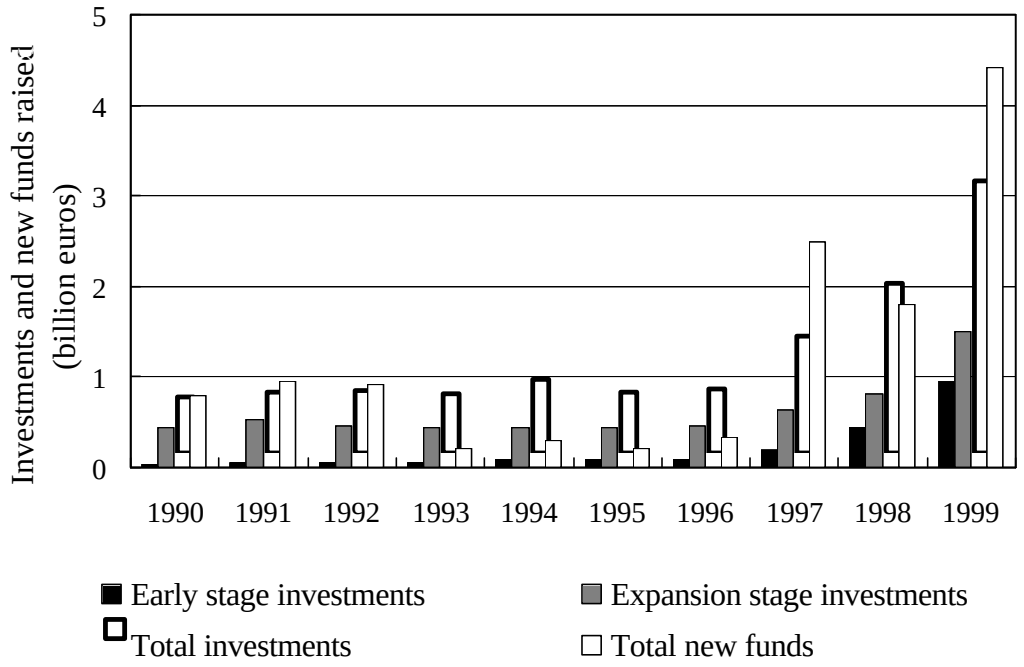
- What types of private equity investors, if any, have to be distinguished in order to understand Germany's venture capital activity?
- Do private equity investors specialize their investments on enterprises in particular development stages or technology fields such as their US counterparts?
- What control mechanisms, such as convertible securities and compensation systems, are utilized in contracts between private equity investors and their portfolio firms, and which ones are utilized between private equity investors and their passive investors?
- What do we know about offering management support and adding value by private equity investors?

In addressing these questions, I will use micro data available on the web site of the German Venture Capital Association (BVK). On this web site, German private equity investors offer a variety of information on their companies, for example the number of their portfolio firms or their propensity to invest in enterprises' early stages. The information offered are often subjective statements of the private equity investors, thus the results must be interpreted with caution. For example, private equity investors indicate whether they would be prepared to invest capital in enterprises' early stages. However, they do not indicate whether they have actually invested capital in these kinds of enterprises in the past.

4.1 General Trends in Private Equity and Its Main Determinants

The German private equity market has experienced strong growth in terms of invested capital and raised funds since 1997 (Figure 8). Two causes of this extraordinary upswing can be identified. First, the establishment of the Neuer Markt, a segment of the Frankfurt stock exchange, has considerably affected the German culture of owning shares in general and venture capital activities in particular. Second, the German government has supported private equity participations substantially. In particular, the government program entitled *Beteiligungskapital für kleine Technologieunternehmen* (BTU) has had a considerable effect on the development of investments in young high-technology enterprises.

Figure 8 — Development of Investments and New Funds Raised (billion euros)



Note: Investment volumes and new funds raised have been deflated using consumer price indices (1995=100) and then converted into euros using 12-month averages. The total investments contain the early and expansion stage investments.

Source: Investment volumes, new funds and exchange rates are from EVCA 1991–2000; consumer price indices are from International Financial Statistics CD ROM IFS (2000).

The Neuer Markt has affected the development of the German market for private equity positively, since it has offered a new exit channel for private equity investors (Heitzer and Sohn 1999). This exit channel is important for private equity investors because it helps them to build a track record for high-technology investments which is in turn important for raising new funds. The development of the private equity market, however, has not been solely due to the stimulus provided by the establishment of the Neuer Markt. The early success stories of publicly offered firms in 1997, for example, Mobilcom, an upstart telecom services provider, contributed considerably to the upswing on the private equity market.

The BTU program, introduced in 1995, has had a positive impact in the German market for equity participations as well (Lessat et. al. 1999). It comprises a loan and a co-investment scheme. Under the loan scheme, the Kreditanstalt für Wiederaufbau (KfW), Germany's state development bank, refinances seventy per cent[16] of private equity investors' participations in small and often young high-technology enterprises,[17] up to a maximum amount of two million euros. Under the co-investment scheme, the Technologie-Beteiligungs-Gesellschaft (tbg, Technology Participation Company), an affiliate of the Deutsche Ausgleichsbank, invests in small, and often young high-technology enterprises as a non-active co-investor, up to a maximum amount of 1.5 million euros, if a private equity investor, the so-called lead investor, invests at least the same amount in form of equity and if the lead investor supports the management team and monitors the development of the enterprise.

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16 In 1995, investments were refinanced up to 85 (75) per cent in new (old) Laender. After 1 July 1999, this ratio was reduced to 80 (70) per cent in new (old) Laender. Since 1 January 2000, the ratio of refinancing has been identical in new and old Laender.

17 An enterprise is defined here as being small if it has fewer than 50 employees, total annual revenues of less than seven million euros or a balance of less than five million euros. This definition of small enterprises is in accordance with EU guidelines. Moreover, enterprises must not be older than ten years; after 1 January 2000 even not older than five years.

In quantitative terms, the BTU program has had a significant positive impact in the development of private equity investments flowing into enterprises which are communications and computer-related. In 1995, the KfW refinanced equity participations of private equity investors in communications and computer-related enterprises with a volume of 2.2 million DM, while the respective amount was 159.5 million DM in 1999 (Schertler 2001). The tbg co-investment volume has also increased considerably. In 1999, the tbg invested 215.3 million DM in communications and computer-related enterprises compared with 28.6 million DM in 1995 (Schertler 2001). However, the co-investment volume of the tbg and in the refinancing volume of the KfW increased not as much as the total volume of investments flowing into communications and computer-related enterprises. In 1995, investments in these enterprises totalled only 165.6 million DM, against 2.2 billion DM in 1999.

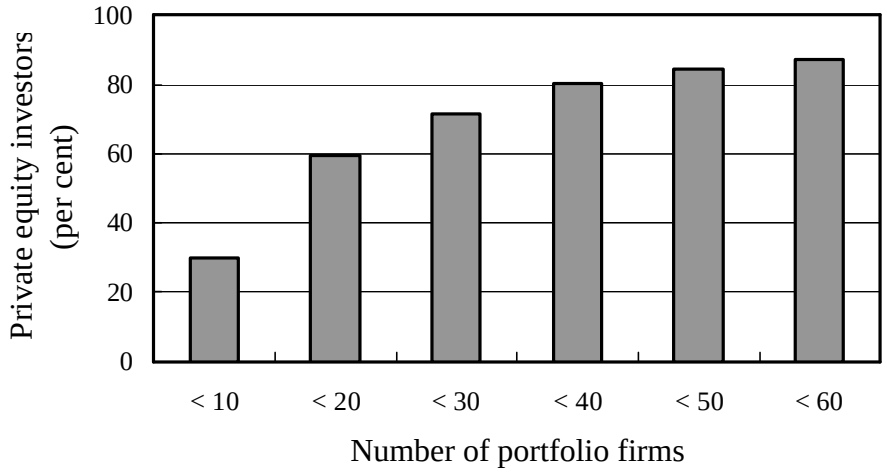
4.2 Private Equity Investors and Their Portfolio Firms

The number of private equity investors has increased significantly in recent years and so has their number of portfolio firms. In 1994, only 75 private equity investors were members in the German Venture Capital Association (BVK). These 75 private equity investors employed 310 so-called (full-time equivalent) professionals to monitor the portfolio firms and to raise funds from passive investors. The 75 investors had 2,780 firms in their portfolios (BVK 1995). In March 2001, however, the BVK had 181 members, members who employed a multitude of professionals and hold a multitude of firms in their portfolios. For 143 of these 181 members, micro data on the number of firms in their portfolios are available on the web site of the BVK and are used in the following. The 143 members for which micro data are available hold 5,501 firms in their portfolios.

Germany's private equity investors have 38.5 firms, on average, in their portfolios. However, the distribution of portfolio firms among the investors is very unequal: The first quartile is 4.8, the median is 17.0, and the third quartile is as high as 114.0. More than 30 per cent of all private equity investors have less than ten firms in their portfolios; almost 60 per cent have fewer than 20 firms in their portfolios (Figure 9). Only seven private equity investors have more than 100 portfolio firms. Of these seven, the *Mittelständische Beteiligungsgesellschaft Baden-Württemberg GmbH*, a

publicly supported private equity investor, has more than 900 portfolio firms.

Figure 9 — Distribution of Portfolio Firms among Private Equity Investors (per cent)



Source: BVK (2001), and Internet pages of the private equity investors (if available).

The next question to be addressed is whether the private equity investors' legal connection to their passive investors affects the number of portfolio

firms. In the following, four groups of private equity investors are distinguished:[18]

- PUBLIC EQUITY INVESTORS. These are publicly supported private equity investors who are controlled mainly by public authorities and which are often non-profit oriented. The largest subgroup in this group is the *Mittelständische Beteiligungsgesellschaften*, which often offer only silent partnerships and which have a strict geographical focus.[19] They rely heavily on the support programs of the government, since they do not have considerable funds themselves (Wupperfeld 1997).
- SUBSIDIARIES OF PRIVATE BANKS. These are private equity investors that rely on funds offered by private banks.
- SUBSIDIARIES OF SAVING BANKS. These are private equity investors which are subsidiaries of Sparkassen (saving banks), Raiffeisenbanken and Volksbanken (cooperative banks). They are distinguished here from private banks because they promote enterprises in the region in which they operate in addition to achieving an appropriate rate of return.
- INDEPENDENT EQUITY INVESTORS. These are investors that are independent of their sources of funds, while the three other groups

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[18] Corporate equity investors are another type of private equity investors acting in the German market for which however comparable micro data are not available. Large firms invest money in small and medium-size enterprises either by offering money to independent equity investors or by creating their own fund that invests equity (Lessat et al. 1999). Both independent and corporate equity investors aim to receive an appropriate rate of return on their invested money. However, they differ with respect to their strategic goals. Corporate equity investors have an interest in building long-term cooperative relationships and in keeping an eye on new technological developments, while independents do not have such strong strategic goals. Independents seek to exit from their participations after five to ten years, corporates often hold their participation for longer (Lessat et al. 1999). At the end of the 1990s, some of Germany's large firms, such as Siemens and Deutsche Telekom, founded subsidiaries that invest money in high-technology enterprises.

[19] For the historical development of the German market for private equity with particular reference to the *mittelständischen Beteiligungsgesellschaften*, see Pfirrmann et al. (1997).

mentioned above are legally connected to their sources of funds and are therefore called dependent private equity investors. This group comprises private equity investors that invest money without supporting the enterprises' management teams, and American-style private equity investors, i.e., venture capitalists that offer management support in addition to financial means.

In order to identify the groups of private equity investors acting in the German market, I use information from the web site of the BVK as well as the information from web pages of individual private equity investors. On the web site of the BVK, private equity investors indicate who their shareholders are. This information is used to identify private equity investors that are subsidiaries of saving banks. Moreover, this information was used to identify several subsidiaries of private banks. Private equity investors indicate on the BVK web site whether they are profit oriented. All non-profit oriented investors were classified as public equity investors. For all remaining private equity investors, I collected additional information from individual web site.

The number of portfolio firms differs considerably between first type of private equity investors and the other three types (Table 4). Public equity investors have more firms in their portfolios than any other type of private equity investor analysed here. Both the average number, which is 144.4, and the median, which is 72.5, are much higher than the respective numbers for the other private equity investors.

Table 4 — Number of Portfolio Firms by Type of Private Equity Investor

	All private equity investors	Public equity investors	Subsidiaries of private banks	Subsidiaries of saving banks	Independent equity investors
Mean	38.5	144.4	23.5	16.5	25.3
Median	17.0	72.5	20.0	13.5	11.0
First quartile	8.0	35.8	10.5	8.5	6.0
Third quartile	33.5	119.5	28.0	20.3	21.8
Number of private equity investors	143	18	31	26	66
Number of portfolio firms	5,501	2,600	729	429	1,673

Source: See Figure 9.

Compared with subsidiaries of private and saving banks, independent equity investors seem to be more heterogeneous with respect to the number of portfolio firms as indicated by the mean and median values. The reason for this is that portfolio firms of subsidiaries of private and saving banks can be interpreted as long-term averages, while the number of independent equity investors cannot because many of the independents were founded only in the last few years. Data on the founding year of the independents are available for 40 investors. Of these 40, seven were founded in 1998 and 13 were founded in 1999 or later. Therefore, independent equity investors have presumably not yet reached their optimal number of firms in their portfolios, since selecting enterprises for investment is a time-consuming task.

4.3 Private Equity Investors' Propensity for Financing Young High-Technology Enterprises

The private equity investors' propensity for financing young high-technology enterprises can be utilized to determine how many German private equity investors would invest capital in young high-technology enterprises. Moreover, private equity investors' propensity for financing particular

stages and technologies contain information on investment behaviour and strategies. In this context, it is interesting to ask whether Germany's private equity investors specialize on particular stages of enterprises' development and/or technologies as their US counterparts do. This may yield some insights into the development stage of the German venture capital market.

Germany's private equity investors have a relatively low degree of specialization on particular stages and/or technological sectors (Table 5). Only around 38 per cent of all private equity investors are specialized either on particular sectors or on particular stages. Only about one fifth of all private equity investors are specialized on particular stages of particular technological sectors.

Private equity investors' specialization on development stages and sectors differ considerably between the four types of private equity investors. Independent equity investors have a considerably higher degree of specialization than their subsidiaries of private and saving banks and of public investors with respect to sectorial and the stage specialization, as well as with respect to simultaneous specialization on particular stages and sectors.

Table 5 — Specialization Patterns of Germany's Private Equity Investors (per cent)

	Private equity investors	Public equity investors	Subsidiaries of private banks	Subsidiaries of saving banks	Independent equity investors
Sectorial preference[1]	37.7	22.2	16.1	19.2	62.1
Stage preference[1]	37.6	22.2	22.6	34.6	50.0
Stage and sectorial preference[1]	21.3	11.1	3.2	11.5	36.4
Number of private equity investors	141	18	31	26	66
Biotechnology and medical/ health-related[2]	69.8	50.0	60.5	100.0	63.4
Communications and computer-related[2]	49.1	0.0	40.0	20.0	56.1
Number of private equity investors specialized on particular technologies	55	4	5	5	41
Seed, start-up and expansion stage[2]	58.5	50.0	57.1	66.6	57.6
Number of private equity investors specialized on particular stages	53	4	7	9	33

[1]Specialized private equity investors as a percentage of all private equity investors. Private equity investors are specialized when they indicate to finance less than six sectors or less than four stages (total number of stages is 7). — [2]Private equity investors infusing money in particular stages or technologies as a percentage of all specialized private equity investors. Computer hardware, software, semiconductor, Internet, and e-commerce enterprises are computer-related.

Source: See Figure 9.

On which technological sectors and stages of enterprises' development do German private equity investors specialize? Almost 70 per cent of all private equity investors who are technologically specialized indicate to invest money in biotechnology and medical/health-related enterprises, while about 49 per cent indicate o invest money in communications and computer-related enterprises (Table 5). Note, that some private equity investors indicate to invest money both in biotechnology and medical/health-related enterprises and in communications and computer-related enterprises, so that the sum of the percentage shares is larger than 100. About 60 per cent of the private equity investors that are specialized on particular stages of enterprises' development, i.e., that invest money in less than four stages, invest their capital in the seed and/or the start-up and/or the expansion stages.

What about the supply of private equity for enterprises that are in the earliest stages of development? Forty per cent of all private equity investors in the sample indicate to offer money to enterprises which are in the seed stage (Table 6), which is the earliest stage of enterprises' development. More than seventy per cent of all private equity investors indicate to offer capital to enterprises in the start-up stage and almost 90 per cent indicate to offer capital in enterprises that need money to finance their growth, since their cash flows are not sufficient to allow inside financing (these enterprises are in the expansion stage).

Table 6 — Propensity of Germany's Private Equity Investors to Invest in Different Stages of Firm Development (per cent)

	Private equity investors	Public equity investors	Subsidiaries of private banks	Subsidiaries of saving banks	Independent equity investors
Seed	40.4	38.9	19.4	38.5	50.0
Start-up	70.2	77.8	54.8	65.4	74.2
Expansion	88.7	77.8	87.1	88.5	89.4
Number of private equity investors	141	18	31	26	66

Source: See Figure 9.

With respect to private equity investors' propensity to invest in enterprises' development stages, the differences between the four types are also substantial (Table 6). Subsidiaries of private banks seem to be more risk-averse, since they shy away from financing enterprises in early stages. Only 19.4 per cent of all subsidiaries of private banks indicate that they offer capital to enterprises in the seed stage, while almost 55 per cent indicate that they offer capital to enterprises in the start-up stage. Compared to subsidiaries of private banks, public equity investors and subsidiaries of saving banks indicate to offer equity for enterprises' early stages more often. About 39 per cent of them invest capital in the seed stage, while 78 (65) per cent of the public investors (subsidiaries of saving banks) invest in the start-up stage. The independents have, with 50 per cent, a considerable higher share of private equity investors who offer capital to enterprises that are in the seed stage than all other groups of investors.

The finding that subsidiaries of private banks invest less money in enterprises' early stages of development than other private equity investors runs counter to the result obtained by Mayer et al. (2001). They find no difference between the various sources of funds of Germany's private equity investors with respect to their involvement in early stages: Bank-funded equity investors are as much involved in financing enterprises' early stages of development as other private equity investors. Mayer et al. (2001) obtain their result using a regression analysis in which the sources of funds[20] are utilized in order to explain the stage focus of Germany's private equity investors.

Although they use basically the same data set as it is used here, their sole use of the sources of funds to determine the relationship between the sources of funds and the early stage focus of Germany's private equity investors may be misleading for several reasons. First, all subsidiaries of saving banks indicate that they only receive capital from a bank. These must be distinguished from private banks, since the former ones have a strong focus on financing young enterprises located in their own geographic

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[20] Private equity investors indicate on the web site of the BVK whether they received capital from banks, private individuals, insurances, the public sector, industry, or independent funds.

neighbourhood. Their failure to make such a distinction might account for their finding being different from the one obtained here. Second, some private equity investors using the BTU program indicate they receive government funding, while others who also use this program do not. Moreover, private equity investors which I have classified as public equity investors cannot be identified as such when only the sources of funds are used. For example, the *Mittelständische Beteiligungsgesellschaft Thüringen GmbH* indicates that it only receives money from banks. It does not indicate whether the sources of funds, i.e., the banks, carry the entire risk of investments or whether public authorities guarantee part of the investments.

4.4 Control Mechanisms Utilized in Private Equity Finance

Various control mechanisms, such as the use of convertible securities or entrepreneurs' and private equity investors' compensation systems, are often utilized in private equity finance to mitigate the incentive problems which can arise between the private equity investor and his portfolio firms on the one hand, and between the private equity investor and his passive investors on the other hand. Comparing the control mechanisms used by several types of German private equity investors helps to understand the overall development of the German venture capital market. A liquid venture capital market can only develop if the contractual arrangements between the three parties, i.e. the private equity investors, their passive investors, and their portfolio firms, are designed to offer each party sufficient incentives to do their specific tasks.

The German market for private equity in general and venture capital in particular is not a homogenous market with respect to the form of participation utilized by private equity investors (Table 7). About nine per cent of all private equity investors use only silent partnerships. This form of participation is very common among public equity investors but not among subsidiaries of financial institutions and independent equity investors. More than 60 per cent of the public equity investors use only silent partnerships. But silent partnerships are not in line with the American model of venture capital finance, since private equity investors in silent partnerships have no incentives to actively engage in monitoring and support of the firms they finance.

Table 7 — Private Equity Investors' Used Form of Participation (per cent)

	Private equity investors	Public equity investors	Subsidiaries of private banks	Subsidiaries of saving banks	Independent equity investors
Only silent partnerships	9.2	61.1	3.2	3.8	0.0
Silent partnership	59.6	88.9	71.0	92.3	30.3
Open participation	82.3	33.3	90.3	92.3	86.4
Number of private equity investors	141	18	31	26	66

Source: See Figure 9.

Besides using silent partnerships, Germany's private equity investors often use pure equity, less frequently the sort of convertible securities (Bascha and Walz 2001) often used by US venture capitalists. Bascha and Walz use a data set containing 60 members of the BVK, that is, 49.6 per cent of all members in January 2000. 33 per cent of the 60 members use silent partnerships, almost 27 per cent use pure equity, while only about eleven per cent use convertible securities. Since these figures are averages of the financial instruments used by several types of private equity investors, they are not directly comparable with US figures which only refer to venture capitalists.

The degree of private equity investors' profit-orientation affects significantly the use of convertible securities. Independent equity investors, who are generally profit-oriented, use convertible securities more often than public investors or subsidiaries of saving banks do (Bascha and Walz 2001). These private equity investors seem to have stronger incentives to solve agency problems than other private equity investors. Moreover, the expected exit channel affects the use of convertible securities; both trade sales as well as an initial public offering have a significant positive impact on the use (Bascha and Walz 2001).

As I have already mentioned, control mechanisms are not only utilized in the contracts between private equity investors and portfolio firms, but also between private equity investors and their passive investors. Professional managers of subsidiaries of private banks often do not receive profit participation in addition to their basic salary. As a consequence, these managers have almost no incentive to support the management teams and to monitor the development of the firms in which they invest (Zemke 1995). Professional managers of independent equity investors, however, receive a management fee and participate in profits due to carried interests (Zemke 1995) and thus have incentives to monitor and support their portfolio firms.

In contrast to the United States, Germany's corporate laws does not know a particular legal organizational form especially designed for private equity investors (Zemke 1995). The only possibility for private equity investors to receive some tax advantages is to adopt the form of Unternehmensbeteiligungsgesellschaften (enterprise participation company, UBG).[21] Private equity investors that are approved as UBG have to satisfy several restrictions in order to receive some tax advantages. Since the number of UBGs is not substantial, it seems that the tax advantages do not offset the costs of the restrictions imposed. Leopold and Frommann (1998) mention the taxation of capital gains as an important limiting factor in the creation of new UBGs.

The predominant organization of private equity in Germany has changed from un-limited open funds to limited closed funds in the last years. At the beginning of the 1990s, private equity funds were often organized as funds without specified time frames or volumes, while at the end of the 1990s, more than 60 per cent of the new funds raised were raised by closed funds (BVK 2000). The reason for this is not a change in the behaviour of the private equity investors already acting in the market in the beginning of the 1990s, but a huge number of young and independent equity investors that

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[21] In the mid-1980s, the German government introduced a special law on private equity funds, the UBBG (Gesetz über Unternehmensbeteiligungsgesellschaften), which was revised in 1994. In 1997, only ten UBGs were active in the German market.

entered the market at the end of the 1990s and refinanced themselves with closed funds (Bascha and Walz 2001).

4.5 Do Germany's Private Equity Investors Add Value?

The question whether German private equity investors' support of the management teams add value to their portfolio firms is important to determine the developmental stage of the German venture capital market as well as to design appropriate public policies to improve venture capital supply for high-technology enterprises in an efficient manner. The answer to this question is presented in two parts. The first part addresses the question whether German private equity investors support the management teams of their portfolio firms and monitor the development of these firms. The second part addresses the question whether German private equity investors' support of the management teams actually add value.

The German private equity investors differ significantly with respect to the intensity of their management support the provided to their portfolio firms. Especially, Germany's *mittelständische Beteiligungsgesellschaften* often do not offer consulting services that go beyond traditional arm's-length board activity (Wupperfeld 1994). The subsidiaries of the financial institutions often do not have the expertise and knowledge to support high-technology start-ups. Compared to all other groups of private equity investors, the private equity investors that are independent of their sources of funds offer a high intensity of support to their portfolio firms (Kulicke 1997).

Germany's private equity investors take on several roles in their portfolio firms (Cooper&Lybrand 1998). Almost 70 per cent of 216 German private-equity-backed enterprises surveyed by Cooper&Lybrand said that their private equity investors were a competent partner for discussion. 46 per cent of the enterprises saw in their private equity investors a source for ideas and suggestions. Management support and help in important decisions were received by 45 per cent of the enterprises questioned. 31 per cent of the enterprises used the network contacts of their private equity investors. However, only 10 per cent of the enterprises received advice when recruiting new managers. Unfortunately, the study does not discriminate between the several types of private equity investors that act in the German market for private equity.

Independent equity investors differ significantly from dependent equity investors (subsidiaries of banks or corporate equity investors) with respect to their intensity of support. Zemke (1995) analyses German private equity investors' intensity of advice and support when strategic decisions must be made in the portfolio firms. He finds that independent equity investors have a significantly higher intensity in supporting the management teams of the portfolio firms than their dependent counterparts. Moreover, the independents in his sample offer more network value, such as building up contacts to customers and suppliers, than dependent equity investors.

Does German private equity investors' involvement actually create an added value in their portfolio firms? The survey of Bürgel et al. (2000) does not find a significant relationship between a private equity participation and the revenue or employment growth among 600 German and British high-technology enterprises. However, Engel (2001a) finds evidence that Germany's private-equity-backed enterprises realize higher growth rates than their non-private-equity-backed counterparts. But higher growth rates are not the result of private equity investors' active involvement in their portfolio firms. Indeed, private equity investors are capable of selecting firms with higher ex ante and ex post growth prospects, i.e., the pre-investment screening procedure by private equity investors is the reason for the higher growth rates of their portfolio firms. Engel (2001b) finds evidence that young private-equity-backed enterprises realize significantly higher annual growth rates in employment than their non-private-equity-backed counterparts when private-equity and non-private-equity-backed enterprises are matched.

4.6 Development Prospects of the German Private Equity Market

The development prospects of the private equity market in Germany are hard to determine due to the developments on stock markets in the last two to three years. These have affected the private equity market in two ways. Most portfolios of private equity investors were inflated in the course of the stock market bubble, and private equity investors adjusted the portfolio values by large amounts after spring 2000. Moreover, private equity investors who are listed on a stock exchange experienced substantial losses in their share prices. Therefore, the number of private equity investors, especially the number of independents, might drop.

Developments in the Neuer Markt make it virtually impossible for Germany's private equity investors to exit from their participations via an initial public offering. The next initial public offerings are not planned until the mid-2002. In the meantime, private equity investors are likely to use the trade sale channel more extensively. This will certainly affect the rate of return of private equity investments negatively. Thus, raising new funds is likely to be more difficult in the future. Again, this development will affect the independents more than other private equity investors.

However, rather than the short-term sentiment in the stock markets seems the innovation potential in Germany for the long-term prospects of the German private equity market. Only if Germany offers sufficient investment opportunities in young high-technology enterprises for private equity investors, can a venture capital culture similar to the US model, where investors do not only offer financial means but also management support, develop.

5 Characteristics of French Private Equity Investors

This section analyses the characteristics of French private equity investors with respect to their investment behaviour towards young high-technology enterprises. Unfortunately, the value added by private equity investors as well as the control mechanisms used in the contracts between private equity investors and their portfolio firms and between private equity investors and their passive investors have not been analysed for the French private equity market in the recent literature. However, the information offered by the *Association Francaise des Investisseurs en Capital* (French Venture Capital Association, AFIC) on French private equity investors is to some extent richer than the German data and thus offers deeper insights into the investment behaviour of French private equity investors.

The following questions will be addressed in this section:

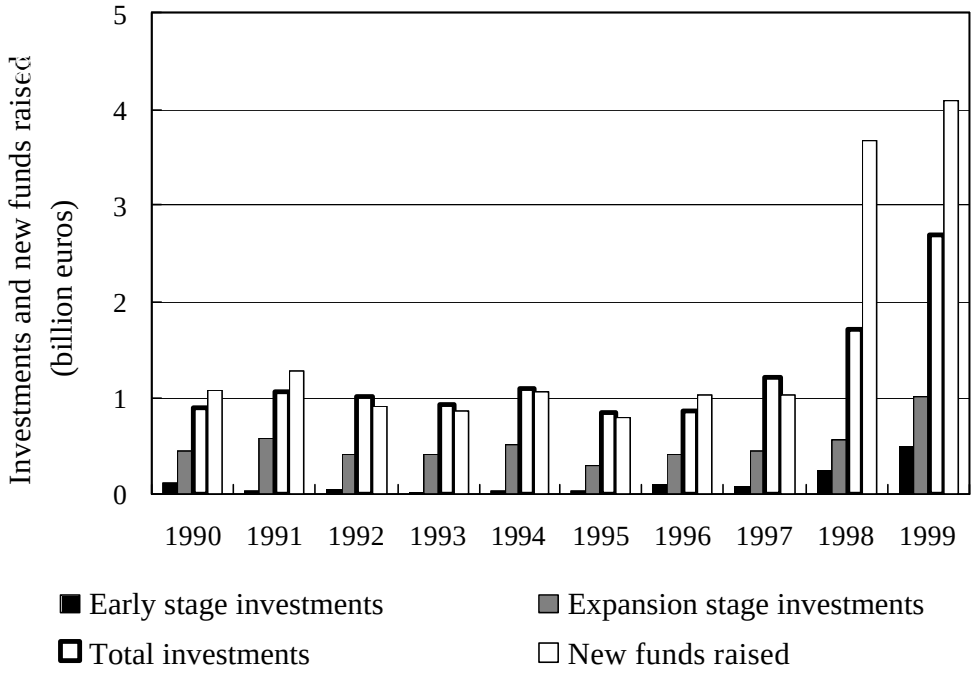
- What are the main differences in the development between the French and German private equity markets?
- Which types of private equity investors are present in the French market for private equity?
- Do French private equity investors vary with respect to their investment strategies, especially with respect to the intensity with which they support their portfolio firms?
- How does the specialization pattern of French private equity investors regarding particular stages or technologies compare to the German pattern?

5.1 Development of the French Market for Private Equity in Comparison to the German Market

The French market for private equity has experienced strong growth in terms of investments and to some extent also in terms of new funds raised since 1997 (Figure 10). Early stage investments grew annually by 15 per cent between 1990 and 1999, while the expansion stage and total investments realized an annual growth rate of eight and eleven per cent, respectively (Table 8). The bulk of investment growth took place at the end of the 1990s, while growth rates were sometimes even negative in the first half of the 1990s. Between 1997 and 1999, expansion and total investments grew with an annual growth rate of below 30 per cent, while early stage investments grew at an annual rate of 58 per cent. New funds raised grew at an annually rate of 13.3 per cent between 1990 and 1999. Again, the annual growth rate of 45.6 per cent between 1997 and 1999 is considerably higher.

Comparing investment growth of French private equity with the growth of investments of private equity in Germany (Table 8) shows that Germany's investments grew stronger than the French investments between 1990 and 1999. Especially the German early stage investments grew at an annual rate which is twice as high as the French growth rate. However, at the end of the 1990s, early stage investments in France grew with a higher rate than in Germany. The French and German growth rates of total investments and expansion stage investments between 1990 and 1999 do not differ as much as the early stage investments.

Figure 10 — Investments and New Funds Raised by French Private Equity Investors (billion euros)



Note: Investment volumes and new funds raised have been deflated using consumer price indices (1995=100) and then converted into euros using 12-month averages. Total investments contain early and expansion stage investments.

Source: Investment volumes, new funds and exchange rates are from EVCA 1991–2000; consumer price indices are from International Financial Statistics CD ROM IFS (2000).

With respect to the new funds raised for investments, German private equity investors achieved a higher annual growth rate, 17.2 per cent, than the rate of their French counterparts, whose new funds activity grew only at an annual rate of 13.3 per cent. However, between 1997 and 1999, the French private equity investors again realized a higher annual growth rate of new funds than German private equity investors.

Two differences between the German and French early and expansion stage investments in absolute terms are notable. First, French early stage investments have exceeded the German early stage investments in only two years. In addition, the difference between German and French early stage investments has increased since 1997. In 1999, German private equity

investors invested an additional half a billion more euros in enterprises' early stages of development than their French counterparts. Second, at the beginning of the 1990s, French expansion investments exceeded German investments in absolute terms. Since 1997, German private equity invested in enterprises' expansion stage exceeded the French ones.

Table 8 — Growth Rates of Investments and New Funds Raised by French and German Private Equity Investors (per cent)

		1990–1999	1990–1993	1994–1996	1997–1999
Early stage investments	France	15.5	–46.6	44.8	58.0
	Germany	31.9	9.0	3.8	52.9
Expansion stage investments	France	8.3	–1.6	–6.8	28.2
	Germany	12.1	–0.7	1.6	28.9
Total investments	France	11.1	1.3	–8.1	26.7
	Germany	15.8	1.4	–4.8	28.4
New funds raised	France	13.3	–5.7	–1.4	45.6
	Germany	17.2	–32.2	3.7	19.1

Note: Investment volumes and new funds raised have been deflated using consumer price indices (1995=100), converted into euros using 12-month averages and then growth rates calculated.

Source: Investment volumes, new funds and exchange rates are from EVCA 1991–2000; consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Moreover, it seems that the German and French markets for private equity have reacted differently to the establishment of secondary stock market segments. Germany's early and expansion stage investments started to rise significantly in 1997 when the Neuer Markt, the secondary stock market segment in Frankfurt, was established. France's early and expansion stage investments, in contrast, did not start to rise considerably in the year in which the Nouveau Marché in Paris was established.

The development of the number of professional managers acting in the French and German markets for private equity suggests that the development of the German and French markets was not as similar as

suggested by the growth rates of investments (Figure 11). Until 1996, the number of professional managers was nearly constant in both countries. Between 1991 and 1996, the average number of French professional managers exceeded the average number of German professional managers by around 200. After 1996, the number of professional managers in the German market for private equity started to increase and exceeded in 1998 and 1999 the number of French professional managers.

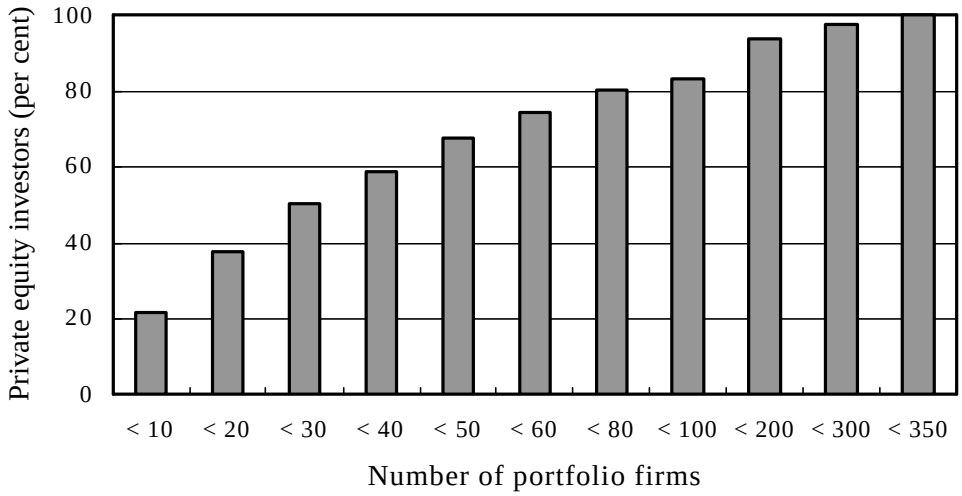
Figure 11 — Development of the Number of Professional Managers (Full-Time Executives) in Germany and France

Source: EVCA 1991–2000.

5.2 Private Equity Investors and Their Portfolio Firms

French private equity investors have on average 52 firms in their portfolios; 13 firms more than their German counterparts. More than 20 per cent of the French private equity investors have less than ten firms in their portfolios, and another 20 per cent have more than 100 firms in their portfolios (Figure 12). Thus, the distribution of firms among the French private equity investors' portfolios is rather unequal; similar to the German distribution. The median of the number of portfolio firms is as low as 27, while the third quartile is only 60 (Table 9).

Figure 12 — Distribution of Portfolio Firms among Private Equity Investors (per cent)



Source: AFIC (2000).

In order to see whether the number of portfolio firms depends as much on the private equity investors' type as in the German case, I had to identify the main types of private equity investors acting in the French market for private equity. Four groups of private equity investors can be distinguished in the French market. The definition of some of these differs from the groups in the German private equity market:

- SUBSIDIARIES OF BANKS. All private equity investors are classified as subsidiaries of banks when they rely predominantly on bank funds. Unfortunately, it is not possible to distinguish between banks controlled by public authorities and private banks.
- INDEPENDENT EQUITY INVESTORS. This group is defined in the same way as German independent equity investors and are thus comparable.
- CORPORATE EQUITY INVESTORS. These are private equity investors legally connected to a corporation. Corporate equity investors differ from independent equity investors with respect to their strategic goals. Corporate equity investors have an interest in building long-term cooperation relationships and in keeping an eye on new technological developments, while independents do not have such strong strategic goals.

- SUBSIDIARIES OF INSURANCES. These are private equity investors legally connected to an insurance company. The investment behaviour of these private equity investors is comparable with the investment behaviour of banks. The number of subsidiaries of insurances in the French private equity market is rather low. Therefore, data on the group of investors have to be interpreted with more caution than other data offered on the other types of French equity investors.

The figures for subsidiaries of banks and independent equity investors can be directly compared with the German data, while corporate equity investors and subsidiaries of insurances cannot, since these types are not present in the German sample.

Table 9 — Number of Portfolio Firms by Type of Private Equity Investor

	Private equity investors	Subsidiaries of banks	Independ-ent equity investors	Corporate equity investors	Subsidiaries of insurances
Mean	52.2	71.7	35.0	56.3	34.2
Median	27.0	44.0	17.0	20.0	15.0
First Quartile	10.0	20.0	9.0	18.0	9.0
Third Quartile	60.0	82.5	40.0	50.0	40.0
Number of portfolio firms	6,939	3,941	2,066	507	171
Number of private equity investors	133	55	59	9	5

Source: AFIC (2000).

In order to identify the groups of private equity investors acting in the French private equity market, I have used information from the AFIC, the information in Hugot (in this book, a lot of private equity investors present their company), the member index of the EVCA, and the information offered on the web pages of particular private equity investors if necessary. The member list of AFIC and EVCA includes information on the legal status of the particular members. Combining the two lists, it was possible to

identify all independent equity investors and most of the other types of private equity investors. Hugot (2000) contains information on the shareholders of private equity investors which I have predominantly used to identify the subsidiaries of banks.

French private equity investors differ considerably with respect to the number of firms which they have in their portfolios (Table 9). With an average number of 72 and a median value of 44, subsidiaries of banks have particularly large numbers of firms in their portfolios. Moreover, French subsidiaries of banks have considerably more firms in their portfolios than Germany's subsidiaries of private banks. Corporate equity investors have fewer portfolio firms than subsidiaries of banks but more than independent equity investors.

Interestingly, French independent equity investors have 35 firms on average (median value is 17) in their portfolios, while the German independent equity investors only have 25 firms on average (median value is 11) in their portfolios. This difference can be explained by the fact that German independent equity investors are comparably young. About 50 per cent of the German independent equity investors have been established since 1998. In France, foundation data of 40 independent equity investors are available. Three of them were founded in 2000, three in 1999, and two in 1998. Thus, 20 per cent of the French independent equity investors have been established, while in Germany, 50 per cent of the independents have been established in the last three years.

The annual number of investment deals confirms the existence of considerable differences between the various types of French private equity investors (Table 10). Using the annual number of investment deals instead of the number of portfolio firms (Table 9) has the advantage that the comparison is less biased. The bias stems to a great extent from the fact that private equity investors follow different divestment strategies. Corporate equity investors, for example, often hold their participations for a longer time, since they build up long-term cooperative relationships, while independents principally seek to exit from their participations after five to ten years (Lessat et al. 1999). Moreover, the annual number of investment

deals is not affected by the lifetime of the private equity investor itself, while the number of portfolio firms is.[22]

Table 10 — Annual Number of Portfolio Firms by Type of Private Equity Investor

	Private equity investors	Subsidiaries of banks	Independent equity investors	Corporate equity investors	Subsidiaries of insurances
Mean	13.1	17.6	8.8	12.1	18.3
Median	10.0	13.8	5.0	8.0	20.0
First Quartile	4.5	7.0	3.5	5.0	17.5
Third Quartile	17.5	19.5	11.5	15.0	20.0
Number of private equity investors	79	34	36	6	3

Source: Hugot (2000).

Data on the annual number of investment deals available for 79 private equity investors that are members in AFIC have been taken from Hugot (2000). Each of these 79 investors invests in 13 deals per year on average. Subsidiaries of banks finance on average almost 18 deals, followed by corporate equity investors that invest their capital on average in 12 deals. Independent equity investors concentrate their activities on fewer deals. They only finance an average of nine deals per year. The number for the first, second and third quartile of the independent equity investors also indicate that this type of investor invests money in fewer deals per year than the other types of private equity investors. Under the assumption that a deal is equal to a portfolio firm (i.e., each portfolio firm receives capital only

[22] While the age structure of private equity investors plays a crucial role in the German market because age structure differs between types of private equity investors (independents are relatively young), this does not seem to be the case in the French market. All types of French equity investors have a similar age structure. About 20 per cent of the private equity investors are younger than five years. Slightly less than forty per cent are younger than ten years and about 80 per cent are younger than twenty years.

once), private equity investors need on average four years in order to reach the total number of portfolio firms reported in Table 9. Put differently, private equity investors exit from their participations after four years on average.

5.3 Private Equity Investors and Their Funds under Management

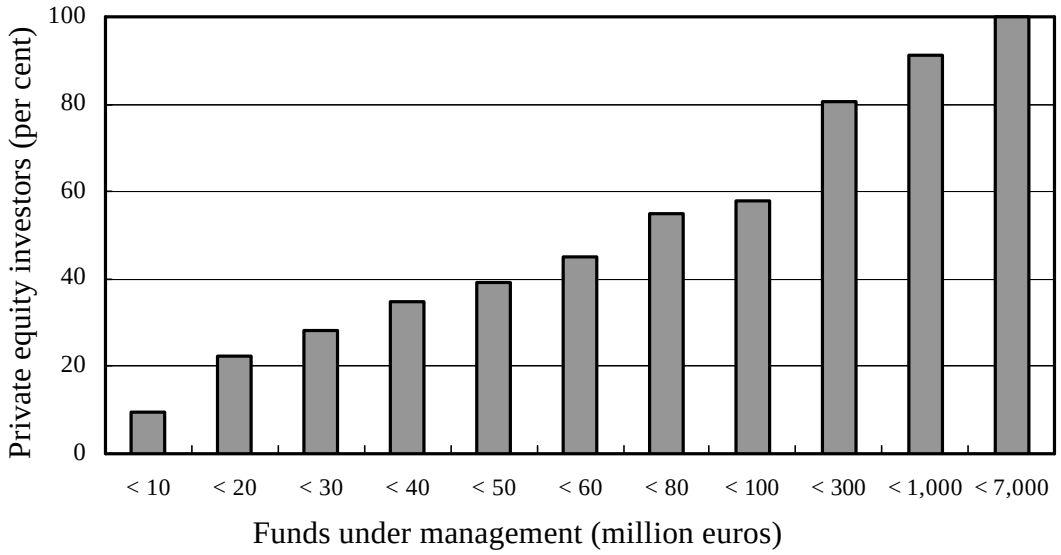
French private equity investors differ not only with respect to the number of portfolio firms but also with respect to the volume of funds which they have under management. Funds under management denotes the volume of capital raised by private equity investors, i.e., it covers capital already invested as well as capital available for future investments. 138 French private equity investors have almost 50 billion euros under management (Table 11). On average, each private equity investor manages 357 million euros. However, the median value is as low as 73 million euros and the value of the first quartile is only around 23 million euros while the third quartile is as high as 229 million euros. The large difference between mean and median value is caused by the presence of a few large funds: five private equity investors manage more than 3,000 million euros (Figure 13).

Table 11 — Funds under Management by Type of Private Equity Investor (million euros)

	Private equity investors	Subsidiaries of banks	Independ-ent equity investors	Corporate equity investors	Subsidiaries of insurances
Mean	356.8	325.1	394.3	579.2	157.1
Median	72.8	76.2	65.6	137.2	28.2
First Quartile	22.9	29.7	22.1	79.9	16.8
Third Quartile	228.7	188.3	242.0	198.2	170.0
Funds under management	49,233.6	17,878.0	24,842.9	5,212.4	942.7
Number of private equity investors	138	55	63	9	6

Source: AFIC (2000).

Figure 13 — Distribution of Funds under Management (per cent)



Source: AFIC (2000).

The funds under management differ to some extent between the four types of private equity investors (Table 11). Corporate equity investors have the highest mean and medium values of funds under management. The mean, and medium values of independent equity investors are similar to those of subsidiaries of banks. Interestingly, while, of the private equity investor groups, subsidiaries of banks have the lowest average funds under management, except subsidiaries of insurances, they have, on average, the highest number of portfolio firms and annual investment deals. One reason for this is that the funding practice between corporate and independent equity investors on the one hand and subsidiaries of banks on the other may differ significantly. Corporate and independent equity investors often raise funds before suitable investment possibilities are identified (they raise funds beforehand), while subsidiaries of banks identify first suitable investment possibility and then the required money is transferred from the parent company (thus they raise money with hindsight).

Using solely the funds under management for the analysis of investment activity is to some extent misleading because funds under management are the result of several years of activity. Therefore, private equity investors established only a few years earlier may have a significantly lower volume

of funds under management at a given point in time than a private equity investor established for a long time. Moreover, funds under management are affected by the divestment strategy of private equity investors as well as by strategy for raising new capital. One would expect that corporate equity investors' funds under management would exceed the funds under management of independent equity investors because of the different divestment strategies mentioned above: corporate equity investors often build up long-term cooperative relationships, while independent equity investors are more interested in a fast exit.

The annual investment volumes are utilized to detect some further information on the significance of the differences between the various types of French equity investors (Table 12). French private equity investors invest on average 32 million euros per year. This figure is based on data for 85 private equity investors taken from Hugot (2000). Subsidiaries of banks invest slightly less money per year, while independent equity investors invest slightly more capital annually. In order to build up the funds under management reported in Table 11, private equity investors need eleven years on average. Subsidiaries of banks need slightly more time than independent equity investors to accumulate their funds under management.

Table 12 — Annual Investment Volume by Type of Private Equity Investor (million euros)

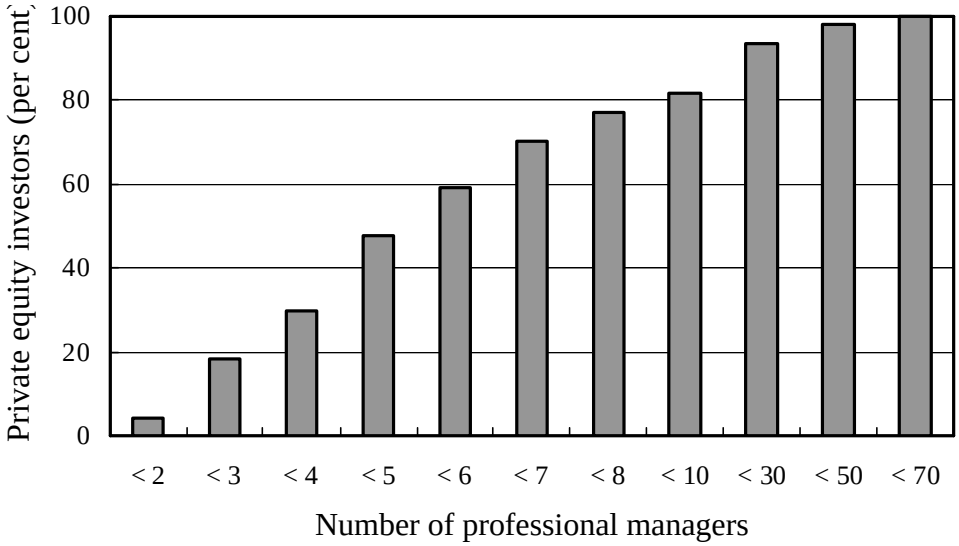
	Private equity investors	Subsidiaries of banks	Independent equity investors	Corporate equity investors	Subsidiaries of insurances
Mean	32.0	28.9	36.1	43.2	13.5
Median	19.8	17.5	30.5	29.0	9.2
First Quartile	6.9	7.6	6.8	19.3	6.9
Third Quartile	41.9	32.0	44.8	38.1	17.9
Number of private equity investors	85	36	38	6	3

Source: Hugot (2000).

5.4 Management Resources and Monitoring Intensity

AFIC reports the number of professional managers employed by French private equity investors. I use this information to calculate the number of portfolio firms and the investment volume per professional manager. These ratios offer some insight into the management resources and monitoring intensity of French private equity investors. However, since these ratios cannot be calculated for the German private equity market, a direct comparison between these two countries is not possible. However, the various types of French private equity investors can be compared with each other.

Figure 14 — Distribution of Professional Managers among Private Equity Investors (per cent)



Source: AFIC (2000).

French private equity investors differ with respect to the number of professional managers who support and monitor the firms of the private equity investors' portfolios and who probably raise new funds for investments (Figure 14). The French private equity investors in the sample used here employ more than 1,100 professional managers. On average, each private equity investor has almost eight professional managers (Table 13). How-

ever, the distribution of professional managers among the private equity investors is very unequal: the first quartile is 3, while the third quartile is as low as 7. Almost 20 per cent of all private equity investors have less than three professional managers. Independent equity investors have fewer professional managers on average than subsidiaries of banks and corporate equity investors. The number of professional managers in the group of subsidiaries of banks varies considerably, as indicated by the higher third quartile compared to the average number of professional managers.

Table 13 — Number of Professional Managers by Type of Private Equity Investor

	Private equity investors	Subsidiaries of banks	Independ-ent equity investors	Corporate equity investors	Subsidiaries of insurances
Mean	7.9	9.8	6.4	9.5	7.2
Median	5.0	5.0	4.0	7.0	4.0
First Quartile	3.0	3.0	3.0	5.5	3.3
Third Quartile	7.0	8.0	6.0	9.0	7.0
Number of professionals	1,161.5	560.5	434	105	43
Number of private equity investors	147	57	68	11	6

Source: AFIC (2000).

The volume of funds under management by professional managers (Table 14) provides information about the investment behaviour of the various types of French private equity investors. Table 14 shows that the funds under management per professional manager are significantly lower for bank subsidiaries than for corporate and independent equity investors. As mentioned before, this result can be driven by the different fund raising practices. In the case of subsidiaries of banks, funds under management only denote the investments already made, and not the sum of invested capital and capital available for investments.

Table 14 — Funds under Management and Annual Investments per Professional Manager by Type of Private Equity Investor (million euros)

	Private equity investors	Subsidiaries of banks	Independent equity investors	Corporate equity investors	Subsidiaries of insurances
Funds (Mean)	53.1	38.2	69.1	62.9	9.4
Funds (Median)	15.2	14.7	19.1	19.3	7.1
Funds (Number of private equity investors)	121	51	57	8	5
Investments (Mean)	4.6	3.4	6.1	4.7	1.7
Investments (Median)	3.2	2.9	4.6	4.1	1.7
Investments (Number of private equity investors)	80	32	38	6	4

Source: AFIC (2000), Hugot (2000).

Thus, the basis for comparison can only be the annual investment volume per professional manager. On average, each professional manager invests annually 4.6 million euros. A professional manager employed by a subsidiary of a bank invests less than his counterparts employed by an independent equity investor. A professional manager employed by a corporate equity investor invests more than a professional employed by a bank subsidiary but less than a professional of an independent equity investor. Therefore, a professional of a bank subsidiary has more time per money unit than other professionals employed by independent and corporate equity investors. Thus, professionals employed by subsidiaries of banks might more intensively support and monitor their portfolio firms than their counterparts employed by independent equity investors or corporate equity investors.

Table 15 — Number of Portfolio Firms and Number of Annual Investment Deals per Professional Manager by Type of Private Equity Investor

	Private equity investors	Subsidiaries of banks	Independent equity investors	Corporate equity investors	Subsidiaries of insurances
Total (mean)	9.0	11.5	7.4	4.9	8.4
Total (median)	4.8	7.5	3.3	2.5	5.0
Total (number of private equity investors)	121	51	57	8	5
Annual (mean)	2.3	2.9	1.8	1.5	3.4
Annual (median)	1.5	2.4	1.3	0.9	3.1
Annual (number of private equity investors)	80	33	37	6	4

Source: AFIC (2000), Hugot (2000).

However, the intensity of support determined by using the annual investment volumes is to some extent misleading, since the intensity depends more on the number of deals than on the volumes. The number of portfolio firms per professional manager suggests that managers of subsidiaries of banks spend less time per firm than their counterparts employed by corporate or independent equity investors (Table 15.). On average, a manager of a bank subsidiary has to look after more than eleven portfolio firms, while a manager of an independent equity investor only has to look after seven firms on average. This is also the case as regards the annual number of investment deals. A manager of a bank subsidiary has to look after three investment deals each year, while a manager of an independent equity investor only has to look after 1.8 investment deals. The annual number of investment deals of corporate equity investors per manager is even lower than that of independent equity investors. Interestingly, of the private equity investor groups, managers of bank subsidiaries have the lowest annual investment volumes, except subsidiaries of insurances, and the highest annual number of investment deals. Thus, managers of bank subsidiaries invest smaller amounts of money per year than independent and corporate equity investors.

5.5 French Private Equity Investors' Propensity to Finance Particular Stages and Technologies

French private equity investors' propensity to finance particular stages of enterprises' development and enterprises in particular technology areas can be used to analyse how many French private equity investors are willing to invest capital in young high-technology enterprises. Moreover, investment behaviour and strategies can be analysed using private equity investors' propensity for stages and technologies. In the following, both private equity investors' willingness to invest capital in young high-technology enterprises and their degree of specialisation will be compared with those of German private equity investors.

Compared to Germany's private equity investors, French private equity investors seem to have a higher degree of specialisation on particular stages, but not on particular technologies (Table 16). Only around 22 per cent of all private equity investors are specialized on particular sectors, while almost 90 per cent are specialized on particular stages. Only about one-fifth of all French private equity investors are specialized on enterprises of particular stages in combination with particular technological sectors. Unfortunately stages of enterprises' development are defined in a slightly different way in the two countries. In the German data sample, seven stages are distinguished, while in the French sample only five stages are distinguished. This could cause the difference between French and German private equity investors.

French private equity investors' specialization on investment stages and sectors differs considerably between the four types of private equity investors. French independent equity investors do not show, as do their German counterparts, a much higher degree of specialization than their dependent counterparts with respect to their sectorial and stage focus. Almost fifty per cent of the independent equity investors are specialized on financing biotechnology and medical/health-related as well as communications and computer-related enterprises. Almost 88 per cent of the specialized subsidiaries of banks focus on communications and computer-related while 38 per cent focus on financing biotechnology and medical/health-related enterprises.

Table 16 — Specialization Patterns of French Private Equity Investors (per cent)

	Private equity investors	Subsidiaries of banks	Independent equity investors	Corporate equity investors	Subsidiaries of insurances
Sectorial preference[1]	22.4[3]	16.7[4]	21.1[5]	36.4	66.6
Stage preference[1]	89.2	87.9	92.7	100.0	100.0
Stage and sectorial preference[1]	20.8[3]	14.6[4]	19.3[5]	36.4	66.6
Number of private equity investors	148	58	69	11	6
Biotechnology and medical /health-related[2]	28.6	37.5	41.7	0.0	0.0
Communications and computer-related[2]	64.3	87.5	41.7	75.0	75.0
Number of private equity investors specialized on particular technologies	28	8	12	4	4
Seed, start-up and expansion stage[2]	22.7	18.8	28.6	0.0	50.0
Number of private equity investors specialized on particular stages	132	48	63	11	6

[1]Specialized private equity investors as percentage of all private equity investors. Private equity investors are specialized when they indicate to finance less than six sectors or less than three stages (total number of stages is 5 including Funds to Funds). — [2]Private equity investors infusing money in particular stages or technologies as a percentage of all specialized private equity investors. Computer hardware, software, semiconductor, Internet, e-commerce enterprises are computer-related. Seed, start-up and expansion stage contain 'amorcage creation and development'. — [3]Number is based on 125 observations. — [4]Number is based on 48 observations. — [5]Number is based on 57 observations.

Source: AFIC (2000).

Almost every other French private equity investor offers capital to enterprises which are in the early stage which contains the seed and start-up stage (Table 17). In Germany, by contrast, more than seventy per cent of all private equity investors supply capital to enterprises in the start-up stage. Thus, French private equity investors seem to be less willing to invest money in high-risk enterprises than their German counterparts. Three out of four French private equity investors are willing to invest capital in enterprises which are in their development stage (in which capital is required to finance the enterprises' growth) while in Germany nine out of ten private equity investors are willing to invest money in these enterprises.

Table 17 — French Private Equity Investors' Propensity regarding Investment Stages (per cent)

	Private equity investors	Subsidiaries of banks	Independent equity investors	Corporate equity investors	Subsidiaries of insurances
Seed and Start-up[1]	45.3	44.8	42.0	54.5	66.7
Expansion[2]	73.6	86.2	62.3	81.8	50.0
Number of private equity investors	148	58	69	11	6

[1]Private equity investors who would and probably invest capital in the stage *amorcage creation*. — [2]Private equity investors who would and probably did invest capital in the stage *development*.

Source: AFIC (2000).

The various types of French private equity investors do not differ considerably with respect to their willingness to finance enterprises' early stages of growth. Moreover, the differences with respect to financing the expansion stage of enterprises' development stage also seems extremely moderate, while the differences between the four German types are substantial. While French subsidiaries of banks do not seem to differ much from their independent counterparts, German subsidiaries of private banks differ substantially from the German independents. Above all, German

subsidiaries of private banks generally do not finance enterprises' early stages, while independent equity investors have a rather high propensity to do so.

5.6 Tax Incentives and Public Support for Private Equity Investors in France

Like other European governments, the French government has tried to improve the supply of capital for young high-technology enterprises by using guarantees, state-owned funds, and tax incentives. Several state-owned or publicly supported institutions are used for the promotion of young enterprises (Lessat et al. 1999). SOFARIS (Société Francaise de garantie des financements des Petites et Moyennes Entreprises) is the main loan guarantor agency owned by the French government, French financial institutions and insurance companies (OECD 1997). SOFARIS guarantees participations of private equity investors in start-up enterprises up to 65 per cent of the investment volume, which is restricted to five million FF per enterprise (Lessat et al 1999).

Moreover, the Groupe Caisse des Dépôts et Consignations (CDC) supports young enterprises through the Banque de Développement des Petites et Moyennes Entreprises (BDPME) and through the CDC-IXIS Private Equity. In 1996, the BDPME was established to improve the supply of capital for young high-technology enterprises by offering co-investments. Under a co-investment, the BDPME and French private equity investors simultaneously invest capital in a young enterprise (Lessat et al. 1999). CDC-IXIS Private Equity is a private equity investor who provides equity capital across all stages of enterprises' development and across all industries. In 2000, CDC-IXIS Private Equity had 1,700 million euros under management, invested 400 million euros and divested 410 million euros (CDC 2001).

Moreover, the French government has created two fund and one company organizational structure comprising tax incentives to promote private equity investments in young enterprises. These are the Sociétés de Capital Risques (SCRs), the Fonds Communs de Placement Risques (FCPRs), and the Fonds Communs de Placement-Innovation (FCPIs). The SCRs, which can be created since 1988, are similar to German UBGs (equity participation companies). Under certain conditions, SCRs are exempt from corporate

income tax on income and capital gains realized from investments. In order to qualify for the SCR status, 50 per cent of the SCR's net assets must be invested in unquoted companies (Berwin & Co 1997).

Fonds Communs de Placement Risque (FCPRs, mutual venture capital funds), which can be created since 1985, are funds with a specific organizational structure. FCPRs have to invest at least 40 per cent of their investment volume in shares of unquoted companies. The income from the investments in FCPRs is tax-exempt if it is reinvested. That advantage of FCPRs is the reason for the high realized capital gains in France discussed in Section 3. Fonds Communs de Placement-Innovation (FCPIs), which can be created since 1996, should push up investments in the high-technology enterprises. FCPIs are similar to FCPRs; the main difference is that FCPIs have to invest at least 60 per cent of their assets in *innovative* unquoted companies (Berwin & Co 1997).

Almost 30 per cent of the French private equity investors are qualified as SCRs (Table 18). The number of subsidiaries of banks qualified as SCRs is to some extent higher than number of independent or corporate equity investors. Moreover, 20 per cent of the private equity investors' funds are qualified as FCPRs and only 2.3 per cent of the funds are qualified as FCPIs. The differences between the various types of private equity investors are rather small with respect to the FCPRs and FCPIs.

Note, that Table 18 does not indicate that 50 per cent of the French private equity investors are supported by government's tax incentives. The reason for this is that FCPRs and FCPIs offer tax incentives for funds but not for the private equity investor company as a whole, as it is done by the SCRs. Moreover, French private equity investors often have more than one fund but qualify only one of them as FCPRs or FCPIs.

Table 18 — The Use of Tax Incentives by Type of French Private Equity Investors (per cent)

	Private equity investors	Subsidiaries of banks	Independent equity investors	Corporate equity investors	Subsidiaries of insurances
SCR[1]	28.4	37.8	24.4	16.7	0.0
FCPR[2]	21.6	18.9	22.0	16.7	50.0
FCPI[3]	2.3	2.7	0.0	0.0	25.0
Number of private equity investors	88	37	41	6	4

[1]Sociétes de capital-risques. — [2]Fonds communs de placements à risques. — [3]Fonds communs de placement-innovation.

Source: Hugot (2000).

6 Summary

This paper has analysed the differences and similarities between the markets for private equity in Europe and the venture capital market in the United States. In the American tradition, venture capital comprises management support and financial means for a subset of young high-technology enterprises provided by experienced intermediaries, the venture capitalists. The term private equity has been used because data on European markets not only cover venture capital investments but also investments in low-technology areas as well as investments in established firms. Private equity investments in enterprises that are in their early stages of development, or which are classified as high-technology enterprises, has been used as an approximation of European venture capital activity. Due to data limitations, all the results obtained here have to be interpreted with caution.

European markets for private equity differ considerably with respect to the amounts of money invested in enterprises' early and expansion stages as a share of GDP. In Sweden, for example, early stage investments accounted

for more than one per mil of GDP in 1999, while the Austrian early stage investments are below 0.09 per mil of the GDP. With respect to the expansion stage investments, the differences are even larger. The British expansion stage investments accounted for 1.7 per mil of GDP in 1999, while the Austrian ones were only about 0.2 per mil of GDP.

The European markets for private equity also differ with respect to their sources of funds. In some countries, banks are the main contributors to private equity, while in others, pension funds play a significant role. Traditionally, pension funds have contributed considerable amounts of capital to private equity in the United Kingdom, while in countries such as Portugal pension funds have never been active as capital providers. Banks have invested large amounts of capital in private equity in France and Germany, while in the United Kingdom banks have been less important.

In addition, the European markets differ with respect to governments' role. Some countries use tax incentives for passive investors in order to ease the capital access for young high-technology enterprises, while others use guarantees and co-investment programs in order to reduce the risk of young high-technology enterprises for private equity investors. In all European countries, except Denmark, the public sector accounts for a part of the private equity investments. However, the degree of government involvement varies considerably. In countries such as Belgium, the government plays an important role, since the public sector accounts for about 37 per cent of the private equity investments in 1999, while in the United Kingdom and France, governments do not play a significant role. In both countries, the governments invested less than one per cent on the private equity investments.

However, there are also some interesting similarities between the European markets for private equity. First, all European markets experienced substantial growth in terms of investments in enterprises' early and expansion stages as well as in terms of new funds raised, which jumped significantly at the end of the 1990s. And second, the importance of banks as capital providers for private equity has decreased in almost all European countries, while the capital amounts contributed by pensions funds have risen during the 1990s.

In comparison to the United States, some countries have similar amounts invested in enterprises' early stages, while all European countries have considerably lower volumes invested in enterprises' expansion stage relative to GDPs. In 1999, US investments in enterprises' early stages accounted for one per mil, investments in enterprises' expansion stage for about three per mil of GDP. Dutch, Belgian and Swedish private equity investors' investments in enterprises' early stages also accounted for one per mil of the respective GDPs. As mentioned above, the United Kingdom is the leading country in Europe with respect to investments in enterprises' expansion stage.

US venture capital investments are more concentrated on high technologies than European private equity investments. In the United States, almost 80 per cent of the venture capital investments went into communications and computer-related enterprises in 1999, while only 24 per cent of the European private equity investments were invested in these enterprises. This might be the result of the definition of private equity in Europe, because private equity also contains private equity investors that exclusively finance traditional enterprises.

The differences between the US market and the European markets for private equity with respect to the investments in young high-technology enterprises relative to GDP do not offer meaningful information on the development stage of the European venture capital markets. The reason is that each market has its own, often quite special, innovation system which determines the role of venture capital in an economy. For example, when the innovation system is dominated by in-house research and development, one cannot expect a dynamic venture capital market. Moreover, the figures presented on venture capital activity do not include other financial sources for high-technology enterprises such as business angels, which are, however, important to determine the development stage of venture capital markets.

In addition to identifying the differences and similarities between European private equity markets, the paper has also discussed the differences between private equity investors acting in one national market by analysing micro data on French and German private equity investors. Private equity investors acting in one national market can differ significantly with respect

to their investment behaviour. This view is supported by the evidence of the US and the German market, while the results of the French market support it only to some extent. Germany's private equity investors differ considerably with respect to their investment strategies. Independent equity investors have a high degree of technological specialization compared to all other groups of dependent equity investors. Moreover, independent equity investors are more willing than subsidiaries of banks to invest capital in high-risk enterprises.

The German market for private equity has not only experienced a significant upswing in the last few years but also a fundamental structural change towards financing high-technology enterprises. The French market, by contrast, has merely experienced a quantitative expansion. The number of private equity investors that are not legally connected to another company (i.e. independent equity investors) has increased significantly. This particular type of private equity investor differs fundamentally from other private equity investors such as subsidiaries of private and saving banks with respect to the control mechanisms utilized first in the relationship between passive investors and private equity investors and second between private equity investors and their portfolio firms. Germany's independent equity investors, in contrast to their dependent counterparts, act more like US venture capitalists and make more intensive use specific control mechanisms such as convertible securities and compensation systems.

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Table A1 — Investments in Enterprises' Early Stages of Development (million euros)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria	1.73	0.88	0.00	0.18	0.02	0.29	0.25	2.90	11.76	13.49
Belgium	10.18	28.63	14.87	11.82	15.15	6.39	19.92	28.73	133.42	199.63
Denmark	6.25	5.68	1.02	3.67	3.98	3.39	2.25	2.76	12.32	28.16
Finland	8.47	10.45	6.58	6.42	5.65	7.88	8.66	8.56	59.80	64.96
France	105.97	32.93	42.38	16.44	25.63	26.62	98.37	87.35	248.25	497.01
Germany	39.12	46.37	51.90	56.06	83.41	89.09	93.60	193.73	446.23	946.72
Ireland	1.11	5.08	1.43	3.63	2.55	0.88	2.97	1.33	19.46	37.72
Italy	15.73	69.77	64.52	5.98	38.91	44.89	43.63	69.53	135.78	133.67
Netherlands	10.51	22.67	20.31	21.69	42.82	76.30	90.23	145.75	159.69	314.90
Portugal	12.72	9.75	7.01	4.99	7.15	4.24	1.12	10.59	12.02	7.60
Spain	16.04	45.52	34.34	17.39	10.97	17.60	11.39	20.20	43.89	84.29
Sweden	4.96	1.54	1.18	1.87	1.81	6.14	5.47	4.45	24.20	238.22
United Kingdom	140.53	75.20	56.63	49.25	60.08	27.86	39.84	94.61	162.06	229.50
Total Europe	373.3	354.4	302.2	199.4	298.1	311.6	417.7	670.5	1468.9	2795.9
United States	1001.3	695.3	928.7	1864.8	1290.3	1658.1	2409.8	2932.0	4401.6	9245.6

Note: Investment volumes in enterprises' early stage have been deflated using consumer price indices (1995=100) and then converted into euros using 12-month averages.

Source: European investment volumes and exchange rates are from EVCA 1991–2000, US investment volumes are form NVCA (2000), consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Table A2 — Investments in Enterprises' Expansion Stage (billion euros)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.04
Belgium	0.05	0.08	0.11	0.06	0.04	0.10	0.08	0.13	0.09	0.36
Denmark	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.05
Finland	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.08	0.05	0.06
France	0.45	0.59	0.42	0.42	0.51	0.31	0.42	0.44	0.56	1.03
Germany	0.45	0.53	0.47	0.43	0.44	0.44	0.46	0.63	0.81	1.50
Ireland	0.03	0.03	0.02	0.01	0.02	0.02	0.03	0.03	0.02	0.04
Italy		0.36	0.34	0.18	0.12	0.14	0.21	0.15	0.31	0.36
Netherlands	0.03	0.18	0.15	0.13	0.22	0.28	0.31	0.30	0.37	0.52
Portugal	0.03	0.04	0.04	0.05	0.05	0.04	0.02	0.03	0.03	0.04
Spain	0.05	0.14	0.10	0.11	0.09	0.12	0.16	0.16	0.13	0.35
Sweden	0.04	0.01	0.01	0.02	0.08	0.02	0.22	0.05	0.10	0.17
United Kingdom	0.81	0.70	0.60	0.50	0.67	0.66	0.55	1.02	1.34	2.06
Total Europe	1.94	2.67	2.27	1.94	2.27	2.16	2.51	3.05	3.86	6.56
United States	1.40	1.01	1.55	1.38	1.12	1.52	2.77	5.04	6.66	22.64

Note: Investment volumes in enterprises' expansion stage have been deflated using consumer price indices (1995=100) and then converted into euros using 12-month averages.

Source: European investment volumes and exchange rates are from EVCA 1991–2000, US investment volumes are from NVCA (2000), consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Table A3 — Private Equity Investments (billion euros)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.09
Belgium	0.09	0.11	0.15	0.10	0.11	0.11	0.11	0.17	0.25	0.64
Denmark	0.02	0.02	0.01	0.02	0.02	0.03	0.03	0.02	0.04	0.11
Finland	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.11	0.18	0.24
France	0.89	1.07	1.02	0.93	1.11	0.85	0.87	1.21	1.71	2.70
Germany	0.62	0.67	0.69	0.65	0.82	0.67	0.71	1.28	1.87	3.01
Ireland	0.04	0.04	0.03	0.02	0.03	0.02	0.04	0.04	0.06	0.10
Italy	0.26	0.61	0.58	0.28	0.29	0.25	0.49	0.57	0.86	1.62
Netherlands	0.04	0.32	0.26	0.22	0.33	0.47	0.58	0.73	1.00	1.57
Portugal	0.06	0.05	0.05	0.08	0.08	0.05	0.03	0.06	0.05	0.11
Spain	0.11	0.19	0.15	0.12	0.12	0.16	0.19	0.25	0.34	0.66
Sweden	0.14	0.05	0.05	0.06	0.19	0.09	0.42	0.35	0.20	1.26
United Kingdom	2.22	1.92	1.97	1.73	2.35	2.63	2.90	4.19	6.50	10.36
Total Europe	4.51	5.10	4.99	4.24	5.45	5.37	6.40	8.99	13.10	22.45
United States (Venture Capital)	3.20	2.31	4.07	4.37	4.20	4.38	7.61	11.76	16.02	41.22

Note: Private equity investment volumes have been deflated using consumer price indices (1995=100) and then converted into euros using 12-month averages.

Source: European investment volumes and exchange rates are from EVCA 1991–2000, US investment volumes are form NVCA (2000), consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Table A4 — Investment Disbursement Among Stages and Technologies (billion euros and per cent)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total Europe (private equity, billion euros)	4.5	5.1	5.0	4.2	5.5	5.4	6.4	9.0	13.1	22.5
Per cent of private equity										
Seed	0.6	0.9	0.6	0.5	0.7	0.5	1.0	0.9	1.2	1.9
Start-up	7.7	6.0	5.5	4.2	4.8	5.2	5.5	6.6	10.0	10.6
Expansion	46.8	52.4	45.5	45.6	41.7	40.3	39.2	33.9	29.4	29.2
Replacement capital	7.0	5.8	8.4	8.3	8.1	6.5	7.2	9.1	7.4	4.6
Buy-out	37.9	34.9	40.1	41.4	44.8	47.5	47.0	49.6	51.9	55.5
Communications and computer-related	13.0	9.7	10.7	10.7	10.4	16.3	13.4	16.7	19.8	24.0
Biotechnology and medical/health-related	5.9	5.5	5.4	5.9	4.9	7.9	6.4	7.0	7.1	6.5
United States (venture capital, billion euros)	3.2	2.3	4.1	4.4	4.2	4.4	7.6	11.8	16.0	41.2
Per cent of venture capital										
Early	31.3	30.0	22.8	42.5	30.7	37.9	31.7	25.0	27.5	22.4
Expansion	43.7	43.6	38.1	31.5	26.6	34.6	36.4	42.9	41.6	54.9
Later	11.9	18.0	23.4	16.1	25.4	17.1	21.3	20.0	19.1	18.2
Buyout	13.1	8.3	15.7	9.8	17.3	10.4	10.7	12.2	11.9	4.4
Communications and computer-related	45.2	46.7	46.1	49.4	46.1	49.2	50.7	54.6	61.5	77.8
Biotechnology and medical/health-related	22.4	22.6	27.1	21.7	25.9	21.3	21.1	22.7	17.8	7.6

Note: Investment volumes have been deflated using consumer price indices (1995=100) and then converted into euros using 12-month averages.

Source: European investment volumes and exchange rates are from EVCA 1991–2000, US investment volumes are form NVCA (2000), consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Table A5 — New Funds Raised (billion euros)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria	0.00	na	na	na	na	0.00	0.03	0.06	0.12	0.18
Belgium	0.04	0.10	0.09	0.11	0.09	0.16	0.18	0.18	0.40	0.73
Denmark	0.04	0.03	0.01	0.01	0.11	0.03	0.00	0.00	0.04	0.16
Finland	0.02	0.01	0.00	0.01	0.04	0.05	0.05	0.23	0.35	0.60
France	1.09	1,28	0.91	0.86	1,07	0.79	1,03	1,04	3,67	4,10
Germany	0.79	0.95	0.91	0.22	0.30	0.21	0.34	2,49	1,80	4,41
Ireland	0.02	0.04	0.05	0.03	0.19	0.01	0.02	0.03	0.16	0.29
Italy	0.24	0.27	0.51	0.34	0.33	0.26	0.70	1.01	0.87	1.60
Netherlands	0.10	0.12	0.10	0.14	0.26	0.26	1.37	0.82	1,09	0.97
Portugal	0.03	0.02	0.02	0.10	0.12	0.09	0.04	0.05	0.04	0.06
Spain	0.20	0.18	0.21	0.22	0.06	0.14	0.05	0.39	0.64	0.57
Sweden	0.21	0.12	0.36	0.13	0.24	0.44	0.05	0.98	0.99	0.98
United Kingdom	2.42	1.46	1.35	1.31	3.99	1.84	3.65	11.59	8.20	8.89
Total Europe	5.19	4.58	4.50	3.48	6.81	4.29	7.50	18.87	18.37	23.54
United States (Private Equity)	9.85	5.45	13.35	18.78	26.03	30.12	32.11	58.50	78.98	82.32
United States (Venture Capital)	2.43	1.34	3.02	3.55	6.20	6.29	8.07	13.06	23.13	39.55

Note: New funds raised have been deflated using consumer price indices (1995=100) and then converted into euros using 12-month averages.

Source: European new funds raised and exchange rates are from EVCA 1991–2000, US new funds raised are from NVCA (2000), consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Table A6 — Sources of New Funds (billion euros and per cent)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total Europe (new funds, billion euros)	5.19	4.58	4.50	3.48	6.81	4.29	7.50	18.87	18.37	23.54
Per cent of new funds										
Banks	39.4	36.6	34.5	30.5	28.0	25.8	29.7	25.9	28.2	28.3
Pension funds	16.2	15.8	12.7	16.3	20.0	27.8	23.4	25.1	24.2	21.1
Insurance companies	15.6	11.5	9.2	10.4	12.4	11.1	11.6	16.6	8.8	12.9
Realised capital gains	10.9	16.8	15.8	20.0	16.9	17.2	15.6	6.6	9.3	6.9
Corporate investors	4.4	4.8	5.9	5.3	10.3	4.6	3.3	11.2	9.4	9.1
Private individuals	3.7	4.7	3.4	3.2	2.7	3.4	7.0	3.9	7.0	5.8
Government agencies	2.8	1.5	9.3	6.7	2.8	3.2	2.4	2.3	5.2	4.5
Academic institutions	0.2	0.3	0.0	0.8	0.2	2.0	1.1	0.7	0.1	0.4
United States (new funds for venture capital, billion euros)	2.43	1.34	3.02	3.55	6.20	6.29	8.07	13.06	23.13	39.55
As percentage by type of limited partner										
Corporations	6.8	4.0	3.3	8.4	9.1	4.1	18.9	24.0	11.8	15.0
Endowments and Foundations	12.5	24.2	18.6	10.7	21.3	19.6	11.3	16.0	6.2	21.0
Foreign Investors	7.6	11.4	11.1	4.3	2.4	3.8	5.6	4.0	1.2	6.0
Individuals and Families	11.3	12.1	11.1	7.4	11.9	16.2	6.5	12.0	11.2	22.0
Financial and Insurances	9.4	5.4	14.4	10.4	9.5	19.2	2.9	6.0	10.2	13.0
Pension funds	52.5	42.3	41.7	59.1	45.8	37.0	54.8	38.0	59.4	23.0

Note: New funds raised have been deflated using consumer price indices (1995=100) and then converted into euros using 12-month averages.

Source: European new funds raised and exchange rates are from EVCA 1991–2000,US new funds raised are from NVCA (2000), consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Table A7 — Divestments (billion euros)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria	0.00	0.0	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.02
Belgium	0.03	0.05	0.07	0.08	0.04	0.06	0.08	0.03	0.10	0.07
Denmark	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Finland	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.08
France	0.25	0.66	0.49	0.69	0.81	0.51	0.67	1.13	1.87	2.28
Germany	0.18	0.19	0.21	0.39	0.43	0.22	0.40	0.75	0.58	0.80
Ireland	0.18	0.03	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01
Italy		0.02	0.01	0.02	0.04	0.01	0.03	0.01	0.02	0.01
Netherlands	0.11	0.19	0.22	0.19	0.19	0.23	0.28	0.43	0.37	0.42
Portugal	0.00	0.01	0.01	0.03	0.02	0.04	0.04	0.03	0.07	0.07
Spain	0.02	0.10	0.19	0.09	0.06	0.08	0.11	0.19	0.12	0.18
Sweden	0.02	0.01	0.04	0.03	0.01	0.09	0.09	0.15	0.05	0.23
United Kingdom	1.72	0.74	1.07	1.44	1.40	1.65	1.69	2.53	2.62	3.12
Total Europe	2.52	2.03	2.33	3.02	3.02	2.90	3.41	5.29	5.90	7.33
As percentage of divestments										
Write-off	na	27.6	24.6	16.0	13.3	11.7	10.6	9.6	5.7	6.4
Trade sale	na	38.2	36.6	39.9	26.2	36.3	42.7	44.1	54.9	37.0
Public offering	na	8.8	9.7	20.4	27.3	29.3	19.5	14.0	16.4	19.9

Note: Divestment volumes have been deflated using consumer price indices (1995=100) and then converted into euros using 12-month averages.

Source: Divestment volumes and exchange rates are from EVCA 1991–2000, consumer price indices are from International Financial Statistics CD ROM IFS (2000).

Table A8 — European Countries' Sources of New Funds (per cent)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria										
Corporate investors	50.00					0.00	0.00	3.55	15.22	25.57
Private individuals	0.00					0.00	5.95	2.37	18.79	0.00
Government agencies	0.00					58.82	0.40	11.30	23.00	9.09
Banks	50.00					35.29	93.65	82.75	39.68	56.15
Pension funds	0.00					0.00	0.00	0.00	2.00	0.00
Insurance companies	0.00					0.00	0.00	0.00	0.55	8.94
Realised capital gains	0.00					0.00	0.00	0.04	0.68	0.25
Belgium										
Corporate investors	1.39	3.89		0.93	2.01	3.00	0.58	4.51	9.10	14.86
Private individuals	45.59	7.38		3.02	3.59	6.68	0.00	11.34	1.79	13.68
Government agencies	0.88	6.75		31.44	0.00	7.37	2.97	0.00	7.71	3.63
Banks	40.22	26.88		19.18	70.20	15.60	12.25	30.02	38.67	14.88
Pension funds	0.00	0.00		15.19	0.00	16.38	0.00	3.76	0.00	0.00
Insurance companies	1.39	10.78		7.08	0.16	1.04	0.00	3.16	1.24	4.72
Realised capital gains	10.54	35.86		22.27	23.48	43.59	84.21	46.11	22.43	35.83
Denmark										
Corporate investors	9.15	0.00	0.00	0.00	17.97	0.00	0.00	0.00	0.00	10.40
Private individuals	0.00	0.00	0.00	24.94	7.55	3.90	0.00	0.00	35.84	16.00
Government agencies	0.00	15.85	0.00	0.00	0.00	22.41	0.00	0.00	0.00	3.20
Banks	20.21	31.71	0.00	0.00	24.48	52.61	0.00	53.38	36.50	35.61
Pension funds	34.04	15.85	0.00	40.53	32.34	13.64	0.00	0.00	0.00	7.21
Insurance companies	27.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Realised capital gains	6.39	36.58	100.00	34.52	5.69	7.45	100.00	46.62	27.66	10.20
Finland										
Corporate investors	37.50	44.09	79.24	20.75	14.91	0.00	9.09	18.60	4.43	1.66
Private individuals	0.00	0.00	0.00	0.00	2.23	0.00	0.00	0.83	2.57	1.95
Government agencies	4.93	0.00	0.00	44.22	33.84	6.61	12.77	8.13	19.90	12.01
Banks	33.90	28.87	12.15	14.17	19.64	22.33	21.06	22.59	13.80	12.99
Pension funds	0.00	4.91	0.00	2.07	0.00	15.02	29.10	23.64	38.62	26.27
Insurance companies	19.57	3.39	0.00	4.62	13.42	48.06	14.55	22.16	4.21	36.33
Realised capital gains	1.36	3.98	8.61	0.00	0.30	1.40	7.86	3.68	2.48	2.35
France										
Corporate investors	2.92	4.55	3.42	2.22	2.94	6.76	2.68	16.64	11.17	4.59
Private individuals	3.78	3.48	1.44	2.37	0.09	0.86	4.16	1.12	3.52	4.48
Government agencies	0.15	3.16	0.49	0.77	0.31	1.79	2.00	0.72	1.41	2.75
Banks	38.73	41.36	37.80	31.15	39.93	39.47	40.89	34.89	27.82	25.05
Pension funds	18.35	4.86	5.47	2.34	2.43	9.66	5.56	2.63	12.89	9.24
Insurance companies	14.66	11.84	10.59	10.60	9.40	10.38	10.52	3.44	11.14	14.76
Realised capital gains	11.30	19.77	34.29	38.37	41.31	28.87	31.34	39.64	32.11	23.80

Table A8 continued

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Germany										
Corporate investors	4.55	5.06	5.61	9.27	7.84	9.84	8.60	7.45	8.32	8.55
Private individuals	5.71	10.31	5.40	6.66	8.24	4.56	4.31	5.63	7.54	9.22
Government agencies	7.37	0.05	3.76	5.62	6.97	7.90	6.78	4.49	3.60	11.55
Banks	67.46	52.73	51.64	52.25	55.12	57.21	59.03	58.11	51.10	31.96
Pension funds	0.00	0.00	0.00	0.00	0.00	8.57	10.11	11.67	14.18	22.87
Insurance companies	6.31	9.58	11.52	12.12	11.71	7.89	7.91	11.34	13.81	9.14
Realised capital gains	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00
Ireland										
Corporate investors	0.00	0.36	0.20	2.52	1.46	12.17	6.68	5.05	0.83	3.13
Private individuals	20.07	34.82	19.16	40.03	8.47	0.00	0.00	13.75	26.20	21.68
Government agencies	0.00	0.82	0.00	0.00	0.45	0.00	16.26	36.27	12.70	3.84
Banks	64.75	20.76	27.08	23.00	35.00	29.76	45.39	17.19	3.74	25.04
Pension funds	0.00	0.00	0.00	0.00	36.47	34.23	6.10	6.88	8.25	26.76
Insurance companies	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.39	6.75
Realised capital gains	15.18	41.34	53.56	34.45	6.24	23.83	25.57	20.85	5.07	0.00
Italy										
Corporate investors	14.34	9.07	10.00	9.60	2.15	0.65	4.67	3.37	10.10	14.24
Private individuals	2.37	3.43	4.00	3.50	1.41	13.59	34.22	10.37	28.74	6.97
Government agencies	34.81	0.00	0.00	2.50	4.64	13.15	2.01	0.00	0.00	1.50
Banks	16.71	71.88	70.00	71.19	68.01	14.23	32.22	46.62	42.15	40.85
Pension funds	9.47	0.00	0.00	0.00	0.97	0.00	2.54	12.47	6.94	6.32
Insurance companies	4.74	5.82	5.00	1.50	2.60	3.17	5.41	5.53	2.38	5.98
Realised capital gains	17.56	9.80	11.00	11.71	20.22	33.87	13.78	17.39	5.53	8.09
Netherlands										
Corporate investors	2.00	0.00	5.50	5.17	1.00	0.00	0.00	0.00	2.66	5.75
Private individuals	4.00	0.00	3.30	1.72	0.00	0.00	1.00	0.00	7.46	3.76
Government agencies	0.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19	1.79
Banks	15.00	42.00	11.00	32.76	29.17	51.85	66.70	40.11	25.90	50.19
Pension funds	7.00	4.00	21.82	12.07	9.53	0.00	8.90	23.79	0.57	2.01
Insurance companies	12.00	3.00	5.50	17.24	23.51	7.41	10.20	7.26	26.81	15.25
Realised capital gains	60.00	45.00	52.88	31.03	35.71	40.74	10.90	25.00	20.04	15.34
Portugal										
Corporate investors	43.71	31.93	24.25	0.64	1.46	0.56	0.05	0.00	1.08	0.00
Private individuals	0.75	0.61	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government agencies	0.00	0.00	14.69	40.64	56.77	12.43	31.57	18.83	19.48	28.92
Banks	27.33	25.15	39.89	56.61	39.38	80.96	35.28	64.22	46.94	35.59
Pension funds	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Insurance companies	5.30	14.50	14.30	0.00	0.00	0.06	0.00	0.00	0.00	0.67
Realised capital gains	21.94	13.88	6.04	2.11	2.38	5.90	7.80	7.33	9.91	30.12

Table A8 continued

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Spain										
Corporate investors	22.13	0.64	17.47	16.40	18.25	7.32	15.28	10.45	0.54	11.81
Private individuals	4.09	5.00	1.04	8.32	0.00	0.15	2.85	3.62	12.82	1.63
Government agencies	0.00	4.53	14.53	56.52	18.18	11.39	19.31	7.22	2.36	14.78
Banks	46.78	29.09	32.29	9.09	31.19	51.77	37.06	37.24	42.90	46.07
Pension funds	0.00	42.48	2.07	2.68	25.47	11.55	0.30	1.85	7.27	12.75
Insurance companies	22.44	9.66	6.72	0.66	0.00	0.00	0.09	6.30	4.92	2.59
Realised capital gains	4.55	1.48	1.24	0.78	3.57	1.81	4.36	1.02	16.81	0.24
Sweden										
Corporate investors	0.84	24.34	0.20	4.83	18.88	6.49	1.63	17.64	21.97	20.42
Private individuals	0.00	2.16	0.00	0.30	0.00	5.24	0.00	2.08	10.40	3.10
Government agencies	0.77	0.00	95.36	0.00	3.86	0.00	0.00	3.86	6.84	0.72
Banks	51.34	24.69	0.00	0.00	14.90	6.92	0.00	7.53	4.61	7.24
Pension funds	17.16	26.96	0.00	35.13	4.29	49.52	0.00	23.37	16.95	34.53
Insurance companies	23.75	13.84	0.44	1.41	43.77	3.39	3.73	23.10	10.40	22.40
Realised capital gains	1.53	4.30	3.96	11.35	2.60	9.16	38.19	3.69	2.22	5.45
United Kingdom										
Corporate investors	2.10	3.12	5.99	4.44	13.78	4.01	3.83	12.50	9.14	9.28
Private individuals	2.69	1.89	4.10	1.96	3.19	3.05	5.78	3.61	5.10	4.35
Government agencies	0.00	0.11	0.56	0.28	1.18	1.14	2.34	1.71	7.24	1.82
Banks	32.51	18.37	21.18	21.86	18.70	14.87	10.20	16.03	24.23	25.98
Pension funds	23.26	37.17	36.80	34.64	29.52	44.61	41.40	32.82	40.08	31.46
Insurance companies	19.30	14.73	12.07	15.50	13.16	16.58	14.94	20.59	5.76	14.13
Realised capital gains	12.91	24.77	17.75	16.93	12.43	10.25	11.27	2.69	0.00	0.00

Source: EVCA 1991–2000.

Table A9 — Sectorial Disbursement of Investments (per cent)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria										
Communications and computer-related	39.25	30.06	78.68	58.57	6.25	0.00	0.00	12.14	19.88	16.50
Biotechnology and medical/health-related	16.47	16.89	18.54	10.00	0.00	0.00	0.00	7.15	6.87	4.60
Belgium										
Communications and computer-related	21.48	17.49	7.98	10.90	15.10	39.99	49.19	60.80	62.08	50.54
Biotechnology and medical/health-related	19.00	12.51	3.97	4.63	10.20	65.09	15.09	13.86	3.18	10.06
Denmark										
Communications and computer-related	25.68	42.19	5.27	45.21	39.19	32.24	22.04	36.36	42.12	16.70
Biotechnology and medical/health-related	11.29	12.71	9.56	8.37	15.47	9.28	7.21	18.39	18.25	8.20
Finland										
Communications and computer-related	15.83	30.64	26.76	56.28	38.50	22.01	42.21	28.86	10.34	31.34
Biotechnology and medical/health-related	11.81	13.22	2.52	1.49	14.38	14.09	11.48	3.99	11.01	12.66
France										
Communications and computer-related	16.22	8.95	15.23	8.86	11.81	15.18	18.67	13.56	16.06	38.58
Biotechnology and medical/health-related	8.33	6.64	6.54	7.17	4.47	7.82	7.97	5.80	11.23	5.50
Germany										
Communications and computer-related	15.29	11.50	9.68	7.22	8.96	18.90	18.32	20.78	23.20	30.66
Biotechnology and medical/health-related	3.17	3.23	2.34	1.93	3.64	2.34	8.30	4.58	11.41	11.97
Ireland										
Communications and computer-related	19.04	3.98	25.18	3.13	3.60	33.95	34.23	45.92	52.07	68.70
Biotechnology and medical/health-related	0.33	7.48	3.20	2.16	8.02	0.00	9.68	7.52	1.88	2.50

Table A9 continued

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Italy										
Communications and computer-related	8.24	3.96	9.00	1.20	3.80	2.85	0.82	4.14	9.99	17.05
Biotechnology and medical/health-related	1.34	10.73	10.57	2.10	7.07	1.70	1.38	2.32	0.68	1.22
Netherlands										
Communications and computer-related	39.25	13.00	23.12	17.00	17.00	39.80	19.29	16.61	16.46	31.00
Biotechnology and medical/health-related	16.47	4.00	6.97	4.00	7.00	9.18	6.22	5.95	6.32	4.50
Portugal										
Communications and computer-related	11.10	7.33	7.74	3.87	8.13	5.14	2.91	0.44	9.15	42.60
Biotechnology and medical/health-related	2.52	0.18	0.36	0.63	0.11	2.95	8.26	1.11	0.00	0.70
Spain										
Communications and computer-related	6.71	2.38	7.94	2.13	3.37	4.12	5.92	13.14	24.03	20.41
Biotechnology and medical/health-related	0.00	2.61	5.28	3.14	2.19	0.79	0.96	4.22	2.36	3.08
Sweden										
Communications and computer-related	31.53	4.11	3.00	1.56	13.94	14.14	4.57	19.56	30.43	19.71
Biotechnology and medical/health-related	5.16	11.24	4.75	13.55	8.93	6.74	0.81	0.55	23.17	14.93
United Kingdom										
Communications and computer-related	9.60	10.74	7.87	14.28	9.60	13.66	11.32	15.74	19.45	16.82
Biotechnology and medical/health-related	5.92	3.93	4.33	7.90	4.52	9.85	7.11	9.30	5.51	5.17

Source: EVCA 1991–2000.

Table A10 — Investments by Type of Private Equity Investor (per cent)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria										
Independent	100.00	33.19	100.00	100.00	100.00	100.00	100.00	78.84	29.84	18.47
Dependent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.18	70.50
Semi-dependent	0.00	66.81	0.00	0.00	0.00	0.00	0.00	9.24	52.18	7.10
Public sector	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.92	12.80	3.93
Belgium										
Independent	31.06	22.63		33.25	23.49	6.03	8.20	5.68	5.22	19.30
Dependent	14.70	10.68		19.20	34.95	21.57	18.49	22.21	48.25	32.20
Semi-dependent	0.00	6.63		0.00	0.00	37.40	5.67	7.51	0.60	12.00
Public sector	54.23	60.07		47.55	41.56	34.99	67.64	64.60	45.93	36.50
Denmark										
Independent	100.00	100.00	100.00	100.00	100.00	100.00	100.00	75.88	58.09	82.62
Dependent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.91	3.17
Semi-dependent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.12	0.00	14.21
Public sector	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland										
Independent	30.12	19.53	13.97	6.29	14.96	39.75	17.56	59.54	30.11	48.30
Dependent	33.57	15.37	16.78	7.99	0.65	11.88	23.77	4.18	20.13	19.10
Semi-dependent	0.00	1.83	9.90	5.98	8.03	6.47	7.92	0.89	31.83	16.70
Public sector	36.31	63.27	59.34	79.75	76.36	41.91	50.75	35.39	13.50	15.90
France										
Independent	32.25	33.24	32.27	37.71	33.14	37.18	35.52	52.23	37.58	60.67
Dependent	51.34	37.88	38.30	36.98	40.48	34.52	36.56	31.70	48.67	8.04
Semi-dependent	15.07	27.68	28.40	24.59	25.32	26.74	26.64	15.41	13.74	30.71
Public sector	1.34	1.20	1.02	0.71	1.07	1.56	1.29	0.67	0.00	0.58
Ireland										
Independent	44.64	70.08	42.98	41.31	53.05	56.17	49.74	45.61	29.88	37.47
Dependent	35.86	21.90	47.76	34.54	11.80	7.85	3.46	0.00	35.07	6.66
Semi-dependent	0.00	0.00	9.27	24.15	35.15	24.73	44.22	48.43	30.77	15.86
Public sector	19.50	8.02	0.00	0.00	0.00	11.24	2.58	5.96	4.28	40.01
Italy										
Independent	41.11	41.33	48.00	46.50	42.11	13.89	54.54	31.65	38.45	34.96
Dependent	23.46	29.05	31.00	29.47	32.69	29.15	12.91	43.05	46.30	56.86
Semi-dependent	15.99	23.52	10.00	18.50	5.51	13.27	17.94	12.04	7.25	2.23
Public sector	19.44	6.11	11.00	5.53	19.69	43.70	14.60	13.25	8.00	5.94

Table A10 continued

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Netherlands										
Independent	62.00	64.00	61.00	58.89	64.29	61.73	45.91	47.92	42.61	38.90
Dependent	28.00	27.00	27.00	26.67	28.57	32.65	49.37	47.32	52.38	56.10
Semi-dependent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.30
Public sector	10.00	9.00	12.00	14.44	7.14	5.61	4.72	4.76	5.01	2.70
Portugal										
Independent	69.06	43.28	31.80	21.68	22.69	34.48	5.87	0.00	67.22	0.18
Dependent	11.27	11.27	3.77	4.77	31.32	4.35	22.24	3.44	19.65	85.88
Semi-dependent	5.18	3.50	12.47	72.80	45.90	61.05	71.44	96.24	12.40	8.00
Public sector	14.49	41.94	51.95	0.75	0.09	0.12	0.45	0.32	0.73	5.93
Spain										
Independent	30.48	66.59	69.13	50.01	57.14	64.83	74.36	62.00	58.07	74.12
Dependent	46.26	7.46	4.85	3.53	10.76	4.71	5.61	17.27	2.91	12.05
Semi-dependent	0.00	1.54	22.87	46.46	32.11	30.46	20.03	20.73	32.22	4.82
Public sector	23.26	24.42	3.14	0.00	0.00	0.00	0.00	0.00	6.81	9.00
Sweden										
Independent	33.33	47.90	89.71	76.14	74.01	64.47	95.13	48.22	14.39	60.30
Dependent	13.33	10.71	4.35	3.04	6.25	11.91	1.82	2.74	84.05	12.00
Semi-dependent	0.00	1.22	4.49	18.91	19.74	23.62	3.02	32.23	1.56	17.50
Public sector	53.33	40.17	1.45	1.92	0.00	0.00	0.03	16.80	0.00	10.20
United Kingdom										
Independent	65.02	61.58	54.74	51.68	64.45	49.69	57.62	65.82	60.90	78.45
Dependent	29.34	32.34	33.43	31.19	21.49	28.51	10.72	9.95	10.20	5.17
Semi-dependent	4.66	5.24	10.99	16.43	12.57	21.29	31.27	24.06	28.71	16.21
Public sector	0.98	0.84	0.84	0.70	1.49	0.50	0.39	0.16	0.19	0.17

Source: EVCA 1991–2000.

Table A11 — Comparing the Stylised Characteristics of European Markets for Private Equity with the US Venture Capital Market in 1999

	Early stage to GDP	Expansion stage to GDP	Role of public sector	Technology focus	Net flows
Austria	+	+	+++	+	+++
Belgium	+++	+++	+	+++	+
Denmark	+	+	+++	+	+++
Finland	++	++	++	++	+++
France	++	++	+++	++	+
Germany	++	++	++	++	+++
Ireland	++	+	+	+++	+++
Italy	+	+	++	+	+++
Netherlands	+++	+++	+++	++	+
Portugal	+	+	++	++	+++
Spain	+	++	++	+	+++
Sweden	+++	++	++	++	+
United Kingdom	++	+++	+++	+	+
United States	+++	+++	+++	+++	na

Note: *Early stage to GDP*: + (+++) is used when early stage investments have been lower (higher) than 0.3 (1.0) per mil of GDP. *Expansion stage to GDP:* + (+++) is used when expansion stage investments have been lower (higher) than 0.5 (1.0) per mil of GDP. *Role of public sector:* + (+++) is used when the public sector has infused more (less) than 20 (5) per cent of the private equity investments. *Technology focus:* + (+++) is used when less (more) than 30 (50) per cent of the private equity investments has been infused in communications and computer-related enterprises and in biotechnology and medical/health-related enterprises. *Net flows:* + (+++) is used when the country has experienced a capital outflow (inflow).

Source: EVCA 1991–2000.