

# THE ROLE OF VENTURE CAPITAL FOR ECONOMIC GROWTH IN THE NORDIC REGION

Nordic Venture capital and private equity associations (DVCA, FVCA, NVCA and SVCA)

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# Content



# PART I:

Growth contributions and potentials of Nordic venture capital (VC)

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# PART II:

Nordic VC industry: State of play, potential and what holds it back

# PART III:

Policy recommendations

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# PART 1 GROWTH CONTRIBUTIONS AND POTENTIALS OF NORDIC VENTURE CAPITAL (VC)

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# The unique value creation of venture capital

Venture Capital (VC) brings unique growth contribution by supporting innovative and highly competitive growth firms in becoming established companies through 3 main channels:

### **1: A UNIQUE TYPE OF FUNDING**

Bringing funding to new risky growth companies, often built on brand new ideas from universities etc.

### 2: PICKING FUTURE WINNERS

Identifying high-growth opportunities at the right time, in the right markets

### **3: ACTIVE OWNERSHIP**

Leading start-up companies to success through strategic and operational support

### 4: VC BRINGS ALONG SIGNIFICANT NATIONAL ECONOMIC BENEFITS

- · Spill-over to the rest of the economy
- Creation of highly productive jobs
- Return to investors

In this part, we go through each of the three channels and then analyse the derived national economic benefits



# VC fills crucial funding role in the ecosystem of young companies

### **Capital ecosystem of innovative start-ups**

### A gap in the capital ecosystem

- The VC model is about identifying highgrowth – and high-risk – companies, bring them to the market and develop scale.
- As such, VC plays an important part in the journey from turning a small, innovative start-up into a proven business concept.

# The eco-system is not stronger than the weakest part

- The capital food chain is depending on the effectiveness of early-stage funding.
- If there is no funding for seed and startup companies, few companies make it to the later stage and gain scale.
- In the early stages, VC is often domestically based, but companies increasingly obtain funding from abroad, as they increase in size.





# VC is a long-term high-risk investment with a strong up-side

# Most VC investments are unsuccessful

• Around 2/3 of all early-stage VC investments generate a loss (based on US data), cf. figure.

### However, the possible upside is high:

- For the remaining 1/3, the return is on average three times the paid-in investment.
- For around 1.5%, the return is higher than 20 times the paid-in investment.
- This secures an average annual return of some 20% for early-stage VC funds (based on US data).
- The high return discrepancy of the individual companies is mitigated through diversification where a typical holding represent less than 15% of the total fund size.

### **Distribution of returns of early-stage venture in US, 2004-2013**



Note: The return multiple is measured as TVPI is the total value of the funds cumulative distributions compared to paid in capital. Source: Industry Ventures (2017)

Source: Industry Ventures (2017)



# VC funding crucial for high-tech industries

# Innovative high-tech sectors depend on equity finance...

Companies that rely on successful outcome of R&D efforts are often too risky for standard credit finance and relies on equity.

R&D and equity dependence for the median firm in US, 1980-2005



...as a result, VC focuses on these sectors; ICT and Life science attract 70% of VC investments





1) Includes all companies in sector code SIC 28: Chemicals And Allied Products. 2) A simple average of SIC 35. 36. 38., which Brown et al. (2016) denotes "ICT".

# VC is important for the creation of the world's most valuable companies



World's four most valuable companies are ICT-companies with VC-backing early on. While VC funds invest in only around 0.2% of new U.S. businesses, 43% of U.S. public listed companies founded between 1979 and 2013 were VC-backed.<sup>1</sup>

The world's most valuable companies, measured by market cap in October 2018

1	Apple, est. 1976 (US)	é 🛛	VC backed	ICT
2	Amazon.com, est. 1994 (US)	amazon	VC backed	ICT
3	Microsoft, est. 1975 (US)	Microsoft	VC backed	ICT
4	Alphabet/Google, est. 1998 (US)	Google	VC backed	ICT
5	Berkshire Hathaway, est. 1839 (US)	Berkshire Hathaway		
6	Facebook, est. 2004 (US)	f	VC backed	ICT
7	Alibaba Group, est. 1999 (CN)	Alibaba.com		ICT
8	Tencent, est. 1998 (CN)	Tencent 腾讯		ICT
9	JPMorgan Chase, est. 2000 (US)	JPMorganChase 🏮		
10	Johnson & Johns on, est. 1886 (US)	Johnson-Johnson		

Source: Invest Europe and National Account

1) OECD (2018): A portrait of innovative startups across countries



### VC funds offer competitive returns for investors

US venture capital funds deliver returns that compete with investments in blue chip companies, even allowing for a premium for illiquidity.

Internal rate of return (IRR)



S&P 500 Index

Note: The venture capital index is a pooled horizon internal rate of return (IRR) calculation. The timing and magnitude of fund cash flows are integral to the IRR performance calculation. S&P index is an average annual compounded return (AACR) Source: Cambridge Associates (2018) Returns from EU VC is still below the more mature US VC market. The low returns in EU is linked to low, and unstable, returns in the lowest quartile.





Note: TVPI is the total value of the funds cumulative distributions compared to paid in capital. The figures are net of fees, expenses and interest. Source: Cambridge Associates (2018) and Preqin (2017)



# VC supports a range of highly productive companies



Note: Numbers of VC-backed companies Denmark and Sweden are estimated based VC investments as a share of GDP and number of companies for Finland and Norway. Numbers of employees for Denmark is from 2013. The rest of the figures all have different sources. Source: Norway, Menon, Finland, FVCA, Vækstfonden, Invest Europe, BvD, SVCA, Invest Europe and Statistics Denmark.



# VC-backed companies contribute to economic and employment growth

Average growth in turnover for VC-backed companies is five times higher than for regular small- and midsize cap

Annual average growth in turnover for VC-backed companies in Sweden, Finland and Norway



Average growth in employment for VC-backed companies is twice as high as regular small- and midsize cap

Annual average growth in employment for VC-backed companies in Sweden, Finland and Norway



Note: Growth for VC-backed companies can be high due to low initial starting level. Numbers for VC-backed comapnies have a different source and might have different method of measuring. Source: FVCA, NVCA, SVCA

Note: The numbers are based on Sweden, Finland, Norway. Norway 2011-2016, Finland 2011-2017. Sweden 2005-2014. Data was not available for Denmark.



# Innovation created by VC-backed companies have large spill-overs to the wider economy

# Results from key literature on spill-over effects from VC and R&D:

- An increase of VC of 1 EUR results in an increase in output growth of 3.33 EUR as a result of economic spill-overs, based on an analysis of 16 OECD countries.
- Social return (impact on the entire economy) of R&D investments is about three times higher than the private return.
- The increase in patents of R&D investments is about 2-4 times larger in VC-backed companies than in regular companies.
- 8 percent of the innovation in US companies in the period 1983-1992 is a result of venture capital investments.

Source: See appendix

# VC investments have strong benefits for the wider economy

- Assuming a social return three times higher than the private return, we estimate that every vintage of VC investments brings about a total societal return of some EUR 300 million, *cf. figure*.
- This comes on top of wages to employees, procurements from other companies, etc., at the VCbacked companies.

Estimated total economic return <u>each year</u> of VC investments in the Nordics



Note: We have assumed an average annual IRR of Nordic VC of 15% (on page 23 we find that Nordic VC funds have an average TVPI of 1.4, corresponding to an IRR of 15%), that R&D investments have a social return three times higher than the private return (see appendix), and that annual VC investments in the Nordics are on average 0.05% since the financial crisis (see page 16).

# PART 2: NORDIC VC INDUSTRY: STATE OF PLAY, POTENTIAL AND WHAT HOLDS IT BACK

# State of play and potential for Nordic VC industry

In this part we assess the State of play for Nordic VC industry:





# An international comparison shows great potential for further growth

### Three out of four of the Nordic countries have VC markets above OECD median. However, the gap to US shows there is still a large potential for the Nordic VC markets to grow.

Venture capital investments in 2016, share of GDP



### **Comparison to relevant European** peers

In the rest of this chapter we will compare the performance of the Nordics with the following European peers (marked with dark-blue):

- Netherlands
- Belgium
- France
- Germany

# The journey of the Nordic VC industry: A bumpy road with <sup>1</sup> STATE OF PLAY a steep learning curve

### VC investments as share of GDP, average across Nordic countries



Note: In 1997-2007, the development in venture capital investments is approximated by the development in total private equity investments. The figure is calculated as a simple average of Nordic countries. Source: Eurostat, Copenhagen Economics



# **VC** has been instrumental in creating Nordic unicorns

The 15 most valuable VC-backed companies in the Nordics (last 20 years)

Market value, bn. EUR



Note: The market value is based on market cap when available - when not, market values is estimated based on earnings (average PE for small cap Nasdaq stocks multiplied by earnings) earnings) Source: Annual reports and dealroom.com

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# **Growing optimism in the Nordic VC community**

In making this paper, we have conducted a survey among Nordic VC funds, where we asked about prospects for the future and barriers. The results show great optimism among VC funds:

# Nordic VC are more optimistic about the future...

"Are you more or less optimistic about the future of Nordic VC today than you were 12 months ago?"

### ... the main reason being a growing number of high-quality investment opportunities...

"In case you are more optimistic, what part of the process of running a VC fund does this especially relate to?"

### ...especially among Nordic tech and life science start-ups.

"In my opinion, the most prominent future domain in the Nordics is?"



Source: Survey among Nordic VC funds

### 2 POTENTIAL FOR FURTHER GROWTH

# Nordic countries are highly innovative, digitalised and skilled

Nordic countries are highly innovative in a global context

Individual ranking on Global Innovation Index 2018



Source: Global Innovation Index 2018 by Cornell University, INSEAD and the World Intellectual Property Organization (WIPO) Nordic countries are highly digitalised, skilled and stable



Note: Higher ranking is indicated by being closer to the outer circle Source: World Economic Forum Global Competitiveness Report 2018



# **Nordic countries: natural hub for VC-backed industries**

ICT and life science industries play a larger role in the Nordics than in the rest of the EU – and at level with the US



Note: Life science is proxied by manufacture of basic pharmaceutical products and preparations. Sweden and Norway do not report life science separately and for Sweden it is estimated as the same share as in Denmark of total value added from manufacture of pharmaceuticals and chemicals products. Norway is the total sum of oil refining, manufacturing of chemical products and pharmaceutical products due to lack of data. Source: OECD, Statistics Sweden and Statistics Norway Strong life science and ICT give great opportunities for growth within VC

- Nordic countries are in lead in ICT and life science, with strong academic and research communities (partly linked to government funded research).
- This gives a critical mass of new innovations and ideas to to build world-class companies with global reach.
- To realise this, we need:
  - Larger funds with the financial muscle and experience to commercialise and expand internationally, and more specialised funds, particularly for the life sciences sector.
  - Develop interaction between the venture capital community, the industries, research institutions and start-up community.
- Developing the energy solutions for the future:
  - o Denmark has strong track record for wind energy.
  - Norway has several hubs for energy within oil and gas, knowledge that could be transferred to renewable energy.
  - Norway also recently established a state-backed fund with a mandate for both fund investment and direct investments within renewable energy.

# **Clear indications of specialisation reflecting** national comparative advantage





Note: Only two hubs per country are included and so represents a selection of hubs and sectors.

#### 21

ICT



0.01%

0.05%

Finland

# **Potential for Nordic VC markets – double in size?**

In general, countries with large ICT and life science sectors have strong VC markets – with US being the important showcase, where VC is paramount in financing these two sectors<sup>1</sup>... ...If the Nordics fully utilized their industry potential within ICT and life science, the VC markets could double in size. Even greater potential with US market as a long-term target.

VC investments, share of GDP (2015) and potential based on size of ICT and life science sector

0.04%

0.04%

Sweden

0.04%

0.03%

Denmark



Energy

0.01%

0.02%

Norway

1) In both figures life science and ICT are proxied by manufacture of basic pharmaceutical products and preparations. Sweden and Norway do not report life science separately and for Sweden it is estimated as the same share as in Denmark of total value added from manufacture of pharmaceuticals and chemicals products. Norway is the total sum of oil refining, manufacturing of chemical products and pharmaceutical products due to lack of data.

VC investments

Source: OECD, Statistics Sweden and Statistics Norway



# **Performance of Nordic VC improving but still behind US**

Nordic VC is still underperforming compared to US, although the gap has decreased since the financial crisis. The performance data for Nordic VCs incapsulates great dispersion between different funds, e.g.  $\frac{1}{4}$  of the investments by VCs (reporting to NVPI<sup>1</sup>) have TVPIs above 2.

### TVPI (based on different data sources, see note)



Note: TVPI is the total value of the funds cumulative distributions compared to paid in capital. US numbers are based on Cambridge Associates and is calculated as a simple average based on annual TVPIs. Nordics is calculated as a simple average of the four countries. Data for Denmark is based on the public fund "Vækstfonden" and hereby only include a subset of Danish funds. Data for Finland is based on the public fund "TESI", which includes the majority of Finnish funds. Data for Norway is based on Preain and data for Sweden is based on EIF. We do not have time series data for Norway and Sweden, and we assume that the growth of TVPI in Norway and Sweden follows that of Finland and Denmark. Source: Pregin, Cambridge associates, Vækstfonden, TESI.

... the fragmentation of investments (as funds relative to other countries.

**Reasons for lacking behind** 

Nordic VC markets are still relatively

young compared to US. Often it takes

1 Some 25% of the investments of the eight VC firms reporting to the Nordic Venture Performance Index have TVPIs above 2.2) See "Nanda, R., Samila, S., & Sørenson, O. (2018): The Persistent Effect of Initial Success: Evidence from Venture Capital" and "Shaw, K., & Sørensen, A. (2017). The Productivity Advantage of Serial Entrepreneurs"

# Too small investments size for later stage growth companies means they must find funding abroad

Later-stage VC investments are in general At the same, time the average investment size is underrepresented in the Nordics (except in Sweden) lower in the Nordics compared to European peers Venture capital investments as a percentage of GDP, 2016 Average investments size in 2015-2017, EUR million 0.36% 2.4 Seed/ +53% Early stage = 1.6 1.3 +19% 1.1 0.05% 0.04% 0.7 Later stage 0.03% 0.03% 0.03% **+127%**) 0.3 Finland Sweden Denmark Norway European United Seed Start-up Later stage States peers Nordics European peers Source: OECD Source: Invest Europe

### Implication

Many successful later-stage growth companies must find funding abroad, once they have reached a certain size – typically in relation to international expansion. This is a key factor in Nordic VC not utilising their full potential and also holds back average returns.

#### 24





# **Nordic VC markets lack institutional investors**

Most Nordic countries have large pension funds available for investments with the goal to create return on investment for beneficiaries

### Private pension funds as a share of GDP, 2015



Nevertheless, institutional investors are overall quite absent as investors in Nordic VC funds and investments have declined since 2007 – small ticket size is a barrier.

VC fundraising as a share of GDP, annual average in 2012-2017



### Large potential in increased involvement of pension funds

Nordic pension funds have currently around 0.1% of their portfolio invested in VC. As a hypothetical illustrative example, if this share was increased to e.g. 0.5%, total annual VC fundraising would increase by more than 60%.

Data do not cover the whole private pension system
 Data refer to 2014.

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# Lack of sufficient number of serial entrepreneurs and high-skilled workforce



VC-backed companies are dependent on availability of highly skilled specialised labour. VC funds, e.g., invest in life science - a sector that lacks highskilled workers

Unemployment for science educated (STEM) and for total population, 2013



Note: STEM educations are Science, Technology, Engineering and Mathematics educations

Source: Caprile, M., Palmen, R., Sanz, P. & Dente, G., 2015. Encouraging STEM studies for the Labour Market, s.l.: European Parliament, EMPL Committee.

#### Potential labour shortages are already clear in all **Nordic countries** Scarcity of VC relevant skills -157 1 52.00 7.000-9.000 new Swedish businesses 52% of Norwegian have a serious programmers growth companies problem in finding are needed in report access to software skilled labour within the aualified labour as a areas of engineering companies in barrier to growth and IT Finland Danish businesses have difficulties finding skilled labour such as software developers and financial business partners

Source: For Denmark and Sweden: Hays Global Skill Index, for Norway: Menon Economics (2018) and for Finland: Finnish Business and Policy Forum EVA

### Lack of high growth entrepreneurs in Nordic countries

- Nordic countries lack sufficient high-growth enterprises and entrepreneurs<sup>1</sup>. In 2015, Sweden ranked 14 out of 32 OECD countries measured by number of high-growth enterprises. Finland, Denmark and Norway ranked between 19 and 25 out of 32 OECD countries.<sup>2</sup>
- Spinoff entrepreneurs outperform those entering outside the industry: over the first four years of their lives, spinoffs enjoyed survival rates roughly **10 percentage-points higher** than non-spinoffs.<sup>3</sup>
- The lack of high growth and successful serial entrepreneurs in the Nordic countries hampers VC funds because VC funds depend on employing successful serial entrepreneurs to spot future high-growth entrepreneurs.

Note: 1) EU defines high-growth enterprises as all enterprises with at least 10 employees in the beginning of the growth period and having average annualised growth in the number of employees greater than 10% per annum, over a three-year period, 2) OECD (2017) and 3) Dahl and Sorenson (2013) Source: OECD (2017) and Dahl and Sorenson (2013)

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# PART 3 POLICY RECOMMENDATIONS

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# **Realising the VC-based potential in the Nordics:** Five policy priorities

### **The potential**

- Nordic area as cluster for high-tech industries with supporting eco-system around VC firms
- Eco-system strong enough to attract international funding and take Nordic and other European firms all the way

### What is needed

- More large VC funds with sufficient international scale and experience, delivering competitive returns
- More serial entrepreneurs driving start-ups as founders and business angels
- Substantial increase in funding from institutional investors attracted by the longer term return potential from VC

### Five policies that deliver

- Clear, competitive and foreseeable tax environment
- Create and incentivise talent
- Increase involvement of institutional investors, notably pension funds
- More proportionality in regulation of VC funds
- Nordic co-operation on key policy areas seamless cross boarder investments

# **Transparent, competitive and stable tax environment**

# Taxation is the key area to be changed in order to promote Nordic VC

"If your government were to prioritize taxation or regulatory changes to boost/ease one area of venture capital, which should it be?"

### Share of answers



### Key concerns expressed by Nordic VC funds

- Uncertainty about tax treatment prior to investment in VC funds hold back commitments to invest, in particular in Sweden.
- Economic double taxation resulting from non-matching bilateral taxation treaties.
- Complex fund structures because LP from different tax locations have challenges in entering in same fund structure.
- Rule for capital gains taxation of individuals makes it difficult to retain and attract international talent, e.g., when companies are growing.
- For Denmark, very high capital gains taxation is noted as a key factor.
- Finally, national regulation on stock options and warrants cause problems in terms of compensation competition, as attracting the right employees and managers becomes harder.

# **Create and attract scarce talents**

### Talent is the precondition for success

#### Competition for the staff required to create successful VCbacked growth is ferocious and global:

- Mobility of key staff is high and increasing
- Substantial mismatch in the educational systems: too few natural science-based and information technology candidates

### In absence of reforms: potential for expanding the strong hightech firms in the Nordic region...

.... will simply be blocked by a lack of qualified labour

### **Educational reforms and international recruitment**

Educational reforms are also needed to lift the share of the population with skills relevant for high-tech industries. Notable, but not only, more natural science graduates.

To plug the gaps AND utilise the benefits of experiences from other countries, increased international recruitment is also a must.

# More proportionality in regulating VC funds

### **AIFMD challenges Nordic VC firms**

"What part of the European regulation, especially, makes it challenging to operate VC firms?"

### Share of answers



### Key issues raised by VC funds in our questionnaire

High compliance costs and complexity linked to implementation of the Alternative Investment Fund Managers Directive (AIFMD), which nearly 50% of the respondents pointed out as a clear challenge. We have identified the following three main issues:

- 1. It treats VC in the same way as other leveraged types of alternative investments that have higher impact on systemic risk.
- 2. It is implemented differently across EU typically stricter in the Nordics, so-called gold-plating.
- 3. The rules are equal across size of funds (VC, PE etc.), whereby it will be relatively more costly in terms of compliance etc. to run the typically smaller funds in the Nordics.

# Mobilise institutional investors, notably pension funds

### Institutional investors the natural partner for VC

#### Long investment horizon:

- Institutional investors typically have a long-term investment horizon, e.g. pension funds have pay-out obligations decades into the future.
- This means they have a low need for liquidity relative to other investors, making VC a suitable asset class.

#### Large and increasing capacity to invest:

- Generally, Nordic pension funds have a high level of available capital as a share of GDP widely exceeding US levels.
- Nordic pensions increasingly build up internal investment teams to place funds outside the fixed income and blue chip company segment.

#### So all the ingredients are there!

### Three factors are holding investments back

- 1. Tax and regulatory reforms are making investments more expensive and complicated than they should be, as noted previously.
- 2. Burned fingers: VC dot-com and bio-tech failures in mid-2000.
- 3. Limited number of Nordic VC funds have sufficient ticket size.

### Factors to mobilise investments

Over time, tax, educational and regulatory reforms will help deliver potential, including lifting return performance and creating more scalable investment opportunities.

The need for more and early inflow of capital from institutional investors will also speed up the process.

# **Nordic co-operation: four focus areas**

1) Learning from best practice	2) Creating scale in the Nordic VC market	3) Utilise comparative advantage within the Nordic region	4) Joint EU action in areas of common interest
<ul> <li>There is large divergence in VC industries' ability to create new firms and boost innovation across the Nordics.</li> <li>This should provide a foundation of experience to learn from and adopt best practice within the Nordic countries.</li> <li>A key focus area could be co- operation between research institutions and VC funds in high-risk technology development.</li> </ul>	<ul> <li>Existing programmes to boost innovation and funding to VC firms have a very national focus.</li> <li>This hampers development of Nordic – and ultimately international-scale – VC companies.</li> </ul>	<ul> <li>Nordic countries and regions excel in different parts of the eco-system around the VC universe.</li> <li>Rather than attempting to replicate all parts of this universe in each region, co- operation and specialisation could help create the needed scale.</li> <li>Review public VC funding, regulation and tax policies to identify what holds co- operation and synergies back.</li> </ul>	<ul> <li>A national interest point is ensuring that EU regulation focused on economic and financial stability does not inadvertently lead to compliance costs for the VC firms and related stakeholders that are out of proportion to the benefits.</li> </ul>
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# APPENDIX

# Innovation created by VC backed companies creates large spillovers to the wider economy

### Literature on social economic return on VC investments

Spill-over effects from VC are hard to estimate, but the literature agrees on a multiplicative effect of approximately three

Effect	Paper	Description
The article examines the social return of business R & D, public R & D and VC. They find that <b>an increase of VC of 1 EUR results in</b> <b>an increase in output growth of 3.33 EUR</b> . This increase is described in the article as the social return.	Astrid Romain and Bruno van Pottelsberghe (2004) "The Economic Impact of Venture Capital"	The article examines the difference between investments made by VC and R&D for 16 OECD countries.
The article finds that the <b>social return on R&amp;D is about three</b> <b>times greater than the private return.</b> The article also finds that the effects of R&D and patenting are greater for complex industries and established companies.	David Colino (2016) "Cumulative Innovation and Dynamic R&D Spillovers"	Estimates the effect of dynamic spillovers on R&D investments. The article examines both the impact of established businesses and VC backed startups.
The article finds significant spillover effects on VC funding. They find that the VC-funded start-ups have more patents per dollar and that these patents are of <b>higher quality.</b> The article shows that an increase in VC of 1 million USD increases the number of patents in other companies by between 1.89 and 13.11. This figure is <b>between</b> <b>2.07 and 3.41 times greater</b> than the spill-over effects of R&D investments.	Monika Schnitzer and Martin Watzinger (2017) "Measuring the Spillovers of Venture Capital"	The article tries to estimate spillovers from VC- funded companies in the form of an increase in the number of patents sought in other companies. Examines VC-funded start-ups.
The article estimates that 8 percent of the innovations in American companies in the period 1983-1992 is due to venture capital. Schnitzer and Watzinger (2017) report that this article finds that an <b>increase in VC of USD 1 at industry level is associated with</b> <b>three times as many patents as 1 USD corporate R&amp;D.</b>	Samuel Kortum and Josh Lerner (2000) "Assesing the Contribution of Venture Capital to Innovation"	The article examines whether venture capital financing has boosted innovation in US companies.

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