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### [INVESTMENT CRITERIAS OF CORPORATE VENTURE CAPITAL IN LIFE-SCIENCE INDUSTRY]

#### Abstract:

Venture capital (VCs) and Corporate Venture Capitals (CVCs) are among the most important source of funding of small companies in life-science industries. In this study we try to determine the employed criteria of CVCs for making investment decisions by analyzing the investment portfolio and also conducting phone interview with some investors from venture firms of big pharmaceuticals. In first study, we evaluated their investment portfolio in terms of field of interest, countries, therapeutics areas, phase of investment, role of investors and amount of investment based on their published data in official website. We did semi-structured interviews with 6 investors from Corporate Venture Capital (CVCs) and one from independent VC. The data were collected by visiting the official websites of CVCs and invested companies, displayed that CVCs are more interested in Biotech and Pharmaceutical projects and in preclinical stages. The average amount of investment in each project vary significantly among companies (Roche was highest with 65mUS\$ and Mitsubishi was lowest with 11.5 mUS\$). U.S has more investments than EU and there is no investment in Sweden. Products with general usage, Oncology, neuroscience and infectious diseases are among the highest invested projects. In terms of average amount of investment, drug development platform, infectious diseases and transplantation and immunology could attract more money. It seems that the investment decision of CVCs are influenced by strategic importance of projects/products for parents companies; however factors such as location, therapeutic areas and development stage of products also can influence the investment decision of CVCs. Moreover, factors such as competent management team, preferred therapeutic areas, geographical location and success story are among the factors that investors usually take into account. Networking is one of the recommended tools that small companies can utilize to attract investors, as investor pay a lot of attention to meet management team before investment. Interestingly, tax structure and salary are not issue for investors. **Conclusion:** small companies need to analyze the portfolio of CVCs, know their preferences and limitation and meet investors before submitting their proposal in order to increase their chance for receiving investment from CVCs.

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## **Introduction**

Enormous amount of resources, including capital, human and time are needed for development of an idea to a product/service in life-science industry. According to the report of Tufts Center for the study of drug development, it takes 15 years and US\$ 1 billion to develop a blockbuster drug through to regulatory approval (Håkan Kirkbey Buch et.al, 2011). Unpredictable response of human body to drugs and ever increasing regulatory requirement are among the main factors that lengthen the commercialization process of life-science products. So biopharmaceutical companies need to finance their activities, usually externally, in order to reach the market.

There are several ways for life-science start-ups to finance their activities including R&D limited partnership, angel investors, private and public Venture Capital, Corporate Venture Capital, mutual funds and public offering. Angel investors and venture capitals(VCs) are among most common methods that start-up biotechnology and pharmaceutical utilize for funding their companies (Beth Sliverstein and Carl Osborne, 2002).VCs are usually absorb capital from different sources such as banks, corporation, insurance companies and pension funds and invest in young, high risk companies. In lieu of their investment, VCs take considerable equity of companies and expect a high return on investment when company goes public or is acquired (Douglas P Lee & Mark D Dibner, 2005).

Drying the product pipeline of big pharmaceutical companies, they have been interested in investing in small start-up biopharmaceutical companies with innovative products. Looking at new molecular entities that have been approved by FDA during last 5 years, we can find that more than 25% of them come from small biotech companies (LT Ratcliffe, 2011). As these small companies are highly dependent in external funds, it is a great opportunities for big pharmaceutical to make more collaboration with these start-ups via investment in these types of companies.

In this report we are going to identify and categorize factors/criteria that affect the investment decision of big pharmaceutical based on analysis of investment portfolio of corporate venture capital that are affiliated top 50 pharmaceutical companies. We hope that the result of our study can provide a clearer picture form investment process in life-science industry.

## **Background**

### **Life-science industry in Sweden**

Life-science industry is one of the most important sectors for Swedish economy. Swedish life-science industry represents around 20% of net export of Sweden. It is equal to 40 billion SEK net export revenue (Short fact, Swedish life-science industry, SwedenBio website). Life-science industry is also

important from the perspective of employment rate. In 2009, 32000 employees were involved in manufacturing, consultancy, product development and/or research and development (R&D) in life-science industry (Life science companies in Sweden, Including a comparison with Denmark, VINNOVA report 2011)

As the home of the world-class universities like Karolinska Institute and Uppsala University, Stockholm-Uppsala region is the leading life science cluster in Europe. About 60% of employment in life science industry in Sweden, is at companies located in Stockholm, Uppsala and Södermanland (fact and figure on Sweden's number on life-science region, Stockholm Business region report)

Venture Capitals (VCs) are among the most common sources for financing start-ups in life-science industry. Many start-ups in life-science industry have used fund from VCs during the past three decades (LT Ratcliffe, 2011). In recent years, especially after financial crisis, the availability of fund in VCs has been diminished as many VCs have shifted their investment in later stages projects/products (Peter Mitchell, 2009).

## **Venture capitalists and their policies**

In recent years, VCs frequently invest in high-tech start-ups companies, since the selected entrepreneurs of these companies have very good technical expertise in the field; another point is that the new technology has high potentials to be a real product in the reasonable term, such as biotech, telecommunications, or any other industry where new developments are creating rapid change and increasing prospects for future growth (Victoria Duff, 2011) Most VC investments are done in a pool format, where several investors combine their investments into one large fund that invests in many different startup companies. By investing in the pool format, the investors are spreading out their risk to many different investments versus taking the chance of putting all of their money in one start up firm.

There are some basic criteria that VC will use, after doing exhaustive due diligence, to evaluate whether to invest in a company. (Victoria Duff, 2011)

**Large Lucrative Market:** As we mentioned before, most venture capitalists are only interested in investing in the newest, fastest-growing industries, such as nano-technology, telecommunications, biotech or any other industry where new developments are creating rapid change and increasing prospects for future growth.

**Quality of management:** VCs look for companies who have assembled a management team with significant work experience in the industry. As manager of a small company looking for capital, he or she should know how to convince other people to help develop his company and has not provided knowledgeable people in key areas such as accounting, manufacturing, marketing and fulfillment, the venture capitalist probably will reject the investment because the manager is too inexperienced a leader to build a successful company. (Peter Mitchell, 2009)

**Breakthrough technology of idea:** No ordinary business idea is going to achieve big returns, so the investment must be in a company that has created a significant improvement or breakthrough

technology that will dramatically lead its industry or create a totally new industry. (Garage Technology Ventures, 2010)

**Competitive advantage:** A company also must have a good marketing plan that will launch the product rapidly into leadership in the industry. Every good idea or product will soon have many other companies trying to copy it, so the VC looks for patented technology, trademarks, brand recognition, extensive research and development necessary to duplicate the product or service; control of unusual knowledge or resources necessary for production; or great expense involved for a competitor to duplicate the business model. These elements create a high barrier to entry for any potential competitor.

## **Corporate Venture Capital (CVC)**

According to Financial Times “Corporate Venture Capitals (CVCs) are the specific types of VCs in which non-financial firms invest target companies such as startups or buyouts. These investments often follow not only purely financial interests, but also pursue strategic goals in developing new or complementary technologies or business fields to those in which the firm is already active” (Financial Time Lexicon, 2011). Big pharmaceuticals established a VC-arm which scans start-ups and try to deal with interesting project in at early stages. While VCs focus more on ROI, CVCs are more interested in making deal with company that can fulfill the strategic needs of the mother company (Peter Mitchell, 2009).

As the continuing financial doldrums temper the appetite of traditional private equity VC for startups, investment funds set up by big pharma companies are beginning to dominate early-stage financing of pharma and biotech firms (Ian MacMillan et.al, 2006). Some big pharma and biotech firm such as Pfizer, Eli Lilly and Amgen have their own internal venture capital units or wholly owned subsidiaries focused on venture capital. This kind of the investment of corporate funds directly in external start-up companies is called corporate venture capital (CVC). Strategic and financial issues are the main reasons for pursuing CVC. Most pharma/biotech related CVC companies looks for at least be budget neutral to their parent companies; strategic reasons are generally stronger motivators than financial ones. One basic strategic reason many pharma/biotech related CVCs cite for investing is to seek new directions and develop new products. Another strategic motivation for engaging in corporate venture capital activities is to supplement and support the activities of the parent company. While all of the companies which were researched also had R&D divisions and were actively pursuing improvements to their products, the leadership of these firms recognizes that developments reached by other companies could certainly be helpful to them.

CVC programs are structured in various forms. Some CVCs are organized as independent subsidiary companies, while others operate as a group within the parent company organization. Some CVCs have a “dedicated” investment fund, where the corporation commits a given amount of capital for investment. Other CVC programs are “discretionary,” in that investment capital is allocated as investment opportunities arise. Most CVC programs have a corporate-wide mission, receive corporate funding, and report to the corporate level (Ian MacMillan et.al, 2006).

## **Project aim and method**

The main aim of our project is to provide an overview of pharma-backed VCs investment criteria. After meeting with project supervisors we decided to limit the scope of project to CVCs affiliated with top 50 pharmaceutical companies. Digging more in the website of CVCs and other documents, we understood that most of provided information by them about investment criteria is non-specific and could not provide objective information for our purpose. So we decided to analyze the investment portfolio of each CVC, as we assumed that investment history can provide more firm data about the investment criteria which are employed by big pharmaceutical venture funds.

The information about each CVC was categorized in two main groups. In VC characteristics part, we mainly gathered the information under the categories of field of interests, phase of investment, amount of investment (in million US\$), investment criteria and investment horizon based on information that they announced in official website of specific CVCs. In the part we called "Investment Portfolio", we collected information under the categories of name of companies, field of interest, region, therapeutic area, phase of investment, type of investment, role of investor and amount of investment (in million US\$). We found the name of invested companies from the official website of CVCs and we gathered the information about each category from the official website of invested companies by searching in among press releases and other available information in official website of companies if applicable. If the information is not available in the official website, we went to other business news website to provide as much as information about invested companies. All the information was entered to a sheet in Microsoft® Excel to make further analysis easier. The collected data is formed to a "Pivot table" that enable user to filter the information based on selected criteria. We focus only on the current investment of CVCs, as the information of acquired or merged company is not accessible in their website.

## **Terminology Definition**

As there is not general consensus about some of employed terminology, we try to provide a clear definition some of less distinct terms we used in different categories.

### **Field of interest**

The field of interest is categories under 6 items including Biotech, Pharma, Medical device, Diagnostics, Bioinformatics and vaccines. Biotech applies to all companies which clearly declare that they are biotech companies, or their product has a protein/large molecule with more than 500 kDalton molecular weight. Pharma are all companies that their products have molecular weight under 500kDalton. Medical Device is the all medical technology that is used for treating or rehabilitation of patients, while Diagnostics is applicable to all medical technologies which are used in detection of diseases.

### **Therapeutic area**

Most of the employed term is compatible with current clinical practice and definition; however it seems that some of terms need to be clarified. Term "General" is applied to all products that have more than one (intended) clinical usage, while term "Not specified" means that the company does not provide a specific usage for its product. The term "Not Applicable" (N/A) refers to product/services that a clinical indication/category is not applicable for them like some of

bioinformatics services. “Drug Development Process” applies to all technologies that are not specifically for a specific clinical usage while they are exploited to develop other medications.

## Type of investment

We use the terminology that usually companies used for description of financing round including seed financing, round A, B, C, D, and E.

## Role of investors

Role of investors refers to role that investor acquires after investment including Board member or board observer. “board member” indicates the board member who has voting right, while “Board Observer” has not.

## Result

Based on the data we have gathered in press releases from VCs and invested companies’ website, business news and academic article, we got around 300 invested companies from 19 CVCs. We analyzed the data using different perspectives, such as Fields of Interest, Region, and Amount of investment, Therapeutic areas, and Phase of investment. Unfortunately, our data are not completely sorted in our categories because of limited access and lack of information. For instance, some of the companies didn’t mention clear phase of investment.

Biotech and pharma is still the top investing target for VCs. Around 30% investment went to biotech, the other 30% went to pharma firms. Below, you can see the exact number of the invested company in the fields of interest. (Fig. 1)

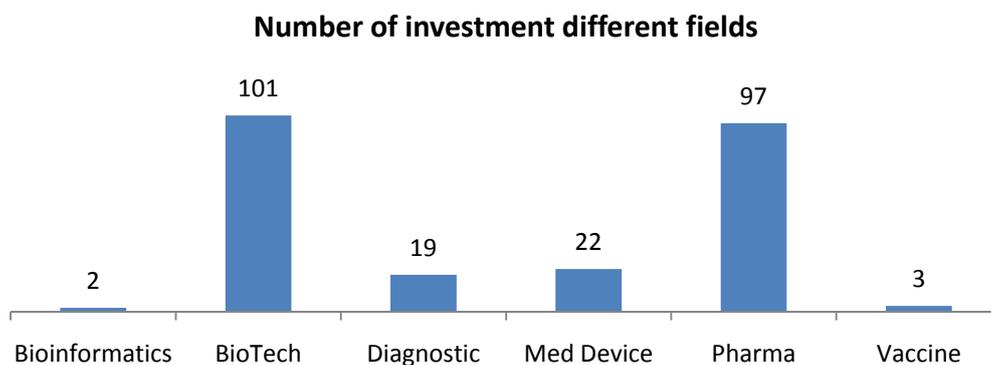
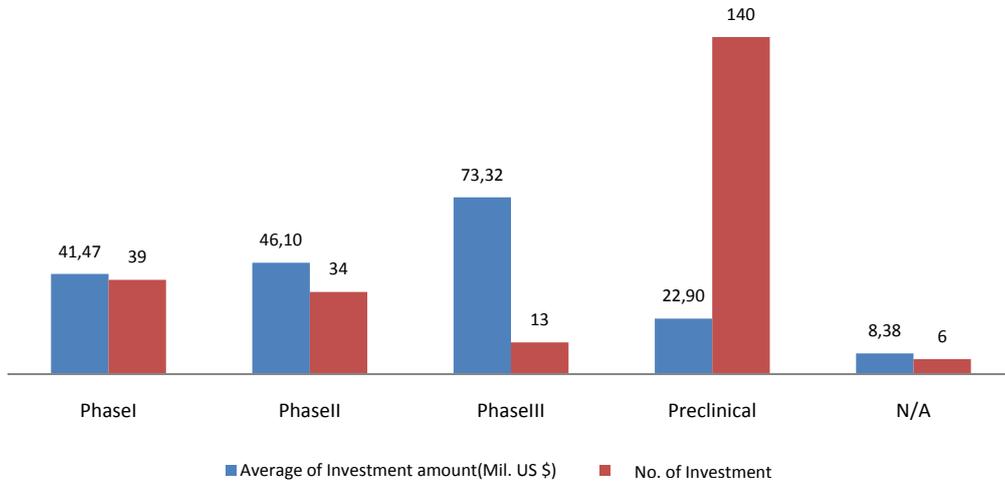


Figure 1

Interestingly, investment in preclinical phases is much higher than others, and phase III investment is really low, but invested capital is the highest. There are 140 companies were invested in preclinical phase. (Fig. 2)

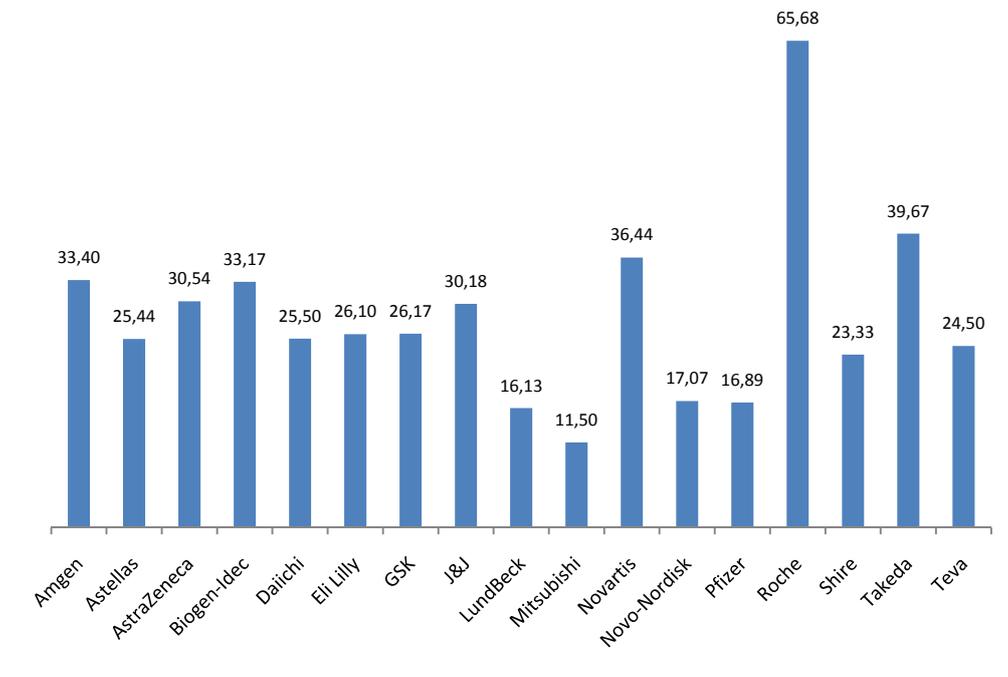
**No and average amount of investment (mUS\$) in different development stages**



**Figure 2**

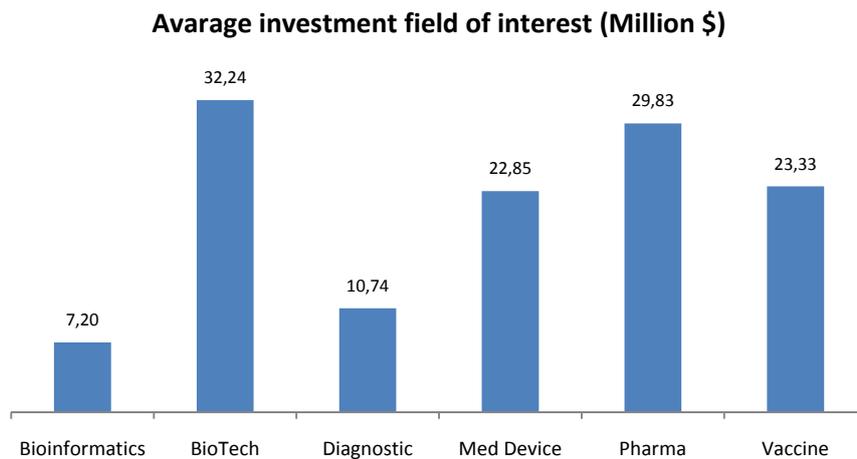
As you can see below, the average investment is mainly ranged between 20 till 35 million US\$. We focused on up-front investment. In most of the cases, investment is initiated by one or two VCs, and then more will join in after that. The numbers showed below mostly are the total amount of investment, and VC we mentioned in the diagram is just one of VCs in the pool. It is difficult to find exact number of money from each source. (Fig. 3)

**Average amount of investment (mUS\$)**



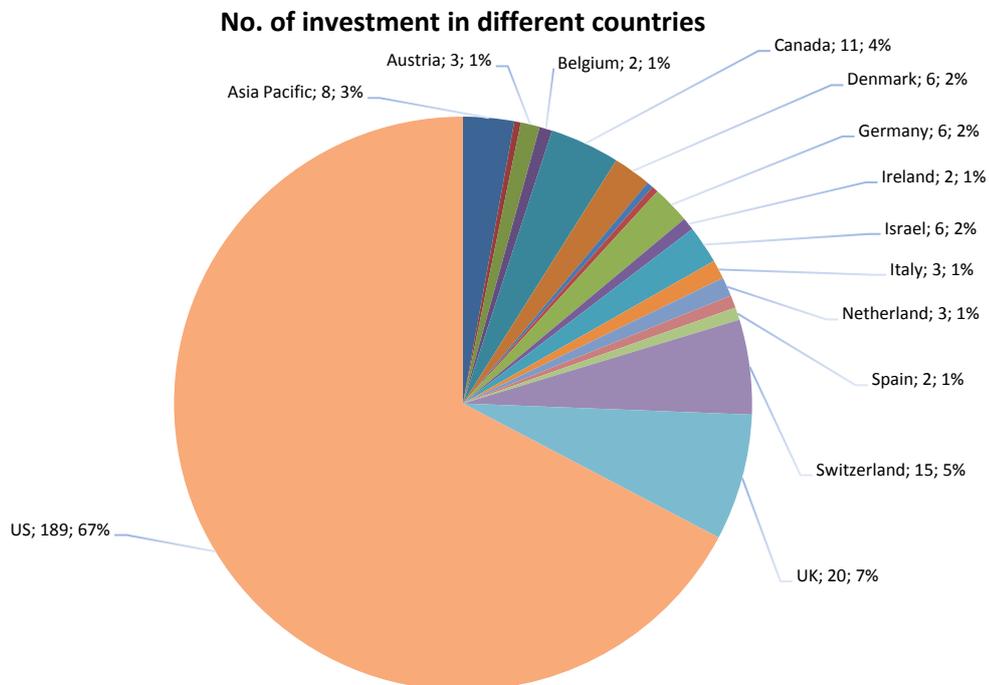
**Figure 3**

The figure below is the average investment in different fields. Again, biotech and pharma firms are clearly higher than others. Vaccine investment has the high number as well. (Fig. 4)



**Figure 4**

U.S. is the heaven for VCs. It is well-known that lots of and famous big pharma/biotech companies are located in U.S., innovations are really active. It is easier for VCs to find their target. There are 189 companies were invested in U.S., and 11 Canadian companies too. Whole Europe also had good numbers of investment, especially for U.K. and Switzerland, but not in Sweden. Asia and Africa are extremely poor in this business (Fig. 5). We also did statistic of investment in EU by CVCs, UK and Switzerland stand of almost 50% of investment; Denmark, Germany and Israel are the second biggest group in EU (Fig. 6).



**Figure 5**

### No of investment in EU countries

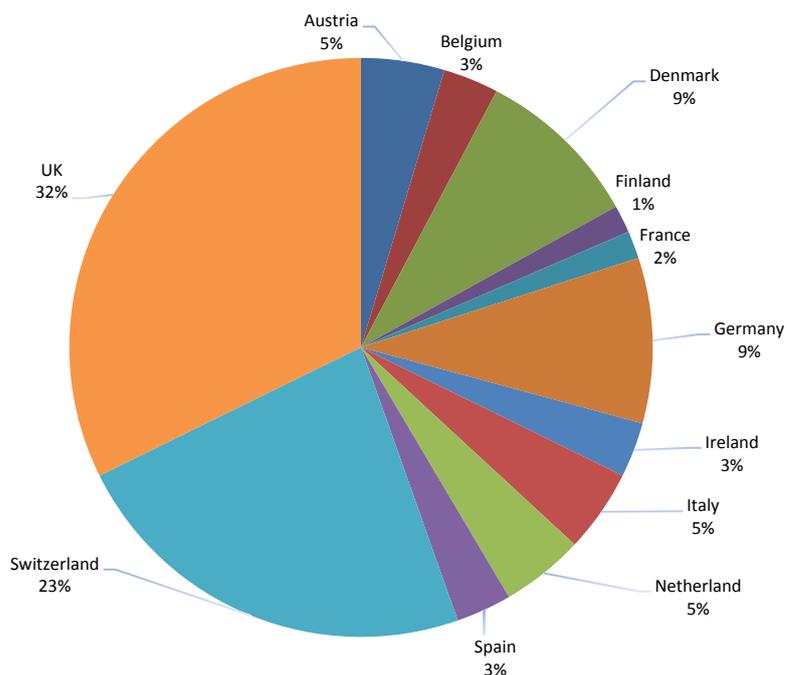


Figure 6

Therapeutic area is the other angle to analyze data. We can see that 27% of investment went to general products/projects of the small companies. Oncology with 16%, infection disease 11% and neuroscience 11% are the popular areas to invest. Transplantation/Immunology 6%, drug development platform 5% and cardiovascular/metabolism 5% also got the quite good investment as well. (Fig. 7)

### No. & percentage of Investment based on Therapeutic areas

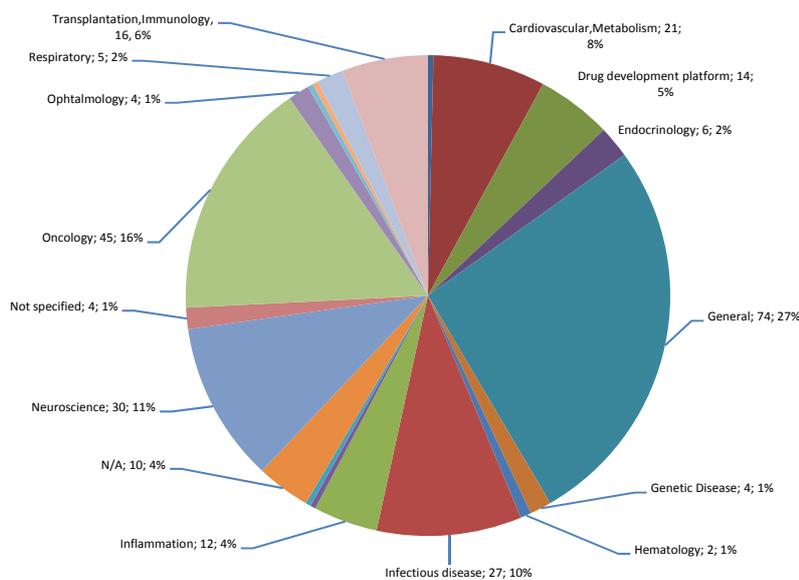
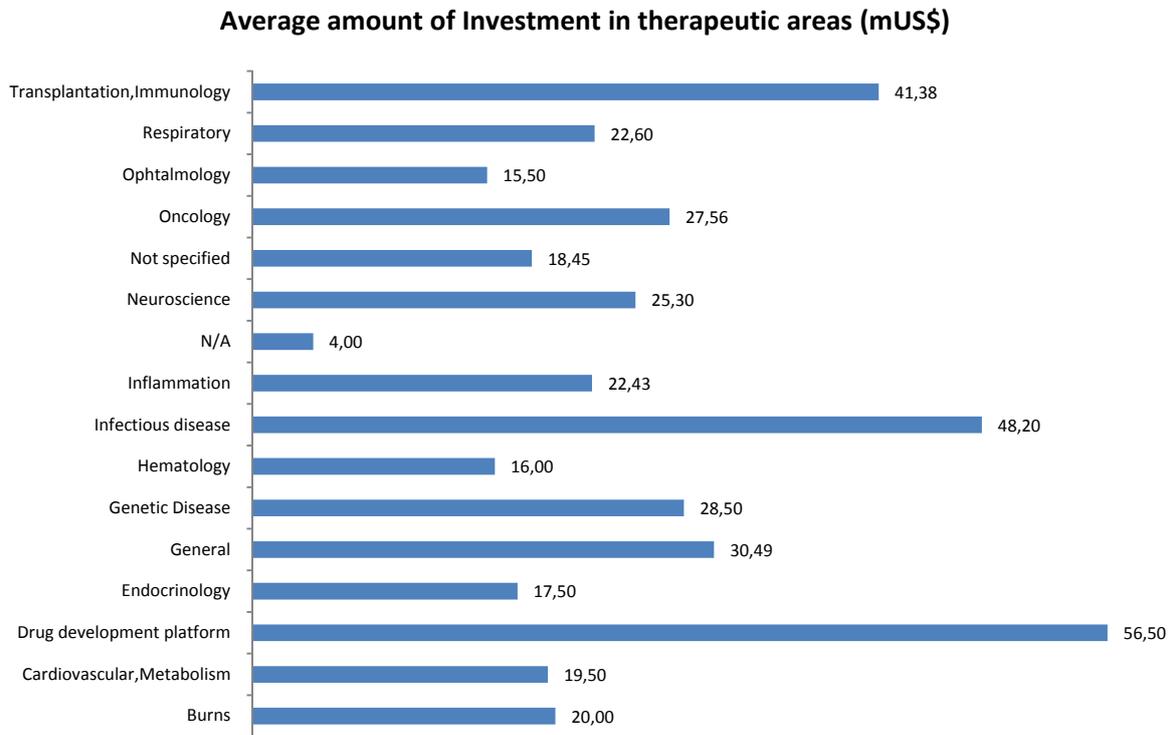


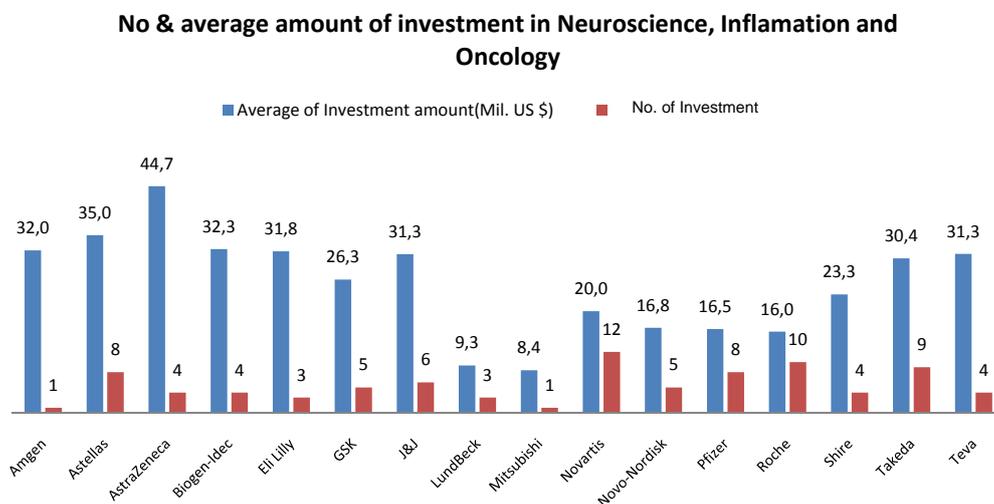
Figure 7

Average amount of investment in different therapeutic areas can provide valuable information about the investment strategies of CVCs (Fig. 8). Drug development platform could absorb about 56 mUS\$ in each project, while infectious disease and transplantation projects could receive 48 and 41 mUS\$ respectively. These numbers can represent the value of each therapeutics fields for big pharmaceuticals; however, the value can be affected by many factors such as success rate and novelty of compounds.



**Figure 8**

During the study we realized that neuroscience, inflammation and oncology are the popular therapeutic area to invest. The figure below shows the number and amount of investment from companies (Fig. 9).



**Figure 9**

It will be interesting to see that, what different therapeutic areas were invested by pharma and biotechnology fields. See below. The exact number of invested companies in different therapeutic areas can be seen in appendix. (See Appendix, Table 1)

## Discussion

Venture capitals play an important role in developing life-science industry by providing enough capital that enable small innovative companies to run their researches. Venture Capitals have provided the enough funds for developing many high-tech industries during the last three decades (LT Ratcliffe, 2011). So their criteria for selection of their investment have an immense importance for business developer in life-science industry; however, it seems that employed investment criteria by VCs are quite diverse and not all VCs employ solid criteria for selection of their projects. Kuckertz and Kollmann divided the employed investment criteria by VCs to five main categories including personality of entrepreneurs, experience of entrepreneurs, product or services, market characteristics and financial characteristics. These five categories also divided to fifteen subcategories that are emphasized by other researchers in this field as well (Kuckertz and Kollmann, 2010). They also realized while Venture capitalists have a clear understanding about factors such as innovativeness and the compatibility of projects with VC investment strategy from the beginning of their investment, there are some other factors such as personality of entrepreneurs (leadership capabilities or commitment) still remain uncertain even till the stage that VCs want to structure their deal.

In response to different environment of life-science industry including high regulated market and high risk of failure especially in clinical phase, VCs usually exploit different criteria for assessing their investments. Meyerson and Agge studied eight criteria that VCs used for evaluation of their investment in biotechnology fields and they categorized these criteria in three main groups named idea , including concept, science and intellectual property; business including , market, competition, valuation and geography; and finally people including management. They understood that companies mostly matched with two of the main groups that are management and concept (Meyerson and Agge, 2008). Ratcliffe considered seven criteria that VCs usually take into account for assessment of product-based companies including compelling science, high quality asset, strong intellectual property position with clear freedom to operate, unmet medical need, defined regulatory path, strong team, indication that many big pharma are interested, capital requirement, timeliness to exit and future financing risks (LT Ratcliffe, 2011).

While independent venture capitals focus more on the return of their investment, corporate venture capitals (CVCs) consider the strategic opportunity for their parent companies. Generally CVCs have the strategic mission to provide the opportunities for parent companies to “grow their business” by access to novel innovative technologies, development of new products, enter new market or enhance existing business (Ian MacMillan et.al, 2006).

In our study we tried to investigate the pattern of investment of CVCs associated with top 50 pharmaceutical companies by evaluation of their investment portfolio. The higher number of

investment in pharma and biotech can be justified by the higher number of available project in these two main fields and also higher needs of small biotech and pharmaceutical for capital for running their research projects in comparison with medical device and diagnostics. In the case of CVCs, it seems that higher level of strategic importance of pharma/biotech for growing the business of parent companies is another reason that attracts CVCs towards interesting projects in small companies.

While there is consensus among all article that independent VCs are recently are more risk averse and tend to invest in late-stage projects, our data represents that most of CVCs investment were done in pre-clinical projects. This phenomenon also can be justified by “strategic mission” of CVCs for top big pharmaceuticals; however the scarcity of interesting project in late developmental stage should not be underestimated.

The average amount of investment per projects is generally compatible with the rank and size of companies; however, low amount of investment by Pfizer and absence of Sanofi-Aventis, as second big companies in our list, is noticeable. It seems that small companies looking for investment need to estimate the amount of needed capital before approaching CVCs, as the variance of investment amount among CVCs is quite big. Moreover for small companies that need a lower amount of investment, collaboration with CVCs of lower rank companies is a more rational option due to lower level of competition for receiving of funds.

The huge differences between the number of investment in US and other countries, even region such as EU, cannot be revealed explicitly by our study, since our study could not consider all factors that a Venture Fund take into account for selecting an specific location. This statement can be proved when the distribution of investment is analyzed among European countries. Finding understandable and clear factors that justify the distribution of investment among European countries is not possible based on our study. It seems that other studies with focus on the main drivers of CVCs for investment decision such geography, legislation etc, can explain the main reason for this differences.

Projects with general clinical usage, which means products/services with more than one specific clinical use, Oncology and anti-infective, are among the most invested types of projects by CVCs. Other studies indicate that independent VCs are really interested in specialty products e.g. “orphan products”, which needs relatively low marketing investment with high sales. In contrary, our results show that CVCs are really interested in projects which can be used in more than one clinical indication. It may be explained by the fact that most of big pharma usually owns already established sales and marketing team and expanded network among clinicians, then these kinds of product is more proper for parent companies. Additionally, the needed capital for marketing of these types of products is higher and small enterprises have to collaborate with big pharma in promotion of “General products”. From the perspective of big pharma, “General Products” have the higher sales potential in case of excellent marketing campaign where the “core competencies” of big pharma lies.

It seems that the other two most invested clinical areas, Oncology and Anti-infective is quite compatible with other “core competencies” of big pharma and is quite matched with their development strategies. Marketing authorization of Anti-infective usually depends on clinical trials

that involve high number of patients (Arthur Klausner, 2005). Running of these big clinical trials needs a lot of capital and extended network among hospitals, clinicians, regulatory authorities, etc, that usually big pharma has. Successful Commercialization of oncology products is dependent on world-class marketing campaign, attending in expensive oncology seminars, sponsoring several studies about the safety, efficacy and recently health economic aspects of medication that usually pharmaceutical companies with capable R&D and medical department can handle these issues. According to survey of "Swedish drug development pipeline" which was published in May 2009, Neuroscience and Oncology were among the dominant areas in Swedish life-science industry, so this compatibility between the strategic needs of pharmaceutical industry and strengths of Swedish life-science can be an opportunity for more collaboration with industry leaders for Swedish start-ups.

It seems that valuation plays an important role in determining the average amount of investment in different therapeutic areas. The average amount of investment in different therapeutic areas can be justified by the success rate of projects in therapeutic areas. Kola and Landis studied the portfolio of biggest pharmaceutical companies between 1991 - 2000 and concluded that average success rate of project is 11%, while for instance the success rate for projects in infectious diseases are 17% and 5% for oncology products (Ismail Kola & John Landis, 2004)(Table. 2 Appendix). So it seems success rate is one of the factors that influence the final value of products/projects on top of market needs and potential profitability from perspective of CVCs.

## **Limitation**

Finding official and complete information about the investment portfolio of CVCs of different pharmaceutical companies is one the main barriers that we faced during the data gathering process. Availability of precise information went worth when one the invested companies has been acquired by other ones, as official website and all related information such as press release became unreachable.

Lack of accepted and employed categorization of therapeutic area was other problem we have during the designing of study. We employed the system that mainly focus on clinical usage of product/services in daily practice, while matching all of these products/services were not always possible with our categories.

## **Further studies:**

The main aim of our studies was determining the main considered criteria for selection of investment; however, we could not really determine all the factors that CVCs take into account. We also realized that there is no investment by CVCs in Sweden, so it seems that conducting a survey in order to finding the main reason that why CVCs have not been invested in Sweden yet, can be very helpful and also can reveal more criteria that CVCs take into account for investment. Our study mentioned that "strategic mission" is one of the important drivers for decision makers in CVCs, so it makes sense if portfolio of big pharmaceutical analyzed and their strategic needs are revealed. This analysis enables small companies to predict next move of big pharmaceuticals and attract capital for their activities more effectively.

# QUALITATIVE RESEARCH IN INVESTMENT CRITERIAS OF CORPORATE VENTURE CAPITAL (CVC) IN LIFE-SCIENCE INDUSTRY

## Background

In our first study, we analyzed more than 300 invested biotech/pharma companies from 19 corporate venture capitals (CVCs) in last ten years; however, it seems that analysis of investment portfolio cannot explore all the important criteria of decision-making process. For having first-hand knowledge about the decision-making criteria of CVCs, we decided to use qualitative research methodology to get more clues about the way CVCs select a project.

## Methodology

### Type of study

We choose the “**qualitative research**” for our project. We realized that this type of study can assist us to explore the mind of our informant and explore their employed criteria to select a project for investment. Qualitative research also helps us to provide a comprehensive list of factors that can affect decision-making process of CVCs.

We have to choose phone interview as the main method for doing qualitative research, since other methods such as focus group discussion and observation is not suitable to our project.

### **Selection of interviewees**

CVCs of top 50 pharma/biotech companies are the target group for conducting interviews. These CVCs are divided between project team members and we provide a list that indicates who contact which companies for further investigation.

### **Interview**

There are different types of interview such as informal conversation, thematically structured or standardized structured interview. According to experience of other researchers, we preferred to have a **standardized structured interview**. The main advantage of structured interview is the harmony in conducting the flow of interview regardless of interviewer and compatibility of gathered information of different interviews. This compatibility makes the better analysis possible.

### **Aim of interview**

We determine two main aims for our interviews:

1. The main objective of our interviews is to extract the main factors that CVCs take into account if they decide to invest in Stockholm region and possible barriers that influence them to come to Stockholm. For the purpose of getting valuable and correct information, we avoid to ask direct questions, such as “Why don’t you invest in Stockholm”, that would kill interviewee’s motive and trust, instead, we asked questions about the all factors that we think CVCs evaluate before making investment decision. After finishing interview, all the provided information by interviewees was reviewed and final conclusion was made.
2. Second part of interview is devoted to short presentation about investment opportunities in Stockholm region. We provide a customized pitch based on information that interviewee provides in first section. Moreover, we will review the portfolio analysis of each CVCs before initiation of interview. This pre-study helped us to have efficient customized pitch based on strategies and history of each CVCs.

### **Structure of interview**

The structure of our interview is shown in Figure 1 (See appendix also). We try to gather information about all factors that affect final investment decision. For this purpose, we plan to divide our interview time to two main parts. In the first part we try to gather information about the factors that usually investors evaluate before making decisions. These factors are categorized in two main categories including product related and environmental factors. For each area some sample questions are designed in advance that can help interviewer to track the interview more effectively.

In the second part, we try to have a short pitch about the available investment opportunities in Stockholm region and correct misperception if applicable. We also customize our pitch based on the information that we gathered in the first part of interview.

## **Result:**

As we mentioned above, in our quantitative research we got the data from more than 300 invested companies by 19 CVCs, and in this qualitative study we reached seven CVCs by phone interviews.

In general, management competency and human resources are the most important factors for CVCs, when they evaluate a company. As one of them mentioned “if I have a competent manager, I can handle everything”. But who is the competent manager? The competent manager should be experienced in the field of life-science industry especially in product development process. One of them defines competent manager as “a manager who has done the process of product development couple of times”. It seems that finding a qualified human resources, especially in management area, is the most crucial factor for them.

The second important factor for CVCs is the clinical field of company/project. Most of CVCs have already an internal analysis and preferred areas for investment. These areas are defined based on the strategic needs of Mother Company. Proposals about the project/product which are excluded from these pre-determined areas are usually rejected. In most cases, it is unlikely that CVCs invest in projects out of strategic needs of their Mother companies. So determination of these clinical fields before submission of a proposal is crucial for start-ups.

The other important factors is innovation of project, as many CVCs explicitly announced that they only invest in really novel compound rather than in “me too” drugs. Then strong and reproducible science is one of the factors that CVCs consider to invest in company project.

Three CVCs thinks physical distance is one of the factors that they consider when making a decision about investment. The main reason is the shortage of human resources to attend in board meeting of invested companies. They usually prefer to invest in companies which can fly easily to them. For bigger corporation which has representative in different regions, it has less importance.

Taxation system of host country is not important for investor at all. They did not even ask any question about the detail of taxation in Sweden from us. A one of them mentioned “*We look at Sweden as a standard financial market, so we are not concerned about taxation in Sweden*”.

It seems that labor market and legislation can be a concern for some investors. One of interviewee asked about the liabilities of investors in case of shutting down of a company/project in Sweden. He described that his company had to pay two years to its employee after failure of one of project in Netherlands. Then it can be one of the areas that small companies should gather enough and precise information about it.

## Discussion

Big pharmaceuticals and their venture arms (CVCs) can play an important role in commercialization of project in life-science industry due to their experiences in product development process, organizational competencies, extensive marketing capabilities and enough financial resources. As drivers of these corporations can be different from other investors in life-science industry, knowing their priority and decision-making process can be extremely important for start-ups in life-science who are looking for cooperation with CVCs. However, it should be considered that there is not “one size fits all” approach for all CVCs, so it is recommended to do an extensive and sufficient research in each CVCs before submitting any request (CVC seeking innovation and growth, 2008)

Management competencies and expertise, especially in senior management team, is the most important parameter for CVCs. Usually investors feel strongly that the management competencies are the key factor for success of company. So many experts recommend that achievement of management in relevant business fields should be presented for investors (Silversetein and Osborne, 2002)

As the mission of CVCs is finding strategically-fit project for their parent company, CVCs rarely go out of the areas that are defined by parent companies as “preferred areas”. It is crucial for companies who look for investment to know these areas and prepare a presentation based on the strategic needs and interests of CVCs. Considering this “strategic needs” also sends signal for CVCs that small enterprise has already studied CVC investment portfolio and reflect the professionalism of proposal.

The importance of strategic and financial objective may vary from CVC to CVC and even among different strategic areas within one single CVC. CVCs try to bring the innovation to their parent company by dealing with different smaller company, however, some of CVCs would like to return a reasonable profit to their parent company, while in other CVCs they only want to be a part of market and view the “deal flow” of specific technology. Consequently, in some cases, CVCs are not interested in taking “equity” from the company (CVC looking for innovation and growth, 2008). Considering different drivers of CVCs can lead small start-ups to have more profitable deal.

Novelty of product/services is one of the areas that have high value for CVCs. Companies who look for investment should consider this aspect and try to reflect it in their presentation. It seems that it is quite important for investors to see the way that your product/service can be differentiated from existing solution and how your product/service can add value for prospective customers. It is advisable that this part writes in non-technical language and tries to use other descriptive tools, such graphs and bars, to convince the investors. On top of strengths of product, the weakness of product also should be presented to create a reasonable expectation for investors (Silverstein and Osborne, 2002)

VCs and CVCs usually control their invested companies by assigning representative in board of directors. Consequently, the distance between their head-quarter and location of companies is important for them. It is clearly mentioned in some of our interview that they limit their investment in specific geographical location.

Swedish taxation structure is not an issue for investors at all. Tax was considered as one of the barrier for investor, before initiation of interviews; however, during conducting interviews,

researchers realized that none of interviewees are concerned about taxation. We even tried to ask specific question about possible tax issue, while all of interviewees told us confidently that it will not be an issue for us in case of making investment.

## **Recommendation**

### **Meet investors as much as you can proactively**

Almost all of investors emphasize that they need to meet the management team of company. It seems that on top of management competencies, investors also need to evaluate characteristics and personality of key managers, as they need to work together for a long time. Meeting investors can also work as individualized marketing activity for companies. So it is highly recommended to plan to visit and knock the door of your prospective investors. Events such Bio-partnering events can be a good start. Moreover, utilizing the network and expertise of other people/organization such as Stockholm Business Region Development can be very helpful.

### **Improve and document your management skill**

Mentioned above, a management competency is one of the most important factors that investors look for. As a start-up you need to represent a reasonable level of managerial competencies. You can acquire these competencies or bring it to your organization by hiring by hiring experienced managers. In both ways, recording and documentation of your achievement is very important, as "*being on track*" from time and financial perspective can make your position in stronger for future deals.

### **Presenting your achievement in professional way**

The importance of presentation of result and achievement should not be undermined, as it can affect the perception of investors from your presentation skill significantly. A professional presentation does not necessarily mean the positive points and strengths of product. In some cases presenting negative results in very smooth way can send the signal for investors that you are able to handle even negative consequences of your project. Always remember that fantastic achievement cannot guarantee that you get the deal, so do not forget to meet investors.

## **Conclusion**

Our analyses reflect that CVCs create firm value mostly when pursued strategic reasons. Despite of independent Venture Capitals, CVCs are highly interested in investing in early stages projects, as it seems that they want to provide enough strategic support for their Mother companies. CVCs also invest more in drug development platform, infectious disease, Neuroscience and oncology, as these therapeutic areas are quite match with the strategic needs of parent companies. As most of CVCs based on US, they mostly interested in North America's firm. A qualitative research is needed to reveal CVCs' criteria in more comprehensive way.

We interviewed seven biotech/pharma CVCs globally. Our study showed that CVCs' investment more relies on strategic development of their mother company. There are some important factors that CVCs will consider when they evaluate the target company. They more focus on management skills and competencies, scientific background, their strategic needs, communication and distances of companies. We also obtained some information which we hypothesized for lack of investment in Sweden. Financial structure such as tax is not the problem. There should be some success story in Sweden as a "good beginning" for attracting CVCs into here.

## References:

- Driving the path to a successful European exit, Håkan Kirkeby Buch, Anna C Gustafsson, Viktor Drovota & Carl Johan Sundberg, *Nature of Biotechnology*, 2011
- Strategies for attracting healthcare venture capital, Beth Silverstein and Carl Osborne, *Journal of Commercial Biotechnology* (2002) Vol. 8, 4, 315-319
- The rise of venture capital and biotechnology in the US and Europe, Douglas P Lee & Mark D Dibner, *Nature Biotechnology*, June 2005, Vol. 23, No. 6,
- A Venture Capital View of Challenges, Opportunities, and Innovation in Biomedical Research, LT Ratcliffe, *Nature of Biotechnology* (Feb. 2011), VOL. 89, No.2
- Financial Times Lexicon, <http://lexicon.ft.com/Term?term=corporate-venture-capital>
- Evaluation of uncertainty of venture capitalists investment criteria, Tobias Kollmann, Anders Kuckertz, *Journal of Business research*, 63 (2010) 741-747
- Geoff Meyerson and Ameya Agge, *Biotech Venture Capital: the investment decision process*, the journal of private equity, summer 2008
- Corporate Venture Capital (CVCs) seeking innovation and strategic growth, Ian MacMillan, Edward Roberts, Val livada, Andrew Wang, National Institute of Standards and Technology, U.S. Department of Commerce, 2006
- Corporate venture funds chase early-stage deals, Peter Mitchell, *Nature of Biotechnology*, Vol. 27, Number 5, May 2009
- Critical Factors for Obtaining Venture Funding, *Garage Technology Ventures*, 2010

Biotech venture capital- it's not too late to be early, Arthur Klausner, Nature Biotechnology, Vol. 23, No.4, April 2005

Can the pharmaceutical industry reduce the attrition rates? Ismail Kola and John Landis, Nature reviews, Drug Discovery, Vol 3, P. 711, August 2004

The Swedish Drug Development Pipeline produced five new products during 2008 May, 2009, the survey conducted by SwedenBio, Invest in Sweden and Vinnova

<http://www.swedenbio.se/en/About-Life-Science/Swedish-Life-Science/Short-facts-on-Swedish-life-science/>

# Appendix

## Number of invested companies in therapeutic area

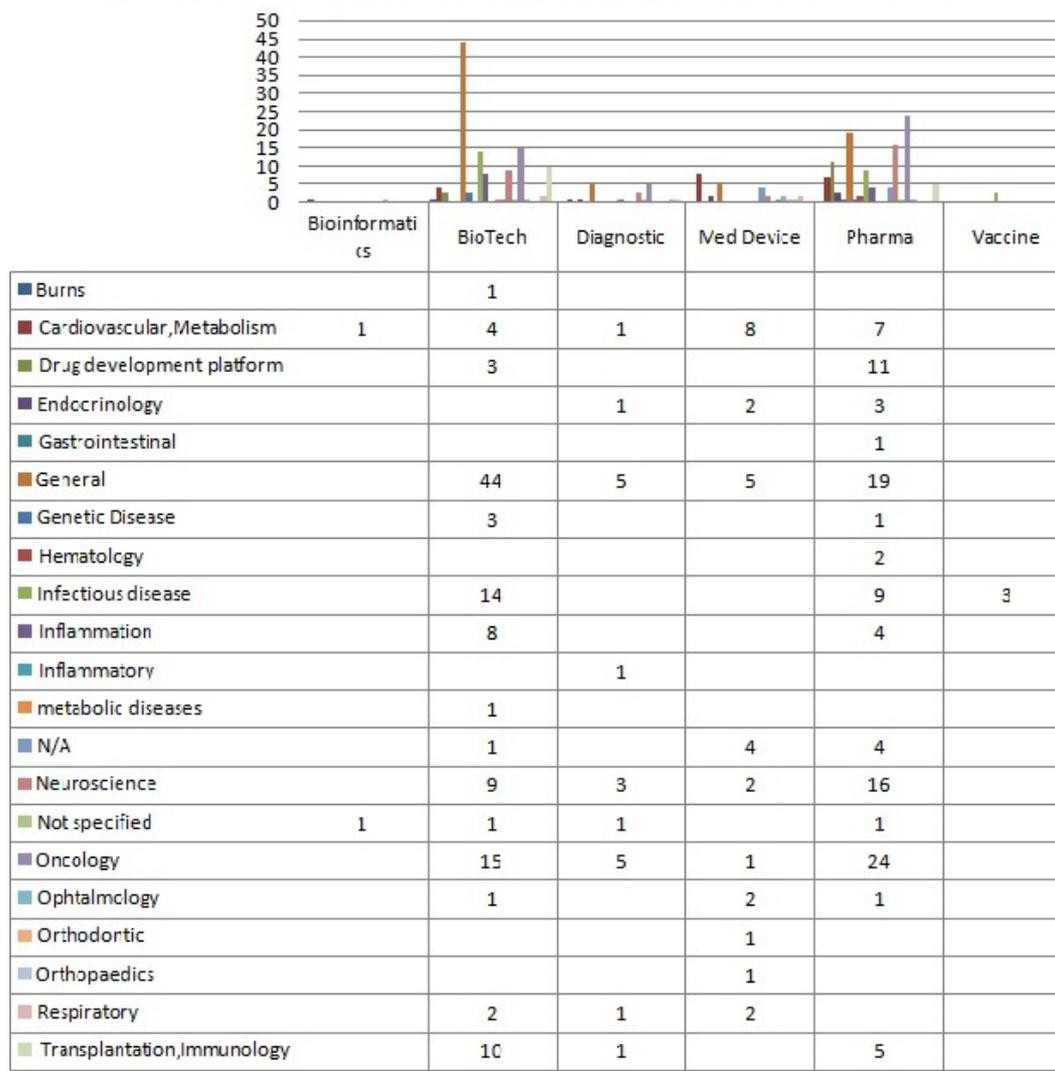
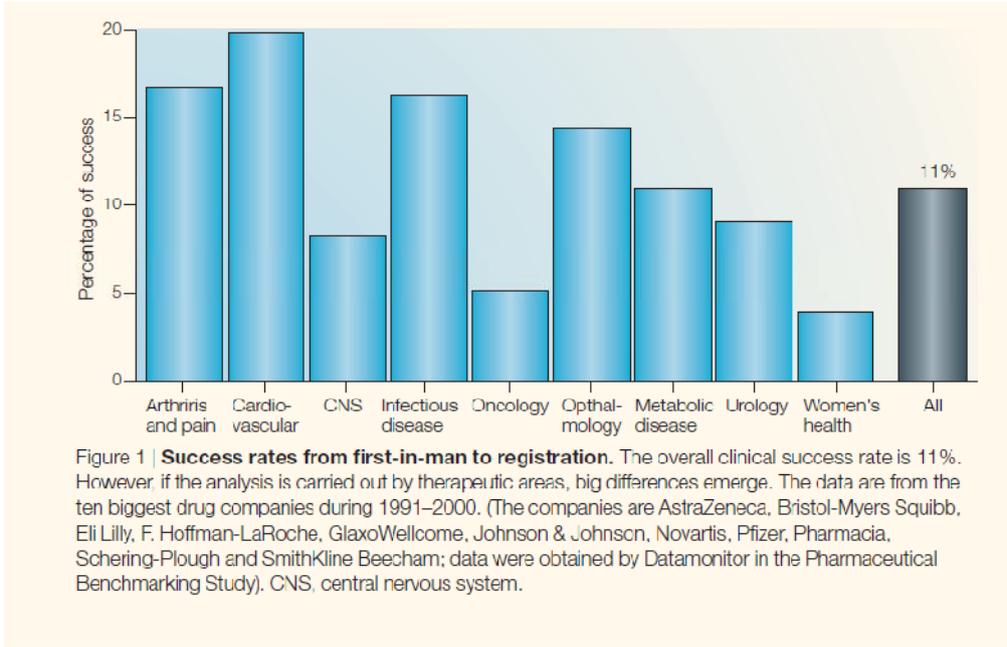


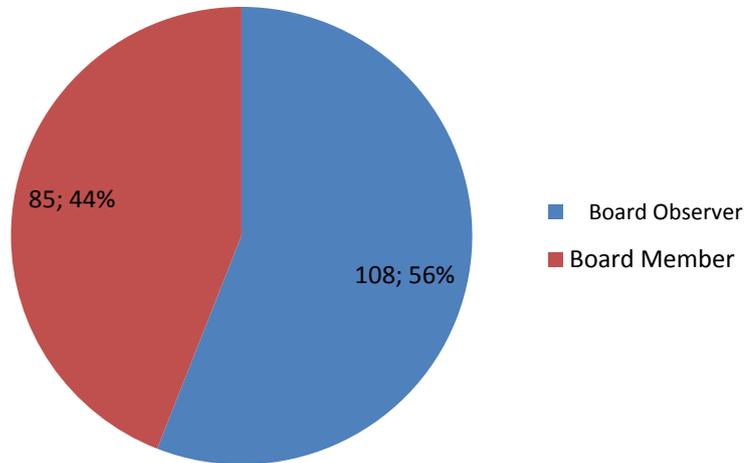
Table 1



**Table 2: Success rate of project in different therapeutic areas in clinical stages**

Source: Can the pharmaceutical industry reduce the attrition rates? Ismail Kola and John Landis, Nature reviews, Drug Discovery, Vol 3, P. 711, August 2004

## Role of Investors



**Table 3: The distribution of Board member and board observers in invested companies**

### Summary of Interviews:

Interviewee A is the Head of Venture Investment one of the biggest pharmaceutical industry.

### Summary of interview with A:

- A analysis and defines its needs periodically and the projects are selected based on this internal prioritization
- Management is the most important factors for A. if A can find competent managers, it decides to invest in company
- As a huge company with different department, they evaluate most of project that different areas; however, they also consider their internal prioritization
- They consider strategic fitness of project with needs of mother company, so they are flexible about ROI
- They are not so concerned about the financial market and regulation in different countries, as they see the similar frameworks in different countries
- They have concerns about the liabilities of investors in EU countries.
- They prefer to have a local partners that can provide local information and also help them to find local talents
- In contrary to the most of American CVCs, they have local agents in different areas who can watch different projects. Their local agents for EU is based on Belgium (half of his time) and Israel.
- The way that A defines and prioritizes its needs is quite unique. They have two different areas:
  - The strategic needs of current business of A
  - The strategic needs for future goals of A. For instance, they realized that A should be active in “Neurostimulation” field in near future, so they look for projects that can help them to address this need.
- One of the most interesting points that representative of A CVC mentioned was that “they first look for competent manger and if they can find him/her, they can handle everything; otherwise they are so hesitant to invest. So competency and quality of management is the main and first factor that they consider
- He has a serious concern about the labor market and liability of investor in a company in front of employee. A had a tough experience from an investment in Netherlands and as he said they were liable till two years about their employee after their investment, while the company is not so long active.
- A is interested in investment in Sweden; however, he referred me to his colleague who is responsible for EU.

### **Summary of interview B:**

#### **Interviewee B is managing director of one of the biggest Biotechnology firm.**

- B prefers to invest on really novel compounds not me too product
- Strong science is needed that means reproducible science in different set up
- They look for experienced management teams who has been worked in biotech or big pharmaceutical in relevant department; however it depends on nature of companies
- They invest only in specific therapeutic areas. They even ignore the interesting project that is not in specific therapeutic areas. The future of specific therapeutic area is so important for B.
- They prefer to not enter into highly competitive market with lots of competitors as it is the place of smaller companies. they prefer to work on novel clinical areas

- Strategic aspects are more important than ROI for B, but it depends on companies as Novartis, Roche, Eli Lilly are more restrict about the ROI. B also likes to have a good ROI, but strategic value is more important.
- B prefers places with strong biotechnology industry and good universities.
- Taxation is not an issue at all.
- B usually invests in project in cooperation with other investors. So existing competent local investors is key for B.
- B usually invests in North America in order to shortage of people. Janis knows that a lot of interesting project is available out of North America, but she currently cannot afford to invest in them.
- The typical project that B is interested in investing is strategically important project in preclinical stage. The project should have enough data behind it e.g animal data and scientifically sounds, so they prefer to invest in products which are not in lead generation phase. Project should have strong science and B prefer to partner with other investors.

### **Summary of interview with C:**

Interviewee C is the vice president of one of the biggest industrial company that has pharmaceutical division as well and it is based on Boston MA.

- They only invest in really innovative project
- When the company is based on license-in technology, they do not expect too much from management to have scientific background, but they expect to have managerial competence in running companies
- Honest and transparent, not hide negative things, carefully spending money, and good network
- They prioritize the therapeutic areas internally and only invest in selected fields. If they face very interesting project out of these selected therapeutic areas they ignore
- It depends on how competition is defined. They enter a market with really high number of products which do not work, but they avoid to enter the market with many outstanding products
- For C strategic importance always ranks first, so they do not care too much about valuation and ROI but due to partnership with other VCs, they cannot invest in a project with unreasonably high value.
- It is the macroeconomic factors that out of our control, so they do not care about it
- They consider most of the cities as the standard market that have the quite same situation.
- Except the very limiting rule they do not care about it
- They prefer to collaborate with local partners and they expect their local partners to assist them in understanding market situation, access to better network for hiring managers ...
- C makes an internal prioritization that usually is tied with strategic value of Mother Company. Unlike VCs, this CVC is highly focused on strategic importance of project.

### **Summary of interview with D:**

Interview D is one of managing partner in San Francisco who has had work experience as venture capitalists in Sweden

- Sweden needs more success story in life-science industry. These success stories can attract more investors
- the research are perfect, but development process should be improved
- People in Bay Area are very hard-worker and disciplined.
- They focus only on tasks that they are good at.
- People in SF have more freedom to choose their working style (Teaching Vs. research)
- Transfer between academia and industry is much easier than KI
- Genentech play the role of an engine for development and innovation in biotech in Bay Area. It seems that Stockholm suffers from lack of the same thing.
- Lots of big pharma founded research centers around UCSF campus.
- The number of start-ups in Bay Area is enormous. Many persons have example among friends and relatives that found a company. This atmosphere encourages others to build his or her company.
- The competent manager for investors is a person who has already done the process of product development for couple of times.

### Survey from company E

- E had some contacts before with *Invest in Skåne* and *Invest Sweden*. Unfortunately, they couldn't support suitable project to company.
- There is no difference in E's evaluation system among counties in these areas.
- E are very strategic investor for E pharma. The investment is not for financial return, but for the returning in the future such as research collaboration, licensing or acquisition of the company by E. E are looking for the company which is fitting to the E strategy.
- E don't need involve in management of Venture Company, they just take board observer role for tracking the company progress, not board seat.
- Science and technology are the most factors. The science should be evaluated by E researchers or outside experts. ii) Quality of management. The company experience and humanity are important. iii) Venture capital syndicate. See what kind of VCs is involved in the investment. iv) Business of model of venture company, like is there any clear goal, exact plan, the timing of the goal etc.
- Financial structure (eg. tax) is not a problem at all. E is board of observer in Denmark Company before; they don't feel any problem there.
- They don't know that much about Stockholm-Uppsala region.
- E thinks Stockholm situation quite similar to Copenhagen, New Zealand or Israel. There are so many countries are enhancing pharma/bio venture activity. Sweden is a good place for E to think of investment. Unfortunately, they can't find suitable opportunity there. That is the only reason.

### Survey from F

- F has strategic angel to our business, they don't invest any company from financial prospect.
- Country and geography are not issues and problems.

- Companies should be active in the area that F interested in, such as diabetes and inflammation. Some other technology company which could generate and complement their internal pipeline.
- F has very good internal collaboration with their R&D function. Their needs, interests will make the direction of the investment.
- F search targets basically through other VCs. Joining the VC pool, and attend lots of investment conferences.