Foreign Investments and Peripheral Science & Business Parks - a Complex Relationship

A case study on the attraction and effects of foreign investments in rural science and business parks

Bachelor Thesis

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Abstract

This thesis aims at monitoring and evaluating the processes of policies on science and business parks, attracting foreign investments which facilitate knowledge spill-overs. The different location factors in rural science and business parks are assessed by using the case of *Kennispark Twente. C*onclusions are drawn on the attractiveness of these sites for foreign venture capitalists and investing companies. These types of inbound investments are evaluated as mandatory for a successful transformation from a de-industrialised region towards a high-tech cluster of national importance, creating positive spill-over effects and ultimately increasing the regional wealth.

The overall research question, *"How can the attraction of inbound foreign investments in science parks contribute to regional re-industrialisation"* is answered by applying a mainly qualitative research design based on various interviews with involved stakeholders and a secondary literature and newspaper analysis.

This research identified a variety of measures which have a signifiant impact on the regions attractiveness to foreign investors. The main assets of the Kennispark Twente lie in the proximity between the academia to the private business sector. Yet, it seems that all the available domestic funding, business support and access to research led to the development of a homogenous but in size limited business sector, dominated by spin-offs and smaller SME's. A barrier is detected in the development of SME's from the roll-out towards the growth stage in which additional talents with non-technical but international backgrounds are needed. This diversity in the local HR-pool is sufficiently visible and limits the business developments of the respective companies. Yet, the recent settlement of Cottonwood European Technology Fund, an American VC, gives hope that this barrier will soon be overcome if future measures enhancing the visibility and attractiveness of the region are implemented by the respective local and regional authorities.

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Finally, without the support and willingness of my family and friends to assist me in the writing process of the thesis, I would not have reached this point.

Sincerely,

Yann Paul Hengstenberg

Enschede, in June 2016

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List of Abbreviations

A-B-P	Academia-Business-Public
BA	Business Angeles
B2A	Business-to-Academia
B2B	Business-to-Business
CETF	Cottonwood European Technology Fund
CoC	Chamber of Commerce
FDI	Foreign Direct Investments
FTE	Full Time Equivalent
HRM	Human Resource Management
IP	Intellectual Property
IPO	Initial Public Offering
MNE	Multinational Enterprise
OECD	Organisation for Economic Co-operation and Development
PA	Public Administration
SBP	Science and Business Park
SME	Small and Medium Sized Enterprise
SP	Science Park

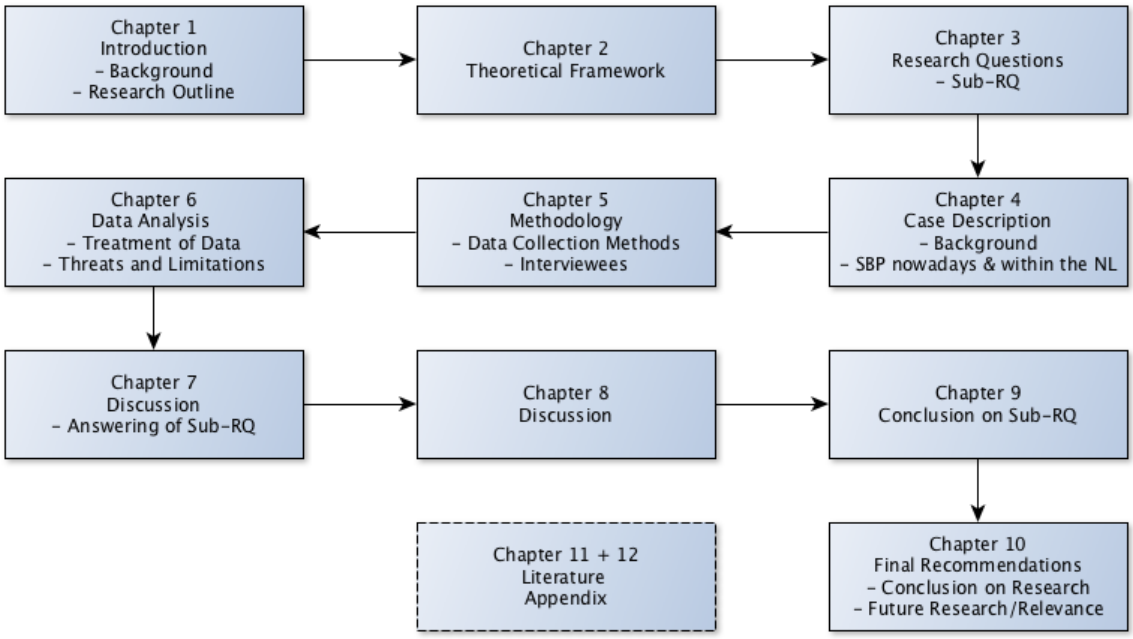
UNCTAD	United Nations Conference on Trade and Development
UT	University of Twente
UMC	University Medical Centre
VC	Venture Capitalists

Key words: Science and Business Parks, Foreign Direct Investments, Regional Spill-Overs, Start-Ups

Structure

This thesis is structured as follows:

Figure 1. Structure of thesis



Chapter one focusses on the scientific relevance of the scientific study and how it contributes to the existing knowledge base. This implies an introduction to the exact research objective and the resulting research questions. Chapter two provides the current state of art of available theories on relevant concepts for this investigation and shows how these interrelate. Section three provides the reader with the research questions, followed by chapter four in which a detailed description of the relevant case is given. Chapter five presents the overview over the applied research design and methodology. The sixth section provides the data analysis while chapter seven deals with the gained evidence of the research. The final two chapters of this paper, nine and ten, subsume the collected theories to the gained intelligence and develop recommendations for involved stakeholders for the attraction of FDI. Chapters eleven and twelve provide the literature and references.

1. Introduction

1.1 Background

“If you always do what you always did, you will always get what you always got.”
Albert Einstein

Many Western industrial areas have experienced in the second half of the past century an enormous decrease in economic wealth and business activities. These trends were accompanied by an increase of production related costs and deteriorated locational qualities. The effects were manifold, making these regions unattractive for private investments and ultimately led to a phase of outward-industrialisation and economic downturns. The Ruhrgebiet, Wallonia, Twente and North-East-England are just a few prominent examples of regions which suffered from this trend but sought new strategies and profiles to overcome this recession. As a result, the second half of the past century has been characterised by policy makers applying a variety of different innovation policy instruments to stimulate the economy and foster entrepreneurial activities. Among the affected regions in Europe, the strategies which were identified and used to compensate best for the de-industrialisation differed strongly.

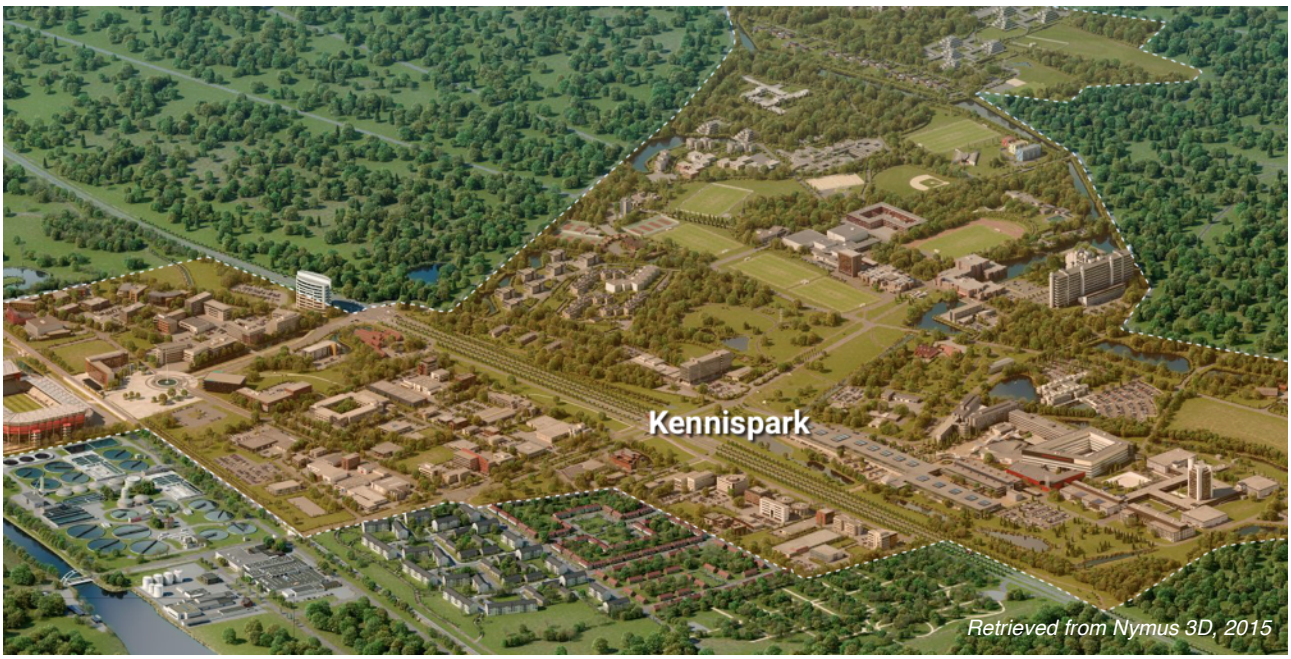
One of these applied instruments were spatial experiments in which clusters were created to foster knowledge transfers between the business and academic sector. These approaches sought to establish new and revitalising connections which were assumed to recover regional wealth. Etzkowitz (1993) stated that “the vision [of a knowledge precinct] encompasses not only the creative destruction that appears as a natural innovative dynamic (Schumpeter, 1942), but also the creative renewal that arises within each of the three institutional spheres of universities, industries and governments”. Etzkowitz’ defines Science and Business Parks (SBP’s) as the entity in which these three relevant local stakeholders collaboratively interact to create positive spill-over effects. OECD research confirms Etzkowitz’ theories, defining as critical drivers of regional growth the spatial proximity between infrastructure, human capital, innovation and agglomeration within regions (OECD, 2011).

1.2 A short overview of the case “Kennispark Twente”

Twente as a non-administrative region is situated in the East of the Netherlands in the province of Overijssel. Back in the 1950’s, Enschede won a competition held by the

Ministry of Economic Affaires to establish the Netherlands third technical university (de Boer, Drukker, 2011). The University of Twente opened in 1964 and was designed to support the local but declining textile industry with a diverse pool of highly qualified engineers (Schutte, 1999). The Science Park "*Kennispark Twente"* was officially founded three decades after this milestone in regional development policies. This SBP was planned as a spatial experiment, merging the existing business park and science cluster around the campus of the university. A decade later, the establishment of the Kennispark Twente Foundation to further facilitate the knowledge exchange was realised by the local stakeholders. Nowadays, a mix of 400 local and foreign companies is present at the site, employing a total of 6.500 workers (Heiinovate, 2015).

Figure 2. SBP *Kennispark Twente*



1.3 *Research outline*

Specifically, this paper is interested in how regional policy makers act to attract foreign investments for start-ups in peripheral SBP's which ultimately lead to positive spill-over effects. It is expected that innovation is likely to be triggered by foreign investments in start-ups and SME's. Yet, specific measures by policy makers are necessary to promote and compensate for a reduced international recognition of the SBP due to a peripheral location (further visualised in graph 1, *Assumed Processes).* These assumptions lead to the exploratory research question of "*How can the attraction of inbound foreign investments in science and business parks contribute to regional re-industrialisation?"* Based on the following theoretical framework, four sub-research questions are derived to

Figure 3. Assumed causations

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further define the research's goal. In order to trace the actual knowledge spill-overs in the Twente region as the respective case, several interviews among relevant stakeholders are conducted, supplemented with findings from a web-research. The gained evidence leads to an evaluation of the attractiveness of rural SBP's and provides recommendations for their future development.

This thesis aims at contributing to simultaneously conducted research on the Kennispark Twente by increasing the understanding of how peripheral SBP's struggle to attract foreign investments.

2. Theoretical Framework

2.1 Introduction to theoretical framework

In the following, the three relevant concepts "Innovation Policy Instruments on Science Parks", "Inbound Foreign Direct Investments" and "Knowledge Spill-Overs" are further assessed in the light of the relevant literature. Since the collaboration between the various stakeholders plays an important role in understanding the dynamics between the responsible stakeholders, Etzkowitz' Triple-Helix model is briefly introduced to the reader.

2.2 Concept of "Innovation Policy Instruments"

The concept *"Innovation Policy Instruments"* on SP's is a measure ultimately aiming at realising outcomes of strategic relevance for large-scale initiatives such as regional development projects. OECD-research on regional growth determinants has identified several complementing aspects which influence urban development, namely (1) the local infrastructure, (2) the human capital, (3) innovation capacity and finally (4) the economies of agglomeration (OECD, 2014). Yet, these growth determinants are evaluated as only successful if realised in an endogenous approach at regional level. This claim is validated by further studies of the OECD on urban growth determinants, revealing the negative and unsustainable impact of national top-down policies (OECD, 2011). This implies the

necessity for local legislators to built upon place-based factors and geography, mobilise local actors and develop an inclusive and co-ordinated policy agenda targeting the growth potential of the region (OECD, 2014).

The local human capital pool has to be therefor the key target of any innovation policy instruments. As OECD-research has shown, the most robust and also sustainable economic growth can be achieved if the local workforce is trained and qualified while at the same time the long-term unemployment-ratio are significantly lowered. Infrastructure improvements as an additional element of effective regional innovation policy instruments are by itself not necessarily successful but prove to lead to higher growth (OECD, 2014). Furthermore, the effect of economics of agglomeration on the urban development is evaluated by the OECD as beneficial but does not exclusively count as a precondition for local prosperity.

Another influential element in innovation policies is the innovation-component itself. Innovation is assumed to produce the most lasting and positive effect on regional growth, especially in regions with a high GDP per capita (OECD, 2014). Innovation itself is defined as “new creations of economic and societal significance, primarily carried out by firms (but not in isolation)” (Edquist, 2014). It is assumed that innovation policy instruments tend to be successful if these “include [measures which] support linkages between firms and knowledge institutions across the border, cluster-related efforts to support companies in common areas and shared access to certain science facilities” (OECD, 2014). From a practical perspective, these innovation instruments “have to embed knowledge communities within emergent knowledge districts and [have] to identify the key areas of leverage and dynamism (Benneworth and Ratinho, 2012). More generalistic, Iammarino and Archibugi (1999) evaluate as the most appropriate approaches policies targeting the diverse fields of public administration, education and training.

Innovation policy instruments can be applied through the entire hierarchical axis of public legislation and -execution. Entrepreneurial universities are according to Etzkowitz (2005) the most influential actor and catalyst of any innovation policy. The commercialising of higher education and strengthening of socio-economic developments led to the establishment of many SBP’s in the past decades (Lindholm and Lawton, 2003). It is assumed that especially SP’s “are a major source of technological innovation” (Acs and Audretsch, 1987) and have a positive influence on the performance measures of already established SME’s (Westhead and Batstone, 1999).

2.3 Concept of "Inward Foreign Direct Investments"

The effects of *Inward Foreign Direct Investments* on the innovation capacities and economic performance of companies have attracted in the past decade a high amount of attention. Much research was conducted to monitor the origins and destinations of monetary flows, the specific impact on local, regional and national economies and how corporate decisions were influenced. Research confirmed that foreign investments tend to increase the economic productivity within the recipient country (Aitken, Harrison, 1999). The concept of foreign direct investments is defined by UNCTAD (1993) as "an investment made to acquire a lasting interest in or effective control over an enterprise operating outside of the economy of the investor." The OECD extends that definition by adding that FDI's are "creating stable and long-lasting links between economics" (OECD, 2015).

As Moosa (2002) states, foreign direct investments normally occur as a sustainable engagement in foreign businesses. Therefor, the concept of inward foreign direct investments can be viewed as a mechanism generating economic growth by enhancing technology-absorption and knowledge-acceleration in the target areas (*for further illustration, see Appendix, Figure 12.8*). Since FDI's and economic growth turned to be increasingly endogenous, "the promotion of human capital, technological capabilities and economic development [via the means of policies targeting specific tangible areas] will lead to more FDI inflows" (Li, Liu, 2005) (*for further illustration, see Appendix, Figure 12.2-12.5)*. All *foreign direct investments* are equity based and differentiate from other forms of entry strategies such as licensing or joint venturing via the supervision and control of the management team of the acquired company (Ball et al., 2008). Inward foreign investments can occur as either direct investments or acquisitions (Buckley and Casson, 1998).

The choice which of these strategies to perform rests on the exact market structure within the recipient country. If local competition is high and various companies strive for market shares, acquisitions are evaluated as a more successful entry tactic. In contrast, if the market is not fully developed, it is more favourably to use foreign capital to invest in to-be-built own subsidiaries. These greenfield investments are evaluated to stimulate effectively the local economy by increasing the competition among the already existing market participants and hence are preferred by national governments (Buckley and Casson, 1998). Regions striving for foreign investments are likely to apply regional development measures to demonstrate "how good returns can be made on investments in their territory, and be ready to help make those deals attractive" (OECD, 2007). The actual companies of interest for foreign direct investments are typically in the roll-out or

growth-phase of their business development (*see Appendix, Figure 12.9*). Yet, promising intellectual properties are also able capturing foreign investments even if the respective company is still within the prototype-phase according as visible in figure 12.9 To capture the different types of inward foreign direct investments, greenfield investments, acquisitions and loans by foreign companies, venture capitalists and business angels are evaluated as relevant elements in this research.

2.4 Concept of "Knowledge Spill-Overs"

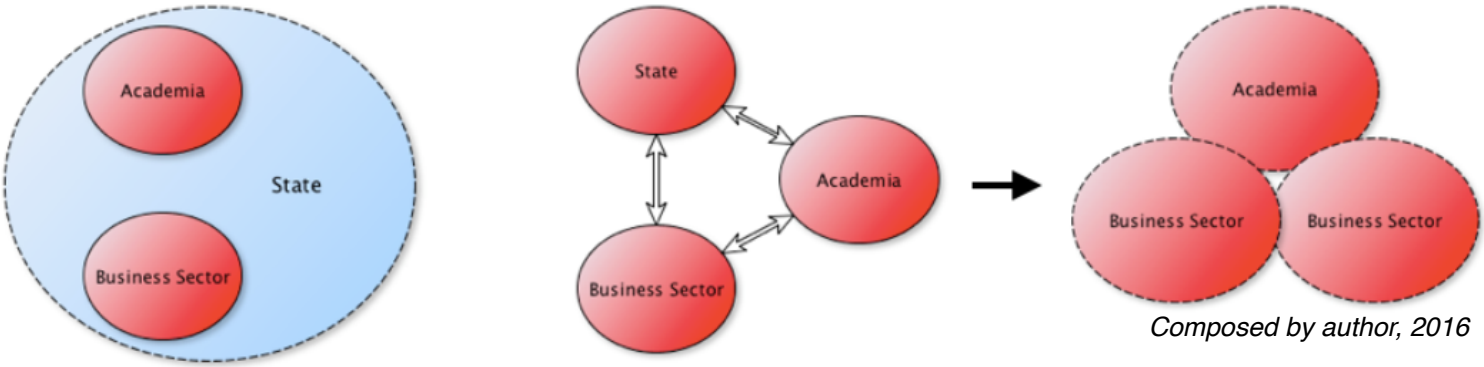
"Knowledge Spill-Overs" count as one of the most relevant components of innovation systems and bear high importance for any public policy targeting the economic sector (Deng, 2005). Knowledge, partially non-excludable, is assumed to evolve in densely concentrated areas with a high concentration of qualified agents in similar professions. Therefor, proximity between the knowledge-sharing actors in these communities bears essential importance in order to generate "learning and create compatible knowledge spill-over effects (Hu et al, 2005)" (Benneworth and Ratinho, 2014). If knowledge is mobilised and shared between parties, innovation and subsequently (foreign) investments are likely to be attracted. This requires a high degree of connectivity within the system in order to fully exploit the potential of proximity effects.

Yet, as Acs, Audretsch and Feldman have stated (1994), knowledge spill-overs between research institutes and the business sector do not enfold always the same impact. Research evidences suggests that these effects tend to have a more significant impact on the innovation activities of SME's than on MNE's. As Zacs and Audretsch (2005) conclude, "[…] in fact, large firms are more active in university-based research. However, small- and medium-sized enterprises apparently are better able to exploit their university-based associations and generate innovations." The efficiency of SME's with normally employing not more than 5 to 15 staff members (Zacs, 2005) originates in their professionalism of utilising best the (intellectual) resources provided by research facilities such as universities to transform these into economic success. Concluding, Jaffe, Trajtenberg and Henderson (1993) suggest that knowledge spillovers tend to be geographically bounded within the region where the new economic knowledge was created" (Acs, 2006).

2.5 "Triple-Helices"

"Triple-Helices" refer to the collaboration between Universities, Governments and Industries and was first introduced by Etzkowitz in 1993. The concept is the result of transitions in Western countries in the mid 1970s when "the role of the military [as driving force behind economic development] decreased and academia [arose] in the institutional structures of contemporary societies" (Etzkowitz and Leydesdorff, 2000). This concept was controversially discussed among scholars (see Lawton-SMith, Leydesdorff, 2014) and textual questioned wether universities shall play such a prominent role in contributing directly to industrial operations instead of focussing solely on their traditional mission of educating societies (Benner and Sandström, 2000). Nowadays, universities still undergo this purpose-transformation to expand their missions (Etzkowitz and Leydesdorff, 2000). Concluding, Ranga and Etzkowitz (2013) argue that the shift from the industrial society, dominated by Industry-Government boundaries, towards the modern knowledge society expanded the traditional Dual-Helix to a Triple-Helix (*see Figure 4.*).

Figure 4. Triple-helix models



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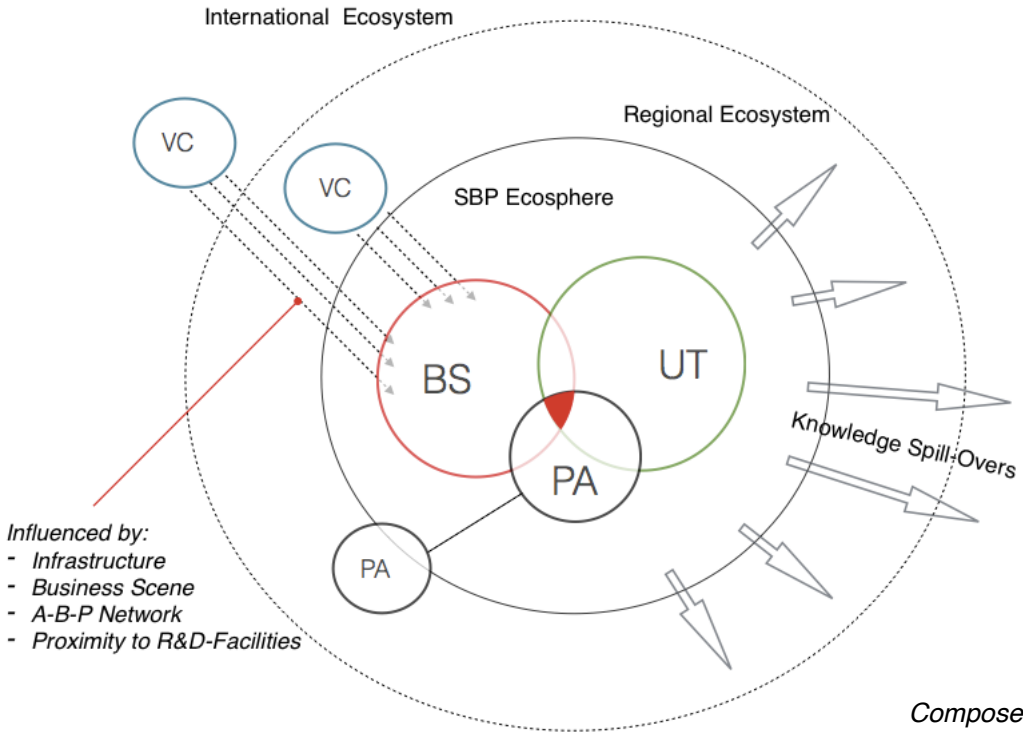
The triple-helix model ads to this analyse by understanding the interactions between the different helix-actors as observed and analysed in the following. Etzkowitz and Leyesdorff put the argument forward that the *état* (innovation is managed by the state) and *laissez-faire* (innovation is the result of loosely coupled parties)-models of innovation recently developed into an interrelated model since "it is necessary for governmental institutions, universities and industries to interact closely" (Brännback et. al., 2008) (*see Figure 4. Triple-helix models*).

2.6 Summary

Together, these three concepts form the core of this research on how FDI's could successfully being attracted, creating knowledge spill-overs through investments in start-ups and finally benefit the region. *Figure 5, SBP ecosystem,* illustrates the expected correlations and exclusive interactions of the introduced concepts and contextualises these for the following elaborations.

Figure 5. SBP ecosystem



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3. Research Question

3.1 Introduction

The preceding sections have elaborated on the overall conditions of the ecosystem of the Kennispark Twente and the theoretical background of this study. The already mentioned, exploratory research question of:

“How can the attraction of inbound foreign investments in science parks contribute to regional re-industrialisation?”

is further defined by the following four sub-research questions. Especially the complexity of monitoring and understanding foreign investments in rural science parks required these additional sub-research questions. Consequently, a focus has to lie on the characteristics which actually make the Kennispark Twente an attractive target for foreign investments. It is therefor necessary to understand the underlying mechanisms behind the organisational structure and how the different stakeholders interact. Furthermore, it is of importance to analyse what the exact needs of SME’s and start-ups in SBP’s in generally and within this particular case are.

3.2 Sub-research questions

For this purpose, the following sub-research questions sound:

Sub-RQ 1: “Which factors are most efficient in attracting inbound foreign investments?”
Sub-RQ 2: “What are the long-term effects of foreign investments on invested SME’s?”
Sub-RQ 3: “To what extent can an association between FDI’s and measurable regional spill-over effects be observed?”
Sub-RQ 4: “Which policy instruments attract most foreign investments?”

By answering these sub-research questions, a better understanding of the relationships between the different stakeholders and mechanisms behind the successful attraction of foreign investments is aimed to be achieved.

4. Case Description

4.1 Background

The science and business park *Kennispark Twente* in the Dutch province of Overijssel was chosen because it reflects well the developments over the past 50 years

having severely affected Western industrial regions. The monopolistic position of the textile industries in the Twente region with some supporting branches such as machinery and metal engineering shaped the local economy for decades. In the wake of the de-industrialisation and decline of textile manufactures in the 1960's and 70's and the establishment of the UT in 1961, the following years have seen many different approaches in changing the traditional economic trajectory. Early research on the impact of the University of Twente on the surrounding businesses led to the confirmation of the underlying "positive effects of geographical proximity to academic knowledge production on investments and innovation in incumbent firms" (Florax, 1992; heinnovate, 2015).

These results provided the arguments for committing to the spatial experiment of establishing the Kennispark Twente, a business and science park around the Djienerlo estate. This site aimed from the beginning at bringing together the different regional actors in close proximity to further attract high-tech and knowledge-intense businesses, ultimately leading to a dynamic, cross-fertilised knowledge community (Reezight, 2010). The SBP faced over it lifespan many developments such as the establishment of the MESA+-laboratories and the settlement of the High-Tech factory, the opening of a business incubator in "The Gallery" and additional re-organisations, leading to the present-day science park (Kennispark Twente Foundation, 2015).

4.2 The Kennispark Twente nowadays

The Kennispark Twente, to be distinguished from the Kennispark Twente Foundation, providing services and business support to young start-ups, faces each year between 40 to 60 new ventures, originating in research activities at the University of Twente and Saxion Hogeschool (Kennispark Twente, 2015). Over the life span of the SBP, more than 2.000 companies originated at the two universities (Future of High Tech, 2016). Approximately 50 million EUR are available as venture capital each year within the ecosystem, provided by the Twente Technology Fund, private investors such as Cottonwood and Siemens Capital (The Future of High Tech, 2016) and national funding programs (exemplarily, the Dutch "Innovation fund SME+" and the "Horizon 2020" initiative in conjunction with the European Commission; Netherlands Enterprise Agency, 2016).

In addition, business development services within the VentureLab Twente and through the TOP-program are available for start-ups and entrepreneurs. The resulting spin-offs of the science park demonstrated to have an impact on the region by supporting the creation of more than 6500 new knowledge-intense jobs (Kennispark Twente Foundation, 2016) and represent with reference to 2011 and onwards 10% of the fastest

growing high-tech companies in Belgium, Luxembourg and the Netherlands (heinnovate, 2015). The economic structure is nowadays dominated by the three spearheads, the information and communication sector, nanotechnologies and biomedical industries.

4.3 The Kennispark Twente and other Dutch SBP's

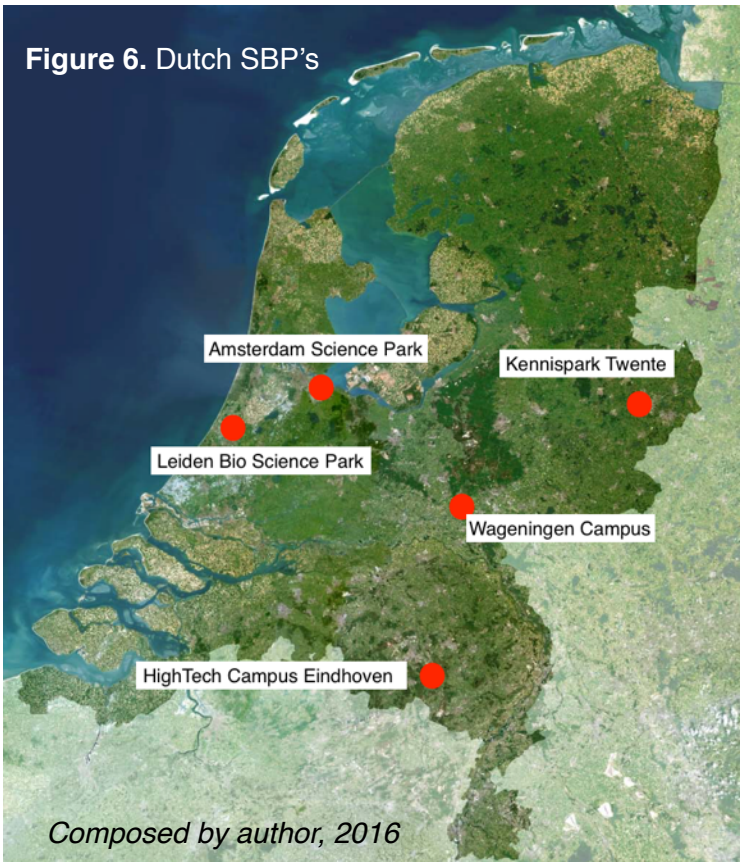

Figure 6. Dutch SBP's

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The Kennispark Twente differs from third SBP's in the Netherlands and on European level in size and structure. Compared to the most influential science and business parks on national level, namely the HighTech Campus Eindhoven, Leiden Bio Science Park, Wageningen Campus and Amsterdam Science Park, Kennispark Twente features notable differentiations as presented in *Table 1. Comparison of Dutch SBP's*.

The number of companies being physically located in Kennispark Twente ecosystem scores by far highest among the compared Dutch science and business parks. In contrast, the average number of employees lies lowest (~15 FTE) compared to exemplarily Leiden with an average of 51 and Eindhoven with 74 FTE. The main distinctive difference lies in the presence of several multinational companies at Eindhoven High Tech Campus, employing more than 1,500 FTE's directly and many more at their affiliates. In comparison, the Kennispark Twente does not host any MNE nor other company similar in size and turnover, leading to a contrasting economic climate. Furthermore, the Kennispark Twente falls behind with regard to the invested capital compared to SBP's located in the West of the country where companies collected several dozens of million EUR as venture capital (*see Table 1.*). Also, the overall available ground is by far smallest in the Kennispark with less than 24ha compared to the four-times larger HighTech Campus in Eindhoven with 103 hectares.

Table 1. Comparison of Dutch SBP's

Science & Business Parks	Number of Companies	Number of Employees (scientific staff)	Average Number of employees/ company	Area	Major Employer	Highest Investment in Enterprise
Kennispark Twente	421	6.500 (3.600)	15	24ha	Apollo Vredestein (1.400 FTEs)	Service2Media 9.0M (07/11) (n.a.)
Amsterdam Science Park	130	5.000 (5.000)	38	70ha	Amsterdam University College (~200 FTEs)	Ayden 243,3M /(12/14) (Late Growth)
Leiden BioScience Park	130	6.628 (10.272)	51	90ha	Leiden University Medical Centre (6.978 FTEs)	Aspects Software 23.8M (12/02) (Late Growth)
HighTech Campus Eindhoven	135	10.000 (0)	74	103ha	Philipps (>1.500 FTEs)	G-Therapeutics 36.0M (04/16) (Early Growth)
Wageningen Campus	85	1.999 (5.000)	23	55ha	Frieslandcampina (400 FTE)	Star Engines 2.0M (02/15) (Early Growth)

Data retrieved from StartupDelta, 2016 *Composed by author, 2016*

4.4 Conclusion

Coming to the conclusion, the local SME- and especially start-up scene has a constant need for new and additional fundings from all available sources. Especially young enterprises of the high tech sector with a high demand of capital seek access to finance. Still, barriers existed in the past to access foreign investments which remained rather negligible in this region. This is remarkable since the Netherlands score high in limiting barriers to foreign investors (*see Appendix, Figure 12.6: Restrictions to Inward Foreign Direct Investments)*. The one exemption of this trend is Cottonwood European Investment Fund (CETF) being attracted to the Kennispark Twente in early 2015 (Kennispark Twente Foundation, 2015).

5. Methodology

5.1 Research design

The goal of this thesis is to show on the case *Kennispark Twente* how peripheral science and business parks function to attract FDI's and how these processes could be improved in order to facilitate knowledge spill-overs. To answer this exploratory research, a

cross-sectional single-case (embedded) research design was applied. The single case design was appropriate because the explored instance built upon already established theories and represented a rare circumstance (Yin, 2009). It was also preferred since the method allowed the exercise of both primary qualitative and secondary quantitative measures. Qualitative research was preferred in this setting since it provided an in-depth understanding on the SBP by allowing social interactions between the interviewer and interviewees. Also, this strategy enabled the researcher to adapt to the social context. In addition, quantitative data provided further information on the units of analysis and was used to the check assumptions.

The numerous investigation-techniques were evaluated to be the most suitable approach to cope with this particular research layout since they map best “a contemporary phenomena within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 1994). Consequently, the motivation to apply a case-study research design was based on its ability to “cope with the technically distinctive situation in which there will be many more variables of interest than data points” (Yin, 1994).

5.2. Applied data collection methods

The qualitative part of this research, conducted in spring 2016, focussing on semi-structured interviews with professionals representing the relevant units within the observed ecosystem. In addition, quantitative data was collected to extend the knowledge base on foreign investments in the SBP Kennispark Twente by conducting a literature review on journalistic publications using the LexisNexis-database and the library archive of the University of Twente. The high degree of confidentiality on investment decisions of venture capitalist’s activities in the observed SBP and the relative small number of corresponding local businesses made it necessary to use extra data from the OECD and IMF, Kennispark Twente and from the local Chamber of Commerce to ensure a deep understanding. Also, a conference hosted by the Kennispark Twente Foundation on the future of high tech businesses in spring 2016 was attended and utilised for this investigation since many relevant speakers discussed the SBP’s development and specifically the current financing situation. Among others, the CEO’s of CETF, Siemens Venture Capital and Clearflight Solutions were present.

5.3 Usage of resources

The selected research design appeared to be resource-saving. The proximity to the chosen setting with all the relevant interview partners available within a radius of less than ten minutes reduced significantly the travel expenses and time losses. Furthermore, it enabled the researcher to react spontaneously on changes in the interview schedule and provided an overall comprehension of the physical and organisational conditions of the surroundings. To meet the tight schedule of less than three months, the chosen cross-sectional case-study design seemed most appropriate to achieve meaningful results under the given limitations. Furthermore, the additional information of importance for the literature review and the development of the final conclusions were free of charge retrievable via the university library, the StartUpHub-database and LexisNexis. This specific method in the data gathering process was assisted by a research specialists of the own department at the Universiteit Twente.

As a result, the overall amount of needed resources, both monetary and temporal, was rather modest and within the scope of the student.

5.4 Interviewees and respondents

The identification and selection of the relevant sample required an effective sampling strategy to ensure high standards in the sampling procedure (Curtis, Gesler, Smith and Washburn, 2000). Using the words of Patton (1990), “the most meaningful results of studies are achieved if multiple sampling schemes are applied.” The following schemes were applied to select the most relevant interviewees within the local ecosphere, representing the academia, business and public sector. The main method being applied among the individuals from the business and public sector was opportunistic or emergent sampling. The advantage of this sampling lied in its flexibility to spontaneously react on arising opportunities. Also, several interviews with professionals of the Kennispark Twente Foundation were achieved by applying a snow-ball sampling strategy. This method was beneficial since the recommendations of the first interviewees compensated for the lack of organisational knowledge within the relevant organisations by the authors of this paper (Palinkas et. al., 2013).

The criterion-i strategy was applied among the researchers at the UT which focus on cases that feature aspects of the research object. This method was useful since it allows the identification of information-rich individuals. Key features of these samples were their smallness relative to the amount of information they generate and the consequence

to allow rather analytic rather than statistical generalisations (Curtis et. al., 2000). The application of different sampling techniques resulted in the identification of a number of 10 potential research objects (*see Table 2, Interviewees*) with a total of 15 interviewees.

Table 2. Interviewees

Public Sector	Academic Sector	Private Sector
Euregio	University of Twente, NIKOS	Micronit
Kennispark Twente Foundation	University of Twente, CHEPS	Eurekite
City of Enschede	University of Twente, Entrepreneurs & Researcher	Start-Up on Peptides, to-be named
		Satrax

Composed by author, 2016

To compensate for the absence of other respondents of interest such as Demcon or Clearflight Solutions, interviewees within the academic and private sector with meaningful connections to these missing stakeholders were asked to also evaluate their situation with regard to foreign investments. The relevant organisations and individuals within this ecosystem were detected as a result of the beforehand conducted literature investigation and approached via eMail or phone. The following section defines the sampling procedures grouped according to their affiliation with one of the triple helix sections.

5.4.1 Business sector

The different observed companies were all located in the Kennispark Twente and associated with foreign investments. The main attribute the observed enterprises share is the engagement of a foreign investor or their explicit seek to attract external fundings. Cooperations between the investors and the local SME's took either place as complete acquisition of the respective company as occurred in the Vredestein-acquisition by Indian tyre-manufacturer Apollo in 2009 (The Economic Times, 2009) (*see Appendix, Text 12.1.1: The case of booking.com and Apollo Vredestein)* or as a foreign direct investment through business angels or venture capitalists (exemplarily the Cottonwood-involvement in Eurekite). The different studied companies, excluding Vredestein, count all as SME's with employee-numbers varying between 10 (Lionix) and up to 250 (Demcon). The response rate for interviews within this group was lowest with approximately 20%.

5.4.2 Public sector

The public stakeholders of interest were of the City of Enschede, Euregio and the Kennispark Twente Foundation as the entities directly influencing the attractiveness of the SBP for FDI. The Kennispark Twente Foundation represents the City of Enschede, the UT and Saxion Hogeschool and is the responsible managing organisation in the SBP. The city of Enschede is directly involved in co-shaping the development of the Kennispark Twente by being the competent municipality and one of the (co-founding) partners of the Kennispark Twente Foundation, providing FTE's and further financial support to the management team. Euregio functions as a communal cross-border association supporting the cultural, economic and societal exchange between the involved Dutch and German municipalities and fosters trans border mobility in the Euregio-region.

5.4.3 Academic sector

The UT as an entrepreneurship supporting organisation is together with Saxion Hogeschool very much involved in shaping this region to attract FDI. Within the institutions of higher education, several researchers were interviewed. These individuals either conducted research on the Kennispark Twente, had ties to involved other stakeholders or participated in the launch of spin-offs which faced or are about to face inward foreign direct investments. Researcher who developed prototypes or achieved intellectual property rights but maintain in their position at the University of Twente or Saxion Hogeschool are considered as academics. The majority of interviewees was associated with either the NIKOS-institute or were the representatives of the University of Twente in the Kennispark Management and Business Development Team. Together, eight academics participated in the interviewing process.

6. Data analysis

6.1 Treatment of data

Following up on the previous section, this chapter briefly summaries how the gathered data was transformed to allow a precise analysis of the observed phenomena. The various data collection methods being applied within this study produced a diverse pool of qualitative but also partly quantitative data. This diversity within the data-set

required a sensitive treatment to eliminate potential threats to the reliability of the final conclusions. It was assumed that especially the qualitative part of the data provided sufficient information for reliable conclusions on the relationship between “regional policy instruments” and “attractiveness of SP’s for FDI’s”. The 15 interviews were analogously transcripted by focussing on the main statements of the interviewees and grouped according to their classification as shown in *Table 2, “Interviewees”*. In a next stage, the compressed interview transcripts were coded since “coding is a crucial aspect of any qualitative analysis” (Basit, 2003).

The aim of this research was to monitor different aspects of the observed concepts through several data gathering techniques to capture a maximum of relevant characteristics. Taking the contrasting results of the particular methods into account, it can be concluded that this intention was successfully met. By subsuming the codes and the results of the literature analyses under the previously stated theories (theoretical framework, section 2), the following recommendations were developed.

6.2 Threats and limitations to data analysis

Reliability as the degree to which the conducted research leads to reproducible and consistent results can be ensured via different approaches. For this research, modified variants of test- re-test and inter-rater reliability were applied. Further reliability was achieved via co-gathering data with a second student researching on a similar topic.

Threats to internal validity exist if the relationship between the dependent and independent variable. Yet, the chosen research design allowed the reduction of these threats. Furthermore, the theoretical framework aimed at limiting the potential impact of unanticipated events on the final conclusions.

The external validity refers to the generalisability of the findings of the conducted research. The gained and objective findings on foreign investments created just a mosaic contributing to the overall debate. It remains to be hoped that this research design as an embedded single case study motivates for future investigations on the Kennispark Twente if analogous results in third projects are found. This “develops greater confidence in the findings of the cases in the same way that we gain confidence in experimental results that are found in repeated experiments” (Vaus, 2001).

In cross-sectional research designs, the confidentiality and the informed consent have to be guaranteed by the interviewee (Vaus, 2001). The particular attention to confidentiality issues originated in the sensitivity of the chosen research focus on FDI’s in local companies. Companies which already collected foreign fundings were experienced

being rather reluctant to reveal the exact procedures of how these transactions took place. The same was even more visible in interviews among young entrepreneurs just launching a new prototype.

7. Evidence

7.1 Introduction

In this chapter, the results of the conducted research are presented in the context of the Kennispark Twente. This allows an examination of which factors proved to be influential over the past years. The answering of the beforehand stated research question *“How can the attraction of inbound foreign investments in science parks contribute to regional re-industrialisation?”* evolved into a diverse data pool. This section specifically provides the evaluations of the respondents and key findings of the literature analysis on how SBP’s attract and facilitate foreign investments. Particularly, this chapter presents (1) various relevant location factors for FDI-attraction, (2) followed by an elaboration on the societal factors and (3) available funding sources. It concludes (4) with findings on the match-making processes within the SBP.

To recap, in spring 2016 at the beginning of this investigation it was expected that foreign acquisitions are mainly attracted by young, highly-innovative SME’s. These companies would accelerate their business development exceptionally through the external impetus and generate positive spill-over effects through increased employment rates, larger turnovers and further knowledge-transfers (Graph 01, Causal Model). Yet, the following section will show that this research was able to confirm parts of the previous assumptions while other expectations in this theory were not fulfilled.

7.2 Relevant location factors for FDI-attraction

The first notable characteristics for the attraction of FDI's referred to the various location factors of the Kennispark Twente. Location factors as such have to be distinguished into soft (e.g. political climate or urban attractiveness) and hard factors (e.g. infrastructure, proximity to research clusters and availability of qualified labor). In their answers, the interviewees mainly referred to geographical, economic, political and less often societal factors affecting foreign investors’ decisions to invest in the Kennispark Twente.

Physical connectivity effects within the Netherlands and Europe

International investors seem to perceive the connectivity within the Netherlands as already very high, especially compared to the United States or Asia-Pacific (Future of High Tech, 2016). Yet, while foreign investors evaluate this location factor as preponderantly positive and as one of the key advantages compared to other international SBP's, the local entrepreneurs and researchers drew a contrasting picture. Twente as a region is perceived to be remotely located within the Netherlands and lacks satisfactory infrastructural connections to other growth centres of the country.

Connectivity effects as a result from the region's specialisation

The nowadays three specialisations of the UT in nanotechnologies, ICT and biomedical engineering are the core-domains in which local companies experienced in recent years foreign investments (The Future of High Tech, 2016). The commitment of the UT to follow this path is increasingly visible in the ongoing merger of educational programs and project-based research. This enlarges the local, tech-affine, community around the existing three research-focusses. The introduction of the co-financed TOP-program of the UT in conjunction with the national government in 1984 to enhance the strategic specialisation on entrepreneurship counted for the public interviewees as another foundation of nowadays success (Eijkel, Zomer, 2007; Kennispark Twente Foundation, 2016). In line with other national and regional programs such as STW-grants, this region and the SBP in particular was evaluated to develop towards a rather unique and entrepreneurial profile, distinguishing itself from neighbouring SBP's.

Connectivity effects triggered by the Kennispark Twente Management Foundation

Starting in 1999 with the creation and a further re-organisation in 2005, the Kennispark Twente Foundation managed to position itself as a central point of contact for start-ups within the SBP. The foundation furthermore tried to connect with other SBP's within the Netherlands and national authorities to promote the Kennispark Twente, also visible in various news-articles found in the LexisNexis-data base. Yet, several interviewees from the academia and business sector stressed that these efforts were less successful. Also, the visibility of the SBP is still rather limited, leading to a comparatively smaller network of business contacts in other regions. The two entrepreneurs and academics evaluated this task as an actual focal point for any management team, but especially for organisations representing rural SBP's. Also, innovation networks between

international SBP's focussing on knowledge-transfers were not recognised in Twente. The only applied tool which comes somewhat close to this preferred state is the platform StartUpDelta, hosted by the Ministry of Economic Affaires. Yet, actual efforts to explore such a new cooperation which is assumed to attract foreign investors are not recognised by the respondents.

Also, another task of the management team, the provision of consultancy-services over a mediation between the public and business sector to the provision of network activities was not unanimously rated as effective in successfully stimulating connectivity and growth.

Business-to-Academia connectivity effects

The interviewees stated that the strongest impact on the attraction of foreign investors lies in the proximity to and accessibility of the University of Twente as the regions central powerhouse. A variety of factors mentioned increasing the attractiveness of the region which originate in the direct environment of the UT.

First, an effective knowledge transfer between the different research institutes and the regional business sector is recognised and evaluated as contributing to the local economic activities. Every single interviewed party highlighted the implicit necessity of maintaining, but preferably even increasing the cooperation between the UT, its research facilities and the local business sector since this collaboration is perceived as the main driving force behind the past economic development. Examples were given, referring to the joint execution of projects by private and academic research units, the provision of co-financed PhD-positions by the business sector and events involving the different parties physically on the campus. Especially the spatial delineation was perceived as productive in creating connectivity.

Secondly, the focus of the University of Twente to actively encouraging young students to engage in entrepreneurship through practice-oriented projects and the TEM-system in general is perceived by the respondents of the academia and private sector as successful in including students more into the entrepreneurial environment of the SBP ecosystem. Also, foreign investors evaluated this rather soft externality as the fertile soil for a potential increase of regional productivity (The Future of High Tech, 2016).

Finally, the public accessibility of the research centres is of noticeable significance for the development of high-tech companies as academic respondents stated. The financeable provision of expertise and laboratories, equipped with state-to-the-art machineries, was used in the past by many spin-offs, proceeding their research and

continue developing pre-series products. Exemplarily, Xsens as a company experiencing foreign investments relied on this mechanism to design its products for market maturity, as a business developer explained.

Business-to-Business connectivity effects

As already discussed and visible in *Chart 2. "Comparison of SBP's in the Netherlands"*, the SBP is composed by many small and medium sized companies with an average of 15 FTE/business. The largest among these firms is the tire-manufacturer Apollo-Vredestein with approximately 1.400 FTEs, followed by Demcon with 200 employees. This dynamic ecosystem is perceived by the academic and public interviewees as the main fertile ground for future growth. The interviewees saw the constantly renewing and very competitive business scene as being able to attract some international recognition if promoted successfully. The proximity between the various companies of different size within a common sector was perceived as highly vitalising. Especially the professionals of the business sector emphasised the high potential which lies in the collaboration-possibilities with larger SME's within this ecosphere. Various young start-ups were mentioned, using the facilities and expertise of other companies and partner up in the following product-development. As an example, Micronit was named, providing smaller enterprises with know-how and research contracts.

7.3 Societal environment

An aspect which was controversially mentioned throughout the interviews lies in the attractiveness of the urban life of Enschede and Twente to external professionals. Interviewees from all three helices mentioned limited offerings compared to exemplarily Randstad and Eindhoven in appealing international experts. These are important for the local economy to trigger a knowledge transfer, enable businesses to approach new markets and increase external recognition. It was stated that a cosmopolitan environment and diverse cultural offerings by the local municipalities would help establishing international linkages ultimately benefiting the local ecosphere. Yet, interviewees claimed that the cultural offerings by local policymakers, especially in recent years, did not fully satisfy nor were helpful in the development of the internationalisation process of the Twente region.

In line with these elaborations, the existence of an international school was evaluated as equally important for the attractiveness of the region for foreigners. Even

though the City of Enschede offers international classes, this offering was evaluated as not sufficiently marketed nor effectively positioned to enhance the regions internationalisation.

7.4 Available funding sources

The availability of a variety of public and private funding sources and further capital in the form of research grants was evaluated by interviewees from the business sector as generally positive.

Subsidies in the forms of tax credits, supplemental grants as exemplarily used in the TOP- and STW-program by the public sector, including Oost NV, the city of Enschede and further municipalities, and in form of material contributions at the research facilities at the UT and Saxion Hogeschool were perceived by the various respondents as one key instrument in developing new businesses and accelerating existing MNE's. In addition, funding-programs for young enterprises and start-ups in which the UT and Saxion Hogeschool participate were evaluated as effective in enabling local companies to develop their business to the stage at which a successful competition for foreign investments is possible. In this context, the Twente Technology Fund (TTF) is seen as one of the main provider of early-stage solvency to companies such as Xsens and Clearflight Solutions which later faced investments by CETF (Ray, 2016).

The last relevant group of funding originates from national and international private parties. Siemens Venture Fund and Cottonwood Euro Technology Fund (CETF) have been mentioned as the main spearheads in this context. Among the private funds, Cottonwood stands out with a remarkable balance sum of more than 14 million Euro (CETF, 2016) and its commitment to the region. This is exemplarily visible in the decision to locate its European headquarter in the Kennispark Twente. Especially CETF is of growing importance for the business development in the science park, since it successfully accelerates its investment capacities through the attraction of third parties capital. In May 2016, CETF announced an investment by KPN Ventures, following contribution of Thales, Oost NV, the UT and Twente region (Kennispark, 2016). Cottonwoods main investments in this region are by 2016 in Clearlfight Solutions, Urekite, OPNT and Xsens.

7.5 Match-making between investors and high-tech start-ups

As previously stated, high-tech start-ups in the ecosphere of the University of Twente were evaluated to have a variety of financing available. Most of these sources were associated with domestic investors. Yet, especially the business sector evaluated the

application-processes for public fundings as rather complex, in particular in the post-seed phase of the business development. In comparison, private investments in this region which do not represent the majority of available capital are more easy to access. The two interviewed entrepreneurs stated that especially CETF keeps investment processes short and rather simple. The role of Siemens Venture Capital in this region is evaluated as similar but not equally accessible. The available domestic fundings are facilitated through a dense network of agents, associated to exemplarily Oost NV, the Kennispark Twente Foundation and the local municipalities. This network is evaluated by the majority of interviewees as efficient in establishing contacts between the investing Dutch funds and local start-ups. Also, these funds were perceived to be well-known in the region among entrepreneurs and start-ups through an efficient publicity work.

On the other side, CETF as the main private investor in the Kennispark Twente benefited much from its proximity to the ecosystem. Respondents confirmed that representatives of this particular fund are very visible in the SBP and engaged in a variety of network-events or conferences. The investment in Eurekite by Cottonwood was exemplarily initiated through a work-shop at the MESA+-laboratories, attended by both parties. Third international investors such as Siemens Venture Capital or other MNE's were perceived to be less visible by a majority of the interviewees. Except Thales as a greenfield investor located in Hengelo, larger international corporations are not often involved and present in the dynamics of the Kennispark Twente as stated by academic and private interviewees.

7.6 Preliminary conclusions on the attraction and effect of FDI

Building upon the analysis of relevant newspaper articles, literature and interviewees, ***Table 3.*** below will summarise the relevant assets and pitfalls. The resulting consequences from these findings for the future development of the Kennispark Twente in particular and science and business parks in general are addressed in chapter eight.

Table 3. Strengths and weaknesses in FDI-attraction of *Kennispark Twente*

Assets in FDI-attraction	Pitfalls in FDI-attraction
High-Tech Cluster with Clear Specialisations	Visibility of the Region
Entrepreneurial & innovative environment	Diversity in Talent-Pool
Solvent Environment	Internationalisation of the Region

Assets in FDI-attraction	Pitfalls in FDI-attraction
Public Commitment	Absence of UMC
Step-Stone for Expansion in EU	Perceived Distance to Major Economic/Cultural Centres
High-Class R&D at UT & Saxion Hogeschool	Absence of Large MNE's Investing in SBP
Large IP-Base	Young Age of SBP

Composed by author, 2016

8. Discussion

This thesis has accessed in detail the environment, location factors, funding sources and match-making procedures affecting the attraction of foreign investments in start-ups and SME's. The gained data corresponded to the mentioned concepts and added evidence to the analytical framework. Also, while comparing several Dutch knowledge precincts, similarities and differentiations became visible which enabled the student to draw more general findings. Therefor, the findings on the Kennispark Twente bear also interesting bits for third science parks striving for innovation.

The research has shown that the business markets of local start-ups and SME's are often geographically scattered and spread over distant regions. Both, the literature analysis and the qualitative investigation showed that SME's in Twente but also in other SBP's increasingly participate in an ongoing internationalisation process. The theoretical explanations on foreign investments and their influence on the stimulation of innovation highlighted the importance to attract external recognition. Globally operating VC's and companies investing in local start-ups often act as change agents. These actors do not only bring in their wide, transnational network and provide relevant professionals for the invested company, but also trigger a more risk-affine and entrepreneurial atmosphere.

The ideal role any management team seems to circle around a self-sustaining process of FDI-attraction, business development and knowledge spill-overs leading again to further FDI (*Figure 12.10. Ideal SBP-development).*

Even though a variety of other factors also influences the attraction of FDI, the external visibility of a rural cluster seems to be the essential part of any regional promotion strategy. The establishment of a promotion agency on municipal or regional level to

increase this recognition proves to be generally beneficial. Yet, it is likely that the success of these strategies correlates with the internationalisation of the hosting municipality. Cities as Amsterdam provide their SBP's naturally with a wider network of potential investors and customers while regions as Twente lack these conditions. Despite the shown efforts of local authorities in compensating for the weaker network, Twente is still overshadowed by neighbouring SBP's. It is rather unusually that local companies develop further beyond the roll-out and growth-stage (*see Chart 2: Comparison of SBP's in the Netherlands, 12.9 Figure: Stages of Business Development and Financing*). While the digital development will continue to reduce barriers in the international financing system and make liquidity for start-ups and SME's more accessible (The Future of High Tech, 2016), the international recognition of the Kennispark Twente as an attractive investment target has to be significantly increased.

Managers of sites comparable in size, business structure and history such as Wageningen Campus in the Netherlands or Hermia Tampere in Finland are likely to be interested in the outcomes of innovation strategies being applied in Twente and vice versa. Innovation policy instruments in Twente can therefor be also of relevance for these SBP's since the struggle for foreign investments is almost universal.

9. Conclusion

9.1 Introduction

The conducted literature study, expert-interviews and data analysis resulted in the identification of several factors influencing the attraction of foreign investments.

9.2 Sub-RQ 1

Sub-RQ 1, *"Which location factors are most efficient in attracting inbound foreign investments"* generated a large amount of data. It is split into factors that are evaluated as (1) efficient and (2) hindering in attracting foreign investments.

9.2.(1) Aspects benefitting FDI-attracting and knowledge-spill overs

The existing knowledge spill-overs in the Kennispark ecosphere can be evaluated as a result of the commitment of the three different triple-helix actors contributing to the

realisation of this spatial experiment. In the 1970's and 80's, the approach to build upon a newly established research cluster with a distinct profile in order to establish a business and science park is for European standards revolutionary and laid the ground for the recent developments.

The UT is strongest advocate of cooperations and exchange between the helix actors in the Kennispark Twente ecosystem. Knowledge spill-overs of the UT are explicitly desired and facilitated through the SBP management team in which the university is engaged. The concentration on and commitment to the three profiles nano-, communication- and medical-technologies is an additional aspect that contributes to the knowledge agglomeration within this region. The number of start-ups and SME's within these fields indicates that the concentration and spill-over effects achieved results. In combination with the support and provision of funds by the local authorities, these conditions are favourable to lay the ground for foreign investments in innovative start-ups and SME's. The establishment of the Kennispark Twente Foundation to facilitate the transition of start-ups into small SME's was the right decision to smoothen the collaboration between the triple-helix actors. This led to the creation of a holistic image to foreign parties as potential investors.

The dynamic ecosphere has a potential to further attract BA's and VC's, focussing on early stage investments. One of the main assets of these investors, their already established network and expertise in management-related matters, remains to be a success-guarantor for local SME's and start-ups. Especially since these young enterprises often experience difficulties in homogeneous ecospheres such as the Kennispark to clearly define strategies and approach their target markets.

9.2.(2) Barriers to knowledge spill-overs

All three observed sectors, the public, private and academic, confirmed a lack of specific human resources, being mandatory for the successful transformation of SME's into MNE's. *booking.com, thuisbezorg.com* and Apollo Vredestein are just prominent examples of SME's on the bridge to enter international markets which left Twente due to the lack of qualified staff in the local talent pool. To set up new departments focussing exclusively on marketing, business and sales management, these SME's relocated their headquarters to Amsterdam (*booking.com* and Apollo Vredestein) and Utrecht (*thuisbezorg.com*). Especially the two service-oriented SME's faced in recent years massive foreign investments (Ecommerce, 2014) and multiplied their workforce. And since the University of Twente and Saxion Hogeschool reorient their study programs towards a

more technological focus in social sciences, this trend is unlikely to be endogenously resolved by the local universities (Issuu, 2015). This migration of promising companies leads also to a brain drain of alumni of business administration and other social sciences while graduates of the core disciplines of this region find better conditions to stay in Twente.

Further limitations can be found in the perceived remoteness to the economic, public and cultural metropoles in the North-East of the Netherlands and to the German Ruhr-area. Even though this criticism originates more to the domestic view on Twente than in the position of the internationals, the Kennispark does not experience similar PR than other Dutch SBP. In the sense that residents normally act as advocates of their flagships, the Kennispark faces a significant burden. This results in the lack of visibility in third countries such as Germany or Belgium. As the research has indicated, foreign private investors and corporates are not instantly familiar to this ecosystem and its inherent potential. The main criticism addresses the Kennispark Management Team and regional authorities which do not exploit their full potential in reaching further out to foreign companies and investors to promote and enhance international recognition. This limited (inter-) national recognition of Twente led even to a discrimination in the *National Policy Strategy for Infrastructure and Spatial Planning* in 2013. *C*ompared to regions which faced similar structural changes but positioned itself more prominently around new innovativeness as exemplarily Brabant, the developments in Twente resulted in lower allocations by the national government (SIVR, 2013).

An additional unsettling example of the unexploited potential to present the SBP to a national but especially international audience is connected to the StartupDelta-initiative by the Ministry of Economic Affaires. This project, accessible via the web, aims at promoting the Netherlands as a highly entrepreneurial ecosystem to investors. The thirteen most important SBP's and knowledge precincts are portrayed by providing a variety of different information on the local enterprises, clusters and location factors. The web presence of the Kennispark Twente illustrates well a lack of efficiency in approaching third parties. Mildly speaking, the page would benefit from an extended review, update of relevant data and functioning of provided links. The dilemma of Twente becomes visible if the web presence is compared to competing science parks such as Brainport Eindhoven or Leiden BioTech Park which dispose over a very detailed and sophisticated webpage.

Also, the management team did not engage so far in serious attempts to establish partnerships among other international science park managements to create a network of

high-tech clusters similar to its academic (national) pendants 4TU, involving the four technical universities in the Netherlands.

9.3 Sub-RQ 2

The answer to **sub-RQ 2** on *"What are the long-term effects of foreign investments on invested SME's"* is mainly based on the qualitative data sets. As already stated, foreign investments provide not only further capital beside the existing national funds. The main impetus of external VC's and companies on the business development lies in the network of the investor to foreign markets and knowledge and in the promotional effect of having attracted a renowned financiers. Together, the effects proved to accelerate the business development and led to the creation of many more jobs. The three mentioned companies which (partly) left the Kennispark Twente are prominent examples of the leverage effect of venture capital in general and foreign investments in particular. The different attitude of especially anglo-saxon investors proved to further accelerate the business development because of the influence of their more risk-affine mentality on the respective company.

9.4 Sub-RQ 3

The answer to **sub-RQ 3**, *"To what extent can an association between FDI's and measurable regional spill-over effects be observed"* relates to the interviews with the entrepreneurs and academics. Companies which experienced FDI's were able to reduce the time-consuming efforts to attract further fundings and concentrate instead more on the actual business development. The fundings were also regularly used to employ more professionals to accelerate the growth of the company, apply for IP-rights and engage in costly product-testings at research facilities often within this ecosphere. All these effects caused at least short-termed externalities to the local ecosystem. Taking Eurekite as an example, after the investment of CETF in 2015, the company increased their workforce by 8 new members (The Future of High Tech, 2016). The interviews with the entrepreneurs also confirmed similar processes at more mature SME's such as Xsens or *thuisbezorgt.com*. Yet, it remains unclear if an exodus will always be the logical consequence if a company faces a certain stage of maturity, triggered by the external investment. A longitudinal study could further monitor how companies like Xsens or Clearflight Solutions develop and if they follow *booking.com* to larger agglomerations within the Netherlands.

The research on the final **sub-RQ 4**, *"Which policy instruments are most efficient in attracting foreign investments"* led to variety of instruments being applied to stimulate foreign investments. Yet, this investigation did not identify one specific measure having a direct and effective impact. Instead, the successful attraction of FDI's largely depends on a set of different indirect instruments which together lay the ground for the attraction of external investors. Still, the very basis lies in the existence of a technical university or research cluster, enabling students to develop curiosity and engage in projects leading to innovative prototypes and ideas. High-class research facilities are needed to further refine and test these concepts but also provide local start-ups and SME's with access to otherwise unaffordable laboratories. Therefor, the funding-instrument on universities, research institutes and necessary infrastructure to host and enable students, start-ups and SME's is of central importance for local policy makers. This also requires that municipalities apply measures to enhance the visibility of the city and the respective SBP to students, professionals, businesses and ultimately investors. This can be achieved by the establishment of an internationally operating promotion agency and further FTE's within the administration to facilitate and maintain public relations. Measures to enhance the internal transparency of the involved organisations is also evaluated to positively contribute to the external recognition.

Furthermore, this thesis confirmed that creating physical proximity between the academia and business sector needs to be constantly further developed and supported. This relates to spatial planning concepts, but also to the provision of sufficient fundings for these projects and the establishment of dialogue platforms to monitor the needs of the ecosystem and create a vibrant network. Also, actions to increase the cultural and recreational offerings, especially in peripheral regions, should never be underestimated nor neglected. Culture as an activity producing any monetary benefit but affecting the international recognition therefor remains in the responsibility of the local municipalities. Finally, direct monetary contributions of municipalities to investment funds (as happened with CETF), flexible micro-loan programs and a specific project support tend to affect positively foreign investment choices.

10. Final Recommendations

10.1 Introduction

In this concluding section, final recommendations based on the previous' analyses for future regional development policies are given. Generally, an ideal situation would show the self-renewing dynamics as illustrated below, in which foreign capital and know-how is invested in a start-ups, which then are enabled to grow into SME's, facing further investments and know-how, turning it into MNE's while new spin-offs are realised from within the ecosphere.

10.2 Financing

To attract FDI, the managers of the SBP have to make use of the renommée and know-how of already investing foreign VC's and companies such as Cottonwood or Siemens. By understanding funds as Cottonwood as change agents, a possible solution to exploit this potential can be the set-up of an informal committee. In this body, the Kennispark management team and further representatives of the SBP-founding partners and the respective locally committed investors should be represented. By doing so, the different parties could learn from each other and mutually develop a vision of a future strategy to increase to attractiveness of the SBP for foreign investors and companies. Based on the findings from this research, such a bottom-up initiative and resulting policy interventions are likely to have a direct and stimulative effect on the micro-economic development. Therefor, the expansion of a denser and more fluid value network continues to be the central task for the management team and local authorities.

10.3 Visibility and connectivity

Furthermore, the Kennispark management team as the promoting agency of the SBP could apply further measures to enhance the visibility of the region and the Kennispark Twente itself. Any action has to circle around the image of Twente as an attractive and dynamic destination for bottom-up business activities, referring to the entrepreneurial environment, the proximity to the UT and access to high-tech enterprises forming innovation clusters. The enhancement of the visibility of the SBP requires from the Kennispark Twente management team to spent significantly more efforts on the web-presence of the SBP on official national pages and in diverse internet forums. Within a

digital community in the digital age, a maximum of efforts has to focus on professional and dedicated information policies to reach out to interested entrepreneurs, investors and companies. The frequent organisation and hosting of international conferences in Enschede by specifically involving entrepreneurs, investors and researchers is a further step in shaping the external recognition. The Future of High Tech is just one prominent example. These events have to be organised more periodically but also focus on differing clientele to reach out to many more persons of relevance and establish new networks.

In addition, the local public authorities and the management team have to increase the connectivity between the region and neighbouring markets since business partners can quickly turn into future investors. The Münsterland and the Dortmund-area in Germany as regions housing many high-tech and logistic companies have to be further connected to Twente. This includes further infrastructure linkages but also actions within the scope of Euregio. The resulting positive impact would add on reducing the low visibility of the Kennispark Twente in these specific regions of interest which bear a high potential due to their close proximity to Twente. Furthermore, as already stated, the absence of any network organisation between various SBP's, preferably on international level, demands immediate action. The resulting renommee for the Kennispark Twente as a first SBP initiating such an international cluster being similar to town twinnings would clearly enhance the awareness of an international community and is likely to facilitate foreign investments.

10.4 Urban liveability

The previous elaborations imply that the local stakeholders have to apply also soft measures to further promote the overall attractiveness and liveability of the urban area. Even though this relates rather indirectly to FDI, it is still perceived as a corner stone in the successful attraction of foreign investors. Public spendings in this area by the City of Enschede, targeting cultural and recreational offers and the overall quality of life, are therefor necessary for the successful attraction of professionals. This will influence the external recognition of this region, even though these investments normally tend to need up to five years in producing a visible result (OECD, 2013). This approach has to be further supported by the development of an unique urban profile, highlighting the specific appealing features of the involved municipalities. In the case of Enschede, this would certainly involve the art school *ArtEZ* and music academy *Attak*. The success of such a branding as experienced over the history of the UT proves that this approach in rural areas such as Twente bears an outstanding potential.

The University of Twente and Saxion Hogeschool can further contribute to the regional development process by engaging in the provision of a more balanced and locally rooted talent pool. First-class education should not solely drawing attention on specific fields of expertise without recognising the local demand for a more diverse labour market. It has proven to be effective to hold a clear profile focussing on nano-technologies, IT and precision mechanics, but a renunciation from a homogenous student body from mixed disciplines will further extend the existing gap in the talent pool.

10.5 Potential impact of an UMC

As already elaborated on, a key success factor for regional development lies in the collaboration of the different helix actors. A specific example can be given, lifting an unexploited potential in this region for further job- and knowledge creation in cooperation between the University of Twente and the City of Enschede. The Medisch Spectrum Twente, located in the city centre of Enschede with satellite locations in Oldenzaal, Haaksbergen and Losser, is a major non-academic hospital within the Netherlands with leading medical departments and an own training academy (MST, 2016). The possible synergies between the current research fields at the UT and potential future research in medical science are already nowadays identifiable. It can therefor only be strongly suggested that the municipality of Enschede and the province of Overijssel and the UT act to use this unique asset and extend the regional market for high-tech research and business activities.

This project would receive a substantial amount of domestic but also national fundings from a variety of public but also private parties. Secondly, a medical research clusters would furthermore affect positively the enrolment-numbers at the UT and considerably counteracting the rising monotony within the student body. A last argument lies in the potential for future job creation. As Table 1, *Comparison of Dutch SBP's* has shown, the major employer in Bioscience Park Leiden with over 6.300 FTE is the local UMC. These jobs are well paid, knowledge intense and internationally-connected, therefor reflect precisely the aim of the local legislators of how future employments in the Twente region should look like. The resulting impact on the local entrepreneurial scene and attractiveness for foreign investors through a further interconnected knowledge- and innovation-sphere deserves therefor highest attention among the relevant local stakeholders.

10.6 Final conclusion

This thesis contributes to the knowledge pool by making a clear statement for the attraction of foreign investments. It has highlighted how important FDI are for peripheral SBP's since these tend to lack large and international networks. Furthermore, it has shown that narrow specialisations in disconnected SBP's are both, a curse and a blessing at the same time. Specialisations enable SME's to develop advanced products while also limit the necessary talent pool and further economic development. Foreign investors could provide the cure in the form of connectivity and enhanced international recognition.

10*.7 Scientific and social relevance*

As already stressed in the introduction, the scientific and social relevance of this contribution lies in the importance of creating cross-fertilised connections between the triple-helix actors in order to enable regions to maintain and even expand a strong position within an highly globalised and competitive environment. Future research following up this compelling topic bears the potential by applying time-series analyses to evaluate potential changes in the mindsets and perceptions of the involved interviewees and dynamics within the setting. Especially the external visibility of the region remains to be an interesting topic to be further observed. Results could then be used to monitor the specific developments of foreign direct investments in this science and business park.

10.8 Future research

Concluding, this research has put much effort in understanding how the Kennispark Twente functions to attract FDI and how these facilitate knowledge spill-overs. While the theoretical framework suggested that the value of foreign investments lies in the provision of liquidity, the study has shown that network-effects are of greater importance for start-ups and especially SME's. Therefor, it is of interest to conduct a future research on the same variables over a longer period of time to monitor any development of the SBP. Furthermore, this investigation focussed solely on FDI being attracted by a nano- and ICT-dominated cluster. Yet, if the UT establishes in the near future a fourth domain specifically focussing to medical engineering, foreign investment flows are likely to change. This also invites to be further monitored and could lead to a strong argument promoting the establishment of an UMC.

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12. Appendix

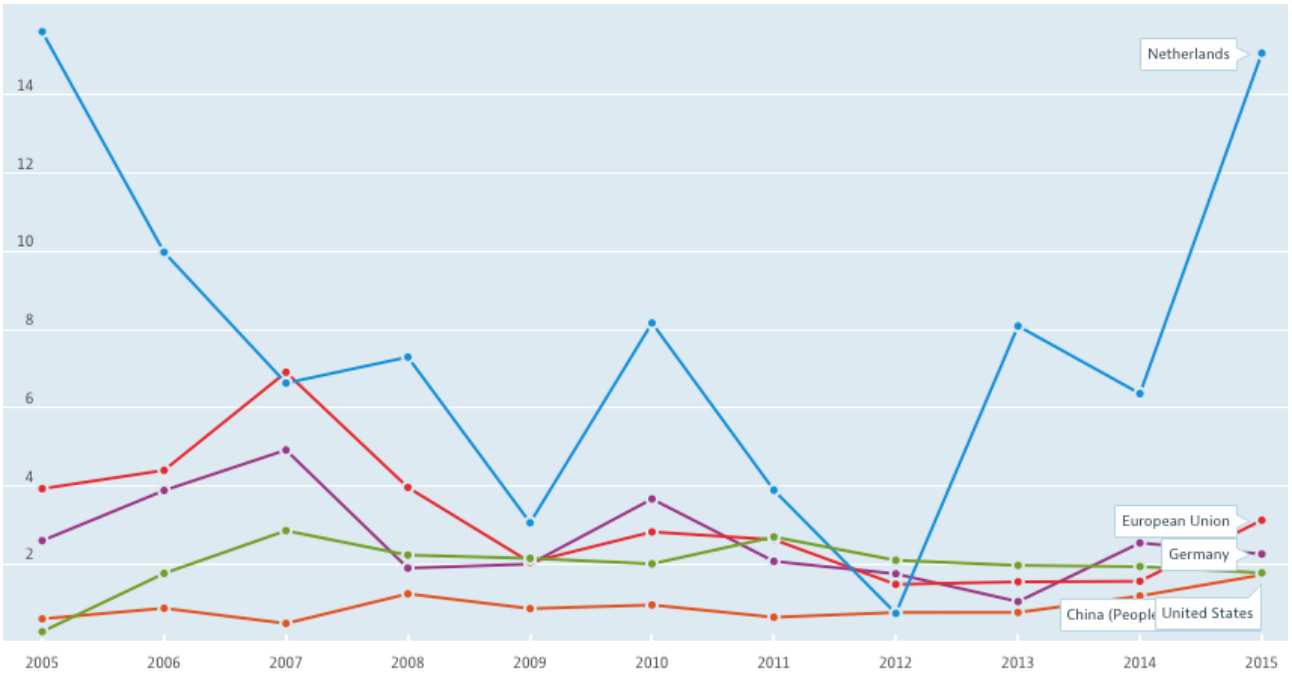
12.1.1 ***Text:*** *The case of booking.com and Apollo Vredestein*

It seems to be the fate of the Twente Region that its *High Road* to urban prosperity can not entirely rely upon the permanent settlement of larger corporations of international importance.

A bad omen could have been detected in the resettlement of *booking.com* in 2006, a start-up founded ten years earlier at the University of Twente. The argument at that time referred to the already known point of closer proximity to relevant human resources, financiers and business contacts, all features which were evaluated also by the former management team of the software company to be underrepresented in the Twente region. A story, which might even face a renewal. Apollo Vredestein announced in mid 2015 to relocate 30 FTE's into a newly established branch office in Amsterdam. This announcement would not have faced such national recognition if it would not have included the entire management team and marketing department. Even though production facilities and the wide majority of jobs remain in Enschede, another decision of a large corporation to leave the Kennispark Twente in favour of the Randstad region occurred.

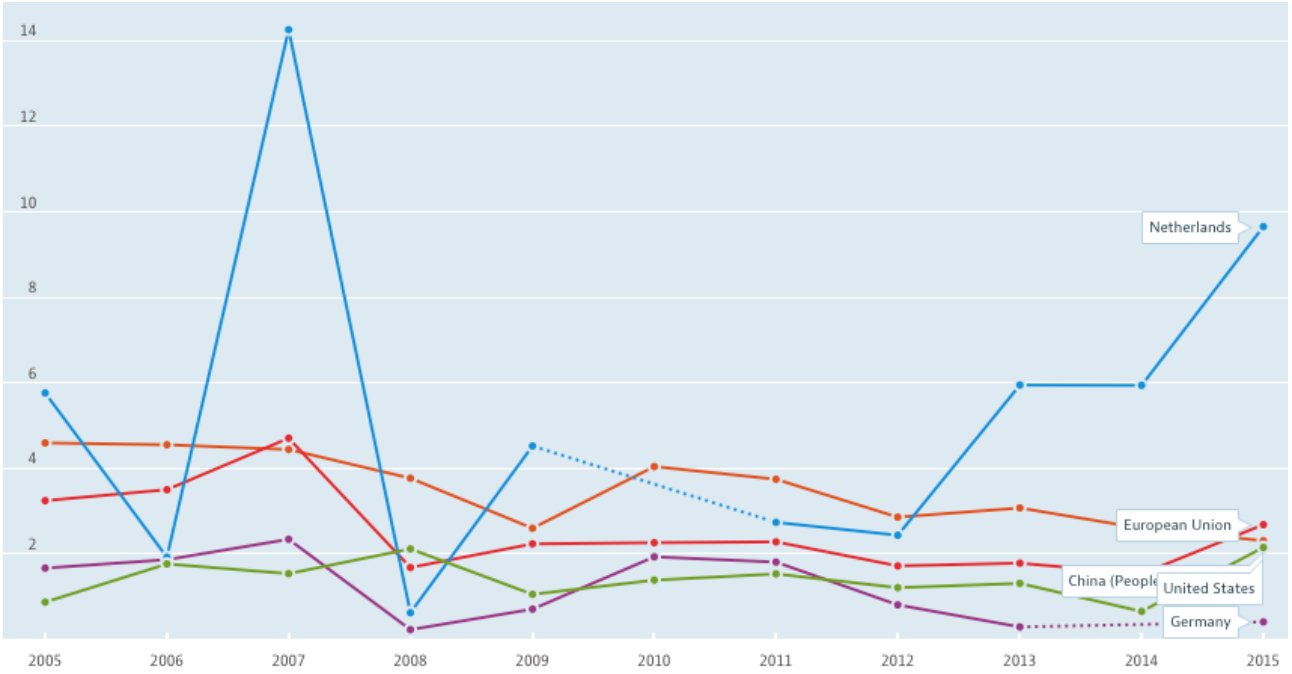
Both companies were able to attract before their relocation large investments by foreign companies. More specifically, US-based Priceline bought *booking.com* in 2005 while Indian tire-manufacturer Apollo acquired Vredestein in 2009. These investments marked new steps in the business development of the respective companies and pushed their needs for specific location factors.

12.2 Figure: *Inward Foreign Investments; in % of GDP*



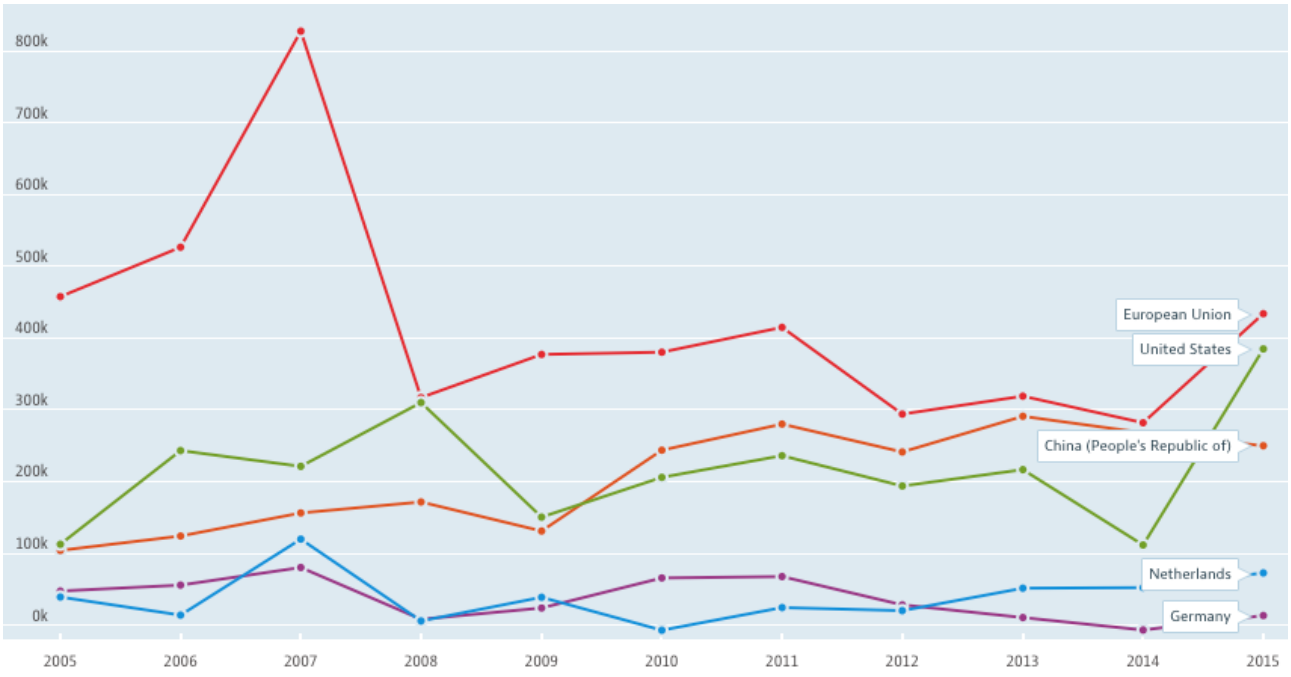
Source: OECD, 2016

12.3 Figure: *Inward Foreign Investments; in total US*



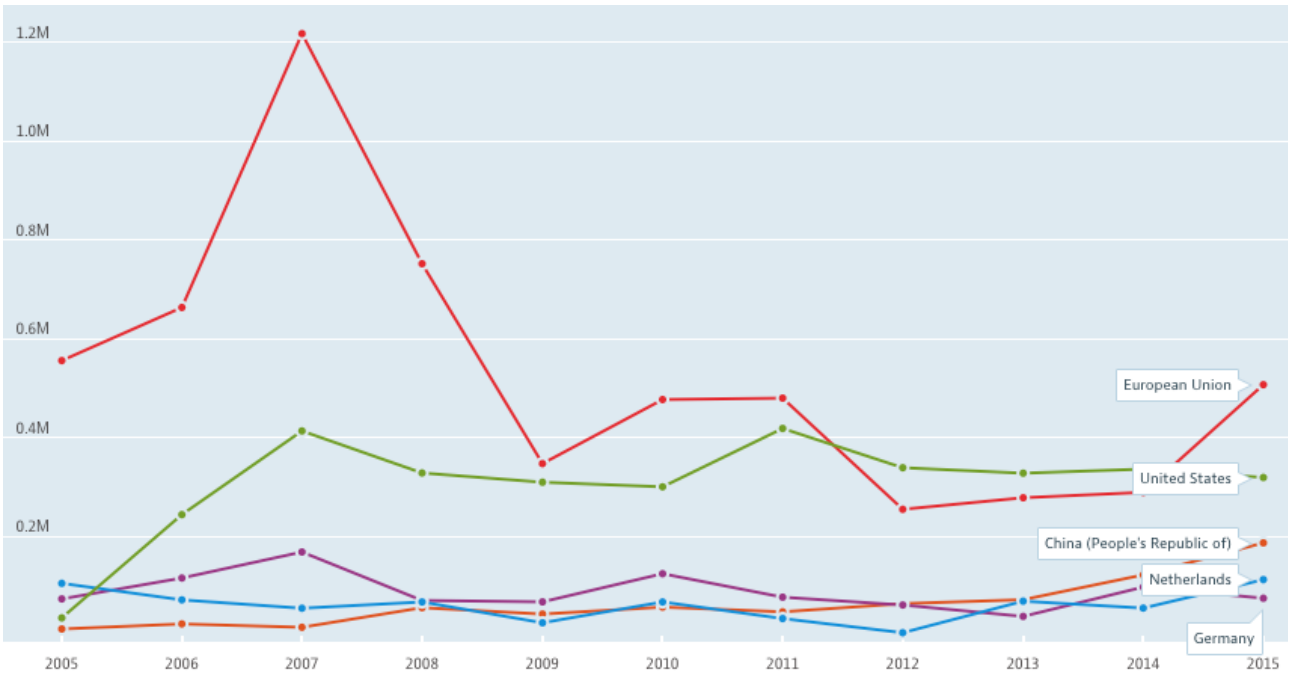
Source: OECD, 2016

12.4 Figure: *Outward Foreign Investments; in % of GDP*



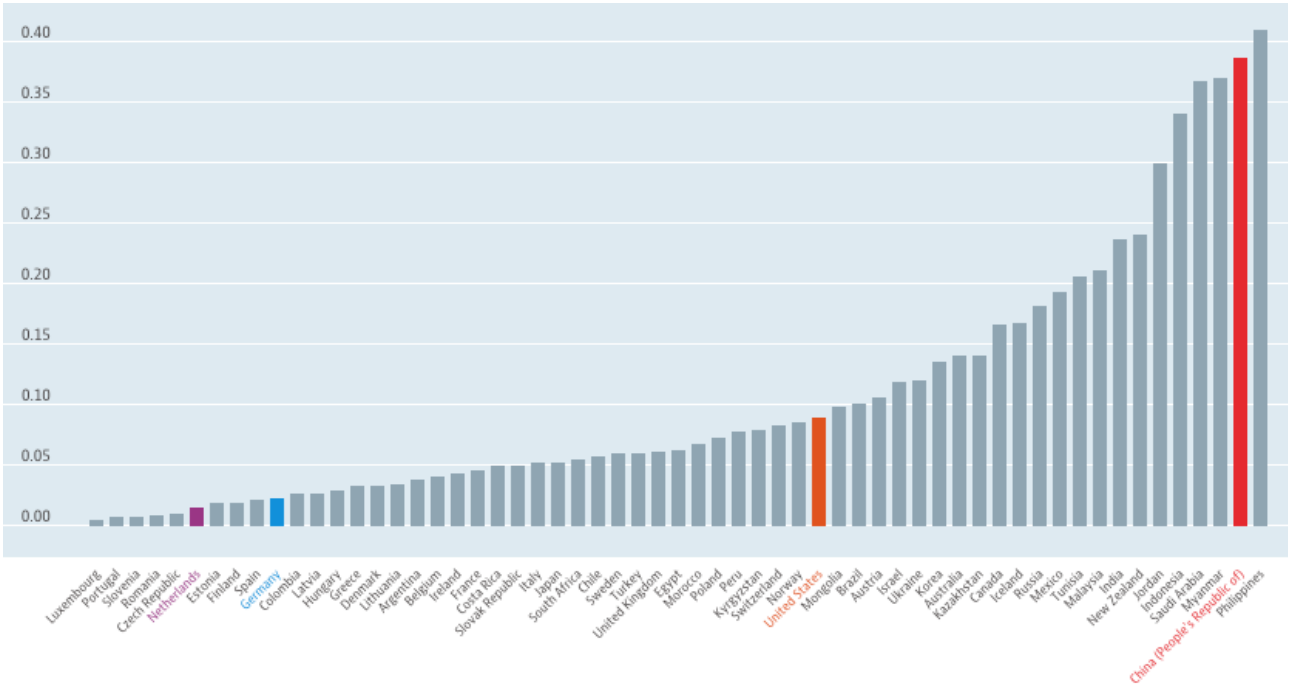
Source: OECD, 2016

12.5 Figure: *Outward Foreign Investments; in total USD*



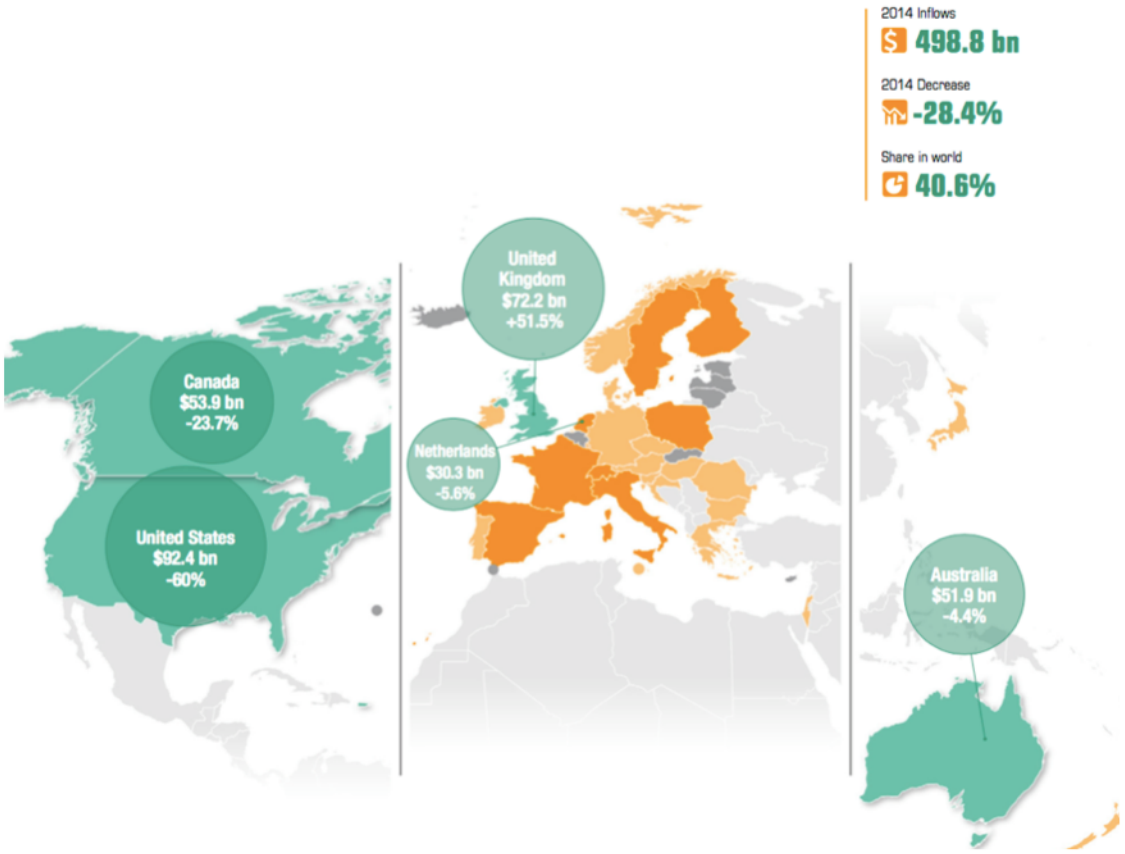
Source: OECD, 2016

12.6 Figure: *Restrictions to Inward Foreign Direct Investments*

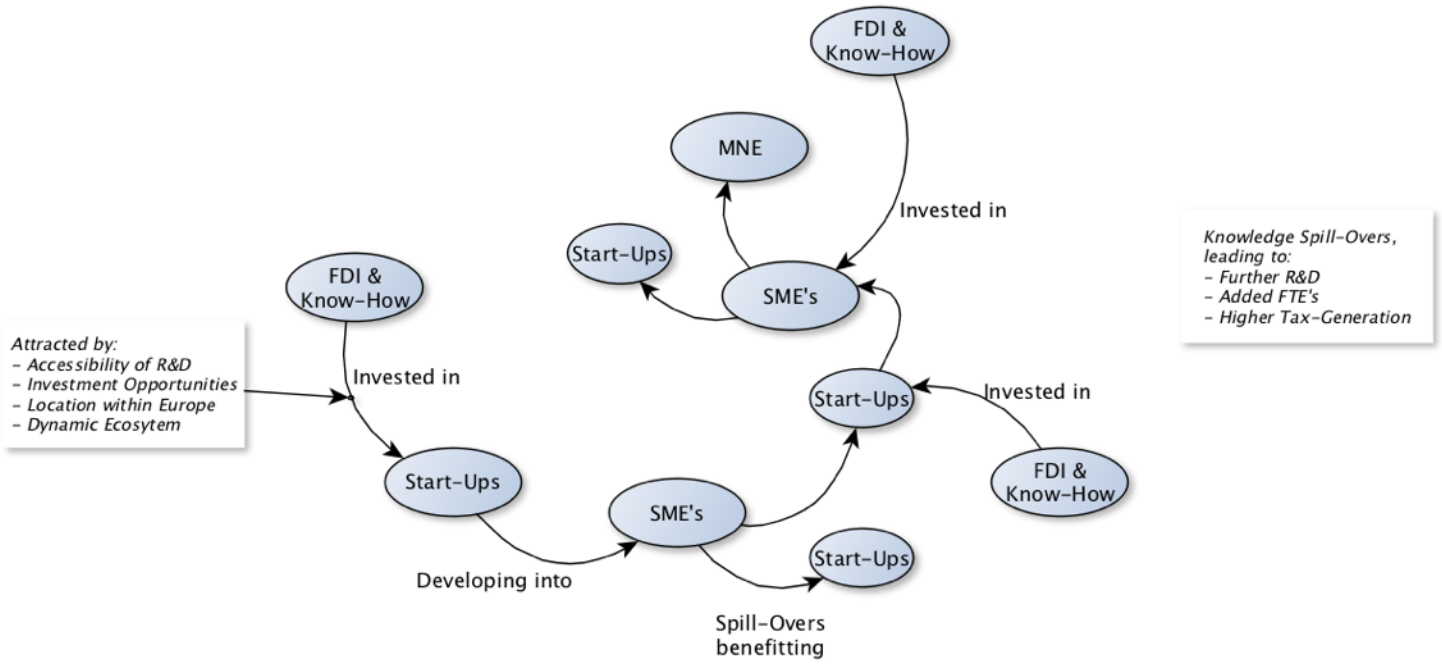


0: No Restrictions *1: Maximum of Restrictions* *Source: OECD, 2016*

12.7 Figure: *Expectations for global FDI activity level from beginning 2015 until 2017; in % of executives based in each region*



12.8 Figure: *Ideal mode of SBP-management*



12.9 Figure: *Stages of Business Development and Financing*

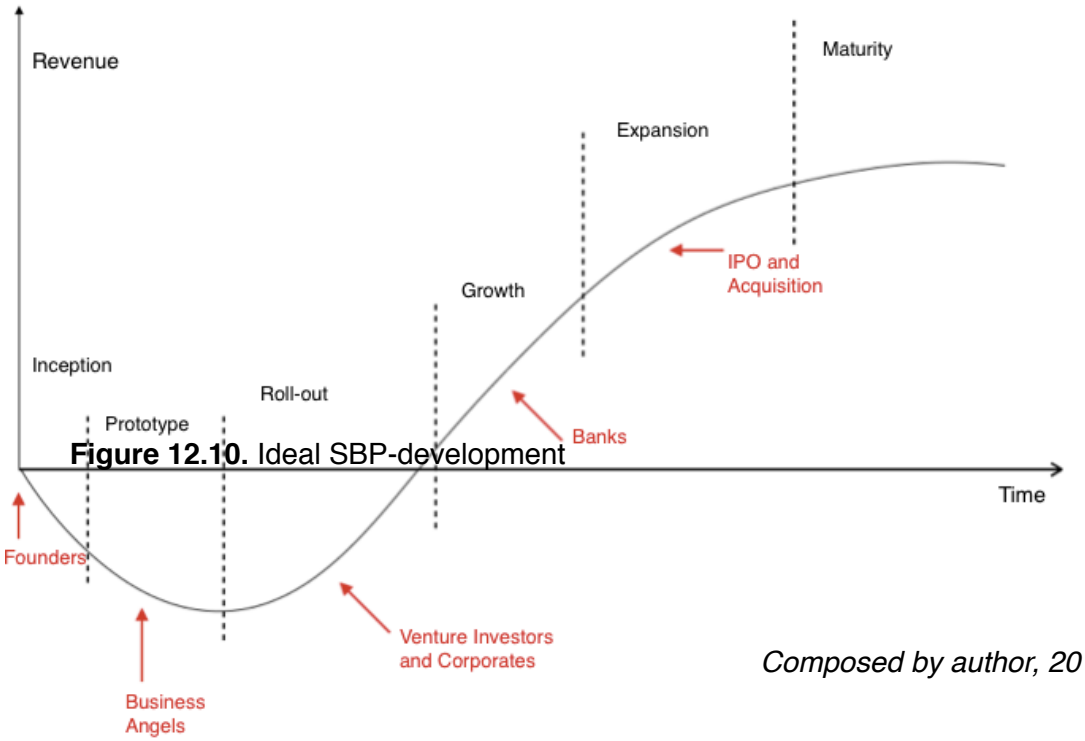


Figure 12.10. Ideal SBP-development

Composed by author, 2016

Table 12.10. *Interviewees*

Public Sector	Academic Sector	Private Sector	Other data sources
Dr. E. Schwenzow	Prof. Dr. A. Groen	C. Roeloffzen	LexisNexis on
M. Verkouter	Dr. R. van Reekum	G. Gazquez	Tubantia archive
Dr. R. Kolkman	Drs. P. Bliek	Anonymous entrepreneur	StartUpDelta
E. van Hattem	Dr. M. van den Berg		CoC
P. Dillingh			Future of High Tech conference
Dr. K. Eijkel			UT Library

Text 12.11. *Guide for semi-structured interview-process - these questions functioned as orientation within the interviews*

- *Which local/regional policy initiatives do you evaluate in the past ten years as relevant for the development of the Kennispark?*
- *Could you describe the effect and potential success of these policy initiatives?*
- *Which policy instruments were used?*
- *What was achieved until now in your opinion and what needs to be targeted in the next years?*
- *How would you describe the current development of the Kennispark Twente?*
- *Which are the key success factors of the Kennispark?*
- *Which are the most significant weaknesses of the Kennispark science park?*
- *With whom are you collaborating within the Kennispark community?*
- *Does a collaboration exist between the UT and your company/organisation?*
- *How would you describe the impact of the UT on your company/organisation?*
- *More explicitly, of the Business Development Team of the UT?*
- *How do you evaluate the influence of the SP management team on your company?*
- *How do you evaluate the influence of the regional legislation on your company?*
- *How do you evaluate the entrepreneurial spirit in this region?*
- *What makes this region in your perspective attractive to businesses?*

- *Which specific factors motivated most your company to invest in this science park?*
- *Which were the strongest location factors of the Kennispark?*
- *Where do you see your company in the future within the context of the Kennispark?*
- *Do you expect within the next years investments of external VC's?*
- *What would them specifically attract in your company?*
- *Did you experience in your environment FDI?*
- *What is the effect of FDI on local companies?*
- *Which measures need to be undertaken to attract further FDI?*
- *How is the Kennispark performing compared to other science parks?*