

Employment contribution of Private Equity and Venture Capital in Europe

Research Paper

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On behalf of the European Private Equity and
Venture Capital Association (EVCA)



European Private Equity &
Venture Capital
Association



About EVCA

The European Private Equity and Venture Capital Association (EVCA) was established in 1983 and is based in Brussels. EVCA represents the European private equity sector and promotes the asset class both within Europe and throughout the world.

With well over 900 members in Europe, EVCA's role includes representing the interests of the industry to regulators and standard setters; developing professional standards; providing industry research; professional development and forums, facilitating interaction between its members and key industry participants including institutional investors, entrepreneurs, policymakers and academics.

This publication is based on a pan European Survey conducted on behalf of the EVCA by the Center for Entrepreneurial and Financial Studies (CEFS), Technische Universität München, Germany.

Disclaimer

The information contained within this report has been produced based on the data from the EVCA yearbook, European national associations and with reference to the contributions of a survey conducted on behalf of EVCA by the Center for Entrepreneurial and Financial Studies (CEFS), Technische Universität München. EVCA has taken suitable steps to ensure the reliability of the information presented; however, it cannot guarantee the ultimate accuracy of the information collected. Therefore neither EVCA nor the Center for Entrepreneurial and Financial Studies (CEFS), Technische Universität München, can accept responsibility for any decision made or action taken, based upon this report or the information provided herein.

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List of abbreviations

AFIC	Association Française des Investisseurs en Capital (French Venture Capital and Private Equity Association)
AIFI	Associazione Italiana degli Investitori nel Capitale di Rischio (Italian Private Equity and Venture Capital Association)
APCRI	Associação Portuguesa de Capital de Risco (Portuguese Venture Capital and Private Equity Association)
ASCRI	Asociación Española de Entidades de Capital – Riesgo (Spanish Venture Capital and Private Equity Association)
AVCO	Austrian Private Equity and Venture Capital Organisation
bn	Billion
BVA	Belgian Venturing Association
BVCA	British Venture Capital Association
BVK	Bundesverband Deutscher Kapitalbeteiligungsgesellschaften (German Venture Capital and Private Equity Association)
CAGR	Compound annual growth rate
CEFS	Center for Entrepreneurial and Financial Studies (at the Technische Universität München)
DJ Euro STOXX	Dow Jones Euro STOXX index
DJ STOXX 600	Dow Jones STOXX 600 index
EU	European Union
EU 15	European Union of 15 members (as of 1995)
EU 25	European Union of 25 members (since 2004)
EVCA	European Private Equity and Venture Capital Association
FVCA	Finnish Venture Capital Association
GDP	Gross Domestic Product
HVCA	Hungarian Venture Capital Association
IPO	Initial public offering
IVCA	Irish Venture Capital Association
m	Million
MBI	Management buyin
MBO	Management buyout
No	Number
NVCA	Norwegian Venture Capital Association
NVP	Nederlandse Vereniging van Participatiemaatschappijen (Dutch Venture Capital and Private Equity Association)
p.a.	Per annum (per year)
PhD	Philosophiae Doctor (Doctor of Philosophy)
PPEA	Polish Private Equity Association
R&D	Research and Development
SECA	Swiss Private Equity & Corporate Finance Association
SVCA	Swedish Private Equity and Venture Capital Association
UK	United Kingdom
US	United States (of America)

Foreword

With some 20 million jobs needing to be created in the EU's 25 countries to meet the overall target of bringing the Union back to full employment, job creation is a fundamental part of Europe's present and future success¹.

The private equity and venture capital industry is at the heart of the European economy actively investing and supporting high potential companies in existing industry sectors, as well as creating new innovative enterprises. This investment helps to enhance and sustain growth, support innovation and crucially contributes to job creation across Europe.

This study has been undertaken for EVCA by the Center for Entrepreneurial and Financial Studies at the Technische Universität München (CEFS). It is the first pan-European survey on the overall employment contribution of the private equity and venture capital industry to European job creation. It examines both the current levels of employment by private equity and venture capital financed companies as well as the new jobs created by the industry in recent years.

The study also analyses the contribution to employment of each stage of investment showing that both the venture capital stage and the buyout stage has its own particular role and contribution to make to the overall employment created by the asset class. It shows the current levels of employment in each stage as well as the growth rates in employment. In particular, for the buyout stage, these figures show the overall net job creation for the stage, while for venture capital, it highlights this stage's contribution to innovation and R&D activities across Europe. For both stages, the employment growth rate substantially exceeds the annual growth rate of total European employment.

This survey clearly demonstrates European private equity and venture capital can make a difference to the European economy by providing sustainable, high quality jobs across Europe.

Sir David Cooksey
EVCA Chairman (2005-2006)

¹ European Commission, http://europa.eu.int/growthandjobs/areas/fische08_en.htm

Executive Summary

Over the past ten years, private equity and venture capital have played an increasingly important role in the European economy. Investments by European private equity and venture capital funds have increased by more than six times from €5.5bn in 1995 to a record of €36.9bn in 2004². Correspondingly, the number of companies receiving private equity or venture capital was 5,000 in 1995 and has increased to 7,000 in 2004.

In 2004, two thirds of the €36.9bn invested by European private equity and venture capital players was invested in companies at the buyout stage (€26.6bn), with the remaining €10.3bn invested in companies in the venture stage. As companies at the buyout stage are more mature, the average investment size is normally larger.

However, more than three quarters of the companies financed (5,557) were in the venture stage, compared to only 1,427 companies that underwent a buyout. Despite the fact that the largest proportion of capital is invested in buyout deals, it is the venture sector that accounts for the majority in terms of *number* of investments.

In parallel to the increase in private equity and venture capital investments, the industry's contribution to employment, growth and innovation in Europe has grown. The industry's role in rejuvenating and restructuring existing companies, as well as its support in financing high-potential and often innovative enterprises has become widely recognised. This has been reflected in several previous studies analysing the economic and social impact of private equity and venture capital at both European and national levels³.

Against this background, EVCA has commissioned the Center for Entrepreneurial and Financial Studies (CEFS) at the Technische Universität München to undertake a research study on the contribution of the private equity and venture capital sector to European employment. The study aimed to gauge the effects upon overall employment for the whole of Europe, as well as the separate contribution to employment by buyouts and venture capital investments and the growth rates in employment for each stage. In addition, it analyses the qualification of the employees and the research activity in venture capital-financed companies in particular.

² Source: EVCA/Thomson Venture Economics/Price Waterhouse Coopers.

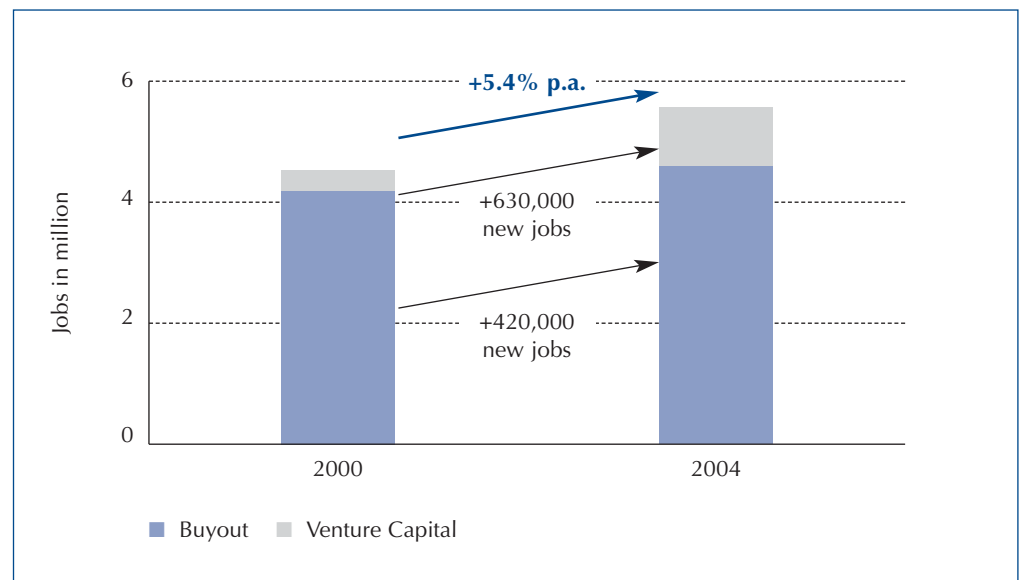
³ EVCA research papers "The Economic and Social Impact of Buyouts and Buyins in Europe" (2001), "The Economic and Social Impact of Venture Capital in Europe" (2002); BVCA (2004): "The Economic Impact of Private Equity in the UK 2004"; BVCA (2003), "The Economic Impact of VCTs in the UK"; AFIC (2004): "Le poids économique et social du capital investissement en France"; BVK (2005): BVK Statistik 2004; ASCRI (2004): "Impacto económico y social del capital riesgo en España".

Key findings of the study

Job creation

- **1 million new jobs** created by European⁴ private equity and venture capital-financed companies between 2000 and 2004.
- **420,000 new jobs created by buyout-financed companies** between 2000 and 2004, net of any reduction in headcount in the years following the buyout investment.
- **630,000 new jobs created by venture-backed companies** between 2000 and 2004.
- **Employment grew by an average rate of 5.4% annually⁵** over the period between 2000 and 2004. This is eight times the annual growth rate of total employment in the EU 25 (0.7%)⁶ between 2000 and 2004.

Figure 1: Job creation by private equity and venture capital-financed companies



Source: CEFS/EVCA

Estimation of total employment contribution in Europe

- **Private equity and venture-backed companies employed close to 6 million people in Europe in 2004⁷** - this represents 3% of the 200 million economically active people in Europe⁸.
- **Buyout-financed companies** employ 83% of the total employment in portfolio companies, accounting for close to 5 million jobs.
- **Venture-backed companies** employ 17% of the total employment in portfolio companies, accounting for close to 1 million jobs.

⁴ Europe here refers to the European Union, Switzerland and Norway unless otherwise stated.

⁵ All growth rates presented in this study refer to Compound Annual Growth Rates (CAGR).

CAGR is a method that determines growth over time taking the starting and the ending value, and calculates an average growth rate per year for the period in-between, assuming that growth has happened at a constant rate.

⁶ Eurostat (2005).

⁷ Given the conservatism of the estimation approach and the fact that the underlying EVCA yearbook data represents responses from 73% of the market players, the real employment effect may be higher than estimated in the study.

⁸ Eurostat (2005); figure for 2004.

Employment growth in buyout-financed companies

- **Employment in buyout-financed companies grew by an average rate of 2.4% annually over the period between 1997 and 2004.** This is nearly four times the annual growth rate of total employment in the EU 25 member states (0.7%) between 2000 and 2004⁹.
- **67% of those buyout-financed companies surveyed either kept their headcount stable or increased the number of employees overall.** 33% of the surveyed companies increased their number of employees by more than 5% on average per year between 1997 and 2004.
- **Buyout transactions of family businesses show the highest employment growth** with an average growth of 7% per year following the investment.

Employment growth in venture-backed companies

- **Employment in venture-backed companies grew by an average rate of 30.5% annually** over the period between 1997 and 2004. This is nearly forty times the annual growth rate of total employment in the EU 25 member states (0.7%) between 2000 and 2004.
- 73% of those venture-backed companies surveyed increased the number of employees by more than 25% on average per year.
- **Highest employment growth in biotechnology and health care & medical devices industries** – these industries contributed most to employment with an average employment growth rate of over 45% per year.
- **University spin-offs grow fastest** - the highest employment growth rate was achieved by university 'spin-offs' (62% on average per year following the venture capital investment) followed by corporate spin-offs and independently founded companies.

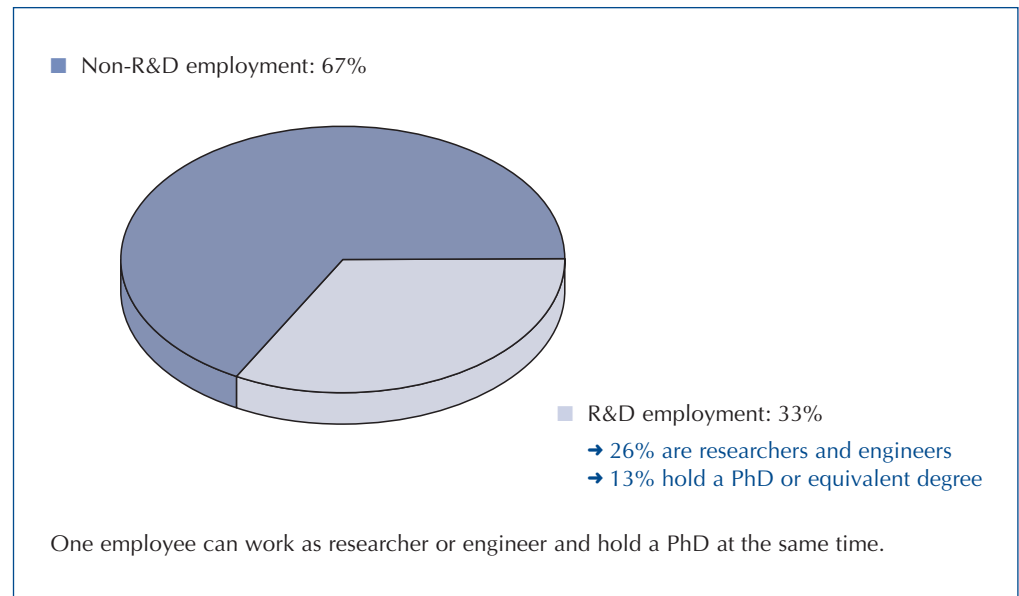
Research activity of venture-backed companies

- **Venture-backed companies when surveyed spent on average €3.4m per year on R&D activities** - their average R&D expenditure by employee was €50,500. This is six times more than the R&D expenditure per employee of the 500 companies in the EU 25 with the highest R&D spending at €8,500¹⁰.
- **Every third employee in those venture-backed companies when surveyed works in R&D** with 13% of the employees holding a PhD or equivalent degree. Extrapolating these proportions to the 1 million people working in venture-backed companies in Europe in 2004, it can be assumed that around 330,000 of those are researchers and around 130,000 hold a PhD or equivalent degree.

⁹ Eurostat (2005); data on the EU 25 is from the period 2000-2004, as earlier data are not available. Employment growth between 1997 and 2004 is available for the EU 15 and was 1.2% on average per year.

¹⁰ Industrial R&D Investment Scoreboard (2004) as published by the European Commission.

Figure 2: Average proportion of R&D related jobs in European venture-backed companies



Source: CEFS/EVCA

Employment contribution by company size

- **Large portfolio companies with more than 1,000 employees contribute 58% or over 3 million jobs to the overall employment** by private equity and venture-backed companies in 2004. At the same time, these companies represent only 4% of the total European portfolio companies.
- **Smaller companies experienced the largest employment growth rate**, independent of the investment stage of the company.
- Buyout-financed companies with between 1-99 employees experienced the highest employment growth out of those buyout-financed companies surveyed, increasing employment on average by 7% per year between 1997 and 2004.
- Venture-backed companies with between 1-20 employees experienced the highest employment growth out of those venture-backed companies surveyed, increasing employment on average by 70% per year between 1997 and 2004.

1. Introduction

What is Private Equity and Venture Capital?

Private equity and venture capital is an asset class that focuses predominately on actively investing in and supporting businesses with the potential for high growth. These businesses are typically not listed on the stock market. The aim of investors is to help them grow and create value over several years by providing advice, incentives, networking and knowledge through a range of specific investment structures.

The private equity/venture capital firm makes investments through a negotiated process with a company or an entrepreneur in order to achieve growth objectives and returns on behalf of their investors. For the company or entrepreneur, the investment is made over a limited timeframe to help grow the business or to make it more efficient and, thus, to further its development.

Most of the money raised for investment by the European private equity and venture capital industry comes from institutional investors such as banks, pension funds and insurance companies. Other contributions come from commercial corporations, government agencies, academic institutions and private individuals. The capital gain for investors is derived from the value creation achieved in the underlying company and is realised and redistributed once the investment in the company is exited. This happens when the portfolio company is either acquired by a corporation or another financial investor, or listed on a stock market via an initial public offering (IPO). Only then are the capital gains returned to the institutional investors – the pension and insurance funds – thereby benefiting the individual policy holders, whilst also providing capital to put into future investments.

Although private equity and venture capital have very similar processes and cycles of fundraising, investing and exiting, there are also some differences between them. *Venture capital* is a subset of private equity and refers to equity investments made in companies at an early stage of their development i.e. for the launch, early development or expansion of a business. Investments at the *later* or *buyout stage* tend to apply to more mature companies, where larger amounts and different types of finance are deployed.

The European private equity and venture capital market

Over the past decade, European private equity and venture capital funds have raised, invested and divested ever larger amounts of capital. According to the EVCA Yearbook¹¹, European private equity funds invested a record sum of €36.9bn in about 7,000 portfolio companies in 2004. This represents a 27% increase over the €29.1bn invested in 2003 and a 52% increase since 2001 (€24.3bn). More than two thirds of those funds (€26.6bn) were invested in companies at the buyout stage, with the remaining €10.3bn invested in companies in the venture stage. The maturity of portfolio companies in the buyout stage gives rise to a larger than average investment size per deal. By contrast, in 2004, the majority of companies invested in (80% or 5,557) were in the venture stage. This compares to the just 1,427 companies that underwent a buyout transaction.

¹¹ EVCA (2005): *Annual Surveys of Pan-European Private Equity & Venture Capital Activity*.

Economic and social impact of private equity and venture capital

Several earlier studies focusing on Europe as well as individual countries in and outside Europe, have illustrated the positive impact private equity and venture capital has on the economy¹². Particularly its role in rejuvenating and restructuring existing industries as well as its support in financing and growing high-potential, often highly innovative, companies is widely recognised today. Given the greater activity of private equity and venture capital players in Europe today, the industry has become an important pillar of the European economy.

With high unemployment as one of the main problems in Europe at the moment, much of the attention has recently shifted to the industry's contribution to job creation and employment in general. Thus, several European associations, notably those of France, Germany, Spain and the UK have estimated the contribution of the industry to national employment¹³. Although these studies already provide a first estimate for parts of Europe too, their different methodologies and the lack of information on the remaining countries, do not allow for a meaningful analysis of the industry's contribution as a whole. Furthermore, the studies mentioned focus exclusively on the quantitative effect of employment, but does not provide any insights into the growth rate and hence job creation or the quality of the jobs created.

Aim of this study

Against this background, EVCA commissioned the CEFS to undertake a study analysing the employment contribution of portfolio companies financed by European private equity and venture capital funds. In addition to deriving a total employment estimate for the industry, the study aims at a better understanding of the relative contribution from larger buyout-financed companies compared to smaller venture-backed firms. On top of this, an estimate for employment growth over time has been calculated. The study also takes a closer look at the qualification of employees and the research activity in venture capital-financed companies.

Main topics of the study are:

- Estimate of total employment by European portfolio companies
- Employment growth in buyout-financed companies
- Employment growth in venture-backed companies
- Research activity and employment quality in venture-backed companies
- Total employment growth.

¹² EVCA (2001): "The Economic and Social Impact of Buyouts and Buyins in Europe" and EVCA (2002): "The Economic and Social Impact of Venture Capital in Europe".

¹³ Cf. BVCA (2004): "The Economic Impact of Private Equity in the UK 2004"; BVCA (2003): "The Economic Impact of VCTs in the UK"; AFIC (2004): "Le poids économique et social du capital investissement en France"; BVK (2005): "BVK Statistik 2004"; ASCRI (2004): "Impacto económico y social del capital riesgo en España"; and further studies for these and other countries. Appendix 3 highlights the results of these studies. Studies on employment also exist for non-European countries with venture capital or private equity activity, e.g. for the US market: Global Insight (2004): "Venture Impact 2004".

Database and methodology

The study is based on two different types of data: First of all, statistics from EVCA and other European private equity and venture capital associations are used to estimate the total employment effect and the separation in buyout and venture-backed employment¹⁴. Secondly, an online survey was conducted among buyout and venture capital-financed companies asking for information about the portfolio companies' employment level and growth, as well as the company background. For this survey, more than 1,000 funds (EVCA members and non-members) located in one of the seven major European private equity markets accounting for 94% of total European investment activity were contacted. The countries surveyed were France, Germany, Italy, the Netherlands, Spain, Sweden and the United Kingdom. Funds were asked to reply for representative companies invested in between 1997 and 2004. Answers from 114 buyout-financed companies and 116 venture-backed companies were received. Of these, 99 and 102 respectively, provided sufficient information to be included in the analysis. All the resulting estimates and extrapolations made erred on the side of caution. The methodology applied is explained in detail in Appendix 1.

Structure of this paper

Following the introduction, Section 2 presents an estimate of the total number of employees working in European private equity and venture capital-financed companies. It also distinguishes between employment in buyout-financed and venture-backed companies. Section 3 focuses on the buyout-financed portfolio companies only, describing employment growth over time and comparing the findings with a peer group of listed companies. Section 4 focuses on the venture capital-financed companies, analysing their respective employment growth over time and benchmarking those findings with some economic indicators. Section 5 takes a closer look at employment quality and research activity in venture-backed companies. Section 6 combines the findings of the above sections and derives the total employment growth while Section 7 concludes with the key findings. Appendix 1 includes the methodologies and sample descriptions for the different sections of this study. Appendix 2 contains definitions of key terms and Appendix 3 provides an overview of related studies on employment by other European national associations.

¹⁴ *Special thanks are due to the following associations for their support: AFIC, AIFI, APCRI, ASCRI, AVCO, BVA, BVCA, BVK, FVCA, HVCA, IVCA, NVCA (Norway), NVP, PPEA, SECA, and SVCA.*

2. Estimate of total employment contribution

This section contains an estimation of the total employment contribution of private equity and venture capital-financed companies in Europe. The following study findings are presented:

- Total employment contribution
- Contribution of buyout and venture-financed portfolio companies
- Distribution of portfolio companies by company size
- Employment contribution by company size.

2.1 Private equity and venture capital-financed companies employ close to 6 million people

In 2004, portfolio companies held by European private equity and venture capital funds employed close to 6 million people. This represents 3% of the economically active population - about 200 million people - in Europe in 2004 (see Table 1)¹⁵. As a share of total employment in the 600 major European public companies listed in the Dow Jones STOXX 600 index¹⁶, jobs in private equity and venture capital-financed companies amounted to around 25%.

Underlying this, private equity and venture capital employment have been estimated to range from 4.8 to 6.3 million (see Table 2). The real employment effect is likely to be close to the upper end of this boundary, as information from the EVCA Yearbook and national venture capital associations represents less than 100% of the market players (i.e. EVCA data represents responses from 73% of the market players).

Table 1: Comparison of employment in portfolio companies with selected employment figures

	No. of employees (in thousands)	Employment in portfolio companies as percentage of employment in comparable group
Economically active population in Europe	196,947	2.4% - 3.2%
Employees in DJ STOXX 600 companies	22,051	21.8% - 28.7%

Source: CEFS/EVCA, Eurostat, Thomson Financial
Comparative data for 2004

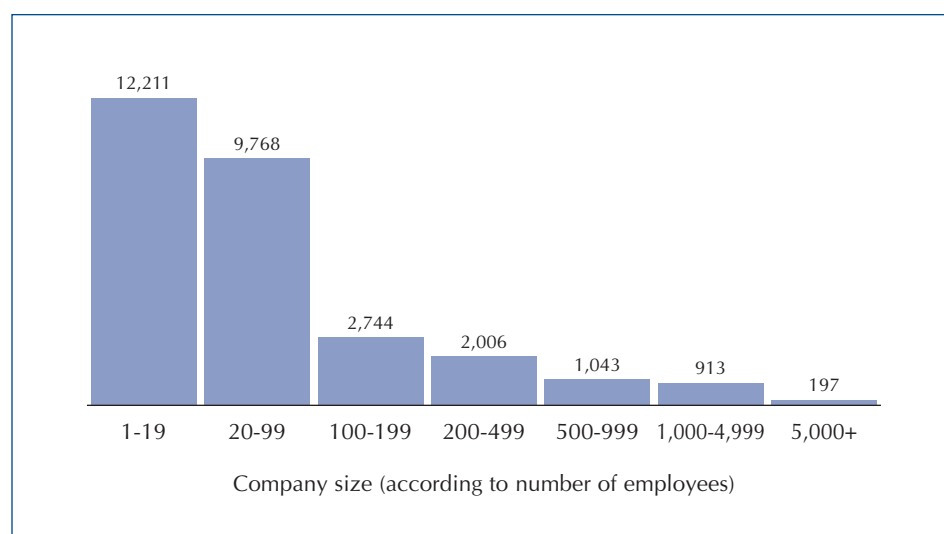
2.2 Majority of portfolio companies are small

Overall, European private equity and venture capital funds held stakes in 28,882 portfolio companies in 2004 (see Figure 3). Most European portfolio companies (86%) are of small or medium size, employing up to 200 people. But a significant share (14%) of portfolio companies is larger, with employment ranging from 200 to more than 5,000 people.

¹⁵ Eurostat (2005).

¹⁶ Employment data for the Stoxx 600: Datastream, Thomson Financial (2005).

Figure 3: Number of portfolio companies by employment



Source: CEFS/EVCA
Data for Europe in 2004

2.3 Buyout-financed companies account for 80% of total employment in portfolio companies

Although the majority of portfolio companies has fewer than 200 employees, it is the larger companies that contribute the greatest share to employment. Overall, 83% (around 5 million people) of the European private equity and venture capital-financed jobs are in portfolio companies with more than 200 employees (see Table 2). The smaller companies (with less than 200 employees) account for the remaining 17% of employment, providing employment to around 1 million people. Assuming that those companies with more than 200 employees are buyout-financed and companies with fewer than 200 people are mainly venture-financed, it is the former group that contributes the most jobs to total European portfolio company employment.

Table 2: Employment in buyout-financed and venture-financed companies

	No. of employees (in thousands)	Stage-related employment as percentage of total employment in European portfolio companies
Employment in buyout-financed companies	4,012 - 5,205	83,5% - 82.1%
Employment in venture-financed companies	795 - 1,132	16,5% - 17.9%
Total European portfolio company employment	4,807 - 6,337	100%

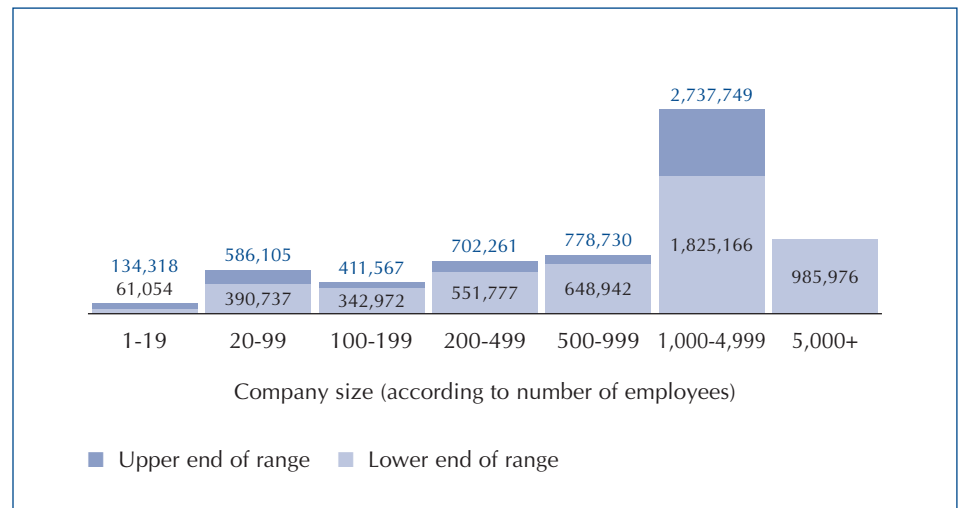
Source: CEFS/EVCA, Eurostat, Thomson Financial
Data for Europe in 2004

2.4 Buyout-financed companies with more than 1,000 employees contribute the most to European employment

Looking at employment contribution by company size, the survey reveals that buyout-financed companies with more than 1,000 employees contribute 58% (around 3.5 million people) to total portfolio company employment (see Figure 4). This stands in sharp contrast to their numbers, as companies with more than 1,000 employees represent only 4% of total European portfolio companies.

Companies employing between 200 and 1,000 people provide jobs for around 1.4 million people, while representing 11% of total portfolio companies. By contrast, portfolio companies with less than 200 employees contribute around 1 million jobs to total European private equity and venture capital employment, despite accounting for 86% of all portfolio companies.

Figure 4: Employment contribution by company size



Source: CEFS/EVCA

Data for Europe in 2004

3. Employment growth in buyout-financed companies

This section analyses the responses from the 99 buyout-financed companies that participated in the survey with sufficient information to be included in the analysis. Results are analysed in categories and are compared to relevant information from peer groups. The findings cover the following issues:

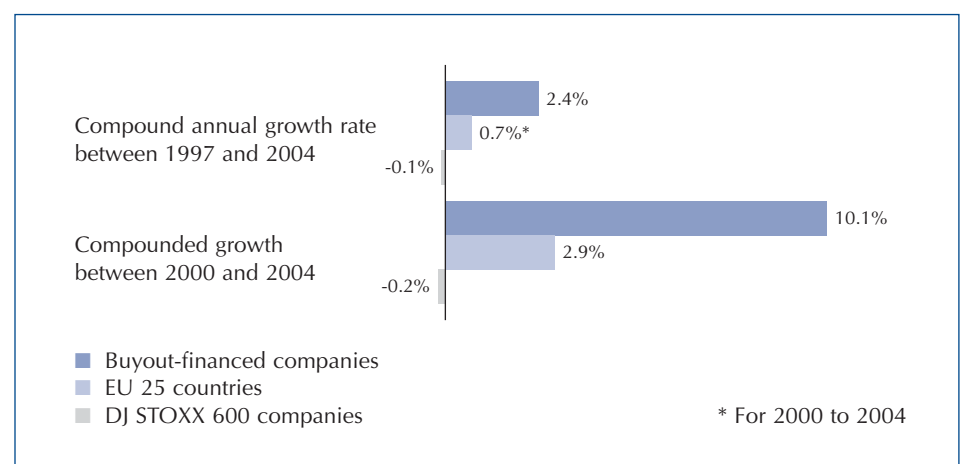
- Employment growth in buyout-financed companies
- Distribution by employment growth
- Employment growth by company size
- Employment growth by industry
- Employment growth by buyout background
- Employment growth by type of buyout.

3.1 Employment in buyout-financed companies grew 2.4% on average annually

Employment in the surveyed buyout-financed companies increased on average by 2.4% per year between 1997 and 2004 (see Figure 5)¹⁷. Thus, employment in these companies grew at a higher rate than the EU 25 average annual employment growth rate (0.7%) between 2000 and 2004¹⁸. Moreover, buyout-financed companies created more jobs than the large European publicly listed companies, as a comparison with the Dow Jones STOXX 600 companies shows. Over the same time period, employment in those companies showed a slight annual decrease of 0.06%.

Between 2000 and 2004, employment in the buyout-financed companies grew by a compound rate of 10.1%. Applying this figure to the total employment in buyout-financed companies in 2004 reveals that 420,000 new jobs were created in this period. Employment in the EU 25 grew by a compound rate of 2.9% over the same time period, while employment in the DJ STOXX 600 companies declined by a compound rate of 0.2%.

Figure 5: Comparison of employment growth in buyout-financed companies, EU 25 countries and DJ STOXX 600 companies



Source: CEFS/EVCA, Eurostat, Thomson Financial
Data on buyout-financed companies and DJ STOXX 600 companies between 1997 and 2004, annualised growth. Data on EU 25 employment between 2000 and 2004, annualised growth

¹⁷ Growth rates for buyout-financed companies are adjusted to account for organic growth only. Therefore, three of the companies have not been taken into account when calculating employment growth.

¹⁸ Eurostat (2005); data on the EU 25 is from the period 2000-2004, as earlier data are not available. Employment growth between 1997 and 2004 is available for the EU 15 and was 1.2% on average per year.

3.2 Two thirds of buyout-financed companies increased headcount

A closer look at the buyout sample reveals that the development of portfolio companies varied significantly. While almost two-thirds (63%) of all buyout-financed companies increased their number of employees (see Table 3), one third (33%) cut back on staff, with the remaining 4% keeping staff levels constant. Employment growth in excess of 10% per year was reported by around 14% of the responding companies, while most portfolio companies (29%) increased their headcount by up to 5% following the buyout transaction. Similarly, most portfolio companies reducing their headcount (20%) did so by five percent (-5%).

Overall, this shows that the restructuring process following a buyout differs across portfolio companies in its effect: While a smaller number of buyout-financed companies reduces its staff, the majority increases the number of its employees, thereby offsetting the job losses from the former.

Table 3: Breakdown of buyout-financed companies according to employment growth

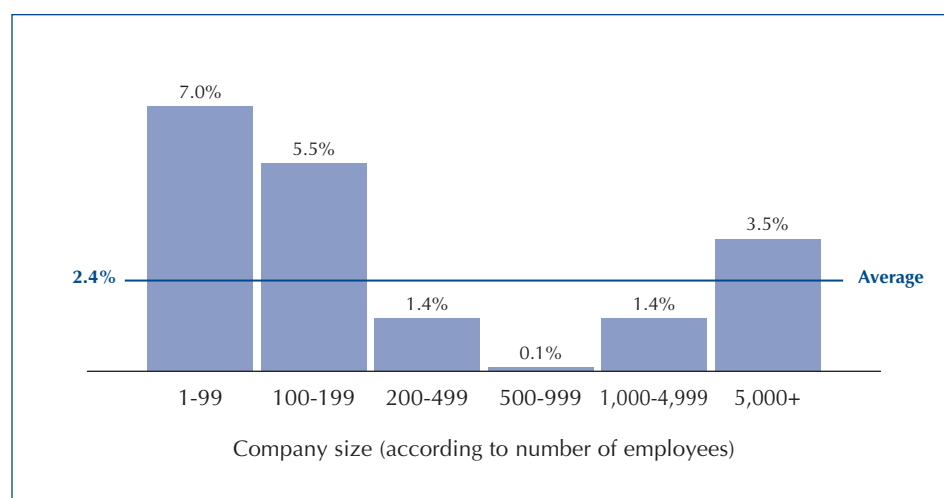
Average annual employment growth	No. of companies	As percentage of total companies surveyed
More than 15%	3	3.1
10% to 15%	10	10.4
5% to 10%	19	19.8
0% to 5%	28	29.2
0%	4	4.2
-5% to 0%	18	18.8
-10% to -5%	10	10.4
Less than -10%	4	4.2

Source: CEFS/EVCA

3.3 Small portfolio companies show highest employment growth

Dividing the sample by company size reveals that the smaller buyout-financed companies, in particular, demonstrate strong employment growth (see Figure 6). Thus, buyout-financed companies with fewer than 100 employees increased employment on average by 7% annually. This is above the employment growth rate in companies with 100 to 200 employees (5.5%), twice the rate of companies with more than 5000 employees (3.5%), and at least five times the growth of the remaining companies. This indicates that smaller companies having undergone a buyout add new jobs at a faster rate than larger buyout-financed companies - underlining their larger potential for business expansion.

Figure 6: Employment growth in buyout-financed companies by company size



Source: CEFS/EVCA

3.4 Buyout-financed companies outgrew listed companies in most industries

Employment growth in the buyout companies surveyed was further split according to industries and compared to respective peer industries on the DJ STOXX 600. In six of the ten industries analysed, the buyout-financed companies surveyed exhibited positive growth rates that were well above those of comparable DJ STOXX 600 companies. Buyout-financed companies in transportation and computer-related industries showed average employment growth rates of more than 10% p.a. (17.3% and 10.3% respectively) compared to 0.6% and 1.4% in the peer group of listed companies. Companies operating in the medical, health-related and biotech industries (6.7%), construction (5%), consumer-related (4%), as well as industrial products & services and manufacturing industries (2.7%) showed positive annual employment growth overall.

Buyout-financed companies in other services industries and in chemicals and materials decreased employment by 2.3% and 3.0% respectively, compared to a slight increase of 0.6% and a reduction of 2.8% in the peer group of listed companies. For the financial services industries and the communications sector, the difference between the buyout-financed companies and the peer group in the same sector was more significant. Financial services companies and communications companies that underwent a buyout transaction decreased employment by 3.8% and 6.3% respectively. Peer group companies, by contrast, increased employment in the respective industries by 0.4% and 1.3% respectively.

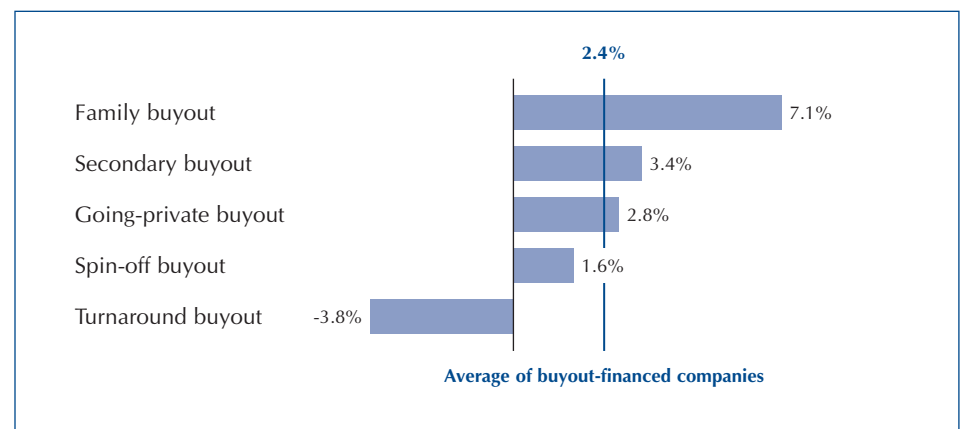
Although this shows that the possibility of employment creation among buyout-financed companies differs according to the industry the portfolio company operates in, most buyout-financed companies significantly outperform the listed companies in the same industries.

3.5 Buyouts of family businesses entail highest employment growth

A closer look at the background of the buyout-financed companies reveals that buyouts of family businesses, in particular, resulted in a strong increase in the number of employees (see Figure 7). Employment in family-owned businesses grew by an average 7.1% per year following the buyout transaction¹⁹. This particularly high employment growth rate underlines the large economic potential of family businesses and may be a sign that family-run firms sometimes do not capitalise on all the growth opportunities that their businesses offer. In the aftermath of secondary buyouts and going-private transactions, portfolio companies showed employment growth of 3.4% and 2.8% respectively. This is still above the average of 2.4%, but below that of the former family-owned businesses. In spin-off buyouts, employment growth was below average but still positive (1.6%) and higher than the growth in the DJ STOXX 600 companies (-0.06%). Only turnaround buyouts cut jobs following the buyout deal (-3.8%). This could be explained by the need for an immediate and significant improvement of efficiency within the target business.

Overall, this shows that the surveyed buyouts from all backgrounds - except turnaround situations - increased staff significantly and above the employment growth rate of listed companies. As the number of buyouts in family firms is expected to increase over the coming years, this general trend may even become stronger. This is due to the large number of family-owned businesses in which a succession problem will require a change in ownership.

Figure 7: Employment growth in buyout-financed companies by buyout background



Source: CEFS/EVCA

3.6 Managers from within the portfolio company soften the restructuring process

An analysis of the sampled answers with regard to the type of buyout the company underwent reveals an interesting trend: While management buyouts (MBOs) on average entailed an increase in employment of 3.1%, management buyins (MBIs) reduced the headcount by an average of 2.3%. This may indicate that restructuring by buyins is more intense than by buyouts, as, with MBIs, the previous management is replaced by a new outside team. However, given the small sample size of buyins surveyed, this finding is just an indication and would require further investigation.

¹⁹ More details on the role of private equity for family businesses can be found in EVCA (2005): "Private Equity and Generational Change: The Contribution of Private Equity to the Succession of Family Businesses in Europe".

4. Employment growth in venture-backed companies

This section analyses the responses from 77 venture-backed companies that participated in the survey with sufficient information to be included in the analysis. The results are analysed in sub-categories and are compared to overall economic indicators. The findings cover the following issues:

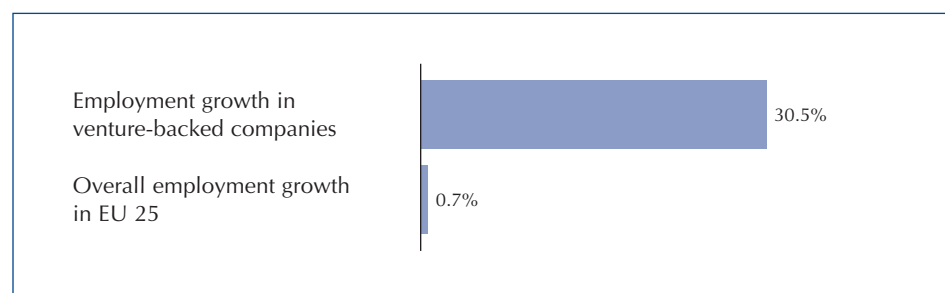
- Employment growth in venture-backed companies
- Distribution by employment growth
- Employment growth by company size
- Employment growth by industry
- Employment growth by type of company formation.

4.1 Employment among venture-backed companies grew by one third each year

Employment in the surveyed venture-backed companies increased by an average of 30.5% per year between 1997 and 2004 (see Figure 8). This is around forty times the average annual growth rate of total employment in the EU 25 (0.7%)²⁰.

Between 2000 and 2004, employment in the venture-backed companies grew by a compound rate of 190%. This translates into the creation of 630,000 new jobs when extrapolated to the total employment in venture-backed companies. By comparison, employment in the EU 25 grew by a compound rate of only 2.9% between the years 2000 and 2004.

Figure 8: Comparison of growth in venture-backed employment and overall employment



Source: CEFS/EVCA, Eurostat

Data on venture-backed companies between 1997 and 2004, annualised growth

Data on EU 25 employment between 2000 and 2004, annualised growth

²⁰ Eurostat (2005); data on the EU 25 refers to the period 2000-2004, as earlier data are not available.

4.2 73% of venture-backed companies increased staff by more than 25% per year

A closer look at the breakdown of surveyed portfolio companies by employment growth reveals that virtually all companies displayed a significant growth in the number of employees following investment by the venture capital fund (see Table 4). 92% of all venture capital-financed portfolio companies surveyed increased the number of jobs between 1997 and 2004. About three quarters (73%) of all venture-backed companies increased their staff by an average of more than 25% per year. 17% of the venture-backed portfolio companies more than doubled their number of employees on average each year. Only two companies in the sample reduced the number of jobs following investment.

The majority of companies (30%) increased their staff by between 50% to 100% per year on average.

Table 4: Breakdown of venture-financed companies according to employment growth

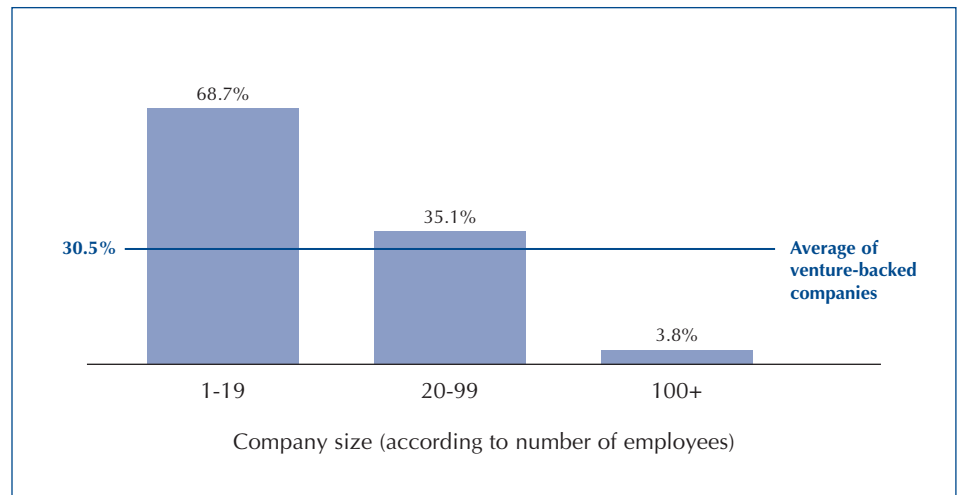
Average annual employment growth	No. of companies	As percentage of total companies surveyed
More than 100%	13	16.9
50% to 100%	23	29.9
25% to 50%	20	26.0
10% to 25%	8	10.4
0% to 10%	7	9.1
0%	4	5.2
Less than 0%	2	2.6

Source: CEFS/EVCA

4.3 Portfolio companies with up to 20 employees grow fastest

Analysing employment growth according to company size reveals that smaller venture-backed companies in the sample exhibited the highest job growth rate (see Figure 9). Companies with less than 20 people grew on average by 68.7% annually. Companies with 20 to 99 employees grew on average by 35.1% per year following the investment, which is slightly above the average growth rate of the whole venture-backed sample put together. At the other end of the scale, venture-backed companies with more than 100 employees grew more slowly (3.8% per year) than the average but still faster than the overall employment rate for the EU 25 (0.7%). It is worth noting that the same growth pattern applies for the venture-backed companies as for buyout-financed companies, i.e. smaller companies grow faster than larger ones, indicating a larger growth potential.

Figure 9: Employment growth in venture-backed companies by company size

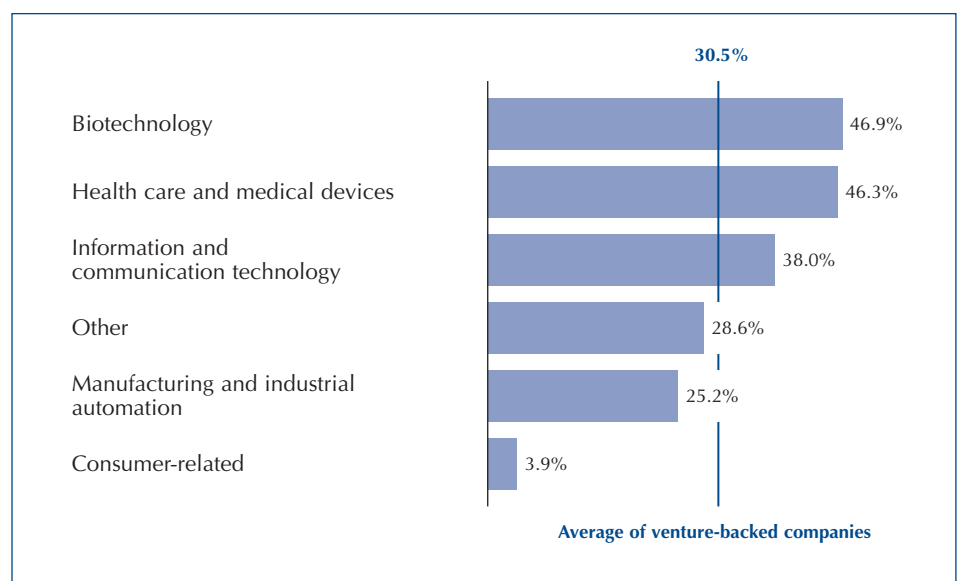


Source: CEFS/EVCA

4.4 Highest employment growth in biotechnology and health care & medical devices industries

A closer look at the industries in which the venture-backed companies operate, shows that, except for one industry, all increased employment by an average of more than 25% per year (see Figure 10). Average annual employment growth was highest in biotechnology and health care companies with both showing growth rates of approximately 47%. The information and communication technology industry grew by 38% - well above the overall average of venture-backed companies. While manufacturing and other companies displayed strong growth of 25.2% and 28.6% respectively, employment growth among consumer-related companies was lowest (3.9%) but it still outperformed average annual growth in the EU 25 (0.7%).

Figure 10: Employment growth in venture-backed companies per industry



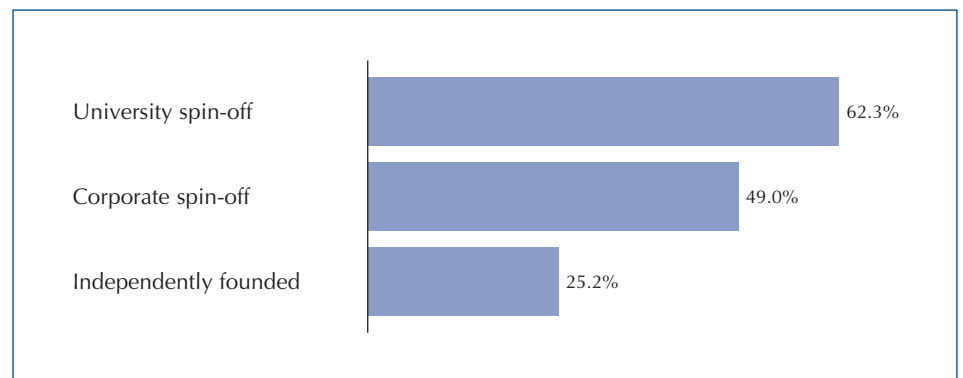
Source: CEFS/EVCA

4.5 University spin-offs grow fastest

Examining company formation reveals that university spin-offs display the highest growth in employment (see Figure 11). In these sample companies, employment grew by 62.3% on average every year following the venture capital investment. Spin-offs from corporations increased their employment by 49.0% per year on average and independently founded companies by 25.2%.

The high growth rate among university spin-offs is probably linked to the high number of biotech-ventures in this group, as 14 of the 26 university spin-offs in the sample were operating in the biotech industry. By contrast, spin-offs from corporations are largely active in information and communication technology (8 out of the 14 corporate spin-offs in the sample).

Figure 11: Employment growth in venture-backed companies by type of company formation



Source: CEFS/EVCA

5. Research activity and employment quality in venture-backed companies

This section analyses the responses received from 102 venture-backed companies regarding their research activity and quality of employment. The findings cover the following issues:

- Human resources dedicated to research and development (R&D)
- Financial resources dedicated to R&D
- R&D activity by industry
- Patent activity
- Remuneration of employees
- Training of employees.

5.1 Every third employee in venture-backed companies works in R&D

The surveyed venture-backed companies were asked about the proportion and quality of human resources they dedicate to research and development (R&D). Their responses showed that on average every third employee (33%) in venture-backed companies works in R&D and every fourth (26%) contributes significantly as a researcher or engineer (see Table 5). In addition, every eighth (13%) employee in a venture-backed company holds a PhD or equivalent degree. This shows that ventures devote a large proportion of their human resources to R&D activities. It also indicates that the new employment created in those companies is related to research and development activities.

Applying these ratios to around 1 million people working in venture-backed portfolio companies in 2004 implies that around 330,000 of them are likely to be working in R&D and 130,000 hold a PhD or equivalent degree.

Table 5: Human resources dedicated to R&D²¹

	Averages reported by surveyed companies	As percentage of average employment in companies surveyed
Employees in R&D	22.0	33%
Researchers and engineers	17.1	26%
Employees holding a PhD	8.6	13%
Total number of employees	67.3	100%

Source: CEFS/EVCA

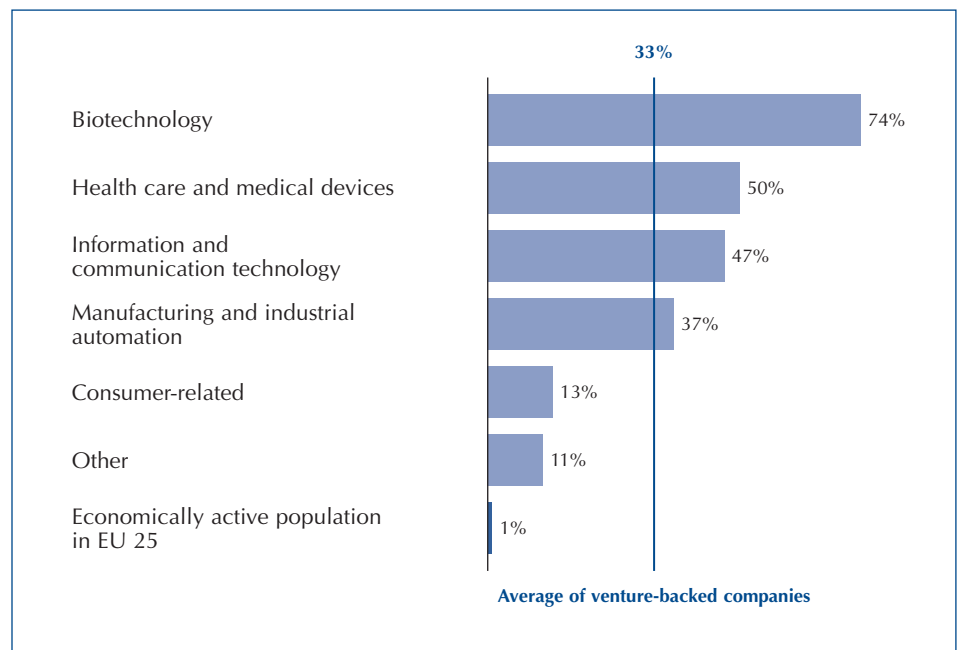
²¹ One employee can be simultaneously counted in either category.

5.2 Most researchers employed in biotech companies

Looking at the ratio of R&D employees to total employees in the surveyed companies relative to the economically active population shows the following: While 33% of all employees in the surveyed venture-backed companies work in R&D, only 1.3% of the overall economically active population in the EU 25 did so in 2003²² (see Figure 12).

Closer examination of the ratio of R&D employees to total employees by industry reveals that this ratio is highest in biotechnology ventures (74%). Portfolio companies in health care and medical devices (50%), information and communication technology (47%) and manufacturing and industrial automation (37%) show ratios at times well above the average of all venture-backed companies. Ventures operating in the consumer-related industry (13%) and other companies (11%) feature ratios below the average, but still above the ratio for the whole economically active population of the EU 25 (1.3%).

Figure 12: Ratio of R&D employees to total employees by industry



Source: CEFS/EVCA, Eurostat

Data on the economically active population of EU 25 in 2003

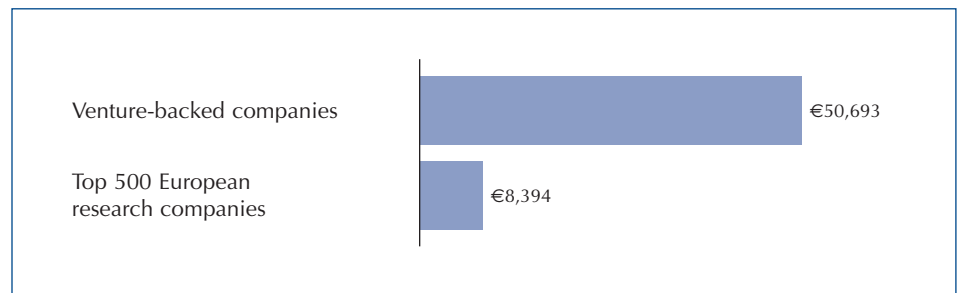
5.3 Venture-backed companies spend on average 45% of their expenses on R&D

The research contribution of the venture-financed companies is further reflected by the budget allocated to R&D. The sample companies spend on average €3.4m per year on research and development. This amounts to a total R&D spending of €218m for the 64 companies that provided information on their R&D expenses. In relation to total expenses, these companies spend on average 45% of their total expenses on research and development and 85% of their sales.

²² Eurostat (2005).

In relation to the number of employees, the venture-backed companies surveyed invest on average €50,700 per employee per year in R&D (see Figure 13). This is significantly more than the €8,400 per employee spent on R&D by the 500 companies with the largest R&D spending in the EU 25²³.

Figure 13: R&D expenses per employee



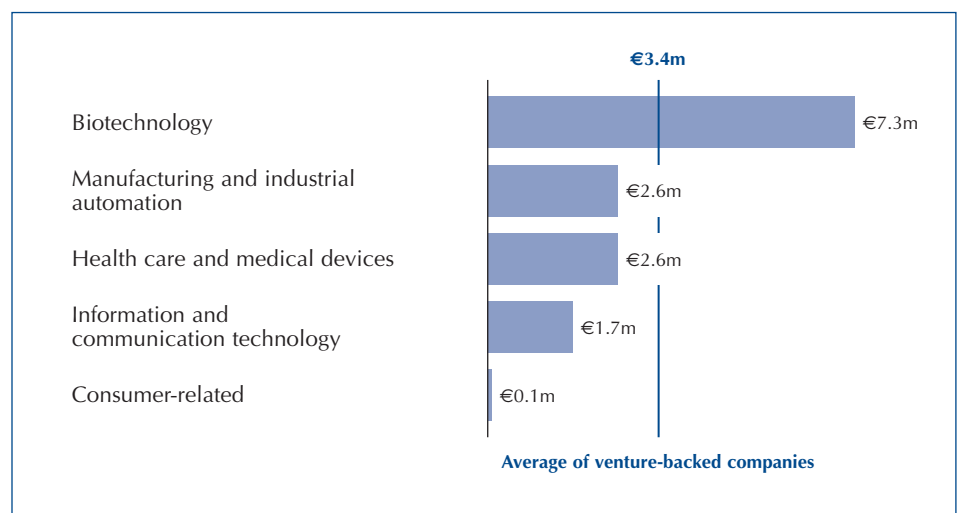
Source: CEFS/EVCA, Eurostat, European Commission (2004)

Data of Top 500 EU 25 research companies for 2003

5.4 Biotech companies invest most in R&D

Similar to the large proportion of researchers in biotech ventures, these companies also display the highest R&D expenses per company at €7.3m (see Figure 14). Ventures in manufacturing, health care (both €2.6m) and information and communication technology (€1.7m) also display very high R&D investments, but below the sample average of €3.4m. On average, consumer-related ventures invest (€0.1m) the least in R&D, given the sector's low research intensity. These findings underline that venture-backed companies contribute significantly to non-public research investments throughout the European economy.

Figure 14: R&D expenses per company split by industry



Source: CEFS/EVCA

Remaining companies did not provide data and thus are not listed

²³ European Commission (2004): 2004 Industrial R&D Investment Scoreboard.

5.5 Venture-backed companies have been granted eight patents on average

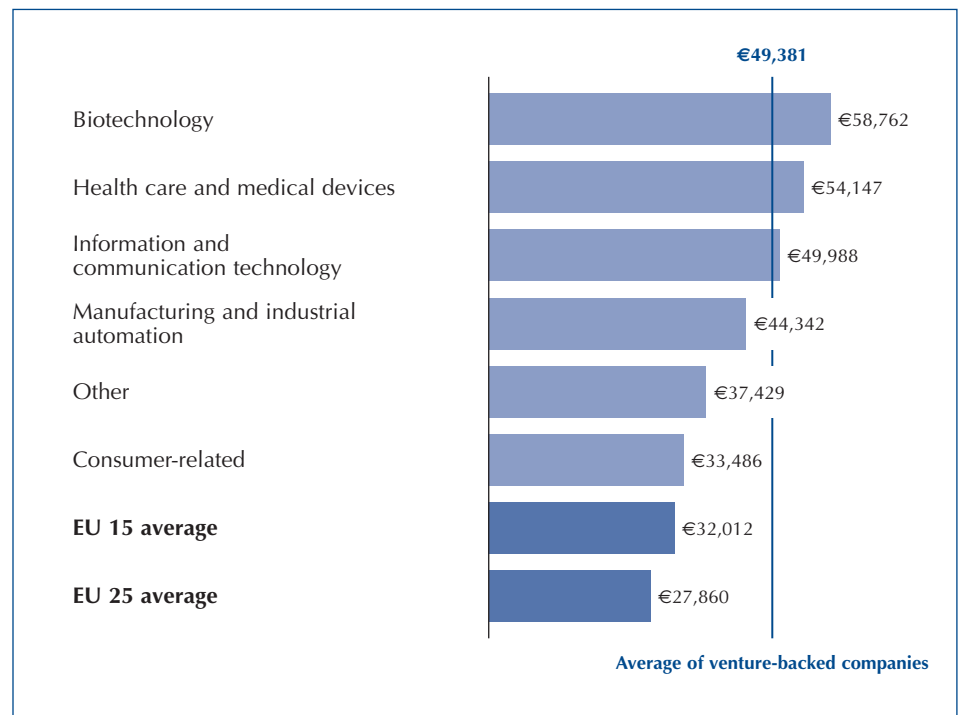
A further indicator of a company's contribution to research is patent activity. Portfolio companies within the sample currently apply for 14 patents on average and have been granted eight patents. In total, the 75 companies providing information on this issue hold 569 granted patents. This figure represents more than four times the number of patents granted in the EU 25 per 1 million employees each year (134 patents)²⁴ – although the surveyed portfolio companies employ only a total of about 6,800 people.

5.6 Venture-backed companies remunerate above EU average

Remuneration is often seen as an indicator of an employee's quality. Looking at our sample of venture-backed companies, average remuneration in the venture-backed companies surveyed (€49,381) was more than 50% higher than the average gross wage in the EU 15 countries (€32,012)²⁵ and more than 75% above average gross wages in the EU 25 (€27,860)²⁶ (see Figure 15).

Employees in biotech companies received the highest average annual remuneration of €58,762, underlining once more the research intensity of this sector. Employees in venture-backed companies operating in the health care (€54,147) and information technology (€49,988) industries both received slightly less, but were remunerated above the overall sample average. Ventures in manufacturing (€44,342), other industries (€37,429), and consumer-related products (€33,486) paid salaries below the sample average, but are still above both EU averages.

Figure 15: Average remuneration of employees



Source: CEFS/EVCA, Eurostat
Data on EU 15 and EU 25 average for 2002

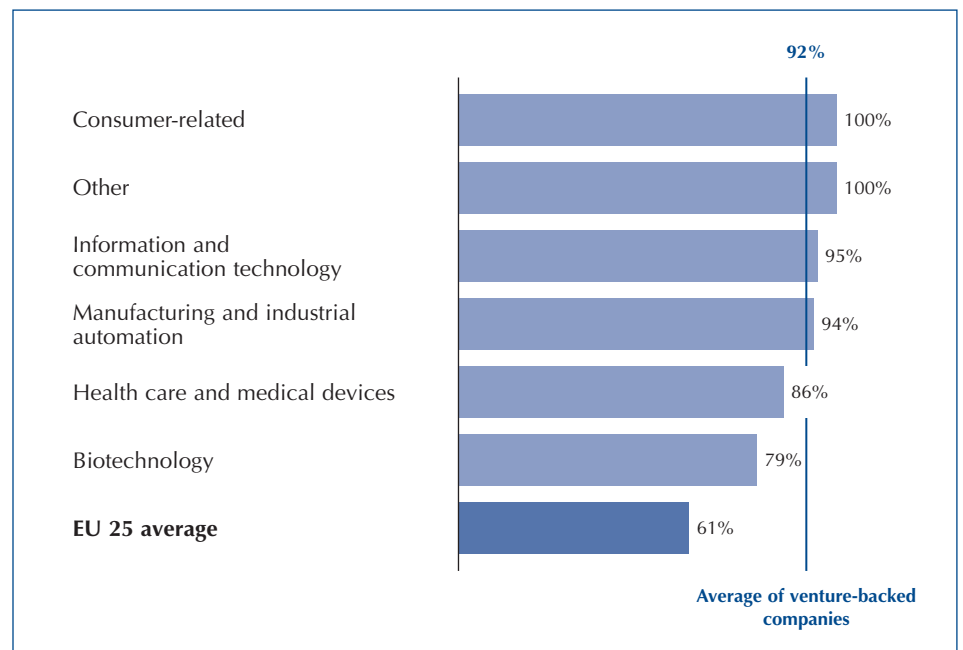
^{24/25/26} Eurostat (2005); figure for 2002.

5.7 Venture-backed companies are more committed to training

A last aspect looked at in this study was the proportion of venture-backed companies engaging in employee training. 92% of the responding venture-backed portfolio companies train their employees (see Figure 16). This is significantly above the EU 25 average of 61%.

In the consumer-related and other industries all the venture-backed companies surveyed invest in the training of their employees. Companies in information technology (95%) and manufacturing (94%) also display a high commitment to training, which is above the overall average of the surveyed companies (92%). Companies in health care (86%) and biotechnology (79%) are also very engaged in the professional development of their employees when compared to the EU 25 average, but their engagement is below the sample average. Therefore, it is possible to conclude that venture-backed companies play a vital role in the continued education and formation of employees.

Figure 16: Engagement in professional development



Source: CEFS/EVCA, Eurostat

Data on EU 25 average for 1999

6. Total employment growth

By combining the findings of the buyout and venture section above, it is possible to gauge the overall employment evolution for the private equity and venture capital industry between the years 2000 and 2004.

Given the total employment by European portfolio companies in 2004 and using the individual growth rates for buyout and venture financed companies, around 4.5 million people would have been employed by those companies in the year 2000 (see Table 6). Given that these figures are based on conservative estimates and the fact that the underlying EVCA Yearbook data represents responses from 73% of the market players, the real employment effect will, however, be higher than this estimate.

Furthermore, this translates into 1 million newly created jobs between the year 2000 and 2004 and represents an employment increase by a compounded growth rate of close to 23% over this period.

The 1 million newly created jobs mean that, on an annualised basis, the growth rate for private equity amounts to 5.4%, which is eight times the overall average employment growth rate of the EU 25 (0.7%). Within the 1 million newly created jobs, around 630,000 were created in venture-backed companies, with the remaining 420,000 jobs created in buyout-financed companies.

Table 6: Total employment growth of buyout and venture-financed companies

	Based on lower end of range	Based on upper end of range
Employment in 2000	3,919,436	5,119,631
Employment creation between 2000 and 2004		
in venture-backed companies	520,548	741,423
in buyout-financed companies	366,639	475,653
Total new jobs	887,187	1,217,076
Employment growth between 2000 and 2004	22.6%	23.8%
Compound annual employment growth rate	5.2%	5.5%

Source: CEFS/EVCA

7. Conclusion

Employment and the preservation of jobs, especially high-quality jobs, is a key concern for policy makers across Europe. The EU has set an employment target of 70% by the year 2010 – a goal requiring effective measures if it is to be met. This target is made all the more difficult by the high unemployment rate in the EU and the rising competition from further afield. Implementing the right policies to increase and conserve employment in the EU is therefore one of the key missions for European policy makers.

As this study reveals, private equity and venture capital play a vital role in the conservation and creation of employment at a European level. The larger buyout-financed companies represent the majority of jobs, accounting for close to 5 million or 83% of the total number of people employed by private equity and venture capital backed companies. Venture-financed companies embody the around close to the 1 million remaining jobs that the industry as a whole provides. Those close to 6 million people together account for close to 3% of the around 200 million economically active people in Europe.

In addition to its role in employment conservation, this study underlines the private equity and venture capital industries' role in the creation of new jobs. Between 1997 and 2004, the buyout-financed companies surveyed in this study experienced an average growth rate in employment of 2.4% per year following the buyout transaction. This is nearly four times the annual growth rate of employment in the EU 25 (0.7%) between the years 2000 and 2004. Two thirds of those companies surveyed increased their headcount or kept it stable, while only one third of buyout-financed companies decreased their headcount. Family-owned businesses, in particular, have been a strong driver, increasing employment on average by 7% per year following the buyout.

Between 1997 and 2004, venture-backed companies in the survey grew on average by 30.5% per year following the investment. This is around 40 times the annual employment growth rate of the EU 25 (0.7%)²⁷ between 2000 and 2004. 73% of companies increased their headcount by more than 25% per year. Furthermore, 33% of the people employed by a venture-backed company work in research and development. When extrapolated to the 1 million people working in venture-backed companies in 2004, an estimated 330,000 are working in R&D. Additionally, around 13% of the people employed by venture-backed companies hold a PhD or equivalent degree.

This survey also underlines private equity and venture capital contribution to supporting the wider European economy. The smaller deals, either on the venture or the buyout side, create employment at the highest rate. Moreover, venture-backed companies are often located in research intensive industries, with around one third of the people working in research and development. However, job conservation occurs mainly in the larger more mature companies and is a key contributor to bringing the employment level to 70% of the European population. To reach this target, an employment growth rate of 1.5% per year is required until 2010, implying a significant increase on the 0.7% growth rate seen annually between 2000 and 2004. Moreover, the EU 25 need to create an additional 20 million jobs to meet the overall target of bringing the European Union back to full employment levels. Although initiatives in different areas and throughout the economy are required to reach this, the private equity and venture capital sector is well poised to contribute to this endeavour.

²⁷ Eurostat (2005); data from the period 2000-2004, as earlier data are not available.

Appendix 1: Methodologies and sample descriptions

This section provides details on the methodology applied in this survey and the underlying samples used to derive the findings of this study. Subsection A.1 describes the methodology for the total employment estimate. Subsection A.2 specifies the methodology for the analysis of the employment growth rates in buyout-financed companies and describes the underlying sample. Subsection A.3 explains the methodology for the calculation of the employment growth rates in venture-backed companies, the analysis of research activity and employment quality, as well as describing the underlying sample used.

A.1 Estimate of total employment effect

Basis data for the estimate

The employment estimate presented in this study is based on two main sets of data:

1. The total number of European portfolio companies that are financed by private equity and venture capital funds
2. The distribution of those portfolio companies according to company size in terms of number of employees.

Geographic scope of this study

In line with EVCA membership, this study covers Europe as a region, comprising the EU 25, Switzerland and Norway. Some smaller EU member states, where private equity markets are relatively small with only a few active players, were not included in the study. The countries excluded are Cyprus, Luxembourg and Malta. A full list of the countries covered is provided in Table 7 and Table 8.

Number of portfolio companies

The number of portfolio companies per country held by private equity and venture capital funds at the end of 2004²⁸ was collected from the national private equity and venture capital associations whenever those figures were available (see Table 7). When these numbers were not available within national associations, the number of portfolio companies were counted by hand from the individual funds' websites if they were a member of the association (see Table 8).

Figures provided by national associations have been adjusted for national syndication, but not for trans-national syndication (e.g. syndication with non-domestic funds). Figures counted by hand were adjusted for both using the percentages of national and trans-national syndication provided on a country basis in the EVCA Yearbook. The working assumption was that the average number of syndication partners is two.

²⁸ When calculating the results, data on the number of portfolio companies held were not yet available for some countries for 2004 so figures from the previous year were used.

Table 7: Number of portfolio companies by country as reported by the respective national association

Country name	No. of portfolio companies
Belgium	739
Finland	748
France	3,600
Germany	5,497
Italy	1,300
Netherlands	402
Norway	489
Poland	312
Spain	1,282
Sweden	1,195
United Kingdom	11,268
Total	26,832

Source: CEFS/EVCA

Data as of 2004 or latest information available

Table 8: Number of portfolio companies by country counted by hand

Country name	No. of portfolio companies
Austria	452
Czech Republic	28
Denmark	639
Estonia	45
Greece	76
Hungary	60
Ireland	187
Latvia	35
Lithuania	21
Portugal	262
Slovakia	43
Slovenia	18
Switzerland	184
Total	2,050

Source: CEFS/EVCA

Distribution of portfolio companies according to company size

The size distribution of European portfolio companies held in the private equity and venture capital funds was derived from information available on the company size of new investments²⁹. To adjust for market trends, an average of the distributions of new investments over a five year period (i.e. 2000 - 2004) was calculated. The company size distributions of the last five years were weighted with the number of new investments in the respective year. The five year period was chosen as academic research confirms that this time span corresponds to the average holding period in the industry³⁰. Table 9 shows the resulting distribution of portfolio companies by company size category based on the number of employees.

Table 9: Distribution of portfolio companies by company size

Company size (by employment)	% of investments
0-19	42.3
20-99	33.8
100-199	9.5
200-499	6.9
500-999	3.6
1,000-4,999	3.2
5,000+	0.7

Source: CEFS/EVCA

²⁹ Data taken from the EVCA activity surveys of the respective years.

³⁰ Cf. Kuemmerle, Walter (1998): "Survey of Private Equity in Germany", Harvard Business School, p. 7; Baumgärtner, Carsten (2004): "Die Portfoliosteuerung von Venture Capital-Gesellschaften – Eine theoretische und empirische Analyse", dissertation project, University of Hohenheim.

Employment estimation

Following the calculation of the total number of European portfolio companies and their distribution according to company size, the total employment level was derived in three steps:

1. In a first step, the *distribution* of portfolio companies per size category was multiplied by the total number of portfolio companies to get the number of European portfolio companies per size category.
2. In a second step, the number of portfolio companies in each size category was multiplied by an estimated average number of employees in the category. As the distribution of company sizes within each category is unknown, a range for the employment estimate for each category was calculated. These ranges contain a conservative estimate as the lower border and the category average as the upper border. The conservative estimate takes into account any potentially skewed company size distribution and was thus chosen well below the category average. This estimate is given by one quarter of the interval length of the respective category (i.e. 40 for the category of 20 to 99 employees). As a second estimate, the average of each category (given by half the interval length of the respective category) was used (i.e. 60 for the category of companies employing between 20 and 99 people). For the largest size category (i.e. 5,000 or more employees), the lower boundary of the whole category was taken for both calculations (i.e. 5,000).
3. In a third step, the employment ranges per size category were aggregated over all size categories to obtain the range for the total number of employees in European portfolio companies.

The employment estimate is based on a range as there is no information available on the distribution of companies within a certain size category. However, the distribution of companies by different size categories suggests that investments in portfolio companies are not uniformly distributed but rather right-skewed (with the lowest size category being the left boundary). To reflect this, the estimate is provided as a range with the category average and the conservative estimate as boundary values.

Distinction between venture-financed and buyout-financed investments

To separate the employment contribution from the buyout stage and the venture stage respectively, a distinction was drawn for the purpose of this study at 200 employees. This means that portfolio companies with less than 200 employees at the time of investment are considered venture capital investments and portfolio companies with more than 200 employees are considered to have received buyout financing. This cut-off is a reasonable assumption, as it is close to the European Commission's definition of small and medium-sized enterprises as having, amongst other criteria, less than 250 employees³¹. The cut-off is further supported by the fact that only three out of the 102 venture-backed companies participating in the survey had more than 200 employees in the year of investment.

³¹ Cf. European Commission (2003).

Limitations of the estimation

Despite the conservative approach chosen, several points might lead to a discrepancy from the survey findings and the real employment effect.

First of all, the estimation is only based on data available to EVCA or one of the national venture capital associations. A number of funds are member of neither organisation and are therefore not included in the data used. Moreover, a number of funds do not participate in EVCA or other European associations' annual activity surveys and so their investment activity and, more specifically, the portfolio companies invested in, are not included in the calculations, resulting in a smaller employment contribution³².

On a similar line, investments by non-European private equity and venture capital funds, most notably US-based, are not counted unless the fund is a member of EVCA or one of the European associations. This effect is partially compensated by investments of European funds outside Europe, for which data was not adjusted. Nevertheless, total investment of non-European funds in Europe is likely to be higher than total investment of European funds outside of Europe, since around 95%³³ of European private equity funds investments are made nationally or in other European countries. This means a slight underestimation of the employment contribution.

Furthermore, no adjustment has been made for the migration of portfolio companies between different size categories over a fund's investment period. Although company migration is very likely, no detailed information is available on the effect, so it has been left out. Overall, the net effect is assumed to be positive (i.e. more companies migrate upwards to a size category with more employees than in the other direction), which leads to a potentially smaller employment contribution estimate. All three limitations support the conservative estimates applied and may result in the underestimation of the employment contribution in this study.

No allowance was made for a possible survivorship bias of the European portfolio companies invested in. This bias refers to the fact that not all ventures that received financing at their incorporation will survive long enough to be examined in this study. The same bias is likely to be found among buyout-financed companies included in this survey, as they might be written off by the fund before exit. No adjustments were undertaken to mitigate this effect as no European data on the survival rate of buyout-financed and venture-financed companies exist.

³² Around 73% of the all private equity and venture capital funds active in Europe reply to the EVCA activity survey.

³³ Cf. EVCA Yearbook (2005).

A.2 Employment growth in buyout-financed companies

Survey and sample description

The growth figures provided in Section 3 are based on the responses to an online survey that CEFS conducted on behalf of EVCA from March to July 2005. The participating private equity funds were asked to provide employment information on portfolio companies they had previously invested in, as well as some general background information on the business. The funds also had the option of forwarding the questionnaire for the portfolio company to fill in. Table 10 provides details on the sample of companies that completed the questionnaire.

Table 10: Sample description of surveyed buyout-financed companies

Company-size (by employment)	No of buyout-companies
Fewer than 100	14
100 to 200	10
200 to 500	25
500 to 1,000	12
1,000 to 5,000	27
More than 5,000	11
Total	99

Buyout background	No of buyout-companies
Family buyout	30
Spin-off buyout	40
Turnaround	8
Privatisation	0
Going-private	5
Secondary	15
Other	1
Total	99

Country of portfolio company	No of buyout-companies
France	11
Spain	7
Germany	29
Sweden	12
Italy	13
United Kingdom	15
Netherlands	4
Other	8
Total	99

Buyout type	No of buyout-companies
MBO	68
MBI	15
Other	16
Total	99

Industry	No of buyout-companies
Chemicals and materials	7
Industrial products, services & manufacturing	37
Communications	2
Medical, health-related, biotech	5
Computer-related	2
Other services	13
Constructions	4
Transportations	5
Consumer-related	21
Financial services	3
Total	99

Year of transaction	No of buyout-companies
1997	7
1998	7
1999	26
2000	12
2001	10
2002	15
2003	12
2004	9
Total	98

Source: CEFS/EVCA

If the total number of respondents is smaller than the sample size, this indicates that some portfolio companies did not disclose the relevant information.

Three of these companies have shown employment changes which are unlikely due to organic growth. Therefore, these companies have not been taken into account when calculating employment growth.

A total of 114 responses from buyout-financed portfolio companies were received. Of these, some were incomplete or flawed and had to be left out of the analysis, leaving 99 answers. To ensure a geographically representative sample, portfolio companies located in France, Germany, Italy, the Netherlands, Spain, Sweden or the United Kingdom were mainly targeted. These markets represent 94.3% of the total European investment activity. Answers received from outside those countries were, however, still included in the analysis and grouped in the category “other”. Respondents were asked to report on deals that took place between the years 1997 and 2004. This allowed for a long enough time frame to avoid any cyclical effects and for sourcing from a large enough number of transactions. When analysing the sample representativeness, it should be noted that there is a small bias towards larger companies, deals from Germany and towards industrial products & services, and manufacturing companies.

Calculation of growth rates of sample companies

Employment figures given by a portfolio company for two consecutive years were compared and translated into growth figures. Where employment figures were not provided for consecutive years, these figures were interpolated using the years reported by the funds on the assumption of linear growth. Based on that information, the average annual growth for each company was calculated. This was done by aggregating the growth rates of different years to an average growth rate per year at the company level. This average annual growth rate per company was calculated as the geometric average of all growth rates provided for that company³⁴. Thereafter, the average employment growth of the whole sample was calculated, meaning that growth rates were aggregated over all the buyout-financed companies surveyed. To aggregate them, a weighted arithmetic average was calculated using the company size (i.e. the number of employees at the time of investment) as the weighting factor to reflect the stronger impact larger companies have on overall employment growth.

Please note that employment changes were analysed exclusively within the closed set of sampled companies. Thus, the growth rates presented refer to a fixed sample of companies and do not account for an increase in the number of investments by funds.

Limitations

Although funds were asked to reply for representative portfolio companies, the representativeness of the sample is somewhat restricted because some funds might have answered using their most successful investments leading to an overestimation of the employment effect. However, due to the fact that negative employment figures were also reported by some of the responding companies, it is assumed that this does not jeopardise the findings of the study. Another bias inherent in the data sample is evoked by the fact, that some portfolio companies of buyout funds are typically written off during the holding period. These liquidated companies are not reflected in the sample.

³⁴ *The geometric mean is used to determine the mean of a certain set of factors. It should be used instead of the arithmetic mean, as total growth is calculated by multiplying a set of growth factors (linked by multiplication) instead of adding up a set of growth summands (linked by addition). Example: If a company's employment of 100 changes by +10%, +50% and +30% in three consecutive years, the arithmetic mean would be +30%, which would result in 219 employees. In fact, employment amounts to 215, which equals an average annual growth rate of 28.9%. This number is exactly the geometric mean.*

Calculation of comparable figures

The employment contribution of the buyout sample was compared to the DJ STOXX 600, which represents the 600 largest European listed companies according to market capitalisation. For some analyses, these companies were split according to industry to facilitate comparisons. Employment data for the DJ STOXX 600 companies was taken from a Datastream access providing data from Thomson Financial. Table 11 shows how the DJ STOXX 600 industry indexes were assigned to respective peer groups to be comparable to the industries of the surveyed buyout-financed companies.

In addition, the employment growth in buyout-financed companies was compared to total employment growth in the EU 25 countries, which was calculated based on Eurostat data. Employment data for 2000 and 2004 was compared and the compound annual growth rate calculated.

Table 11: Industry matches of buyout-companies and DJ STOXX 600 companies

Buyout industry	Comparable DJ STOXX 600 industry index
Chemicals and materials	Chemicals, basic materials
Communications	Telecommunications
Computer-related	Technology
Construction	Construction
Consumer-related	Food & beverage, consumer goods, consumer services
Financial services	Financial services, banks, insurance
Industrial products & services, manufacturing	Industrial goods & services, industrial, automobile & parts
Medical, health-related, biotech	Healthcare
Other services	Media, industrial goods & services, retail
Transportation	Industrial transportation (Euro STOXX), Travel & leisure (DJ STOXX UK)

Source: CEFS/EVCA

Adjusting for non-organic growth

As the acquisition or sale of certain corporate divisions (e.g. buy and build strategies) does not affect overall employment within an economy, the data was adjusted to only account for organic growth. This was done by assuming that the non-organic development of a mature company can lead to a maximum change in employment of 20%. Therefore, employment increases or decreases of +/-20% p.a. were excluded from the dataset. Thus, three companies have not been taken into account when calculating employment growth. This exclusion of growth and reduction was symmetrically applied to buyout-financed companies as well as to DJ STOXX 600 companies.

A.3 Employment growth, research activity, and employment quality in venture-backed companies

Survey and sample description

Data in Sections 4 and 5 are based on responses to an online survey that CEFS conducted on behalf of EVCA from March to July 2005. Similar to the survey for buyout-financed companies, the venture capital funds participating in this survey were asked to provide employment information on portfolio companies they had previously invested in, as well as some general background information on the business. The funds also had the option of forwarding the questionnaire for the portfolio company to fill in. Table 12 provides details on the sample of companies that completed the questionnaire.

Table 12: Sample description of surveyed venture-backed companies

Company size (by employment)	No of venture-backed companies
Less than 20	64
20 to 99	16
More than 100	5
Total	85

Industry	No of venture-backed companies
Biotechnology	23
Consumer-related	7
Health care and medical devices	7
Information and communication technology	44
Manufacturing and industrial automation	17
Other	4
Total	102

Type of company formation	No of venture-backed companies
University spin-off	26
Corporate spin-off	14
Independently founded	62
Total	102

Company of residence	No of venture-backed companies
France	23
Spain	12
Germany	27
Sweden	11
Italy	2
United Kingdom	18
Netherlands	5
Other	4
Total	102

First year of financing	No of venture-backed companies
1997	8
1998	8
1999	12
2000	22
2001	14
2002	9
2003	17
2004	12
Total	102

Source: CEFS/EVCA

If the total number of respondents is smaller than the sample size, this indicates that some portfolio companies did not disclose the relevant information.

In total, responses from 116 venture capital backed portfolio companies were received of which some were incomplete or flawed and had to be left out of the analysis, leaving 102 eligible answers. To ensure a geographically representative sample, portfolio companies located in France, Germany, Italy, the Netherlands, Spain, Sweden or the United Kingdom were mainly targeted. These markets represent 94.3% of the total European investment activity. Answers received from outside those countries were, however, still included in the analysis and grouped in the category "other". Respondents were asked to report on deals that took place between 1997 and 2004. This allowed for a long enough timeframe to avoid any cyclical effects and for sourcing from a large enough number of transactions. When analysing the sample representativeness, it should be noted that there is a minor overrepresentation in the responses of ventures operating in the biotechnology or information and communication technology industries. Furthermore, only a few responses were received from Italian companies indicating that venture investments are less frequent in that market.

Calculation of growth rates of venture sample companies

The same method as for the buyout sample was applied to derive the growth rate for the venture sample. Employment figures given by a portfolio company for two consecutive years were compared and translated into growth figures. These were then aggregated on the portfolio company level by using the geometric mean. The resulting average annual growth rates for each company were used to calculate the arithmetic mean of all companies weighted with the number of employees. The result corresponds to the average annual growth rate of all venture-backed companies.

It should be noted that employment changes were analysed exclusively within the closed set of sampled companies. Thus, the growth rates presented refer to a fixed sample of companies and do not account for an increase in the number of investments by funds.

No adjustments were made for employment growth from non-organic growth as acquisitions or sales are usually not part of the venture business model and growth rates of +/-20% or more are very likely.

Calculation of qualitative indicators

For each of the qualitative responses received, the arithmetic mean was calculated based on all the responses that included data on the question concerned. Results were split according to industry where this is indicated in the analysis. Furthermore, findings were benchmarked to the R&D activity of the 500 European companies with the highest R&D spending in 2003 and to data from Eurostat.

Limitations

Although funds were asked to reply for representative portfolio companies, the representativeness of the sample is somewhat restricted because some funds might have answered using their most successful investments leading to an overestimation of the employment effect. However, due to the fact that negative employment figures were also reported by some of the responding companies, it is assumed that this does not jeopardise the findings of the study.

Appendix 2: Definitions

Buyout

A buyout is a transaction in which a business, business unit or company is acquired from the current shareholders (the vendor). Variations of this include:

- A management buyout (MBO), i.e. a buyout in which the target's management team acquires an existing product line or business from the vendor with the support of private equity funds;
- A management buyin (MBI), i.e. a buyout in which external managers take over the company and financing is provided to enable a manager or group of managers from outside the target company to buy into the company with the support of private equity funds.

Compound annual growth rate (CAGR)

The compound annual growth rate is a method to determine the average growth of a value over time. It takes a starting value and the ending value, and calculates an average growth rate per year for the period in-between, assuming that growth has happened at a constant rate. The following formula is used:

$$\text{CAGR} = \left(\frac{\text{Value at the end of period}}{\text{Value at the beginning of period}} \right)^{\left(\frac{1}{\text{Period [in years]}} \right)} - 1$$

Geometric mean

The geometric mean of a set of numbers is defined as the product of all members of the set raised to a power equal to the reciprocal of the number of members. The geometric mean is a useful summary when it is expected that changes in the data occur in a relative fashion.

$$\text{Geometric mean} = (\text{Factor}_1 \times \text{Factor}_2 \times \dots \times \text{Factor}_n)^{\frac{1}{n}}$$

Portfolio company

The company or entity into which a private equity fund invests directly.

Private equity

Private equity provides equity capital to enterprises not listed on a stock market. Private equity can be used to develop new products and technologies, to expand working capital, to make acquisitions, or to strengthen a company's balance sheet. It can also resolve ownership and management issues. A succession in family-owned companies, or the buyout and buyin of a business by experienced managers may be achieved using private equity funding.

Private equity fund

A private equity investment fund is a vehicle for enabling pooled investment by a number of investors in equity and equity-related securities of companies. These are generally private companies whose shares are not listed on any stock exchange. The fund can take the form either of a company or of an unincorporated arrangement such as a limited partnership.

Start-up

These are companies that may be in the process of being set up or may have been in business for a short time, but have not sold their product commercially.

Venture capital

This is professional equity co-invested with the entrepreneur to fund an early stage (seed and start-up) or expansion venture. Offsetting the high risk the investor takes is the expectation of a higher than average return on the investment. Venture capital is a subset of private equity.

Write-off

The write-down of a portfolio company's value to zero. The value of the investment is eliminated and the return to investors is zero or negative.

Appendix 3: Overview of related studies

Table 13: Overview of related studies

Study	Methodology	Results
"Impacto económico y social del capital riesgo en España" by ASCRI (2004)	<ul style="list-style-type: none"> • Employment data was taken from database • Data for 796 portfolio companies was gained • Weighted average of growth rates between 1991 and 2002; size taken as weighting factor • 4 years period was analysed 	<ul style="list-style-type: none"> • Average annual employment growth of 17.8% compared to 2.6% growth in GDP • During the first three years, the firms studied created 63,352 new jobs • Employment growth by stage shows that employment grew on average by 23.0% in the early stage, by 21.7% in expansion and by 3.4% in the later stage • For technology companies, employment grew by 21.8% compared to non-technology firms at 17.2%
"BVK Statistik 2004" by BVK (2004)	<ul style="list-style-type: none"> • Survey based on 132 answers of members and non-members • Results are not extrapolated (at least 220 funds active in German market) 	<ul style="list-style-type: none"> • 638,000 employees in venture capital and buyout-backed companies in 2004
"Le poids économique et social du capital investissement en France" by AFIC (2004)	<ul style="list-style-type: none"> • Survey based on 211 participating funds (140 responses and 71 datasets collected from internet) • Results of 2,065 portfolio companies were linearly extrapolated to 1,633 non-participating portfolio companies 	<ul style="list-style-type: none"> • 1.03 million employees in 3,700 venture capital and buyout-backed companies in France in 2003 • This is 6.1% of private sector employment • Number of employees increased by 4% (39,000 between 2002 and 2003) • Number of employees in large portfolio companies (with more than 1,000 employees) is estimated at 672,000, that of medium-size companies (employment between 200 and 500) at 250,000, leaving 112,000 employees in small companies (fewer than 200 employees)
"The Economic Impact of Private Equity in the UK" by BVCA (2004)	<ul style="list-style-type: none"> • Survey among 1,500 buyout-backed companies • 222 answers were received and analysed • Methodology is not disclosed 	<ul style="list-style-type: none"> • 2.7 million employees in UK or 18% of UK private sector employment attributed to venture capital and private equity • In the 5-year period to 2003/2004, the number of people employed in venture capital and buyout-financed companies increased by 20% p.a. on average • Buyout-financed companies' employment grew at 11% p.a.
"The economic impact of private equity and venture capital in the UK" by IE Consulting/BVCA in 2003	<ul style="list-style-type: none"> • Survey among 1,500 selected portfolio companies • 213 responses • Sample composition disclosed • Employment estimate calculated by multiplying number of portfolio companies by average headcount of portfolio companies 	<ul style="list-style-type: none"> • 2.7 million employees in companies financed by private equity, this is equal to 18% of UK private sector employment; however survey results suggest 1.8 million employees • Employment in venture-backed companies grew by 19% p.a. between 1997/8 and 2002/3, compared to 0.5% average employment growth p.a. in UK • Employment in buyout-financed companies grew by 7% p.a. on average • R&D expenses increased by 27% per year

Source: CEFS/EVCA, ASCRI, BVK, BVCA, AFIC

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