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Struggling with Technology

**A Critical Investigation of the Role of the Information
and Communication Technology-Sector in Stockholm's
Regional Development**

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ABSTRACT

This thesis investigates the role of the local ICT-sector in Stockholm's regional development over the last four decades. The inquiry is motivated, on the one hand, by economic polarization in the region and, on the other hand, by the increasing centrality of technical innovation in the region's development over the last decades.

The theoretical background is based on the literature that covers financialization and entrepreneurialization. These concepts are mobilized together with Marxist methodology to provide a critical perspective and to guide the analysis.

The results of the inquiry are presented in the form of a historical narrative that describes how the Stockholm region's ICT-sector has evolved from being dominated by industrial production of networks and mobile phones; to involving software development and Internet services; and then to revolve more and more around radical innovation, sharing economy applications and smart city technologies. This evolution is paralleled by a gradual retrenchment of corporate operations in the region. In their stead, startup companies, incubators, co-working spaces and angel investors proliferate.

The thesis finds that the ICT-sector has had a transformative impact on the region by introducing business concepts and organizational forms that have transcended societal institutions, particularly institutions associated with the societal division between production and reproduction. The thesis also finds that the sector, due to the scaleable nature of digital services, has served as a profitable outlet for financial capital which have been central to the Stockholm region's post-crises regenerations during the studied time-period.

Keywords: *Stockholm, Kista, Ericsson, Entrepreneurialization, Entrepreneurialization of the self, Financialization*

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INTRODUCTION

This thesis studies the relationship between technological development and urbanization. Specifically, it investigates the role of Stockholm's information and communication technology (ICT) sector in the evolution of the regional economy over the last four decades. During this period, Stockholm's regional economy – like many other metropolitan regions – have undergone processes of financialization and entrepreneurialization. The thesis shows how the local ICT sector has been a key element in this development; on the one hand, as a carrier of disruptive business concepts and organizational forms and, on the other hand, as an outlet for speculative finance capital. These tendencies are conceived as constitutive of a greater process in late capitalism under which production and valorization have been increasingly separated – spatially as well as organizationally – with considerable impact on cities and urban populations.

Background

This section briefly presents the key entities upon which this investigation is based: The Stockholm region and the local ICT-sector. Apart from providing background information and introducing some key concepts, the comments also contain some basic analytical delimitations.

A Historical Overview of the Stockholm Region

The Stockholm region (here used interchangeably with Stockholm Region or Greater Stockholm) is delimited to the jurisdiction of Stockholm County which also corresponds to the European Union's NUTS2-categorization. The region has about 2.1 million inhabitants divided over 26 municipalities that range in size from 10 000 to 900 000 inhabitants. The municipality with the largest population is Stockholm City which covers the central districts of the region or, alternatively expressed, the inner city (Stockholm City, 2018; Stockholm County, 2018; EU 2018).

Greater Stockholm is characterized by well-functioning governance, a fairly de-regulated political landscape and a high degree of regional autonomy. This, in combination with high-ranking universities and an extensive innovation infrastructure, has contributed to making the region an internationally recognized center for ICT, Life science and Clean-tech (Stockholm County, 2016; Tillväxtverket, 2014a: 2). With a large share of employment within knowledge intensive sectors, and a high number of patents and innovative capacity in startup companies, Greater Stockholm is considered one of the most innovative regions in Europe (OECD, 2013; Tillväxtverket, 2014a: 2;

Sannandaji & Rankka, 2015:17). What more, Stockholm City has the second highest ratio of "unicorn companies" per capita in the world, after Silicon Valley.¹

The booming industry is generally conceived as the outcome of a decades-long transition towards a post-industrial "knowledge economy". Since the 1980s, a significant part of the region's economic growth has occurred within knowledge-intensive industries. While this sector has expanded, traditional manufacturing industry has declined as production has relocated outside the region, or in its southern areas (SOU, 1990; Stockholm County, 2016).

As the region has transitioned to a knowledge economy, the labor market has become segmented. The workforce with higher education has formed an internal labor market in the knowledge intensive sector which is relatively insensitive to market fluctuations. Meanwhile, the personal service sector has grown, occupying many of the inhabitants with no or irrelevant education as well as immigrants. Over time, this sector has tended to inflate and deflate in tandem with economic cycles, resulting in uncertain employment conditions for the labor group (Stockholm County, 2016).

This process has been paralleled by increasing economic polarization. In international comparison, Sweden stands out as one of the countries in which economic polarization has accelerated the most since the 1980s (OECD, 2015:31-35). Greater Stockholm, in turn, is more economically unequal than the Swedish average (Lund Hansen et al. 2015). Moreover, profit shares has increased, and the fraction of GDP constituted by wages has decreased (Lindberg & Bengtsson 2013). This development can, *on the one hand*, be understood as an element of globalization. As the labor supply available to western capital has increased drastically – doubling since 1980 according to some – workers and labor markets around the world have ended up in competition for limited investments, undermining the influence of labor unions and so forth (Lindberg & Bengtsson, 2013:37-8). Also, the emergence of global networks of production – through practices of routinization connected to offshoring and outsourcing – has functioned as a "carrier of commoditization tendencies" into progressively advanced labor activities, effectively deskilling workers and preparing the ground for accelerated automation (Peck, 2017:125, 179; Lindberg & Bengtsson, 2013). *On the other hand*, since the IT-revolution in the 1980s, productivity augmenting technological development has, overall, been "capital augmenting," generating increasing profits while being detrimental to employment and to the labor income-share (Guscina, 2006; Lindberg & Bengtsson, 2013:35-36). Contributing to this development is the increasing flexibility of labor processes – brought about technical management or "business intelligence" – which grants producers an enhanced ability to adjust their output to demand-impulses while maintaining productive capacity. This has resulted in a decoupling of productivity rates from wage compensation in many sectors (Lindberg & Bengtsson, 2013).

There is a marked difference in affluence within the region. During the period between 1995 and 2010, districts in and around the city center has experienced a substantial increase in relative wealth. Meanwhile, in the more peripheral areas, the corresponding development has been more modest, even decreasing in some places. What more, during the same period of time, relative poverty – while decreasing in the inner city – has risen in the region's outer districts, particularly in the high-rise

¹ A unicorn company is a private company that is valued to more than one billion dollars. In this thesis the term is used to signify companies that are or have been unicorns.

neighborhoods built during *Miljonprogrammet* ("The Million Homes Program") in the 1960s and 1970s.² The transformation of the Swedish housing system has contributed to this development. During the post-war period, this sector was protected from speculation through regulations and subsidies. However, in the early 1990s and in the later half of the 2000s, the housing system underwent two rounds of deregulation and privatization that facilitated speculation in real-estate and effectively transformed housing from a social right to a commodity. In Stockholm, this has contributed to rising dwelling costs, increasing household indebtedness and a shortage of rental housing and affordable housing (Lund Hansen et al., 2015; Björklund 2017; Andersson, 2017; Lind et al., 2016).

A Historical Overview of ICT

Over the last four decades, the ICT-sector has been the fastest growing sector in Stockholm, both in terms of employees and turnover. The sector has been, and still is, dominated by large corporations.³ However, small companies and startups have gradually increased their presence. Moreover, tech-entrepreneurs have progressively become the primary generators of "radical innovation," that is the introduction of completely new products. (Stockholm County, 2013: 31).

ICT is a combination of two technological niches: information technology (IT) and telecommunication.⁴ The concept emerged in the late 1990s, reflective of a historical process in which these two fields of technical utility have merged into one. In what follows, this process is presented in three phases that reflect revolutionizing innovations within the field. The periodization is heuristic, made to facilitate reading. I have based the account on Inger Björklind Bengtsson's (2015) and Per Göran Ohlsson, Jan Svensson's and Hans Blacman's (2015) writings.

· *Mobile telephony and the IT revolution (1980-1995)*: Computers emerged in the mid 1940s, initially as a tool dedicated entirely to the storage and manipulation of data. Through technical advancements within microelectronics,⁵ making semiconductors smaller and more powerful, the personal computer (PC) evolved. It became commercially viable – chiefly as a

² *Relative wealth*: disposable income above 140 percent of the national median. *Relative poverty*: disposable income less than 60 percent of the national median income (Lund Hansen et al, 2015:34).

³ Out of the Stockholm region's large corporations, this thesis focuses solely on *Ericsson*. The reason for this is the company's size and its pivotal role in the local ICT-sector.

⁴ *Information technology* (IT), on the one hand, refers to the application of computers to store, retrieve, transmit, create and manipulate data, or information. *Telecommunication*, on the other hand, refers to the transmission of signs, signals, messages, words, writings, images and sounds or information of any nature by wire, radio, optical or other electromagnetic systems. *Information and communication technology* (ICT), finally, refers to the convergence of audio-visual and telephone networks with computer networks into a single cabling system, and software, storage, and audio-visual systems, that enable users to access, store, transmit, create and manipulate data or information (Björklind Bengtsson, 2015).

⁵ Microelectronics "is a subdivision of the field of electronics that deals with very small and microscopic elements to manufacture electronic components" (Technopedia, 2018).

professional working tool – with the invention of e-mail and the TCP/IP protocol in the early 1980s.

Around the same time, the first comprehensive generation of cellular technology systems, the *1G*, were launched, making mobile telephony – as we know it today – available to the public. However, it was not until the 1990s and the *2G*-generation that mobile telephony took off commercially. During this period, cellphones became smaller and cheaper and gained the capacity to receive and deliver text-messages.

· *The world wide web (1995-2005)*: the *Internet*, or *World Wide Web*, was made accessible to the public in the late 1980s. Meanwhile, software development (i.e. the conceiving, making and maintenance of applications), as an industry, became increasingly independent from hardware. These changes spurred an explosion of new applications and services with far-reaching influence on social and economic life. Notable examples are search engines, online retail stores and web forums.

Around the turn of the century, the *3G*-generation of mobile telephony systems were launched. Now users had the possibility to connect to the Internet through their mobile devices, marking an important step in the merge between information and communication technology.

· *Web 2.0 (2006-present)*: In 2006, *Twitter* was founded and *Facebook* was made available to the public. The following year, *Apple* released the first *iPhone* and so created the smartphone as we know it today. Together, these technologies make up the core of what has been called the ‘Web 2.0’. This paradigm is characterized by new communicative potentialities: users can now easily engage in dialogical communities and movements of various sorts; and users can be involved in processes of creating and redesigning goods, most saliently expressed in the notion of ‘user-generated content.’

This development has been facilitated by the launch of the *4G* network in 2010, which has substantially improved the capacity and performance of mobile Internet. Increased connectivity, in turn, has contributed to the development of the emerging fields of big data and artificial intelligence which are united in the notion of an "Internet of Everything" where humans and objects in the environment are interconnected (Hussain, 2017).

ICT in the Swedish Society

The Swedish population is, in international comparison, comprised of so-called "early adopters" when it comes to ICT. This has been the case since the 1990s. In 1995, 25 percent of the Swedish population had access to a computer in their home. The corresponding share in 2017 is 93 percent. As for Internet access at home, it rose from 0 percent up to 51 percent between 1995 and 2000; it thereafter increased to 95 percent in 2017 (at this time, 91 percent of the population has broadband in their home). Possession of a personal smartphone, lastly, has gone from virtually 0 up to 85 percent over the last decade. The increased access to ICT is paralleled by changes in the usage of ICT. Since 2005 (when records begin), the Swedish population – particularly those residing in urban areas – have become more prone to use the Internet. More time is also

spent on browsing (particularly on social media platforms), and the execution of "productive" activities on the Internet (such as writing blogs, posting pictures and videos on social media, shopping and so forth) has increased drastically (IIS, 2014; 2017).

ICT also affects working conditions. In 2017, two thirds of the working population use the Internet daily in their professional capacity (the corresponding number for highly educated workers is 97 percent). Out of these, 70 percent use the Internet to work at home at a regular basis (IIS, 2017:32-30). A literature survey from *The Swedish Work Environment Authority*, published in 2018, shows that so-called "flexibilization" of labor processes is a prevailing trend across society. This transformation process, the report concludes, is

enabled by access to digital technology and lead to increasingly fluid boundaries between work and leisure time. Employees are to a lesser extent than before required to be present in a physical work environment or at specific hours (2018:11).

Moreover, ICT has also contributed to informalized work-life relations in the Swedish society:

Digital technology, networking and social capital contribute to merging the professional and private spheres, making employees visible to colleagues and managers to a larger extent than before (2018: 12).

Aim and Research Question

My aim is to create a historical narrative which situates the evolution of the local ICT-sector within Stockholm Region's development over the last four decades. In doing so, I will disclose the ways in which the ICT-sector has exploited the region's collectively produced resources. I will also show how costs and risks associated with developing and implementing new technology has been shifted from the corporate sector to the region's population.

My research question is:

Over the last four decades, what has been the role of the ICT-sector in Stockholm's regional development?

The study is relevant in the context of wide-spread reliance on *technical innovation* in contemporary urban development and governance. This concept has, in the words of Benoît Godin, become "the panacea to every socioeconomic problem," resulting in a hegemonic "pro-innovation bias" that permeates contemporary societies (2015:17). Ugo Rossi seconds this statement, arguing that technical innovation "is no longer just a niche but is now at the centre of contemporary pathways of urban economic regeneration and is also behind their contradictions" (2017:48). Mariana Mazzucato, on this note, has shown how "risk taking has been an increasingly collective endeavor – with the State playing a leading role in the 'open innovation' system – while the returns have been much less collectively distributed" (2013:181).

In 2012, the local government vowed to make Stockholm the "most innovative regional economy in the world" by 2025. The reasoning behind this policy orientation is, on the one hand, that innovation is the key to sustained growth and employment and, on the other hand, that technological development will solve challenges posed by climate change, globalization and an aging population (Stockholm County 2012a:2, see also Stockholm County 2016:44). The decision can be perceived as a continuation of the transformation process in which Stockholm has gone from being "the most modern city in the world" in the 1970s (Andersson, 2013: 23) to becoming "a digital haven and an experimental sandbox for entrepreneurs" (Malm Wiklund & Almeling, 2016:6).

As indicated in the background section, the Stockholm region's transformation has been detrimental to social justice. Moreover, the uncritical celebration and prosecution of technical innovation is likely to obscure alternative pathways of urban development. By revealing the erratic and discontinuous processes that have led up to the present situation, I hope to recover the contingency of the current trajectory of urban evolution and particularly the dominant role of ICT within it.

METHODOLOGY

A History of the Present

With regard to the aim of the thesis, I have tailored the investigation in the form of a "history of the present". This concept pertains to accounts that use history to problematize the present by tracing the contingent processes that have brought the current state of things into being. "The search for descent," writes Michel Foucault, "is not the erecting of foundations: on the contrary, it disturbs what was previously thought immobile; it fragments what was thought unified; it shows the heterogeneity of what was imagined consistent with itself" (1991:82, cited in Garland, 2014:372).

The writing of a history of the present begins by making a "diagnosis" of a contemporary phenomenon. (See sections *Background* and *Aim* for this thesis' diagnosis.) The diagnosis then serves as a position from which a genealogical inquiry into the past is conducted in attempt to describe the emergence of the phenomena in question. The results of this inquiry are then lead back to the present as a destabilizing or problematizing critique (see *Figure 1*). Since this form of investigation begins and ends in a heuristic analytical device (i.e. the diagnosis), this approach makes it possible to pursue an inductive method and still create an effective critique (Garland, 2014).

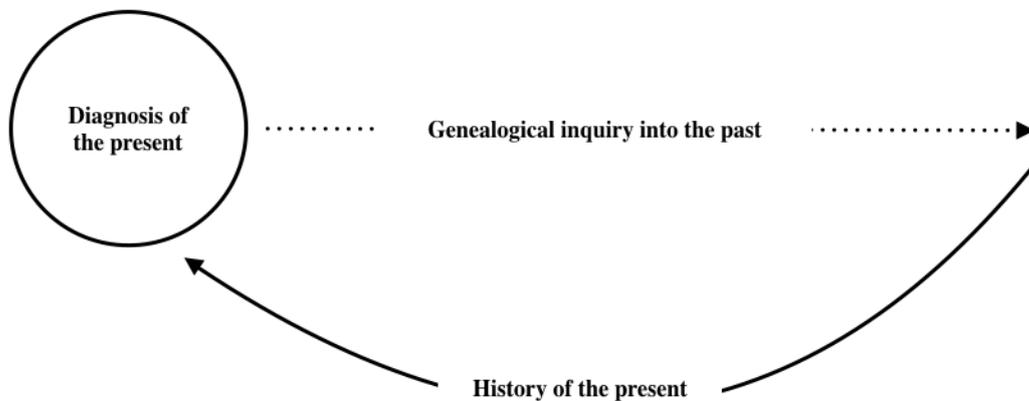


Figure 1. History of the present structured through continuous analysis of the composition of capital.

A history of the present weaves together qualitative and quantitative data. Unlike conventional historical research – which strives to establish the fate and significance of an event within its temporal context; an inherently quantitative endeavor – the construction of a history of the present is the reflexive practice of writing a history *in the present*, relating to contemporary issues. The objective, in other words, is not to discover the past *itself*, but rather to discover the past as the emergence of the present. Accordingly, small and, at the time, insignificant happenings in the past can be attributed great meaning in the inquiry. To attempt an analogy, the logic is similar to that

underpinning the notion of a "butterfly effect" in metaphysical speculations on time travel.⁶

To this background, the narrative comprised in this thesis covers the time period from the 1980s until present time. Developments in the Stockholm region and in the local ICT-sector, constitute the focal point of the investigation, but there are also digressions into processes occurring at other scales, particularly that of the nation with regards to fiscal policy and research and development policy. Drawing on David Harvey, the Stockholm region (i.e. the territorial delimitation) is approached as an "ecological totality" where independent processes, elements and entities are bound together in space, co-evolving in an "open dialectical manner". This means that tendencies which are put forward in the narrative should not be understood as general in an immanent or absolute sense. Rather, these observations should signify how one element (e.g. a company, a mode of production or a social group) becomes dominant and imposes its characteristics on the rest of society (2010:189-212).

Composition of Capital

At a more granular level the methodology has been informed by Michal Hardt and Antonio Negri's critical investigation of the state of economic life. Drawing on Karl Marx, they divide their analysis into two moments. In the *first* moment, they investigate the "technical composition" of capital to ascertain "who produces, what they produce, and how they produce" within a given economic formation (2009:133). This endeavor focuses on the nature, creation, and distribution of use-values. The *second* moment involves establishing the "organic composition" of capital, determining the relation between variable capital and constant capital, or, to phrase it more suggestively, the relation between living labor and *dead labor* (i.e. machines, money, materials and commodities). The objective of this analysis is to outline the conditions of exploitation: how surplus value is created and accumulated (2009:137).

The continuous application of these two concepts on the material, determining the "composition of capital" in the Stockholm region's ICT-sector over time, constitutes the general method for analyzing data and structuring of the content of the historical account (i.e. the history of the present) in this thesis (see *figure 2*). In the following, I discuss conceptual issues associated with this approach – particularly related to the concept of technical composition of capital – that has bearing on the collection of material. The following sub-section also informs the theoretical presentation of the next chapter.

Conceptual Issues

Hardt and Negri argue that "economic production is going through a period of transition in which the results of capitalist production are social relations and forms of life" (2009:131). This shift manifests itself in the increasing centrality of "immaterial

⁶ For a more comprehensive discussion of the difference between history of the present and conventional historical research, see (Garland, 2014:367-76).

goods" in the economy. This category of produce includes, for example, "images, information, knowledge, affects, codes, and social relationships;" goods that are coming to "outweigh material commodities or the material aspects of commodities in the capitalist valorization process" (2009:32).⁷

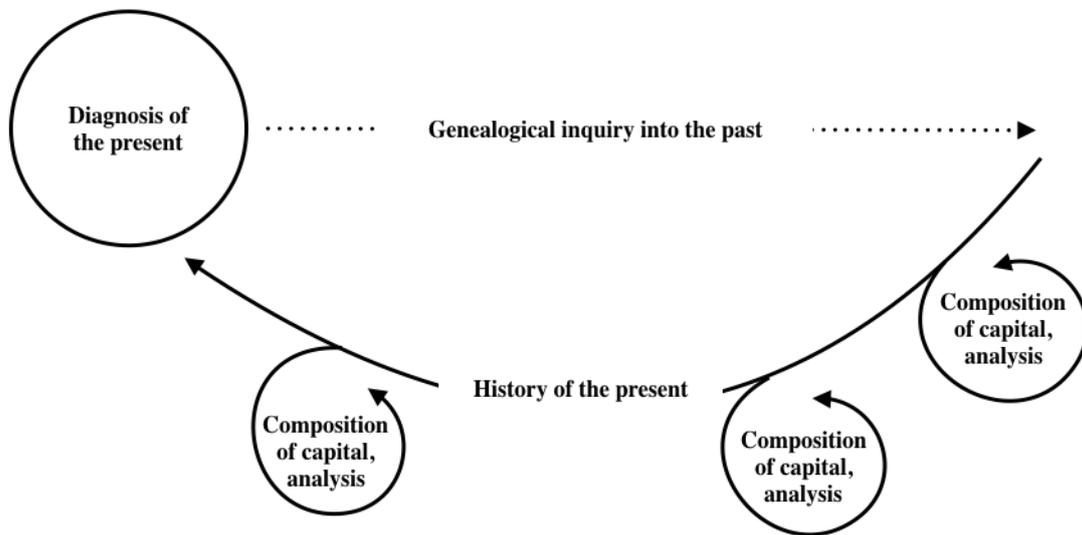


Figure 2. History of the present structured through continuous analysis of the composition of capital.

Production of immaterial goods differs from the industrial production of material goods with regards to the role of capital. In the latter case, the factory workers, to borrow Marx's metaphor, cooperate to form an "industrial army" that is commanded by the capitalist through a network of managers, machinery and supervisors. In the former instance, capitalism does not determine the cooperative arrangement to the same extent. Since the object of production is immaterial, human faculties such as creativity and sociability can take a dominant role in the labor process. Machinery, rigid organizational structures and lavish workplaces – forms of fixed capital that traditionally has been used induce and fashion cooperation – does not play a central role in the creation of immaterial goods. In fact, the mobilization of human faculties in creative enterprise is even likely to be frustrated by structuring interventions from capital. As Hardt and Negri note, "intellectual, communicative and affective means of cooperation are generally created in the productive encounters themselves and cannot be directed from outside" (2009:140).

The prevalence of immaterial goods poses three related and potentially insoluble challenges to the conventional methods of economic analysis.

- Firstly, the value of intangible goods tends to exceed the limits of quantitative measurement.
- Secondly, immaterial production tends to result in products that have the form of a common good. This characteristic does not only include signs, images, ideas, codes and symbols (products that are not consumed or depleted and can

⁷ Hardt and Negri add that, of course, this does not mean that "the production of material goods, such as automobiles and steel, is disappearing or even declining in quantity, but that their value is increasingly dependent on and subordinated to immaterial factors and goods" (2009:132).

be easily shared), but pertains also to embedded forms of social relations, culture, and practices of communication: what economists call "externalities" or even "mysteries in the air" to describe factors that are "outside" of economic ventures but still crucial for their success (2009:140). The "common" nature of immaterial products problematize the notion of ownership and commodity.⁸

· Thirdly, immaterial production, due to its relatively autonomous relation to capital, transcends the distinction between production and reproduction in the economic system. Cognitive, creative and affective labor processes are difficult to confine within the traditional concept of a temporal "working day" (as in eight hours sleep, eight hours leisure, eight hours labor) and a spatial working place. Moreover, these endeavors tend to engage social faculties, competences and networks that are acquired outside of work (2009:132).

With these issues in mind, the analysis of the evolution of the composition of capital – particularly the technical composition of capital (i.e. who produces, what they produce, and how they produce) – has to be dynamic. I therefore use the concept *ICT-sector* (or, alternatively, *local ICT-sector*) as a porous analytical entity, referring broadly to the organizations, networks and spaces within which processes of ICT development, innovation and dissipation has taken place. This includes multinational corporations' branch offices, Internet companies, startup companies, entrepreneurs, intermediary and financial institutions, academia and research institutes; in other words, the local "innovation ecosystem" related to ICT.

Method and Material

To comply with the methodological consideration presented above, the historical account about the Stockholm region and the local ICT-sector has been built from a variety of sources that provide qualitative as well as quantitative data. The major sources are briefly presented below.

Information on the Stockholm region's development has been collected from planning documents and Ola Andersson's (2013) account of the city's history. Particular data has also been collected from Anders Gullmark's (2001) work on the same topic, Nima Sanandaji's (2015, 2018) writings on the regional innovation system, as well as *Storstadsutredningen* (lit. "The Big-City Inquiry") from 1991 by Jan O Karlsson, Sören Häggroth, Sussanne Ingo and Mats Johansson.

As for the evolution of the Stockholm region's ICT-sector, I have relied heavily on Inger Björklind Bengtsson's (2015) comprehensive work on Kista's history. Lasse Åsgård and Christer Ellgren's (2001), Per Göran Ohlsson, Jan Svensson and Hans Blackman's (2015), and Åse Lindskog's (2015) records of the telecommunications company Ericsson's development have also been used regularly. Other important sources include Roger Fagerfjäll's (2003) and Björn Elmbrant's (2005) books on the Dotcom bubble and the crisis that ensued around the turn of the millennium. Regarding more contemporary events in the Stockholm region's ICT-sector, I have relied on Oskar Malm Wiklund and Jonas Almeling's (2016) guide to Stockholm's startup community and innovation system (this is also the source behind the tables in the appendix). I have

⁸ I return to this issue in the discussion on "the artificial common" in the next chapter.

also used articles, chiefly from tech magazines *Di Digital* and *Breakit*, as a source of information.

The process of selecting literature – and, generally, which events to include – has been informed by interviews with four persons who are active in the Stockholm region's ICT-sector. I have also been guided by information and references from the literature. The interviewees are introduced below:

- Stina Lantz administers *Ignite Stockholm*: a project that strives to establish relations between startup companies and large corporations. Lantz also has significant experience from working for *Stockholm Things*, an incubator for ICT-startups.
- Petra Dalunde is the chief operating officer at *Urban ICT Arena*, an ICT-testbed owned by *Kista Science City AB*.
- Inger Björklind Bengtsson worked as a journalist at *Megafonen*, Ericsson's staff journal. She has also been commissioned by *Vinnova* to map startup companies that formed within Ericsson's operations. Most recently, Björklind Bengtsson has published a book about Kista's historical development.
- Göran Pagels-Fick worked with business analysis at Ericsson up until the Dotcom-crash when he started working for *Vinnova* instead. He is currently writing a book on how to develop systematic processes for decision-making in innovative ventures.

In addition to these interviews, I have attended three conferences:

- *Ignite Sweden Day* (16-11-2017). Participants in the project as well as organizers presented their experiences from the project and shared some key insights.
- *Urban ICT Arena Summit* (15-12-2017). Founders and users presented how, and with what results, they had used the ICT-testbed over the year.
- *Things Three Year Anniversary* (22-03-2018). This event comprised a "case-marathon" in which companies presented how they incorporate IoT-solutions in their operations.

Neither the interviews nor my observations at the conferences were conducted systematically. In all of the mentioned instances, I have relied solely on note-taking. In the case of the interviews, the questions have not been structured. Any insights generated from these endeavors have been confirmed using written sources such as policy documents and newspaper articles, often recommended by the interlocutors.

As for the selection of interviewees and events, the process was fairly erratic. I first interviewed Stina Lantz who I have worked with before. She then invited me to *Ignite Sweden Day*, and later to the *Urban ICT Arena Summit* where I met Petra Dalunde and Inger Björklind Bengtsson who both agreed to be interviewed. I know Göran Pagels Fick through a common acquaintance. The reader will note that all the interviews and events took place in an early stage of the investigative enterprise.

Disposition

This section explains how the method is manifested in the inquiry and in the presentation of the findings.

In the following chapter, entitled *Theory and Earlier Research*, I build upon the theoretical position outlined above by presenting some key insights in the literature on what is conceived in critical theory as two major trends in the political economy: financialization and entrepreneurialization. The chapter serves, on the one hand, as an element or dimension of the history of the present, describing an evolutionary process that leads up to the contemporary state of things. On the other hand, it provides some theoretical concepts with which the material is analyzed.

The three chapters after that contains my findings in the form of a historical account. The studied time period is heuristically divided into these three chapters. This division is made to facilitate the presentation. Each chapter corresponds to an economic formation with a particular composition of capital. These compositions of capital are presented in the sixth chapter (*Analysis*). The sixth chapter also contains a description of how the composition of capital has evolved over time. For the sake of overview, the following is a brief reconstruction of the sections.

- The first section focuses on the years between 1980 and 1995. I refer to this period as "late Keynesianism," since Stockholm's ICT-sector at this time still featured many characteristics associated with traditional industry. Following massive – mostly public – investments in research on microelectronics and effective boosterism from city officials, Kista becomes home to large, mostly hardware-producing multinational companies that dominate the ICT-sector long into the 1990s. Meanwhile, financial activities were limited to the large banks and national and local government, restricting speculation. Production and valorization are spatially and organizationally connected.

- The second segment encompasses events which took place between 1995 and 2006. In the section title, I use the imperative "innovate or die" to signify the mentality that then prevailed in the Stockholm region's ICT-sector, and which was manifested in major investments to "digitalize" or "informationalize" society. ICT technology takes off commercially, and rapidly growing software companies (so-called "Dotcoms") are, for a while, widely believed to be revolutionizing the economy. Everyone wants a piece of the growing cake. Speculative capital pours into Stockholm's ICT sector from pension funds, venture capital firms and household investors; valorization is concentrated to the stock-market. Moreover, inner-city districts are increasingly perceived as innovative; as the natural habitat for the emerging "tech entrepreneur" who leads a life with little distinction between work and leisure.

- For the third and final segment (2006 until present time), I have used a slogan which local business institutions use to promote the Stockholm region, namely "The Unicorn Factory" (2013). ICT is now becoming inseparable from society and social life. In addition to being economically necessary, Stockholm's ICT-sector is also becoming perceived as crucial for social and ecological sustainable development. Following a similar pattern, the entrepreneurial community adopts a philanthropic and cosmopolitan understanding of their role in society. The "social entrepreneur" evolves as a figure that is at one and the same time a producer of innovative technical utilities and a distinct figure in the urban culture. Meanwhile, so-called "Internet giants," transnational high tech companies and, eventually, sharing economy companies acquire central roles in the valorization process.

Finally, there is a concluding chapter which summarizes the key insights and discusses prospects for future research.

THEORY AND EARLIER RESEARCH

"Capitalist accumulation today," Hardt and Negri state, "is increasingly external to the production process, such that exploitation takes the form of *expropriation of the common*" (2009:137, italics in original). This practice, they argue, exists in two "guises". The *first* is effectively outlined by Harvey's notion of "accumulation by dispossession" which reveals how neoliberal ideology and policies are mobilized to legitimate massive privatization of public resources (cf. Rossi, 2017:43). This approach conceives contemporary capitalism as parasitic; as solely or primarily the expropriation of already existing wealth.

While this conceptualization is in many ways accurate, Hardt and Negri note that "capital is and has to be in its essence a *productive* system that generates wealth through the labor-power it employs and exploits" (2009:139, italics in original). They accentuate this essence in the *second* guise: the expropriation of "the artificial common". In contrast to the commonly owned wealth that is central to the first guise (e.g. public welfare institutions and public transportation networks), the artificial common is more dynamic. It involves

both the product of labor and the means of future production. This common is not only the earth we share but also the languages we create, the social practices we establish, the modes of sociality that define our relationships and so forth. This form of common does not lend itself to a logic of scarcity as does [that of the first guise] (2009:139).

Capital expropriates the artificial common

not so much from the individual worker (because cooperation already implies a collectivity) but more clearly from the field of social labor, operating on the level of information flows, communication networks, social codes, linguistic innovations and practices of affects and passions (2009: 140).

In the following sections, I contextualize these two guises by presenting an overview of the literature on what is conceived in critical theory as two major trends in late capitalism, namely financialization and entrepreneurialization. Through this exercise, I indicate how, over the last four decades, expropriation of the common in the first guise has paved the way for that of the second guise. This conceived trend also constitutes the overarching theoretical argument in this thesis.

Financialization

Financialization, in its most basic form, refers to "the shift in the center of gravity of the economy from production to finance" (Foster & McChesney, 2010). This shift is manifested in increasing inequality, decreasing wage share of GDP, high asset prices, high levels of private debt, shareholder value orientation, stagnation of fixed

investments and financial volatility; a collection of trends that has been observed in industrialized economies since the late 1960s (Bengtsson et al., 2013). The literature covering financialization comprises three complementary – and, to some degree, overlapping – approaches to the phenomenon (cf. van der Zwan, 2014, see also Rossi, 2017:31).

The *first* approach is to conceive financialization as a recurring moment in capitalism characterized by the rise of an accumulation regime "in which profits accrue primarily through financial channels rather than through trade and commodity production" (Krippner, 2005:174, cited in van der Zwan 2014:103). Ugo Rossi, building on Giovanni Arrighi, writes that

each cycle of accumulation consists of the alternation of a phase of material expansion, when trade and production expand in search of new geographical routes and economic sectors, and a subsequent phase of financial reinvestment, which takes place when profitable opportunities in the trade and industrial sectors are shrinking (2017:28).

Financialization, accordingly, constitutes a "period of hegemonic transition" in which capitalist elites respond to a shifting economic environment. David Harvey compliments this framework with his notion of capitalism's perpetual process of creative destruction. He writes that, "from the standpoint of the circulation of money capital, processes of valorization and realization are mere inconveniences on the way to profit making" (2017:68). Therefore, when difficulties mount in the conventional paths of capital accumulation, capital tends to flow from productive and trade sectors into assets (like stock-markets, real-estate or built environment) and major development programs that typically are mediated by the state (such as infrastructure projects, research programs or social expenditure). These long-term investments (into what Harvey calls the "secondary and tertiary circuits of capital") produce physical and social infrastructure for accumulation; they are "spatiotemporal fixes" that make space for economic growth by creating new industries and milieus that animate wants, needs and desires. In this way, "capital constructs the necessary physical and social conditions appropriate to its own needs at a particular historical time and place" (2017: 167).

To this conceptual backdrop, the current wave of financialization can be traced back to the late 1960s and 1970s when productivity declined, and the symbiotic relationship between rising wages and demand for industrial produce was severed. The old, "Fordist-Keynesian" accumulation regime was then supplanted by a new regime that combined flexible labor markets with an expansion of credit and supply-side economics (Harvey, 2007). Meanwhile, the internationalization of global markets has triggered many firms to withdraw from productive activities, outsourcing manufacturing processes to "offshore" locations in order to cut back on costs. This trend has resulted in vast capital flows being channeled away from productive sectors, partly because of poor exchange rates for mass-produced commodities and monopsony conditions (Peck, 2017), and partly as a result of productivity gains being distributed to shareholders or financial institutions instead of being reinvested in the corporation (van der Zwan, 2014:104). Overall, this process has been criticized as instigating the return of the rentier – or the "functionless investor," as John Maynard Keynes put it – as a primary figure in Capitalism (Hardt & Negri, 2009:141). Since the 1980s, owners and financial institutions have seen their incomes increase substantially. This has been to the

detriment of (a) workers and households who have experienced stagnant wages and increasing indebtedness, (b) public institutions that have been known to bear the costs of systemic risk in volatile financial markets (Cahill & Konings, 2017:60-70) and (c) technological development which presumably has been hampered by decreasing investments in long-term innovation within the private sphere (Lindberg & Bengtsson, 2013:214; see also Mazzucato, 2013:187).

The *second* approach to financialization also relies on the accumulation cycle framework, but it emphasizes the restructuring of capitalist corporations instead of whole economies. Rather than focusing on rentiers as a broad social class, this perspective studies financialization as a redistributive process between social groupings within corporations, i.e. managers, shareholders and employees. From this standpoint, it is possible to understand the "increased financial orientation of non-financial corporations" (van der Zwan, 2014:107), a trend which Damien Cahill and Martijn Konings outline as follows:

Whereas in the Fordist era corporations were responsive to a wider variety of parties with an interest in their operations ('stakeholders'), they now [in the 1980s and 1990s] increasingly became driven by the imperative to maximize 'shareholder value' (2017:68).

This reorientation has been associated with a set of *business practices* aimed at creating a community of interests between managers and owners. Such practices include the introduction of financial performance measures (e.g. return on equity), the publication of – and increasing emphasis on – quarterly reports (manifesting a short-term business outlook), and the tying of managers' remunerations to stock market performance. Moreover, the development of these practices has been paralleled by a managerial concentration on "core competencies" of the firm:

to satisfy the company's investors and business analysts, managers will shed off underperforming branches of the firm in attempts to raise the net worth of the corporation. Other restructuring activities include mergers and acquisitions, hostile takeovers and leveraged buyouts as well as the outsourcing of productive activities (van der Zwan, 2015:108).

These business practices gained popularity when, in the 1970s and 1980s, institutional investors started mobilizing their rights as shareholders in large Fordist conglomerates to increase return rates.⁹ Firms were restructured, and the financial gains were distributed to owners through dividends and share buybacks – instead of being reinvested in productive ventures. Since then, institutional investors have consolidated their influence. As noted by Robin Blackburn,

⁹ An institutional investor is an organization that invests on behalf of its members. Institutional investors face fewer protective regulations because it is assumed they are more knowledgeable and better able to protect themselves. There are generally six types of institutional investors: endowment funds, commercial banks, mutual funds, hedge funds, pension funds and insurance companies.

even the largest and most famous of corporations have only a precarious and provisional autonomy within the new world of business... They may be able to finance all the investments they wish to undertake from their own resources, but this will not mean that they are free from the pressures of financialization. In drawing up their investment plans, they will have to show that these will achieve the benchmark or 'hurdle' rates of return established by the financial sector (2006: 42-3).

Rating agencies and other scrutinizing institutions play a pivotal role in this "new world of business" as their sanctions are necessary for a corporation's ability to access cheap capital. However, this system of continuous investigation and interrogation of corporations also provides disciplinary tools that owners can wield against stakeholders. Credit ratings function as a baseline for management, undermining claims from other interests groups, and protecting the position of the 'pure' investor to whom

the corporation itself is an accidental bundle of liabilities and assets that is there to be rearranged to maximize shareholder value, which in turn reflects back the fickle enthusiasms of other investors. The corporation and its workforce are, in principle, disposable (Blackburn, 2006: 43).

The *third* and final approach to financialization investigates the phenomena as a feature of everyday life for ordinary people, and the notion of the "citizen as investor" (van der Zwan, 2015:115). This approach stands out from the previous ones in emphasising cultural aspects of financialization; particularly how the encroachment of financial concepts into the domain of social life can function as a productive force by affecting how citizens understand their role in the political economy.

Theorists belonging to this ideational current have paid a lot of attention to "securitization". This concept pertains to the panoply of techniques employed to transform illiquid forms of property into tradable assets. These techniques, in turn, comply with the derivate logic of 'slicing and dicing' in so far that assets are disaggregated and repacked to enable realization. Since the 1970s, securitization has been systematically employed to expand credit (Cahill & Konings, 2017:67). On this note, Andrew Leyshon and Nigel Thrift have argued that

financial capitalism is dependent on the constant searching out, or the construction of, new asset streams, usually through a process of aggregation, which then – and only then – allows speculation to take place.

With this conceptualization, they revealed how new financial instruments, asset classes and information technologies have made it possible to operate on a broad array of aggregations that were previously inconceivable and thus impossible to subject to speculation. Trough these advancements, they argue, contemporary finance has come to involve the "capitalization of almost everything" (2007:97).

Securitization and the financialization of everyday life is intimately associated with the rising importance of institutional investors in the aftermath of the structural crises:

the combination of dynamic financial markets and dwindling public sources of income provision meant that savings were increasingly channeled into mutual funds and pension funds ... Ordinary people were now increasingly integrated into financial markets not just as debtors and savers but also as small investors (Cahill & Konings, 2017:68).

This co-evolution has typically occurred in contexts of increasing precariousness in labor markets and retrenchments in Keynesian welfare institutions; situations where household indebtedness has increased drastically, and costs and risks have been "downloaded" onto individuals and communities which have become reliant on increasingly volatile financial systems for their security and sustenance (Peck, 2010; Rossi, 2017). As populations are facing prospects of mounting insecurity, a new figure has emerged in governance discourses: that of the "investing subject". The investing subject is "the autonomous individual who insures himself against the risks of the life cycle through financial literacy and self-discipline" (van der Zwan, 2015:113). Individualistic in nature – acting on his own, chiefly for the benefit of himself and his household – the investing subject, as a prevailing notion in governance, undermines the capacity of collective subjectivities.¹⁰ The development reflects the emergence of a "portfolio society," in which

the investment idiom becomes a dominant way of understanding the individual's place in society. Personality and talent become 'human capital', homes, families, and communities become 'social capital', and the guiding principles of financial investment spread by analogy far beyond their original application (Davis 2009:6, cited in Cahill & Konings, 2017:39).

Entrepreneurialization

Entrepreneurialization – here employed to signify the progressing development of urban entrepreneurialism¹¹ – has been subject to scholarly interest since the 1980s. However, patterns of entrepreneurialization can be traced back to the Italian renaissance (Rossi, 2017). Contemporary processes of entrepreneurialization are typically understood in relation to neoliberalism and neoliberalization; as an important element in the "mobilization of state power in the contradictory extension and reproduction of market(-like) rule" (Peck & Tickell, 2002: 167). Moreover, entrepreneurialization is understood as a chiefly urban phenomena.

Entrepreneurialization processes tend to feed on two, complementary notions: that of austerity and that of international – or, more accurately, "inter-urban" – competition. Austerity refers to a panoply of economizing imperatives which are directed at public spending in times of crises. Common austerity measurements include processes of privatization of public services, the managerialization of governance structures, and the

¹⁰ Like van der Zwan, I consciously use male pronouns here to "signal the gendered nature of these financial discourses" (2015:113).

¹¹ Entrepreneurialism: "[a] form of [urban governance](#) focused on promoting economic growth through enabling the private sector to flourish, in contrast with urban managerialism, which concentrates on the provision of public services" (Castree et al., 2013)

delegitimization of redistribution and social security as prioritized issues for public policy. As for inter-urban competition, it tends to materialize in what Harvey calls "entrepreneurial urban governance"; particularly the proliferation and mounting popularity of "public-private partnerships" in which "traditional local boosterism is integrated with the use of local governmental powers to try and attract external sources of funding, new direct investments, or new employment sources" (Harvey, 1989:7).

Rossi, building on Michael Storper, proposes an understanding of entrepreneurialization as "the way in which economic growth acts as a bridging force ... between different sets of political, economic and spatial entities" (2017:38). To this conceptual backdrop, he conceives an evolutionary trajectory that continues from the tendencies in urban governance observed by Harvey in the 1980s to the "local politics of globalization" in the 1990s. This progression, Rossi argues, was brought into being as

municipal authorities with the support of rent-seeking¹² local actors realized that the key to urban resurgence was the capacity to build bridges between cities and international organizations and investors, obtaining the designation of mega-events [e.g. The Olympic Games or The Fotboll World Cup] and attracting the interest of global brands (2017:39).

The pursuit of these policies rearranged the competitive terrain of the global market within the hierarchical architectures of multi scalar governance, undermining state power while benefitting that of urban politico-economic elites.

Over the last fifteen years, the policy-repertoire of urban renewal and local boosterism has encountered boundaries. In the words of Jamie Peck:

life on the neoliberal plateau is dominated by the prosaic churn of routinized, 'everyday' entrepreneurialisms... On the back of decidedly 'mixed results' ... of earlier interventions, the cluster-development policies of yesterday have been diluted into the creativity districting plans of today. And the hollow promise of mega-event strategies has been exposed for all to see, given the sorry legacies of white-elephant infrastructure projects and fiscal hangover effects (2014: 397, 8)

However, despite "weak policy tools," cities "must act, and be *seen to act*, even if the aspirational reach continually exceeds the effective grasp" (2014:398). This precariousness, Rossi argues, is manifest in the "proliferation and rapid turnover of policy catchwords and corresponding urban development imperatives", which produce the impression that today's cities are "demanded to be at one and the same time smart, start-up-friendly, resilient and creative" (2017:41). Meanwhile, as the process of globalization becomes increasingly multipolar, cities have ramified their coalitions and networks, reaching out to a broader array of public and private institutions and international organizations and companies. These relations constitute a framework for "multi-spatial meta-governance" with "the institutional capacity to deal with different spatialities and corresponding imaginaries of capitalist growth" (Rossi, 2017: 43).

¹² Rent-seeking refers to practices aimed at increasing one's share of existing wealth without creating new wealth.

Entrepreneurialization of the Self

The forward-failing progression of entrepreneurialization, Rossi argues, has prepared the ground for what he calls the "revenant city" as a global experience. In the context of a turbulent global economy and slow growth rates, following a decade-long confrontation between austerity and growth-driven policies, metropolitan regions have acquired a renewed role as "economic-cultural engines of capitalism" manifested in two interrelated phenomena: the formation of high tech clusters comprised of start-up firms agglomerating in inner-city districts, and the emergence of a technology-based "sharing economy" with distinguished actors such as *Airbnb* and *Uber*.

According to Rossi, urban start-up economies are

illustrative of a process of re-enlivenment of capitalist economies within urban social environments. The urban high tech entrepreneur is simultaneously embedded within localized communities and economic 'ecosystems' and defines herself through a global sense of belonging fostered by social media and transnational networks, unlike first-generation post-Fordist entrepreneurs who limited their allegiance essentially to the local and regional scale (2017:165).

The central role of community in contemporary high tech economies stands out in comparison to the wave of "Siliconization projects" during the 1980s and 1990s, which chiefly comprised policy-led, "only way forward for Capitalism" experiments prosecuted by the entrepreneurial state in a late Keynesian fashion. Moreover, whereas original processes of entrepreneurialization targeted societal structures, this new wave of entrepreneurialism reaches further, appropriating fundamentally social qualities such as creativity, ethics and coolness. To Rossi, this illustrates "a shift from the entrepreneurialization of society to that of the self": a transformation in which community has been turned into a key competitive advantage, benefitting those high tech economies that have availed through the technological and societal changes induced by the emergence of the new communication channels associated with the Web 2.0 (see subsection *A historical overview of ICT*). He goes on, saying that

it can be argued that this phenomenon is illustrative of an age of 'communicative capitalism' nourished by a set of animating fantasies such as 'abundance' (there is never enough information and innovation), 'participation' (everyone can launch an entrepreneurial venture) and 'wholeness' (anyone can be part of *the* community, of *the* high tech scene...) (2017:167).

While urban start-up high tech economies oftentimes are represented as self-organizing entities – an ideal that constitutes a key "pillar of the culture of capitalism in the digital era" (2017:168) – these sectors typically rely on a network of foundations, consultancy agencies and local and national governments. These actors rarely take on a directional role. Rather, they support the process of high tech business formation, partly by investing in public discourse and promotional strategies and partly by funding training programs and institutions that specialize in high tech education, fostering human capital.

LATE KEYNESIANISM

Listen up all companies, large and small. Plots ranging in size from 3,000 to 10,300 square meters available for rent with green spaces and beautiful parks. Kista is going to be Stockholm's largest workplace with 18,000 jobs. Heavy industry not permitted, microelectronics companies would fit in well.

– Ad from SML, Dagens Nyheter, 1977

Sweden has lost many years in microelectronics, despite the fact that several studies have shown that it is crucial for Sweden's future as an industrial nation.

– Sven-Ingmar Ragnarsson, government official, 1980

Since the 1980s, a significant part of the Stockholm region's economic growth has occurred within knowledge intensive industries. This development can be seen as a continuation of the gradual shift in the regional economy from traditional manufacturing towards high tech industries and personal services: a transformation that has been going on since the 1950s (Stockholm county, 2016:28; SOU, 1990:24).

Through a national perspective, the 1980s was a period in which Stockholm's role as the dominant center for political and economic power was consolidated. This development took place in the context of emerging international networks that influenced national and regional affairs through the capital which therefore became the central node of interference between Sweden and the world; "a port of entry for new technology, knowledge, ideas and impulses" (SOU, 1990:25).

A key point in Stockholm's reconfiguration process is the development of Kista. Kista is a suburb in the northern part of Greater Stockholm, which housed some of the world's most prestigious IT researchers, IT developers, IT companies, IT business leaders and IT enthusiasts in the end of the 20th century (Björklind Bengtsson, 2015).

Kista was built around the mid 1970s, in the end of The Million Homes Program. However, unlike the adjacent neighborhoods Husby and Akalla, which were built in the same period, Kista was developed with a specific, business-oriented purpose in mind. In 1971, the former mayor of Stockholm, Hjalmar Mehr, and the prominent business-man and industrialist Marcus Wallenberg, together envisioned a scenario in which Kista would become home to companies working at the very forefront of technology, charting the path for Stockholm and Swedish industry into the future (Björklind Bengtsson, 2015).

Stockholm City, through the holding company *Stockholms Mark och Lokaliseringsbolag* (SML, "Stockholm's Land and Accommodation Company") took a leading role in developing and marketing Kista's industrial district. John-Olof Persson, mayor of Stockholm at the time, became SML's first chairman. Under his management, SML bought up leaseholds around Kista to free up land for business formation. LM Ericsson's (later Ericsson) subsidiaries Svenska Radioaktiebolaget ("The Swedish Radio Corporation") and Radioindustrins Fabriksaktiebolag (The Radioindustry's Factory Corporation) were the first major actors to set up operations – specifically semiconductor factories and research facilities – in the newfound tech-district. IBM soon

followed, and by the end of the 1970's more than three thousand people were employed in Kista's tech-industry (Björklind Bengtsson, 2014:34, 41-4).

At this stage, Stockholm City started modeling the development of Kista after Silicon Valley in the United States. They only allowed microelectronics companies to establish themselves in the area, and exercised considerable pressure on The Royal Institute of Technology (KTH) to set up a campus in Kista. Their efforts contributed to a bandwagon effect, and the emerging IT-cluster maintained a steady growth throughout the 1980s, chiefly as a result of microelectronics companies moving in from other parts of the Stockholm region. By the turn of the decade, the area hosted 25 000 employees, most of which were engaged in IT (Björklind Bengtsson, 2015).

In 1986 the Electrum Foundation was established. This was a public-private partnership involving the Swedish state and the City of Stockholm as well as local industry, universities and research institutes. Two years later, the cooperation materialized in the Electrum Building. This facility, which featured industrial space as well as service amenities, was designed to function as a "competence center" for IT by encouraging active co-operation between education, research, and microelectronics industry. Around the same time, an "electronics village" was created to accommodate IT-start-ups in Kista (Björklind Bengtsson, 2014:34, 41-4, 52).

The National Microelectronics Program

Unification of academic and industrial interests through technology and innovation was characteristic of the Swedish research and development (RnD) policy in the 1980s and early 1990s. Before, RnD policy had been conceived as a political tool for ameliorating societal conditions. However, with the emergence of global markets and innovation-driven high tech companies, there was a prevailing tendency to evaluate RnD in relation to economic criteria, particularly competitiveness and innovativeness. The most salient example of this reorientation is the National Microelectronics Program (NMP), initiated in 1983. The program funded specialized educational programs, basic research and product development within the field of computer science. It continued over a five-year-period at a total value of 700 million SEK (Swedish Government, 1983/84).

The program was implemented by a social democratic government. To them, the field of microelectronics – with high profitability-rates and an expanding market – appeared as the only way to secure Sweden's future as an industrial economy. To this background, the Minister of Industry, Thage G Peterson, argued that it was "economically necessary" to subsidize the national industry, partly due to high research-costs and partly with regards to coarse international competition (Swedish government 1983/84:11-12).

The NMP put the Swedish ICT industry in a favorable position, both in terms of international competition and in relation to other industries within the country. Bias towards ICT in the national RnD policy continued throughout the decade. In 1993, Swedish investments in RnD corresponded to three percent of GDP – the highest ratio in the world. The goal of these massive investments, as explicitly stated in policy documents, was to support and strengthen information technology expertise, to promote industrial applications of information technology and to reduce dependence on the outside world (Björklind Bengtsson, 2015:76) In this sense, this policy paradigm served

as a form of "import-substitution," protecting local trade and industry from coercive competition on global markets (SOU, 1996:34).

Ericsson and Kista

The most salient result of the RnD policy conducted in Sweden during the 1980s and early 1990s was the expansion of Ericsson. With funds from the NMP, Ericsson could scale up their production of the AXE switch: a digital telephony exchange system that revolutionized telecommunication and laid the economic and technical foundations for the company's operative trajectory in the 1990s.

Ericsson was also one of the few companies that could make use of the new knowledge and technology generated by the NMP. Sweden's other industrial giants (e.g. Volvo and Electrolux) lacked competence in microelectronics, and smaller companies did not have the economic capacity to engage with expensive high tech ventures (Åsgård & Ellgren, 2000:203-5).

Finally, and perhaps most importantly, the specialized high tech education programs supplied Ericsson with a constant flow of competent engineers. This knowledge-supply was crucial during the 1990s when – following the launch of the first generation of globally standardized mobile telephony networks (i.e. GSM, or 2G) – cellular technology took off commercially. At this point, Ericsson quickly emerged as a key actor, taking an astounding 41.5 percent share of the global mobile telephony market by 1993. All major technologies in Ericssons mobile devices at this time had been developed in Kista (Björklind Bengtsson, 2002; 2014:14).

INNOVATE OR DIE!

The Swedish entrepreneurial spirit has a great deal in common with the young Silicon Valley – a desire to achieve what the establishment says is impossible and to change the world.

– Paul Saffo, Newsweek, 2000

Workers – people in software houses in Frankfurt; shipyard workers in Stavanger; creatives in Chinese ad agencies; suits in offices in Sydney; factory workers in Los Angeles; delicate traders in Singapore – use their brains and, sometimes, their brawn to create new wealth. In a modern company 70 to 80 percent of what people do is now done by way of their intellects. The critical means of production is small, gray and weighs around 1.3 kilograms. It is the human brain.

– Funky Business [widely read handbook for the New Economy], 1999

We are more than consultants. We are the architects of a new era. In the course of our everyday work, we are drawing the blueprints for the network society and laying the foundation upon which the network economies of tomorrow will be built.

– Jonas Birgersson, CEO of Framfab, 1998

In the later half of the 1990s, a period of high growth, low inflation and high employment rates – particularly in the U.S. – animated the notion that a "New Economy" had arrived. This idea was effectively reaffirmed by the *Federal Reserve*, which conducted a fiscal policy that made stock markets the growth-engine of the American economy, and therefore were unable to hold back the surging stock prices. In 1998, Alan Greenspan, then Chairman of the Federal Reserve, explicitly joined the New Economy-advocates, arguing that the rapid development of IT and the prevailing digitalization of services had changed the very nature of economic activity (Greenspan, 1998; Elmbrant, 2005:53-8).

Before, the expansion of economic operations had been held back by physical or organizational boundaries that, when transgressed, resulted in diminishing returns. In cyberspace, however, the situation is reverse. Software products, unlike material goods, tends to rise in value the more they are used. Therefore – as economist Brian W. Arthur theorized – IT is an economic sector characterized by "increasing returns," pertaining to "the tendency for that which is ahead to get further ahead, for that which loses advantage to lose further advantage" (1998).

Companies gradually apprehended this trend and became obsessed with market-shares. "Get large or get lost" was a reoccurring parable, often mobilized to motivate daring organizational extensions, or to silence investors who complained about staggering expenditures and disappointing profits. In the high tech sector – particularly within software-development and Internet-services – the notion of "first-mover advantage" enrolled large corporations in a constant search after 'the next big thing'. In this pursuit, they directed considerable funds towards aggressive buyouts and

acquisitions, oftentimes targeting newly started ventures that were little more than business ideas (Fagerfjäll, 2003:19-21).

The wide-spread belief in the New Economy surfaced in the technology-heavy *Nasdaq Stock Market*, which boomed in the late 1990s. Everyone – investment firms, pension funds and household savers – wanted a piece of the "Internet revolution" which surged the organizational landscape. This technological oscillation was also fueled by the rapid increase of private equity companies, which invested with progressively increasing enthusiasm in unlisted tech-companies during the course of the 1990s (Fagerfjäll, 2003:75).

Stockholm's High Tech Boom

By the turn of the millennium, Sweden, and especially Stockholm, was at the forefront of the New Economy (Fagerfjäll, 2003:22). In February 2000, the cover of *Newsweek's* February edition featured a picture of the skyscrapers at Hötorgscity with the headline "Shining Stockholm". Inside the magazine, the influential tech-journalist Paul Saffo wrote that "Sweden is the most wired and wireless nation in Europe, and Internet fever is energizing its capital from business to the arts". Two months later, *Red Herring* proclaimed that Stockholm "is arguably the most important city in the wireless world" (both quotes cited in Björklind Bengtsson, 2015:192).

Stockholm's position as a technological forerunner can be traced back to a series of paradigmatic shifts in economic policy which were taken before and under the recession between 1989 and 1994:

- In the late 1980s, the Swedish credit market was deregulated. During the entire post-war period, vast flows of credit had been channeled to the public sector, particularly to the housing and construction sector where actors were guaranteed access to funds and subsidized interest rates. After the deregulation, capital was free to flow into more lucrative outlets (Terje Asheim & Maurissen, 2003:97; Fagerfjäll, 2003).
- In 1991, the tax policy was reformed. Up until then, formal corporate tax rates were high – between 50 and 62 percent – but there was a significant gap between formal and effective rates. This was partly due to generous deductions and allowances that could be made for investment in machinery. Also contributing was the fact that untaxed profits could be put aside in special investment funds for future use. This system had greatly benefitted large and diversified industrial companies. With the new system in place, small and medium sized enterprises were able to compete with larger actors on more similar terms (Terje Asheim & Maurissen, 2003:98; Fagerfjäll 2003). The 1991 tax-reform also had redistributive consequences. Income tax was lowered across the board, but the progressivity of the tax-system decreased. The reform was financed by an extended value-added-tax and by raised living costs. Overall, the changes left the richer part of the population with a significantly increased disposable income (Sangregorio, 2018:64). This rapid inflow of additional funds contributed to the speculative impulses that diffused in broad segments of the Swedish population (Fagerfjäll, 2003:24).

- In 1992, after being subjected to foreign speculation, the Swedish currency was left to float freely. This induced a drastic and immediate devaluation, with two significant effects on the economy: firstly, foreign capital poured into the *Stockholm Stock Exchange*; secondly, Swedish exports shot through the roof, increasing with more than 20 percent annually between 1993 and 1995. Ericsson and the medical company *Astra Zeneca* were responsible for the bulk of this increase (Fagerfjäll, 2003:23-9).
- In 1994, a broad political coalition decided that the Swedish pension system should be reconfigured. The state administered *Allmän tillägspension* ("General supplementary pension") – which had been in place since 1960 and was perceived as the "crown jewel" in the social democratic post-war reform program – was supplanted by a new system based on occupational pensions (specific to a given profession) and private old age pension insurances. In effect, this meant that life-long wage labor no longer guaranteed a livable pension. This point was emphasized through the introduction of so-called "orange envelopes" which, at a yearly basis, inform Swedish citizens of their (oftentimes meagre) economic prospects for retirement; spurring them to work more and up to a higher age. Moreover, the new system, through the introduction of *Premiepensionen* ("the Premium pension"), forced workers to invest a part of their pension savings into stock markets (Sangregorio, 2018:96). In this way, money was indirectly channeled to the ICT-sector.

Also contributing to Stockholm's booming high tech economy was a reorientation within national RnD policy that occurred in the mid 1990s. Previously, public support had been limited to purely technical aspects of innovation (SOU, 1996). Now, policy programs were directed at integrating IT into society. This shift started in 1994, when the conservative government established an IT-commission under the leadership of the then Prime Minister, Carl Bildt, who was personally intrigued by the new technology. The commission's first rapport, *Vingar åt människans förmåga* ("Wings to Human Capacity"), was written to "stimulate imagination and chart the way forward" for the Swedish economy; "a lighthouse in the debate", as Bildt himself described it (Matsson & Carrwik 1998:24-5, my translation; see also Björklind Bengtson, 2015:80).

Two years later, a national strategy for "broadening and developing the usage of IT in society" was put forward by the recently elected social democratic government. The national strategy anticipated that, as the economy was digitalized, creative usage of IT would become the primary mode of generating value. Accordingly, it was not only important to develop new technology, but also to diffuse it. Therefore, government – at all scales – would work as a "catalyzer", providing economic support and the technical and cognitive infrastructure necessary for IT to permeate all branches of Swedish society. While the state would have a coordinating role, regional governments were encouraged to collaborate with local trade and industry and to actively stimulate innovation and IT usage within their jurisdiction, for example by sponsoring "industrial villages" or by buying services from small and medium sized companies in the vicinity (Swedish Government, 1995/96:1,16,57, my translation).

In 1997, Hem-PC-reformen ("The Home-PC-Reform") was introduced. (It would remain in place with slight modifications until it was abolished in 2009). Modeled on programs initiated by labor unions *LO* and *TCO*, The Home-PC-Reform subsidized personal computers (in the home) for employees. The goal was to enhance the public's IT competence and to increase the number of computers in Swedish homes. When, after

three years, the reform was evaluated, Sweden had among the highest computer densities in the world. However, the reform had already costed the public close to four billion SEK, and marginalized groups had not been able to benefit significantly from the subsidies (Steen, 2002).

Ericsson and Kista

The early 1990s was the time when information technology and telecommunication technology really reached the broad public. Between 1993 and 2000, Ericsson increased its sales by 1800 percent. By the turn of the millennium, the company was active in 140 countries, and the revenue from cellular products reached 214 billion SEK (Lindskog, 2015:11). Meanwhile, Ericsson were working on developing the next generation of mobile network systems (i.e. 3G). These efforts required a lot of staff. Between 1995 and 2000, 50 percent of all the engineers that graduated from Swedish universities started working for Ericsson. Before long, the company was the biggest private employer in Sweden.

At Ericsson's RnD facilities in Kista, everything was about innovation. Project-leaders had a lot of power vis-a-vis headquarters, and many units developed a "skunk work" culture, pursuing projects without interference from the management and focusing on technical excellence rather than economic constraints and delivery-deadlines. Tinkerers and engineers were free to pursue their goals within the non-hierarchical organizational structure. As one employee recalls, "before the crises [of 2001], it was all about innovation and making sure there was funds available to do things that you did not know of. There should be room for Gyro Gearloose characters, and there couldn't be too much bureaucracy" (cited in Lindskog, 2015:34). This entrepreneurial atmosphere spawned a series of innovations out of which several would crystalize into new successful high tech companies (Åsgård & Ellgren, 2000:187-8).

Mobile devices were particularly in demand. During the 1990s, Ericsson increased its production of cellphones with almost 100 percent every year. This was achieved by outsourcing. Over time, more and more of Ericsson's mobile phone production was offshored. The spatial and quantitative expansion strained the organization's manufacturing branch, which became all about effectivity. Innovative impulses from project leaders and designers were difficult to integrate into the company's operations. This problem materialized in a dull-looking mobile devices. While competitors – specifically the finish telecommunications company *Nokia* – released phones with bright colors and rounded edges, Ericsson's products remained squarish and gray (or possibly blue). Eventually, as the 90s progressed and consumption increasingly was apprehended as a way of manifesting personality, Ericsson's inability to come up with inspiring designs resulted in lost market shares (Blackman et al, 2015).

Ericsson's expansion and international success propelled Kista's development. Before long, this cluster north of Stockholm was internationally recognized as one of the most important nodes in the global ICT-industry, with state-of-the-art research in wireless networks and mobile Internet. Global corporate actors established themselves in the area to tap into the innovative dynamics of the world leading telecom industry. At the peak, just before the turn of the millennium, Kista housed specialized branch offices

from IBM, Sun, Oracle, Intel, Compaq, Motorola, Nortel, and Microsoft, all working with "wireless solutions" (Maurissen, 2004:71; Björklind Bengtsson, 2015).

The inflow of multi-national corporations induced a building boom in Kista. However, despite massive construction projects, housing costs soared during the course of the 1990s. By the end of the decade, there was an acute shortage of office space and traffic congestions were becoming an increasingly apparent problem. These factors hemmed further growth in the area (Terje Asheim & Maurissen, 2003:74).

The Internet Revolution

In 1989, Tim Berner-Lees invented the programming language html, which could be read at any computer. Web pages and browsers were developed, and soon the Internet – or rather the World Wide Web – was in a state of rapid expansion (Fagerfjäll, 2003; Björklind Bengtsson, 2015). Meanwhile, software development emerged as an increasingly independent niche within the IT-industry. In the 1980s, when the development of software and hardware were practically inseparable, high tech was associated with staggering set-up costs that made it difficult for small actors to participate. But now, revolutionizing applications could be developed by small companies with relatively limited means.

The new technical possibilities offered several opportunities for 'high-risk high-reward' ventures. In Stockholm, where there was a lot of excess capital after the financial crises, venture capital firms multiplied with dispatch and became progressively more prone to risk-full speculation. In 1994, and for the rest of the decade, the average return rate on venture capital exceeded 30 percent (Fagerfjäll, 2002).

Politicians, journalists and corporate leaders who wanted to appear modern were quick to publicly celebrate the promise of "cyberspace" and "information highways". Two major state owned companies, the *Postal service* and *Swedish Telecom*, were quick to bet on the new technology. In 1994, fearing obsolescence, they each invested several hundred million SEK in creating "digital marketplaces". The Postal service's platform was called *Torget* (lit. "The Square"), and Swedish Telecom's service was called *Passagen* (lit. "The Passage"). Both applications turned out as technical and commercial disasters and were more or less scrapped shortly after they were launched (Matsson & Carrvik, 1998:131-149, 191-203, Fagerfjäll, 2003: 73-4).

In the second half of the 1990s, central Stockholm experienced a surge of so-called "Dotcoms" – Internet start-up companies, chiefly consultancy firms and operators – that thrived in the abundance of finance capital and the hyped-up interest that surrounded the Internet. These companies reflected the central notions of the New Economy. Typically, they were built around a concept rather than a concrete business venture. Instead of focusing on profitability, the Dotcoms directed most of their efforts toward expansion and generation of finance capital. Oftentimes, the goal of the ventures were to be bought up by an "IT-giant" such as Microsoft or IBM (Kadhammer, 2005; Fagerfjäll, 2003).

The Internet revolution induced a kind of "corporate cultural revolution" (Karl Palmås cited in Grundberg, 2009) in which modernist institutions such as strict hierarchies and formal office hours were rejected. The Dotcoms and new venture capitalist firms were figureheads in this movement. Visionary corporate leaders and entrepreneurs perceived these practices as "Old Economy". Their organizations, on the

contrary, were "feel-good companies" in which the employees worked to "realize themselves" spiritually and economically. In accordance with this philosophy, unions had a limited – if any – presence at these workplaces, and staffs were known to systematically work overtime, oftentimes long into the night. Moreover, it was common that, instead of regular salaries, employees were payed in stock-options which could skyrocket in value. Compensation also took the form of extravagant parties and lavish conferences (Kadhammar, 1999).

The Internet-sector's influence – as well as its esoteric practices – resonated through the mass media. Dotcoms depended on their brand to accrue continuous investments, and spent considerable funds on advertising. Leading newspapers and magazines, correspondingly, started featuring special IT-sections where ads were mixed with uncritical reporting and enthusiastic stock tips. Further, charismatic Internet moguls – the most famous being Johan Staël von Hollstein, founder of Icon Medialab, and Johan Birgersson, founder of Framtidsfabriken (later Framfab) – were allowed to cultivate their status in extensive interviews and TV-appearances. At these occasions, they were known to act like "verbal sluggers" that virtually "spoke in headlines" (Almgren, 2002, my translation; see also Matsson & Carrvik, 1998:188-9).

The relevance of the new corporate culture was saliently manifested in two urban revitalization projects in central Stockholm. Hötorgscity is the first example. This area – built in the 1960s, following the construction of the subway system – constituted the apex of modernistic planning in Stockholm (Andersson, 2013:148). As functionalism fell out of fashion, Hötorgscity was neglected. It remained so until the mid 1990s when the sidewalks were widened along the bypassing road Sveavägen, and the ground-floors were re-designed to accommodate high-end concept stores, restaurants and delicatessens. In 1997, one of the skyscrapers was converted to a startup-hub marketed as the "Hitech Building". Despite staggering rents, this luxurious office-space became a center for software startups and Dotcoms. These companies were attracted by the dynamic urban environment – centrality, radiance and access to services – that suited the nature of their operations. What more, the move back into the central districts was perceived as a way of differentiating ones organization from the Old Economy in places like Kista (Göransson, 2000; Andersson, 2013:148). Stureplan, secondly, became an agglomeration point for the financial sector (particularly the new venture capitalist firms). Since its construction in the 19th century, this area in central Stockholm had served as a frequented entertainment district for the posher elements in the city. These activities seized when, in the late 1960s, the square was transformed into a roundabout for automobiles. Some ten years later, a luxurious department store was constructed at the eastern side of the square. The traffic juncture was removed, and restaurants and nightclubs once more popped up in the surrounding locales. These establishment were known to serve as informal meeting-places for the venture capitalists, with offices in the area, and Internet-entrepreneurs who where working in Hötorgscity some 600 meters away (Andersson, 2013:140; Mauno Pettersson, 2015).

Another important element in Stockholm's spatial development during this period was the city's application to host the olympic summer games in 2004. The process was directed by *Stockholm 2004 AB*, a company that comprised representatives form local government, trade and industry and the sporting associations. An ambitious plan for how Stockholm could accommodate the event was drafted and delivered to the international olympic committee in 1996. Hammarby Sjöstad, a large residential area that was being constructed directly south of Södermalm, had a central role in the

application as the intended site for the olympic village. Additional investments ensued as economic and political interests aligned in the construction project, and although Stockholm lost the olympics to Athens, Hammarby Sjöstad would become the first area in Stockholm that was built with integrated ICT-solutions and with the explicit ambition to be environmentally sustainable (Stockholm City, 1999; Radio Sweden, 2014).

The IT and Telecom Crises

In the first two years of the new millennia, two interrelated crises brought about great economic consequences on the world: that of the IT sector and that of the telecommunication sector. The IT-crisis was generated by "Internet hype" in so far that the commercial potential of Internet-services was systematically overestimated. The telecom-crisis stemmed from magnified expectations on mobile Internet, resulting in inflated prices for 3G licenses that effectively drove operators – the buyers of mobile networks – out of business (Fagerfjäll, 2003; Elmbrant 2005; Lindskog, 2015).

In March 2000 – following a disappointing performance report from Intel and the liquidation of the multi-national Internet-retailer *Boo.com* – Nasdaq's technological stock exchange index went into free fall. Later that month, *Barron's* featured a cover article with the title "Burning Up; Warning: Internet companies are running out of cash – fast". The text concluded that "the Internet investing game has been kept alive in large part by a massive flow of money out of Old Economy stocks and into New Economy stocks... Once psychology changes, cash-poor Internet issues tend to fall farthest, fastest" (Willoughby, 2000).

The downturn gradually dissipated around the world, enforced by a recession in Japan and, later, the 9/11 terrorist attack in the U.S. In Sweden, well-informed investors – chiefly venture capitalists and corporate leaders – started selling of their IT-shares in April 2000. In the following two years, more than 400 Swedish IT-companies went bankrupt – most of them Dotcoms – and more than 4000 people were forced to leave the industry. The Swedish venture capital sector underwent a similar acid test, dismissing about 1000 employees (Fagerfjäll, 2003:84-5).

Around the same time, Ericsson experienced economic hardships – particularly the mobile phones division, which had struggled with decreasing profitability rates since 1997. The company's management failed to grasp the gravity of the situation, resulting in ineffective measurements and misleading revenue prognoses. In March 2001 – following the presentation of a disheartening interim report – the stock price plummeted. At the conference, Kurt Hellström, Ericsson's CEO at the time, had refused to comment the company's poor performance and, afterwards, made himself unavailable to the media. *Expressen* responded with a front page featuring a wanted notice – mugshot and all – for the missing director. The preamble read: "Information concerning the whereabouts of this man can be left to 586 000 disappointed shareholders and every Swedish citizen with savings in pension funds" (Herlitz, 2001; Lindskog, 2015).

This episode marked the beginning of a two year-period during which the Ericsson stock lost 96 percent of its value (an amount corresponding to one third of Sweden's GDP). A re-emission of shares to a value of 30 billion SEK was announced and completed in 2002. In this process, banks and institutional investors strengthened their share of the company's stocks. The re-emission also contributed to a organizational

centralization, as the 'top-down' input of capital allowed headquarters to effectively take control over how money and information flowed between different cells. This facilitated the execution of savings programs. Everything that was not directly necessary for core operations was sold of or shut down; as one employee recalls, "nothing was sacred" (Lindskog, 2015:171). Between 2002 and 2003, the company reduced its spendings by half a billion SEK per week. 63 000 employees (20 000 of which worked in Sweden) had to leave the organization (Lindskog, 2015:7).

The Aftermath

The IT-bubble had severe redistributive consequences. As mentioned, many well-situated investors were able to pull out in time, and consequently secured tremendous riches. On the other hand, the bulk of private persons that had invested in the stock market missed the opportune moment and lost their savings in the crash. Banks and mass media contributed to this speculative calamity by encouraging small savers to invest in Dotcoms, even after many of the private equity firms started dumping their IT-shares (Elmbrant, 2005:252). Further, Swedish pensioners and tax-payers lost about 100 billion SEK as a result of poor investments from pension funds (Fagerfjäll, 2003:63).

Paradoxically, the Swedish state benefited financially from the IT-bubble. At least in a short-term perspective. During the 1990s, income from capital gains-tax increased from 10 billion SEK per year to 70 billion SEK per year (Elmbrant, 2005:257), and when the inflated IT-companies embarked on spending sprees – distributing valuable stock options, paying six digit salaries (in SEK) and hiring expensive consultants – money flowed into the state treasury. As a result, tax-revenue's fraction of GDP grew from 50 percent in 1994 to 56 percent in 1998 (Fagerfjäll, 2003:25-6).

After the crash, venture capitalists became increasingly unwilling to make investments. Consequently, several Swedish innovations and businesses – the most famous being IP telephony company *Skype* – had a hard time securing capital and had to be sold off, oftentimes to foreign buyers (Elmbrant, 2005: 261-72; Björklind Bengtsson, 2015:194).

Ericsson and Kista, Post-Crises

In the beginning of 2003, Carl-Henric Svanberg took over from Kurt Hellström as Ericsson's CEO. Svanberg was the first in his post to have been recruited from outside the corporation. A senior employee describes how the recruitment was perceived by the staff as "a punch in the mouth from the owners" (Lindskog, 113). Under Svanberg's command, the organization was rationalized and formalized. "We had to deliver high profitability to create our [Ericsson's] own destiny," says Svanberg, "otherwise we [the company] would have been in the hands of the bankers" (cited in Lindskog, 2015:113, my translation). To achieve this, Svanberg implemented what he called "operational excellence" (basically order, diligence and effectivity) as a standard in all Ericsson's operations. Mats Granryd, member of Ericsson's executive board of directors (2003-2010), describes the process:

We transformed Ericsson from a technology-oriented to a customer-oriented corporation. There was more business intelligence and more market analysis; more competitiveness. We worked more with media and communication, and Ericsson's was made more visible. At the same time, we became better at processes and reduced spending to a minimum (cited in Lindskog, 2015: 127, my translation).

The reorientation was implemented in the context of an extreme downward pressure on the prices on mobile networks, Ericsson's core product. Operators teamed up and demanded better deals from the network providers. Moreover, the Chinese telecommunication company *Huawei* was able to put up increasingly stern competition. Ericsson responded to the situation by restructuring production. The company's factories were reconfigured to focus on so-called "industrialization". This meant that new products were produced in-house, but as soon as volumes increased and the manufacturing process was routinized, the production process was outsourced, typically to a low-cost location in Asia, eastern Europe or South America. Meanwhile, several factories and research facilities in Sweden were closed down (Lindskog, 2015:187-9). In the late 1990s, 50 percent of Ericsson's employees were based in Sweden. After Svanberg took office, the share was sinking rapidly; a trend that has continued since.¹³

Ericsson's cutbacks had a direct impact on Kista. Here, unlike in central Stockholm where the Dotcoms and venture capitalists took the heaviest blow, it was the big corporations that scaled down their operations. The corporate retreat made room for new economic activities. Particularly, the abundant supply of office spaces at reasonable prices attracted small and medium-sized companies that could no longer afford the rents in central Stockholm. What more, many of those who had lost their jobs at Ericsson or some other IT-giant established new business ventures. A small firm-structure evolved, and it brought about an economic diversification in the area. Before, all activity in Kista was more or less networked into Ericsson's operations, resulting in an extreme specialization around a handful of huge projects (e.g. the development of 2G and 3G systems). As the regional network became more horizontal, smaller business ventures and development schemes could emerge (Björklind Bengtsson, 2015:162)

A New Innovation System

The massive cutbacks made in the IT and telecom crises were manifested in a diminishing RnD sector. This was the result of reduced investment from the corporate sector, as well as the general lack of risk-prone venture capital. In this context, a series of initiatives were taken to renew innovative capacity in Sweden and Stockholm:

- From 1980 up until 2000, the Swedish state's total support for the ICT industry amounted to five billion SEK. The money had been channeled through a myriad of government agencies.¹⁴ In 2001, *Vinnova* was founded and took over as the

¹³ In 2015, only about ten percent of Ericsson's total staff (of 118 000 employees) worked in Sweden (Lindskog, 2015:306).

¹⁴ These institutes include *The National Swedish Board for Technical development (STU)*, *The Swedish National Board for Industrial Development (Nutek)*, *Council for Technological Research (TFR)*, *Faculty Council for Science (NFR)* and *The Swedish Council for Planning and Coordination of Science (FRN)*.

central governmental institution for distributing financial support to technological development and to the innovation system as a whole. To mitigate the effects of Ericsson's cutbacks and the venture capital-sector's risk aversion, Vinnova established the *National Incubator Program* (NIP), which funded a number of incubators in Sweden. The operation was later taken over by state-owned *Innovationsbron AB* (Björklind Bengtsson, 2015:194).

- Between 1997 and 2002, state ownership in research institutes was collected under *IRECO Holding*. In 2007, IRECO implemented a consolidation of the institutes, dividing them into four corporate groups: *Inventia* (paper, pulp, packaging and biofuel), *SP Technical Research Institute of Sweden*, *Swedish ICT*, and *Swerea* (material's technology). In 2009, IRECO Holding changed name to *Research Institutes of Sweden* (RISE). Under the new name, the organization's mandate was extended and its funding was increased significantly (OECD:2016).

After the turn of the millennia, a series of incubators were formed (partly with support from Vinnova). These institutions have significantly affected the Stockholm region's economic landscape and nurtured several of the local ICT-sector's most prominent startups. The, in the assessment of the thesis, most important incubators founded at this time are listed below (a comprehensive account is found in *Appendix 2*):

- In 2002, as part of Vinnova's NIP, *Kista Innovation and Growth* (KIG) was founded as a subsidiary to the Electrum Foundation. Vinnova funded the establishment, largely as a response to the cutbacks made by Kista's ICT corporations. KIG was a support system – offering business coaches, office space and seed capital – for high tech start-ups. In 2005 KIG and KTH innovation – an incubator connected to the technical university – merged and formed *Stockholm Innovation and Growth AB* (STING) with operations in central Stockholm as well as in Kista (Terje Asheim & Maurissen, 2003:81-4). STING has been instrumental in the establishment of several of the Stockholm region's co-working spaces for startups (more on this in the next chapter). Since its start in 2002, the incubator has supported more than 200 startups out of which 70 percent are still operating and growing. The founder (of KIG) and CEO of STING is Pär Hedberg. In this capacity, he plays a central role in the startup scene, perceived as "the chief architect of [the Stockholm region's] innovation system" (Björklind Bengtsson, 2015:131;195).

- Also in 2002, *Stockholm School of Economics* founded *SSE BusinessLab*: an incubator which provides office space, as well as financial and consulting support to students with scaleable – chiefly tech-oriented – business ideas. SSE BusinessLab hosted financial technology (or "fintech") company *Klarna* which later achieved unicorn-status (Malm Wiklund & Almeling, 2016).

- In 2004, *Serendipity Innovations* was formed. This venture is run by an investment company that manages startup and scale-up companies that develop cutting edge technologies – particularly environmental and health technologies – with global applications (Malm Wiklund & Almeling, 2016).

THE UNICORN FACTORY

Stockholm has been called many names over the years: 'Startup capital of Europe', 'Unicorn factory' and 'The Future' to name just a few. In only a few years, Stockholm has become a melting pot for of high tech startups.

– Startup Guide Stockholm, 2016

Stockholm is an amazing place to live and work in. And I should know, having lived in 7 countries, attended 11 schools and worked across the globe. Its no wonder Stockholm is considered a startup mecca. The collective attitude towards entrepreneurship is great, and very supportive of new ideas. Stockholm as a city has many benefits for an aspiring entrepreneur. It's small. You can pretty much walk or cycle everywhere. Infrastructure and business culture is great... nobody is ever late.

– Jenny Theolin, entrepreneur, 2016

In 2006, Sweden (and particularly Stockholm) received international attention when the country topped the internationally acclaimed urbanist Richard Florida's "creative class index".¹⁵ The same year, Florida was keynote speaker at an event in Stockholm's City Hall. Despite staggering ticket prices, the room was filled to the brim with 1200 political, cultural and economic bigwigs. The lecture – entitled *Folkhemmet 2.0* (lit. "The People's Home 2.0"), drawing on the social democratic party's grandiose political project in the 20th century – celebrated "Swedish values", the welfare state, and "hip" urban amenities as conducive to creativity and growth (Svenska Dagbladet 2006; Andersson, 2017). In a preparatory interview for the event, Florida – or the "Guru" as he is referred to in the text – is asked to council Sweden's then Prime Minister, the social democratic party leader Göran Persson, on how Sweden should develop. Florida replies:

The country that figures out how to convey the advantages of the creative economy and how to derive creative energy from all its citizens will enjoy tremendous economic success in the global economy. This presupposes a reconfiguration of the industrial notion that a person remains at one job all of their life, and that workers in the service sector are made more creative... What is exiting about this challenge – and with the creative global economy in general – is that, for the first time in history, economic development can coevolve with human development... Now, the smarter and more creative your citizens are, the better for everyone. That is the solution to the puzzle (cited in Färgfabriken, 2006:34-5, my translation).

While it is unclear if Florida's recommendations ever reached the Prime Minister, an overlook of policy and planning documents suggests that his ideas at least has had some impact in the Stockholm region. In 2006, shortly after Florida's visit, the publicly owned place-marketing company *Stockholm Business Region* (founded in 2004) launched a new branding strategy for the city which, the strategy dictated, would

¹⁵ This index is based on Florida's "three Ts" – Talent, Technology and Tolerance – which he argues are crucial factors for creating regional growth.

henceforth be marketed as "Stockholm – The capital of Scandinavia". The promotion platform – which costed millions to develop – was launched to "support the vision of Stockholm as being one of the most attractive places in Europe for dwellers, visitors and business" (Stockholm City, 2006:4, my translation). In 2007, the municipality released a document in which it committed itself to creating a "world class Stockholm" by 2030. "To make the vision a reality," the document states, "it is essential to have shared goals and a partnership among the City, other public-sector players and the business community" (Stockholm City, 2007:9, my translation). In 2010, Stockholm County found that the region "must work actively to attract foreign talent [in order to] maintain its knowledge-intensive profile". This, in turn, requires that Greater Stockholm "strengthens its international profile [so not to be] overshadowed by other established or growing knowledge regions that can bolster greater accessibility to continental Europe and higher wages for highly educated people" (2010:67-8, my translation). Stockholm's masterplan from 2012, lastly, is based on the presumption that "In a globalized world, it is expected that a livable environment, a varied supply of housing and workplaces, extended services and a rich cultural life will be increasingly important competitive advantages" (2012:7, my translation).

Stockholm's Startup Miracle

After a few years, the Stockholm region's ICT-sector started recovering from the blows it had suffered in the IT and telecom crises. Despite corporate and financial calamities, ICT had continued to develop and to expand commercially. Moreover, Greater Stockholm still housed a lot of technical competence, and there were many experienced business leaders, investors and entrepreneurs who had gained capital, experience and influence during the Internet boom and were looking for new opportunities. The newly formed incubators also contributed to the favorable climate for startups. Under these circumstances, a myriad of new, promising companies were founded. Several of these initiatives turned out as unicorn companies. Many of them have been sold on stock-markets or to other corporations for staggering amounts (see *Appendix 4*).

A factor that is likely to have contributed to Stockholm's startup miracle is the fact that the region's ICT-sector – and financial system – went through the global financial crises of 2008 relatively unharmed (in international comparison). This circumstance can, to a great extent, be attributed to state interventions. Following the collapse of the American bank *Lehman Brothers* in September 2008, the *Swedish National Debt Office* borrowed 120 billion SEK which were used to relieve Swedish banks of their poor mortgage bonds. Meanwhile, *The Riksbank* (Sweden's central bank) lent the banks more than 400 billion SEK over a three month period. These supportive measures were complemented by actions from the government aimed at strengthening confidence in the Swedish banks. Most significantly, a guarantee program for loans taken by Swedish banks was launched. By June 2009, the government had issued warranties for 354 billion SEK, chiefly to Swedbank (Björklund, 2017:21). Government support also reached out to industrial companies – particularly Ericsson – through *Exportkreditnämnden* (EKN, "The Board for Export Credit") which insures Swedish exporters against defaulting customers abroad (Lindskog, 2015:276).

The Startup Community and Ecosystem

In 2013, Stockholm Business Region hired Tyler Crowley, an American startup consultant, to strengthen the local tech scene. Crowley had made a name for himself in 2008 when he founded *Silicon Beach*, an immensely successful co-working space in Los Angeles, which made it possible for the region to compete with Silicon Valley. Taking his ideas abroad, Crowley claims that he saw a lot of potential in Stockholm's rich supply of startups, but that this promise was largely unknown internationally (Videla, 2013). To promote the region's entrepreneurial qualities, and to strengthen the community, Crowley started arranging monthly meetings – so-called "tech meetups," which featured announcements from the startup sphere, special lectures and business idea-pitches – and an annual event, *Stockholm Tech-Fest*, at which "the [local] startup scene shows the world its worth, with 3 000+ participants, panel discussions, startups-investor meetings, pitches and ... a huge party to wrap it all up" (Malm Wiklund & Almeling, 2016:251). Through his endeavors, Crowley has become something of a figurehead for the entrepreneurial community in Stockholm. He is regularly interviewed as a representative for the tech scene (see for example Anderberg, 2015), and has been describe as "omnipresent" in the startup sphere (Malm Wiklund & Almeling, 2016:251).

Another central element in Stockholm's startup scene is the office spaces which host many of the region's entrepreneurs. Generally, these places are configured as so-called "co-working" spaces. This term signifies workplaces where independent projects and professionals – typically entrepreneurs and startups – are brought together to avoid isolation and to create synergies. A prominent example of a co-working space in the Stockholm region is *Sup46*.¹⁶ *Sup46* is located by the central station and focuses on Internet, media and gaming companies. *Sup46* was founded in 2013 to serve as a place where relevant actors in the tech sphere could come together: "We don't define ourselves as [just] a co-working space," says Jessica Stark, co-founder and CEO. She continues: "We want to gather great startups in one central hotspot. Entrepreneurs can come here to meet, exchange ideas, and establish a network of contacts" (cited in Malm Wiklund & Almeling, 2016:50). The facilities – which covers 2000m² – encompasses a public space, meeting rooms and a members-only area. At any given time, *Sup46* accommodates 50 selected startups that stay for a fixed period of 18 months. The spacious locales are also used to regularly host events and delegations from near and afar. Particularly, Stockholm's startup scene receives a lot of attention from international investors. In 2015, surveys show that 59 percent of foreign investments in the Nordic countries was directed to Sweden. Out of this amount, almost 95 percent was investments in startup companies in Stockholm. This sum, it is estimated, amounted to almost one billion dollars (Malm Wiklund & Almeling 2016: 22).

As mentioned in the previous chapter, Stockholm boasts a number of incubators which help entrepreneurs to develop their business concepts. These institutions facilitate the formation of new startups and help people to reinvent themselves as entrepreneurs. The latter concept was advanced in 2015 when STING initiated a specialized incubator called *Test Drive* which caters to aspiring entrepreneurs who have little more than a business idea. Participants that qualify are offered four workshops that concern finance,

¹⁶ Stockholm's first co-working office, *United Spaces*, was founded in 2000. However, the concept did not proliferate in the region's startup scene until about 10 years later (see *Appendix 1*).

sales strategies and internationalization. Admission is free of charge, and the workshops take place in the evening so that those who work full-time are able to participate.

The proliferation of meeting-places, incubators and events, together with the emergence of social networks such as Facebook, Twitter and LinkedIn has connected local entrepreneurs and formed a collective identity. (Also contributing to this development are the magazines *DI digital* and *Breakit* – both founded in 2015 – that provide coverage of the local high tech startup sector.) In 2015 (and again in 2018), this identity was articulated in the form of a "Startup Manifesto" in which leading entrepreneurs demanded, among other things, business-friendly reforms, and changes in the Swedish housing and immigration policy to facilitate the recruitment of foreign talent (Startup Manifesto, 2018). These later appeals are characteristic of the cosmopolitan values that permeate the community. Stockholm's high tech startup economy attracts entrepreneurs from all over the world. The culturally diverse workforce is often described as one of the economic ecosystem's competitive advantages (Malm Wiklund & Almeling, 2016: 29).

On a similar note, several of the region's entrepreneurs have adopted an increasingly philanthropic attitude in their operations over the last decade. This trend manifests itself in 'social entrepreneurs' who dedicate their work towards solving global problems, but also in successful corporate leaders who 'give back' to the community through charitable projects or reinvestments in the local startup scene (Malm Wiklund & Almeling, 2016: 41-43). Embodying both these trends is Niklas Adalberth, co-founder of *Klarna*. In 2016, he established *Norrskan Foundation*, a privately funded non-profit organization dedicated to "effective altruism". The foundation controls *Norrskan House*. Situated at Birger Jarlsgatan in central Stockholm, this building serves as a co-working space, a "lab" and an incubator that provides subsidized services to about 300 social entrepreneurs (Frostberg, 2017).

Another form of entrepreneurial support is performed by the so-called "angel investors". This group includes senior business leaders, typically entrepreneurs, who use their financial capital and knowledge to 'uplift' promising startups. Over the last decade, Stockholm has experienced a significant increase of angel investment funds. A good example is the STING initiative *Propel Capital*. Since it was founded in 2014, this fund has channeled investments to companies in the STING Accelerate incubator (see *Appendix 2*). So far, the fund has an impressive track-record. This, in combination with the intensive "deal flow," makes investors line up to join the fund (Björklind Bengtsson, 2015: 323; Ekström, 2016).

On a final note, Stockholm's high tech startup-economy is – despite significant inflows of international venture capital – dependent on a network of foundations, consultancy agencies and local and national government. Apart from more or less direct grants to individual startup companies.¹⁷

¹⁷ I have listed key financial institutions in *Appendix 3*. A more comprehensive account which also includes final funding sources (e.g. The EU and The Swedish Government) can be found in OECD, 2016: 58-60, 70-2.

Strategic Investments and Smart Cities

In 2007, *The Government's Globalization Council* presented a report which concluded that "Sweden's relative advantage in a globalized economy is rooted in the production of goods and services that are knowledge intensive" (Swedish Government, 2006/7:23, my translation). This insight underlined the 2008 research and innovation bill which directed significant public resources to strengthening the Swedish innovation system. Particularly, Vinnova and Innovationsbron AB received increased grants with directives to provide seed investments¹⁸ and business development service for research or knowledge intensive ventures with vast commercial potential (Swedish Government, 2008/9:24; OECD, 2016).

To further consolidate Sweden's position as a knowledge intensive economy, the bill introduced a new concept into Swedish RnD policy: "strategic investments". This meant extra funds could be directed to University research on specific scientific sectors in which Sweden accommodates research that can contribute to solutions to pressing global problems and issues; and sectors in which "private companies in Sweden already conduct research and where additional public funding would strengthen Swedish company's and Sweden's development and international competitiveness" (Swedish Government, 2008:24). With the following two research and innovation bills (published in 2012 and 2016), the policy tool was broadened, allowing more direct support to private actors in the form of "strategic partnership programs". Moreover, so-called "smart cities" emerged as a field that was liable to strategic investments (Swedish Government, 2012/13;2016).

This process of policy evolution was paralleled by developments in Stockholm. In 2011, after almost ten years of planning, the construction of Stockholm Royal Seaport (Norra Djurgårdsstaden in Swedish) was initiated. The area is situated in the northeast part of Stockholm City, and is estimated to be completed in 2025. At that point, it will house 12 000 new dwellings and 35 000 new workplaces (Stockholm City, 2011). Apart from accommodation and mundane logistical functions, Stockholm Royal Seaport is built to forward Stockholm's development and boost the region's status internationally. According to Sten Nordin, Stockholm's former mayor:

Stockholm Royal Seaport will be a spearhead for sustainable urban development where innovative Swedish environmental technology and creative solutions are developed, tested and displayed. The area will, in the same way as Hammarby Sjöstad, but with higher ambitions, be a beacon for other cities (cited in Stockholm City, 2011:1, my translation).

The transformative aspirations are materialized in *Stockholm Royal Seaport Innovation Center*. This is a collaboration between Stockholm City, Vinnova and *The Swedish Energy Agency* (these actors contribute with most of the funds; 24 million SEK during the year 2016), local universities and business.¹⁹ All partners have signed Stockholm's "World Class treaty" which binds them to high environmental standards set by the local government. The center was inaugurated in 2010, and it has since then served as the

¹⁸ Seed investment, or seed capital, is the initial capital used in the process of starting a business.

¹⁹ Relevant actors include Ericsson, and technology companies ABB and Electrolux.

base for a series of large scale research projects, the biggest of which has been *Smart Energy City*. In this project, 150 households have been given the possibility to monitor and control their energy use with the help of a digital application developed by Ericsson. The overall idea is to investigate how information can be used to alter unsustainable behavioral patterns (Smart Energy City website, 2018).

Kista also hosts an initiative that is similar to the innovation center: *Urban ICT Arena*.²⁰ This is a testbed that consists of an extensive and diversified IT-infrastructure in an integrated urban setting. Here, corporations and entrepreneurs can develop, test and showcase innovations and business models that will "futureproof" Sweden by securing jobs and creating new sustainable technologies. Petra Dalunde, COO at Urban ICT Arena, writes that the testbed is striving to become a "quadruple helix" in which "industry, academia and the public sector develop things with citizens" (2018). To this background, Dalunde has invented the notion of an "Automagic [*sic!*] City" to overcome the boundaries between engineers and regular people:

The difference between tech and magic is that many of us lack the tools for imagining the workings of tech and all that is possible. With magic, it's the other way around – we can easily imagine how we would use magic to fulfill our wishes but not how magic is created or controlled. So why don't we simply use our magic mental tools and apply them on tech? One step in this direction would be to stop using terms such as smart, connected, viable, expanding and sustainable when we talk about the kind of city we want to live in (2017).

Urban ICT arena was inaugurated in 2016. Keynote speaker at the ceremony was the social democratic Minister for Industry and Innovation, Michael Damberg. Drawing on the 2016 research and innovation bill, he argued that testbeds like Urban ICT Arena are a way of combating global challenges – particularly challenges related to environmental degradation, inequality and aging populations – while creating economic growth:

[Smart city testbeds] are crucial for addressing global challenges here in Sweden, but also for exporting technologies and concepts to the rest of the world. India, for instance, said that 'we want to build one hundred new smart cities that are not around today'. Of course, this is a challenge for India, but I see the interest for Sweden being a partner in this [project]. By solving our own problems at home, we can help the world solve their problems as well (cited in Stockholm stad [video], 2016:14:06-14:52).

Damberg also emphasized how public–private collaboration is fundamental – even intrinsic – to testbeds and smart city development as a value-creating process:

²⁰ The founding Partners are Ericsson, IBM, Royal School of Technology, Stockholm University, Swedish ICT (one of the member institutes of RISE), the City of Stockholm and the County Government of Stockholm. The testbed is also open for other companies, but they are charged for using the facilities (Urban ICT Arena website, 2018). Since 2017, Vinnova sponsors promising startups operations at the testbed (Vinnova website, 2018).

The interest from the rest of the world is learning what we learn from the process [of implementing new technology]. It is not only about building a connected car – almost everybody can do that – [it is also about questions like] how do you build the system? ... what procurements do you need for the future? how do you make the regulatory framework for these kinds of environments? This is the knowledge that we actually bring to the table in the rest of the world if we succeed in creating testbeds in Sweden (cited in Stockholm stad [video], 2016:12:13-12:44).

Internet Giants and Sharing Economy-Services

Over the last decade, Swedish society – and, in particular, the Stockholm region – has been affected by an increasing presence of multinational tech-companies, so-called "Internet giants," in a range of sectors. In the media sector, there is an ongoing shift in which audiences (particularly younger consumers) and revenue streams (chiefly from ads) are favoring digital platforms over broadcasting media and daily newspapers. This shift has significantly benefited Facebook and *Google*. These companies accrue ad revenue by providing portals through which users search for and consume material produced by other media companies. In 2016, Google and Facebook are estimated to have earned close to ten billion SEK in Sweden (de Vriss, 2016; Magnusson, 2017).

In the tourism business, browser-based booking services such as *Expedia* and *Priceline* – together with the rating site *TripAdvisor* – have established an online marketplace for temporary accommodations. Hotels are effectively forced to comply with the conditions set by the booking companies which charge the hotels a 12 to 25 percent commission on booked rooms. Some Swedish hotels pay as much as ten percent of their turnover to these companies (Magnusson, 2017). On a similar note, the online accommodation service Airbnb has had a considerable impact on tourism in Stockholm. Since its launch in 2008, the service has expanded rapidly. According to the companies own records for the year 2017, 180 000 guests stayed in Stockholm using Airbnb. In average, Stockholmers who rented out their apartments did so for 28 days, earning about 25 000 SEK (Blixt, 2018).

Another sharing economy actor, Uber (which offers transportation services from signed up drivers through a smartphone application), has also had a disrupting effect on the Swedish transportation sector. The company, which established its Swedish branch-office in 2012, currently has 600 000 users (out of which 100 000 travels every month) and 1500 active drivers in the country. Uber became subject to controversy after the launch of *Uber Pop*: a low-price service that allowed unlicensed drivers to transport passengers. Uber claimed that these journeys were a case of "carpooling" and not a regular taxi ride, why fees and taxes could be avoided. Public outrage followed, and in 2015 the first Uber pop driver was sentenced in court. The service closed down eight months later (Carlsson, 2017).

On a macro level, the increasing presence from Internet giants affects Sweden and Stockholm's regional economy. These (mostly American) companies are effectively 'cream skimming' their respective sector, expropriating surplus value without necessarily contributing to the process of production. On this note, digital valorization processes can quite easily be designed to evade tax regulations. The most prominent example is Google and Facebook, which are estimated to withhold more than two billion SEK in Swedish corporate tax on a yearly basis (Magnusson, 2017).

Corporate Innovation

In 2005, Svanberg (Ericsson's CEO) saw himself dethroned by the founder of Skype, Niklas Zennström, in the tech magazine *NyTeknik*'s annual ranking over the most influential persons in the Swedish ICT-industry. This was the first in a series of events that signified a shift in the high tech-sector, and that the telecommunications giant was lagging behind. The second blow to Ericsson's status came in 2007, when *Apple* launched the iPhone. The staff at Ericsson's cell-phone test-lab was not impressed by Steve Job's creation. They claimed that the iPhone "didn't meet a single technical criteria" and was "overall a really lousy product" (Lindskog, 2015:216). What the tinkers at Ericsson missed was that the iPhone actually was such a revolutionizing device that it created new behaviors:

If there was poor reception, iPhone users were happy to move a couple of meters to get reception. [Ericsson's] engineers thought that the battery capacity was unacceptable, but the users quickly got into the habit of loading their phones at night. As long as the battery lasted over a day, they were happy (Lindskog, 2015: 217).

Despite Ericsson's shortsightedness, the company was able to earn a lot of money from Apple's commercial success since the explosion of iPhone users who were streaming music, browsing the Internet and sharing photos and videos pressured operators to develop their mobile networks. (On a less positive note, the release of the iPhone marked the beginning of the end for the joint venture *SonyEricsson* which managed Ericsson's cell-phone production.) Nevertheless, Ericsson's arrogant and aloof response to the iPhone was a clear indicator that the corporation was no longer on top of what was happening in the field of commercial ICT. This impression was reaffirmed in 2010 when the operator *Telia* announced that Huawei's 4G network in Oslo had close to double the capacity of Ericsson's 4G network in Stockholm. This came as a chock to Ericsson's engineers. Before, the Chinese telecom giant had challenged Ericsson primarily on a price-basis. In the 1990s and early 2000s, Huawei had no real product development on its own, but worked with so-called "reversed engineering" (i.e. picking apart competitors devices and copying the design). However, as more and increasingly complex production processes were relocated to Asia – particularly the Shenzhen region in China – Huawei's access to skilled personnel and state-of-the-art research was facilitated. In 2012, after several years of steady increases, Huawei's investments in research and development matched those of Ericsson (Sanandaji & Rankka, 2015:24).

In response to Huawei's advances, Ericsson has attempted to orientate the company's development towards service-provision, a niche that is characterized by higher profitability than manufacturing, and one (the niche, that is) in which Ericsson still has a significant advantage over Huawei. This strategy has demanded that the organization becomes more dynamic and that it adapts to the opportunities and challenges brought about by prevailing digitalization (Lindskog, 2015:302-6). Ericsson, to this end, has established a special branch to its research and development department that is called *Ericsson Garage*. Ericsson Garage is a kind of incubator in which startups (and internal projects that do not belong to the company's core-operations) are granted access to Ericsson's facilities, staff and network of distributors and partners to develop a product that solves a concrete problem that Ericsson faces (Henricsson, 2015). The projects are

seen as a way of broadening the range of services Ericsson has to offer; and as a way of reaching out to new sectors, particularly with the advent of 5G. Pontus Sandberg, Managing Director at Ericsson Garage, elaborates:

We see that we can't possess all the skills of all applications when they can hardly be foreseen. On the other hand, we are very good at communication. Then we want to work with startups that are good at various things: sensors, medical applications, etc. The complexity of the use of 5G is so much bigger that we have to work differently. We believe this will lead us to deliver the best 5G system... The business case is also different today. Previously, we have sold our systems to major operators. Now, our potential customers are brand new players [such as] construction companies and property owners for integration in smart houses (cited in Mjärdevi Science Park AB, 2017)

Moreover, the systematized interaction with small companies and entrepreneurs is also perceived as an exercise in renewing the organization. Mala Chakraborti, Senior Advisor at Ericsson Garage, explains:

... interacting with startups is not just important for Ericsson; it is vital. We are looking at a society that is transforming rapidly and our processes and, frankly, a lot of the pieces of our [corporate] culture are built for the status quo. We need to learn agility, and we think that we earn a lot by bringing that in [through our collaboration with startups] (cited in Ignite Sweden [video], 2017: 00:00-00:28).

In 2015, the first facility dedicated to Ericsson Garage was opened in Kista. Since then, thirteen additional sites have been established in cities across the world.

Ericsson Garage can be conceived as part of a global trend in which large corporations collaborate with startups and entrepreneurs to create new products and to improve the agility of their organizations. In 2017, the total invested corporate venture capital in the world amounted to 250 billion SEK, an increase by 18 percent compared to the previous year (CB Insights, 2017). In Sweden, prominent examples (other than Ericsson) are ABB (which integrates tech-startups through their corporate incubator *Syneraleap*) and truck manufacturing company *Scania* (which has formalized its investments in startups related, for example, to autonomous driving and connected cars). Daniel Wedberg, head of business development at Scania, explains their strategy:

We can learn from companies that are small and driven by entrepreneurs, and help them scale-up their technologies and business models while they are being of use to our customers, who face increasing competition and shrinking margins (cited in Karlsson, 2018, my translation).

These kinds of synergies are also being cultivated through initiatives such as *Ignite Sweden*. Since its establishment in 2016, this organization helps startups find their first corporate customer, and develops collaboration models in the process.

ANALYSIS

This chapter is divided in two sections. The first section presents my analysis of the composition of capital in the three economic formations that have been described in the previous chapters. This account leads into the succeeding section, in which I attempt to answer the research question with specific reference to entrepreneurialization and financialization.

Three Compositions of Capital:

Late Keynesianism

Technical composition of capital

The Stockholm region's ICT-sector, during this period, is dominated by material mass production of microelectronic hardware. The hegemony of industrial production is manifested in the spatial configuration of Kista which – although it also accommodates workplaces for cognitive and innovative labor (particularly research facilities) – complies with the Keynesian division between production and reproduction.

Organic composition of capital

Valorization processes in the local ICT-sector chiefly comprises (*a*: at the scale of the individual firm) production and selling of digital networks and devices, often to government actors; and (*b*: at the scale of the region, or nation) of "tertiary circuit" (see section *Financialization*) investments in research and development programs that result in a profitable local industry. In the latter case, national and local government, as well as big corporations – particularly Ericsson – make up the overarching framework for surplus value creation.

Innovate or Die!

Technical composition of capital

The logic of immaterial production asserts itself on the local ICT-sector through new, less rigid organizational forms that rapidly gain popularity. The rise of the Dotcoms and their particular corporate culture expresses this shift. So does the agglomeration of high tech startups (and venture capitalist firms) in the inner city, where the urban environment provides the requisites of a post-modern lifestyle with a relatively vague distinction between work and leisure, or production and reproduction.

Material production is quantitatively important (most notably in the form of mobile phones and computers), but it is progressively being outsourced and offshored to low-cost locations, particularly after the crises (in the case of Ericsson). At this point, the

same thing happens to processes of product development – of innovation – which, in addition, are being formalized under cost-saving imperatives.

Beyond the formal production sector, massive cognitive efforts are mobilized as IT-competences are dissipated within the Swedish population. The increasing access to ICT in society also undermines the division between production and reproduction as people are able to work at home and outside the temporal confinements of the working day.

Organic composition

The processing subordination of material products to immaterial ones (and immaterial aspects of material products) is manifested in the gradually decreasing profitability of ICT hardware under this period. Another indication of the shift is the emerging consumer demand for ‘individualistic’ cell-phone designs which Ericsson – to the advantage of Nokia – fails to accommodate. Moreover, in the later half of the 1990s, staggering amounts of capital flow towards stock markets and venture capital funds in the search for easily attainable surplus value. These institutions have – it eventually turns out – vital functions in Dotcoms and other software startups, financing grandiose expansions and providing founders with the opportunity to make profitable exits (i.e. selling the company, either to another company or by introducing it at a stock market).

Looking beyond the speculative bubble, it is interesting to note how many of the business models for Internet services are unsuccessful as the companies at the time struggle with finding ways of generating revenue from users.

Within the tertiary circuit, government measures to promote the local ICT-sector are – in addition to specialized research and education programs – complimented by broader projects. Particularly, there are efforts aimed at stimulating "the creative usage of IT" among the population, and at increasing the general IT-competence. These efforts include investments under the national digitalization strategy, and the Home-PC-reform. (The latter also functioned as a demands-side subsidy to the ICT-sector.) Unlike in the previous period, the framework of institutions within which these investments can be realized must go beyond the workers-corporations-banks-state helix and include an entrepreneurial population that turn ideas and practices into commercialized products.

The Unicorn Factory

Technical composition of capital

During this period, material production has an extremely limited – and decreasing – role in Greater Stockholm’s ICT-sector. Large-scale manufacturing processes are almost entirely outsourced and offshored, together – to some extent – with industrial product development. In the case of Ericsson – and, earlier research indicates, for the majority of multi-national industrial corporations (see for example Peck, 2017) – this trend is an element in the company’s increasingly transnational configuration. Corporate retrenchment is compensated by the emerging small-firm and startup structure, which further dissolves rigid organizational structures. This development is manifested in the formation of a startup community (through events, press coverage, co-working spaces and incubators) that transcends traditional institutional arrangements, particularly organizational forms and spatial scales. While corporations are still important, social networks and intermediary institutions (such as incubators, testbeds and meeting places)

are becoming more central in the production of use-values in the Stockholm region. These use-values, moreover, are increasingly immaterial in character (including ideas, codes, business models, information and knowledge). Specifically, the production of radical innovations appears as increasingly dominant.

Beyond the formal production sector, *the user* is emerging as a new kind of value-producer. This trend is manifested in the prevalence of social media and interactive Internet services, where users contribute with their attention and by producing content (t.b.d.). It is also manifested in "smart city" projects. A good example is *Smart Energy City*, in Stockholm Royal Seaport. Here, users create the service, on the one hand, by recording their practices, allowing them to be subjected to evaluation; and, on the other hand, by – presumably – adapting their behavior to align with the dictates subscribed by the service.

On a similar note, the ICT-sector, under this period, penetrates the service and accommodation industries in an organizing capacity through sharing economy applications such as Airbnb and Uber.

Organic composition of capital

Considering the centrality of radical innovation (manifested in the proliferation of startups) in the contemporary formation of the local ICT-sector, there appears to be three major forms of generating surplus value for this kind of enterprise:

- through speculation, when stocks increase in value and change hands in stock markets or in corporate acquisitions.
- through the introduction of new, profitable services. This is quite rare. A clear majority of the Stockholm region's ICT startups are not making profits. The same goes for established actors such as Uber and Spotify (Carlsson, 2017a; 2017b).
- through corporate innovation, when large corporations buy products or services from startups in order to improve their own products and practices. (Of course, corporate acquisitions can also result in similar gains.)

It should be added that the financial institutions that revolve around the production of radical innovations in the ICT-sector (e.g. incubators, angel investors and (corporate) venture capital funds) accrue profits entirely through speculation.

Another prominent business model is that of the large Internet services, or "Internet giants". These web-platforms attract users by featuring vast amounts of content. This content, however, is produced by the users themselves, who receive no direct monetary remuneration; they labor for free. The companies behind the web-platforms (e.g. Facebook) expropriate the attention that users pay while using the services for selling ad-space and marketing services and thereby creating surplus value. This business concept is – at least in theory – extremely profitable. Since the value-producing users are paid nothing, the rate of exploitation (the divergence between labor productivity and the wage rate) is virtually infinite (cf. Feenberg, 2017:19). In a similar way, Airbnb, Uber and Expedia also rely heavily on expropriation in their production of surplus value, since they only operate in the aspects of their respective sector where the rate of exploitation is highest (that is, at the point of realization). In doing so, they download the costs and risks associated with keeping various forms of constant capital (apartments, cars, hotels) to other institutions, or to their users.

In the tertiary circuit of capital, surplus value is – or at least it is attempted to be – created by valorizing whole urban life forms and governance systems. This trend

materializes in smart city projects and testbeds. Here, knowledge of how to create and integrate new technologies is produced; knowledge that can be packaged (as, for example, models for innovation ecosystems, public–private collaboration and governance structures, business concepts and juridical systems) and sold to other countries, particularly the rapidly urbanizing economies in the global south. On this note, it is also interesting to see how the notion of smart cities as a framework for accumulation potentially encapsulates the region's entire ICT-sector and population as a productive totality. This concept is most saliently expressed in the idea of a "quadruple helix" and, even more so, in that of that "Automagic city" where citizens, without visible technical hindrances, can translate their preferences, desires and creative impulses directly to the workings of their environment.

The Role of the Local ICT-Sector in Stockholm's Regional Development

Entrepreneurialization

Over the studied time-period, Stockholm's regional development has been characterized by a gradual shift from modernity to post-modernity. The inquiry took off with the construction of an industrial microelectronics cluster in the (functionalist) suburb Kista. In the 1990s and early 2000s, the study took us through urban renewal projects in and around Hötorgscity, Stureplan and Hammarby Sjöstad, adapted for a more dynamic lifestyle. During the course of the last decade, the investigation has revealed a reorientation in planning and policy documents towards livability and creative environments; qualities that have been aspired in the construction of Stockholm Royal Seaport. As we have seen, a recurring motive in all these developments has been to strengthen the region's competitiveness, sometimes in a strictly economic sense, and sometimes through increased "attractiveness" for dwellers, workers and visitors. Over time, and most saliently since the turn of the millennium, the latter form of competitiveness-boosting appears to have acquired a more central role. This can be conceived as an aspect of the eroding division between production and reproduction.

A similar trend is discernible in the evolution of state investment programs under the studied time period, particularly the NMP (in the 1980s), the National Digitalization Strategy and the Home-PC-Reform (in the 1990s), and the Strategic Investments program (in the late 2000s). All of these programs were, to some extent, initiated in response to changes in the world:

- The NMP was initiated by the social democratic party in an attempt to preserve Swedish industry (which was the foundation for the party's success) in the face of international competition.
- The national IT-strategy and the Home-PC-Reform was initiated to digitalize Swedish society, consolidating Sweden's position as a leading IT nation through the rise of software development and (later) the internet revolution.

- The Strategic Investments program – and in particular its smart city branch – was founded to address global challenges while strengthening the competitiveness of Swedish industry.

Looking at these programs in succession, we see that the range of social and economic entities that they target become progressively broader, transcending the division between production and reproduction. The NMP, firstly, is almost exclusively directed at the industry. The programs in the 1990s target the population in the capacity of workers and, to some degree, citizens. Lastly, the Strategic Investment program, and in particular its smart city branch, has urbanity (conceived as one big sociotechnical system) as its primary terrain of reference.

Considering the transformations described in the two previous paragraphs, Stockholm's ICT-sector can be conceived as a re-organizing element in a larger process of entrepreneurialization in the region. As shown in the analysis in the previous section, the local ICT-sector has continuously produced new organizational forms and business concepts that have bridged contemporary configurations of social, economic and spatial entities. Particularly:

- the NMP and the construction of a microelectronics cluster in Kista introduced formalized triple-helix collaboration (that is collaboration between industry, government and academia) in Sweden. This collaboration constituted the basis for Ericsson's commercial success and rapid international expansion in the decades that followed.
- the Internet revolution, through the Dotcoms and software companies, brought with it new modes of organization which transcended the work–leisure division. The Internet revolution also resulted in a series of new business concepts that attempted to capitalize on the wide-spread usage of ICT and the traffic it created. However, as we have seen, it was not until the mid 2000s that technological progress and new financial tools laid the ground for profitable online advertisement and data-mining; a process that co-evolved with the rise of Internet giants.
- following the emergence of Airbnb and Uber, ordinary people are now able to reinvent themselves as part-time entrepreneurs through a technically mediated sharing economy (cf. Rossi, 2017).
- in the Stockholm region's contemporary ICT-sector, 'talent' is attracted from all over the world. Production (immaterial), moreover, takes place in networks; in an innovation ecosystem or startup community where a myriad of different types of actors participate. Finally, business concepts have emerged that attempt to capitalize on urban life forms and governance models (i.e. testbeds and smart city solutions).

While bridging social, economic and spatial entities, the innovations listed above also create new outlets for continuous accumulation. Indeed, the evolution of the Stockholm region's ICT-sector can be conceived as being propelled by a strife to put to work, record, encapsulate, track or in some other way savor increasingly intangible forms of wealth and labor, in other words: the artificial common. For example:

- the triple-helix collaboration in Kista – and, in particular, the loosely structured Ericsson of the 1980s and early 1990s – was able to make use of the knowledge produced in the NMP (unlike more orthodox industrial entities).
- the Dotcoms – apart from presenting business concepts based on the capitalization of user activity – drew on revitalized urban milieus, partly to

sustain their innovative but unstructured labor processes, and partly to present themselves as a revolutionizing force that was about to rework society (and, accordingly, was worthy of continued investments).

· in the context of Web 2.0, the contemporary granular, informalized and internationalized innovation ecosystem is capable of operating at several scales and of incorporating virtually any aspect of social life in pursuit of new, scaleable business concepts. Similarly, sharing economy services provide a framework for valorizing urban milieus.

This evolutionary progression indicates a tendential prevalence of Rossi's notion of entrepreneurialization of the self. As the boundaries between production and reproduction have eroded, an increasing range of social groups are able, incentivized or forced to reinvent themselves in some kind of entrepreneurial guise. Uber and Airbnb clients are a clear manifestation of this tendency. So is the proliferation of incubators, office spaces and events through which a talented and driven outsider can navigate herself into the startup scene. At a higher scale, the encroachment of entrepreneurial logic into social life seems to have been taken to its apex in the notion of smart cities. As described earlier, this concept (and the technologies that constitute it) relate to the dweller not only as a producer (in the form of a creator of data and creative concepts) but also, ultimately, as the object of production: a figure that disciplines herself to align with the dictates of an energy-saving application or similar.

Financialization

Over the studied time period, Stockholm's regional economy has been affected by a wider deregulatory process that targets the financial system. Crucial in this regard are the reforms which took place in the late 1980s and early 1990s, and which contributed to a more volatile economy characterized by what seems to be a cyclical pattern of decennial booms and busts. Associated with this development is an increasing precariousness which emerges in the vacuum of state retrenchment. The reconfiguration of the pension system is probably the most salient manifestation of this trend, although changes in housing policy (as indicated in the background) also constitute a good example. Common to the mentioned deregulations and austerity measures are the fact that they free up capital from processes of production and reproduction by offloading risks and costs from capitalists onto public institutions (for example through bailouts or support programs) and onto individual citizens (by dismantling the social safety net).

Contributing to the overall precariousness which characterizes the contemporary economic paradigm are oscillations in the productive sector. At the level of the corporation, Ericsson's development is illustrative of a shift of influence from stakeholders to shareholders. In the 1980s and early 1990s, Ericsson was an "engineering oriented company" with vague hierarchies and plenty of room for "Gyro Gearloose characters". In the late 1990s, and after the IT and Telecom crises and the re-emission, vast cutbacks and savings programs are implemented. This process continues under Svanberg's command. The industrialization strategy, through the implementation continuous outsourcing and offshoring routines, effectively trims the company to the bone. The process of transnationalization, in this sense, can be said to have co-evolved with a transformation in which, to paraphrase Blackburn, *the corporation itself has*

been turned into an accidental bundle of liabilities and assets that is there to be rearranged to maximize shareholder value.

Ericsson's transformation takes place simultaneously as the notion of the New Economy and, specifically, "increasing returns" gain popularity. These concepts enforce the stream of venture capital that flows into the ICT-sector, inducing a bubble. Notwithstanding the crises that ensued, the "get large or get lost" business strategy has prevailed, gaining an increasingly central role up to this day. While this trend is most salient in the case of unicorn companies that accrue huge investments despite tremendous losses (like Uber and Spotify), it is also characteristic of a large part of the startups in the contemporary high tech economy. Potentially, this tendency is illustrative of an aspect of accumulation through expropriation of the artificial common. Considering Hardt and Negri's claim that the artificial common is expropriated *not so much from the individual worker, but more clearly from the field of social labor*, it seems reasonable to assume that the profitability of this kind of venture is intimately connected with scale and, therefore, dependent on large, highly speculative investments. Supportive of this hypothesis is the fact that the Stockholm region's ICT-sector has become more dependent on risk prone venture capital as its center of gravity has shifted from material production to immaterial production, and possibly even more so as urbanity itself has become an object of production.

The apparent symbiosis between venture capital and the ICT-sector echoes Harvey's notion of how capital, through secondary and tertiary circuit investments, *constructs the necessary physical and social conditions appropriate to its own needs at a particular historical time and place*. As demonstrated in the previous subsection, the evolving ICT-sector – propelled by (public and private) financial capital – has had a central role in processes of post-crisis regeneration that have taken place in the Stockholm region over the studied time period. While these regenerative processes have been economically successful, they have chiefly benefited the richer part of the population.

- Following the crises in the late 1980s, the ICT-sector – particularly the Dotcoms – turned over huge amounts of financial capital. Nevertheless, in the crisis that ensued, household investors and pension funds lost tremendous amounts while many well-situated corporate leaders and investors (and, indirectly, to the public purse) gained.
- After the IT and telecommunication crisis, the emerging startup scene accrued considerable investments from public and private actors alike. However, the chief mode of realization was through exits to the stock market or corporates, which resulted in a concentration of profits to founders and share-holders.

Since the financial crisis of 2008, (corporate) venture capital and money from the Strategic Investment program has flown into a series of new fields of ICT. While the material is insufficient to ascertain how, and to whose benefit, these investments will be valorized, there is little that points towards a more socially just division of the profits.

CONCLUSION

This thesis has investigated the evolution of Stockholm's ICT-sector in an attempt to disclose its role in the region's development. The inquiry has shown how the Stockholm region's ICT-sector, since the 1990s, has become increasingly dominated by various forms of immaterial labor.

Throughout this transformation, the sector has produced new business concepts and organizational forms that have impacted the region by bridging societal institutions, particularly the division between production and reproduction. This impact is conceived as having contributed to a wider process of entrepreneurialization which is manifested in urban development programs aimed at making the region competitive; and state investments that have, directly or indirectly, benefited the ICT-sector.

On another note, the Stockholm region's ICT-sector has progressively become a profitable outlet for finance capital, particularly in the form of venture capital and, later, corporate venture capital. This process has co-evolved with the emergence of increasingly scaleable, digital business concepts which have taken a central role in the local ICT-sector to the detriment of material production. Digital business concepts (and the companies behind them), moreover, has had a significant role in the region's economic regeneration after the crises in 1989, 2000 and 2008. However, the benefits of these economic recoveries have accrued to a relatively limited group of people.

Further Research

During the course of the inquiry, I have come across a topic which appears to be relatively unexplored within human geography, namely smart city technologies. In the context of planetary challenges (particularly of an environmental nature), Smart city technologies seem to me to constitute a close-to perfect Panoptical mechanism. As such, it ought to be a powerful tool for advancing, or consolidating, entrepreneurial ideology and practices. It should therefore be subjected to scrutiny.

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APPENDIX

1. Co-Working Spaces in the Stockholm Region

Co-working/office-space name	Description	Funded	Established, year
THINGS Stockholm	This is an office and cowering-space and workshop for high tech hardware startups. Large companies interact as partners and through events.	Privately	2015
Sup46	A co-working space for startups in IoT, media and gaming.		2013
Hus24	This is a "co-living space" where entrepreneurs live and work together in a five-story house.	Privately	2016
Cafe & Co	This is a cafe and co-working space.	Privately	2014
Slottet	Co-working space with a lot of social spaces.	Privately	-
Open Lab	Office-space for entrepreneurs developing tech-solutions to urban problems.	Publicly (Eu, Stockholm City and local universities)	2012
Epicenter	Office-space in partnership with Google for Entrepreneurs.	Privately	2015
United Spaces	Co-working space situated above Stockholm's Central Station.		2000
Knackeriet	Co-working space.		2015
Hoffice	This is a "mobile" co-working space where people host temporary offices at their homes.	Privately	2013
Impact Hub	The local branch of a global network of social entrepreneurs. This facility offers 77 workspaces in Central Stockholm.	Privately	-
The Park	Relatively "coporate" office space that hosts companies such as Uber Sweden.	Privately	2010

2. Incubators in the Stockholm Region

Incubator name	Description	Funded	Established, year
SU Inkubator	Stockholm University's incubator. Features a 12-18 months program that supports entrepreneurs from idea to deployment.	Publicly	1994
SSE Business Lab	Stockholm School of Economics' incubator. Gives support from idea to deployment.	Privately	2002
STING	Stockholm Innovation & Growth (formerly Kista Innovation & Growth).	Publicly	2002
Student Inc	Connected to The Royal Institute of Technology (KTH). Targets affiliated students. Supports entrepreneurs from idea to deployment.	Publicly	2007
Springfield project	Driven by a Stockholm-based investor. Supports 20 startups every year to make them attractive to venture capital	Privately	2015
STING - Accelerate	This incubator only works with Internet companies, eight per year.	Publicly	2013
Karolinska Innovations	This incubator is connected to Karolinska Institutet. It helps scientists from nordic universities commercialise their research.	Publicly	1996
500 Nordics / Distro Dojo	This incubator was initiated by 500 Startups, the most active seed investor in the world. Provides venture capital and mentorship.	Privately	2015
Serendipity innovations	This is an investment company that offers venture capital and management guidance.	Privately	2004

Source: Malm Wiklund & Almeling, 2016

3. Institutions for Financial and/or Consulting Support

Organization name	Description	Funded	Established, year
Start-up Stockholm	Consultancy agency dedicated to startups and entrepreneurs	Publicly	1987
Tillväxtverket	Works to improve the competitiveness of Swedish businesses. Offers financial and consulting support.	Publicly (Swedish state and EU)	2009
Vinnova	Promotes need-based research and innovations that contribute to sustainable growth. Vinnova distributes grants.	Publicly (Swedish state and EU)	2002
Almi	Invests in newly founded and developing companies.	Publicly	1994
Almi - Invest	This branch of alms focuses on startups, 70 per year. It also hosts the yearly <i>SuperStartup</i> competition, awarding 250 000 SEK to the winner.	Publicly	2004
KTH Innovation	Supports researchers and students (see Student Inc) financially and through consulting.	Publicly	2007
Connect	Non-profit organization that gives entrepreneurs access to network and capital.	Publicly (Ingengörsvetenskapliga Akademin)	1999
Coompanion	Coompanion consults entrepreneurs on how to start and run a business, free och charge.	Publicly (Tillväxtverket)	2014
Flemingsberg science center	This is a collaboration between three universities and three municipalities in Greater Stockholm. The ambition is to unite academia, policy and business in need-driven innovation projects.	Publicly	2011

Source: Malm Wiklund & Almeling, 2016

4. Unicorns Companies Founded in the Stockholm Region

Company name	Venture	Established, year	Founder(s)	Exit
Spotify	Music streaming	2006	· Daniel Ek · Martin Lorentzon	· IPO, NYSE (2018), 250 billion SEK
Klarna	Financial technology	2005	· Niklas Adalberth · Sebastian Siemiatkowski · Victor Jacobsson	-
Skype	IP-telephony	2003	· Niklas Zennström · Janus Friis	· E-bay (2005) · Microsoft (2011)
King	Mobile Games	2013	· Riccardo Zacconi · Melvyn Morris · Sebastian Knutsson · Toby Rowland · Lars Markgren · Thomas Hartwig · Patrik Stymne	· Activision Blizzard (2016), 50 billion SEK
Mojang	Mobile games	2009	· Carl Manneh · Markus Persson · Jakob Porsér	· Microsoft (2014), 22 billion SEK
Evolution Gaming	Live Casino, software	1996	· Jens von Bahr · Fredrik Österberg	-
Avito	E-commerce	2007	· Jonas Nordlander · Filip Engelbert · Mattias Danielsson · Daniel Larsson · Tobias Adolfson	· Naspers (2015), 10 billion SEK
iZettle	Fintech	2010	· Jacob de Geer · Magnus Nilsson	· Paypal (2018). 20 billion SEK
Bambora	Fintech	2015	· Johan Tjärnberg	· Ingenico Group (2017), 15 billion SEK

Source: Malm Wiklund & Almeling, 2016

5. Prominent Swedish Dotcoms

Company name	Venture	Established, year	Founder(s)	Exit
Blocket	Online marketplace	1996	· Henrik Nordström	· Schibstedt (2003) 183 million SEK
Boo.com	Online fashion retailer	1998	· Ernst Malmsten · Kajsa Leander · Patrik Hedelin	-
Bredbandsbolaget	Internet operator	1998	· Jonas Birgersson · Jan-Erik Fiske · Jan Nilsson · Mattias Söderhielm	· Telenor (2006) 6 billion SEK
Framfab	Internet consulting	1995	· Jonas Birgersson	-
Icon MediaLab	Internet consulting	1996	· Johan Staël von Holstein · Jesper Jos Olsson · Erik Wikström · Magnus Lindahl	-
Letsbuyit	Online retail	1999	· Johan Staël von Holstein	-
Spray	Internet portal and consulting	1995	· Johan Ihrfelt · Sebastian Knutsson · Michael Daun · Gunnar Lindberg · Årneby · Patrik Stymne	Allers förlag (2006) 150 million SEK

Source: Fagerfjäll, 2003