

IMPACT OF VENTURE CAPITAL IN DENMARK

-ENGLISH VERSION

Vækstfonden

Vækstfonden is a government backed investment fund. Operating as an independent entity in the capital market, we facilitate the supply of venture capital in terms of start-up equity and high-risk loans. Our financing is provided on commercial terms. Our investment strategy extends across a wide range of industries. We invest in companies with high growth potential that offer innovative product solutions and new business models. Furthermore, we invest in private venture funds specialising in specific industry sectors. Our vision is to create the best market for innovation finance in Europe.

Our capital base is € 300M.

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1. INTRODUCTION

Access to competencies and the ability to use them in the company is crucial in a time where globalization and increasing international competition characterizes the conditions on the market. The venture capital industry supports young companies with high growth potential, providing them with both capital and competencies. The definition of venture capital is risk capital from active investors ensuring development and growth in their portfolio firms through a broad network in addition to extensive technology and industry experience.

Venture capital has played an increasingly important role in economies throughout the world in the last decade. Venture-backed firms are innovative and technology based companies, where a large share of the value-add descends from research and development (R&D). Meanwhile, innovation and R&D have become top priorities on the political agenda. Therefore, the aim of this study is to highlight the impact of venture-backed firms in Denmark.

This study has been undertaken by the government's venture capital fund, Vaekstfonden. Vaekstfonden implemented a new strategy back in 2000. The objective of the new strategy was to invest in equity in exchange of a fair share of the potential return. Prior to the new strategy Vaekstfonden worked on less commercial conditions. Loans were given to a wide range of firm in exchange of a fixed low return. In 2000 the investment activity in Vaekstfonden more than doubled, supporting the market of high risk financing in stages where other private players hesitate. With this study we aim to see if the new strategy has had any effect in relation to increased R&D and activity.

The study is based on two different data sources. Firstly, Vaekstfonden's database, which contains all investments in Danish portfolio companies of domestic venture capitalists. This database is updated annually from annual accounts of each individual fund. Secondly, an online survey was sent out to approximately 500 portfolio firms in February 2006. A sample of 100 portfolio companies responded on the survey, which make up 17% of the entire population of 578 active portfolio firms. The results in the study are calculated from an extrapolation of the sample, where segment, age and size is taken into account. The methodology applied is explained more detailed in Appendix A.

Venture capital is a type of finance which primarily includes equity in innovative small and medium sized entities (SMEs) with a major growth potential. The companies are often very young and the business strategies and –models are exposed to high risk and a high

degree of complexity. Venture capital is *intelligent* type of financing, where investors typically take in business development and strategy besides very frequent contact relating to management, knowledge, counseling, guidance, and network

Venture capital is a part of the private equity segment which indicates funding to unquoted businesses. Venture capital is targeted at the stages of the development of innovative companies: seed, start-up, and expansion.

2. PROGRESS ON THE DANISH VENTURE MARKET

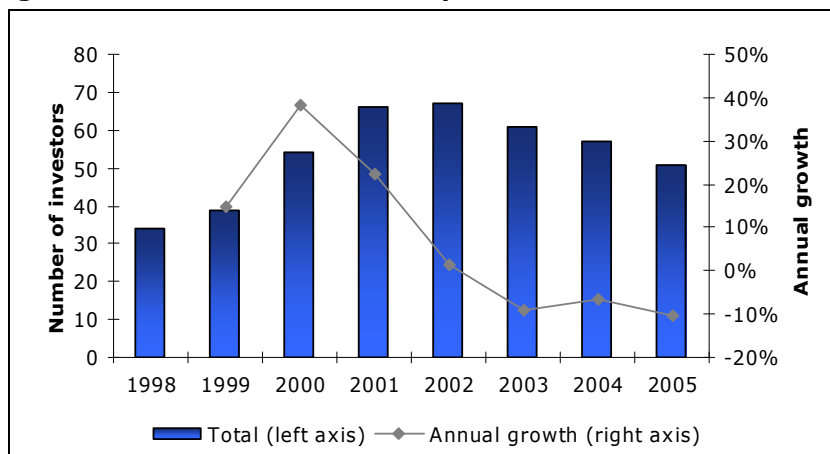
The Danish market for venture capital has undergone a period of high volatility since the burst of the IT-bubble in the beginning of this century. However, government initiatives have brought more capital and competencies to the venture market. In 1998 public incubators were established, and in 2000 Vaekstfonden changed its strategy towards equity venture investments on entirely commercial conditions. Both governmental funded initiatives support innovative high tech companies in the early stages, where the market hesitates to invest.

Defining the Danish venture market three parameters need to be stressed: Number of investors, capital under management, and the investment activity.

2.1 DROP IN THE NUMBER OF INVESTORS

The number of investors on the Danish venture market has varied significantly since 1998. Between 1998 and 2002 the number of venture capitalists (VCs) was increasing strongly following a faith in a New Economy and the excitement of especially the ICT segment. However, after 2002 the number has decreased to a five year low level in 2005 at 51 investors. Despite the drop in Danish VCs the number of investors increased by 17 investors in the period 1998-2005.

Figure 2.1: Number of venture capitalists in Denmark



Source: Vaekstfonden.

The growing uncertainty following the terror attacks on September 11th 2001, resulting in an economic downturn, has also affected the Danish venture market. A reduction in the number of investors who did not have sufficient diversification in their portfolio occurred.

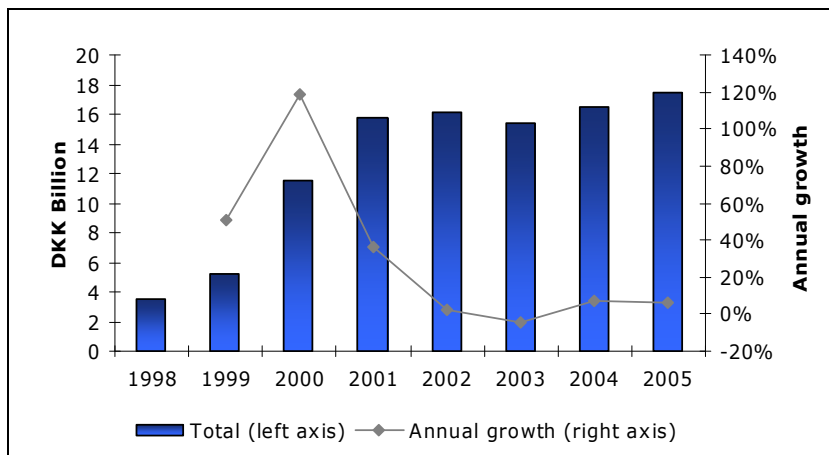
- **Drop in number of venture capitalists**
- Five year low in 2005 at 51 investors
- 50% growth since 1998
- Consolidation of market players since a peak in 2002

Meanwhile, a number of the venture investors consolidated to achieve a sufficient size in order to meet future demand for capital.

2.2 INCREASING CAPITAL UNDER MANAGEMENT

Despite a recent drop in the number of venture capitalists in Denmark, the capital under management has increased remarkably. In 2005 the venture capital base reached an all time high of DKK 17.5 billion (€ 2.36 billion) while the amount in 1998 was only DKK 3.5 billion (€ 471 million). The boost does not necessarily raise the number of companies to receive venture capital. Instead venture capitalists are more likely to invest larger amounts of money in each firm and to follow the firm to a successful exit.

Figure 2.2: Capital under management in Danish VCs



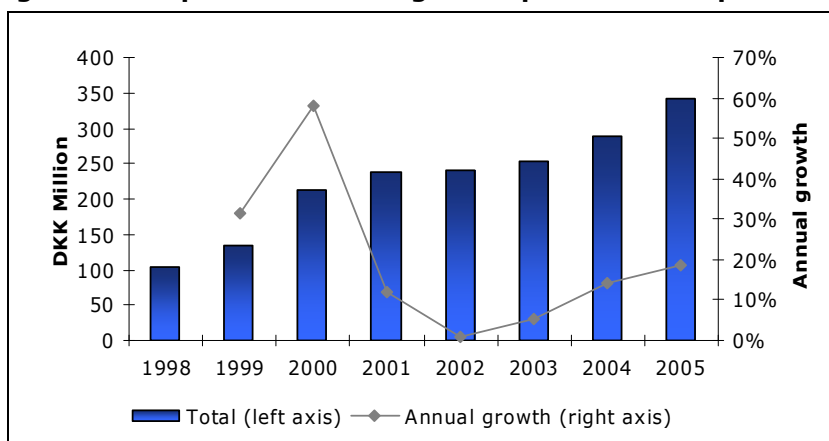
Source: Vaekstfonden.

Between 1998 and 2002 the number of investors as well as the capital under management increased significantly. However, after 2002 the annual growth in capital under management has slowed, while the number of investors has decreased drastically.

A fall in the number of investors along with an increasing capital base on the venture market is resulting in larger venture funds. The average capital under management of Danish venture capitalists in 2005 reached an all time high of DKK 350 million (€ 47 million) per investor – corresponding to an annual growth of 20%. Moreover, in 2005 the venture capitalists have increased their average capital base by 250% compared to the 1998-level.

- **More venture capital in Denmark**
- Venture capital base of DKK 17.5 billion in 2005
- Increase of DKK 14 billion since 1998
- 95% raised by new investor teams

Figure 2.3: Capital under management per venture capitalist



Source: Vaekstfonden.

The boost in capital under management per venture capitalist shows a growing understanding among venture capitalists and institutional investors that venture funds must have a sufficiently large capital base to bring their portfolio companies all the way from seed to exit. However, Danish venture capitalists are still far behind similar U.S. funds which each manage more than DKK 1 billion (€ 135 million) on average.

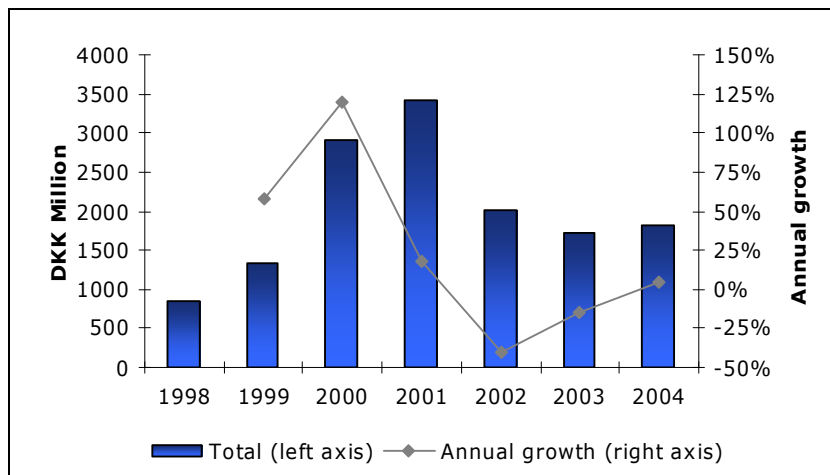
2.3 GAIN IN INVESTMENT ACTIVITY

In 2004 the investment activity on the Danish venture market increased for the first time since 2001. The progress shows a renewed confidence in the market of risk capital finance which has been characterized by a decline since the burst of the IT-bubble in 2000-01.

While the investment activity on the Danish venture market in 2001 was DKK 3.4 billion, the level was reduced by approximately 50% by 2003. The decline in the investment activity along with increasing capital under management shows a sign of reluctance among investors. Thus, a lower number of companies received venture capital in 2003. However, the ones that did should be better prepared for the future as the investors have the opportunity to provide more capital to the individual companies.

- **More capital per investor**
- Average capital base of DKK 342 million in 2005
- More than a trebling since 1998

Figure 2.4: Venture investments in Denmark



Source: Vaekstfonden.

The downturn in venture investments after 2000-01, and the renewed positive income growth in 2004, has not only characterized the Danish market, but also the large international markets in Europe and the U.S.

- **Renewed positive growth in investment activity**
- Growth in activity before 2001
- Strong decline after 2001.
- New gains in annual investments accounting for DKK 1,809 million in 2004

3. IMPACT OF VENTURE CAPITAL IN DENMARK

Over the years several studies have showed that venture capital has an increasing impact on economic growth in both the U.S. and Europe. But what is the impact of venture capital in Denmark?

This part of the study is divided into two sections. First section identifies the macroeconomic impact of venture capital, where the development of venture-backed firms is compared to the development in the Danish economy. Second section shows an international benchmark, where the development of venture-backed firms in Denmark is compared to similar firms on foreign markets.

3.1 LARGE MACRO ECONOMIC EFFECTS

This section identifies the development of venture-backed firms in regards to five different macroeconomic parameters. All parameters have crucial impact on the economic growth and welfare. The parameters are:

- Employment
- Wages
- Revenue
- Export
- Research and development

How many people are employed in venture-backed companies? What is the employment share of the total Danish employment in 2004? Or in 2010? What is the growth rate relative to the entire private sector? And which sectors perform the best? That is some of the questions that will be answered in this chapter.

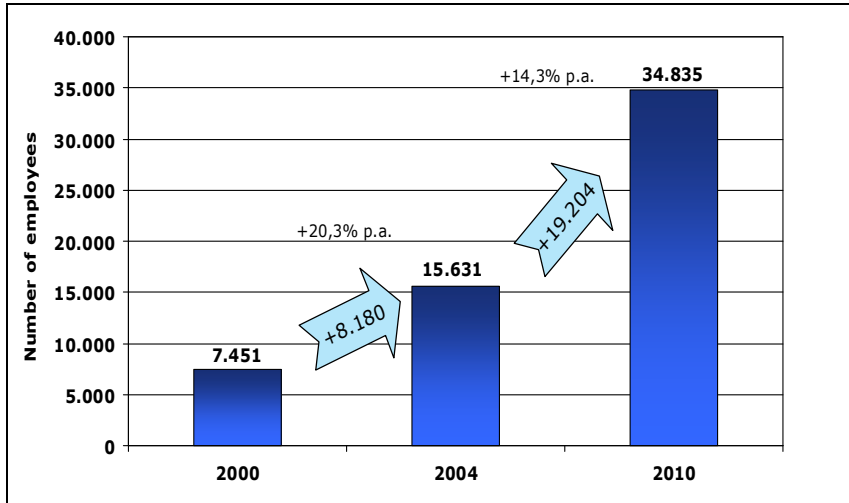
3.1.1 EMPLOYMENT DOUBLED IN FOUR YEARS

In the last five years the venture market has experienced a boom in employment in venture-backed firms. The number of employees in 2000 of 7,500 increased over the following four years to more than 15,000 in 2004. Thus, in four years the employment more than doubled, corresponding to an annual growth rate of more than 20%.

Some of the employment growth has its impact in foreign markets. The majority of venture-backed firms are *born globals*, indicating that they need to target the global market in order to become a successful company. As a result the sales department will often be placed in the target market – e.g. the U.S. An example of a venture-backed company dividing its business between several markets is Enigma

Semiconductor, which has located their research and development department in Denmark while their commercial headquarter is located in the U.S.

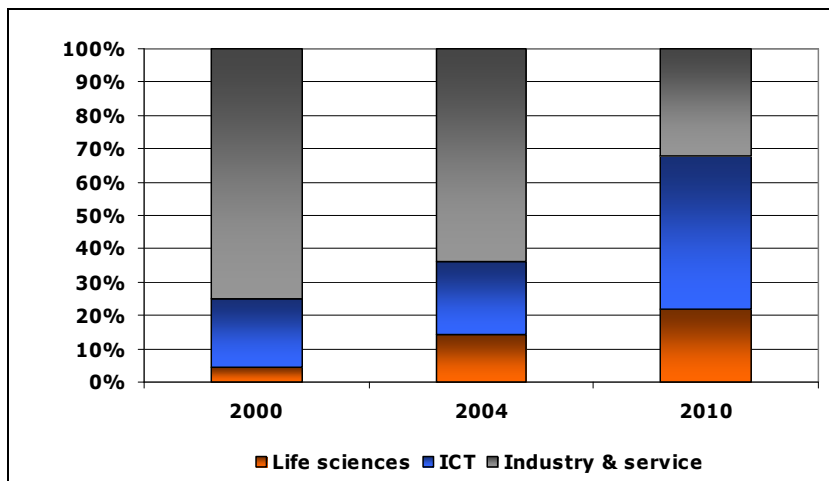
Figure 3.1: Employment in venture-backed firms



Source: Vaekstfonden

Venture-backed companies expect that the number of employees over the next five years will increase even more to 35,000 people in 2010. The majority of the new jobs will be created in the two traditional venture segments – Information and communication technology (ICT) and Life sciences.

Figure 3.2: Employment by industry



Source: Vaekstfonden

The employment growth between 2000 and 2004 is caused by two different components. Firstly, organically growth has raised the number of employees in each venture-backed firm in the underlying period. Secondly, the establishment of more venture-backed firms in 2004 has increased the total employment in venture-backed companies. Venture-backed firms in 2000 have increased the number

- **Doubling of employment between 2000 and 2004**

- Employment of more than 15,000 in 2004
- Firms forecast another doubling in 2010

- **90% of new jobs will be created within ICT and Life sciences**

- Most jobs have been created within Industry, service etc.
- ICT is expected to constitute 50% of the venture market in 2010

of employees by 87% from 7,500 in 2000 to 14,000 in 2004. Correspondingly, companies which have obtained venture capital subsequent to 2000 had 1,500 employees by the end of 2004.

The growth in venture-backed firms is remarkable in the light of a general decrease in the Danish economy in the same period. In the period from 2000 to 2004 the employment in the Danish private sector dropped by 2.3% – corresponding to a decrease of more than 32,000 people.

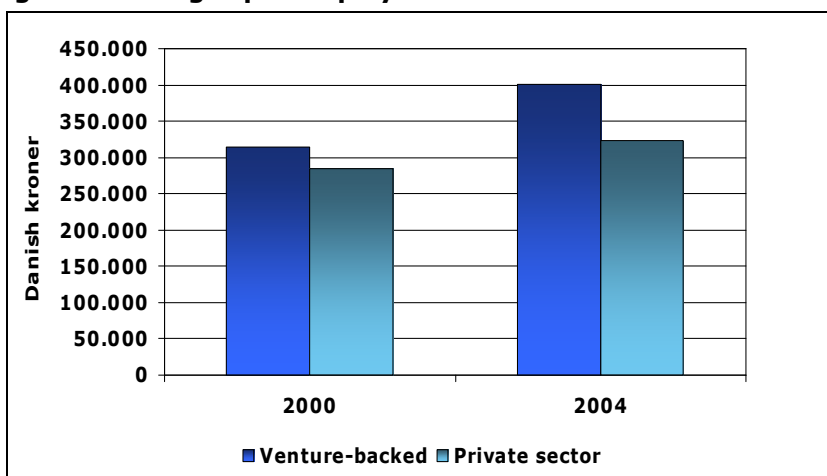
Thus, in a period where the overall employment in the private sector was reduced significantly, venture-backed firms experienced a large employment growth of more than 8,000 people. Hence, the impact of venture capital has reduced the decrease in private sector employment by 20%.

3.1.2 HIGHER WAGES IN VENTURE-BACKED FIRMS

Besides the fact that venture-backed firms create many jobs, the type of jobs in these firms is another interesting issue. With a historically low unemployment rate in Denmark it is now the type of jobs that is especially important to the Danish economy. Hence, average wages in venture-backed firms are significantly higher than wages in the overall private sector.

As the size of the wages reflects the value creation, the jobs in venture-backed firms add more value per employee than elsewhere in the private sector. Furthermore, these jobs generate a higher level of tax income for the state, which is in favor of the Danish economy.

Figure 3.3: Wages per employee



Source: Vaekstfonden

- **Venture-backed companies experience strong increase in wages**
- Higher wages in venture-backed companies
- Increase in wages of DKK 90,000 in four years
- 25% above the wage level in the private sector

Furthermore, the average wage per employee has increased significantly in the last couple of years. While the average salary in 2000 was DKK 315,000 (€ 42,000), it increased to DKK 400,000 (€ 54,000) in 2004. In comparison the average wage in the private sector is DKK 315,000 (€ 42,000) in 2004.

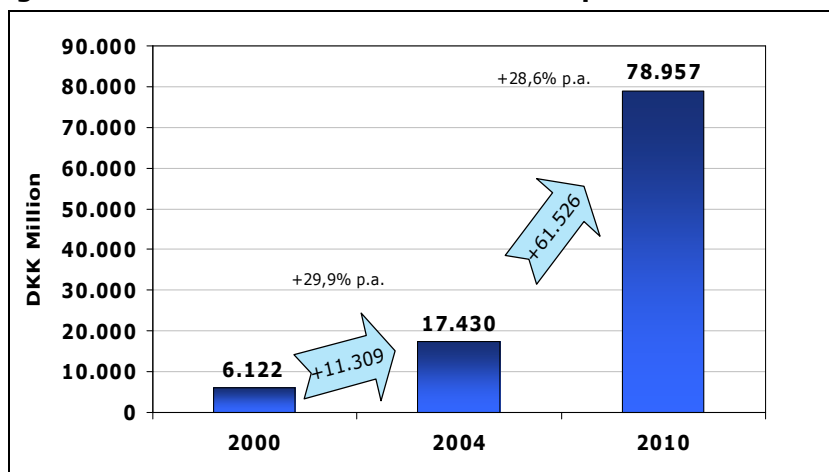
The increased wages can be explained by the fact that there is a larger share of Life science companies in the population of venture-backed firms in 2004 than in 2000.

In addition venture-backed companies most often have a high share of employees with specialized competencies, which helps keeping the wages at a high level, see also section 3.1.5. The level of the wages is thus crucial in attracting qualified employees.

3.1.3 HIGH REVENUE IN YOUNG FIRMS

An area where venture-backed companies have achieved especially large growth is revenue, which has increased by 30% annually from 2000 to 2004. Where the venture-backed companies had a total revenue of DKK 6.1 billion (€ 820 million) in 2000 – the amount in 2004 has increased to DKK 17.5 billion (€ 2.4 billion). Consequently, the venture-backed companies constitute slightly less than 3% of the total revenue of the private sector excluding wholesale in 2004.

Figure 3.6: Revenue in venture-backed companies



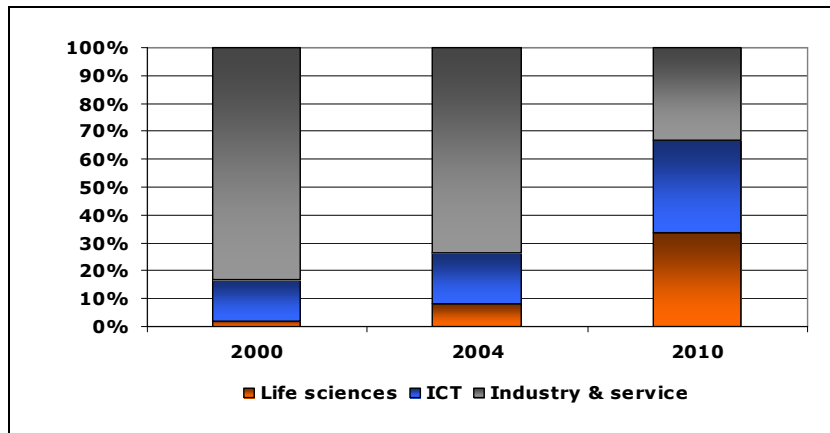
Source: Vaekstfonden

Towards 2010 the companies expect that their combined revenue will continue to increase by 30% annually. If these expectations are met, the revenue of the venture-backed companies will be DKK 80 Billion (€ 10.8 Billion) in 2010 – or 10% of the expected revenue in the private sector excluding wholesale.

- **Strong growth in the revenue of venture-backed companies**
- Revenues tripled from 2000 to 2004
- Expected quadrupling from 2004 to 2010

The main share of the increase in revenue of DKK 60 billion (€ 8 billion) from 2004 to 2010 is expected to be created in Life science and ICT companies.

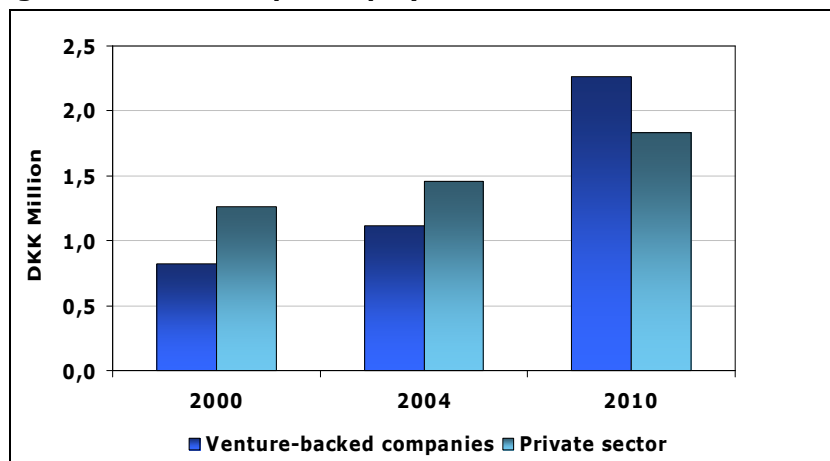
Figure 3.7: Revenue by industry



Source: Vaekstfonden

When revenue is calculated per employee the results show that the average revenue in the venture-backed companies are lower than in the private sector excluding wholesale – in both 2000 and 2004. The revenue in the private sector is derived by projecting the growth achieved by this sector in the period 2000-2003.

Figure 3.8: Revenue per employee



Source: Vaekstfonden

The difference in revenue per employee is not surprising, as a large share of the venture-backed companies is young research-based with no product launches. However, if these companies meet their own expectations the revenue per employee will rise to DKK 2.3 million (€ 310,000) in 2010 – or approximately 50% higher than the amount achieved by the average company in the private sector excluding wholesale. The venture-backed companies thus constitute a very large growth potential.

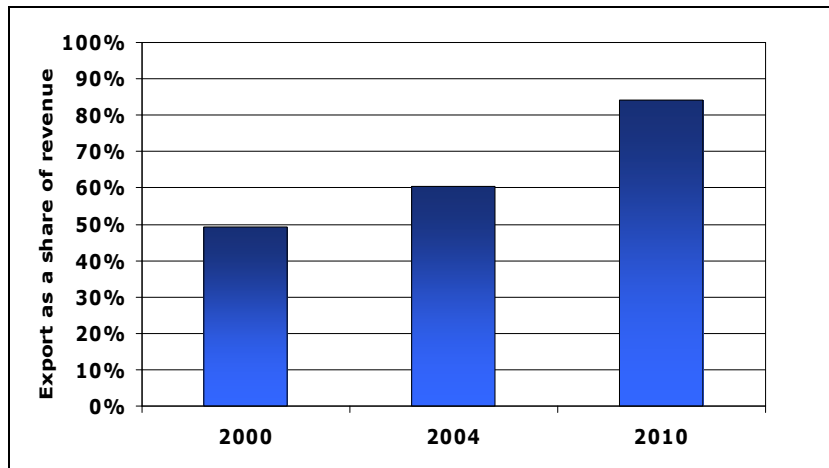
- **Strongest revenue growth in ICT and Life Sciences**
- Industry & service behind 2/3 of revenue in 2004
- Towards 2010 the revenue growth is expected to be created within Life Science and ICT companies

- **Expected high revenue growth in venture-backed companies**
- Average revenue smaller in venture-backed companies than in the private sector
- Venture-backed companies are expected to have the highest revenue per employee in 2010

3.1.4 INCREASED EXPORT IN VENTURE-BACKED COMPANIES

Export in the venture-backed companies grows even faster than the revenue. Where the export among venture-backed companies constituted 50% of the revenue in 2000 – the share in 2004 has increased to 60%. According to the venture-backed companies own expectations export – as a share of revenue – will constitute close to 85% in 2010!

Figure 3.9: Share of export in venture-backed companies

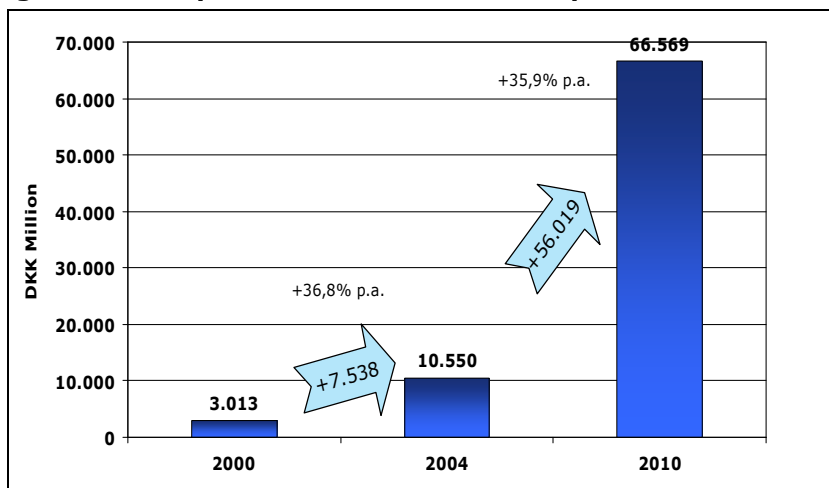


Source: Vækstfonden

- **Venture-backed companies more dependant of export**
- Rise in export share from 50% in 2000 to 62% in 2004
- Expected export share of 85% in 2010

The combined export of the venture-backed companies constituted DKK 3 million (€ 406,000) in 2000. However, since then export has increased by 40% annually – resulting in an export of more than DKK 10 billion in 2004 (€ 1.4 billion).

Figure 3.10: Export in venture-backed companies



Source: Vækstfonden

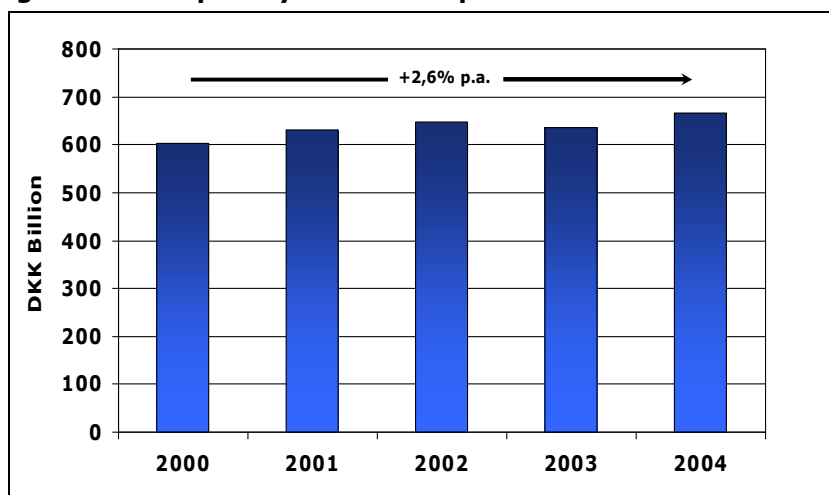
- **Annual rise in exports of 37%**
- Venture-backed companies have exports of DKK 10.6 billion in 2004
- Rise in exports of DKK 7.5 billion from 2000 to 2004
- Export is expected to be seven times higher in 2010

The venture-backed companies clearly expect that the strong growth will continue in the years to come. Thus, export in 2010 will

constitute almost DKK 70 billion (€ 9 billion) if the expectations are fulfilled.

The combined export of goods and services by Danish companies constitute approximately DKK 680 billion (€92 billion) in 2004.

Figure 3.11: Export by Danish companies

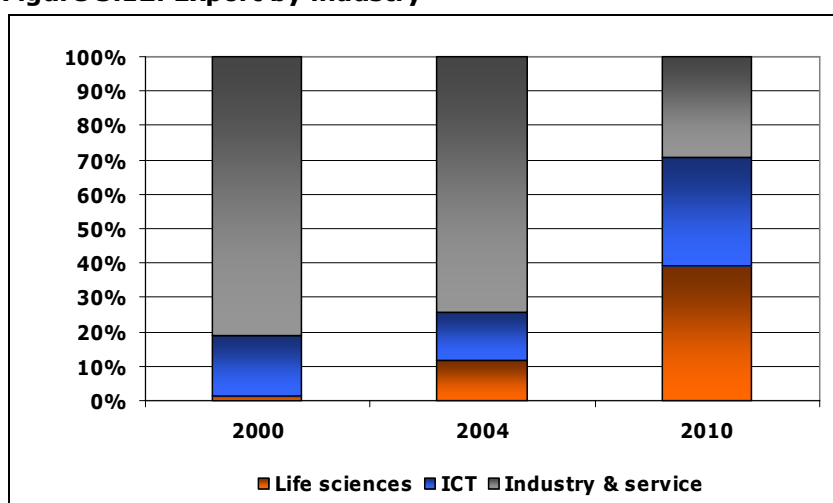


Source: Statistics of Denmark

The export of venture-backed companies constitutes 1.5% of the total export by Danish companies in 2004 – a share which will increase to 10% in 2010 if the growth expectations of the venture-backed companies are realized.

Historically, the increase in exports by venture-backed companies is created within traditional industry and service.

Figure 3.12: Export by industry



Source: Vaekstfonden

However, in the period 2004-2010 the venture-backed companies expect that the growth will be created within Life science and ICT

- **Export by Danish companies reaches new heights**
- Combined export of DKK 680 billion by Danish companies in 2004
- The Danish export of goods and services have been more than DKK 600 billion annually since 2000
- Average annual increase of 2.6%

- **Significant changes in exports by industry**
- Industry & service companies behind 70% of growth in exports from 2000 to 2004
- Life science and ICT companies expected to contribute with 80% of the export growth from 2004 to 2010

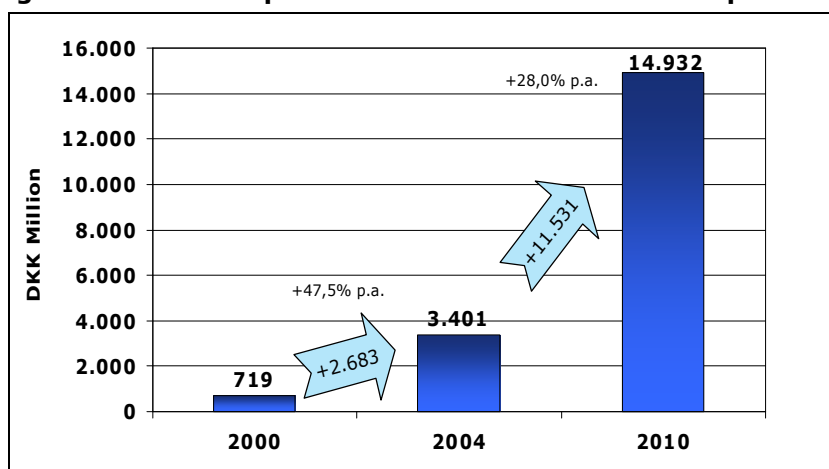
companies. The Life science companies expect to increase their export by no less than DKK 23 billion (€ 3.1 billion) – while the ICT companies expect to increase their annual export by DKK 18 billion (€ 2.4 billion).

3.1.5 VENTURE CAPITAL SPURS R&D EXPENDITURES

The starting point of venture-backed companies is most often a unique idea or concept. Hence, research and development (R&D), which can transform these development projects into commercial viable products, play an important role in these companies.

R&D expenditures by venture-backed companies increased by more than DKK 2.5 billion (€ 336 million) from 2000 to 2004 – a period where the market for venture capital in Denmark and the number of venture-backed increased strongly. Since the R&D expenditures constituted only DKK 700 million (€ 94 million) in 2000, the amount has increased annually by 50% to a total of DKK 3.4 billion (€ 458 million) in 2004.

Figure 3.13: R&D expenditures in venture-backed companies

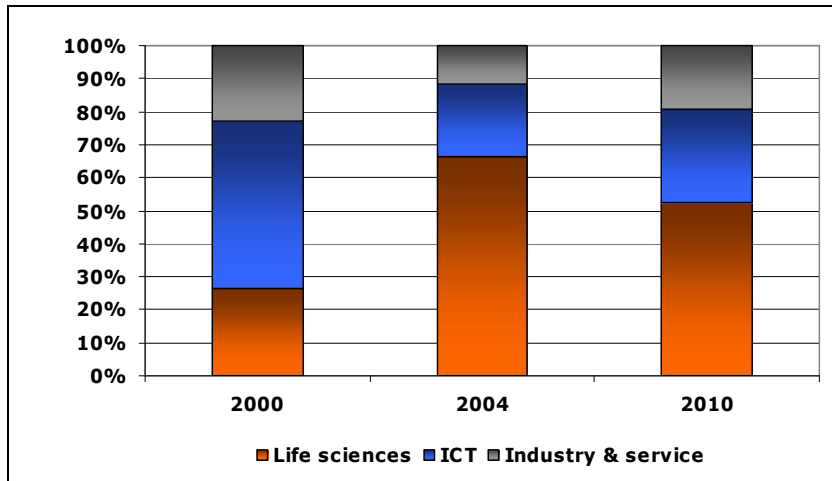


Source: Vaekstfonden

A large share of the Danish venture-backed companies is Life science related – typically with larger R&D expenditures than companies within other industries. Furthermore, many of the companies are fairly young and expect to increase their activities substantially in the years to come. The total population of venture-backed companies expects that their R&D expenditures will rise to DKK 15 billion (€ 2 billion) in 2010. Especially Life science companies expect to increase their annual R&D expenditures significantly towards 2010.

- **R&D expenditures multiplied by five in four years**
- Average annual growth rates of 47.5%
- Expected quadrupling of R&D expenditures from 2004 to 2010

Figure 3.14: R&D-expenditures by industry

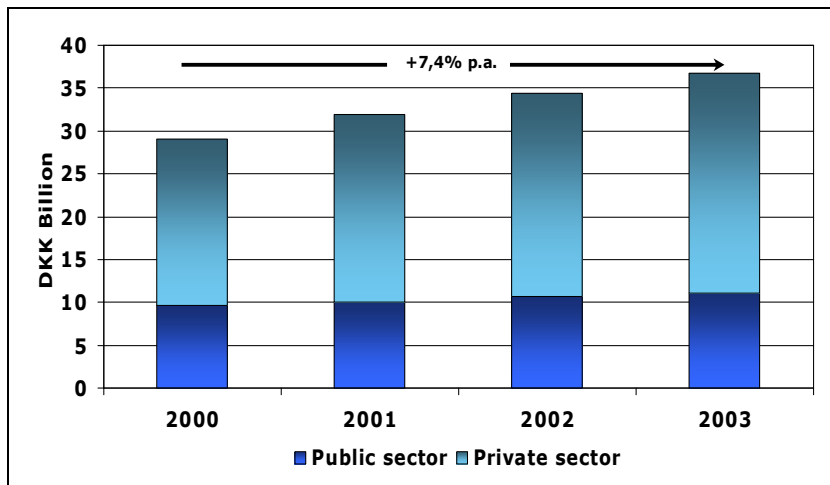


Source: Vaekstfonden

The level of R&D expenditures in venture-backed companies is also of great importance for the Danish economy. In 2002 the EU countries highlighted the importance of research and development (R&D). This was done by the European Council, which in Barcelona formulated an ambition that R&D expenditures should constitute 3% of GDP in 2010 – of which 2/3 shall be undertaken by the private sector.

In the period 2000-2003 the annual R&D expenditures in Denmark grew by DKK 7 billion (€ 942 million) to DKK 36 billion (€ 4.8 billion) – an annual increase of 7.4%. Meanwhile the R&D expenditures as a share of GDP grew from 2.3% in 2000 to 2.6% in 2003.

Figure 3.15: R&D-expenditures in Denmark by sector



Source: The Danish Centre for Studies in Research and Research Policy

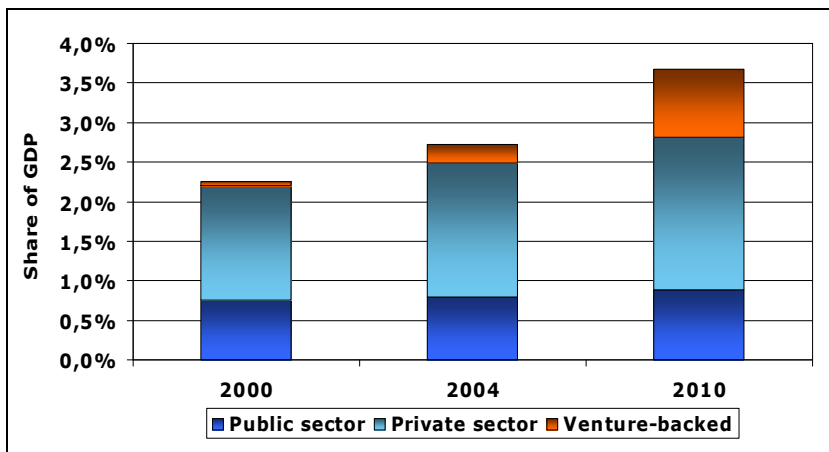
R&D expenditures in Denmark are 0.4% percentage point below the Barcelona declaration. However, the venture-backed companies expect to increase their R&D expenditures significantly, indicating

- **Largest increase in R&D expenditures in Life sciences**
- Life science companies expect increase in annual R&D expenditures of DKK 5 billion from 2004 to 2010
- Life sciences is expected to undertake 1/2 of all R&D expenditures by venture-backed companies in 2010

- **Modest increase in total Danish R&D expenditures**
- Public R&D at a standstill...
- ... while private R&D continues to increase

that these companies alone can lift the combined R&D expenditures above the target of 3%. This result emerges from a simple projection of the total R&D expenditures for the period 2004-2010.

Figure 3.16: R&D-expenditures in Denmark – share of GDP

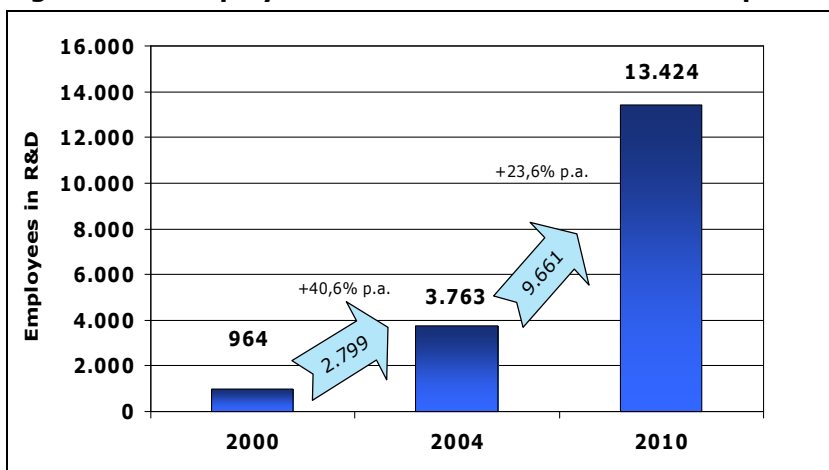


Source: Vaekstfonden and The Danish Centre for Studies in Research and Research Policy

While the public R&D will not meet the target in 2010, venture capital is expected to secure the required increase in private sector R&D. Venture-backed companies will contribute with R&D expenditures constituting 0.85% of GDP in 2010. Hence, the combined R&D expenditures in Denmark will rise to 3.6% of GDP – well above the level prescribed by the Barcelona declaration. However, in order for the companies to be able to raise their R&D expenditures the right supply of qualified labor has to be present.

In 2004 the venture-backed companies employ approximately 4,000 people in their R&D departments. This is four times the number employed in 2000.

Figure 3.17: Employees in R&D in venture-backed companies



Source: Vaekstfonden

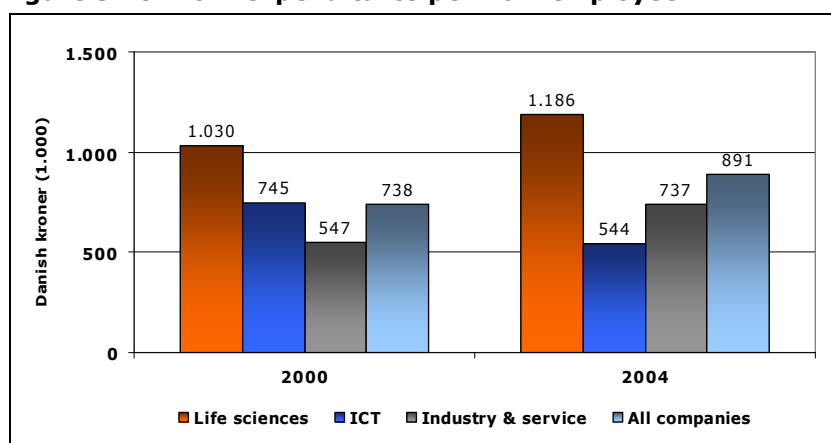
- **With venture capital we are able to fulfil the Barcelona-target**
- Total R&D expenditures in Denmark account for 2.6% of GDP in 2004
- R&D expenditures in venture-backed companies are expected to account for 0.85% of GDP in 2010

- **Increased need for R&D employees in the future**
- R&D employees in venture-backed companies is quadrupled since 2000
- From 2004 to 2010 the number is expected to triple to 13,500

In Denmark the private sector employs approximately 36,000 people in R&D. Hence the venture-backed companies employ 10% of all R&D employees in Denmark in 2004. This share is expected to increase to 25% in 2010.

The number of R&D employees has not increased quite as strongly as the R&D expenditures from 2000 to 2004. The result shows that the R&D expenditures per R&D employee have increased DKK 200,000 (€ 27,000) to almost DKK 900,000 (€ 120,000) in the period 2000-2004.

Figure 3.18: R&D-expenditures per R&D employee



Source: Vaekstfonden

Life science companies have the highest R&D expenditures per R&D employee. In 2000 they used DKK 1 million (€ 135,000) per R&D employee – an amount which increased to DKK 1.2 million (€ 160,000) in 2004. In comparison the ICT and Industry & service companies spend only DKK 0.5-0.7 million (€ 67,000-94,000) per R&D employee.

R&D employees as a share of the total number of employees in the companies also vary significantly across segments. In Life science companies R&D employees constitute 75% of the total number of employees, while the share for ICT and other are 37% and 5% respectively.

Table 3.1: R&D-employees by industry

R&D employees as a share of all employees	2000	2004
Life sciences	51,9%	77,2%
ICT	30,2%	36,9%
Industry & service	5,1%	4,9%
All companies	12,9%	24,1%

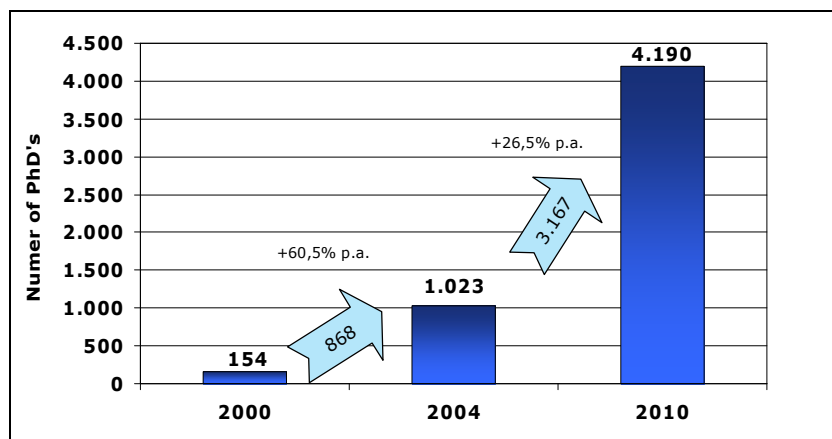
Source: Vaekstfonden

- **Highest R&D spending in Life sciences**
- R&D expenditures per R&D employee increased to DKK 1.2 million in 2004
- Total R&D expenditures per R&D employee increased by DKK 150.000 to DKK 890.000 from 2000 to 2004

- Life science companies have the largest share of R&D employees ...
- ... 52% in 2000 and 77% in 2004

The number of PhDs employed in venture-backed companies has exploded from 2000 to 2004. While only 150 PhDs were employed in 2000 the number has risen to more than 1,000 in 2004.

Figure 3.19: PhDs in venture-backed companies



Source: Vaekstfonden

The venture-backed companies expect that the demand of PhDs will continue to rise in the years to come. In 2010 they expect to employ 4,200 on their payroll. In other words, they have to find additional 3,200 PhDs toward 2010 – or 530 annually.

Within the technical and natural sciences 600 PhDs graduate annually. Hence, venture-backed companies expect to hire a number of PhDs almost corresponding to the entire Danish production of PhDs in the period 2005-2010. Especially Life science companies expect to increase the demand of PhDs. While 17% of the employees in 2000 were PhDs, the share in 2004 constitutes almost 30%. In 2010 the demand for PhDs within Life sciences will alone constitute 3,000.

Table 3.2: PhDs by industry

PhDs' as a share of all employees	2000	2004
Life sciences	17,3%	28,1%
ICT	5,5%	8,5%
Industry & service	0,0%	0,3%
All companies	2,1%	6,5%

Source: Vaekstfonden

To support the development of Danish venture-backed companies – and especially Life science companies – it is required to set aside more resources in Denmark for the education of specialists within natural sciences.

- **PhD's in venture-backed companies increased by 700% in four years**
- In 2004 the number of PhD's exceeded 1,000
- The demand for PhD's is expected to increase by 3,200 towards 2010
- Venture-backed companies is expected to hire 550 PhD's per year

- PhD's constitute 30% of all employees in Life science companies in 2004

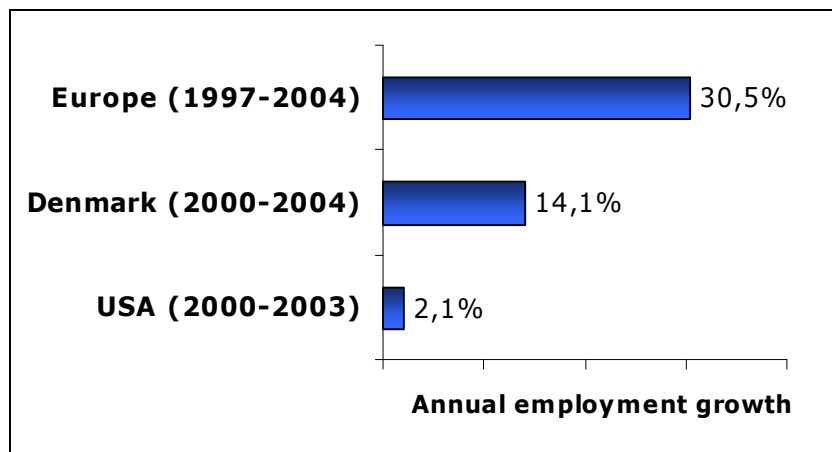
3.2 INTERNATIONAL BENCHMARKING

Venture-backed firms are increasingly important to the Danish economy. However, other studies also show a significant impact of venture capital in foreign markets. Thus, this section 3.2 reveals an international benchmark of the impact of venture-backed firms in Denmark against the U.S. and European market.

The figures for employment growth in venture-backed companies in the previous section (3.1) are derived by examining the number of employees in 2000 (if the company had received venture capital at that before 2001) and 2004. If actual growth rates for the new companies - the ones who have raised venture capital after 2000 - are included, a growth rate of 14% is achieved. This growth rate is comparable with results found in international studies. Thus, it is possible to measure how well the Danish venture-backed companies perform compared to similar companies in the U.S. and Europe. For a more detailed description of the method used see Appendix A.

In the period 1997-2004 venture-backed companies in Europe have achieved an annual employment growth of 30%. Over the period 2000-2004 approximately 600,000 new jobs in Europe were created in venture-backed companies.

Figure 3.20: Employment growth in VC-backed companies



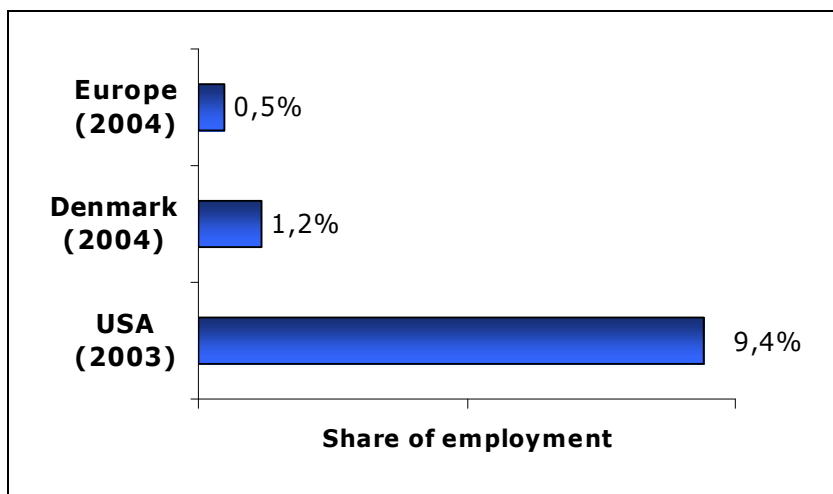
Source: Vaekstfonden, EVCA and NVCA

The corresponding annual growth rate for U.S. companies was 2.1% in the period 2000-2003 - significantly below the levels achieved in both Denmark and Europe.

An important explanation for the large differences in growth rates is to be found in the current size of the market for venture capital in the different countries. In the U.S. the number of employees in the venture-backed companies constituted almost 10% of the total number of employees in the private sector in 2003.

- **Employment growth in Denmark exceeds the U.S.**
- Annual growth of 30.5% in European venture-backed companies

Figure 3.21: Employment share in companies with VC

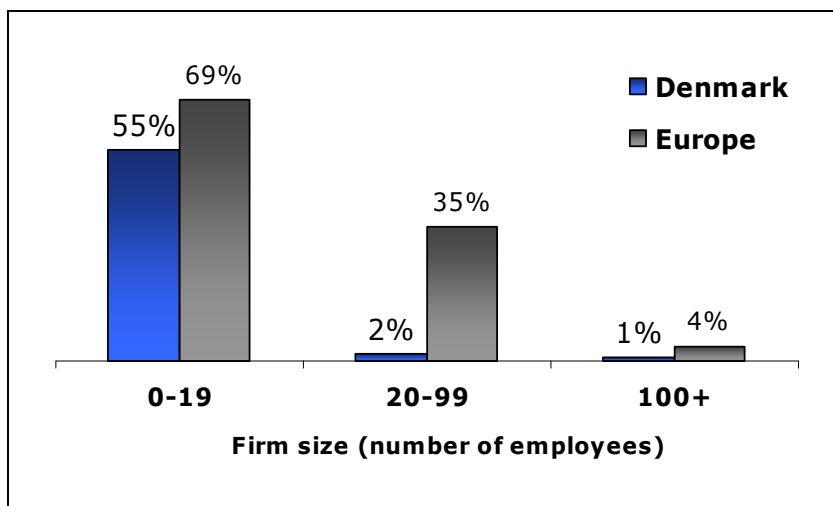


Source: Vaekstfonden, EVCA and NVCA

The corresponding level in Denmark and Europe is 1.2% and 0.5% respectively in 2004. A lower starting level should – all other things equal – make it easier to obtain higher growth rates.

As expected, the highest growth rates have been achieved by very small companies. Danish venture-backed companies who initially have 0-19 employees obtain annual employment growth rates of 55% – while the corresponding level for the European companies are close to 70%.

Figure 3.22: Employment growth by firm size



Source: Vaekstfonden and EVCA

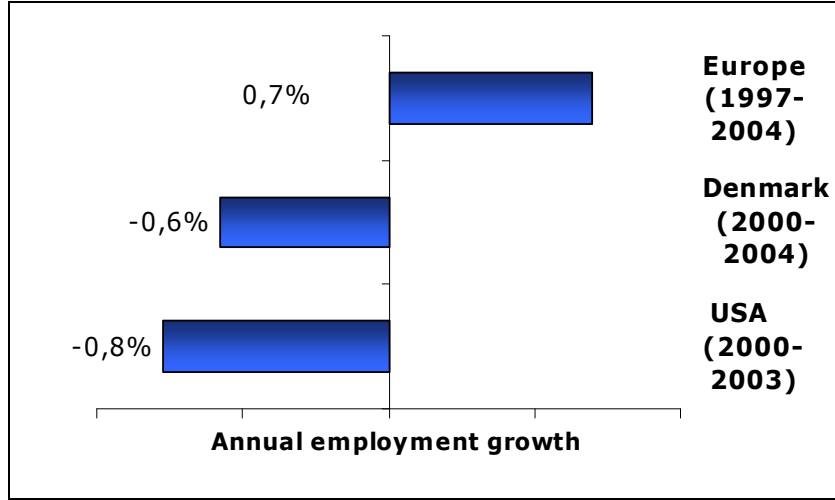
Venture-backed companies with more than 19 employees grow more slowly. In Denmark they achieve annual growth rates of 1-2%. Middle-sized (20-99 employees) venture-backed European companies obtain growth rates of 35% – while the employment growth achieved by large companies (+100 employees) is only 4%.

- **More maturity on the market for venture capital in Denmark than in Europe**
- Jobs in venture-backed companies constitute almost 10% of all jobs in the private sector in USA
- Danish venture-backed companies constitute 1.2% of total employment in Denmark

- **Strongest employment growth in small companies**
- Annual growth rates exceeds 50% in small companies..
- ..while larger companies achieve growth rates of only 1-4%

Another explanation of the different growth rates in Denmark, Europe and USA can be found in the time period used. The European companies have obtained the strongest growth rates – but in a period where the economic cycles were extremely beneficial. Thus, Europe achieved annual employment growth of 0.7% in the period 1997-2004.

Figure 3.23: Employment growth in selected countries/regions

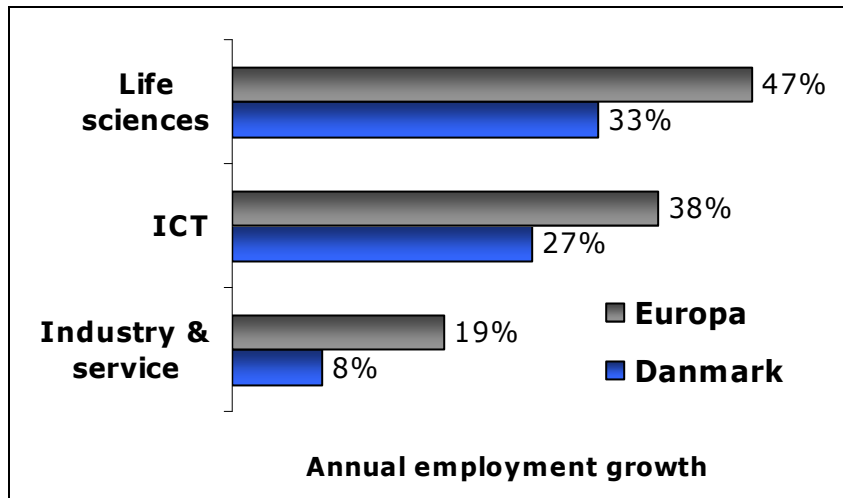


Source: Vaekstfonden, EVCA and NVCA

In Denmark and USA the venture-backed companies have achieved positive growth rates in periods where the overall employment was declining.

Life science companies in both Denmark and Europe obtain the highest annual employment growth – closely followed by the ICT companies.

Figure 3.24: Employment growth by industry



Source: Vaekstfonden and EVCA

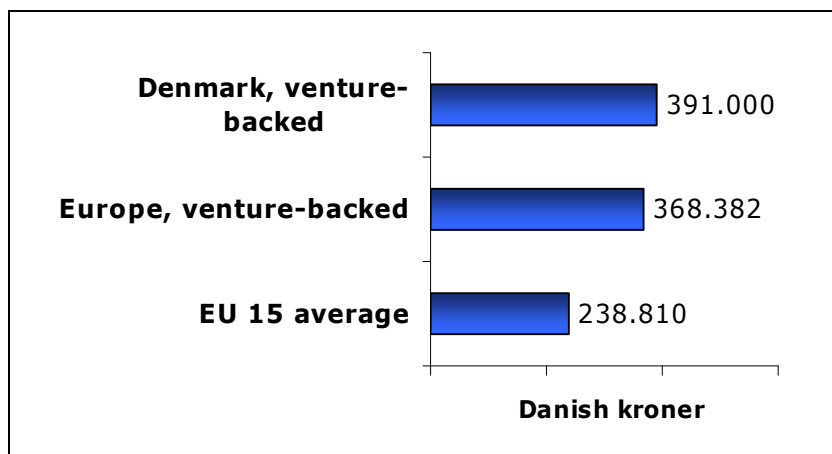
- **Negative employment growth in Denmark**
- European employment growth constituted 0.7% annually in the period 1997-2004
- Negative annual employment growth in Denmark in the period 2000-2004

- **Strongest employment growth in Life Science companies**
- ICT companies have achieved annual growth rates of 27%-38%

Thus, a Life science company achieves annual employment growth rates of 33% and 47% in Denmark and Europe respectively – while the level for ICT companies is 27% and 38% respectively. In comparison companies within other industries obtain growth rates of only 8% in Denmark and 19% in Europe. Thus, the growth rates in the European companies are 1½-2 times higher than the ones obtained by the Danish companies within all three industry segment. As mentioned earlier this can be explained by the lower starting level – and the time period used.

When it comes to the level of the wages the Danish companies are in front. The average wage expenditures per employee in a Danish venture-backed company is DKK 390.000 (€ 52,000), while the corresponding level for the European companies is DKK 370.000 (€ 50,000).

Figure 3.25: Wage expenditures per employee



Source: Vaekstfonden and EVCA

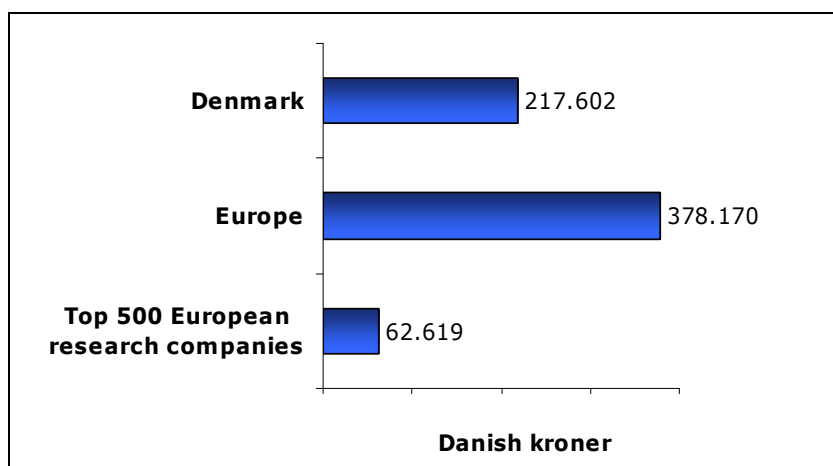
Venture-backed companies in both Denmark and Europe also have higher average salaries than the average for all private companies in the EU. Hence, venture capital is able to create high value jobs in both Denmark and the rest of Europe.

R&D expenditures per employee in Danish venture-backed companies are DKK 220.000 (€ 30,000). That is substantially above the level of the 500 largest research companies in Europe.

However, European venture-backed companies have an even higher level. In these companies the average R&D expenditures per employee is almost DKK 400,000 (€ 54,000). That the level is higher than in the Danish companies can be due to their being bias in form of a disproportionate high share of large Life science companies in the EVCA-study.

- **Highest "venture-wages" in Denmark**
- Danish venture-backed companies have higher wage expenditures than the corresponding European companies

Figure 3.26: R&D expenditures per employee



Source: Vaekstfonden and EVCA

The differences in the population of companies, which are being analyzed, become even clearer by looking at R&D employees and PhDs as a share of the total number of employees. In Denmark ¼ of the employees is employed in R&D. The corresponding share for the European companies is 1/3. Moreover, the share of PhDs is lower in the Danish venture-backed companies. In Denmark they only account for 6.5%, while the share in the European venture-backed companies is twice as high.

Table 3.3: Employees in R&D per company

Share and number of Employees in the R&D department	Denmark		Europe	
	Avg.	Share	Avg.	Share
Employees in R&D	6,5	24%	22	33%
Researchers & engineers	N.A.	N.A.	17,1	25%
PhD's	1,8	6,50%	8,6	13%
All employees	27		67,3	

Source: Vaekstfonden and EVCA

As Life science companies have a very high share of R&D employees and PhDs, the industry composition of the sample can influence the results significantly. In the analysis of Danish companies, Life science companies account for 25%, while the share in the EVCA-study is 30%. If the share of Life science companies in the analysis of Danish companies also was 30%, the share of R&D employees would rise to 26% and the share of PhDs would increase to 7.5%. Additionally, the Life science companies in the EVCA-study are generally larger than in the analysis of the Danish companies. If it was possible to correct for the differences in company size the share of R&D employees and PhDs in Danish venture-backed companies would probably be higher than in the European companies.

- **70% higher R&D expenditures per employee in European venture-backed companies**
- Venture-backed companies in both Denmark and Europe have much higher R&D expenditures per employee

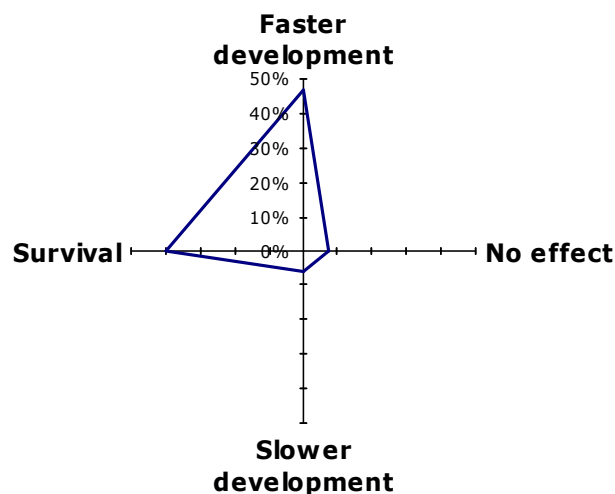
- Higher share of R&D employees and PhD's in European venture-backed companies

4. VENTURE CAPITALISTS DOES PLAY A SIGNIFICANT ROLE

The impact of venture capital has more dimensions than indicated in the previous chapter. As shown in chapter 3, venture capital has a significant impact on the entire Danish economy through technology based companies. The result is a consequence of the investors' competencies and network creating value and success in the individual company. However, the role of the investor is more complex to measure. But in the survey – on which this analysis is based – it has been possible also to focus on the qualitative contribution of the investor.

Venture capitalists are characterized by bringing both risk capital and competencies to their portfolio firms. Thus, by obtaining venture capital the firms – all other things equal – have a competitive advantage compared to companies obtaining bank finance or other types of passive equity finance from family and friends. Corresponding to nearly half (47%) of the respondents in the survey, venture capital has boosted the development in the firm. Another 40% replied that venture capital resulted in firm survival. Only 13% of the respondents believed that venture capital had no or negative effect on firm development

Figure 4.1: Impact of venture capital on firm development



Source: Vaekstfonden.

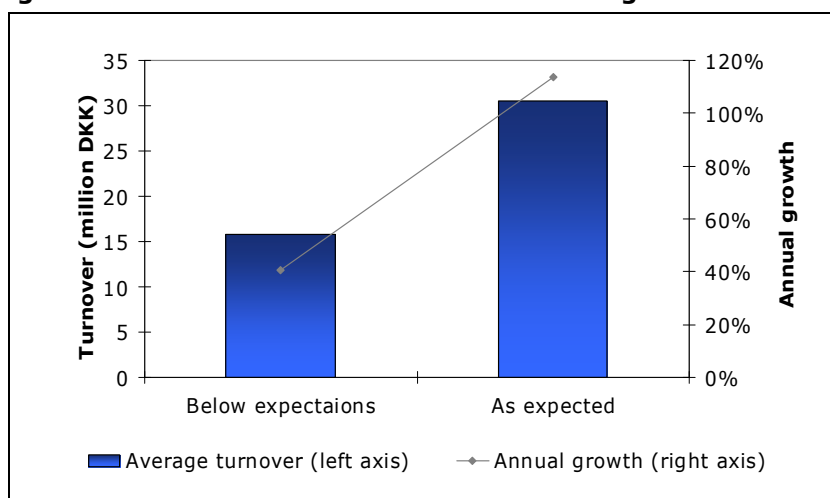
Thus, it is not only due to the isolated capital infusion to venture-backed companies that this market performs better than the general economy. Also through their competencies and network the venture investors have significant positive influence on their portfolio companies.

- **Venture capital means faster development**
- 47% believes that faster growth is due to venture investors
- 40% believes the survived because of the investors

Venture capitalists are trained in identifying strengths and weaknesses in their portfolio companies. The survey shows that the investors contribute more in the Life science segment than in the ICT segment – or that Life science companies are more satisfied with the contribution of the investors. The Life science segment is generally characterized by longer time to market due to more R&D intensive technologies. At the same time the ICT segment has been more negatively affected by the burst of the IT-bubble. The burst of the bubble in 2000 made it harder especially for ICT companies to attract venture capital. Meanwhile, building up customers and sales channels required larger investments than prior to 2000. These differences can influence how the ICT companies value the contribution of their investors as entrepreneurs are more likely to blame investors for business failures than themselves.

The survey also shows the importance of initial clarification of expectations. In companies where the contribution of venture capitalists corresponded to the company expectations the revenue as well as the growth in revenue is significantly higher than in firms where investors contributed below expectations. Revenue growth over the five year period has been 114% and 40% respectively.

Figure 4.2: Investor contribution and revenue growth



Source: Vækstfonden.

The displeasure among some venture-backed companies with the investor contribution is likely to stem from the fact that they have not reached their own revenue targets. It was determined in figure 4.1 that the investors have a significant positive impact on firm development. Thus, the investor contribution below expectations must be attributed to a high level of expectations.

- **Fulfilment of expectations imply high growth**
- Revenue increase if investors contribute corresponding to company expectations
- Annual revenue growth on average 114% in satisfied companies

5. VÆKSTFONDEN IS VITAL ON THE VENTURE MARKET

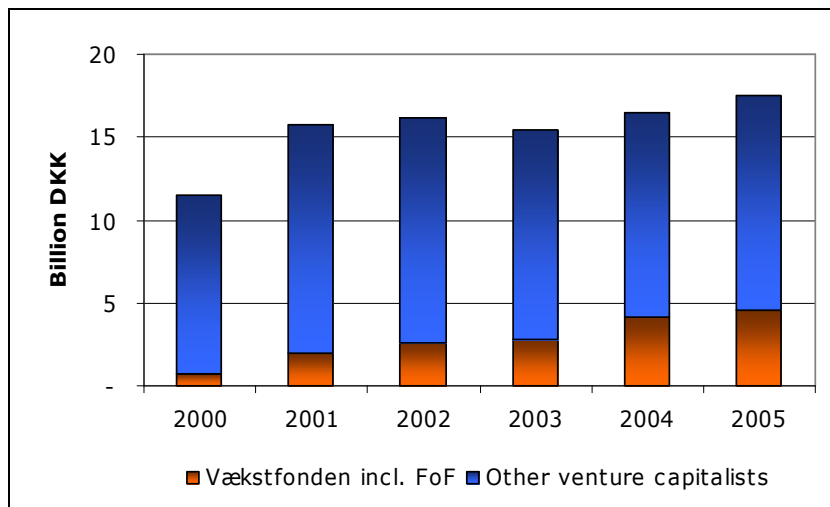
Vækstfonden changed its strategy in 2000 resulting in a large share of the stock of bonds activated through equity stakes in new portfolio companies. Subsequently, Vækstfonden increased the volume development activities by investing in innovative high-risk firms against an equivalent return of the projects. This way Vækstfonden believed to obtain a greater deal of innovation for the capital base. Now five years have passed, and a sufficiently long period exists to analyze the impact of the new strategy.

The overall objective of Vækstfonden is to create Europe's most efficient market for innovation finance in Denmark. The strategy has two dimensions. Firstly, Vækstfonden invest directly in promising innovative young companies. Secondly, Vækstfonden invest in other venture funds – Fund of Funds – which operate in promising technology based segments in Denmark. Thus, the impact consists of a direct and indirect effort.

5.1 26% OF THE VENTURE CAPITAL BY VÆKSTFONDEN

As the largest and most active seed investor in Denmark, Vækstfonden plays an important role in funding the early stage financing gap with risk capital where other private investors hesitate. Vækstfonden and their portfolio funds represent 26% of the total capital under management in Denmark in 2005. This corresponds to an amount of DKK 4.5 billion. The market share has increased every year since 2000 as the portfolio of other venture funds also has increased.

Figure 5.1: Capital under management – Vækstfonden's share



Source: Vækstfonden.

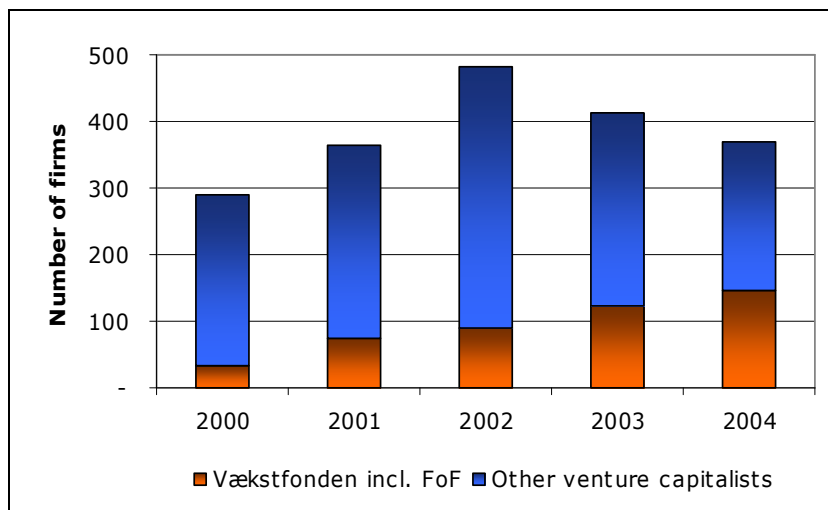
- **Vækstfonden behind 1/4 of the venture market**
- Vækstfonden and its portfolio funds has a market share of 25.7%
- Vækstfonden's new strategy followed an increasing share of the venture market

Vækstfonden's direct and indirect contribution to innovative firms of DKK 4.5 billion is based on capital under management from Vækstfonden and 11 venture capital funds in the portfolio – holding out Erhvervsinvest and Nordic Biotech II. Nordic Biotech II has been added to the portfolio subsequent to September 1st 2005, where the figures of the Danish venture market were updated last. Erhvervsinvest is not included due to their focus on the buy-out segment.

5.2 VÆKSTFONDEN BEHIND 40% OF ALL VENTURE INVESTMENTS

As the largest seed-investor in Denmark, Vækstfonden invest in more companies, than the share of capital under management indicates. In the period 2000-2004 Vækstfonden has invested in an increasing number of companies. 33 companies received capital from Vækstfonden or one of the portfolio funds in 2000, while the number increased to 147 in 2004. At the same time the venture market experienced a more unpredictable period, reducing the number of annual venture investments since 2002. Thus, Vækstfonden's share of total investments of 40% in 2004 constitutes a significant increase since 2000 – where Vækstfonden made only 11% of all venture investments.

Figure 5.2: Venture investments – Vækstfonden's share



Source: Vækstfonden.

Portfolio firms on the venture market typically raise capital in several financing rounds. Thus, numerous firms in Vækstfonden's portfolio have received finance more than once in the period 2000-2004. The total number of portfolio firms receiving venture capital from Vækstfonden or one of the portfolio funds in this period is 203. Of

- **Vækstfonden behind 40% of venture investments in 2004**
- Increasing annual shares since 2000
- 33 investments in 2000 increased to 147 in 2004

these, 57 were closed in the same period. Thus, 146 portfolio firms were still active by 2005.

A total of 578 active firms received venture capital between 2000 and 2004. Thus, Vaekstfonden has invested in – directly or indirectly – 25% of all the active portfolio firms on the venture market. This share also represents Vaekstfonden's share of the amount of all venture investments in Denmark. For that reason, 25% of the venture impact on the Danish economy seems to be a reasonable estimate of the contribution of Vaekstfonden.

6. CONCLUSION

Venture-backed firms in Denmark constitute only a small fraction of the private sector in Denmark. Of the 15,000 to 20,000 new companies which are established each year in Denmark, only 0.2% receive venture capital. However, the impact of venture capital on the overall economy – employment, revenue, export, and research & development (R&D) – is significantly larger.

Through Vaekstfonden's Venture database Danish venture-backed firms are identified. Venture capitalists in Denmark have invested in 911 companies since 1998, of which one third have stopped its operations due to exits – primarily through industry sales, mergers, or bankruptcy. Through an online survey the development of the remaining 578 portfolio companies has been conducted. 100 companies responded to the survey – a sufficiently large sample of the total population of active venture-backed firms.

Venture-backed firms take lead in job creation

This study reveals that venture capital plays an important role on job creation on a national level. In the period following 2000 the employment in venture-backed firms rose on average 20.3% annually to a total of 15,631 in 2004. The high employment growth of this segment has raised the number of employees in venture-backed firms to constitute 1.2% of the total private sector. In 2010 this share is expected to increase to 2.6%. The growth in venture-backed firms in Denmark exceeds the growth in the U.S. However, this fact is caused by the low maturity level of the Danish venture market compared to the U.S. Employment in venture-backed firms in the U.S. constitute 9.4% of the private sector.

Increasing impact on national GDP

An increase in revenue of DKK 11.3 billion among venture-backed firms between 2000 and 2004 corresponds to an annual growth of 30%. Thus, venture capital funded companies were responsible for DKK 17.4 billion (€ 2.34 billion) in revenue in 2004. This corresponds to 1.2% of Danish GDP. Companies established after 2000 are responsible for some of the revenue growth. However, the existing portfolio expects total revenue in 2010 of DKK 61.5 billion (€ 8.28 billion) – corresponding to 5% of GDP.

High export growth

The majority of the venture-backed firms are globally or internationally focused from the very beginning. A high level of technology and a small home market means that it is crucial for this type of companies to look abroad for costumers. Thus, exports constitute an important part of the revenue. Exports increased by 37% annually to a total of DKK 10.6 billion (€ 1.43 billion) in 2004. In

the coming period towards 2010 the annual growth rate is expected to continue – resulting in total export by venture-backed firms of DDK 66.6 billion (€ 8.88 billion). This corresponds to approximately 10% of total Danish exports.

Venture capital is the key to reach the Barcelona-target

Venture capital funded companies are typically based on heavy R&D investments. For this reason the R&D share of total expenses is high. R&D investments in venture-backed firms increased by DKK 2.7 billion (€ 360 million) in five years. This corresponds to an annual growth of 47.5%. The existing portfolio companies expect a further increase in R&D spending to reach 0.85% of GDP in 2010. Thus, venture-backed companies can raise the overall Danish R&D level to reach the Barcelona-target on 3%, of which 2% must come from the private sector.

Summing up, this study shows that venture capital funded companies have a significant impact on the Danish economy. This means that we have an opportunity in Denmark to boost growth and development in the economy by exploring the properties of venture capital as a generator. However, it assumes a targeted effort from a large group of stakeholders and players in the venture market – e.g. venture capitalists, institutional investors, universities, incubators, Vaekstfonden, the private sector and the government.

Like former studies have accentuated, e.g. Vaekstfonden's "*Benchmarking af markedet for innovationsfinansiering*" (2005), the effort needs to be centered on certain areas of contribution. Most importantly we need to:

- Streamline the commercialization of public research
- Increase fundraising at Danish venture and buy-out investors
- Extend the integration of foreign markets for venture capital
- Improve exit conditions
- Strengthen the entrepreneurial incentive

With a coordinated and focused effort in these five areas, the perspectives of the future look promising in order to continue the increasing positive impact of venture capital in Denmark.

The data behind this study has been conducted from two different sources. Firstly, Vaekstfonden's Venture database includes the venture-backed firms in Denmark, collected on an annual basis. Secondly, an online survey has been conducted in February 2006.

A.1 VAEKSTFONDEN'S VENTURE DATABASE

Vaekstfonden has collected information of the portfolio of all venture capitalists (VCs) in Denmark since 1998 – building up Vaekstfonden's Venture database. The data is mainly based upon annual reports and press releases. Subsequently, the data is verified and supplied with additional information by Danish Commerce and Companies Agency.

Venture investments are defined as down payments in the database. Thus, investments are registered when the capital flows into the company. Deviations from other studies might be due to different calculation methods – e.g. commitments.

A.1.1 Danish venture-backed firms

Number of firms

VCs established in Denmark have financed 911 Danish companies between 1998 and 2004. Of these, 333 (35%) are closed by 2006. Thus, the remaining 578 venture-backed companies are included in this study of the venture capital impact in Denmark.

Size of venture-backed firms

The market of venture capital in Denmark is dominated by many small companies. 71% of the total portfolio of firms has less than 20 employees in 2004, while only 3% has more than 200 employees, see table A.1.1.

Table A.1.1: Size

Company size (# of employees)	# of portfolio firms in 2004	Share
0-19	408	71%
20-99	126	22%
100-199	27	5%
200+	17	3%
<i>Total</i>	<i>578</i>	<i>100%</i>

Source: Vaekstfonden.

Sector distribution of the venture portfolio

The traditional segments on the venture market – Life sciences and ICT – together constitute the majority of the portfolio, cf. table A.1.2.

However, a large group of 209 companies in the portfolio belong to other segments – Industry and service.

Table A.1.2: Segments

Segment	# of portfolio firms in 2004	Share
Life sciences	142	25%
ICT	227	39%
Industry & service	209	36%
<i>Total</i>	<i>578</i>	<i>100%</i>

Source: Vaekstfonden.

Year of establishment

The majority (52%) of the venture-backed companies are established in 2000 or after. This indicates a very young portfolio in Denmark. In 2004, 7% of all the active firms in the portfolio are established, see table A.1.3.

Table A.1.3: Year of establishment

Year of establishment	# of portfolio firms in 2004	Share
Before 2000	278	48%
2000	84	15%
2001	81	14%
2002	43	7%
2003	50	9%
2004	42	7%
<i>Total</i>	<i>578</i>	<i>100%</i>

Source: Vaekstfonden.

A.2 ONLINE SURVEY

To supplement the information from Vaekstfonden's Venture database, an online survey has been conducted. Of the total population of 578 active venture-backed firms the majority were contacted – where contact information was available. Response from 100 companies corresponded to a response rate of 17%. Subsequently, this sample is examined in regards to three variables – size, segment and age – in order to make a detailed extrapolation.

A.2.1 Description of sample

Size

The majority of the respondents are small companies. 67 venture-backed companies have 0-19 employees, while less than 50% have 20-99 employees, see table A.2.1. Total share of firms with less than 100 employees thus reaches 96% which is close to the share of similar firms in Vaekstfonden's Venture database (93%).

Table A.2.1: Size

Company size (# of employees)	# of portfolio firms in 2004	Share
0-19	67	67%
20-99	29	29%
100-199	3	3%
200+	1	1%
<i>Total</i>	<i>100</i>	<i>100%</i>

Source: Vaekstfonden.

Segments

A large part of the respondents (45%) belong to the Information and Communication Technology (ICT) segment while 29% of the companies work within Life sciences. The distribution of companies in the sample diverges just slightly from the distribution of the venture-backed firms in Vaekstfonden's Venture database – 39% and 25% respectively.

Table A.2.2: Segments

Segment	# of portfolio firms in 2004	Share
Life sciences	29	29%
ICT	45	45%
Industry & service	26	26%
<i>Total</i>	<i>100</i>	<i>100%</i>

Source: Vaekstfonden.

Year of establishment

One third (35%) of the respondents were established before 2000, while 28% are established in 2003-04. Thus, the share of very young firms is almost twice the share in the total population (16%) from Vaekstfonden's Venture database.

Table A.2.3: Year of establishment

Year of establishment	# of portfolio firms in 2004	Share
Before 2000	35	35%
2000	13	13%
2001	16	16%
2002	8	8%
2003	10	10%
2004	18	18%
<i>Total</i>	<i>100</i>	<i>100%</i>

Source: Vaekstfonden.

The characteristics of the companies in the sample are close but not similar to the characteristics of the venture-backed companies from the Venture database. However, an extrapolation of the sample data in regards to all presented parameters minimizes the margin of errors, and make up a good estimate for the development and impact of venture-backed firms in Denmark.

A.3 ESTIMATE OF TOTAL MACRO ECONOMIC IMPACT

Assumptions for the estimates

The impact of venture capital in Denmark (chapter 3.1) is estimated upon the online survey of 100 responding venture-backed firms.

For the most true and fair picture of the macro economic impact, an extrapolation of the online survey data has been conducted in regards to parameters already known from Vaekstfonden's Venture database:

1. Number of firms
2. Size (employment)
3. Sectors
4. Year of establishment

The calculations of the impact of venture capital constitute of two steps. Firstly, the sample is extrapolated four times in regards to each of the parameters above. Secondly, an average of the four results is used to define the total impact of venture-backed firms on the Danish economy.

For the companies to enter Vaekstfonden's Venture database they must have received venture capital from one of the venture capitalists (VCs) established in Denmark. Of the 228 companies which had received venture capital in 2000 or earlier which are still active. Including the subsequent period until 2004 the number increases to 578. The growth in the macro economic parameters from 2000 to 2004 is due to two factors: organic growth and an increase in the number of companies. However, the main contribution to the increasing impact of venture capital is caused by firms which were already in the portfolio in 2000 – organic growth.

In the estimation of the future growth from 2004 to 2010 only organic growth is taken into account. However, the actual development will be heavily influenced by the accession of new firms on the venture market as well as the departures of firms which go bankrupt or close due to other reasons. A conservative estimate is that these two contrary effects equalize one another. Thus, this possible error is expected not to influence the survey results of the development of the venture-backed firms.

A.4 METHODOLOGY OF INTERNATIONAL BENCHMARKING

In section 3.2 the development of venture-backed firms in Denmark are compared to similar firms in Europe and the U.S. In the present study the growth rates are adjusted for the accession of new companies. Thus, for companies which had received venture capital in 2000, the growth rate has been calculated for the period 2000-2004. For companies which received venture capital in 2001, the growth rate has been calculated from 2001 to 2004, etc.

For this reason, the results of the venture-backed firms in Denmark are comparable to studies of venture-backed companies in Europe and the U.S. The European data used in the reports are derived from to the research paper "Employment contribution of Private Equity and Venture Capital in Europe" (2005) - referred to as the EVCA-study (European Venture Capital Association). The U.S. data derives from "Venture Impact 2004 - Venture Capital Benefits to the U.S. Economy" (2004) prepared for National Venture Capital Association (NVCA).

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