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## Innovation, Culture and the Path to Postmodernism: Finland vs. Denmark

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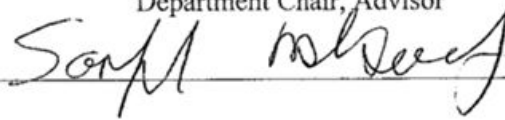
College of Saint Benedict and Saint John's University

# Innovation, Culture and the Path to Postmodernism: Finland vs. Denmark

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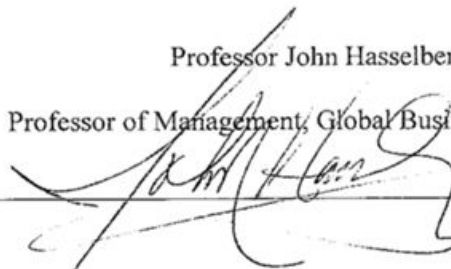
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## Abstract

The purpose of this study is to explore the concept of postmodernism as it applies to the innovative process as carried out in the 21<sup>st</sup> century. In doing so, this study compares and contrasts two countries within a region of the world with differing innovative capacities and then link these differences to their different engagements with the forces that characterize what scholars have terms “postmodernism”. From this study we find that countries that are more closely engaged with these postmodernist forces thrive as 21<sup>st</sup> century innovators; those that are less engaged –i.e., have trouble transitioning from the old “modernist” ethos—falter as engines of technological change. In order to better understand the innovative structures of these countries, this study compares these countries with two exemplars: Silicon Valley as representative of the new world of postmodernism and New England’s Route 128 (near Boston) as the region too tied to “modernism” and unable to transition to the “postmodernist” mentality, which has left it “in the dust” as a once-promising area that never truly fulfilled its potential. Methodologically, this study probes these themes by exploring how history and culture intersect to create an innovative ability, or lack of, within a country, using Denmark and Finland as examples. AnnaLee Saxenian’s book *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* compares two regions of the United States and their ability to innovate. The text looks at the nexus of history and culture in the two respective regions of the Silicon Valley in California and Route 128 in Boston. I will be applying the same analysis to the two countries of Scandinavia, discussing the conflict between bureaucracy and egalitarianism. As an academic and business professional, I was motivated to construct this study due to my intrigue of the perplexity of business cultures, aspects of cultural immersion, particularly in Scandinavia, and a need to understand cultural barriers.

The goals of this paper include: documenting cultural differences between Denmark and Finland based on selections of Saxenian’s *Regional Advantage* and analyzing their effects on innovation in business. Upon analyzing this theory, the intersections of history, culture, and innovation between Denmark and Finland can be compared to the Silicon Valley and Route 128 in the Saxenian Model, proving excellent country cases for showcasing the effects on the innovative competition and growth, and business culture. In turn, this study sheds light on innovation today and suggests the nature in which each respective nation conducts business.

Cultural immersion, primary and secondary research, and interviews are included in the building of this study. Data was collected from a multitude of business forums, supporting data from Hofstede’s Cultural Dimensions Theory, guided interviews, and participant observations. The researcher characterizes cultural understanding as a continuous development which only further benefits international relationships and globalization.

## Sources and Methodology

This study is composed of both qualitative and quantitative data. I have gathered a large portion of primary and secondary research from Denmark and Finland, having both visited and worked in both countries. I spent my time in Scandinavia exploring culture, history, and business structures through a multitude of interviews with business professionals and those who have worked in the public sector. This cultural immersion has not only inspired this study, but offered a first-hand experiences. I also toured a variety of history museums and art exhibits that shed light on the organizational structures of each country respectively. Other sources include public sources published by the national government of Finland and Denmark, the companies explored in the case studies, and the cultural perspectives of other authors, including Geert Hofstede.

In regards to this study, there are limitations and issues to be explored. The study provides a large amount of qualitative insight into the innovation management processes at company levels and show many interesting perspectives on innovation and innovation cultures in Danish and Finnish context. Generally younger and smaller companies tend to be more open than more established organizations, but due to the limited scope of the study it can be difficult to draw general conclusions on culture structures in both Danish and Finnish companies as such. However, the study sheds light on a number of relevant elements that it would be interesting to study in more depth with the application of other managerial and innovation theories. For instance, the method of studying best innovation practices in Denmark limits the knowledge about challenges with regard to innovation. It would be very interesting to investigate cases in which innovation structures and organizations have failed, and vice versa for Finland.

Another limitation of the chosen methodology is the bias that may be generated by the literary and documentation reading chosen, as well as the possibility of misinterpretation in qualitative data research. But, the data in the study obtained from numerous data sources and we consider our analysis strong due to the relevance and variety of documentation and data for the company case studies. The arguments made illustrate the application of AnnaLee Saxenian's *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* of regional culture and the power to innovate in the context of Finland and Denmark.

## Chapter 1: Introduction

Revolutions come in different forms. They may strike suddenly – or at least appear to do so—and destroy all the came before it in one fell swoop. The French Revolution was such a cataclysm. Alternatively, a revolution can come on slowly and in increments. In this case, it does not ride over the existing order all at once. The old and the new reside side by side for a while. They interact through conflict and also sometimes through creative interactions. There are certainly geographical differences, some regions and nations holding on to the traditional way of doing things while others latching on to the new, and often benefitting tremendously in being

what is considered “modern.” After all, as Weber reminds us, the industrial revolution seemed to take hold stronger in such protestant nations as the UK followed by the US southern Europe faltered in their industrialization. This study is concerned with the co-existence of the old and the new, as defined in the 21<sup>st</sup> century. For most of the 20<sup>th</sup> century, the word “modern” has been attached to, among other things, a way of producing things. Another term for it is “Fordism”. At the center of this “modern” system is the large-scale, geographically confined and concentrated integrated plant. Focused, hierarchical, rigidly intense production within a production “city” characterizes Fordism. Ford’s massive and legendary River Rouge plant outside of Detroit serves as the prototypical example. So do the large, integrated petrochemical complexes that dot the Gulf Coast. These are the 20<sup>th</sup> century artifacts of modernism that we have come to exalt as the reasons for American economic greatness in the last century. But the rise of globalization over the last few decades has ushered in a new revolution. If modernism in the form of Fordist principles encroached on the old ways of doing things—farming and old craft traditions of the 19<sup>th</sup> century—“postmodernism” in the form of “post-Fordist” systems now is slowly replacing modernism that so defined the 20<sup>th</sup> century and replacing it over time and across geographical space. If local concentration of industry—what we can call “nationalist” production—defined the industrialized world in the last century, global dispersal—or “internationalist” production—is more and more characterizing business and industry in this present time. This rise of global postmodernist production does not just define existing industrial technology but, as importantly, increasingly dictates the rate and direction of innovative activity of nations. That is to say, countries—and regions within countries—that embrace and incorporate postmodernist thinking into their society tend to be more successful innovators than those who continue to adhere to the older modernist (Fordist) model of industrial technology<sup>1</sup>. These countries then are more successful technically and, through new technology, economically than those that remain tethered to the old “modernist” way of thinking. Further, whether a country does embrace postmodernism or not depends on that country’s historical and cultural DNA. Some areas of the world then are simply constituted historically and culturally to be more adaptable to the global changes taking place in industrial production than are others. Those left behind, however successful they may have been in the now rapidly eroding “modernist” world, cannot seem to adjust easily to the more flexible, geographically wide-ranging, organizationally flat and elastic world of the 21<sup>st</sup> century. These firms, rigidly tied to the past, are the ones that find themselves out in the cold, and “bound in shallows and in miseries” of the old ways of doing things.

This thesis is a study of successes and failures in the new post-modernist world. Using the research and model of Annalee Saxenian’s influential book *Regional Advantage* as a map from which to negotiate an understanding of why certain countries—and regions within countries—are

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<sup>1</sup> An interesting and insightful case study on the importance of post-Fordist thinking in recent innovation concerns, of all things, the mountain bike. See: Rosen, P. (1993) “The Social Construction of mountain Bikes: Technology and Postmodernity in the Cycle Industry,” *Social Studies of Science* (Vol. 23, No. 3): pp. 479-513.

more successful innovators than others, we can place this understanding within the context of society's transformation from a "modernist" approach to the more recent globalist "postmodernist" frame. This study looks at two Scandinavian countries – Finland and Denmark—and compares and contrasts their attitudes and reactions to this transformation. While one country (Denmark) is shown to be most receptive to the new worlds of post-modernism, the other (Finland) remains mired in the old ways of modernism. This case study is an excellent way to see how very different historical and cultural contexts make big differences in the ability—or at least the willingness of countries—even in the same region of the world—to walk confidently through the door of post-modernity and thus to embrace the only viable option for succeeding as innovators and powerful global economies in the 21<sup>st</sup> century. Before proceeding further, it is important to first discuss innovation and its relationship with an increasingly global world.

### The Nature of Global Innovation and its Cultural Context

As we move further into the 21<sup>st</sup> century, a higher intensity of globalization processes have connected the world through trade, technology, the free-flow of information, and competition. This has made for a highly globalized world that has led to an overall general growth. It is undisputed that globalization aspects are affected not only by market forces, but are also significantly influenced by political and other microeconomic factors, including historical and cultural roots of different countries. But, globalization has revealed variations in geographical regions and individual countries that affect growth, and innovation to a large extent. National borders, historical backgrounds, geographic size, and cultural subgroups all influence innovation and globalization within the context of a country, shedding new light on innovation and competition practices.

Innovation has also produced structural change in networks of competition and globalization. The perception of innovation can be described as generated knowledge that enterprises and organizations use for enhancing methods, ideas, or products and achieving success in the market. Creation of knowledge and research are vital to a nation's capacity for innovation. At the same time, it is not just the ability to generate new knowledge that is important for innovation and growth, but also the way in which the knowledge is shared between universities, research institutions, and businesses. This means that an innovation system, sustainable at the national as well as regional level, plays a most important role in generating economic growth (Park, 2005). To encourage innovation, enterprises can receive information from research institutes, government authorities, consultants, and universities. Important international organizations evaluate various indicators valuable for researching the role of innovation in fostering competitiveness and economic growth (the Summary Innovation Index measured by Eurostat, the Global Competitiveness Index and Innovation sub-index prepared by the World Economic Forum). Various research studies have emphasized the importance of innovation in supporting competitiveness and economic growth on a global scale. The attention to innovation

was identified by Adam Smith (1776) in the “An Inquiry into the Nature and Causes of the Wealth of Nations”, where he indicated the new group of specialists ready for productivity advancement through knowledge. Joseph Schumpeter (1934) highlighted innovation as a foundation of economic performance. Many economists continued, revised, and expanded upon Schumpeter’s theory. For example, John Kenneth Galbraith (1967), and Richard Goodwin (1946) created a method of economic performance in order to examine the interchange between business activities and economic growth. Grossman and Helpman (1991) enhanced growth theory by analysing the role of the innovation in fostering economic growth (Terzić, 2017). Their work analyzed innovation performance and economic growth in the global economy.

Innovation often leads to benefits and challenges in both economic and socio-economic forms. A classic example of innovation is the development of steam engine technology in the 18th century. Steam engines could be utilized in factories, enabling mass production, revolutionizing transport in the growing industrial world. More recently, information technology has transformed the way companies produce and sell their goods and services, while opening up new markets and business models. Innovation is often associated with new enterprises that provide the market with new offerings and job opportunities. But, at the same time, innovation can also lead to firm closures and job destruction if the products or services become obsolete or are replaced by more competitive options. Innovation can also assist and challenge social practices and economic growth, health and demographic issues, and social inequalities, among others. As an example, innovation can aid elderly individuals in remaining healthy, live independently longer, and counteract the declination of physical capabilities that become more prevalent with age. Innovation can also provide more personal, predictive and preventive health care products that improve the quality of human life. In addition, frugal or inclusive innovations that may be inexpensive and simplified versions of existing goods reduce differences in living standards between economic and social groups in society. Innovation can address social exclusion and benefits that can arise by creating employment opportunities and addressing particular challenges faced by lower income groups (The Innovation Policy Platform, n.d.). Innovation has a multitude of effects on economies across the globe.

Cultural, historical, and geographical forces also come into play to influence innovation and economic growth, factors that are underestimated in the consideration of accounting for current and future demands of innovation. An example can be derived from the development and growth of the American nation’s frontier mentality in bringing individuality and risk taking into the U.S. psyche and its effect on innovation and economic growth. The Frontier Thesis is the argument, advanced by historian Frederick Jackson Turner in 1893, stating that American democracy was formed by the American frontier. While the theory is focused on the development of democracy, his ideologies can be applied to the growth of the mental capabilities towards innovation. He proposed that the stress of moving the frontier line in the early stages of a developing America had an impact on the pioneers going through the process. Turner set up a



transformative model using the formation of American history and the geographical size of the land that was the early United States.

The first settlers who arrived at the East colonies in the 17th century operated and thought like Europeans. They had to adapt to the new physical, economic and political environment in a variety of ways; the cumulative effect of these adaptations was the mentality of Americanization. Subsequent generations moved further inland, pushing the lines of settlement and wilderness. European characteristics failed to continue and the old country's institutions (e.g., established churches, aristocracies, intrusive government, and land distribution) increasingly declined. Every generation that moved further west became more American, more intolerant of hierarchy, and increasingly innovative in their need for survival. They also became more individualistic and dependent on organizations they formed themselves. In broad terms, the further west, the more American the communities became. In the thesis, the American frontier established liberty and the acceptance of risk taking by releasing the newly established Americans from the European mindsets and old, dysfunctional customs. The mindset shifts of American settlers forged a new people and resulted in the acceptance and desire for competitive and innovative practices, pushing new frontiers beyond that of land into commercial business and economic growth. The desire to explore new boundaries, geographical, industrial, and overseas expansion "was not carried in the Susan Constant to Virginia, nor in the Mayflower to Plymouth. It came out of the American forest, and it gained new strength each time it touched a new frontier," states Turner. The American mentality has carried throughout the decades into today's innovation sectors.

The historical influence of the American mentality, among many other factors, contributed to the United States becoming one of the innovative leaders in the world today. Each nation possesses unique frontier experiences in their formation and development, resulting in a variety of differing government policies, cultural practices and traditions, mentalities, and innovation and economic growth. By contrast, less innovative countries also differ culturally and historically from the United States in their innovative and developmental efforts. Factors of colonization, independence, war and civil strife, religious and governmental influence all play a role. Countries like Egypt and Israel, for example, have both faced their fair share of historical conflict and development as nations. But, even though these countries are geographically neighbors and in large part shared similar histories, they have evolved drastically contrasting innovation and competitive systems. Israel has developed extensive innovation and entrepreneurial clusters and ranked in the top 25 of both the 2017-2018 Global Competitiveness Report (24th) and the Global Innovation Index (17th), while Egypt has fallen behind, ranking 115th in competitiveness out of 138 countries and 105th in innovation out of 127 countries. Why has Egypt, which has had great difficulty in pursuing a post-modernist approach to innovation, lagged behind in terms of scientific, innovative, and competitive development, in contrast to Israel's achievements—a country it might be argued has been far more open to globalist post-Fordist ways of thinking—and its high global ranking in entrepreneurship and inventions? There are a variety of answers to the reasons Egypt has not taken advantage of their resources to establish advanced innovation

institutions, including differing cultural and historical backgrounds and practices from the surrounding countries and the mentality/attitudes it produces in the citizens who live there, but it is important to note is the level of regional variation that exists in the same geographical region.

The same regional variation can be applied within a singular country as well. This brings into discussion that even within countries, one can see historical/cultural/geographical differences that result in different levels of innovation and economic growth. Looking at Germany for example, more specially the differences between Northern and Southern Germany, one can see variation in cuisine, dialect of language, drinking habits, religion, geography, and socio-economic structures of the two regions. In 1989, Germany celebrated the reunification of a country divided since World War II with the destruction of the Berlin Wall. But, even though the Allies split up Germany between East and West in the aftermath of World War II, the recognized real differences between Germans, as one will hear in Munich as well as Hamburg, isn't between East and West, but between the more globalized North and the less internationally-oriented South. Differences have emerged in their innovation structures and economic growth. In the 2016 reports from The IDW (Institute of Public Auditors in Germany, Incorporated Association), Federal Employment Agency, Initiative Neue Soziale Marktwirtschaft, and DAX, Southern Germany has shown increasingly growing prospects over that of the Northern states. Southern German states has seen an increase of approximately 1.3 million in population in 1990. Southern states rank lower in insolvencies (49,895 compared to 72,619 in the North), unemployment (1.0mil compared to 1.7mil), and debts to other countries (€170bn compared to €371bn). The South ranks higher in GDP per person (€39,481 compared to €34,967 in the North), exports (€558.8bn verses €390.9bn in the North), and patents registered (34,782 verses only 13,692), exhibiting factors of greater innovation and economic growth. It appears that states of Southern Germany go to better schools, express more job opportunity, earn more, and live longer. Their local governments have healthier finances to invest more, sometimes five times as much as in the North (Bremen, Dresden, 2017). This regional variation within a country can essentially be applied to every country to exhibit the differences that result in varying levels of innovation and fiscal improvement.

This leads to the application of AnnaLee Saxenian's book *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* and the comparison of the regions of the United States and their ability to innovate. History normally has distinguished the regional variation of the innovative North versus the backwards South in 19<sup>th</sup> century. Saxenian's book discusses the contrasts between today's West coast Silicon Valley and the East coast Route 128. In the 1980's, the two regions appeared similar in their mixture of large and small technology firms, ivy league universities, military funding, and venture capital opportunities. If anything, Route 128 was more widely recognized for their association with technology than the Silicon Valley. So then why is it that business in the Silicon Valley flourished while Route 128 declined moving into the 1990's? The answer, Saxenian asserts, has to do with the fact that despite similar histories and technologies, Silicon Valley developed a decentralized but cooperative industrial culture while Route 128 came to be dominated by independent, self-sufficient corporations. Saxenian states that

the Silicon Valley had a unique dynamism about it. Extensive professional networks, willingness and acceptance to take risks, openly exchanged information, job hopping, and an egalitarian environment, openness to global companies –in other words a definite post-modernist world-- gave the area an undeniable competitive advantage in entrepreneurship and innovation. The Silicon Valley's culture supported entrepreneurial experimentation and collective learning.

Silicon Valley's organizational structure was in deep contrast to that of Route 128. Large, vertically integrated, and enigmatic corporations dominated within the boundaries of the area. The connections with almost exclusively large corporations limited growth and innovation, emphasizing the hierarchical promotion over collaboration. Silicon Valley's interest in local networks, innovative thinkers, and educational institutions were far more attractive than their east coast counterparts who focused more on tradition and established firms, drawing new talent and global business professionals towards the West instead of the East.

As a result of these differing cultural and organizational worlds –with Route 128 adhering to the hierarchical, insulated, geographically isolated, mechanized mentality of the “Fordist” universe-- Route 128 fell behind in the shift of technology as the focus moved from minicomputers to personal computers. Silicon Valley on the other hand, adapted to the changing market, diversifying their range of products and systems with chips, routers, application softwares, and ecommerce. Today the Silicon Valley remains one of the leading locations for technology innovation and venture activity both nationally and on a global scale. Saxenian's pioneering research into the dynamics and regional variation of competition offers a compelling analysis of the importance competition and innovation need to answer the individual local terms and outcomes of a region, as well as maintain competitiveness in frontier industries when the country is already at the forefront as a result. With the aim of determining interconnections between the variables of innovation, competitiveness and growth through historical and cultural roots, the application of utilization of Saxenian's work helps corporations, regions, and countries find a competitive advantage in a volatile world economy.

It is widely accepted that innovation adapts in developed economies and leads to growth in the global markets. Looking more in depth at the nations of Northern Europe, the Nordic countries have some of the most developed regional dimensions of innovation policies and institutions. The countries Finland and Denmark have developed innovation strategies and respective instruments that have been recognized in global context. For example, the Capital Region of Denmark has its strategy ‘The Capital Region of Denmark: The Green, Innovative Growth Engine of North Europe’ and similar strategies that have been employed in the regions of Sweden and Finland. While Scandinavia is considered highly innovative and has top-ranked in such aspects in the past decade, regional variations exist between the countries, including within the historical and cultural contexts discussed earlier. These regions are considered to be important players in global innovation systems and prove to be excellent cases to apply Saxenian's theory of regional advantage in a globalized scenario. It's important to note when examining how people from different cultures relate to one another, what matters is not the absolute position of either

culture on the scale but rather the relative position of the cultures (Meyer, 2014). In regards to this study, Denmark is comparable to “postmodernist” Silicon Valley and Finland with “modernist” Route 128. Similar to the question of competitive advantage in the regions of the United States, we ask why has Denmark adapted successfully to changing patterns of international competition and innovation while Finland appears to be losing its competitive edge. This paper seeks to answer this question as well as explore independently the interconnections of histories and cultural practices of both countries, their effects on the innovative competition and growth, and business culture today.

Examining both Denmark and Finland within the context of Saxenian’s theory will demonstrate why companies like Nokia, a Finland native, which quickly garnered market share initially, followed the path of Route 128’s decline and flat lined in innovation and competition while companies like Apple and Samsung surpassed them. Denmark in contrast, appears to be thriving in the technology industry, taking innovation to new heights through competition and collaboration. This study will uncover the source of differentiation in innovation ideals between the two nations. As the world shifted from modernist to postmodernist, the model of innovation and production that Nokia used to gain competitive advantage in decades past no longer worked. Competitive advantage required a post modernist way of behaving, one more flexible, flat, collectivist and globally oriented. The underlying reasons for these differences lies in their very different historical and cultural experiences, experiences that began to emerge centuries past.

The focus in Denmark lies in the understanding of how Viking community ideals influenced the egalitarian behaviors of Danish culture and contributed to innovation. The Danish Law of Jante will also come into focus as the study will investigate the unspoken cultural rule written by Danish author Aksel Sandemose. This rule has major influence on the cultural identity and tends to pull Denmark more towards collectivist ideals that influence innovation policies and practices. The belief lays with the idea that individuals are to be considered equal and achievements are to be downplayed as a part of Scandinavian culture. The law states:

You're not to think *you* are anything special. You're not to think *you* are as good as *we* are. You're not to think *you* are smarter than *we* are. You're not to convince yourself that *you* are better than *we* are. You're not to think *you* know more than *we* do. You're not to think *you* are more important than *we* are. You're not to think *you* are good at anything. You're not to laugh at *us*. You're not to think anyone cares about *you*. You're not to think *you* can teach *us* anything (Sandemose, 1933).

This idea has root in Danish culture, holding its members to a set of societal standards. One should not boast about their accomplishments which may set them apart. Citizens do not wear flashy jewelry or drive fancy cars to demonstrate wealth. In fact, walking throughout the city

of Copenhagen, one can see a sea of blacks and greys. While it is a part of the minimalist lifestyle the Danes have adopted, it also stems from the Law of Jante and the value of homogeneity.

Finland, in contrast, is not culturally considered a part of Scandinavia, but is a part of the larger Nordic region. Denmark, Sweden, and Norway share a common Scandinavian root language and a common Viking history, based on North Sea and Northern European traditions, linked to Germany and England. Finland, however, shares the linguistic roots with Estonians and Hungarians, which is very different from the Scandinavian roots and languages, and originates from central Asia. The people of Scandinavia emerged from northern Europe, while the people of Finland emigrated from the East. Like their Hungarian cousins, who differ from their Slavic neighbors ethnicity but share some culture and traditions, Finns today share more cultural traits with the Nordic countries than with their eastern neighbors (Cultural Advice, 2005). Finland, leaning more towards bureaucratic than collectivism in social ideals, is affected by Eastern European influence. Finnish nationalism has developed from cultural and linguistic origins with the influence of Russian ideals. The protection of the land in Finland is rooted in historical developments, the beginnings of which traced to the latter part of the eighteenth century. It was then that the idea of Finnish national separateness began to gain traction and other studies of the Finnish people began to contribute to the rise of modern nationalism and eventually the consciousness of cultural unity. This also lead to the notion of Finns being a more taciturn and conservative people.

In addition to differing backgrounds and social structures, cultural and individual differences are often wrapped up with differences among organizations, industries, professions, and other groups (Meyer, 2014). Initial differences in social structure and industrial practices laid the foundation for the creation of distinct innovation systems. These institutions shape and continue to be shaped by the local culture and the shared understanding and practices that unify a community, defining everything from labor market behavior to attitudes toward risk taking. A region's culture is not static, but rather is continually reconstructed through social interaction. No single dimension adequately accounts for the adaptive capacity of a regional competitive economy, nor is any single variable prior or causal of the others. Regional culture is important, but is not alone decisive in promoting innovation forums (Saxenian, 2005). This is to be considered with high regard in the context of this study.

## Chapter 2: The Saxenian Model

AnnaLee Saxenian has, in *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, made significant contributions to the historical understanding of the American high-technology industry and mechanics of technological innovation growth. A professor at the University of California, Berkeley, Saxenian sought to uncover how regional economies figure into industrial and innovative success and failure in the late 20th century. Her research indeed illustrates two divergent paths of industrial growth and technological advancement in the two

coastal regions of the United States, clarifying the less than rigid culture of the American industry.

Saxenian's research is ethnographic in nature, with the empirical material accumulated over the course of nearly a decade of immersion and observation in the two regional economies. Her core of the argument is built from more than 160 in-depth interviews with entrepreneurs, industry leaders, corporate executives, and representatives of local business associations, governmental organizations, and universities in Silicon Valley and Route 128. *Regional Advantage* also draws heavily from the industry and trade press, both local and national, corporate documents and numerous public and private databases, and from the *County Business Patterns* which was published by the U.S. Bureau of the Census (Saxenian, 2005). Her hypothesis proposes the Silicon Valley's growth and success in the late 1990's can be attributed to the region's decentralized organizational culture, cooperative exchange traditions, and the value placed on risk taking. In opposition, Route 128 on the East coast fell behind in technological progress due to their hierarchical and independent industrial systems. The histories and organizational cultures highly influenced the outcomes of both regions, causing one to flourish and the other to fall to the wayside.

With Route 128's historical links back to New England, flourishing in Massachusetts was almost inescapable. Building on history, capital, and technology, the region quickly became a leader in new technical knowledge, launching early startups like Teradyne, Computervision, and later the MIT Radiation Laboratory at MIT, beginning an era of substantial government R&D funding which expanded public and private organizations in radars, computing, and new technology. The identities of the corporations and persons of the region were shaped largely by the hierarchical and authoritarian ethics of Puritanism, and continued to influence the emphasis of family, class backgrounds, and location in a well-defined social hierarchy. Most of the New England population resided in stable communities and neighborhoods that were often home to families reaching back multiple generations. These longstanding ties to community ensured a strict separation between work and social life among its engineers and innovators (Saxenian, 2005). Through the 1980's, firms began to inherit and reproduce industrial order based on the independent, autarkic structures in organizations, adopting the strategies of earlier East Coast generations (Saxenian, 2005). The region's location and concentrations of capital, skill, and technology had Route 128 poised for growth, but proved to be slow to changing markets and technologies moving into the 1990's. New England's traditional outward-looking mentality to be expected by a community that lived on seafaring trade has rigidified and turned in on itself. Its most advanced technological region—route 128—had become rigidified, bureaucratic and insular; places like MITRE retained close association with government agencies and with a certain level of self-satisfaction showed the clear signs of “not-invented-here” syndrome and the lack of interest in outside talent or ideas, whether they emanated from other companies or other countries.

According to Saxenian, Route 128 never reached its promised prosperity due to the emphasis on such Fordist characteristics as corporate secrecy, vertical integration, formal

hierarchies While it did provide the area the with stability that is critical in an environment of volume markets and price-based competition –that is, it was inadequate for the accelerating the pace of technological and market change in up-and-coming technology (Saxenian, 2005). The East Coast business culture had produced an environment where employees were generally expected to stay for the long term, working their way up the corporate hierarchy and retiring with a comfortable pension (Saxenian, 2005). This resulted in some of the lowest employee turnover rates in the computer industry, reinforcing isolation and employee loyalty to individual firms over the industry as a whole (Saxenian, 2005). These internal organizational structures emphasized status, corporation loyalty, and the avoidance of taking risks, and did little to cultivate the strong regional or industry-based loyalties that unified the members of the Silicon Valley’s technical community (Saxenian, 2005). The firms of Route 128 were too disciplined to the point of organizational rigidification and stifling specialization –echoing the inflexible, difficult to change Fordist production factory<sup>2</sup> – making them unable to respond to the innovation emerging from the opposite coast of the country.

The Silicon Valley entrepreneurs were post modernists in many respects. They saw themselves as pioneers forging a new industrial settlement in the natural boundaries of the California peninsula. Interestingly, the person who figured prominently in creating a post modernist industry that was decentralized with interconnected firms and flexible R&D production systems was actually a person who was active in the years before and following World War II, Frederick Terman, who Annalee Saxenian mentions as creating the 20th century technical community (Saxenian, 1995). A professor at Stanford, Turner worked to build up Stanford University's program in electronics and electrical engineering, encouraging faculty and graduates to start businesses locally. These ideals eventually evolved to create the diversified fabric of external relationships and supplier infrastructures that helped the Silicon Valley excel in specialization and experimentation (Saxenian, 2005). One of the first and most famous firms to embrace the open and inclusive networks in the Silicon Valley was Hewlett-Packard. The firm founded on the basis of an audio-oscillator invented by William Hewlett and developed by David Packard under the guidance and encouragement of Terman at Stanford University.

Silicon Valley evolved an industry that did not resemble most of the American economy, especially the East Coast, in that they ditched organizing around self-sufficiency and the hierarchical corporation structures that were predominantly independent to the surrounding environment. They instead adopted a decentralized organizational system in which firms

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<sup>2</sup> The inflexibility of Route 128 is reminiscent of Henry Ford’s rigidified assembly line system that defined the “modernist” system. As David Hounshell in his book *From the American System to Mass Production* tells us, Ford found it extremely costly and too consuming to try to impose model changes into his factor, a factory geared to making only one standard product, the Model T. (See Hounshell, D.(1985) *From the American System to Mass Production 1800-1932: The Development of Manufacturing Technology in the United States (Studies in Industry and Society)*(Baltimore: Johns Hopkins University Press).

specialized and competed intensely, but while still collaborating in informal ways with one another and local institutions to gain insight about changing markets and technologies. With such a strong link to local and competing firms, corporations in the region were distinguishably showing unusually high levels of job hopping, the rates of mobility forcing firms to compete fiercely for experienced talent. Most firms eventually came to accept high turnover as a normal cost of business in the region (Saxenian, 2005). The evolution of Silicon Valley firms thus relied heavily on the interconnections of local social and technical networks and as well as their own individual activities for competition and growing innovation.

Saxenian asserts the Silicon Valley's success was attributed to the inclusive and decentralized networks that developed among managers, entrepreneurs, and executives on multiple levels, and the continual shuffling of employees within various firms to reinforce the value of personal relationships and networking. The pioneers of the Silicon Valley explicitly sought to avoid the hierarchical structures of the East Coast companies, developing stronger commitments to one another and to the cause of advancing technology than to the individual companies or industries (Saxenian, 2005). The contrasting values and practices of the Silicon Valley from Route 128 proved beneficial in their rise as innovation leaders in the mechanical and technological industries.

Companies from both regions continued to compete for market value through technological advancement, despite their differentiating regional business cultures. Intel Corporation, from Silicon Valley, and Digital Equipment Corporation (DEC), from Route 128, fought vigorously in the field of semiconductor microchips and computer systems. Intel, however, eventually became more successful even though DEC was the older and considered more respectable company. Both companies reflect Silicon Valley and Route 128 perfectly in their representation.

The Intel Corporation focused on manufacturing chipsets, flash memory, embedded processors and other devices related to communications and computing. But by 1985, Intel abandoned memory production, dramatically increasing its pace of new product introduction and by the end of the decade had revitalized its microprocessor business (Saxenian, 2005). During the 1990s, Intel invested heavily in new microprocessor designs, fostering the rapid growth in the computer industry. Intel became the dominant supplier of microprocessors for PCs and was well known for innovative maneuvers in response to its market position during this time.

Intel had early advantages through Silicon Valley connections by joining the Santa Clara County Manufacturing Group (SCCMG) in the 1970's with David Packard, chairman of Hewlett-Packard. The formation for the SCCMG centered around the strong belief that the future of the electronics industry was directly related to the future of the Silicon Valley. The twenty-six founding members, including both electronics, non-electronics companies, and banks, aimed to work "side-by-side" (Saxenian, 2005). Intel's encouraged openness facilitated the exchange of ideas and information through these organizational structures.



The rapid expansion of Intel contributed to the creation of more than 200,000 net new technology employment (Saxenian, 2005). Intel became to be known within Silicon Valley for its attention to managing people as well as technology. They were seen as a model of good management that encouraged excellence through competitive achievement. Intel founders Robert Noyce, Andy Grove, and Gordon Moore focused on recruiting recent graduates of engineering schools rather than experienced managers, believing that employees would develop a passionate commitment to the firm's goals and make appropriate decisions unencumbered by layers of management (Saxenian, 2005). They also encouraged unity in the firm's vision and community through the avoidance of such Fordist concepts as social hierarchies, bureaucratic boundaries, and siloed specializations. Within Intel's office spaces reserved parking spaces, executive offices and dining rooms were nonexistent. Offices consisted of rearrangeable partitions where everyone, including the founders, worked in the same space to promote discussions of new ideas and problem solving. The decentralization of Intel continued through the level of autonomy and responsibility given to all levels of management.

During this time period, Silicon Valley companies were growing faster than those along than those along Route 128. By 1990, 39 of the top 100 fastest growing electronics companies in the nation were based out in Silicon Valley and only 4 were based on Route 128. Intel ranked among the fastest-growing enterprises in 1990. CEO of Whitehorn Group, Christopher Johnson, commented on the growth of Silicon Valley corporations, including Intel, stating that, "given their history of organic and strategic development, these companies have both the foresight and resources to make large acquisitions, take risks to deliver the market valuations which, in turn attracts the flow of venture capital that drives innovation" (Marketwired, 2014). Intel, utilizing Silicon Valley ideals, quickly became a household name in the American economy.

Although Intel was not clear of trouble between 1970 and 1990, they recovered more quickly from loss in the memory markets, largely due to their control of the profitable microprocessor market and their model of flexible R&D and manufacturing, corporate autonomy and self-reliance and ultimately the services of foreign (Asian) production facilities through strategic outsourcing of chip manufacture. Intel, among the other Silicon Valley firms, continued to rely on local patterns of inter-firm mobility and exchange. These relationships ultimately facilitated the recovery through technology market changes and adjustments in the regional economy (Saxenian, 2005). Corporations of Route 128 demonstrate a contrasting adaptation to the changing market needs.

The Digital Equipment Corporation, headquartered in Massachusetts and representative of the old-style "modernist" approach to innovation characterized by large, hierarchical, fully integrated operations, was never able to recover from the technological market shifts between the 1970's and 1990's. The world increasingly required successful DEC began designing and manufacturing its own integrated circuits in 1976. But already in 1959 DEC introduced the Programmed Data Processor, the first commercially available general-purpose computer. With the price tag of \$120,000, only fifty-three of these computers were sold. By 1967, however, the firm

was producing low-cost minicomputers in large volumes. By 1977, with revenues exceeding one billion dollars, DEC easily led the market with 41% of worldwide minicomputer sales (Saxenian, 2005).

By 1979, after three years of heavy investment, its internal semiconductor operation had increased tenfold in size, making it one of the largest integrated circuit producers in the nation. By 1983 DEC was building its minicomputers from the bottom up, manufacturing everything from microprocessors, disk drives, and circuit boards to monitors, to floppy disks and power supplies. DEC even tooled the sheet metal and plastics for its components (Regional Advantage, pg. 97). But the vertical integration further narrowed the possibilities of innovation, creating timing and coordination issues and locking the sources of supply into its existing technologies and skills and eliminated competitive pressure to innovate or control costs (Regional Advantage, pg. 102). DEC was a leading corporation of computer systems and integrated circuits, but quickly fell to the rapid rise of the innovative business microcomputer in the late 1980's that made their internally manufactured products obsolete.

DEC's organizational structures varied too from that of Intel Corporations and contributed to the regional shift to the West. While DEC experimented with non-hierarchical organizations, however, the networking and collaborative practices that typified Silicon Valley never became part of the mainstream business culture of Route 128, and the region's new management models only partially departed from traditional corporate practices (Saxenian, 2005). Instead, DEC implored the popular matrix management model, which was pioneered by DEC itself, for it appeared to offer a compromise between the decentralization of their entrepreneurial origins and the traditional corporate hierarchies to which they increasingly aspired. In practice, unfortunately, these hybrid organizations often created confusion and conflict. They undermined informal communications and decision-making processes and distanced management from employees and customers (Saxenian, 2005). DEC ended up sticking with traditional, "modernist" corporate cultural practices and bureaucratic decision-making processes.

DEC's functional groups eventually grew increasingly insulated from changing market demands. The engineering group, still oriented toward highly engineered mid-sized time-sharing systems for price-insensitive markets, built costly features into new product that consumers were not willing to pay for. Marketing continued to devote most of its efforts to the company's profitable mid-sized computers rather than promoting personal computers. As a result, DEC's early PCs were over engineered, overpriced, and under-marketed (Saxenian, 2005). DEC was ultimately acquired by Compaq, merged with Hewlett-Packard, or sold to Intel.

By the end of the 1980's, Route 128 producers had ceded their longstanding dominance in computer production to the Silicon Valley (Saxenian, 2005). The contrasting responses of Digital Equipment Corporation and Intel to changing competitive conditions in computing illustrate the relative strengths of Silicon Valley's network-based from industrial systems over Route 128's firm-based industrial systems. These two companies contribute and advance Saxenian's hypothesis of the two region's responses to the changing patterns of competition.

## Chapter 3: Finland- Independence and Hierarchy

### General Overview

There is little question that Finland has many important qualities embedded in its history, geography and culture that should make it a prime example of an innovating country. And in truth, Finland has demonstrated great ingenuity and purpose in moving ahead technologically since the end of World War II. But, as with the once-promising Route 128, Finland finds itself facing a changing world and, also like Route 128, those changes requires a shifting toward a postmodernist way of thinking, a shift that the country has not been able to negotiate with the same speed and dexterity as demonstrated by other nations, such as Denmark. The example of Nokia and its fall from grace is a case in point. But first it makes sense to address some of the important geographical, economic and political aspects of Finland through a detailed PESTLE analysis.

Finland's political, economic, social, and other various systems provide excellent insight to the general overview of Finnish life and society. Finland today is in many ways a prime example of an advanced, forward-looking industrialized country. Finland has produced a reputation as a comprehensive and progressive society, ranking highly in a multitude of global studies, e.g the Human Development Index (scoring 0.895 and 23<sup>rd</sup> out of 177 countries) and the Transparency International's Corruption Perception Index (3<sup>rd</sup> out of 163 countries). The country shows significant achievement in its ability to control corruption and provide a satisfactory life for its inhabitants. Finland has also performed notably in terms of Global Gender Gap, which capturing the equalities in achievement between women and men. The country shows high participation of women active in political and economic life, showcasing Finland's ability to create a positive social climate for women. Finland's 1995 Act of Equality ensures an equal proportion of men and women in public institutions. The provision stipulates that the gender with less representation should have at least 40% representation in government committees, advisory boards, other corresponding public bodies.

Finland also has advantages politically and geopolitically that many countries do not. It is a democratic republic of 5.5 million people with an extensive welfare system. The country's citizens are able to participate in the selection their government, as well as freedom of expression, freedom of association, and free media. Finland is noted for their military neutrality in their election not to join NATO, despite the end of Russia's influence, but did join the European Union in 1995.

One aspect of the Finnish economy does work against its striving towards innovativeness. Finland currently operates through a set of high rate taxes, particularly for high income earners, which may make it difficult for the country to attract and hold highly skilled employees. People who earn more than E60,800 are taxed at the rate of 32%, which is added to other taxes such as

the municipal tax. The personal income tax is added to the municipal tax, church tax and social insurance contributions, increasing the tax burden further. These high tax rates may make it difficult for Finland to attract talent with the right skills (PESTLE analysis Finland country profile, 2008). On the other hand, the country has a reputation for a comprehensive and progressive social policy, which has led to one of the highest levels of educational attainment and lowest prison incarceration rates in the world. The Finnish government has come out with measures to upgrade labor skills by fostering lifelong learning and increasing the number of students in vocational training. Finland's strong investment in higher education and research has produced record numbers of doctoral candidates and highly qualified personal, attracting investment in high-tech sectors. Finland's strong investment in higher education and research has more than made up for its high tax policy so that the country has more people per capita working in R&D than any other OECD country (OECD, 2016).

The cost of labor in Finland is high compared to other advanced European economies, such as the United Kingdom, Austria and Germany, but the age of retirement in Finland is one of the lowest among the Nordic countries with the opportunity to retire at the age of 63. Around 80% of the city's 20-64-year-old residents are part of the workforce an approximately three-fourths of the capital city Helsinki residents work in the municipality where they live. However, the number of jobs in Helsinki is 1.3 times the number of its working population, which makes Helsinki dependent on external workforce (Assadi et al. , 2016- 2017). The number of unemployed people has grown immensely during the global recession that started in 2008, but a positive turn was observed in employment figures in December 2016, an indicator that Finland has successfully recovered from the global recession.

The innovation and technology programs of Finland is characterized by the government's policy of encouraging the interactions among private companies, universities and academic institutes in research and development activities, the high level of R&D intensity, and the dominant role of private sector in IT development. The talented labor force educated under the Finnish world-renowned education system also contributes to Finland's success (Legislative Council Secretariat, 2014).

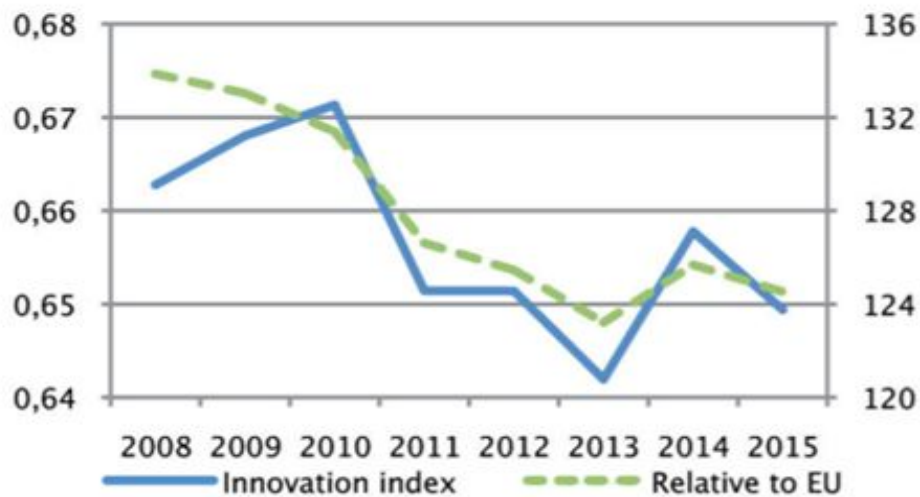
Overall then, Finland's economic, political and social structures should have propelled the country as a technological dynamo equal to, if not superior to, Denmark. Yet the country has experienced technological decline over the last two decades while Denmark has strengthened as a technological leader. The following section takes a closer look at technology clusters and innovation generally in Finland and focuses in on the important role of Finland's government policy and incentives for innovation.

### Finland Innovation Systems & Clusters

Since early 1990s it has been popular to study organizations and institutions of innovation, as well as how innovation prospers. All economic, social, political, organizational, institutional,

and other factors influencing the development of innovation are called the innovation system, and the actions of public bodies influencing it innovation policy (Edquist & Hommen 2008). Finland is recognized globally as an innovation leader, with their strengths lying in their international scientific co-publications, license and patent revenues and applications, and public-private co-publications. Through the 1990s, Finland underwent an economic transformation. Beginning the decade in a severe economic depression, Finland boosted globally around the middle of the decade to emerge as one of the most competitive economies. This dramatic rise and success in the new and growing global framework the result of deliberate government policies aimed at fostering economic growth through innovation. Finland operates largely under the concept of a national innovation system (NIS), the basis for its technology and innovation policy. The country's innovation movements function through a multitude of key Finnish organizations, which include the Academy of Finland, public research and development organizations, the National Technology Agency of Finland (TEKES), and capital providers like SITRA. These diverse ranges of capital and public providers promote the competitiveness of Finnish industry and innovation as they assist in and fund research for both start-ups and existing companies looking to engage in technology industries. These public and private regional developers, while very active, tend to promote cluster development "from above" without intense attention given to assuring close interactions between startups, universities and entrepreneurs.

In recent years, innovation performance in Finland has decreased since 2010, with a small increase in 2014, followed by a decrease in 2015. Finland's performance relative to the European Union has also been declining from its peak of 134% in 2008 to 124.5% in 2015 (*European Innovation Scoreboard 2016 - Finland*, 2016). There has been concern about the level of competitiveness and innovation of Finnish industries. Finland has seen a general stagnation or decline in international innovations studies, shown in the figure below.



Source: Innovation in Finland [From the European Innovation Scoreboard 2016]. (2016). Retrieved April 17, 2018, from <file:///C:/Users/Owner/AppData/Local/Temp/7z002C68626/Finland.pdf>

Indeed, the economic crisis of the early 1990s, as well as the membership in the European Union in 1995 and the European Economic and Monetary Union in 1999, induced a shift in Finnish policy thinking: greater emphasis was put on long-term microeconomic as opposed to short-term macroeconomic policies, in acknowledgement that prosperity is largely created by private individuals conducting business activities within national borders (Oy, 2009). But such a policy, according to a number of scholars, is actually making things worse for Finland in terms of its innovative output. For example, Acemoglu, Aghion, and Zilibotti (2006) oppose this strategy, saying that the country should be more focused on the short-term and minimize investment while also searching for younger firms and new and better management that interconnects companies on a consistent and dynamic basis.

This in large part means that Finland's innovation goals, especially as pursued within its high-tech cluster communities, tend to be relatively consumer-oriented and like that of the United State's Route 128 region, reproduce an industrial order based on large, organizationally rigid, integrated and isolated independent firms. Sabel and Saxenian (2008) claim that "Finland is at risk of becoming a victim of its economic success," based as it is on large, integrated companies mass producing standardized products. They conclude that "... prospects of longer term growth in Finland will require rethinking... [The system] that fuelled successful innovation... appears to have become self limiting in the global environment of the 2000s" (Sabel and Saxenian, 2008). In other words, the authors confirm that Finland's "modernist" thinking is increasingly at odds with the more globalist, flexible and interconnective post- Fordist world. Few firms in Finland can challenge Nokia as the preeminent case study to encapsulate what has been going on in the Finnish economy over the last few decades: a rising, high-technology company incorporating all of the essential elements of the modernist (i.e., Fordist) system that it worked very well for a time.

But as the global economy changed and increasingly required companies to incorporate post-modernist business structures to succeed, Nokia's rigidified regime did not allow it the flexibility to change with the fast-moving high-tech times. In short order, it became nothing more than a lumbering, slow-moving giant unable to wrest competitive position from its fast moving and more nimble post-modernist competitors.

### Case Study: Nokia

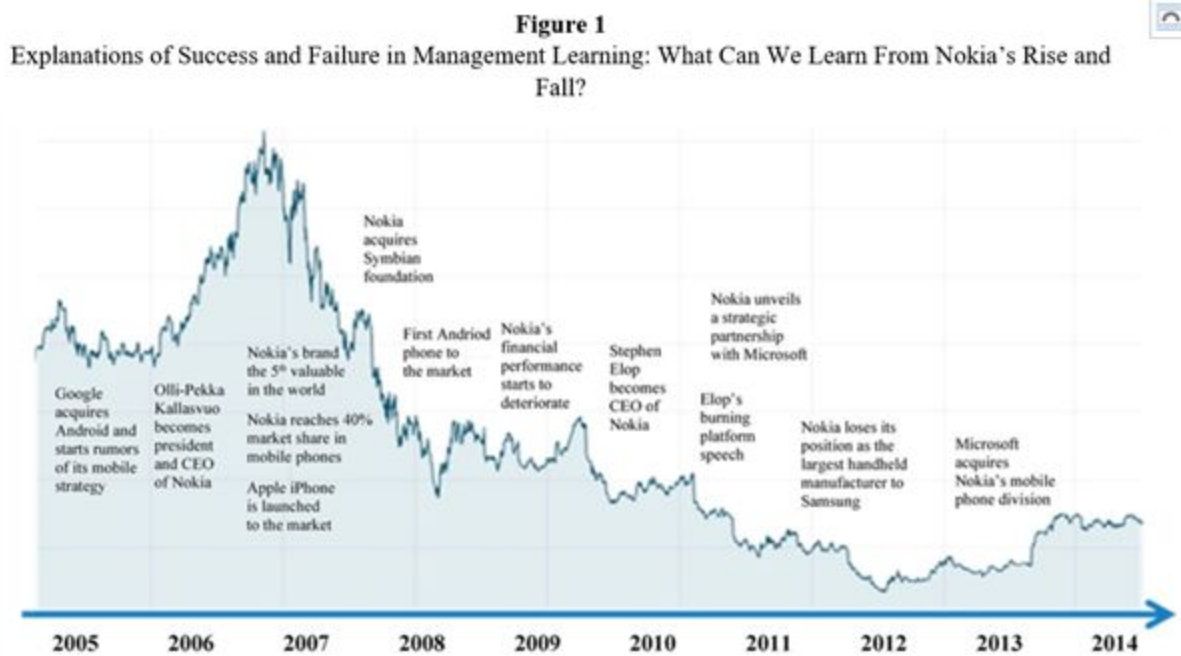
The analysis of the Nokia Corporation's rise and fall during the 1990s through early 2000s allows for further comparison of Saxenian's Route 218 region. The study of the Nokia corporation becomes an important research topic due to its symbolic position in Finnish society as well as in the application of Saxenian. Although Nokia has received global attention, the consequences of its success and failure were most important in Finland, where it had become a symbol of professional management and innovativeness (Lamberg, Laukia, & Ojala, 2014). When Nokia became the opposite, the societal effects of that transformation were magnified because Nokia's oft-imitated management practices –practices that reflect older modernist ideas-- were suddenly questioned (Laamanen, Lamberg, Vaara, 2016).

Nokia experienced two distinctive periods in its history: its strategic rise to leadership in the mobile telephone industry in the 1990s; and the erosion of its market position after 2006 as a consequence of regime-changing business model innovations by competition like Apple, Samsung, and Google (Laamanen, Lamberg, Vaara, 2016). Similarly, Saxenian asserts that the Route 128 region was in a position for growth and leadership, but also proved to be slow to changing markets and technologies. While Route 128 did provide the eastern U.S. region the with stability that is critical in an environment of volume markets and price-based competition, it was inadequate for the accelerating the pace of technological and market change in up-and-coming technology (Saxenian, 2005). Companies like DEC examined earlier, and other companies of the region seemingly followed the same downfall as Finland's Nokia while competitors gained the competitive advantage through their focus on innovation and strategic ability.

Founded in 1865, the Nokia Corporation is a Finnish provider of multinational telecommunications, information technology, software, services and advanced technologies and licensing. Throughout the early 1980s and early 1990s Nokia built and sustained leadership in the mobile communication industry as a diverse conglomerate. Initially, Nokia grasped essential early insights that were critical to their strategic success. The Finnish company took advantage of international governments that were likely to to invite new entrants to provide mobile services on a commercial competitive basis, and realized full digitalization of networks were on the rise. By understanding these two discontinuities, and how the company could benefit from them, Nokia was encouraged to commit early to the emerging European digital GSM mobile communication standard, to focus on base station development in the GSM European R&D alliance, and to eagerly start building relationships with the newly franchised independent mobile network

operators (Doz, Kosonen, 2008). During this time, Nokia also made the executive decision to focus explicitly on mobile communications and providing high value-added products, above other factors of the company. Figure 1 below provides an overview of the key turning points explaining Nokia’s success and failure.

Nokia’s fast international expansion arose from their ability to adapt to differencing local demands without losing economies of scale and global integration, while exploring user-friendly digital interfaces with excellent designs. Nokia recognized that mobile phones could become mass consumer products rather than mere network end as its competitors believed (Doz, Kosonen, 2008). Early and collective foresight, Nokia’s experience, and the corporation’s culture and systems were also used as explanations of success.



However, Nokia’s success was short-lived, as its ambition to internationalize and diversify led to costly acquisitions in electronics and computers, in addition to a series of poor decisions made by the corporation, including; the neglect of innovations and products that could have been successful, shifting from the opportunistic agility of the early 1990s into a more formal process of managing growth, and management’s underestimation how intensely competitive other telecommunication businesses were (Doz, Kosonen, 2008). The previously praised strategic leadership and organizational capabilities of Nokia had become some of their key sources for failure. Scholars offered the following interpretations of Nokia’s decline: “the company did not pay sufficient attention to the emotional undercurrents caused by internal competition for resources to develop a vast array of phone models” (Huy & Vuori, 2014). Ex-Nokia executive



Frank Nuovo highlighted Nokia's organizational stagnation that results from the combination of normal corporate evolution and large size:

I look back and I think Nokia was just a very big company that started to maintain its position more than innovate for new opportunities ... we realized at Nokia that touch was increasingly important and were working toward doing it, but when a company is really busy holding on to what it has built, it is difficult to put enough of a push toward something so drastically new and engender urgency in it (Frank Nuovo, 2013).

Nokia had failed to develop its organizational structures, management systems, and competences to keep pace with growth and watched as its products became obsolete or less than desirable compared to competitor products. They didn't just struggle to keep up with competitor products and prices, but fell short in adapting culturally to the changing, global business environment. Apple's Tim Cook echoed this interpretation in an interview by recalling that "Nokia's internal bureaucracy inhibited efficient software development" (Grobart, 2013). The Nokia Corporation aligns with Saxenian's evaluation of the Route 128 region in how its corporate structure and power, or lack of, to innovate play critical roles in the success of a company or region. Like that of Route 128, Nokia's bureaucratic structures characterized by formal decision-making procedures and management styles failed to keep up with those willing adopt openness and specification in their efforts to innovate, resulting in the loss of leadership in the market. Looking at Nokia from the modernist vs. postmodernist perspective, we note the company's adherence to the former and inability to evolve into the latter. While certainly Nokia was (and is) an international company, it used its global reach most effectively in developing mass market for a very limited range of mobile phone options. In other words, it focused the company organizationally on making one standard product range and doing this thing very well: Efficient production of a product for a large (more or less) homogeneous market. Like the Ford Motor company, especially in its early days, Nokia's production system—including R&D which fed into this system—was very inelastic – it could not readily adapt to changing competition in telecommunications thereby allowing other and newer firms the opportunity to take control over new generations of telecommunications technology and leave Nokia in the dust. One approach Nokia could have taken was to reorganize itself less along hierarchical, bureaucratic lines and more along horizontal organizational structures that allowed better intercommunications between departments. Internationally, instead of building mass markets to further lock the company into producing one type of product, it could have better leveraged its international position to make its production far more flexible—such as through strategic outsourcing—instead of the inflexible, integrated production operations that was concentrated mostly within a single plant within Finland. Flexibility, custom production for different markets, organizational fluidity, strategic global production systems – all of these define the 21<sup>st</sup> century post-Fordist ways of competing;

Nokia failed to cultivate any of these characteristics and so stay mired in the old Fordist world of mass production, low cost production and a large homogeneous market. No wonder it failed to thrive in such a dynamic industry.

If Nokia reflects Finnish innovation culture as a whole –and this author believe it does—we should also not lose sight of the fact that Finland is a very innovative place in many respects. It certainly beats out many nations as an innovator, even if countries like Denmark have the edge. So it cannot be just that Finland is totally mired in the past modernist world and refuses to wake up and see the post-modernist world as it is. Nor can we assume that Finland went off the right track just in response to the crises (financial) and opportunities (the EU) of the 1990s. Something deeper is going on here. That “something” of course is Finland’s unique and deeply-rooted culture. Looking into that culture a bit deeper will give us a more nuanced understanding of Finland’s relationship with the innovative process and technological change. On the one hand, we will see that Finland’s culture has many elements that at least come close to post-modernism and that, as a consequence, allow it to continue to be a highly innovative country; on the other hand we will also see that, compared to countries like Denmark, its culture is at its core fundamentally “modernist” in its values, goals and beliefs and, as such, hindered the country from moving into the post-modernist 21<sup>st</sup> century. This discussion will take place within the context of Saxenian’s Route 128 model of technical decline.

### Application of AnnaLee Saxenian’s *Regional Advantage: Finland and Route 128*

The association of Finland with Saxenian’s Route 128 is an important point in our analysis of innovation within that country. However, differences in their historical and cultural roots as well must be noted and placed in their proper context. Indeed, historical and cultural comparisons between Finland and Route 128 are not as black and white. Route 128 had longstanding ties to families, neighborhoods, and communities, as the history of the region stretched back to the conception of the United States (Saxenian, 2005). Finland, however, had a contrastingly complicated history in its formation, the present borders being the result of a long process. Originally joined to the Swedish realm during the Christian conversion, continuous wars repeatedly changed Finnish borders, leaving inhabitants in a constant state of in-between. Later on in history, Finland became part of the Russian Empire (1809) as the result of international power politics, resulting in the disconnection from Sweden and Norway for the first time. While Finland was able to keep their own legal and religious systems under Russian rule, they still experienced a large amount of uncertainty moving into the 20th century as leaders sought to strengthen Russian influences, causing a rise in Finnish protests and civil disobedience. Finland finally gained independence in 1917, but was still not exempt from disputes with their bordering neighbors and long periods of conflict. What distinguishes Finland from the rest is the rugged nature of the climate and location and the historic struggles of the Finns against their East and West neighbors in the past. Finland’s Career Guide states:

this has made for an equally powerful belief in ideal of the flexible, clever, ingenious individual, who can find a way through difficult circumstances. Sometimes this strong individualism runs counter to the social welfare goals of the larger group, but in most cases, group pressures tend to “normalize” any overtly individualist behaviors.

It should also be noted that Finns have a reputation unlike any other Nordic cultural group, with a reputation for reticence, thoughtfulness and the lack of showcasing emotion. They are known to be quiet, reflective, somber and, for some, and can appear very stubborn or standoffish. They can be unwilling to speak unless they have something important to say. This aloofness is not a reflection of authoritarianism or hierarchy: as with their Nordic cousins, Finns believe in very egalitarian organizations, aligning here more with Silicon Valley than Route 128. While national bureaucracies may be complex, they are not hierarchical. Finnish society is also not overly formal; rather it is relatively relaxed, whether in the home or at work (Cultural Advice, 2005). Within the business environment, power is decentralized and managers count on the experience of their team members, often consulting employees. Anything that emphasizes rank, show or status is generally downplayed. The distinction from Route 128 also lays within the environment of the Finnish office setting, as it promotes decentralization and equality like the Silicon region. The Employment Museum in Helsinki published a series in 2017 on office revolution and environment. Viewers can see that pleasant working environments have become more important for many companies operating in Finland. In the creative industries, employees no longer work in grey offices, but in aesthetic and playful spaces that are equipped with new technologies. The aim is to create a relaxed working environment that promotes communality and creativity. The photographs were taken at three game companies that are based in Helsinki – Supercell, Play Raven, and Seriously. The offices of these company’s pair imagination with practicality in intricate ways, resembling a home-like and inviting atmosphere (Assadi et al. , 2016- 2017).

While such clear historical and cultural differences do exist between Finland and Route 128 and which helps to explain Finland’s great innovative capacity vis-à-vis Route 128 –such as the flexibility and ingenious individuality, decentralized and pleasant working spaces, etc.-- this argument for Finland’s innovative prowess should not be taken too far, as the case of Nokia certainly shows. While the formation of both the Finnish and Route 128 regions may differ, both resulted in a high preference for avoiding uncertainty and risk. The examination of risk avoidance can often correlate with the level of anxiety a country holds. The development of anxiety over time, studied by Richard Lynn, followed eighteen countries from 1935 to 1970. The five countries with the highest anxiety scores in 1935 were Austria, Finland, Germany, Italy, and Japan (the World War II Axis powers). From 1935 to 1950 all countries that had been defeated or occupied during World War II (1939-45) increased in anxiety level, while six out of the nine countries not defeated or occupied decreased. The overall average was highest in 1950, shortly after the war, and then sank to an overall low in 1965, to increase again after that. Lynn’s data suggest that national anxiety levels fluctuate and that high anxiety levels are associated with wars.

The process as follows: When anxiety levels in a country increase, risk avoidance increases. This is noticeable in intolerance, religious and political intolerance, economic or innovative stagnation, and all the other manifestations of risk avoidance. Times of war and conflict also pull in the other countries, countries in which did not show the same direct results, but did develop increasing anxiety because of war threat (House, 2014). Finland has experienced numerous wars, territorial disputes, and exchanges of power. It is reasonable to assume the correlation of Richard Lynn's study to that of Finland's high risk avoidance plays a key role in business culture and innovation practices today. Regions exhibiting high uncertainty avoidance are known to maintain rigid codes of belief and behavior, and are often intolerant of unorthodox behavior and ideas. There tends to be an emotional need for rules, an inner urge to keep busy, and a focus on precision and punctuality (Hofstede, 2011). These values align with many of the business cultural practices of both Finland and Route 128. The Finnish are known to follow timetables and plans faithfully and expect the same of others. Although Finns are careful with the groundwork, they still often make decisions quickly. In line with the rest of Nordic culture, punctuality and organization are essential, and the climate and historical experiences of Finns in regard to their neighbors make Finland a risk-averse culture.

Looking at values of long- and short-term orientation in Finland, the examination is in accordance to the World Values Survey Data, also considering the GLOBE Study's future orientation. Long-term orientation describes the value a culture places on perseverance, thrift, ordering relationships by status, and having a sense of shame; while values at the opposite, short-term orientation values reciprocating social obligations, respect for tradition, and personal steadiness and stability (Hofstede, 2011). Finland falls under the category of short-term orientation. It takes time to convince Finns to do something a new way, especially if it runs counter to their own experiences (Cultural Advice, 2005). People in Finnish society have a great respect for tradition, a relatively small tendency to save for the future, and a focus on achieving results quickly.

While not all Finnish business cultural practices align perfectly with Saxenian's Route 128, there are significant similarities between the two regions in their respect for tradition and risk avoidance, the important role of top-down management and respect for publicly-funded "Big Science"(reflected in the important role played by government agencies and their subcontracting of large corporations,) the rigidification and slow response time to rapid competitive threats, over-dedication to disciplined management in the service of existing technology, and a basically internalized mentality and basically inward-looking and not much attuned to using the global production network for Finland's competitive advantage. All this is reflected in Nokia's organizational culture and both results in, and follows from, Finnish preference for standardized, mass produced goods competing on low prices and incremental innovation within an existing production system.

We will now turn to the case of Denmark and assess its ability and willingness to transition from a "modernist" to the "post-modernist" world of the 21<sup>st</sup> century.

## Chapter 4: Denmark- Competition and Community

### General Overview

Just as we did for Finland, we will first give an overview of Denmark's macroeconomic and social structures. As with Finland, these indicators show a healthy country and one positively aligned with innovation activity.

Denmark is well known for its efficient system of governance based on the democratic principles, mostly governed under the Social Democratic Party, responsible for the large role of government in developing a welfare society. In recent years, the center-right coalition of the liberals and the Conservative Party, led by past Prime Minister Anders Fogh Rasmussen, has taken support from the right wing Danish People's Party to form the government. The government has maintained an effective approach among the coalition partners in passing crucial legislation with respect to welfare measures, reduction of taxes and tightening immigration regulations. Strengths of Denmark's political landscape include the impressive performance on governance indicators and their continuity of policies. Denmark has continued to perform highly in terms of voice and accountability, as well as government effectiveness.

Further, the Gini Index, which measures income disparity, shows the gap between rich and poor in Denmark is one of the lowest in the world (Kingsley, 2012). Government programs are tilted towards lessening the social divisions in society, a university education being an excellent example. Students are granted a monthly government subsidy to study privately, proving the commitment of the state to promote equality. These government subsidies encourage a wider social range of backgrounds and economic classes in the classroom, promoting more socially conscious and grounded students. This idea of cooperation and equality have deep roots in Denmark's egalitarian business practices and cultural norms.

Denmark operates under a clear hierarchy of courts, with the Supreme Court at the top. The judicial system is based on constitutional laws which guarantee independence, transparency, and effective enforcement. Due to the economic freedom of the legal system, conducting business comes with ease. The government implemented several reforms to improve the business regulatory environment to benefit investment inflows and increase competition. There is also openness to foreign investment to further enhance Danish competition. According to the OECD, Denmark has one of the highest tax burdens in Western Europe, mostly on individual incomes, to support the welfare system that is in place.

The Danish economy, after the re-growth of the 2008 financial crisis and recession, shows a healthy state of government finances. A member of the European Union (EU), Denmark has one of the strongest public finance records. The healthy public finance reflects in the country's low debt. While Denmark under the membership of the EU, the currency remains the Danish Krone,

which is pegged to the euro. The Danish Financial Supervisory Authority works to monitor banks, insurance companies, and players in the securities market, making Denmark one of the few countries operating an effective integrated financial regulatory system. Under the control of the Ministry of Economic and Business Affairs, the systems prove more than effective in monitoring activities in all related sectors of the financial system. This access to the various sectors makes it easier to spot in discrepancies in one that could create problems for the other.

A small country in terms of population (approximately 5.7 million in 2018), Denmark has successfully developed a prosperous society for its population. As per the human development index (HDI), the country ranks 14th in the list of 177 countries, indicative of its impressive performance on social development indicators. Further, Denmark ranks 19<sup>th</sup> out of 144 countries in the Gender Inequality Index in 2016, indicating women's participation in economics and political life. Female participation in the labor force is among the highest in Denmark. The public sector has dominated the healthcare and education systems of the country, and the taxation policy has been hailed as a successful example of redistribution. The Danish welfare system is known for its widespread coverage and large scale contribution to the public sectors, including social welfare provided for the old, the disabled, and infants.

Denmark has successfully maintained leadership as innovators. The country's R&D expenditure is well above the EU average. The country ranks at the top position in terms of mobile and internet penetrations, and its intellectual property laws and regulations of innovation have contributed in the involvement of the technological environment. According to the 2016 European Innovation Scoreboard, Denmark as an innovation leader, performing above the EU average in all dimensions, most notably in open, excellent and attractive research systems, entrepreneurship, and intellectual assets. Infrastructure standards in the country also remain high, reflecting on its technological advancement. Top priority is given from the government to evolving transport networks and funding improvements to existing ones, like the large-scale projects of the Oresund Fixed Link (linking Copenhagen with Malmo in Sweden) and the Copenhagen metro railway system. Copenhagen's international airport, Kastrup, which is the largest in Scandinavia, is an important hub for international routes and is consistently ranked as one of the top airports in Europe for its facilities. (PESTLE analysis Denmark country profile, 2008). All these factors have contributed in making Denmark one of the most technologically advanced countries in the world.

We see then that Finland and Denmark, on the macroscale, should both be (more or less) equally innovative; for their "Pestles" are (more or less) equally receptive to innovation. Yet we know the two countries are not equal in this regard. We therefore must look deeper into Denmark's society, history and culture to find out why this country has proven so adept at navigating the treacherous waters between the "modern" and "postmodern" worlds. Let's next look at the nature of the country's innovation system and the general structure of its industrial cluster networks.

## Denmark's Innovation Systems & Clusters

While such external forces as economic and political trends does not tell us very much as to why Denmark appears to be moving ahead of Finland technically, focusing in on Denmark's technology cluster culture is more useful, for in these progressive centers capture the particular and specific cultural attributes of Denmark that are not as evident with the Finnish cluster environment.

Denmark is internationally recognized as a frontrunner in several areas of technology and research with global impact. With Denmark's small geographical size, the country recognizes its need to look outward for inspiration and the nation's citizens readily accept they must do so to survive in a global market. A nation's innovation system is shaped by factors like size and resource endowments that affect comparative advantage at a basic level. But it also is true that a nation's innovation system tends to reflect conscious decisions to develop and sustain economic strength in certain areas, that is, it builds and shapes comparative advantage (Nelson, 1992).

There are two national innovation systems that play a large role in Denmark. The Danish Ministry of Science, Technology and Innovation focuses on research and innovation policy, and is responsible for public research organizations and universities as well as for innovation and high-technology business development. The ministry aims to strengthen collaboration between the business sector and knowledge institutions. In order to meet this target, the ministry adopted the following four objectives: high mobility and interaction between the business sector, universities, and knowledge institutions; high-tech and knowledge-based entrepreneurs; easy access to advanced technological knowledge for companies; and increased focus on standardization (Ministry of Science, Technology and Innovation 2002). The other key player in Danish innovation policy is The Danish Ministry of Economic and Business Affairs, which is engaged in clustering policies and intellectual property issues as well as in efforts to foster innovation in traditional industries. Through these innovation systems, strategies like the Innovation Strategy have been launched within the country. The Innovation Strategy: Denmark A Nation of Solutions (2012-20), launched in 2012, includes 27 policy initiatives focused on research, innovation and education and represents a shift to a demand-driven innovation policy approach with an emphasis on enhanced knowledge flows and stronger innovation capabilities in education. The Innovation Strategy was complemented in 2015 by the "Growth and development in the whole of Denmark" strategy (Vækst og udvikling i hele Danmark) – that intends to foster regional growth and development in the country through “regional smart specialization”. The program includes more than 100 concrete initiatives focused on strengthening partnerships between research institutions and business and intensifying knowledge sharing and innovation in businesses (The Innovation Policy Platform, 2016). In Denmark, the internal learning capabilities and flexible organizational structures appear extremely important in their organizational and innovation systems.

The combination of being both a highly individualist and curious nation drives forces for Denmark's reputation within innovation and design. This emerges through the society's heavy consumerism for new and innovative products and the highly creative industries that thrive in it, e.g. technology, marketing, financial engineering (itim International, n.d.). Danish designer Henrik Vibskov remarked on the globalization of consumerism and ideas stating, "because this is a small country, we are focused on what's going on outside. If something is popular outside Denmark, music-wise for example, people accept it inside Denmark. And it's such a small society that if one thing gets accepted, everyone does it (Kingsley, 2012)." Artist Jesper Elg also comments on the international outlook taking wave in Denmark is a positive light. He thinks it has given his generation wider horizons, making them more ambitious than previous generations, throwing out the idea of the Law of Jante to try and compete elsewhere in Europe (Kingsley, 2012).

Denmark's innovative clusters are accredited to being leaders in the industry and research areas such as green technology, biotechnology, pharmaceutical sciences, telecommunications, IT and design. Furthermore, the Danish government does not want to simply maintain its present position, but to create one of the leading knowledge societies in the world. In order to realize such a national target, the government decided to establish a combined Ministry for Science, Technology, and Innovation, which focuses on scientific discoveries, digital networks, technological service, and human resources (Ministry of Science, Technology and Innovation, 2002). Denmark has a number of innovative networks and clusters that work to promote growth and innovation nationally or regionally. These clusters give companies access to the knowledge and the entrepreneurs who can inspire, raise ideas for prospective business, solve global problems, and gain funding.

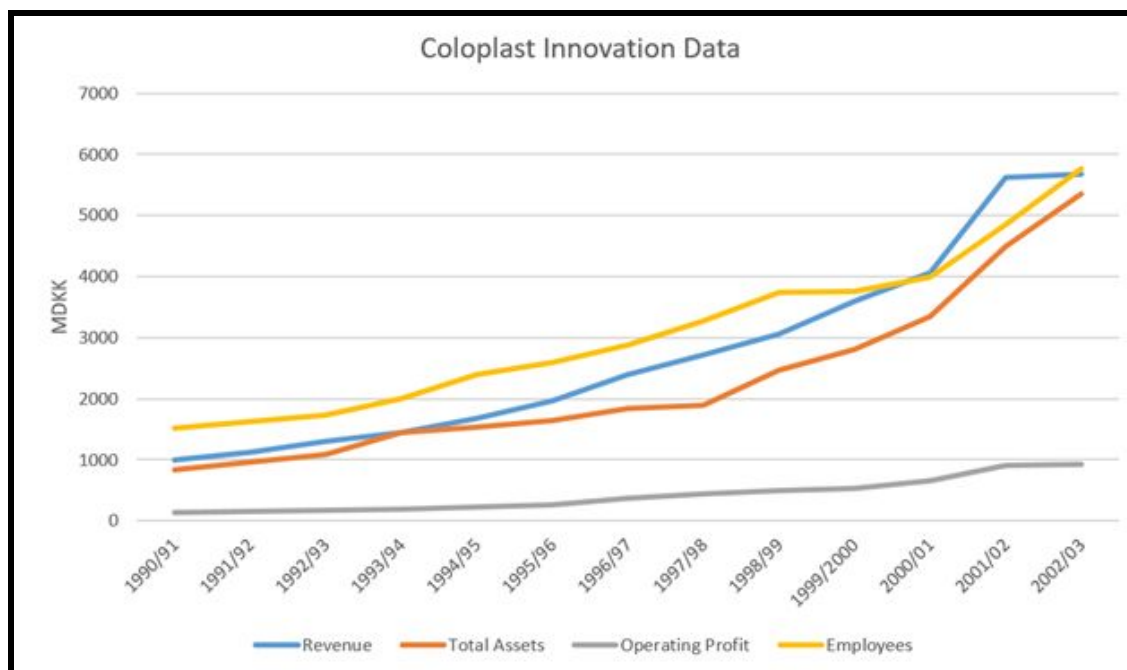
An innovative cluster can be characterized by a set of traits that are recognized by the Cluster Excellence of Denmark as being; the aim to build knowledge bridges between companies and institutions and to create innovation and growth within a group of companies with shared interests, institutions and public partners/civil society take an active part, have a formally established organization of the cluster and its activities with the resources to offer services and activities to the members, and the aim is a long-term, sustainable effort. In Denmark, cluster studies have become in recent years the cornerstone of the business and industry policy making. High-tech clustering in Denmark reflects the the quality of financial services, the technological spillover, and the entrepreneurial competition between firms. Maskell and Malmberg (1999) explained that proximity in the cluster could create a deep village atmosphere, where trust relations can be formed and utilized for sustainable knowledge creation. Maskell (2001) pointed out that competition between firms in a cluster stimulates entrepreneurial spirit and reinforces productivity (Park, 2005). The evolution of Denmark's innovation clusters thus relied heavily on the interconnections of local, social and technical networks and as well as their own individual activities for competition and growing innovation.



Denmark's innovation clusters resemble to a much greater degree than in Finland the inclusive and decentralized networks Saxenian asserts attributed to the success of the Silicon Valley region. Like the West Coast region, Denmark adopted decentralized organizational systems in which firms specialized and competed intensely, but while still collaborated in informal and local institutions to gain insight about changing markets and technologies. Focusing in on one of Denmark's most dynamic high-tech companies reinforces the notion of Denmark as a Silicon Valley-type of innovative center.

### Case Study: Coloplast

The analysis of the Coloplast Corporation's growth and innovation policies allows for further comparison of Saxenian's Silicon Valley and Denmark and, in further contrast to Finland's Nokia, further solidifies Denmark's linkage to the postmodern world. Coloplast is a Danish multinational corporation, founded in 1957, and operates in the med-tech industry, increasing its market share in its three main business areas: ostomy-related products, incontinence products and wound care products. Coloplast also deals in breast care products aimed at women who have been operated for breast cancer and skin treatment products. The corporation continuously works on developments of user- and skin-friendly adhesives and products, which are considered their core technologies. These technologies, most of which have been around for less than 4 years, have accounted for 32% of generated sales. Coloplast is a leading developer of adhesives for attaching plastic products to human skin, including user-friendly packaging, which makes self-application easier for patients. Below is a table showing the growth of Coloplast throughout the 1990s, moving into the 2000's:



Coloplast's production facilities are characterized by a decentralized, loose and informal organizational structure that proved to be quite successful, being recognized by Forbes magazine consistently as a leader in innovation and multinational performance. Not only has Coloplast focused largely on research and development in both new products and enriching their product portfolio, but Coloplast has also created an online community of healthcare providers in efforts for collaborative learning and shared knowledge. It thus closely resembles the regional corporate culture of Saxenian's Silicon Valley. Also reflecting a postmodernist mind-set of wide-spread, efficient and flexible operations, Coloplast leverages its widespread health-care network using advanced communications technology. In particular, Coloplast is oriented towards creating and maintaining relationships with healthcare professionals, particularly nurses, as a means of ensuring the loyalty and involvement of those it believes has key influences on matters relating to postoperative patient care. Coloplast regards its relationships with patients and nurses, together with its ability in adhesive technology, as the company's core assets. As pointed out by Lars Rasmussen, Corporate Director at Coloplast: "In essence our ability to involve nurses by initiating and developing relationships is our core asset: much [as with any flexible production system] we are focused on positioning ourselves centrally or develop our relations to those nurses professionally involved in ostomy or spinal care" (Houman Andersen, 2004). Coloplast's web-enhanced community provide a natural continuation of the organization's strong focus on developing relationships and exchange ideas and knowledge. As a result, Coloplast has not only developed a community of collaboration, but in-depth knowledge of differing global healthcare systems, giving them a competitive advantage in the market.

Coloplast therefore, has not only focused and excelled in quality products, but has distinguished themselves from competitors through strong commitments to helping healthcare providers administer better patient care, and like Silicon Valley, developed stronger commitments to one another and to the cause of advancing technology and care than to individual companies or industries. The case study of Coloplast indicates a strong emphasis on external involvement in innovation processes. Through such a geographically wide-ranging network of healthcare specialists, the company has the flexibility to hand a wide range of healthcare-related issues and situations and do so in a highly efficient manner. This modus operandi contrasts quite sharply with the self-contained, rigid focus on one product that we have seen characterized Nokia. Thus we see that Denmark's high-tech-cluster communities and our case study of Coloplast reinforce the notion of Denmark's post-modernist approach to innovation –so characteristic of Silicon Valley, and an approach that allows it to move ahead technologically with a speed and assurance that Finland is having trouble matching. As we did for Finland, it is now useful to dig a bit deeper into Denmark's cultural psyche to better understand the country's ability to embrace 21<sup>st</sup> century postmodernism to a degree that surpasses Finland.

## Application of AnnaLee Saxenian's *Regional Advantage*: Denmark & Silicon Valley

The natural boundaries of a peninsula, whether it be the relatively narrow stretch of land by the Baltic Sea or the land hemmed in by the San Francisco Bay and Santa Cruz mountains, ensured a density of development that minimized physical distance between companies and facilitated intensive informal communications in both regions of the Silicon Valley and Denmark. Drawn together by the challenge of geographic and technological frontiers, both environments created a culture that transcended form and function. They developed less formal social relationships and collaborative traditions that support experimentation. Both regions promote collective learning and flexible adjustment among specialist producers of complex technologies. The dense social networks and homogeneous work settings have encouraged experimentation and entrepreneurship (Saxenian, 2005).

The promotion of risk taking and informal relationships in Denmark are prevalent in the professional cultures of the workplace and further demonstrate similarities to Saxenian's collaborative and communal Silicon Valley. As noted, Silicon Valley's business culture highly supports experimentation, encourages risk and accepts failure (Saxenian, 2005). The comparability in risk avoidance, also sometimes called uncertainty avoidance, also contributes to fostering innovation within each region. Risk avoidance is defined as the extent to which society embraces ambiguity, or as defined by Robert House's, GLOBE Study, as the "extent to which members of collectives seek orderliness, consistency, structure, formulated procedures, and laws to cover situations in their daily lives." Both regions can be classified as having very low risk avoidance.

Risk acceptance is reflected in the way the Danes are comfortable with changing plans and low predictivity, these aspects being recognized as a natural part of work life. Employees are not given the explicit step-by-step processes or duties that are often seen in American job functions, but are trusted to complete their work with room for creativity and freedom to test their own ideas. In an interview with Danish employee Hanni Niclasen, who works with a financial firm right outside the city of Copenhagen, the decentralized and trusting business culture can be interrupted as:

Scary working environment to have the feeling that nobody is telling you exactly what to do and what is correct and what is wrong. But nobody will hammer you if you make mistakes. It's called constructive criticism in the Nordics. You see, the locals also work in a structured way, you have to, but we earn enormous trust from management in our abilities. This is the norm through all of Denmark. We are well educated and if we fail to produce requirements it will show and then you must do better. I would suffocate and feel like a child if I had to ask my boss for his acceptance and approval all the

time. In my role, I enjoy enormous trust from my boss who is located in Stockholm, Sweden, but at the same time he and the company expects me to work within my role in a structured and efficient way to reach not only what I am measured up against but also to be a valuable contributor to my team. We monitor and measure our performance quite often (Niqlasen, personal communication, 2016).

The layout of office space also reflects on the values of the egalitarian society and resemble the work spaces of Silicon Valley's Intel Corporation. Work spaces often lack dividing walls and employees are seated together, regardless of rank. There are usually a few conference spaces where employees can go if they need a little more privacy, but otherwise all employees are easily accessible through an open layout. This strategic arrangement of the office allows for all forms of management to be approachable and open to discussion among employees. The office design eliminates the traditional boundaries between employers and employees, and between corporate functions within firms, and creates interdependent teams that are linked by informal communications that mirror the country's decentralized industrial structure (Saxenian, 2005). Effective managers and executives themselves are supportive of the staff and involve them through collective decision making, striving for consensus and solidarity, and partaking in long discussions until conflicts are resolved by compromise and negotiation.

These ideals are implemented even in the most mundane of activities. For example during the lunch hours in Danish offices, the designated meal areas oftentimes designed so that colleagues must sit together in a central plaza that occupies multiple corporations, enabling inter-industry and local relationships. In cultivating a place for collaborative competition in the work environment, employees have the allocated time and space to brainstorm new ideas to improve the company and to develop commitments to one another. The informal socializing that grows out these quasi-personal relationships support the ubiquitous practices of collaboration and the sharing of information among colleagues (Saxenian, 2005). The decentralized environment forges employees who can recognize the different problems the industry faces by interacting with a variety of backgrounds in the workplace.

Here, the Danish Law of Jante intertwines with the discussion of collaboration, contributing to the application of Saxenian in Denmark. Within the ideologies of the Jante Law, the concept that no individual is above anyone else promotes cooperation as a collective. A conversation that took place at a Danish lunch plaza further illustrates the connection of communal participation in the egalitarian work culture. In the discussion with a female employee about her child's recent soccer tournament, she expressed that even though her child was playing in what was classified as a competition, the score was not recorded for the game and the players all received medals afterwards. This leads naturally to the follow-up question, "But then how does anyone win?" The answer was everyone did because all teams were viewed as equal (Sollund, personal communication, 2016). This form of communal-based engagement fosters a different strategy of competition through equality, one that is focused on team building and not of

advancing in a hierarchy. The ideas of equality and community impressed on Danish children follow them into the working world. Brainstorming and pitching new ideas becomes easier if employees feel that they can truly explore their thoughts and objectives despite rank or status, resulting in employees that feel appreciated and valued and contribute more to the company (Srivastava, 2011). The collaborative and egalitarian environment Denmark has established largely mirrors the practices and ideals of Saxenian's Silicon Valley.

Inclusive networking through informal relationships and openness in the workplace are values both Silicon Valley and Denmark embody. Their geographical proximity promotes the repeated interaction and the mutual trust needed to sustain collaboration and to speed the continued recombination of technology and skill. When production is embedded in these regional social structures and institutions, firms compete by translating local knowledge and relationships into innovative products and services; and industrial specialization becomes a source of flexibility rather than of atomism and fragmentation (Saxenian, 2005). Both Silicon Valley and Denmark continue to reinvent themselves they learn collectively and adjust collaboration in efforts to enhance innovation and growth.

## Chapter 5: Conclusion

The study began with idea that revolutions can be sudden and immediately devastating (e.g. political revolutions) or they can be more incremental, gradual so that the old and new can exist side by side for many years and even beyond (e.g. intellectual revolutions). We have seen this is true in the case of the postmodernism revolution and the application of AnnaLee Saxenian's *Regional Advantage*. Even in one region of Scandinavia, remnants of the old style modernism (Fordism) exist along with postmodernist tendencies. The case of Denmark and Finland serves as excellent example of this concept. Both countries show evidence of both types of systems –modernist and post-modernist. In this sense both countries have one foot in the 20<sup>th</sup> century one foot in the 21<sup>st</sup> centuries. But what is also important is the degree to which a country is committed to one century or the other. We have seen that Denmark is much more accepting of the ethos of the present century while Finland is committed more to the Fordist mentality of the past century. This correlation between a country's commitment to post Fordism and its ability to innovate in this present century is a powerful relationship, for it allows us to actually predict a country's, or region's innovative capacity within the 21<sup>st</sup> century. To put it bluntly, being "modern" (in the way we have used the term throughout this paper) is fine but only up to a point: as this century proceeds, not moving beyond "modern" will leave a country far behind in global innovative capability. A country must be willing and able to cross the threshold between modernism and postmodernism and embrace the latter if it hopes to remain technologically relevant in the coming decades. Certainly, the case of Finland's Nokia is a warning to other nations that being rooted in the past is a potent way to become irrelevant. Denmark and Coloplast are the more dynamic players that show what benefits the dynamic embrace of the world as it is – or is rapidly becoming— can bring.

As we have seen, it is history and culture that determines a country's willingness and ability to be static ("modern") or dynamic ("postmodern"). And this is important, for by studying a country's cultural roots, we might explain –and possibly even predict— which direction a country or company might go –whether it will be static or dynamic—and therefore how innovative it might be. Finland and Denmark are two countries with very different histories and cultures, but history and culture goes beyond whether or not they can innovate, but can adapt. This, Saxenian asserts how a country or region will succeed in a flat and culturally flexible globalized world.

At the same time, just because a region, country or company is today moving ahead –or moving backward—does not mean they cannot change directions in one way or the other. Finland may in fact prove its mettle as an innovator, at some point. We have seen it has in its history, culture and institutions more than a dollop of 21<sup>st</sup> century thinking; these "hooks" may only need some nurturing by government, universities and industry to set Finland on the path from modern to post-modern. Then too, a prototypical, postmodern society like Silicon Valley is not immune to backsliding, especially as it has grown "fat and happy" and loses its taste for globalization and the radical innovation that such postmodernist thinking can bring. There are indeed such signs in the Valley from startups to venture capitalists that rigidities and the mass production of one standardized thing can be quite attractive – this is especially true as the costs to develop new generations of chips continue to explode. Better then perhaps to focus on the last profitable component and work it to death as a mass produced commodity. Time will tell if the Valley can continue to serve as the post-modernist model that it has for the last couple of decades.

Finally, there is the question one cannot yet answer: Is there a revolution on the horizon that will overtake postmodernism, a revolution perhaps that will be ushered into society by the rise of nanotechnology? We simply do not know at the present. But if there is, will those regions and countries that have proven so adept at sliding out of one system into another be equally fluid in embracing the new nano-order of innovation and production? What indeed the global order will look like if such a revolution comes into focus is a great unknown, as is the case with the emergence of any new and as yet unexplored intellectual frontier.

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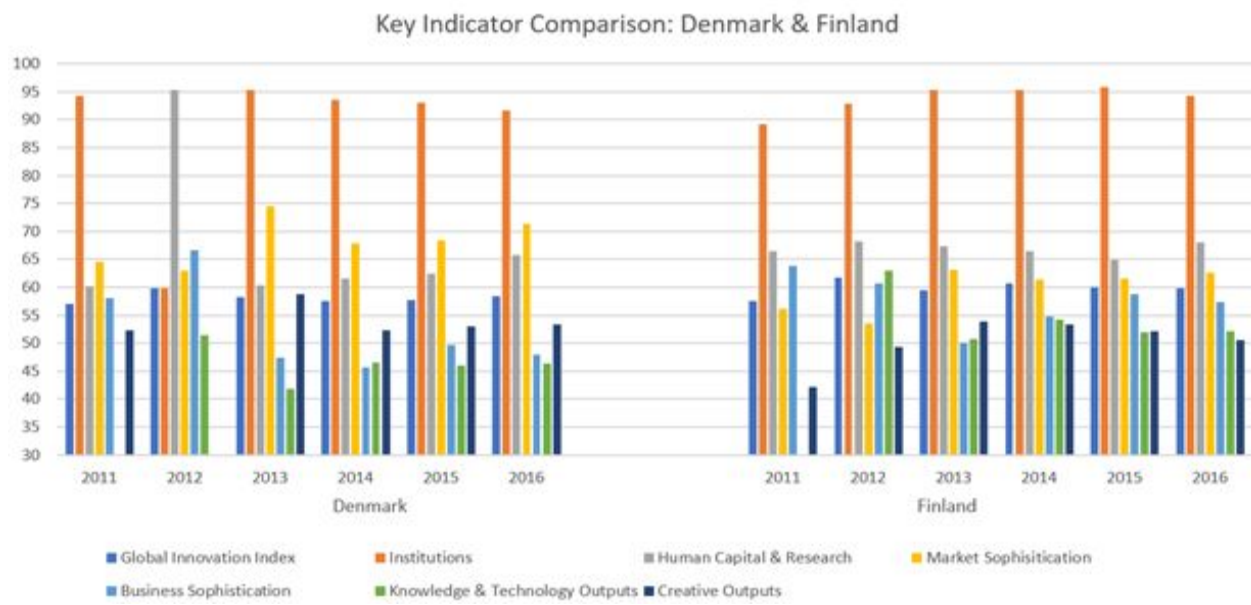
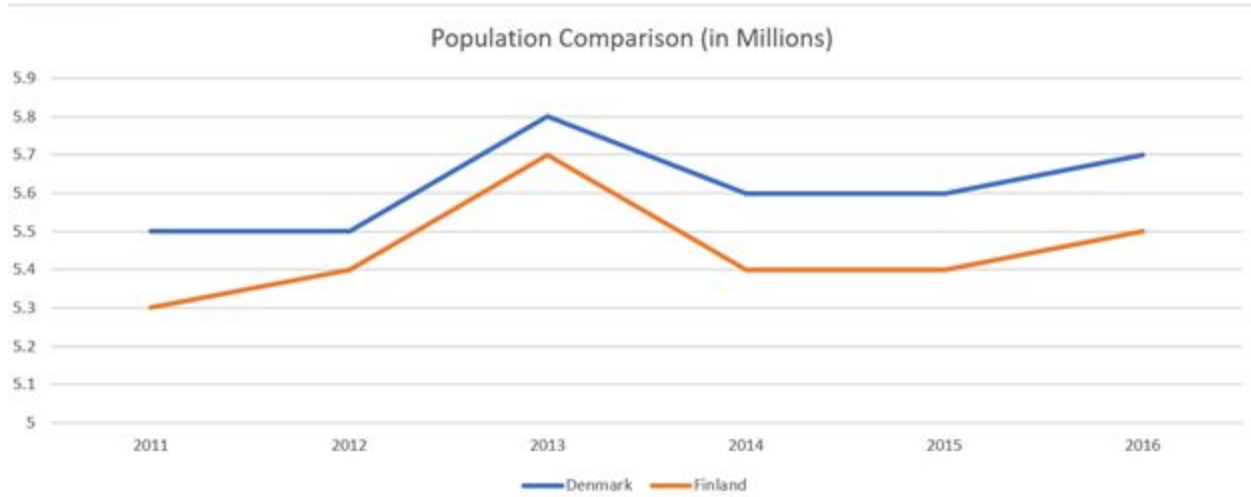


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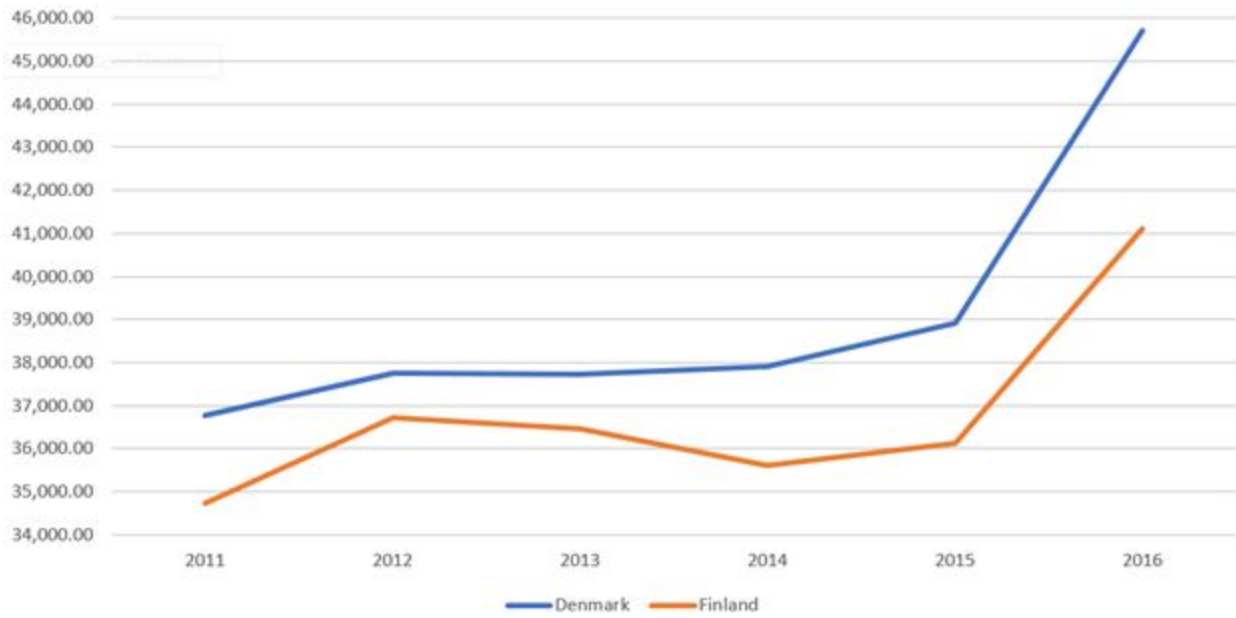
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# Appendix



GDP per Capita (PPP, Current International \$)



GDP Comparison (US\$ Billions)

