

The Indispensable Truism of Innovation

- Improving competitiveness by exploiting the explanatory gaps of innovation theory

Master's Thesis

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Copenhagen Business School

Simon Høigaard Theland

Anders Peter Riis

Supervisor: Steen Andersen, Department of Management, Politics and Philosophy

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Resumé

The present thesis contributes to the perception of innovations in three significant manners: 1) it proposes that innovation theory contains an explanatory gap in regards to the origin of innovations; 2) it develops a framework to explicate and investigate this gap; and 3) it presents tangible recommendations to companies on how performance can be improved by turning their attention towards the insights obtained in the thesis' framework, analyses and conclusions.

The thesis' contributions to both the practical utilisation of and academic theorisation upon innovation are based on a cross-disciplinary analytical framework and thorough analysis of three distinct cases. Initially, we develop the analytical framework from a theoretical review of traditional and contemporary innovation theory and other branches of social science; more specifically history, sociology and philosophy. Consecutively, we conduct case analyses based on the framework, which constitute the foundation for the thesis recommendations in regards to companies' performance.

Concordantly, the last part of the thesis operationalises the insights and novelties from our analytical framework and analyses, and therefore presents tangible recommendations that supposedly can improve companies' innovativeness, market insights, strategising and hereby performance.

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0.2 Introduction

The present thesis contends that innovation practitioners and scholars need to increase the comprehension of their contemporary society, which ultimately enables and determines the continuous realisation of innovations. Concordantly, the thesis at hand presents a novel approach to the origin of innovations and proposes managerial recommendations for corporate strategising, which presumably contribute to the improvement of competitive performance. Thus, by initially proposing a framework, which comprehensively and creatively elaborates upon pre-existing presuppositions of innovations, the present thesis challenges the supposedly common tendency that innovation scholars inadvertently treat the origin of innovation as a truism. Consecutively, the thesis offers concrete recommendations for a supposedly more prolific pursuit of innovation strategies and well-founded strategising process. In essence, the thesis contributes to the general field of innovation by proposing an expansion of the analytical scope of traditional and current innovation theory, and strives to exceed the explanatory power of existing innovation theory by developing a framework, which encompasses a more elucidatory combination of social sciences than has hitherto been conducted.

It is imperative for us to emphasise that it is not our intention to depreciate neither traditional nor current innovation theory. Contrarily, the fact that traditional and current innovation theories adhere to specific positions and therefore perceives innovations in an idiosyncratic manner, enables us to take a step back and question the presuppositions of these theories. It is on the basis of these questions that we propose new perspectives that arguably increase our understanding of innovations. Thus, we acknowledge that if we have seen a little a further it is by standing on the shoulders of giants.

0.3 Field of Study

The present thesis has a threefold purpose and is therefore divided into three parts. The purpose of part 1 is to critically review and analyse pre-existing economic theory on innovations and their origin and on the basis of this, assess whether the general understanding of innovation can be enhanced by combining pre-existing innovation theories with a framework based on other – some might say more humanistic – social sciences. The fundamental idea is that by understanding the contemporary society of a specific innovation more comprehensively through a cross-disciplinary framework, we improve the analysis of innovations and eventually enhance our understanding of innovations and their origin. It is on

the basis of this ambition that the thesis' investigatory and analytical framework (i.e. research design) is developed.

The purpose of part 2 is to examine the explanatory power of the framework developed in part 1 by employing it to three different cases spanning across three different periods from mid-19th century until present. Accordingly, part 2 is concrete analyses conducted in order to obtain new knowledge on innovations and to investigate whether the thesis' framework suits its purpose.

The purpose of part 3 is to operationalise the insights gained from the analyses and conclusions in part 1 and 2. In order to operationalise the thesis' conclusions in regards to innovation, perspectives from literature on strategy, business development, competitiveness and the like are included. Thus, part 3 pinpoints and concretises how businesses in general can benefit from the conclusions of the present thesis. In the remaining sections of the field of study, we elaborate the fields of study of part 1, 2, and 3 individually.

0.3.1 Part 1 Overview – The Analytical Framework

As mentioned above, part 1 of the thesis develops a framework to analyse innovations and the contemporary society in which they originate. As a prerequisite to the framework we initially present three axioms that permeates all aspects of the thesis, and therefore constitute a basis for the thesis' three parts. Based on the axioms, the framework – which eventually also constitutes the theoretical basis for the thesis' research design – is a combination of a critical review on pre-existing economic theory on innovations and other appropriate paradigms within social science. Thus, the ambition is not merely to develop a framework capable of analysing specific innovations and the society that the innovations are embedded in through an economic perspective and hereby humour traditional economic theory. Instead, we strive to question the present presuppositions of innovation theory and hereby exceed the current economic – and ultimately our general – understanding of both innovations and contemporary society by including perspectives from sociology, philosophy and history. Ultimately, perspectives from economics, history, and sociology/philosophy amount to three “pillars”, which constitute the thesis' analytical framework¹. Hence, in regards to the thesis' field of study, part 1 includes an economic review, and an examination/analysis of different paradigms within social science, i.e. the field of study is quite extensive and includes

¹ The three pillars and their interrelationship are elaborated in the research design.

perspectives from economics, sociology, and philosophy that already have and possibly could contribute to the understanding of innovations and their origin.

Each of the three pillars – or paradigms – of part 1 can be concretised as follows: 1) the economic review concerns subjects within economics such as innovation, macroeconomics, and entrepreneurship. The review spans from the seminal innovation theories by Joseph Alois Schumpeter (1883-1950) – which arguably are influential to almost every succeeding theory of innovation – to the latest theoretical economic contributions to the analysis and understanding of innovations. 2) The historic perspective investigates and emphasises the importance of historic circumstances in regards to analysing and understanding innovations. 3) Perspectives from sociology and philosophy constitute a theoretical and methodological addition to the traditional economic analysis of innovations and their origin.

By including and combining the three paradigms, we strive to question the presuppositions of innovation theory and hereby exceed the traditional economic analysis of innovations. We primarily seek to achieve this by including Michel Foucault's (1926-1984) archaeology of knowledge and its emphasis on how discursively accumulated knowledge determines human cognition. Thus, the combination of Foucault's archaeology (particularly the notion of discursively accumulated knowledge) and the study of innovation is the paramount theoretical novelty of the thesis, which forms the foundation of the thesis' framework. In this regard, the thesis' field of study includes Foucaultian reflections on knowledge, which eventually entails that the thesis employs two different concepts of knowledge and a basic conviction that knowledge (in the broadest sense of the concept) governs human cognition. Ultimately, it must be logically deduced that if discursively accumulated knowledge governs human cognition then it is pivotal to innovations and their origin.

Part 1 of the thesis is concluded with a section reflecting upon our methodology and the constructivist perspective we subscribe to, and a section in which we develop our analytical strategy.

0.3.2 Part 2 Overview – The Case Analyses

The second part of the thesis employs the thesis' framework in accordance to our analytical strategy in order to analyse three cases. The three cases, which collectively span across approximately 150 years of world history, represents innovations in the broadest sense of the concept, as the three cases respectively concern the introduction of a technological innovation

in Denmark that initially was developed in and for a foreign market, the invention of a new banking product in Asia; and the continuous technological and political insecurities regarding which alternatively fuelled vehicle could dominate transportation in the 21st century. Accordingly, the three cases are the Danish entrepreneur Carl Frederik Tietgen's (1829-1901) establishment of The Great Northern Telegraph Company; the Bangladeshi banker, Muhammad Yunus' (born 1940) microcredit and establishment of Grameen Bank; and last the continuous initiatives of creating markets for alternatively fuelled vehicles versus the continuous use of traditional internal combustion engine vehicles. These cases are chosen because of their mutual differences and their ability to explicate the thesis' theoretical and practical points and conclusions. Thus, it is our contention that by choosing cases that at first sight appear very heterogeneous, we can explicate the depth and thoroughness of our framework and exemplify that innovations – regardless of time and place – have common denominators. Additionally, all three cases contain a significant portion of capitalistic belief, innovativeness, entrepreneurship, and an achieved or potential market success, which in the context of the present thesis must be perceived as a prerequisite. Hence, the thesis' field of study may seem extensive in regards to cases and empiricism, but – as the analyses eventually will show – the specificity of the thesis' framework entails that the cases are analysed stringently and serve a specific purpose, which also limits the field of study in a logic manner. Consequently, the conclusions we reach by analysing the cases through the thesis' framework are believed to contribute to a generic understanding of innovations and their origin. In order to obtain and eventually contribute with generic insights to the understanding of innovations, a comparative analysis of the three cases' conclusions is conducted. The insights gained from the comparative analysis ultimately form the foundation for the third and last part of the thesis: the operationalisation.

0.3.3 Part 3 Overview - Operationalisation

In some way, part 3 abandons the academic sphere and strives to operationalise the conclusions of part 1 and 2, which hopefully can prove to be of practical value to businesses. Thus, the purpose of the last part of the thesis is to transfer the theoretical points of our analyses and make them valuable in contexts exterior to the academic sphere. Accordingly, if the thesis' analyses in fact do enhance the understanding of innovations and their origin, the insights and conclusions of the thesis can potentially be valuable to all types of businesses in regards to innovativeness, market insights, and competitiveness when considering the significance of innovations in today's competitive markets. Thus, part 3 combines our

conclusions with theory and literature on strategy, business development, competitiveness etc. in order to transform the thesis' conclusions into strategic recommendations that can possibly improve businesses' competitiveness.

0.4 Research Questions

With the above field of study as the thesis' point of departure, we propose the following research questions to guide the analyses:

- How can companies improve innovativeness, market insights, strategising, and hereby performance by perceiving innovations primarily as the outcome of their contemporary society?
 - How have economics and innovation theory generally theorised upon innovations and their origin from the early 20th century until now?
 - How and why does discursively accumulated knowledge affect human cognition and hereby the innovativeness of humans?
 - Why is the origin of innovations ultimately exterior to economy?
 - Why does including a framework, which examines contemporary societies by analysing discursively accumulated knowledge, enhance our understanding of innovations and their origin?

1.0 Part 1: Analytical Framework

At present, innovation theory has not paid significant attention to whether innovations are the outcome of social structures in contemporary society. Instead, theory has prescribed the origin of innovations to the creative mind of the individual (Schumpeter 1934), the personal characteristics of the innovator or entrepreneur (Lazear 2005; Zhao & Seibert 2006; Nicolaou et al. 2008), scientific research (Kline & Rosenberg 1986; Fleming & Sorensen 2004), the cooperation between individuals (Harryson 2008; Harryson & Kliknaite 2007), lead users (Von Hippel 1988, 1994; Hienerth & Poetz 2005), open innovation (Chesbrough 2003; Christensen 2010) etc. In some way, the thesis' analytical framework correlates with the classic innovation adage prescribing that innovators and business developers focus on “the unmet needs of customers”. However, where innovation theory primarily has tried to find ways into the minds of the genius of innovators and entrepreneurs or ways into the customers' minds in the pursuit of the articulation of needs that the customers do not know they have, the

present framework employs a societal perspective on innovation that – without succumbing to explanations of possessing invaluable insights into the psychology of the human mind – locates the social conditions, which have determined that specific innovations have emerged and proved to be successful. Accordingly, a central contention of the present thesis is that the origin of successful innovations which satisfy needs primarily resides in the social structures of contemporary society and not in the ingenious work of an inventor, entrepreneur, lead user or the like. Thus, we propose that by analysing and diagnosing contemporary society, the unmet needs of society will disclose themselves to be exploited by companies. Hence, the keystone of the analytical framework is to develop an analytical perspective facilitating the diagnosis of contemporary society embracing specific innovations, i.e. within which societal settings did specific innovations emerge?

As the above introductory remarks on the analytical framework indicate, the thesis employs a research design, which is influenced by sciences other than economics. Accordingly, the analytical framework constitutes a perspective that through merging economics, history, and sociology utilises the strengths of different branches within social science and humanities in regards to the thesis' field of study. The three aforementioned methodological “pillars” are not to be perceived as equally significant to the method at all stages and levels of the analysis. Instead, the three pillars are a combination of theoretical reflections and prerequisites, analytical perspectives, and historical facts that are methodologically arranged in a specific manner, whereby they provide the analytical perspectives that enable us to conduct the aforementioned diagnosis of contemporary society at different historic periods. As a prerequisite to the three pillars, the thesis employs three fundamental ideas that constitute three axioms, which inescapably permeate and guide all aspects of the thesis. Accordingly, the three pillars are founded on these axioms. The three axioms are respectively based on the works of the French philosopher, sociologist and historian, Michel Foucault (1926-1984), the German philosopher and sociologist, Jürgen Habermas (born 1929), and the French anthropologist and sociologist Bruno Latour (born 1947).

1.1 Three Analytical Axioms of Society

The first axiom is based on the works of Michel Foucault and illustrates the implications of discourse analysis and the archaeology of knowledge. As Foucault is a central figure throughout the thesis, his work is elaborated further upon in the presentation of the sociological pillar below. Initially, however, the thesis merely employs this axiom, as all parts

of Foucault's work are not significant to every aspect of the thesis. Accordingly, by employing the fundamental idea of Foucault's discourse analysis, we acknowledge that:

[...] one cannot speak of anything at any time; it is not easy to say something new; it is not enough for us to open our eyes, to pay attention, or to be aware, for new objects suddenly to light up and emerge out of the ground (Foucault 1972: 44-45).

Admittedly, Foucault's reflections upon "the object" are neither intended for the characterisation of innovations nor their origin. The utilisation of Foucault's discourse theory is, however, one of the methodological developments of merging different branches of social science, the thesis proposes in order to comprehensively analyse the origin of innovation. How the thesis utilises and benefits from this is further elaborated upon in the section on the sociological pillar of the analytical framework. Hence, at present, the crucial aspect to absorb regarding the above quotation, i.e. the first axiom, is that no individual can speak of anything at any time, which additionally entails a limitation to human cognition. In continuation of this, some might argue that this neglects the creativity of the individual, the inventor, the subject, the entrepreneur etc. This is, however, not the methodological intention. Accordingly, Foucault stresses that individual creativity may play a significant part of human agency, but creativity inherently is a function of the discursive limits, which evidently consolidate the discourse and not the individual as the field of research (Nilsson 2009).

The second fundamental idea, i.e. axiom, is encapsulated with ease by the title of Bruno Latour's sociological classic, *Nous n'avons jamais été modernes* (1991, Eng. *We Have Never Been Modern*, 1993). Although a controversial argument at its proposal, Latour's point is widely acknowledged today and adds a level of reflection to the analytical framework and research design. Latour's central contention is that science and culture are not two separate disciplines (Latour 2006), and he argues:

Social scientists have for long allowed themselves to denounce the belief system of ordinary people. They call this belief system "naturalization" (Bourdieu & Wacquant 1996). Ordinary people imagine that the power of gods, the objectivity of money, the attraction of fashion, the beauty of art, come from some objective properties intrinsic to the nature of things. Fortunately, social scientists know better and they show that the arrow

goes in fact in the other direction, from society to objects. Gods, money, fashion and art offer only a surface for the protection of our social needs and interests. At least since Emile Durkheim, such has been the price of entry into the sociology profession (Durkheim 1912). To become a social scientist is to realize that the inner properties of objects do not count, that they are mere receptacles for human categories (Latour 1993:51-52).

The above contention by Latour is interesting to innovations in two regards: 1) Latour's argument fundamentally changes our perception of innovations, because innovations are not *a priori* a synonym to progress. Instead innovations are "mere receptacles for human categories" (ibid.), which entails that innovations in an economic sense do not contain a predestined potential, but a potential that correlates to what the innovator/company can create. 2) Latour's notion entails that in the analysis of innovations' characteristics and their origin the opportunity to question what others might take for granted always exists to the individual, innovator, entrepreneur etc. In theory, this latter aspect might contradict Foucault's aforementioned discursive determination, but in practice, it is basically a call to action regarding whether science (and technology) is utilised and exploited in the most effective and profitable manner in the market, or if culture (e.g. norms, initial practice etc.) is preventing this. Theoretically, Foucault's work exemplifies a perspective that accentuates the discursive nature of science, which to scientific discourses entails the embeddedness of scientific discourses into other discourses (Nilsson 2009). Accordingly, Foucault rejects – in unanimity with Latour – that sciences should be perceived as independent entities and unaffected by external factors, e.g. culture. Consequently, Foucault's analytical point of departure is that the man-made truisms of science and social institutions should not be perceived as the most desirable, enlightened or civilised outcome (Villadsen 2006). Thus, theoretically there is no contradiction between the two scholars' ideas. Instead – and since the theories demonstrate the possibility of the aforementioned inefficiencies and the human ability to question them² – the paramount question becomes how to identify, challenge, and hereby possibly exploit the inefficiencies of applied science and technology.

² Since Foucault and Latour are capable of demonstrating this aspect of society, evidently, it becomes possible to question these within the discursive limits.

The third and last axiom is founded on Jürgen Habermas' perception of civil society and is a somewhat more tangible approach to society and the entities it consists of. Accordingly, Habermas stresses that:

[...] civil society has an institutional core constituted by voluntary associations outside the sphere of the state and the economy. Such associations range from, for example, churches, cultural associations, sport clubs and debating societies to independent media, academies, groups of concerned citizens, grass-roots initiatives and organizations of gender, race and sexuality, all the way to occupational associations, political parties and labour unions (Habermas 1992: 453, cited in Flyvbjerg 1998).

In relation to the thesis, the central aspect of the above quotation is the emphasis on “an institutional core” that does not exist within either the state or the economy. Thus, the purpose of employing this notion as an axiom is to accentuate the necessity of expanding the scope of innovation theory to reach beyond the economy. Accordingly, our point of departure is that if society should be perceived and analysed through a broader scope than economy and state, then inevitably innovation should too.

As the attentive reader will have noticed, the similarities between the remarks by Habermas and institutional theory are significant. Institutional theory's (e.g. Selznick 1949, 1957; Meyer & Rowan 1977; DiMaggio & Powell 1983; Powell & DiMaggio 1991; Granovetter 1985) focus on “[...] institutionalization in organizational environments and their influence on organizational conformity to the environment” (Oliver 1991: 145) does, however, neglect aspects of society that the axioms of Latour and Foucault emphasise. For instance, when North states that institutional change “[...] is a deliberate process shaped by the perceptions of the actors about the consequences of their actions” (2001: 22), North does in no way consider the axiomatic aspects of human action as determined by discursive formations and (cognitive) limitations, as stressed by Foucault. Consequently, for the purpose of the thesis, institutional theory is perceived as too simple an approach to human action. However, as the inclusion of Habermas' remarks on society also illustrates, institutional theory is not rejected as an analytical perspective, but it is perceived as incomprehensive for the thesis' entire purpose. Accordingly, the scope of the analysis includes a wide range of aspects of society – similar to those of institutional theory – but these are analysed on the basis of, and extended by, the perspectives presented through the thesis' three axioms.

Evidently, the above remarks on institutional theory explicate the thesis' ambition to prolong economic theory by utilising a diagnosis of the contemporary based on economics, sociology/philosophy, and history. This diagnostic analytical perspective is employed in order to encompass the origin of specific innovations in a more comprehensive manner than innovation theory and – the inherently sociologically inspired – institutional theory can conduct.

1.2 Diagnosing Contemporary Society

Having presented the axioms, the focus of the present analytical framework returns to the question of how to diagnose contemporary in relation to specific innovations. As mentioned above, the diagnosis of the contemporaries in relation to innovations entails that the analytical framework extends the three axioms by utilising the three methodological pillars based on economic-, historic-, and sociologic/philosophic methodology. The three pillars are elaborated in the subsequent sections.

1.3 The Economic Pillar

As innovations and their origin are the thesis' main field of research, the thesis' point of departure is within innovation theory and economic theory from Joseph Schumpeter till now. Hence, the economic pillar is a review of innovation- and economic theory with the purpose of presenting how the basic properties of innovations are perceived within economics and to show how these properties are insufficient for analysing the origin of innovation, i.e. the purpose of the theoretical review is to portray the hitherto highest echelon of economic theory in regards to the origin of innovations. Then, what the review of economic theory will also show is that present economic theory does not contain the necessary analytical tools, methods or perspectives to analyse and describe the origin of innovations in a comprehensive manner. Consequently, the continuance of the economic review in relation to the thesis' reasoning is the remaining pillars of history and sociology/philosophy³.

1.3.1 The Inadequacies of Innovation Theory

It is a firm assertion in this thesis that in the existing economic literature, the origin of the phenomenon called innovation is portrayed quite elusively to say the least. Consequently, current prescriptions within economic theory on organisational processes that lead to the development of new products or services, optimisation of internal procedures, redesign of

³ Henceforth termed “the sociological pillar”.

collaborative and financial structures, i.e. innovations, seem unsatisfactory. Obviously, economic theory does not assume that innovations appear out of the blue, but academically, the origin of innovations is more or less a black-boxed function inside individuals or between predominantly economic entities. Accordingly, the challenges and opportunities, which concern current innovation theory, primarily prescribe how companies ought to facilitate these individuals and economic entities. Subsequently, it is the contention of this thesis that innovation theory, collectively, has black boxed the origin of innovation by referring to human creativity, genius or “surpluses of spiritual energy” as the origin of innovation. As proposed by our framework, however, this is an unsatisfying simplification, which unambitiously or inadvertently neglect a comprehensive analysis of the origin of innovation. Thus, the purpose of the thesis is to circumvent this black box by – in popular terms – lifting innovation out of the unperceivable psychology of the human mind and into the perceivable relations of society. To this aim, the following sections present an analytical recapitulation of economic theory on innovation, in order for us to illustrate that the origin of innovation is not adequately analysed, and that presently, innovation theory proposes insufficient tools to describe the origins of innovation, as compared to the theoretical framework presented in this thesis. Hence, an overarching aspiration in the sections below will be to rationally question the seemingly common assumption that innovation is the privilege of especially gifted individuals, or that innovation as such is a sporadic occurrence owing to psychological stimuli of speciously selected people, who react to indeterminate input.

The following argumentation for the above assertion regarding economic theory’s perspective on the origin of innovations is basically constructed as a funnel, which entails: 1) a macro perspective of economic theory that reviews the importance and function of innovations within a capitalistic economy; 2) a review of how specific economic theories examine and present the origin, facilitation and processing of innovations; and 3) an examination of the role of the individual/entrepreneur, which eventually reveals the inadequacies of innovation theory regarding the origin of innovations. In order to conduct the proposed economic review, economic- and innovation theories ranging from Austrian economist Joseph Schumpeter to innovation theorists of the 21st century are included.

1.3.2 Innovation through a Macro Perspective

In search of the defining characteristics of traditional innovation theory, we will initially employ and review the work of the aforementioned – and within innovation theory omnipresent – Joseph Schumpeter. To a large degree, the thesis supports the assertion proposed by Schumpeter, and therefore, Schumpeter’s conditional prescriptions on innovation

– as they are presented below – will concurrently be a fundamental part of the assertions of this thesis. Noticeably, however, significant differences in perspective will clearly be portrayed as critiques of Schumpeter’s ideas.

In the seminal work of Schumpeter, entrepreneurial activity is prescribed to be the most significant, progressive factor in societal economies. To Schumpeter, it was evident that entrepreneurial endeavours continuously drove economic change, as these endeavours implied the introduction of innovations – both products and services – to mass-consuming markets. Schumpeter’s basic assertion stems from a critique of the classical economic notion that an economic equilibrium is a prime condition in economies. Schumpeter argues that this type of economy is evolutionary stagnant, because a balanced relationship between supply and demand spells only relocation and mutual exchange, and that an economic actor operating in such a state is nothing but a conservative re-distributor of goods and capital (Schumpeter 1934, cf. Andersen 2004). Consequently, Schumpeter criticised the notion that the introduction of new innovations appeared to be exogenously infused in the classic theories, i.e. economic evolution was only noticeable taking place due to abnormal, uncontrollable, or inexplicable occurrences such as wars, catastrophes, changes in demographics, elaborate macro-economic governance structures, etc. To Schumpeter, however, it seemed obvious that the economy *de facto* produced its own evolutionary conditions by the recurrent and endogenously occurring phenomenon known as innovation (ibid.). Thus, to explain the dynamisms of socio-economic evolution, Schumpeter asserted that the introduction of innovations was – and continuously must be – imperative to change. Concurrently, change continuously occurs because the motivation to innovate is inherent in a capitalistic economy, i.e. inherent in the incentive to create surpluses of revenues from entrepreneurial endeavours. Therefore, as markets, industries, and companies proclaim to be driven by myriads of divergent goals, which are manifested in myriads of divergent products and services, they nonetheless share the indisputably common goal of wanting to maximise their profit, and thus, economies evolve on the basis of a capitalistically fuelled incentive to gain revenue by renewing the settings of given industries.

1.3.3 Creative Destruction and Macro Dynamics

In Schumpeter’s terms, it is entrepreneurs’ ability to radically and innovatively reconfigure “the known” that makes them the masters of the “perennial gale of creative destruction” (Schumpeter 1975:84). Academically, “Creative Destruction” has become Schumpeter’s trademark, and it is the theoretical embodiment of the process whereby new products and processes displace old ones in order for evolution to unfold. In Schumpeter’s own words, it is

a process of industrial mutation "[...] that incessantly revolutionizes the economic structure *from within*, incessantly destroying the old one, incessantly creating a new one. This process of creative destruction is the essential fact about capitalism" (ibid.: 83). As a consequence of Schumpeter's view on the endogenously self-propelling economy, it should be duly noted here that Schumpeter perceives economic change in innovations to originate from within the economic system. Thus, we wish to expand Schumpeter's conclusions, as we disagree with the Schumpeterian assertion that "[...] the really *relevant problem* is not 'how capitalism administers existing structures', but 'how it creates and destroys them'" (Elliot 2007:19). Rather – as we shall later clarify – we believe that in order to conduct a valuable analysis of innovations, one must indiscriminately go beyond the domain of economics, which to a large extent is contrary to the methodology of Schumpeter. The Schumpeterian model, however, perceives successfully introduced innovations as internal "initiating impulses" (Schumpeter 1927), which disturbs the existing order of economies – the equilibrium, as it were. Although Schumpeter – and many authors following his theory – have analysed the evolutionary characteristics of various disruptive innovations, the description of each individual evolutionary trade seems arbitrary as compared to the expanded scope of the present thesis. Thus, as we perceive the initiating impulses to originate elsewhere than inside the economic sphere, it becomes irrelevant for the present argumentation to clarify these exact properties of innovations. Nonetheless, we must for the sake of our argumentation respectfully acknowledge that the Schumpeterian notion of economic evolution – and of individual innovations – is inherently cyclic. This acknowledgement owes to the fact that Schumpeter argues that the cyclically evolving waves are "[...] the reference unit of concern and reflection of the economic actors; every wave has its own life" (Peukert 2002:82). What is revealed here is that although the cyclical waves are uniquely developing due to the potentially irrational decisions made by economic actors, they nonetheless seem to influence the next evolutionary wave, i.e. the succeeding innovations. For that reason, innovations are connected throughout time by virtue of the economic actors' reflections on innovative endeavours and records of such reflections, and thus all innovations have retained a archaeology.

To further clarify the purpose of the present thesis, we must, firstly extend a point of criticism towards Schumpeter's notion that the evolutionary conditions of economies are endogenously created. As elaborated in the thesis' third axiom based on the work of Habermas, it is our contention that the economic sphere – if at all possessing any solid borders – continuously becomes permeated and/or permeates other societal spheres, such as

politics, science, art etc. Schumpeter would probably agree to our segregation of diverging societal spheres, as he states “A fact is never exclusively or purely economic; other – and often more important – aspects always exist” (Schumpeter 1934:3). However, with capitalism as the foundation of all innovation, Schumpeter asserts that “Everyone must, at least in part, act economically; everyone must either be an ‘economic subject’ [...] or be dependent upon one” (ibid.). Compared to the third axiom, the key learning here is that the economy – as Schumpeter also states – does not have other needs than increased profits. Logically, then, human needs besides the need for increased profits cannot emerge solely from within the economy, but must necessarily emerge from a combination of the spheres constituting civil society as argued by Habermas and the third axiom. Thus, in order to attain the aforementioned foresight through keen analysis, one must exceed the Schumpeterian model and regard all societal spheres as somewhat equal in influencing innovators, and not – as Schumpeter did – assert the economic sphere to be unconditionally superior to the point that economies are self-sufficient in terms of creating its own conditions for evolution.

With the above as one of our theoretical prerequisites for understanding the origin of innovations, the questions to be answered in this thesis revolve around the origin of innovation as existing “out there”; as spawned in the cross-permeation and active relations taking place between societal spheres. More precisely, however, this becomes a question of whether innovation is in “the eyes of the beholder”, i.e. what active relations in an innovation process illuminate the most viable solutions to the innovator, and thus, it is the ambition of this thesis to define what societal forces *de facto* govern the beholder’s eyes and how this “lens” can be managed to enhance corporate proliferation of innovative potential.

For holistic analytical purposes, however, the following section will firstly review some of the more acclaimed economic and organisational theorists, who – we argue - consecutively have subscribed to Schumpeter’s theory and assertions on the properties of innovation.

1.3.4 Following Schumpeter

At its most basic level, later innovation theory is predominantly focused on classifying innovations, its characteristics, its evolution, and lastly its cultivation (Henderson & Clark 1990; Utterback & Abernathy 1975; Kline & Rosenberg 1986; Metcalfe & Gibbons 1989; Tushman & Anderson 1990; Klepper 1997; Leonard-Barton 1992; Rogers 2003; McGahan 2004; Christensen et al. 2004). The common denominator for all these theories is that they described the conditions for innovation as exogenous to a company. To specify, according to the above scholars the spark that ignites the flame of innovation stems from basically

uncontrollable circumstances in a firm's environment, i.e. enigmatically evolving consumer needs and technological breakthroughs made by the scientific sphere. Although the conditions for innovating occur exogenously to companies, this point does not conflict with Schumpeter's, as he – on a different analytical level – asserted that innovations stemmed from circumstances owing to a conditional ideology in the overarching economic scheme of society, i.e. capitalism as transcending all societal spheres. Thus, on a more operational level, recent theories on innovation prescribe that companies must organise internally in order to appreciate, handle, and exploit circumstances, which are external to them:

The firms which will come to dominate in a particular sector of the market in the long run, we hypothesize, will be those whose organization is most flexible in the sense that their flexibility allows for a continuous stream of adjustments to the fundamental blueprint as competitive and environmental pressures demand (Metcalf & Gibbons 1989:172).

Accordingly, the above literary base amounts to diverging classifications of innovations, such as “incremental innovation”, “modular”/”innovation of substitutions”, “architectural”/”market innovation”, “radical”/”basic innovation” (Summation of Abernathy & Clark 1985 and Hendersen & Clark 1990). These classifications of innovation concern the actual design properties of the innovation and/or their potential to affect a given market, i.e. how incremental or radical the innovation is compared to existing products and services; what industries can be classified according to the type of innovation, which most frequently occurs (McGahan 2004); or how different organisational constellations foster different attitudes towards innovation (Leonard-Barton 1992; Christensen 2004).

Evidently, the focal point of these theories is relatively far from the origin of the innovation, as they all – albeit they are based on diverging theories – seem to focus on how already realised invention and innovations affect companies and industries, and not by what effect companies and industries can realise innovation. Consequently, innovation in these theories seems taken for granted, i.e. innovations are simply there at some point in time, which has led some of the innovation theorists that succeeded Schumpeter to focus of classifying the evolutionary periods and trades of realised innovation. However, neither “the fluid phase”/”the era of ferment”, “the specific phase with the emergence of a dominant design”, “the era of incremental change”, nor “the point of (technological) Discontinuity” (summation of Utterback & Abernathy 1975 and Tushman & Anderson 1990) seem to reveal

anything about the actual origins of innovation, but rather these theories presume that innovation simply occurs due to undetermined, fortunate opportunities and the enterprising spirit of man. Thus, innovation theory is seemingly prescriptions on the cultivation and preservation of the internal organisational capabilities of companies, which theoretically can ease the proliferation, i.e. identification of, organisation for, and learning from innovation whenever it suddenly emerges; or even more basically, the theories are concrete tools with the same proliferating aim (March 1988; Argyris et al. 1996; Levitt et al. 1996; Nonaka & Takeuchi et al. 1996; Weick et al. 1996; Amabile 1998; van de Ven et al. 1999; Brown & Duguid 2000; Busby 2001; Cusomano 2001; Carlile 2002; Cooper et al. 2002; Winch 2002; Atkinson et al. 2006). To exemplify and review this particular literary base, an overall theme in innovation literature relates to management issues of how knowledge and technologies are transferred in to and exploited inside companies; the main assertion being that there are differences in the availability and compatibility of capabilities and technologies that possess an innovative potential for the company. Accordingly, this theoretical body focuses on the different sourcing patterns between firms and between technologies, however these theories state nothing on the origin of the needs for these capabilities and technologies to be combined and reconfigured into new innovations; except when acknowledging that innovation is desirable, this effectively juxtapose innovation and progress, which we have questioned with Latour and the second axiom. In other words, the need for innovation is taken for granted, and subsequently, the technological opportunities for innovation seem to emerge arbitrarily (Klevorick et al. 1995; Reger & Schmoch 1996; Tidd & Pavitt 2001, 2005; Fleming & Sorenson 2004) To clarify, this literature depicts the search for innovation opportunities as a puzzle, where the company's existing capabilities either enables innovation, or adaptively, the company must be changed for innovation to be realised.

Alternatively – and related to the latter overall theme mentioned above – companies can strive to manage the competencies, which practically entails alterations of the technologies that possess innovation potential, i.e. their work force and potential collaborative partners. On the subject of collaborating one's way to innovation, several authors suggest that innovation is a matter of identifying the most competent individuals as compared to the properties of the innovation at hand – and not necessarily to the company itself. Thus, it is asserted that protective schemes might prove inhibiting to the company and that progressions in the innovation processes of companies come by way of being open to knowledgeable collaborators, by cultivating dynamic capabilities, and by timely protection of certain elements of the companies competencies for the sake of securing the company's position in a

given market (von Hippel 1988, 1994, 2005; Barney 1991; Teece, Pisano & Shuen 1997; Dyer & Singh 1998; Christensen et al. 2000; Pisano & Verganti 2005; Chesbrough 2006; Chesbrough & Appleyard 2007; Harryson 2008). Collectively, this body of innovation literature seems to subscribe to the following notion: “Innovations are not initiated on the spur of the moment, by a single dramatic incident, or by a single entrepreneur” (van de Ven et al., 1999), and so far we agree, but as the authors continue: “In most cases, there was an extended gestation period lasting several years in which seemingly coincidental events occurred that preceded and set the for stage the initiation of innovation”, they do not conclude on this obvious assertion that innovation originates from “seemingly coincidental events”. Rather, these authors – and many like them – reserve the identification of such events to be a practical matter best left in the hands of the individual manager in a given company. Logically, the above assertions are defensible, but due to the importance of innovations as a key propelling force for both individual companies and the economies in general (cf. the Schumpeterian macro perspective on innovation), we highlight these assertions as pivotal points of criticism. Following the prescriptions on securing maximum proliferation, some authors completely ignore the origin of innovation as they quite narrowly assert that innovation management is a matter of pre-empting the protective structures available to the company in order for it to secure the largest possible return of an innovation (Boisot 1998; Shapiro et al. 1999; Cohen, Nelson & Walsh 2000). In other instances, the prescriptions revolve around the cultivation of the company’s workforce and competencies, i.e. what social and economic dimensions require management to comprehend and exploit innovation (Griffith & Boisot 2000; Arora et al. 2001). What the reviewed literature amounts to is theoretical assertions on innovation’s evolutionary properties as they apply to and influence the co-development of technologies, firms and industries, but these analyses of innovation processes presume that innovation is readily available for management and that business professionals – if managed appropriately – are readily capable of handling an innovation process.

1.3.5 Where Do Innovations Originate: Certainties and Black Boxes in

Economics

On a general note, economic activity is clearly a human undertaking, and thus, innovation and entrepreneurship naturally implies human actors. Schumpeter had a very elitist and hierarchical understanding of the roles of various economic actors, and this combined with the economic assertions highlighted above, makes Schumpeter bestow “the Entrepreneur“

with the highest rank of economic importance. Thus, Schumpeter's model asserts that a special breed of economic actors is responsible for the introduction of new innovations:

[...] recurring "Innovation" propels the economy, which exists in a state of constant tumult [cf. the discontinuously evolving cycles outlined above, eds.]. The "New Men", or "Entrepreneurs", operating within "New Firms", drive innovation. All companies react "adaptively" to change, but creative "responses" come only from innovative acts by Entrepreneurs (McCraw, 2006:239).

When viewing Schumpeter's authorship in its entirety, it does not seem to matter whether the entrepreneur is the employer or the employee. Accordingly, it is the contention of the thesis that the function of the entrepreneur need not even be embodied in a single identifiable person, but can in fact be a collection of individuals who jointly performs the innovative function. Thus, the aforementioned New Men and New Firms are quite illusive economic entities, but notwithstanding, we logically assert that it is always human actors who innovate, and as such the origin of an innovation can never be ascribed to any other economic entity than the human mind. To clarify, the human mind is best regarded as a prioritising instrument, which enables innovators to filtrate inputs that lead to the realisation of innovations; and – we contend – the ability to make such prioritisations is a skill that almost all economic actors can acquire. Additionally, to learn such skills seems naturally attractive, simply because economic actors – in Schumpeterian terms – inescapably feel compelled by innovation, because of the capitalistic "entrepreneurial profit" that is a necessary and inevitable companion of any entrepreneur (ibid.).

1.3.5.1 The Trifle of Organisational Settings and Size

In Schumpeter's earlier work, the entrepreneur was described as possessing unique, personal characteristics that supposedly opened more possibilities to him than to his non-entrepreneurial peers, and thus, it was initially conceived that solitary entrepreneurs realised innovations and thereby drove the evolution of the capitalistic system. Accordingly, socio-economic evolution seemed dependent on "[...] an elite of economic actors, who cannot settle down in the continuous repetitive cycles of the economies. If they [the elitist actors, eds.] possess an adequate surplus of spiritual energy, they may try to realise some of the infinite reconfigurations, which in principle always can be instated into the economic system" (Andersen, 2004:33 – own translation). One last aspect, which characterises the

Schumpeterian entrepreneur, is his willingness to take risk. Whether the entrepreneur is self-employment or not, Schumpeter believed him to be somewhat elevated above the nuisance of risk calculations: “Risk bearing is no part of the entrepreneurial function. It is the capitalist who bears the risk. The entrepreneur does so only to the extent to which . . . he is also capitalist, but qua entrepreneur he loses other people’s money” (McCraw 2006:240). This further solidifies the Schumpeter’s notion of an elitist, solitary, and capable entrepreneur.

Later, however, Schumpeter modified this assertion as he realised that the innovation-induced re-organisation of markets practically gave rise to big corporations, i.e. as markets were driven towards a balanced equilibrium following the introduction of innovation(s), various shakeouts and mergers were effectively performed, which accordingly led to the formation of big corporation. In short, Schumpeter emphasized that big companies – with their proportionately advantageous resources – were the absolute optimum facilitators for entrepreneurs to commercialize new inventions or reconfigurations of existing products and services. Respectively, the two assertion depicted here are commonly known as accordingly Schumpeter Mark I and Mark II.

As emphasised in numerous occasions above, scholars and researchers constantly analyse and conclude on the importance of the individual entrepreneurs in regards to innovations. Accordingly, Schumpeter’s Mark I and the subsequent theoretical developments and additions remain relevant to contemporary innovation theory. Contrarily to Mark I, innovation scholars have continued to challenge the notions of Schumpeter’s Mark II, as big companies or incumbent firms appear to be permeated by organisational inertia, myopia are generally perceived as reactionary in their attitude towards innovation (Chesbrough 2001). For instance, Chesbrough presents studies by Cooper & Schendel (1975), Foster (1986) and Utterback (1994) emphasising the incumbent firms’ general inclination to rely on older technologies and the exploitation of these, whereby incumbents come to overlook “[...] the greater long term potential of newer, more radical approaches in technology” (Chesbrough 2001:10). Hence, within contemporary innovation theory incumbent firms are generally not perceived as being innovative. Instead, scholars have turned their focus to the aforementioned individual entrepreneurs and the innovativeness of small and medium enterprises (SMEs). Accordingly, the conviction that SMEs are immensely innovative has contributed to a wide range of research, which argue that innovations primarily originate from capabilities within SMEs that eventually threatens the market position of incumbent firms (Christensen 1997; Christensen et al. 2000; Christensen et al. 2003; Christensen et al. 2004). Although we acknowledge the above theoretical contributions, we employ a different focus that strives to

uncover what innovation effectively originates from, rather than what organisational settings are most efficient for anticipating innovation. Accordingly, the origin of innovations and hereby innovation opportunities exist independently of organisational constellations, but innovations are always an act of economic individuals; and companies – independent of their size – are always only conditional actors influencing the innovation⁴. Thus, we try to evade the general focus of innovation theorists who – regardless of which organisational level they observe – incessantly refrain from clarifying the sources of individual innovations, except when succumbing to explanations of “special individuals”. Similarly, as Schumpeter continuously seems to fall short in explaining what influences entrepreneurs to innovate, we contend that the aforementioned “surplus of spiritual energy” is the closest that classic theory ever came to classifying the true origin of an innovations. Although Schumpeter and other scholars prescribes nationality, culture, or psychological factors to be decisive elements in the skill set of an entrepreneur, these trades nonetheless remain subconscious and subliminally influencing the decisions to innovate. Therefore, these elements practically inaccessible in the daily life of the entrepreneur, and for this particular reason, they are not beneficial neither for the theoretical evaluation of the origin of innovations, nor for practical, everyday matters on this particular subject. Consequently, Schumpeter’s readers are left with an impression of the entrepreneur as an economic actor, who seems divinely (and inexplicably) blessed with favourably foresight and courage. Ultimately then, the portrait of the Schumpeterian entrepreneur has similarities with the Kantian genius (Kant 2005[1790]) and the 18th century controversies on the nature of artists, which in the 21st century appears undesirable in regards to expanding our understanding of the origin of innovations.

The subsequent sections emphasise the abovementioned shift in focus, while simultaneously elaborating on where the thesis theoretically contends innovations originate.

1.3.6 Circumventing The Black Box of Innovation Theory

As logically argued and concluded in the previous sections on innovation theory, the initiation of innovation or initiative to innovativeness must necessarily begin with human action. Again, it is imperative to understand that this deducted conclusion does, however, not imply that innovations originate from within the human mind *per se*, i.e. are down to human creativity, “a surplus of spiritual energy”, “the genius of human kind” etc. Rather, the human mind is an

⁴ The contention is not that organisational settings are irrelevant, i.e. organisational myopia, inertia etc. are acknowledged as significant challenges to innovativeness, but as the primary research object is the origin of innovation, organisational settings and circumstances are analytically irrelevant to the thesis’ analyses.

instrument enabling prioritisation of inputs to the mind of the innovator. Accordingly, the succeeding sections contend that to reveal the origin of innovations, it is imperative to expand the analytical focus beyond the human mind and into the sphere of civil society.

Before we elaborate upon and characterise society, we will firstly expand on the innovative individuals residing in it. Accordingly, and throughout the review of innovation theory, the line of reasoning has not explicitly distinguished between entrepreneur and inventor. However, as the review reaches what we – perhaps a bit pretentious – termed “the highest echelon of economic theory” regarding the origin of innovation, this distinction has become relevant. The classic definition of entrepreneurship – e.g. as advocated by Schumpeter – focusing on the entrepreneur’s personality, and what he or she does, needs to be perceived as more nuanced or complex than a matter revolving around the entrepreneur (Shane & Venkataraman 2000; Burton et al. 2002). Likewise, innovations are generally defined as the commercialisation of an idea, e.g. an invention or a reconfiguration (Schilling 2008), which logically entails that the inventor and the entrepreneur are not necessarily the same person. Hence, the thesis subscribes to Shane & Venkataraman’s perception of entrepreneurship as involving “[...] the nexus of two phenomena: the presence of lucrative opportunities and the presence of enterprising individuals” (2000:218). This division between opportunity and enterprising individuals entails that opportunities and individuals exist independently of each other, and that – as a consequence of this independence – innovations do not originate within the human mind *per se*. Thus, even though ideas/inventions/reconfigurations obviously are commercialised by humans/entrepreneurs, the opportunity itself must logically reside in the sphere of civil society. For instance, if Thomas Edison had not introduced and commercialised the fluorescent light bulb, another enterprising individual would probably have exploited the opportunity in some way or another. In accordance to the thesis’ second axiom, the contention eventually becomes that these opportunities do not have one “true” solution, but that these opportunities are readily exploitable by whoever first pursues them in a manner that persuades and dominates the market, i.e. has the best execution. Consequently, we contend that innovation theory should be less focused on specific individuals and instead broaden its focus to the sphere of civil society, as the social – in contrast to the psychological – is possible to observe and therefore to analyse and exploit. This ontological relocation is additionally emphasised by two aspects examined below:

Firstly, a brief examination of contemporary literature on human creativity and innovation exemplifies that the conviction that creativity and innovation emerge from within

the human mind is, if not deceptive then at least incomprehensible (Larsen 2008). Similarly, the Hungarian psychologist and leading scholar within the subject of creativity, Mihaly Csikszentmihalyi (born 1934), argues that creativity arises “[...] from the synergy of many sources and not just from the mind of the single person” (1996:1), and “[...] in the interaction between a person’s thought and sociocultural context. It is a systemic rather than individual phenomenon” (ibid.:23). It is beyond the scope of the thesis to examine a wide array of psychological literature, but the above interdependence between the sociocultural context and the human mind underpins the significance of moving the primary focus regarding the origin of innovation from the human mind to the social sphere. Our contention is not that the human mind and how enterprising individuals commercialise innovation opportunities in general should be neglected by scholars, but merely that to analyse the origin of innovations the focus should be on factors primarily residing outside the human mind. Thus, individuals willing to pursue an opportunity are obviously significant to the initiation of the innovation process, but the opportunity exists prior to and independently of the initiation and hereby regardless of the initiating individual. Consequently, as the thesis subscribes to the latter convictions, the ontological focus of the analysis is deliberately limited to examining and gaining an understanding of how innovation opportunities exist and emerge in the social sphere, and not to provide further analysis of enterprising individuals.

Secondly, the ontological relocation and analytical isolation of innovation opportunities to the social sphere entails that the analysis starts where the thesis’ economic review ended. By these means, the analysis occupies a privileged analytical point of departure as it is founded on the accumulated knowledge on innovations within innovation- and economic theory, while pertaining the opportunity to broaden the analytical scope in order to improve the premise for locating and understanding the origin of innovation. Additionally, the relocation takes us closer to the origin of innovation, as we avoid the previously mentioned pitfalls of innovation theory, i.e. the blind alley of the human mind and creativity, and hereby, we circumvent the black box of innovation theory. However, the relocation of the origin of innovation from the economic system and the human mind to the sphere of civil society likewise entails that the thesis’ research design is broadened beyond economics with the thesis’ two other pillars.

1.4 Historical Pillar: The Importance of History

In sustaining the present framework, the following section will feature methodological reflections supporting and validating – not only the subsequent empirical studies – but also

pinpoint the methodological strengths of the present thesis, and show how it coincides with and exceeds the theoretical novelty of other frameworks on innovation.

Presently, innovation theorists support their assertions by elaborate case studies portraying each significant outcome of given business decisions. Or as Supple (1991) describes the methodological approach of Alfred D. Chandler, whose significant contribution to economic theory is the development of evolutionary analysis of firms' capabilities and assets, i.e. corporate strengths and weaknesses: "His interests are empirical and evolutionary; his purpose has been to examine the precise ways in which, large-scale enterprises evolved and operated. As a result, [...] his hypotheses [...] pay far more attention to the mechanics of institutional *evolution*, and the empirical rationale for systemic conclusions" (Supple 1991:503). As initially argued, it is essential to the understanding of this thesis that the institutional view is exceeded, and hence, we argue that the traditional methodological approach highlighted here is preoccupied with what immediately constitutes a limited set of institutional conditions for organisational assets and capabilities – hereby also skills for innovation. Our contention is, however, that the systemic approaches of present theory are far too narrow and as such does not adequately explain the origin of innovations due to a myopic perception of what factors might influence the needs for innovation.

Following the traditional empirically focused methodology, authors such as Utterback (1994) show how the so-called QWERTY-keyboard emerged as an industry standard for producers of typewriters and computers. Similarly, Cusumano et al. (1991) show how the VHS-standard produced by JVC conquered the market for VCRs over the supposedly superior technology of Betamax produced by the superior company, Sony. As it is customary, these two studies employ an empirical methodology that verify or reveal what theoretically and meaningfully can be asserted about the properties of an innovation after its realisation. Although, the two above examples predominantly concern the industrial settings surrounding an innovation, others have employed similar methodologies and focal points but opted to theorise on the innovative ingenuity of the individual entrepreneur or firm, or to show the lineage of given technologies unfold between economic actors (von Hippel 1988, 2005; Hienerth & Poetz (2005); Chandler 1992; Utterback 1994; Granovetter & McGuire 1998; Tidd et al. 2001, 2005).

It is crucial to note that what we focus on here is the empirical foundations employed by these theorists and not on their theoretical conclusions and frameworks. Thus, what is common for the vast majorities of innovation studies cited in this thesis is that they all – quite naturally – support their conclusion retrospectively, and in doing so, they focus on very

concrete case studies of already realised innovations. This common methodology is pivotal to understanding how the present thesis differentiates from existing writings on innovation dynamics. By acknowledging the value of the theoretical approaches mentioned above, we argue that the analytical gaze of traditional innovation theory is concentrated at and preoccupied with such properties of innovation that it in fact limits – or even decreases – the ability of these theories’ to serve as an analytical tool for corporate managers.

As previously stated, it is an assertion in this thesis that traditional innovation theory takes the occurrence of the observed innovations for granted to an extent where the dynamics and properties of the innovations – whether these be technological, organisational, or industrial – seem to emerge arbitrarily. Rightfully, many theories do seek to combine multiple scientific disciplines in their analytical frameworks, but all but a few of these approaches fall short in terms of encompassing what we would term a sufficient analysis of the innovation’s lineage or to account for the conditions which enable or make necessary the realisation of a given innovation. With the existing approaches, however, we yet again see a correlation between the generally employed methodology and the theoretical ambition of Schumpeter, who sought to develop what he called an “exact economics”. This term entails the creation of “[...] a hard science like physics, with determinate predictive power. [Schumpeter, eds.] believed that he could reconcile stripped-down mathematical models of abstract theory with the full record of historical and sociological evidence” (McCraw 2007:5). Methodologically, Schumpeter was going against the prevailing academic tide of his time as he aimed at constructing grand social theory that would encompass his observation that

“[...] any economic inquiry which goes beyond mere ‘technique in the most restricted sense of the word has such an institutional introduction that belongs to sociology rather than to economic history as such’ and that, consequently, economic sociology must be introduced as a ‘fourth fundamental field to complement’ economic history, statistics, and theory, even though this necessitates going beyond the “mere economic analysis” embodied in these three” (Elliott 1993:16)

For all intents and purposes, we concur with this assertion, as Schumpeter perceives all who do not appreciate the above to be “dilettantes”. Therefore, he and many others have taken up the practice of sociology as an indispensable means of escaping the strictures of other fields. Nevertheless, Schumpeter’s inclinations to insert a distinct hierarchy among the elements of

his theory, also makes him retain economics at the centre of his thinking, although, “[...] history, sociology, and psychology would claim their own spaces as well” (McCraw 2007:156). Thus, dodging the bullet of being labelled methodological and analytical dilettantes, but without residing a position to deem others as intellectually callous, we assert that economics are not unconditionally more important than other academic disciplines or other societal spheres. And from this holistic approach, we strive to expand and specify the methodological scope of both Schumpeter and the majority of his followers.

In support of this proclaimed approach, we further argue that although Granovetter and McGuire (1998) state that a substantial sociology of industry might be a persuasive explanation of how people and organisations form and co-operate in such a way as to produce those goods and services that consumers demand, they nevertheless do not empirically investigate why or how the consumers demand what they do, i.e. the constituting elements of the innovations lineage. Simultaneously, and although they conclude that their historical analysis allows for the identification of industries whose outcomes are attributed to other factors than economic and technical rationality, individual achievement and omniscience, we retain our argument that the emergence and origin of innovations are phenomena which are largely taken for granted, and that the self-inflicted limits of others theorists’ empirical work weakens their argumentative power. However, in clarification of their conclusion on the emergence of the market for electricity in the United States, Granovetter & McGuire (1998) does in fact, semantically, pinpoint something very similar to the underlying logic of the methodology employed in this thesis: “When the case is carefully examined within its historical context, all these [the factors leading to the formation of industries, eds.] may turn out to be socially constructed by the mobilization of resources and influence through social networks. Industries are constantly re-negotiated, re-framed, and re-mobilized in response to their environment” (ibid.:167).

In agreement of this quote, our methodology combines specific case-based historical analyses, which focuses firstly on the prerequisites for the realisation of given innovations, and secondly, on the actual properties of innovations as presumably (pre)determined by the needs of society. In essence, then, the present section serves to explicate the thesis’ perception of a historical pillar as a methodological prerequisite for conducting substantial analyses of the origin of innovations. However, the thesis’ incessant ambition to exceed existing economic frameworks – hereby also their methodologies – necessitates unbiased inclusion of other social sciences, which consequently is the subject of the following section.

1.5 Sociological Pillar

In continuation of the previous elaboration of respectively the economic- and historic pillar, the subsequent sections examine and present the sociological pillar, whose main purpose is to expand the thesis' analytical scope beyond the classic perspectives employed by economists and historians. Hence, the forthcoming sections of presentation, elaboration and reflection upon sociological and periodically philosophical theory are the thesis' methodological concretisation of the aforementioned expansion of the analytical scope. In order to develop and concretise the thesis' sociologically inspired research design, the sociological pillar emphasises, utilises and refers to the thesis' three axioms, while introducing the work and method of Michel Foucault's archaeology of knowledge.

The paramount theoretical development of the present thesis is the application of Foucault's archaeology of knowledge and the enclosed discourse analysis to the field of innovation. Accordingly, the subsequent presentation and hereby also the inclusion and/or exclusion of aspects, terminology etc. of Foucault's theories and methodology is aligned with the overall purpose of the thesis, i.e. how can we analytically and methodologically come closer to the origin of innovation through empirical research.

The point of departure for the application of Foucault's discourse analysis to the analytical identification of the origin of innovation is an iteration of the thesis' first axiom regarding the restrictions on human cognition. Within this axiom, Foucault contends that it is a precondition to all aspects of society – which logically must include new inventions, innovations and eventually the origin of innovation – that human cognition, speech, action etc. are subject to restrictions that transcend the individual's cognitive capabilities, i.e. humans are restricted and cannot surpass the restrictions⁵. This precondition entails that some sort of restrictions necessarily must determine innovation, and that the total range of new innovations is limited in accordance to the opportunities left possible by the specific restrictions. As a consequence, the question of what is restricting human cognition, speech etc. emerges and becomes pivotal to approaching the field of innovation. Foucault's initial answer to this question is at a glance quite simple: discourses and knowledge (e.g. Foucault 1972, 2005; Nilsson 2009). The apparent simplicity of “discourse” and “knowledge” is,

⁵ Foucault stresses this contention through immense reflections upon the significance of language to human cognition. As the purpose of the present thesis is to utilise Foucault's discourse analysis in relation to innovation, and not to conduct a critical review of Foucault's understanding of language, further analysis of Foucault's reasoning is too peripheral to the thesis to justify an inclusion.

however, swiftly overturned by the complexity Foucault ascribes to the two interrelated concepts, which eventually become the thesis' primary analytical contribution in regards to the origin of innovation, i.e. discourses and the creation of knowledge comprise our theoretical addition to the economic analysis of innovations and their origin. Accordingly, the subsequent sections of the sociological pillar focus on what characterises discourses and knowledge, how human cognition and action are restricted, and how discourse and knowledge influence innovation and invention.

1.5.1 Discourse and Knowledge

Before elaborating on the relationship between discourses and knowledge, a few basic notions of Foucault's work should be laid down. Basically, Foucault's work revolves around a trinity of discourse, knowledge and power (Nilsson 2009; Lindgren 2005). However, the present thesis selectively refrains from engaging in analyses that revolve around the concept of power, which intuitively entails implications for our contention regarding restrictions to innovations. Thus, the present thesis excludes the more sophisticated aspects of Foucault's analysis of power, as an examination of these aspects would be well beyond the scope of the thesis. For instance, biopolitics and biopower (e.g. Foucault 2008, 2009) are pivotal to Foucault's notion of power, but appear irrelevant to the present thesis, as these concepts primarily concern various suggestive powers that – primarily scientific – knowledge performs. Instead, our focus is on the emphasis that Foucault puts on exclusions, restrictions and limitations inferred by discourses and knowledge (Nilsson 2009). Thus, the present thesis' perception of power corresponds with Foucault's understanding of power, but it is pivotal to emphasise that our academic intention is not to engage in thorough analysis of these power relations, which is in contrast to the extensive analysis of genealogy of the late Foucault (Foucault 2002, 2008; Nilsson 2009). Merely, we want to adopt the conclusions of Foucault's analyses of power in modern society, and simply acknowledge and presume that discourses and knowledge determines human cognition and action. Thus, the thesis intends to analyse and examine how discourses and knowledge limit innovations within a simplified perception of power, as an elaborate notion of power would enhance the complexity the thesis' analysis or conclusions without any higher purpose.

1.5.1.1 The Foucaultian Discourse

Generally, Foucault does seldom define his theoretical concepts explicitly (Nilsson 2009). Instead, Foucault often describes his concepts through analysis and what the concepts are not. Foucault does, however, approach a definition of discourses in *L'Archéologie du savoir* (1969, eng. *The Archaeology of Knowledge*, 1972), where Foucault refers to his doctoral

dissertation, *Histoire de la folie à l'âge classique - Folie et déraison* (1961, Eng. *The History of Madness*, 2006), and argues

The unity of discourses on madness would not be based upon the existence of the object 'madness', or the constitution of a single horizon of objectivity; it would be the interplay of the rules that make possible the appearance of objects during a given period of time: objects that are shaped by measures of discrimination and repression, objects that are differentiated in daily practice, in law, in religious casuistry, objects that are manifested in pathological descriptions, objects that are circumscribed by medical codes, practices, treatment, and care. Moreover the unity of discourses on madness would be the interplay of the rules that define the transformations produced in them, the internal discontinuity that suspends their permanence (1972:32-33).

Omitting "all the madness", it becomes apparent that within Foucault's framework, a discourse consists of chains of objects or statements, institutionalised practices and historically and culturally given rules that control the content and form of any conversation (Lindgren 2005). Additionally, it is pivotal to notice Foucault's emphasis on the lack of objectivity within a discourse. Hence, whenever an object emerges within a discursive setting, it is not because it is an objectively "correct" outcome, but merely because the discourse "allows" it. Foucault elaborates:

[...] the object does not await in limbo the order that will free it and enable it to become embodied in a visible and prolix objectivity; it does not pre-exist itself, held back by some obstacle at the first edges of light. It exists under the positive conditions of a complex group of relations. [...] These relations are established between institutions, economic and social processes, behavioural patterns, systems of norms, techniques, types of classification, modes of characterization; and these relations are not present in the object; they do not indicate the web, the immanent rationality, that ideal nervure that reappears totally or in part when one conceives of the object in the truth of its concept. They do not define its internal constitution, but what enables it to appear, to juxtapose itself with

other objects, to situate itself in relation to them, to define its difference, its irreducibility, and even perhaps its heterogeneity, in short, to be placed in a field of exteriority” (Foucault 1972:45).

The above proposition by Foucault is crucial to the present thesis’ application of discourse analysis to the field of innovation. Accordingly, the above summarises the main theoretical argument of the thesis, which entails that in order for us to comprehensively analyse and understand the origin of innovation, the discursive perspectives presented by Foucault must indisputably be included and constitute a significant part of an innovation analysis.

Methodologically, the inclusion of Foucault’s framework entails that the analysis of the origin of innovations conducts a “Foucaultian” discourse analysis and expands its focus to include – among other things – “institutions, economic and social processes, behavioural patterns, systems of norms, techniques, types of classification, modes of characterization”, as argued by Foucault – a perspective which eventually also correspond to the thesis third axiom.

Concordantly, the thesis’ first axiom is pivotal in explicating this causality between discourses and innovations, as this axiom points to the fact that discourses determine what can be said and consequently what can be thought. Accordingly, the correlation between the first axiom and the discourse analysis of Foucault entails that innovations and inventions are determined by discursive circumstances, and not the unbiased facts and breakthroughs of science and scientific knowledge, whose impossibility we also explicated with the second axiom. To consolidate this aspect of invention and innovation, the subsequent sections focus on the relation between discourses and knowledge.

1.5.1.2 The Questionable Blessing of Knowledge

A precondition for demonstrating the interdependence between discourse and knowledge is to distinguish between what Foucault terms respectively *connaissance* (scientific knowledge) and *savoir* (knowledge in the broadest sense of the concept) (Foucault 1972). These two distinct yet interrelated terms encompass virtually every aspect of human knowledge and thus, the terms effectively constitute the cognitive boundaries of humans. Within Foucault’s framework *connaissance* comprises the formalised and rule-governed knowledge developed within distinct scientific disciplines such as economics, physics, medicine etc., whereas *savoir* is a broader notion encompassing all aspects of the human creation and accumulation of knowledge, which implies that knowledge should not be perceived solely within a scientific context, but should include unscientific knowledge that governs human action, which can be

encompassed by “everyday knowledge” (Nilsson 2009), e.g. habits, culture, convenience, “the law of jante”, religion, traditions, astrology, or worse.

The present thesis contends that in order to grasp the origin and market potential of innovations, an innovation analysis should employ the broader understanding of knowledge contained within Foucault’s notion of *savoir*. Theoretically, the practical necessity of employing a broader perspective on knowledge when developing innovations for a market is already partly explored within institutional theory. For instance, Meyer & Rowan (1977) stress that organisations should operate in accordance to “myths”, which are institutionally developed and consist of accumulated social knowledge. The main point of Meyer & Rowan is that these myths not necessarily entail the economically (or scientifically) optimal efficiency of the company’s operations, but the myths represent what the institutional environment expects and demands of the company. Thus, the market, i.e. the customer, does not necessarily expect or demand the “optimal” or “best” solution in regards to science⁶, which extrapolate the fact that innovation analysis should employ a broader and eventually more holistic perspective on innovation, i.e. where they originate, and why some innovations succeed and others fail.

Practically, the proposed expanded scope of innovation theory is exemplified and justified by calling attention to the continuous successes of scientifically inferior innovations in the market, e.g. VHS vs. Betamax (picture quality), direct current vs. alternating current⁷ (safety/efficiency), QWERTY vs. DWORAK-keyboard (typing efficiency) and Windows 3.1 vs. Macintosh (interface design and performance) etc. Innovation theorists – in particular those reviewed earlier – often consider these examples as odd cases, but we reject that the technically inferior but successful innovations necessarily are odd cases. Instead, we propose that if analysed in a broader and more comprehensive analytical perspective these innovations’ successes are as “common” as any other innovation. Consequently, we contend that innovation theory often is obstructed by a myopic and therefore quite limited view on knowledge, which limits the explanatory power of innovation frameworks. The question that remains is how this broader analytical perception of knowledge or *savoir* can be analysed in relation to innovation; the answer resides in the relation between discourse and knowledge.

⁶ This point could obviously also include low pricing or an optimum between price and quality. The main point, however, is that product/service properties – mainly price, quality and design – alone does not determine innovational success.

⁷ In the initial years of electricity distribution Edison successfully made this the electricity standard in the U.S. despite its inferiority to alternating current. (Utterback 1994)

To clarify this proposed answer, we identify Foucault's assertion that discourses and discursive formations⁸ carry knowledge. Knowledge constitutes what is possible to articulate in a discourse, which hereby becomes manifest (Nilsson 2009). As previously stated, knowledge (*savoir*) contains scientific knowledge (*connaissance*) and knowledge exists beyond scientific knowledge, but knowledge does not exist without discourses (Foucault 1972). Referring to the aforementioned definition of innovation as the commercialisation of a new idea or reconfiguration of the existing, it becomes apparent that innovations necessarily entail new knowledge⁹. Thus, we hypothesise that discourses become pivotal to the analysis of innovations, as new knowledge – and therefore innovations – are determined by these and the accumulated knowledge the discourses contain.

1.5.1.3 Genealogy and the Archaeology of Knowledge

As elaborated above, the thesis employs a specific perception of knowledge but wilfully reduces the influence of power in the field of analysis. This deliberate limitation entails that we distinguish between two different methodologies, which Foucault developed throughout his academic career: the archaeology and the genealogy. The methodologies are to a large degree methodologically similar, but differ from each other in two significant manners, which eventually determine what methodology is most appropriate for our analysis. Foucault is probably most famous for his development of a genealogy – inspired by Friedrich Nietzsche (1844-1900) – to analyse power relations in Western society, which he conducted in the later stages of his academic work. Initially, however, Foucault developed the archaeology of knowledge – inspired by Immanuel Kant (1724-1804) – which as a methodology eventually changed its focus to power relations and became a methodological genealogy. The genealogy should, however, not be perceived as a higher level of cognition compared to the archaeology, as their primary focuses differ. To clarify, the genealogy's primary focus is on power and the aforementioned perception of knowledge as contained within *connaissance*, whereas the intention of Foucault's archaeology of knowledge is not to analyse power relations, but to locate the preconditions for *savoir* (Foucault 1972; Nilsson 2009). Consequently, the thoroughly elaborated notion of innovation, its origin, and the differences in Foucault's methodology entails that the thesis employs and utilises the archaeological methodology as developed by Foucault (1972).

⁸ Foucault uses “discourse” and “discursive formation” interchangeably, which is why we simply exclude “discursive formation” henceforth.

⁹ In this regard it is pivotal to emphasise that new knowledge does not entail progress, within the framework of Foucault. The new knowledge is not necessarily more desirable, enlightened or civilised than the preceding (Villadsen 2006).

1.5.2 The Methodology of the Foucaultian Archaeology

The archaeology of knowledge is Foucault's conceptualisation of the methodology he employed in the early period of his academic career (Foucault 2000 [1963], 2003 [1961], 2006 [1966]). Foucault did not describe his method as archaeology until he published *The Archaeology of Knowledge* in 1972, in which he introduces the term to encompass the method of his analyses of discourses

Within Foucault's framework, the archaeology is a method to disclose the "hidden" knowledge contained within the discourse's archives (Nilsson 2009). Archives are, however, not to be understood in its traditional sense, but instead as the general system of the formation and transformation of statements, and as "[...] the law of what can be said, the system that governs the appearance of statements as unique events" (Foucault 1972:129). Accordingly, Nilsson argues, "[...] archives are a set of rules for how different statements are grouped and combined, and hereby determine and limits what is possible to say and think in a specific society, at a specific time" (2009:50-51 – own translation). As the above exemplifies, "statements" have a significant position within Foucault's archaeology, as the archives "expose" themselves in the grouping and combination of statements. Statements (in French *énoncé*) are the smallest analytical unit in Foucault's methodology and are not to be confused with the common notion of statements as utterances. Hence, a statement is not a sentence or a speech act, but a function that makes structures and entities appear (Nilsson 2009). Foucault describes the relation between discourses and statements, when arguing that a discourse is

[...] a group of statements in so far as they belong to the same discursive formation; it does not form a rhetorical or formal unity, endlessly repeatable, whose appearance or use in history might be indicated (and, if necessary, explained); it is made up of a limited number of statements for which a group of conditions of existence can be defined (Foucault 1972:117).

To clarify, the methodology of archaeology entails that in order to locate and analyse the archives, which restrict and determine what can be thought and said within a specific discourse related to specific innovations, the present thesis focuses on statements perceived as functions. These functions can coincide with sentences or other apparent objects, but – as mentioned above – this is not necessarily the case. Thus, to understand the origin and

emergence of specific innovations, the thesis analyses the discursively accumulated knowledge, which the specific innovation is the outcome of, i.e. the analytical object is the discourse, the discursively accumulated knowledge (*connaissance* and *savoir*), the discursive rules (archives) governing the (creation of) apparent objects, structures and entities such as political decisions, economic development, inventions, innovations, and the discursive statements. Additionally, Foucault stresses that discourses should be analysed as “monuments” within an archaeological methodology. This affect the thesis’ ontology, as Foucault contends that

Archaeology tries to define not the thoughts, representations, images, themes, preoccupations that are concealed or revealed in discourses; but those discourses themselves, those discourses as practices obeying certain rules. It does not treat discourse as *document* [...] it is concerned with discourse in its own volume, as a *monument*. It is not an interpretative discipline: it does not seek another, better-hidden discourse. It refuses to be 'allegorical' (ibid.: 138-139).

The above argument put forward by Foucault implies that the investigator does not try to disclose any underlying level of reasoning to the discourse. Instead, the discourse is the final analytical level and should be treated as a monument, which eventually implies a focus on the discourses, the rules (archives), and the accumulated knowledge that govern it. Hereby, we return to the methodological outset, which implies that our analyses locate statements and analyse them and their mutual relations in order to disclose the archives, i.e. the rules governing the evolvement of the discourse – and hereby knowledge – and eventually the occasion for and emergence of innovations, i.e. their origin.

1.6 Methodological Remarks

The thesis’ employment of a Foucaultian framework and methodology entails two pivotal methodological aspects that needs to be addressed and reflected upon if the analytical points stressed in the subsequent analyses are to be perceived as valid, valuable, and as a contribution to the research on innovations and their origin. Accordingly, the succeeding sections of methodological remarks address 1) the inferred analytical and methodological

circumstances of the thesis' (social)constructivist¹⁰ perspective, and 2) the methodological “minimalism” that the analyses forces upon Foucault's archaeology.

1.6.1 Construction of The Research Object

A constructivist perspective entails that reality is a construction and is therefore in contrast to a realistic perspective, which contends that every object of investigation exists independently of the social (Justesen & Mik-Meyer 2010). Accordingly, constructivism focuses on how human beings collectively construct reality (Berger & Luckmann 1966) by emphasising the significance of institutions and discourses while simultaneously neglecting human subjectivity, i.e. the reality does not exist solely in the human mind, but it is dependent on the human interpretation of it (Justesen & Mik-Meyer 2010). Here, it should be noticed that our Foucaultian methodology neglects subjectivity, as discourses are the paramount analytical object of the framework. Additionally, constructivism stresses the contingency of every phenomenon, which induces that everything could be different, i.e. phenomena are historically and socially determined (Collin 2003).

By now, the attentive reader will noticed that the above brief elaboration on the thesis' constructivist perspective is aligned with the thesis' three axioms, which hereby positions the thesis in an academic tradition. However, as the thesis employs a constructivist perspective on innovation – whose theoretical foundation traditionally is within positivism or realism – another aspect becomes significant. Hence, innovation theory's tendency to focus on scientific research and the correlated “scientific facts” as a hotbed for innovations infers important reflections compared to the thesis' constructivism. We do not intend to denounce the importance of science in positivistic sense, but we do – in accordance to constructivism – intend to add a level of reflection to this. Hence, with the above methodological remarks in mind, it is evident that “scientific facts” are contingent, and that the analysis of innovation and their origin should perceive all aspects of reality – including science – as constructed. Within the theoretical scope of the thesis, this implies that science is discursively determined, which entails that science and its results *a priori* are not solely determined by the characteristics of the object, but also – and more importantly – these characteristics are

¹⁰ The notions of respectively constructivism and social constructivism are often used interchangeably as the meaning of both terms is very similar. It could be stressed that the latter through its inclusion of “social” emphasises the interpersonal aspects of the constructions, but we do not intend to engage in such a discussion or distinction, as it is irrelevant to the thesis' field of analysis. Thus, henceforth we only exclude “the social” and use strictly the short terminology “constructivism”.

determined by the human interpretation of the object, i.e. the human construction of the object.

1.6.2 Foucault and Methodological Minimalism

As a reservation in regards to the above presentation and the subsequent employment of the Foucaultian framework, it needs to be emphasised that the thesis' analyses take some liberties in relation to the methodological orthodoxy of Foucault's archaeology of knowledge.

Accordingly, the methodological thoroughness of Foucault's archaeology of knowledge entails that if the methodological guidelines were to be obeyed in their entirety, then the methodology would be almost impossible to utilise for anyone besides Foucault himself.

Thus, in its most fundamental form, the archaeological method imposes requirements especially in regards to sources and empirical proportions that are well beyond the scope of this or any master's thesis. This does, however, not change the fact that the archaeology of knowledge as a method has significant contributions to make to the analysis of innovations and their origin, which the present thesis eventually intends to explicate and underpin.

Additionally, we support our methodological validation and thus the value of our analyses with the work of Justesen & Mik-Meyer (2010), who – on the basis of the work of the American professor and sociologist, Catherine Kohler Riessman (Riessman 1993) – stress that if research is convincing, relevant or interesting then the research and its conclusions are of high quality:

[...] the argument is that if the research contributes with relevant or interesting knowledge in proportion to a well-defined target group, then it has high quality. Or if the analyses appear convincing or reliable, then the research has high quality (Justesen & Mik-Meyer 2010: 48 – own translation).

To the point, we acknowledge that in order to reach our conclusions, our analyses sometimes leapfrog and make methodological exceptions in regards to the employment of a Foucaultian framework. Methodologically, however, it is our firm belief that these exceptions are not significant enough to affect neither the conclusions' validity nor value in a negative way. Consequently, and in alignment with Justesen & Mik-Meyer (2010) and Riessman (1993), we perceive our conclusions to be convincing, relevant and interesting, as the conclusions are

meant to prove a point in regards to innovations and their origin and not to be state of the art methodology.

1.7 Analytical Strategy

As the theoretical framework has shown, present theory on innovations and their origin contains substantial insufficiencies in regards to comprehensively analysing and understanding innovations. Accordingly, a significant part of the thesis and the analyses is to question some of the present presuppositions of innovation theory in order to increase our understanding of innovations and their origin. In this regard, we subscribe to Andersen (1995, 1999, 2010), who states “Our experiences with the insufficiency of categories encourage us to take a step back in order to look at the categories themselves, their construction, their history, and their position within the field of our focus” (Andersen 2010:97). Thus, the theoretical framework of part 1 is ultimately an attempt to develop an approach, which enables us to question the categories of innovation theory. According to Andersen – who like us positions himself as a constructivist – this form of questioning entails “[...] a theoretical shift from the primacy of ontology to the primacy of epistemology. From first order observations of ‘what is out there’ to second order observations of where we are watching from when we observe ‘what is out there’” (2010:99). In the terms of Andersen, this entails a shift from method to analytical strategy (ibid.). The differences between method and analytical strategy can be viewed as follows (Andersen 2010):

Method	Analytical strategy
Observation of an object.	Observations of observations as observations.
The goal is to produce true knowledge about a given object.	The goal is to question presuppositions, to deontologize.
What are the needed rules and procedures to produce scientific knowledge?	Which analytical strategies will enable us to obtain knowledge, critically different from the already existing systems of meaning?

Concordantly, an “Analytical strategy does not consist in methodological rules, but rather in a strategy that addresses how the epistemologist will construct the observation of others – organizations or systems – to be the object of his own observations in order to describe the space from which he describes” (ibid.:99). Thus, through the theoretical framework presented so far in the thesis, we have described from where we describe (and analyse) innovations.

Taken the concept of analytical strategy into consideration, this implies that we acknowledge

that we describe and analyse innovations from a significantly different position than the general innovation scholar. It does, however, also imply that by being aware of this and employing the methodologies of both innovation theory and Foucault's archaeology, we develop an analytical strategy that possibly enable us to "obtain knowledge critically different from existing system of meaning" (op.cit.). Hence, an analytical strategy does not exclude utilising traditional methods to produce new knowledge, which Andersen stresses by emphasising that "The central question is whether a methodological or an analytical strategy perspective is primary in the research design. Naturally, within one analytical strategy different methods can be reintroduced which the analytical strategy then has to question" (Andersen 1999:100).

To the point, the research design of the present thesis is primarily an analytical strategy, whose ambition is to increase our understanding of innovations by obtaining new knowledge different from the existing, and therefore it sets out to question the presuppositions of the existing categories of innovation theory. In order to accomplish this, we employ the methods of innovation theory and supplement this with Foucault's archaeology, whereby we presumably will disclose aspects of innovations and their origin that presently are not encompassed by the categories and presuppositions of innovation theory. Thus, the thesis' analyses are conducted in accordance to different methods, but are not uncritically absorbed, as the last section of part 2 is a comparative analysis of the analyses' conclusions that critically compares the obtained knowledge in order to assess whether any common denominators of innovations or critically different knowledge can be obtained from the analyses.

To explicate and clarify the matter, we finally point to Andersen's (1995) distinction between the diachronic- and the synchronic analysis. Accordingly, the diachronic analysis studies how institutions (in the broadest sense of the concept) have evolved over time, whereas the synchronic analysis studies the effect of these institutions at different moments in time. In this regard, part 1 of the thesis has been a diachronic analysis that has shown how innovations as a concept and an institution has evolved, while part 2 is a synchronic analysis that at specific moments in time seeks to explicate 1) the creation of the innovation as an entity; and hereby 2) how innovations differ from our (economic) categorisation of them.

2.0 Part 2: Analyses

As described in the thesis' field of study, part 2 consists of three different cases analysed through the framework developed in part 1. Accordingly, the subsequent pages take us

chronologically through three distinct cases spanning from the 19th century until now. Thus, part 2 employs our framework, which entails that each analysis contains a traditional historic and economic analysis and a Foucaultian archaeological discourse analysis. Finally, the conclusions from each case are presented as preliminary conclusions. The conclusions are presented as preliminary because the cases *per se* are not our main analytical interest. Instead, we are interested in the innovational similarities, we can disclose and pinpoint from the analytical conclusions from each case. Thus, the idea and ambition is that by conducting the three different analyses and compare their (preliminary) conclusions, we can come closer to the common denominators of innovations and their origin. The common denominators are presented in the last section of part 2 and constitute the foundation for the thesis' operationalisation.

2.1 The Great Northern Telegraph Company and C.F. Tietgen

The following section analyses the case of the establishment of The Great Northern Telegraph Company (1869) (henceforth GNT). The central part of the analysis is conducted in accordance with the framework presented in the analytical framework above, but initially – and following a short case presentation – we seek to relate the case to the approaches employed by business historians and traditional innovation theory in order for us to highlight explanatory shortcomings of such theories.

2.1.1 A Man of Initiative

The establishment of GNT is one of the major achievements made by the Danish entrepreneur, Carl Frederik Tietgen (1829-1901), who – in the view of business historians – reserves a protagonist role as the originator of many significant successes in the Danish economy at the end of the 19th century. Some of these successful enterprises have grown to become significant economic successes, e.g. Tuborg, Danisco, TDC, GN Store Nord, DFDS, and B&W-MAN (Lange 1978, 2006). GNT was founded on May 13th, 1869 as the result of an elaborate amalgamation of three other telegraph companies, whose assets had crucial importance for the Tietgen's telegraphic vision. Tietgen had come to perceive telegraphs as a feasible business opportunity, and he believed telegraphs to be a commercial technology of global proportions. Therefore, GNT was a remarkably ambitious business venture for its time as it strived to connect Europe with both North America and The Far East by telegraph wire. Sadly, the company's most expansive aspirations of becoming monopolised telegraph operator of China was officially abandoned in 1886, but the company's achievements prior to this commercial defeat make the story of GNT an astounding case of a company from the

small kingdom of Denmark, which became a significant player in a significant global market. Regardless of the magnitude of GNT's commercial success and failure, it is not the ambition in this section to give a full historic account of the establishment of GNT, but rather to analyse why telegraphs in this case became Tietgen's innovation of choice, i.e. what possessed Tietgen to strive for establishing a telegraphic enterprise. Hence, the following sections will focus on supporting the argumentation of the thesis' theoretical framework. Accordingly, and although numerous ventures involving Tietgen could be analysed, this section limits its focus to the case of GNT to firstly show the inadequacies of traditional innovational theory, and secondly to propose a new understanding of Tietgen's entrepreneurial venture.

2.1.2 GNT in a Traditional Sense

Traditionally, the case of GNT reads as a primer for Schumpeter-inspired studies of evolving economic phenomena. Firstly, the diffusion of the basic innovation exploited by GNT, the telegraph cable, is generally perceived to be one of the many – but also one of the most diffused – innovations that followed in the slipstream of the establishment of a railroad infrastructure in many countries (Schumpeter 1939; Chandler in Supple 1991; McCraw 2006). “Railroadization”, as Schumpeter called the total amount of innovations that accrued from the diffusion of railways, serves as a “[...] ‘standard example by which to illustrate the working of [his] model.’ Hundreds of innovations emerged, both large and small [following the innovation of the railroad, eds.]” (McCraw 2006:249), and for this reason, it is logically concluded that all other aspects of Schumpeter's analytical framework would apply to the case of GNT. Concordantly, Landes et al. (2010) state: “According to Schumpeter, Britain pioneered not one but two major innovations: first the factory system and then the railroads” (ibid.:220). Thus, with British social and economic developments as empirical evidence, we see that these authors assert that much of the successes of the time are owed to entrepreneurs who specialised in taking very risky decisions about major investments. Following the Schumpeterian train of thought, Landes et al. contend that many great innovations which made the British infrastructure prosper came from this willingness to engage in risky business ventures: “The British Empire was growing fast, and everywhere there were new opportunities for development. Ports, railways, telegraphs, and urban investment were the key” (ibid.:217). Similarly, and in an almost celebratory fashion, our primary empirical sources for this case portray Tietgen to be one of those rare economic actors, who possesses an adequate surplus of spiritual energy that enable him to appreciate innovational opportunities and to exploit these by engaging the right type of people with the right set of

skills at the right time (Lange 1978, 1980, 2006). For instance, Tietgen succeeded in engaging numerous government officials in all countries where GNT was represented, and his venture was widely supported by the Danish government. Even the king, Christian IX, at one point became a lobbyist for Tietgen's massive business plan of becoming telegraph operator in China and Japan (ibid.). In summary, one could conclude that Tietgen was simply a great man of great initiative and skill. However, this conclusion would render our understanding of Tietgen's innovational preferences as enigmatic, flawed and unsatisfactory.

Another aspect that could stimulate traditional innovation theorising, and which in fact seemed to be a substantial reason for the success of GNT, was the technological uncertainties that significantly influenced the relatively new – but no less radical – innovation of telegraph cables. Tietgen was aware of the great ordeals his British competitors had experienced when they throughout the 1850's laid down telegraph cables on the bottom of the Atlantic Ocean. These transatlantic cables, however, incessantly broke and were hard to salvage which at times crippled the business of Tietgen's competitors, and it was not until 1867 – two years before the foundation of GNT – that the cable technology seemed to have reached a temporary and stabile pinnacle, which presumably made Tietgen's timing even more advantageous: “This [the time Tietgen served as an agent for British and American telegraph entrepreneurs, eds.] have provided him with an insight into processes and mechanisms of which he now drew the consequence. Why not secure the concessions for the Scandinavian connections as a Danish venture and exploit them?” (Lange 2006:184 – own translation). Logically, one could here conclude that the success of GNT owes to the fact that Tietgen – being a special breed of economic actor – explored the market to a point where he discovered the right set of organisational and technological opportunities and exploited them at the right time and this would effectively support the unsatisfactory Schumpeterian conclusions above. Additionally, however, theories on the subject of product and industry life cycles – as portrayed earlier in this thesis – might serve some analytical leverage as these theories provide tools which can account for the successful timing of Tietgen's entry into the telegraph market. Nevertheless, these theories remain insufficient in explaining why telegraphs would seem a feasible commodity in the first place. Insufficiencies aside, and following the ideas of PLCs and ILCs, some innovation theorists have argued that it is seldom the first ones to exploit a technology who reap the benefits of an innovation and that “first movers” are first “[...] only in the sense that they were the first to champion the particular product variant that became the dominant design. They were first when the market, not the product, emerged – and this is why they ended up with most of the profits” (Markides et al. 2004:29). Rightfully,

we acknowledge that one significant factor in Tietgen's successes was the fact that he was able to supply telegraphs in accordance with market conditions that were more favourable than those of his competitors, e.g. when he secured a telegraph operator concession in China in 1881, and when he did not succeed in his plans of securing a telegraph line to USA through the northern Danish colonies, because others succeeded in establishing what was perceived as an optimal market constellation before him (Lange 1978, 1980, 2006). However, an analysis of how Tietgen was able to provide better market solutions than his competitors still does not clarify the initial appeal of the telegraph, but rather, it opens a discussion of traditional innovation economics that is unfruitful to the argumentation of this thesis, as it will focus quite narrowly on the life cycles of competing technologies, and the marketing effort these entailed. Alternatively, other explanations of why telegraphs were such a successful innovation will bring the focal point even further away from the actual product, as when Lange (1978, 2006) describes how the competition between Tietgen and his competitors was dirty and effectively decided by lobbyism.

Lastly, we must clarify one last aspect of traditional theory, which could account for the success of GNT, but which would not reveal anything of the origin of the innovation. Hence, we point to the fact that GNT is also the result of elaborate amalgamations, public offerings, and stock market speculation (Lange 1978; 2006). It is out of the scope of this paper to delve into the details of the organisational finances of GNT, but it is no less obvious that an analytical approach focusing on these matters could logically account for GNT's establishment, which subsequently led to its prevalence over its competitors. Thus, along the lines of the latter two aspects of traditional theory, one could argue that the success of GNT owed to the fact that Tietgen was a first mover in Denmark, which secured him and his company with a most favourable market position. Additionally, as Tietgen succeeded in performing a merger of three existing telegraph companies, and at the same time reinvigorate the stocks of the new company (*ibid.*), it seems reasonable to agree along the lines of Landes et al. (2010) who observe that part of the explanation for the developments in British markets around the time of the establishment of GNT occurred due to increasing institutionalisation of both workers and firms (respectively in trade unions and in trade associations or cartels). Subsequently, Landes et al. argue that many mergers were performed in many markets of that time, because the institutional settings in society necessitated increasingly bigger market players who possessed adequate political leverage, i.e. companies of a certain size seemed to be a prerequisite for success: "[...] rent-seeking trade unions and cartels dominated in the second half [of the 19th century, eds.]. Part of the explanation may lie in the shakeout of the

less productive firms that seems to have occurred in a number of manufacturing industries as they matured through the Victorian period” (ibid.:222). Thus, traditional management theory – in combination with institutional theory – might account for the success of GNT, but not for the innovational preferences of Tietgen himself.

In general, it is evident that our empirical sources more than adequately depict the circumstances that led to the establishment and success of GNT. However, the underlying demand which renders the innovation of telegraphs a viable business venture remains inadequately described and to a large extent enigmatic. Thus, we are in a sense facing the same mystery as our primary empirical sources:

How was it possible for a small country like Denmark in the period from 1868-1886 to found, develop, and subsequently seek to expand a – by a contemporary standard – quite impressive multinational company such as GNT in such a new field as telegraphs [...] One can ask: Which factors, i.e. material circumstances, power relations, conceptions and mindsets, institutions and/or people contributed? (Lange 1980:15 – own translation).

However, we want to reach deeper by asking “why realise telegraphs?” – as opposed to “how to realise telegraphs?” – and through this analytical ambition, we will reveal specific “mechanisms” which have led Tietgen to venture into a relatively unexplored and therefore supposedly hazardous market, without succumbing to the conclusion that he was a risk-taking Schumpeterian entrepreneur. Accordingly – and in relation to the limitation sustained by the recognition of innovation theory above – we intensively focus the following analysis on the “conceptions and mindsets” that in fact enabled to the establishment of GNT.

2.1.3 The Imperialistic *Zeitgeist* and Tietgen

As outlined earlier, the outset for analysing the need for an innovation such as telegraphs is the recognition of the discursive restrictions on the cognitive capabilities on human individuals. Accordingly, we will analyse what knowledge is conveyed through the discourses of Tietgen’s contemporary society and assert that these have influenced him to act as he did. As knowledge falls into two interrelated and mutually influencing categories, we assert that the formalised rule-governed *connaissance* partly formed Tietgen’s understanding of the

challenges and opportunities facing him as well as his peers and competitors¹¹.

Simultaneously, however, it is the assertion of the thesis' framework that in order to fully understand Tietgen's reasoning and choices among multiple options, the broader notion of *savoir* must be integrated into our exploration of the case. Hence, whenever we state that Tietgen or his competitors acted in a certain fashion, we simultaneously assume they did so on the grounds of the discursively accumulated knowledge of society. This accumulated knowledge thus also amount to serve as the identified archives that are the discursively instated rules for human cognition, speech, and action, i.e. all human behaviour. Thus, in short, we seek the identification of the discursive elements, which are constitutional to the knowledge and scientific knowledge, which rendered telegraphs a viable solution to certain problems – mainly in the eyes of Tietgen. As an overall methodological approach, we will archaeologically delve into our primary empirical source and perceive these as summarised archives of statements, i.e. functions that make structures and entities appear.

The first clue to uncover Tietgen's underlying motivation for establishing GNT lies in recognising his previously accumulated entrepreneurial knowledge. GNT was not Tietgen's first entrepreneurial venture. He had received a practical education as a merchant in both Denmark and Manchester, England, and at the age of 26 in 1855, he had established himself as a business man capable of running banks and dealing in the import and export of corn, minerals (cryolite), textiles, and telegraph wire – the latter which he had experienced in 1852 (Lange 2006). His firsthand experiences from England made his knowledge of industrialised business in the Western world seem impressive by a contemporary Danish standard, but we no less argue that Tietgen's awareness of all matters was restricted by the discourses of the time, i.e. that his business ventures owed to commonly shared notions of what was possible and viable, and not to his superhuman entrepreneurial intellect. Conversely, Lange (2006) states that the career of Tietgen was exceptional, but as his professional career took off in the period after The Golden Age of Denmark, we would argue that Tietgen and other prominent citizens of the time all felt motivated by the same enterprising spirit that generally seemed to sweep across Europe in the form of industrial revolutions.

¹¹ For instance, Tietgen's understanding of financial practices and processes might be formalised and rule-governed, and might in many instances be restricted by the contentions of common theoretical practice, mercantile laws etc., thus affecting what he perceives as possible and viable. Accordingly, his education and experiences with the establishment and management of businesses restrict Tietgen's view of certain phenomena, i.e. when and why telegraphs were feasible business.

Thus, Tietgen grew up in an age where civilisation and society developed rapidly with many technological breakthroughs as the result and with soaring entrepreneurial activity. Many of these innovational breakthroughs originated in Britain, and subsequently, these innovations were exported to the farthest regions of the Victorian empire. As mentioned, Tietgen's travels to England revealed to him that entrepreneurship flourished on a scale far greater than in his native country, so when he returned to Denmark, his experiences could be realised as comparatively greater entrepreneurial visions than previously experienced: "When Tietgen in 1855 settled down as an independent merchant in the financially underdeveloped Copenhagen, the transition and difference from the dynamic Manchester must have been immense. But for a young man it held opportunities as well. [...] The capitol probably screamed for renewal" (ibid.:79 – own translation). Such a quote clearly indicates that Tietgen's frame of reference and societal understanding was above the Danish average and in a Foucaultian optic, this fact acts to denounce the Schumpeterian notion of an enigmatically gifted entrepreneur. Rather, Tietgen simply possessed knowledge of the dynamics of the global innovational forefront, i.e. Victorian Britain and the US. Generally, Tietgen seems to be very much influenced by British entrepreneurial practices, which – when considering the size and success of the Victorian empire – seems quite natural. A fact to support this suspicion is that Tietgen deliberately named his telegraph company so that it could be associated with – or even mistaken for – the British company, The Great Northern Railway Co., which was renowned at the London Stock Exchange at the time. Supposedly, Tietgen studied British innovations and entrepreneurs closely, and this led him to envision numerous business plans – some more profitable than others. One of the more profitable visions sought to exploit the technology of one type of telegraph, which coincidentally was based on a Danish scientific discovery: electromagnetism by H.C. Ørsted (1777-1851) in 1820 (Lange 2006). The telegraph "[...] would come to revolutionise economic life across the world four-five decades later. At the same time, the telegraph would have significant influence both politically and militarily due to its speed – provided that it functioned properly" (ibid.:70 – own translation). It is important here to recognise that this section does not seek to clarify how the telegraph originated as an invention. Tietgen was in no significant way involved in the technological development of telegraphs, however, he was the originator of a business plan that successfully utilised and innovated upon a technology that had been cultivated from a specific scientific discovery, which emerged exogenously to the market for long-distance communication, but which came to serve the purpose of solving many societal problems in the shape of various new electromagnetic inventions. Therefore, the ambition of this section is

to emphasise why, i.e. by what governing notions the electromagnetic telegraph became the chosen technology in this business endeavour, and what possessed entrepreneurs to strive for the technological cultivation of the telegraph. Our contention is as indicated above that the origin for this choice can be traced to the discourses of the time of innovation.

Concordantly, we see that electromagnetism, which paved the way for the discovery of a new and significantly faster way of communicating, also held great potential for a wide spectrum of human undertakings. Probably the most momentous and comprehensive of these undertakings, which required the need for long-distance communication was the creation and expansion of the British Empire. Since Napoleon Bonaparte (1769-1821) had been defeated in 1815, the British had been able to focus on forging the heart of a vast empire, and although being the rulers of the sea, railroads soon proved to be a vital part of the mainland transportation system of Victorian Britain, as well as in God's Own Country across the Atlantic Ocean: "New opportunities for tourism, commuting, and the development of a national system of banking were opened up [...] Cities began to develop as information hubs as well as industrial centres – a function that they [the British, eds.] had always performed but could perform more easily once long-distance communication had been speeded-up" (Landes et al 2010:216-217). Simultaneously, Denmark had sustained significant economic and territorial losses due to their support of Napoleon, and Denmark's international influence had shrunk to a minimum. Conversely, on the global scene, technological, economical and societal development had evolved since the early 1800's, and in accordance with the theoretical field of this thesis, all accumulated knowledge of this period must have been contained in various discourses, which likewise contained a vast amount of statements on national and personal prosperity, technological breakthroughs, expansive business endeavours, etc., which eventually came to be appreciated by Tietgen.

Hence, we logically assert that years prior to Tietgen's innovation, a discourse had formed to support the diffusion of a technology of swift communication over great distances, which *de facto* fulfilled a widely shared vision of making the world smaller, e.g. telegraphics, and that this discourse consists of chains of statements, institutionalised practices and historically and culturally given rules, i.e. discursively accumulated knowledge and cognition-governing discursive archives, which practically controlled the content and form of any conversation on subjects such as international business establishment, technological breakthroughs, etc.. Thus, Tietgen's innovation is discursively determined and could in theory have been realised by anyone. However, we cannot entirely reject that Tietgen possessed favourable attributes and an aptitude for establishing businesses, and thus, we do not seek to

undermine Schumpeterian theory, but our main argument is that the predominant discourse, i.e. the discourse that revealed telegraphs to be good business, originated in Victorian Britain and USA, and that Tietgen was not superhumanly blessed; he simply appreciated and acted upon the arguments of this discourse. To further clarify, we identify this discourse as one of expansion and control – an imperialistic discourse – that Tietgen simply translated into a Danish context. To specify, what influenced Tietgen’s business plans are various forms of knowledge which were circulated in discourses of the time, and that this knowledge – when continuously being uttered or reproduced in for instance writings – is explicated as statements, which analytically can be summarised to reveal the underlying notions of human cognition and behaviour that expressed certain needs, which subsequently led to specific innovations, cf. the cognitive restrictions of discourses. Accordingly, when employing e.g. Lange (1978, 1980, 2006) as our empirical foundation, the historical observations and assertions of this author reveal to us fractions of the discourses that practically were governing humans when GNT was founded. To exemplify, Lange (2006) quotes that Danish War Minister who in 1869 publicly characterised the foundation of GNT as immensely important for the independence, neutrality, and thereby strength of the entire nation of Denmark. Thus, this statement reveals to us that the telegraphic visions of Tietgen in fact exceed the simple role of being just another innovative business venture, which signified advancements in technology and traditional market mechanisms and which thus would be a mere product of Railroadization. On the contrary, it seems logic to assume that telegraphs concerned so many spheres of (world) society that the innovation was advanced by a myriad of governing notions – all of which were based on certain types of scientific or unscientific knowledge, whereby an enormous range of accumulated knowledge contributed to the very discourses that we here identify as the sole enabling factor and the origin for a Danish innovation based on telegraphs. Thus, we assert that Tietgen and the telegraph market – as well as a significant portion of the global entrepreneurial community at the time – was influenced by discursively accumulated knowledge amounting to discursive rules that governed the statements and everyday notions of geographical expansion, human and technological evolution, and the wealth of nations (no pun intended).

In further support of this argument, we see that Lange (1980) highlights imperialism to be a decisive factor in many business ventures in the 19th century. He defines imperialism as “[...] the process by which Western powers intervene in regions abroad with the intension of inducting these regions in the expansion of Western economy and to adapt these regions, their organisation, their economy, and their policies to the betterment of Western interest”

(ibid.:27 – own translation). Accordingly, imperialistic expansion meant increasingly more interaction with increasingly more stakeholders over greater and greater distances. Obviously, communication was a vital part in the organisation and coordination of such interactions, but this need was poorly served in the first part of the 19th century, where postal services across the Atlantic Ocean or to Asia would take weeks or months to deliver messages (Lange 2006). Evidently, we see that the notions of imperialism and global expansions of national interest originated outside Denmark and were – according to Lange (1980) – a continuous phenomenon that should not be reserved for explaining the geopolitical occurrences up until the First World War. Rather, the entire 19th century seemed to be saturated by expansive imperialistic behaviour – especially in the – to Tietgen – highly influential Britain: “By the end of the century the Victorian economy was economically driven by – and dependent upon – the project of imperialism” (Landes et al. 2010:217).

It is our argument then that the leaders of global commercial enterprise appreciated the need for faster communications as a logical means in expanding the territories of different states; and so did Tietgen, who in 1858-1859 had established cryolite business in the Danish colony, Greenland, where he also experienced the innovation of the shipping trade (Lange 2006). This led Tietgen to initiate the somewhat imperialistic endeavour of founding DFDS, Det Forenede Dampsibs-Selskab (The United Steamship Company) in 1866, “[...] which soon controlled the steamship lines between the Danish islands – the backbone of the Danish infrastructural system until the 1890’s” (Iversen & Andersen 2008). However, as a means of communication, and in accordance with the above statement on the delivery time of postal services, steamships must have seemed a cumbersome, but no less inescapable process, because no intercontinental telegraph lines were sufficiently technologically developed at the time. As Tietgen did not himself engage in the scientific development of the telegraphs – c.f. the nature of our type of entrepreneur as being distinctively different from inventors – it is our assertion that it is in the years between 1855 – where Tietgen establishes himself as merchant in Copenhagen – and 1866 – when Danish entrepreneurship rises after losing the war and substantial territories to Germany in The Second Schleswig War – that Tietgen eventually acted upon discursively accumulated knowledge (both *savoir* and *connaissance*), which makes him comprehend the need for – and commercial potential of – a major, international telegraph line.

Domestically, and on a governmental level, telegraph lines to Denmark’s neighbouring countries were established as early as 1850-1855, and although Tietgen was directly involved in this project, he did in fact serve only as a supplier of the telegraph wire

throughout this period. Accordingly, the fact that Tietgen served only as innovator – in our sense of the word – the following years conditioned Tietgen to become preoccupied with many other ventures than the establishment of intercontinental telegraph lines, i.e. he devoted his time to dealings within textiles, banking, and cryolite, all of which demanded increased attention as a financial crisis arose in 1857 (Lange 2006). This crisis led to a constitutional change in the economic system of Denmark, which presumably also affected the notions and knowledge of what would be feasible business, i.e. the mercantile and economic discourses at the time. The politically induced changes in economics (and economic discourses) brought about more liberal terms of commercialization for Danish merchants and entrepreneurs, and about the time of this change, Tietgen’s entrepreneurial gaze likewise seemed to become less internationally oriented and become more focused on Denmark as he became politically engaged and contributed to the railroad infrastructure in various parts of the country (ibid.). Then, after the loss to Germany and the cession of southern territories in 1864, Denmark as a sovereign state fell even further subject to the geopolitical inferiority complex sustained after the Napoleonic Wars, which supposedly affected the political sphere the worst. Similarly, Iversen & Andersen (2008) conclude that the characteristics of the Danish economy after 1857 owed to “[...] the dominant ideology of the time: Liberalism. The Danish state was weak and important initiatives came from below: the new telecommunications infrastructure was organized in a decentralized manner” (ibid.:325-326). Thus, entrepreneurial initiative soared freely again, and

Tietgen [...] was among the first individuals and institutions, which quickly made themselves free of the defeat, the trauma, and the paralysis. They [Tietgen and his Danish collaborators, eds.] showed the way, because they gradually formed what we today refer to as coherent industrial complexes, i.e. groups of businesses, which mutually supplied and supported each other [i.e. the formation of industrial clusters, eds.] (Lange 2006:157 – own translation).

Thus, Tietgen and his Danish peers seem to epitomise the fabled Danish proverb ”Winning inwards what has been lost to the outside” (Originally: *For hvert et tab igjen Erstatning findes, hvad udad tabes, det maa indad vindes* (H.P. Holst 1872)). These entrepreneurs firstly turned to strengthening the Danish infrastructure, and in so doing, Tietgen helped establishing an industrial complex within transportation and communications (Lange 2006). In this sense,

Tietgen gained much entrepreneurial knowledge in the post-war years, and collectively, in 1866, Danish entrepreneurialism seemed to be completely redeemed from its inferiority complex, as indicated by the abovementioned foundation of DFDS. Simultaneously, as the government retained an attitude towards economic initiative that was equal to the *laissez-faire* attitude that sustained the expansive markets of Victorian Britain (Landes 2010; Iversen & Andersen 2008), the innovational enterprise of Danish entrepreneurs became internationally focused once again.

On the international scene, and in correlation with the above notions of imperialism and expansion, there had been a tremendous increase in economic interactions and commerce – namely between Europe and the US, but also to Russia, Japan, and China (Lange 2006). In the three former parts of the world, telegraph lines had already been established internally, but due to the overall necessity of faster communications technology, fierce competition quickly arose from the prospect of supplying, owning, and operating an intercontinental telegraph line between the major parts of the world. Thus, the soon-to-be global economy quite profoundly necessitated telegraph lines that could significantly decrease the present delivery time of (commercial) messages from 12-14 days by ship to only a few minutes by wire (ibid.). As technological issues were gradually solved, different competitors – among these also Tietgen – continuously proposed different business plans in their attempts to secure a concession to serve a market that hungered for interconnectedness. Thus, it becomes obvious that it is the expansive *Zeitgeist* of the mid- and later half of the 1800's – the imperialism, if you will – which is the occasion for such a dramatic increase in transactions across the Atlantic Ocean and to Asia, and subsequently, this *Zeitgeist* is what led to one of the greater successes in Danish entrepreneurial history.

2.1.4 Preliminary Conclusion

From the above, we put forward the proposition that the innovation behind the success of GNT originated from the fact that Tietgen was embedded in a society, where the discursively accumulated knowledge pointed in the direction of an imperialistic *Zeitgeist*, which made Tietgen realise his visionary business plans based on the invention of the electromagnetic telegraph. This *Zeitgeist* additionally amounts to exemplify the emergence of conditional discursive factors, which originate from economic, technological, political, social phenomena etc. Thus, we observe that the discursively accumulated knowledge of Tietgen's contemporary society, which led him to realise the innovation of telegraphs, was constituted by both the *connaissance* of theoretical business conduct and the scientific knowledge of the technological level of the time; but simultaneously – and perhaps more importantly – Tietgen

was influenced by the *savoir* of practical business conduct and the social and (geo)political discourses in his environment. However, a commonality for all factors is that the identified discursive elements – as they do with all individuals - continuously affect the basis of Tietgen’s cognition, which in return affect his cognitive limits, and subsequently, what he could think, utter, and realise through his actions. Thus, it becomes equally common for all of the aforementioned economic actors that none of them need to be perceived as inexplicably or enigmatically gifted as to appreciate the potential of the telegraph lines. Rather, we here solidify our contention that all of these entrepreneurs sought to realise the innovation of telegraphs because – as we have shown with various summarised statements and archives throughout the above analysis – they were part of a discourse that enabled them to appreciate the meaning and implications of discourses and the statements that were formed on the basis of the fact that means of faster communications were becoming a societal necessity in the near future. In this sense, it is thus also pivotal to understand that the commercial potential of the telegraph at the time the innovation originated in effect did not *create* a consumer need – it simply *supplied* a consumer need that was already evident in the discourses of society. The distinction between the two views relates to the previously highlighted fact that discourses restrict human cognition, speech and action. Thus, although a need for long-distance communication has practically always been present, this need has only been efficiently served by the “technology” that was readily available, e.g. shouting, coded signalling, (mounted) couriers, letter pigeons, steam engine postal service etc. On the basis of the above analysis we contend that whenever both a need manifests itself through discursive statements, which emerge from the accumulated knowledge of society, and a suitable technology is simultaneously readily available, then that technology can effectively be exploited by any entrepreneurial individual who appreciates the message that is conveyed in the relevant discourse. Accordingly, we rightfully acknowledge that once the actual need has discursively emerged, this need can subsequently be served more or less effectively as analysed by and prescribed in traditional innovation management theory. Additionally, the above proposition on the interdependence between discursive timeliness and technological potential also entails that it is never a certainty that a *de facto* superior technology becomes the chosen standard in any situation where an innovation is realised. What we mean is that although Tietgen and his competitors chose to diffuse the electromagnetic telegraph, other technologies could effectively have been cultivated to become even better for the purpose of communicating over long distances. This fact serves to further exemplify that human cognition in all matters is discursively restricted, i.e. human behaviour will never exceed the knowledge that is

conveyed in the discourses of society – nor will anything ever become an innovation, unless a certain amount of society’s accumulated knowledge deems this particular innovation and its underlying and immediately realisable technology as viable. Consequently, the analysis of Tietgen and his contemporary society has exemplified the explanatory power of distinguishing between *connaissance* and *savoir*, when analysing the circumstances and success of a specific innovation. Thus, the inclusion of the discursive circumstances of the contemporary society of Tietgen in the innovation analysis has more comprehensively explained why the telegraph was such an immense success and why Tietgen chose to market it. Additionally, we speculate that as the need for telegraphic innovations seemed to originate primarily in the sphere of consumers, i.e. from postal services consumers, the political or military sphere – rather than in the technologically focused scientific sphere of e.g. H.C. Ørsted – then common knowledge, i.e. the concept of *savoir*, seems much more influential in affecting discourses than scientific knowledge, i.e. *connaissance*. We will elaborate further on this speculation throughout the subsequent analysis of other cases. Distinctively, then, the case in this section has sought to contribute to traditional innovation theory by showing why and how a given technological solution emerges as the chosen innovation of certain markets, as opposed to yield for the usual indiscriminate approach of simply analysing the ingenious innovator and the innovation in itself. From this, the reader should be left with a sense that the historical constellations of economies, technologies, and innovations are not necessarily a logic step-by-step evolution, but rather, that it is an elaborate discursive scheme of accumulated knowledge, which influences what will be perceived as the best solution to societal problems.

2.2 Microcredit, Muhammad Yunus and Grameen Bank

In the following, the case of microcredit, Muhammad Yunus, and the business venture of Grameen bank is presented and analysed within the framework elaborated upon in the thesis’ analytical framework and research design. Initially, the concept of microcredit and its success is presented, which is succeeded by an analysis that lays the foundation for a Foucaultian analysis, which explicate the explanatory flaws of traditional economic and innovational theories in relation to the success of microcredit. Lastly, the thesis’ framework is employed to exemplify its analytical and explanatory power in order to comprehensively grasp the reasons for the immense success Yunus achieved with his version of microcredit.

2.2.1 The Success of Microcredit and Grameen Bank

The innovation and business concept of microcredit emerged before Grameen Bank was founded, but before the analysis turns to the innovation and its development, the successes and idiosyncrasies of Grameen Bank and microcredit are presented in order to emphasise the reasons for the thesis' inclusion of this particular case. Grameen Bank was founded on October 2nd, 1983 and was the result of Yunus' elaborate fieldwork on the alleviation of poverty in rural Bangladesh following the 1974 famine. In 1972, after studying in America, Yunus returned to the newly independent Bangladesh and became head of the economics department at Chittagong University. Yunus initiated the aforementioned fieldwork in 1975 and conducted it in cooperation with some of his fellow scholars and students from the University. Eventually, the fieldwork gave birth to what we know as microcredit.

The basic rationale of Yunus' microcredit is the disbursement of small loans to poor women¹² in groups of five. The destitute women are granted the loans in order for them to earn their own money through small-scale enterprising, e.g. a tiny farm, a craft workshop, retailing of goods with small profits etc. (Yunus 2007). There are no legal instruments between the bank and the lenders, and the loans are disbursed to groups as a substitute for collateral, as the poor women obviously do not possess sufficient collateral to take out loans in the traditional sense of the concept. The basic principle is that the lenders must produce evidence of a social network of five people as an alternative to collateral. Put differently, five people who are socially tied together lend the money as a collective. In the definition of the relation between bank and borrower, Grameen Bank emphasises that:

Although each borrower must belong to a five-member group, the group is not required to give any guarantee for a loan to its member. Repayment responsibility solely rests on the individual borrower, while the group and the centre oversee that everyone behaves in a responsible way and none gets into repayment problem. There is no form of joint liability, i.e. group members are not responsible to pay on behalf of a defaulting member (WEB1).

Additionally, the two poorest of the five lend money first, whereas the other three people are not granted money, until the first two start repaying their loans (Yunus 1998). Thus, by virtue

¹² App. 97 % of the borrowers are women (WEB1)

of their social status, situation, and interconnectedness, the five people are mutually reliable, and thus have incentives to secure the repayment of the loans, but without being liable for the repayment.

Evidently, this innovative business concept has had immense impact and huge commercial success. Grameen Bank has a repayment ratio of 97 %, which must be perceived as enviable by all Western banks – especially with the subprime loans and the financial crisis that took in 2008 in mind. In addition to this, the interest rate of Grameen Bank’s microcredit averages around 11 % (WEB1), and thus, the business case appears extraordinarily attractive compared to the circumstances Western banks are subject to. As of April 2010, Grameen Bank has app. 23,000 employees and has disbursed loans worth US\$ 9.19 billion to 8.1 million borrowers; loans which are 100 % financed through costumers’ deposits in the bank. Every year except 1983, 1991, and 1992, Grameen Bank has made a profit, and in 2009, it generated revenue of US\$ 209.8 million of which it earned a profit of US\$ 5.38 million (ibid.). Additionally, Grameen Bank has (supposedly¹³) lifted millions out of poverty, and achieved worldwide recognition for its effort, e.g. Yunus received the Nobel Peace Prize in 2006; 2005 was declared “The International Year of Microcredit” by the United Nations; and numerous governments and the World Bank has publicly stated their recognition of Grameen Bank’s business (ibid.). While the latter aspects are very virtuous and admirable, our interest is solely in the former profit related aspects of innovative behaviour, i.e. our analysis is only interested in where the innovation of microcredit originates, and how Yunus and Grameen Bank managed to develop such an attractive business model. To clarify, we wish to emphasise Yunus’ own accentuation that Grameen Bank is not a charity but a business venture (Yunus 1998).

2.2.2 Microcredit Analysed within an Economic and Innovational Perspective

The subsequent economic and innovational analysis of microcredit lays the foundation for the Foucaultian analysis by explicating the explanatory flaws of economic and innovational theory in regards to the abovementioned success of Yunus and microcredit. In this regard, the analysis presents the characteristics of the Bangladeshi economy and claims that within a traditional economic perspective, a successful business venture based on loans for rural poor Bangladeshi women seems an irrational business decision.

2.2.3 Institutional Environment of Bangladesh

¹³ We do not wish to engage in this debate, but some scholars are raising questions whether microcredit is as effective as claimed by Yunus, the UN etc. (see for instance Boudreaux & Cowen 2008)

Within economic theory, a strong market – or at least the existence of market institutions – is typically perceived as a prerequisite to conducting viable business. Accordingly, Nobel Prize Laureate, Joseph E. Stiglitz (born 1943), accentuates that within development studies, the creation and sustenance of a strong, competitive, stable, and efficient private sector depends on factors such as a legal infrastructure, a property system, a regulatory framework, a public provision of infrastructure, a stable macroeconomic framework, and a stable and effective financial system (2003). Thus, an elaborate and constituted institutional environment is within an economic framework perceived to be of crucial importance to the conduction of viable business. Additionally, Mike W. Peng, professor of global strategy at University of Texas, argues that entrepreneurial start-ups in developing countries face a difficult set of institutional settings, which eventually entails that start-ups engage in two sets of networks: 1) professionals at other start-ups and managers of other firms, such as suppliers, buyers, and competitors; and 2) political networks with government officials (Peng 2003). However, when examining and analysing the institutional environment within which Yunus developed microcredit, it becomes apparent that Bangladesh had few of the prerequisites a genuine capitalistic concept such as microcredit would require in accordance with economic theory highlighted here.

On December 16th 1971, Bangladesh won its independence, but not without heavy casualties. Approximately three million Bangladeshis were killed, and ten million who had left the country for the safety of the neighbouring country of India where lodged in huge refugee camps. Yunus himself describes Bangladesh as a devastated country where “The economy was totally shattered” (Yunus 1998:57). As if the war for liberation had not taken enough casualties, Bangladesh was hit by a famine in 1974 (the worst in 30 years), which with Yunus’ words left people dying of starvation on the pavements and doorsteps. Consequently, the war for liberation and the famine left the state of Bangladesh with precarious economic conditions, which eventually made the prime minister, Sheikh Mujibur Rahman (1920-1975) – who was elected in 1973 – proclaim a state of emergency. Eventually, the prime minister “[...] used his parliamentary majority to win a constitutional amendment limiting the powers of the legislative and judicial branches, establishing an executive presidency, and instituting a one-party system” (WEB2), which led to some improvements in Bangladesh’s economic situation during 1975. However, change came slow and in August 1975, mid-level army officers assassinated the prime minister (ibid.). Successive military coups and alternating prime ministers continued the dubious development of Bangladeshi society, and not until 1989 did the political situation in Bangladesh become somewhat stable

(ibid.). Needless to say, the economic and institutional situation during the development of microcredit and the entrepreneurial start-up of Grameen Bank was neither optimal nor encouraging. Positively, however, the economic situation of Bangladesh was bettered in 1975 as the government “[...] gave greater scope to private sector participation in the economy, a pattern that has continued”, but “Population growth, inefficiency in the public sector, resistance to developing the country's richest natural resources, and limited capital have all continued to restrict economic growth” (ibid.). In his biographical work, *Banker to the Poor*, Yunus explains that prior to the establishment of Grameen Bank no formal financial funding system was available in Bangladesh (1998), which firstly limits the financing for entrepreneurial start-ups (e.g Leach & Melicher 2009), and secondly contradicts the points contended by Peng, i.e. it was not a possibility for Yunus to become part of an established financial network, as relations to such financial institutions were non-existing or immensely reluctant to co-operate. In the mid-1980’s, however, encouraging, but halting, signs of progress emerged, but not even these improvements can conceal the fact that the economic situation in Bangladesh – even in 2010 – due to the politics of confrontation, the level of corruption, and the slow pace of reform, is not very attractive in regards to foreign direct investments or entrepreneurial start-ups (WEB2). To summarise the institutional and economic environment of Bangladesh, it should be emphasised that it is definitely not the attractiveness of the Bangladesh economy *per se* that theoretically accounts for the success of Grameen Bank’s microcredit. Thus, even though the arguments stressed by Stiglitz contains explanatory and analytical depth in other cases, a stable institutional environment is quite obviously not a necessity in regards to conducting viable business – or more importantly, it is not a prerequisite for innovation. Accordingly, the characteristics presented in the above analysis of the Bangladeshi business environment obstruct the basic economic prerequisites of innovation theory. Thus, the underdeveloped characteristics of the Bangladeshi economy render the utilisation of these theories impossible. Naturally, one should then ask, what in fact holds the analytical depth to comprehensively explain the success of microcredit and where the innovation originated?

Before employing the Foucaultian framework presented in the thesis’ analytical framework, the present analysis briefly turns to the characteristics of the microcredit customers, i.e. the female Bangladeshi borrowers.

2.2.4 The Impossible Market and the Improbable Customer

Following the above economic and institutional analysis of Bangladesh and the conclusion that it is not – as one might expect – the institutional circumstances that account for the immense success of microcredit, it is relevant and necessary to analyse the attractiveness of the customer segment in question. The purpose of the present section is to illustrate how lending a relatively large amount of money to poor people is counter-intuitive within an economic perspective.

Within traditional banking and finance, a loan is the redistribution of financial assets between a lender and a borrower, where terms and conditions for lending and repaying are defined in a legally binding contract. The loan is typically to be repaid over a specific period of time with an interest rate, which eventually secures profits and incentive for the lender. In order for the lender to secure that he does not undertake any loss if the borrower is unable to repay the loan, collateral or security (e.g. a house or any other valuable and easily transferable asset) is typically required. Obviously, such a practice within banking entails that a well-functioning legal system is present and that potential borrowers have sufficient income and assets to take out, i.e. secure, the loan. However, when examining the Bangladeshi population, which – with 40 % of its population living below the national poverty line in 2008 (WEB3) – is one of the world's poorest populations, and where the literacy rate is only 47,5 % (WEB2), it is obvious that the Bangladeshi population in general – and more specifically the rural poor women – are not qualified to take out loans in the traditional economic sense of the concept. Concluding on the economic analysis of microcredit, it is obvious that an economic examination of the case in question can neither explain the success of microcredit due to a specifically attractive market nor provide prescriptive insights to a business model that pre-microcredit were economically viable. Hence, the innovation analysis of the microcredit case is almost forced to turn to the classic explanation of the prolific entrepreneur with insights of considerable dimensions similar to the Schumpeterian elitist economic actor of Mark I. As declared earlier, the ambition of the present thesis is not to decent into this black box explanation of how innovations originate. Rather, the questions that remain to be answered are why the traditional and widespread financial sector did not discover a business opportunity that had such an immense success; how and where the microcredit innovation originated; and why it in fact became such an immense success. To answer these questions, which the above analysis shows lie beyond an exclusively economic framework, the thesis' cross-disciplinary research design is subsequently employed.

2.2.5 Discursive Limitations and the Origin of Microcredit

Before analysing the origin of Yunus' microcredit innovation, the analysis briefly examines the innovation in a negative perspective, i.e. why did a bank or another financial institution not invent microcredit? Considering, the above analysis, the answer is quite obvious: It simply could not be done. History has, however, shown that the required insights were readily available in Bangladeshi society; a fact which renders the traditional economic explanations incomprehensive as the outcome of Yunus' innovation was and continuously is impressive revenues and profits. Thus, the motivation for the negative analysis is that it in no way can be satisfactory that an actual market venture is not encapsulated by economic theories, frameworks, and perspectives.

When employing the thesis' method and the Foucaultian framework, the reason for the financial sectors' inability to innovate on the idea of microcredit is found within the nature of discourses and knowledge. Accordingly, the Foucaultian framework of the analytical framework discloses the pivotal distinction between the knowledge embedded in economic/financial discourses and the knowledge embedded in various discourses in the Bangladeshi society. To the point, as with all discourses, financial/economic discourses contains specific knowledge – and hereby the Foucaultian terms *connaissance*, *savoir*, and archives – which significantly limits the individual human being's ability to observe and analyse aspects of society that *a priori* are perceived as unsustainable, e.g. lending money to borrowers without financial collateral. According to Foucault, the knowledge embedded within a discourse imposes limits on the possible developments of the discourse going forward, which practically correlates with the thesis' first axiom that “[...] one cannot speak of anything at any time; it is not easy to say something new” (op.cit.:44-45). Thus, the paramount insight on the financial sectors innovativeness – or lack hereof – in regards to microcredit is the fact that even though discourses, *savoir*, and *connaissance* create opportunities to some extent, they restrict humans to an even larger extent. Hence, these discursive aspects that dictate the financial sector's development and innovativeness also created an impediment to discover and pursue the relations that constituted the possibility of microcredit to the Bangladeshi people, i.e. the archives of the financial/economic discourse simply excluded the possibility of disbursing loans to poor people without collateral, which in a Foucaultian perspective make up a statement. Thus, given the *connaissance* of the financial/economic discourse, it is easy to conclude that archives – perceived as laws for what can be said and not said – determine what can be thought within the financial/economic

discourse. Thus, the accumulated knowledge about how economics should work impeded the possibility of microcredit being invented by an individual within the economic/financial discourse. Having concluded that microcredit could not originate within a financial/economic discourse, the factors that Yunus, an educated economist, discovered in order to get the microcredit idea, and how he became independent of the knowledge of the financial/economic discourse obtain a significant position in the analysis.

Based on the above conclusions, some might argue that the analytical points so far do not differ significantly from contentions made within innovation theory regarding companies' and especially incumbent companies' need to overcome managers' myopia and organisational inertia in order for the companies to stay competitive, i.e. "thinking outside the box" is pivotal (e.g. Foster 1986, Utterback 1994, Chesbrough 2001, Leonard-Barton 1992, Christensen & Raynor 2003, Markides 1997). Rightfully, we acknowledge that there is a degree of similarity between our approach and traditional innovational theory, but as mentioned previously, innovation theory contains theoretical shortcomings, as the Yunus case violates the theories' economic prerequisites. Additionally – and as the subsequent analysis will show – our approach differs from innovation theory's approach in a couple of significant manners. Thus, in correlation with the thesis' ambition to exceed the aforementioned "highest echelon of economic theory", the subsequent analysis contributes to the abovementioned aspects of thinking outside the box by analysing and explicating what Yunus saw and exploited when he developed microcredit. Hence, by analysing the origin of microcredit through the thesis' framework, we expand the scope of innovation analysis beyond the scope of traditional economic/innovational analysis, i.e. the analysis sheds light on the factors significant to managerial myopia and organisational inertia, and how Yunus circumvented such factors. Eventually, it is the insights obtained through the Foucaultian framework and our analyses that differentiate the present thesis' perspective on innovation and its origin from the traditional perspective of economic- and innovational theory.

As contended above, a pivotal aspect in determining how Yunus came up with the idea for microcredit is to examine and analyse, how Yunus abandoned the discursive limitations of the economic/financial discourse and how the discourses in Bangladesh through different restrictions than the ones of economics enabled the development of microcredit. Accordingly, in *Banker to the Poor*, Yunus describes how he "[...] returned from America in 1972, full of idealism and dreams, bathed in the nirvana of the Western world's rational approach to all problems. I was now more at ease with all the West's social ways and consumer goods" (Yunus 1998:58), which eventually was turned into disillusionment, as

Yunus realised he “[...] got carried away by the beauty and elegance of these theories [economics, eds.]. Now all of a sudden I started having an empty feeling. What good were all these elegant theories when people died of starvation on pavements and on doorsteps” (ibid.:4). Eventually, Yunus “[...] focused on the task of unlearning theory, and on learning instead from the real world” (ibid.:63). The “Barack Obama’ish” rhetoric of Yunus set aside, it is obvious that Yunus’ primary action was an attempt to abandon what economics had taught him to be possible and impossible in order to address a human need. Regardless of the fact that Yunus’ initial incentive was to alleviate people of starving to death, a pivotal aspect of microcredit is how the innovation is in the cross field of capitalism and what Yunus terms the real world. Thus, even though Yunus continuously stresses the numerous shortcomings of capitalism in regards to alleviating poverty (Yunus 2007), the concept of microcredit is founded on an idea, which at its core is capitalistic. To the point, microcredit might not be a viable option within a financial or economic discourse, but the fundamental idea is as capitalistic as it gets, which indicates that Yunus did not unlearn all his theories, but eventually became part of another discourse and hereby also a new type of knowledge, i.e. he broadened his scope from *connaissance* to *savoir*. Eventually, what Yunus did was to address and analyse a human need in a non-economic context, and subsequently develop a solution that utilises the dynamics and ambitions of capitalism. Hence, it is pivotal to acknowledge that Yunus by comparing “elegant theories” to “the real world”, he became part of a discourse that in contrast to the financial/economic discourse was not governed by archives that excluded the possibility of targeting (i.e. disbursing loans to) poor people. Consequently, the quotations from Yunus’ biography act as statements and eventually examples of how two different sets of archives governed his ability to be innovative in relation to alleviating poverty.

The pivotal questions, which remains to be answered, is how Yunus created the market for microcredit and how he came up with the specific microcredit idea, when he merged the *connaissance* of economics and the *savoir* of Bangladesh society. By employing the thesis’ framework based on the works of Foucault, several indicators to why microcredit was invented and became such a success appear. Accordingly, the knowledge and insights contained within the archives of the “new” Bangladeshi discourse contains powerful explanatory perspectives in this regard. Yunus states: “When I returned, I saw bravery and determination among the ruins of war. There were difficulties in every direction, and people faced them resolutely” (Yunus 1998:58). Additionally, Yunus describes how he also met women in his famine fieldwork who had the ability to produce valuable products, but were

unable to make a decent living because they were forced to lend money from loan sharks in order to afford the materials for their production. When perceiving these three aspects (bravery, craftsmanship, loan sharks) as discursive statements, the Bangladeshi society appears as a society, which has the foundation for entrepreneurial activity that, however, is impeded by corruption and structural problems to flourish. In continuation of the impediments of these structural problems and in regards to disbursing loans, Yunus states: “[...] in all cases it is extremely difficult for the borrower to extricate himself or herself from the burden of the loan. Usually the borrower will have to borrow again just to repay the prior loan, and ultimately the only way out is death” (Yunus 1998:8). Consequently, these statements make up the archives of the Bangladeshi discourse, which shows that the Bangladeshi society was – and still is – governed by certain rules that determine the possible development of the country. Thus, the statements exemplify how archives determine the development of a specific part of Bangladesh, while also disclosing how archives – and hereby specific discursive relations – enabled the opportunity for microcredit, while simultaneously excluding the possibility of regular loans. Accordingly, the difference between *savoir* and *connaissance* explicates itself through this discursive and social causality, as it becomes obvious that the *connaissance* (economics) excludes the possibility of microcredit, whereas the broader and more comprehensive perspective of *savoir* (the insights Yunus gained from studying Bangladesh) creates the possibility for microcredit. To the point, within economic cognition and reasoning (*connaissance*) the possibility of entrepreneurship and growth was subject to insurmountable discursive limitations, but in the broader notion of *savoir* these restrictions were not present, and hence the opportunity existed to be exploited through Yunus’ more holistic approach to societal needs.

Taking the above into consideration, it appears that the market and the need for microcredit can be created if a product or service combines some and exterminates other of the aspects of the Bangladeshi society as explicated by the above discursive statements. Hence, Yunus was able to conclude that if nothing were done, then society would continue to develop in the previous detrimental fashion. Yunus, however, created an opportunity to exploit certain possibilities in Bangladesh – as exemplified above in regards to *savoir* – because he broadened his scope beyond the economic *connaissance*. Thus, by employing the Foucaultian framework, we have located the obstacles to and the innovation possibilities for microcredit. What remains unexamined is how Yunus came up with the exact idea for microcredit? How did he get the idea that social relations can be a substitute for collateral and to lend to women rather than men?

2.2.6 Ideation within Discursive Limits

When Yunus started to visit and examine the life of the rural poor in Bangladesh, he quickly discovered that women “[...] adapted quicker and better to the self-help process than men”; “[...] had the vision to see further and were willing to work harder to get out of poverty because they suffered the most”; “[...] paid more attention, prepared their children to have better lives, and were more consistent in their performance than men”; and that “When a destitute father starts making extra income, he starts paying attention to himself” (Yunus 1998:88). Thus, it became apparent to Yunus that because of the unempowered women and religiously induced patriarchal nature of Bangladeshi society, the only viable option was to target women and not men. Accordingly, Yunus stresses that these insights can be observed in the villages of Bangladesh; hence, the above quotations act as discursive statements in regards to the behavioural patterns of Bangladesh society. Accordingly, this is a shift from *connaissance* to *savoir* as the reasons for these behavioural patterns are not scientific, but results of habits, culture, religion, traditions etc., i.e. such factors played an essential role in the creation of the microcredit innovation. More precisely, these aspects of Yunus’ developmental phase exemplifies how the *savoir* of the Bangladeshi discourse and hereby the discursive archives enable some possibilities and excludes other.

When examining how Yunus developed the idea that social relations could replace collateral, the analysis emphasises that the fundamental idea is discursively limited. Additionally, however, we acknowledge that Yunus was creative in getting the idea, but – and in accordance with Foucault – we stress that he was creative within the discursive limits. Accordingly, the choice of targeting women as lenders also opened up for another aspect of Bangladeshi society, which is observable through statements. Thus, in the experimental phase of the development of microcredit, Yunus and his colleagues observed and examined a sizeable number of women and their interaction. Consequently, the observations showed Yunus that trust, honour and shame played a significant part in the relations between the women (Yunus 1998). Accordingly, the actions of Bangladeshi women act as statements disclosing the archive of the village discourses, which the women were part of, i.e. through the discursively contained *savoir* and the related archives, it became apparent that the women were more consistent in their behaviour and therefore more reliable than men. Eventually, Yunus concluded that if he utilised the trust/shame/honour-codex, he had observed between Bangladeshi women, he could create the circumstances necessary to secure that the loans would be repaid. Evidently, such utilisation depends on the social relations between the

women, which is why these are able to substitute traditional collateral. The pivotal point is not that if there is a significant amount of trust between people within a specific group or society, viable business is just waiting to be conducted. The point is that by examining and analysing trust, shame, and honour as statements, and much more importantly as disclosing certain discursive archives, it is possible to gain insights into what it is that determines human cognition. In this regard, the notion of *savoir* is necessary in order to disclose these additional aspects to the innovation of microcredit. Thus, the insights of the Foucaultian framework broaden the explanatory depth of an innovation analysis, as it shows how *savoir* and archives govern societal development and the evolvement of consumer need. Additionally, it is pivotal to emphasise that the above indicates that even though Yunus indeed was creative within the discourse, all the knowledge he utilised was arguably discursively present as *savoir* in the discourses of society, which eventually entails that his stream of thought was restricted by the discursive limits imposed by different archives, i.e. the microcredit innovation was an opportunity made possible by the discourse's archives and *savoir*.

2.2.7 Preliminary Conclusions

Summing up the above analysis, four main conclusions can be derived from the case of Muhammad Yunus' innovation with microcredit, which are briefly summarised below. The point of departure of the conclusions below are the initial economic analysis, which laid the foundation for the Foucaultian analysis and explicated the shortcomings of economic/innovational theory as a means to satisfactorily analyse and explain the invention and success of microcredit.

First, the above analysis has shown that even though Yunus was at the centre of the ideation and development of microcredit, the circumstances for microcredit existed regardless of Yunus and not because of Yunus. The analysis explicates how microcredit is (merely) the result of Yunus connecting the dots that he and his team discovered when observing the poor women of Bangladeshi society. Thus, the case of microcredit exemplifies that the origin of this particular innovation laid dormant within Bangladesh society, i.e. the origin of the innovation resides within discursively accumulated knowledge.

Second, and in relation to the above, the analysis shows the significance of comprehensively and thoroughly conducted analyses of potential customers. Accordingly, it is the contention of both the analysis and of Yunus that the ideation and development of microcredit was the result of thorough analyses of and an all-encompassing approach to a supposedly non-existing market. To the point, Yunus benefitted from taking the non-

economic and otherwise unprofitable aspects of Bangladeshi society – such as shame, habits, culture, religion etc. – into the equation, when developing the concept of microcredit.

Third, the analysis has shown how the thesis' analytical framework supplements the general analysis of innovations and their origin, and the explanatory depth and power by including the framework of Foucault in the analysis of innovations. Accordingly, by differentiating between *connaissance* and *savoir* when analysing an innovation, it has become apparent that 1) innovations and their success cannot be explained with reference only to *connaissance*, i.e. neither science nor logic nor rationality etc.; 2) by assuming that markets and customers act on the basis of *savoir*, the origin and reason for microcredit's success can be respectively located within and explained with societal conditions of Bangladesh, and 3) that by combining *savoir* with the notion of archives, microcredit is the outcome of the restrictions and opportunities of the discourses in question.

Fourth, and perhaps most critically, the above analysis exemplifies that the origin of the microcredit innovation is exterior to the economic discourse, i.e. microcredit did not originate from economic calculations, but from pre-existing human needs, which had been unaddressed and unsolved by economics because all of the discursively accumulated knowledge (*savoir*) did not infer the same restrictions as the more narrow economic *connaissance*.

2.3 Electric Transportation and the Sustainable Future

The following sections analyse a branch of innovations that in present time has come to affect multiple industries and markets. The case at hand is centred on the innovation of electric vehicles (henceforth EVs), albeit this seemingly logic innovation necessitates much greater reflections on the subject of sustainable development and geopolitical concerns of our planet's future. Subsequently, however, the extent of such an analytical object demands thorough argumentation for the claim that sustainable innovations are in fact as urgent and compelling as implied by the global media, politics, academia, and worldwide industries. Evidently, and in the optic of the thesis' framework, the seemingly ever-present contentions of ecology and sustainability come to function as numerous identifiable statements, whereby our previously employed framework becomes extremely prudent for analysing this particular case. Thus, the following sections seek to analytically provide evidence of a discourse that has led to the origin of EVs.

The approach of this section will generally be reminiscent of the previous sections, which entails that firstly, the case is briefly – but sufficiently – described, i.e. the history of

EVs is revised. Secondly, this history is analysed through traditional innovation theory in order to identify potential explanatory shortcomings. Thirdly, the framework of the present thesis is applied to the case to explore the possibilities of further understanding how the EV has commercially performed over time and why. Noticeably, although we employ the same methodology as in the previous sections, the focal point of the present sections is somewhat altered by the fact that we here focus solely on the innovation and not on the innovators *per se*. It should be duly noted that this fact likewise serve to support our hitherto assumption that the Schumpeterian entrepreneur is not necessarily a solitary driving force in the emergence and realisation of innovations, industries, and economies. Rather, as we will show, it is the discourses of society that render it possible for virtually all individuals to appreciate and realise an innovation such as the EV.

2.3.1 Electric Vehicles – A Crash Course in Automotive History

Despite common contentions, EVs are not a new innovation. The first crude electric carriage was invented in Scotland between 1832 and 1839 (the exact year is uncertain) by Robert Anderson (WEB4). Alternatively, Thomas Davenport invented and marketed the first battery-driven electric car in 1834. By and large, EVs emerged – as the majority of automotive innovations of the time – in USA. Therefore, the following presentation of the earliest EVs is predominantly limited to analysing the facts and statistics of the US market between 1889 – when Thomas Edison built an EV using nickel-alkaline batteries (WEB5), which subsequently became the standard of the EV industry – and the mid-1920's, where the EVs seemed to finally have lost the battle for car industry dominance to gasoline-powered vehicles with internal combustion engines (henceforth ICE-vehicles).

In the beginning, EVs were in fact superior to all other automated carriages as EVs would hold all vehicle land speed records until circa 1900 (ibid.). Additionally, EVs were neither as noisy nor smelly as ICE-vehicles and EVs performed better in snow. Likewise, EVs effectively circumvented the difficult task of changing gears in the technologically crude ICE-vehicles (WEB5). Yet another EV-advantage was sustained by the fact that ICE-powered cars did not significantly diminish immense pollution that was produced by dominating means of urban transportation of the time: horses¹⁴. Surprisingly – and perhaps enviably by today's standards – the amount of cars produced in the US in year 1900 was evenly divided between

¹⁴ Around 1900, New York City's pollution problems meant that 2.5 million pounds of horse manure and 60,000 gallons of urine were spilled onto the streets on a daily basis. Additionally, city officials were faced with the task of removing 15,000 dead horses from the streets each year (WEB5).

three distinct categories of urban vehicles, i.e. 33 % were steam cars, 33 % were EVs, and 33 % were gasoline-driven cars (WEB5). Then, in 1904, the car manufacturing industry was forever changed as Henry Ford (1863-1947) began the assembly line production of low-priced ICE-powered vehicles. Subsequently, in 1908, Ford introduced his ICE-powered Model T, which experienced immense commercial success, and from 1910 to 1920, motorised assembly lines produced ICE-powered cars at increasingly faster pace and in increasingly greater volumes, whereby the price per vehicle was dramatically reduced from approximately US\$ 850 in 1909 to US\$ 290 in 1920 (WEB6). In contrast, the price of the less efficiently produced EVs was approximately US\$ 1,750 in 1912 (WEB4). Simultaneously, the price for an EV remained stagnant and therefore became increasingly excessive in comparison (WEB5). Moreover, the initial superior performance features of EVs gradually became less impressive when compared to its contemporary ICE-powered competitors. For instance, The Detroit Electric (henceforth TDE) which was produced from 1907 to 1942 – thus making it one of the major successes in early EV history – was advertised as reliably getting 115 km between battery recharges (WEB7). However, the top speed of TDE was only about 32 km/h (WEB8), as compared to a 64–72 km/h top speed by Ford’s Model T (WEB6). Therefore, in terms of market share, TDE was predominantly sold to physicians and female drivers in urban areas who had short commuting distances and who desired the dependable and immediate start without the physically demanding hand cranking of the engine that was required with early ICE-powered vehicles (WEB9). However, this advantage for the EV was eliminated by the invention of the electric starter in 1912 (WEB5), and in comparison TDE allegedly “only” came to produce and sell 14,000 electric cars from 1906 to 1939 (ibid.), whereas Ford’s Model T came to sell approximately 15 million cars from 1908 to 1927 (WEB6). Following the EVs patterns of sales and usage were the steam cars, which had comparatively shorter driving ranges before needing water. Initially (before 1908), however, this did not spell any competitive disadvantages neither for steam cars nor for EVs, because the only drivable roads of that period were inside the towns, which effectively caused most travels to be local commuting (WEB4). Superseding the steam cars, however, EVs could also in the early years compete with those ICE-powered vehicles that served as connectors on the few constructed or paved roads, which connected railroad stations and cities. However, as the road infrastructure was expanded, farther travels by car were likewise made possible, and gradually steam-powered cars and EVs lost their competitive momentum.

Between the mid-1920’s and the mid-1960’s, the global interest for EVs seems to be at an all time low (WEB10) and presumably with good cause considering the magnitude of

the wars fought at that time; the ensuing rebuilding of entire nations; and the subsequent arms and space race of the Cold War. However, as parts of the public – and governmental – opinion seemed to become aware of and preoccupied with the negative side-effects of human living, i.e. industrial pollution, consumer waste production and disposal, and the incessantly experienced shortages of fossil fuels for ICE-vehicles, the EV once again emerged as a viable innovation – but this time, it had been applied an environmental mission.

In the 1960s and 1970s several problems concerning the crude oil, which fuelled ICE-vehicles, dawned on world society. Firstly, throughout the 1950's and 1960's, studies were conducted – mainly in the US – which conclusively attributed a significant portion of air pollution to the (ICE) automobile, and it was concluded that air pollution was a serious problem to the health of the general public. Secondly, and in addition to problems of exhaust emissions from ICE-vehicles, the geopolitical situation in these decades fostered notions of national self-sufficiency, i.e. many sovereign states – and particularly USA – found it necessary to reduce its dependency on imported foreign crude oil. Thirdly, it slowly occurred to all strata of global society that the natural reserves of crude oil might not be endless – a notion that culminated in 1973 with a worldwide oil crisis. Equally slowly a notion of the urgency of alternatively fuelled vehicles emerged. Thus, many attempts to produce practical electric vehicles occurred during the years from the 1960s to the present, however, the supposed prudence and urgency has proved to be a fluctuating phenomenon – a fact we shall explore later in this section – and therefore, although many attempts have been made, no type of EV has yet experienced a level of commercial success that could not be matched by any contemporary mass-produced ICE-vehicle. The most noteworthy examples of mass-produced EVs include *CitiCar* (1974), which was produced by Vanguard-Sebring, the sixth largest auto maker in the US at the time (WEB5) (app. 4,300 copies produced (WEB11)). In Denmark, the *Hope Whisper* (1981), which famously crashed in front of the world press at its premier and the *Mini-El* or *Ellert* (1985) (app. 4,000 copies produced (WEB12)) were serious attempts to market an EV. Most famous of all, however, is the General Motors *Impact* or *EVI* (1996-1999), whose life cycle and questionable commercial success is meticulously presented in the documentary *Who Killed the Electric Car* by Chris Paine (2006) (WEB13).

At the turn of the millennium, the abovementioned notions of sustainability and clean production and consumption gained renewed momentum and have in recent years reached a temporary pinnacle in terms of dispersion and appreciation of the message of environmental sustainability. Evidently, this has given new life to the EV as a viable innovation, and in later years, numerous EVs have been offered to consumers. None, however, have experienced the

commercial success that perhaps could be expected, and the question thus remains: Why are EVs continuously introduced to the automotive market when previous attempts of market innovation and introduction have failed so candidly?

A simple answer would be that technological progress opens the possibilities for the realisation of better cars, but this explanation seems to obvious and naïve in the view of the present thesis. The main reason for this assertion is as previously contended with other cases from different industries that a chosen technology will not necessarily amount to be an industry's final technological pinnacle at the time it effectively becomes an industry standard. Hence, over the course of history, many technologies have been instated as industry standards, but historically, incremental improvement of rival technologies has continuously proved that industry standards were the wrong technology to pursue.

Additionally, to clarify, it must be stressed that we in the remainder of these sections draw a sharp distinction between the earliest wave of EVs (circa 1832-1950) and EVs in recent times (1950 to present day). The distinction is drawn because of the very different reasons (i.e. also the different discourses) that have rendered EVs a viable innovation in the two periods. Regardless of this distinction, we nonetheless feel compelled to initially analyse both EV-waves simultaneously through the traditional frameworks of innovation theory; the reason being that it through such an analysis should become apparent that traditional theory in certain ways could come to juxtapose EV-innovations that in our view are not necessarily analysed sufficiently through the same theoretical optics. To avoid confusion, the earliest types of electric vehicles will henceforth be referred to as EVs, whereas electric vehicles realised after 1950 will be referred to as alternatively fueled vehicles (henceforth AFVs).

2.3.2 Perspectives of Traditional Innovation Theory

In examination of traditional theory's take on the innovation of electric vehicles, we first and foremost recall that the decline of the first wave of EVs was brought about by several major developments. First, the initiation of mass production of ICE-vehicles made these vehicles widely available and affordable. Second, continuous incremental improvement on the first ICE-vehicles steadily exceeded the initial superior performance features of the EVs. Third, the fuel used to power ICE-vehicles initially seemed to be readily accessible and affordable as enormous reserves of crude oil had continuously been discovered and exploited in various parts of the world. Fourth and last, by the early 1920's, USA – and in the following years many other countries – came to improve their road systems to be interconnecting between cities. Thus, long-distance driving – which could only be efficiently served by ICE-vehicles – gradually became the preferred means of personal in-land transportation, and therefore ICE-

vehicles progressively outcompeted both EVs, but also all types of steam engines operating on roads or tracks. As in the case of telegraphs, we thus see that ICE-vehicles won the market – not because it created a new consumer need – but because it more efficiently served a pre-existing need than its competitors. This naturally also implies that this specific need, i.e. the need for convenient personal in-land transportation, was articulated prior to the realisation of both EVs and ICE-vehicles. Compared to the present thesis' framework, there would therefore also logically exist a discourse on the subject of personal in-land transportation that bore connotations of what was wishful and needed. We will elaborate on this later in this section. For now, however, we focus on traditional innovation theory by arguing that an analysis dedicated to unravelling the technological and road-infrastructure characteristics, which led to sustained competitive advantage for ICE-vehicles, easily could account for the rise and fall of the earliest EVs. Likewise, the attentive reader will recognise that the first waves of EVs emerged as a supplement to the railroad system. Thus, as previously analysed in the case of Tietgen and The Great Northern Telegraph Company, the traditional entrepreneurial analyses of Schumpeter, which were exemplified by and summarised in the term “Railroadization”, could probably account for the majority of significant innovational aspects of early EVs as well.

Additionally, as the earliest EVs failed due to several developments, which left the EVs comparatively inferior to ICE-vehicles, it seems obvious to conclude that some analytical leverage could be derived from the fact that a competitive struggle between three diverging car designs has taken place at the turn of the 20th century. Analytically, this competitive struggle could be investigated and decomposed through traditional innovation theories such as those on technological developmental phases and dominant designs of technologies and industries as presented elsewhere in this thesis (Utterback & Abernathy 1975; Tushman & Anderson 1990). Clearly, the emergence of both EVs and AFVs could – as the majority of all innovations – be analysed by virtue of the known life cycles of the product innovation (i.e. the car itself) or the entire automotive industry and the intermittent discontinuities, which have occurred due to the sporadic introduction of new types of EVs and AFVs throughout time. However, as our contention goes, the focal point of such theories is relatively far from the origin of the innovation, as they seem to focus on how already realised innovations have affected companies and industries, and not – when looking forward – by what effect companies and industries can realise innovation. Thus, traditional reflections of PLC and ILC analyses (Klepper 1997) would in fact reveal how EVs and AFVs several times over the course of history – and following the famous S-curve (e.g. Foster 1986) or bell-shaped curve

(e.g. Rogers 2003) – have developed and diffused; first expansively, then stagnant as various factors would send the sale of EVs and AFVs into recession. Subsequently, a decline ensues, which leads to the disappearance of one type of vehicle, before a redesigned type of vehicle resurfaces as a new market entrant, and lastly, we would see the repetition of the entire cycle, which hitherto will only show several EVs and AFVs emerge and disappear. Hence, if we take the complete EV/AFV-history into account, each new type of vehicle introduced could effectively be labelled a technology of discontinuity (Henderson & Clark 1990), as EVs and AFVs continuously have attempted to substitute ICE-vehicles.

Theoretically, if employing the above analytical optics, one would be able to conclude that the EV initially was simply as viable a solution to a transportation problem and it was diffused among various individuals, because of various factors of demand (i.e. an analysis of customer demographics and needs) or factors of supply (i.e. an analysis of the market, competition, price, etc.). In short, the EVs were initially just as good a solution as ICE-vehicles. In the end, however, the EV was blatantly outperformed and therefore outcompeted by a superior product that was produced in a superior manner – end of analysis. This entails, however, that the subsequent appearances of AFVs in automotive history will have no linkage to the preceding EVs, none other than the technological feature that the vehicles do not run on fossil fuels. As a consequence, although this particular argumentation is theoretically sound, drawing up a lineage between the s-curved evolutionary features of each period that EVs or AFVs have been realised – and basing this on the traditional theory outlined here – will probably leave the reader with an unsatisfactory understanding of an incoherent history of seemingly similar innovations that sporadically have been introduced to markets simply because of technological and industrial evolution seemed to render this a possibility. Additionally, the reader will probably come to think of EV- and AFV-innovators as hopelessly naïve economic actors, much reminiscent of the solitary, heroic entrepreneur that Schumpeter prescribed. Alternatively, employment of this theory results in – for us – fragmented and too narrow analyses of each separate period of EVs and AFVs. Lastly, as also shown with the previous case examples, these traditional theories of market dynamics and industry economics do not provide a satisfactory degree of insight into the entities which throughout time seem to have motivated various innovators in various companies such as GM, Ford, Fiat, Toyota, Renault, etc. to realise in AFVs, i.e. the above theories do not reveal sufficient information of the origin of innovations.

2.3.3 The Contribution of Traditional Innovation Theory

In this section, we review a selection of recent literature, which has been or could be used to analyse the most recent emergence of an AFV-market. As we do not intend to wilfully neglect the learning of innovation theory in general, this body of literature serves as a theoretical – and some cases empirical – foundation for the following assertions of this thesis. However, as the Foucaultian framework of the thesis is meant to exceed the assumptions of existing theory, the reviewed literature likewise serve as our main points of criticism.

Thus, several authors have opted to employ variations of the theoretical approaches denounced above. For instance, Magnusson et al. (2008) conducted an analysis which concluded that “[...] The position of incumbent car manufacturers as systems integrators, building upon deep knowledge in mechanical engineering and combustion engine technology, has remained unchallenged during several decades. However, the development and manufacturing of hybrid-electric vehicles builds upon a different set of technological capabilities” (ibid.:22). The study of Magnusson et al. then shows that “[...] only the firms who had sufficient technological capabilities were able to respond to technical problems that were discovered in the field” (ibid.:23). This conclusion is very reminiscent to that of Dyerson et al. (2005), whose central thesis is [...] that disruption may open the automotive market to new entrants but only if they collaborate with incumbent automobile manufacturers. This appears to support Schumpeter’s argument that large incumbent firms possess innovation advantages over the small entrepreneurial entrant [Schumpeter Mark II, eds.]” (ibid.:391). Evidently, both studies subscribe to traditional notions of technological innovations as disruptively emerging from the outside environment of incumbent firms, and that the evolution of technologies and firms are path dependent or path disruptive, thus presumably evolving in waves as previously described. Nonetheless, both studies seem to take the lineage of AFVs out of the equation by simply presupposing that the most recent type of AFVs, which is the object of their analysis, is as likely to succeed as its predecessors. Little thought is given to the incentivising rationales of business managers in automotive companies, i.e. the authors’ reflections on the subject of what influences innovators are if anything implicit. Additionally, in the view of this thesis, the AFV does not serve as a technological disruption by default, mainly because AFVs have not yet won significant market shares from ICE-vehicles. Hereby one can ask how disruptive the AFV-technology really is. Rather, it seems that it was initially the ICE-powered vehicles that were disruptive, and that the PLC/ILC of this innovation has stretched until present day and is now at worst in recession, cf. the notions of s- and bell-shaped curves.

To expand the employment and criticism of traditional theory, we identify that some authors – admittedly with other empirical cases than AFVs – have proposed theories that build on the above notions of industry incumbents as retaining a key position in technology- or industry platforms (Cusumano & Gawer 2002; Gawer & Cusumano 2002, 2008; Christensen 2010). In our case, employing such an analysis would amount to the assertion that the hitherto failure of EVs and AFVs owes to the fact that its competitors, i.e. the manufacturers of ICE-vehicle, have succeeded in supporting and establishing a shared platform between the preferred available technologies, consumers, and complementary technologies and products. The strength of such a platform is exemplified by its resemblance to an ecosystem, where multiple different providers of different products and services from different industries are joined in a commercial symbiosis to serve a common consumer (ibid.). According to this theory, the aim for any company is thus to become a “platform leader”, i.e. the company with most suppliers of complementary products and services. The position of being a platform leader then amounts to an increase in the likelihood of creating industry standards, e.g. a new type of AFV, and thus the position “[...] can greatly increase the value of [the companies’, eds.] innovations as more users adopt the platform and its complements” (Gawer & Cusumano 2008:28). An example of such an industry platform is the symbiosis that exists between outlets that distribute gasoline and the ICE-vehicles that consume the gasoline. This platform joins together manufacturers of cars, providers of complementaries and services to these ICE-vehicles, expropriators of crude oil, their subdivisions which produce and distribute gasoline, and of course the all-common consumer: the car owner. Viewing EVs and AFVs in the light of this theory, it becomes clear that where these vehicles have failed is in the establishment of a product and industry platform and the “election” of a platform leader, i.e. a company with widespread commercial success (ibid.). However fitting for the case of EVs and AFVs, employers of this theory will nonetheless come to neglect the origin of the desire behind the consumption that connects companies to a product or industry platform, i.e. what made the establishment of a gasoline platform possible, and why does it seem so difficult for the AFVs of today to support and establish a matching platform? Thus, in a somewhat different – but no less related – vein, Struben et al. (2007) investigated the consumer threshold for adopting alternative technologies, which originated from a description of a dynamic model of the diffusion of and competition among alternative fuel vehicles. Quite remarkably, the conclusions from these authors are in some aspects very reminiscent of the conclusion above, which highlight why the first wave of EVs failed in conquering the automotive market: “Current AFVs are expensive and offer lower performance relative to

ICE; many AFV technologies are not yet commercially available [...] Though AFVs undoubtedly would improve with scale, R&D and experience, these innovation drivers remain weak as long as there is substantial uncertainty and limited adoption” (ibid.:31). This conclusion could provide an answer to why AFVs are not the incumbent technological standard of the automotive industry and why no providers of AFV technologies retain an industry platform leadership. However, in our view, this is an oversimplified and insufficient answer that is too narrowly focused in the sense that it only examines the conditions and processes that are internal to the automotive industries and markets, i.e. it is predominantly economically focused.

In summation, we do effectively see that the focus of all the above examples of recent innovation theory is predominantly put on the internal dynamics and processes of the industries that are subject to analysis. Regardless of their accuracy in describing innovations, these theories – in our view – fail to convey an overall understanding of why AFVs hitherto have failed and why they are nevertheless continuously realised as innovations. Thus, without neglecting the valuable contribution that these theories provide to the understanding of innovations, we still believe that scholars, who intend to or who already have employed the traditional innovation theories on the case at hand, conduct their analyses on a theoretical level that we in this thesis perceive as insufficient and unsatisfactory for understanding the origin of (AFV) innovations. What we institute a search for is thus a theory that does not seem to deal loosely with – or even neglect – the origin of innovations, but we seek a theory which broadens the scope of analysis and which can hereby reveal significant aspects of the development of the need for a given innovation.

2.3.4 The Common Knowledge of a Common Future

This section features our contributions to the theoretical frameworks outlined above by adding the previously employed framework based on the work of Foucault to the assertions of contemporary innovational theory. As with previous cases, we – on the most basic level – intend to elaborate on the assertions made by traditional innovation theory frameworks by pointing to how numerous statements in the discourses of society can analytically reveal the origins of innovation.

In relation to the present case, the early wave of EVs is already ascribed to abide by the discourses that were also swaying innovators at the time of Tietgen, the telegraph, the expansion of nations, and Railroadization. Therefore, the present analysis limits its focus to only include the Foucaultian implications on the case of AFVs from 1950 onwards. Subsequently, we identify the fact that various air pollution studies were conducted during the

1950's, which attributed significant portions of air pollution to the ICE-vehicles. As these studies concluded that air pollution poses a significant risk to public health, the studies are in fact the first indicators of a discursive change, which ultimately is also the main reason for our analytical limitation. To clarify, the accumulated knowledge “supporting” the innovation of AFVs from the 1950's till the present seems to render it much more likely that AFVs in present time will result in widespread commercial success as compared to previous AFV-innovations. Throughout this section, we will continuously elaborate on this assertion. Accordingly, the contention follows that the environmental studies conducted from the 1950's till present day can be analysed as discursive statements, which also entails that discursive archives exist, and that these archives are determinant of human cognition in the relation to and in direction of action against air pollution, the ensuing climate changes, and diminishing of both through modification of the factors that create these negative side effects of consumption, i.e. ICE-vehicles. Additionally, our argument is that these environmental studies are substantial statements, which – due to their scientific nature – are identical to the Foucaultian idea of *connaissance*. In relation to the case at hand, enormous amounts of scientific knowledge has thus from the 1950's onwards supplied strong argumentation that AFVs are both prudent and urgently needed, because car emission-induced health problems and climate changes are deemed as (scientifically) real, omnipresent, and potentially annihilating. We will summarise the conclusions of these environmental studies by referring to a 1992 report from the World Health Organisation, which opened with the conclusion that “Since the 1960's, the world's motor vehicle fleet has been growing faster than its population. The problems [of air pollution, eds.] are acute in certain cities in both the developing and the industrialized world and unless controls are applied or strengthened immediately the damage to public health will become very serious” (WHO and ECOTOX 1992:1). Thus, environmentally harmful emissions from car exhaust have been highlighted as the prime factor in the deterioration of the global air quality, whereby the urgency and prudence of AFVs is scientifically and politically solidified.

Interestingly, however, all of these studies, which convey a certain scientific knowledge (*connaissance*) to various spheres of society, have not yet fostered any significant change in the consumption of the general public, which would logically have been evident in a widespread commercial success of AFVs and the abandonment of all greenhouse gas-emitting ICE-technologies. To us, this fuels the contention that scientific knowledge (*connaissance*) is a “sub-knowledge”, which is contained in the larger knowledge pool that in effect governs the majority of human cognition, speech, and action, i.e. the unscientific *savoir*

is superior in governing humans, and *connaissance* seems a mere supplement in the creation of the statements and archives that will eventually make up a discourse. Logically, then, every case of a discourse analysis will have to abide by this condition, and thus, we additionally put forward the claim that because the logic of *connaissance* has not in itself swayed the general public to abandon ICE-technologies – although being threatened with global annihilation – then influencing a change in the *savoir* of all discourses and all individuals is in fact what is practically needed to influence a crucial change in cognition, speech, and action, and thereby a change in world view, preferences, and consumption. Methodologically, however, providing irrevocable proof of the influence of this unscientific knowledge would lead to an orthodox employment of Foucault’s methodology, which is clearly beyond the scope of this thesis (op.cit.:37-38). However, the outrageous absence of rationality that effectively has led to the hitherto disappointing sales of AFVs is – for us – sufficient evidence that *connaissance* in this case has had to give way to *savoir*-influenced arguments that work against investments in AFVs, and thus the common knowledge that governs consumer preferences, whether these accrue from habits, intuition, or everyday influences such as informal conversation or media input, has hitherto obstructed the widespread success of AFVs. Admittedly, we do see an increase in environmentally friendly consumption, such as organic goods or goods that require less resources to produce or consume, and although this does signify a change in environmental awareness, the hitherto change towards environmentally friendly consumption remains outrageously and incomprehensibly small in our view, as compared to the evidence provided by the world’s accumulated scientific knowledge.

Thus, we are left with the fact that *savoir* is the most crucial part in relation to employing the present framework to the analysis of innovation opportunities, cf. Muhammad Yunus created his business partially by circumventing the *connaissance*-induced notions of how to manage a bank; and Tietgen was spurred on by an expansive, explorative *Zeitgeist*. Hence, if we can identify a dawning change in the *savoir* of the climate change-discourse, we should logically also see the dawning of AFVs being consumed on the largest possible scale. Empirically, and in support of this notion, we thus recognise that as scientific knowledge continuously have proven low air quality to affect public health and the climate, the political sphere in various countries have also become increasingly preoccupied with finding an alternative to ICE-technologies. Evidently, politics predominantly amount to *savoir*-statements of what is ideologically good for society, and in support of our argument, politics has also continuously employed scientific knowledge to gain argumentative leverage, thus subordinating science under the cloak of common knowledge. Subsequently, from a

governmental side “controls” have continuously also been “applied”, as stressed by WHO above, and many environmental acts have – or have not – been ratified over the years. Again, in a summarising fashion, we refer to the United Nation’s Kyoto Protocol of 1997 (WEB14) as a primer for the environmental acts that have been ratified due to the accumulated knowledge of decreasing climate conditions. After almost 50 years of accumulating knowledge of climate changes and its devastating potential, this protocol committed 37 industrialised countries to secure a reduction of four greenhouse gases for the betterment of the global environment, and thus, the protocol had far-reaching effects on various national environment policies, which in return came to affect a wide range of industries, markets, and the possibilities for innovation all over the world. Noticeably, then, the discursive causality, we are dealing with here entails that the knowledge of science (*connaissance*) come to influence the political discourse, but it is subsequently a practical – and possibly a long-term – matter, whether this influence will manifest itself as a genuine change in the unscientific ideologies of modern politics and in the world view of the general public (*savoir*). In accordance with the present framework, it is our contention that it is possible to identify whether the abovementioned changes in fact have occurred, or if they will occur in the future. What we institute a search for is thus evidence of changes in the archives, which are created by hitherto accumulated knowledge, and changes in this knowledge base that – when looking forward – will govern the knowledge creation and accumulation, which will manifest itself as new statements in the discourses of the future. Thus, if the influence of the ecological and sustainable message has in fact created a change, we will subsequently see a reaction or adjustment in the statements that are based on the accumulated knowledge of wider society and the private sphere, the latter of which will find itself forced to adapt to both changes in institutional regulation and to changes in consumer preferences, which are altered by the knowledge that is conveyed by the dispersion of knowledge on ecology, sustainability etc. However, it is still crucial to recognise that *connaissance* has not yet manifested a substantial change in *savoir* in general, but continuously, certain spheres of society are seemingly seeking to actively influence the archives of the climate change discourse by “uttering” *connaissance*-statements that might lead to the – by AFV producers – coveted change.

Sociologically, the notions of man-made environmental dangers that affect the everyday life of virtually every corner of world society owe a great deal to the seminal work of Ulrik Beck (born 1944), who introduced the notion of “The Risk Society” in his book *Risikogesellschaft – Auf dem Weg in eine andere Moderne* (1986, Eng. *The Risk Society: Towards a New Modernity* 1992). A core-notion in Beck’s theory is that risk is a harmful bi-

product of the successes of humanity. “Harmful”, however, is to a large extent an understatement, as Beck states that “A confirmation of the danger would mean irreversible self-annihilation, and this is the argument that actively transforms the projected threat into a concrete one” (Beck 1992:52). Thus, the perceived dangers in society – such as climate changes induced by car emission – constitute a real risk, whereby societies in a very real way has come to appreciate and experience the negative side-effects of human and technological achievements since industrialism, i.e. there is a sociological lineage to be traced from EVs to AFVs by virtue of the notions of man-made risk that have risen in society throughout industrialism. To Beck, contemporary society is thus characterised by an obvious consensus regarding the reality of risk, which has marked a historical transformation towards a new global state of mind. This global state of mind is referred to as reflexive modernisation (ibid.). Beck’s notions of risk and reflexive modernisation likewise function as statements, which have evoked widespread attention to the dangers of environmentally harmful actions. Thus, Risk Society’s emphasis on the consequences of industrialisation’s successes – rather than failures – and the accompanying risk draws attention towards the fact that climate changes are real and that it should be part of the world’s population’s conscience – or at least the Western world’s (ibid.).

For the benefit of the present analysis, it is identified that Beck’s theory provides significant empirical evidence that both support our contention that a discourse has risen around the notions of climate change and sustainability; but it also reveals the discursively inter-influencing potential of societal spheres, i.e. how science potentially can impregnate the political sphere with notions of sustainability, which in return can ratify policies that restrict the possibilities of the private sphere. These restrictions might possibly impregnate the general public with notions of what is viable investments and consumption, which again opens for the possibility of science to conduct new analysis and for companies to adjust its production and supply to consumers. However, this causality between discursive influences is hitherto only a utopian example of how things could have been. At best, the causal process outlined above has only reached the point where some businesses change mainly due to legislative restrictions or stakeholder pressure, and some consumers opt to change their habits of consumption at the bidding of their conscience. The reason for this slow transformation is as mentioned that the climate change discourse – like any other discourse – is predominantly influenced by *savoir*, i.e. what humans already know, and scientific knowledge only account for a fraction of this common knowledge, i.e. *connaissance* is only contained in and conveniently employed by *savoir*. Thus, when Beck (sociological science) contends that the

world's population (general public) is constantly exposed to news stories concerning everything from dioxin in oysters to CO₂-emissions and from pesticides in the drinking water to global temperature increase (Rasborg 2005), each of these news streams are – in accordance with our framework – a small part of the accumulated discourse of individual statements that abide by the governing rules of discursive archives, i.e. what can be said, thought, and done in accordance to the subject at hand. Thus, regardless of the causality between *connaissance* and *savoir*, the discourse is still not swaying humans in the direction that render AFVs a sound investment. Increases, however, in the mass-mediated statements on this particular subject – which are partially made of and in effect also affect the *savoir* of the general public – could gradually evoke an increased attention towards climate changes within the world's population, whereby the political, scientific, and private sphere must adjust to or seek to influence this dynamic discourse in order to effectively govern, theorise upon, or produce and sell their products and services. In this sense, it is possible to recognise statements of *savoir* and *connaissance* respectively in all tangible examples where humans (re-)produce their knowledge, and from this identification, it is logically also possible to identify the “tipping point” of when AFVs becomes a preferred innovation by consumers. This analytical advantage in market insights is made possible by the fact that as the entire body of accumulated knowledge on the subject of environment and climate change is expanded and instated as a common reference point for the participants of the discourse, i.e. society, the archives – the governing rules of the discourse – are likewise changed in a specific manner. To clarify, every time the statements and archives are discursively activated by any actor in society and new knowledge is provided – whether it is *connaissance* or *savoir* – the archives are likewise influenced and possibly changed, whereby the restrictions on human cognition are additionally enforced. By this we mean that as the archives – the rules that govern cognition, speech, and action – become more rigid due to overall decrease in what constitutes a sensible notion, utterance, or options in the matter at hand, the freedom of action in relation to climate and sustainability issues likewise become more narrow. Therefore, if the discursive rules that effectively qualify participation in the climate change discourse are sufficiently solidified in the direction of e.g. Beck's notions of risk, then the entire climate change discourse will have no other conclusion than the all-common notion that AFVs is the only solution to the future of personal transportation. Evidently, we thus contend that the failure of solidifying the climate discourse in this manner is exactly what has kept AFVs from winning the market thus far.

We do, however, recognise that a solidification of the pro-AFV side of the discourse is steadily rising. Concordantly, influencing argumentation that might lead to changes in the *connaissance* and *savoir* of the discourse is readily identifiable in the rise of academic branches within economics, which focus on how to manage the environmental impact of industrial production and consumption. Concurrently, the discipline of corporate social responsibility (CSR) is perceived as being emergent during the same period as society became preoccupied with the negative side-effects of human living – circa 1950's. In support of this argument, Carroll (1999) states that “Formal writing on social responsibility [...] is largely a product of the 20th century, especially the past 50 years” (ibid.:268). Within this body of literature, we equally see evidence of the cross-influential powers of different types of knowledge. For instance, various authors acknowledge that as the dangers of climate change were made real by scientific prognoses, numerous regulatory policies were enforced upon the industries, which were to blame for the deteriorating climate conditions, and on the consumers who bought environmentally unfriendly products (Rugman & Verbeke 1998; Kolk & Pinkse 2005; Orsato 2006).

However, when empirically reviewing the success rate of AFVs, we argue that these vehicles since the 1950's have continuously failed simply because the discourse “supporting” this technology has not gained substantial support in society, i.e. AFVs may scientifically be very prudent, but the *savoir* of society is not yet persuasive enough to manifest as a change in the common knowledge that governs consumers' preferences. Much in line with the abovementioned notions of industry platforms and the assertions made by Struben et al. (2007), the discourse of eco-friendly personal transportation has not in its entirety succeeded in supplying persuasive argumentation for the view that the AFV is the technology of the future, neither in terms of technological performance features, price, accessibility, complementary products and services, nor environmental benefits. Thus, what has hitherto deterred consumers from investing in AFVs is obviously also discursively determined. Some evidence indicate that a potential uptake of clean fuel vehicles will depend upon many factors, but that a significant amount of these factors pertain the abovementioned arguments on convenience, price, driving range, etc. (Gould et al. 1998). Evidently, it was on the grounds of such arguments that the ICE-vehicles initially conquered the market over the EVs, because these factors will in the everyday life of ordinary people (i.e. *savoir*) amount to serve as the most persuasive statements of what is feasible, prudent, and logic – quite possibly because of the very tangible, short-term insights and effects that these factors offer. Hence, Gould et al. (1998) come to conclude that

There is some empirical evidence from our current research that opinions towards the EV could weaken over time. The analysis uncovered that, as people acquired more information about EVs from the *mass media* or from *conversation*, they also became less favourable about the clean fuel benefits. We speculate that this decline could be related to negative information in the media about vehicle range, or to stories about electricity generation and fuel source. A decline in public opinion is not favourable towards maintaining and generating support for new clean-fuel mandates (ibid.:167 – emphasis added).

The quote emphasises two pivotal aspects in relation to the points of this thesis. First, it is obvious in this quote that the attitude towards investing in AFVs – and thus its overall commercial success rate – is highly influenced by the overall debate on all subject related to climate change, sustainability, ecology, etc.. In short, the total amount of statements that possibly can affect the success rate of AFVs are virtually endless as new knowledge is constantly produced and dispersed by mass media and everyday conversation, thus shaping the future knowledge that could – or could not – support AFVs. Second, what ultimately will determine the commercial success rate of AFVs is whether a change in the attitude of the consumer will occur, i.e. what needs to be affected is not the scientific knowledge of society (*connaissance*), but it is irrevocably the much wider knowledge that determines most of our everyday decisions (*savoir*).

Empirically, and as previously stated, we observe that such a change is emerging and that the elements of the discourse in question are slowly but one-sidedly beginning to support AFVs. For instance, the most recent report from UN’s Intergovernmental Panel on Climate Change (IPCC), the so-called AR4-report from 2007, states that “Observational evidence from *all* continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases” (WEB15 – emphasis added). UN’s IPCC consists of who is considered as the leading experts on climate change, but regardless of whether the panel’s members are experts or not, i.e. whether their statements utters *connaissance*, *savoir*, or a mix of the two, the panel and its continuous publishing of reports on climate change generally experience a vast degree of legitimacy regarding their conclusions – thus supporting the viable notions of AFVs.

Evidence that further support our notion of the worldwide dispersion of the threat

from deteriorating climate, which in return support the viability of AFVs, can likewise be identified in statements such as Barack Obama's (born 1961) first speech on climate changes after becoming President Elect. Herein, he proclaims that "[...] few challenges facing America and the world are more urgent than combating climate change [...] my presidency will mark a new chapter on America's leadership on climate change [...] by establishing strong annual targets that sets us on a course to reduce emissions to the 1990's-level by 2020 and reduce them with additionally 80 % by 2050" (WEB16). Additionally, UN Secretary-General, Ban Ki-moon (born 1944), declared in a speech on climate change that "We cannot afford to ignore or underestimate this existential threat. Failure to combat climate change will increase poverty and hardship [...] That is why I have made climate change the priority of my mandate as Secretary-General, 2009 will be the year of climate change!" (WEB17). Thus, these political actors activate a scientific knowledge to convey a message of a certain knowledge that will supposedly influence the knowledge (*savoir*) of an enormous range of other actors throughout the world. But, as history has repeatedly shown, change is a slow process¹⁵. Further, our assertion of the dispersion and solidification of the discourse that will render AFVs a viable innovation in the future can be identified in the several hundred thousand individuals and the worldwide media attention that followed the conference, COP15, in Copenhagen from December 7th-18th 2009. COP15 succeeded the aforementioned Kyoto Protocol and was initiated in order to find a solution to how climate challenges can be met (WEB18). However, for reasons that exceed the scope of the present analysis, COP15 did not manage to realise its initial ambition of ratifying a successive commitment to the Kyoto Protocol (WEB19; WEB20; WEB21), but subsequently, the arguable failure of COP15 nonetheless serves as a collective of discursive statements, which all make up a fraction of the discourse of sustainability. The failure of COP15, practically also solidifies that *connaissance* is not prime in influencing a (discursive) change. Rather, the disappointing results of the conference is a testament to the fact that commonly human, but irrational behaviour, habits etc. are pivotal elements of restricted cognition, i.e. a testament to how *savoir* has immense influence over the archives that govern human thought, speech, and action. Regardless of failure, we can nonetheless effectively conclude that as COP15 revolves around how to solve the problem, and not whether the problem actually exists or not, the sustainability discourse that led to COP15 in the first place have become more solidified, and thus, the discourse

¹⁵ The failure of Obama's climate bill in the U.S. Senate is the latest example.

supporting the realisation of AFV innovations seems strengthened in recent years.

Ultimately, the above facts serve as proof that the reality of climate changes is no longer debatable, and hence it follows that the time is ripe for action in the form of altered patterns of consumption. Thus, although significant market barriers at present obstruct AFVs from revolutionising personal transportation for good, it is our firm belief that the discourse on the subject seems to increasingly move in a direction that renders the success of AFVs an inevitable reality in the future. It is equally evident to us that the possibility of a final market-conquering innovation of the AFV is created within the confines of a societal discourse, which is governed by the *savoir* of the political sphere, the corporate sphere and most importantly the private sphere, which includes the preferences of private consumers. Thus, what we achieve through looking at this particular innovation through the lens of the thesis' framework is the conclusion that an innovation is created on the grounds of certain convictions that exist in society. According to the theory, such convictions are discursively restricted, and thus, they are created from accumulated knowledge over time. Hence, we can conclude that innovations possess lineages, which can be uncovered analytically, and even further, as it is the case with our conclusion in this section, we not only account for the origin of an innovation, but the discursive analyses, which are employed in this thesis, can potentially also amount to a realistic forecast of the knowledge-influenced consumption preferences that will emerge in the future.

2.3.5 Preliminary Conclusions

In conclusion, the above sections have sought to contribute to the traditional innovational theories by expanding the analytical gaze that is put in a given innovation. If we had only employed the traditional economic/innovation frameworks, we believe that foretelling conclusions, such as the one at the end of this section, might be deemed as mere guesswork. By employing a Foucaultian framework, however, we achieve much more substantial argumentation for the previous failures of electric vehicles and the possible future success of latest wave of AFVs.

To summarise our conclusions, the commercial success of AFVs is hitherto absent – not because world society is lacking scientific evidence (*connaissance*) of the fact that the climate is rapidly deteriorating – but because the discursively accumulated knowledge (*savoir*) at present is not restricting the possibility of being unsustainable, i.e. the archives have not evolved into exclusively allowing sustainable cognition, however, it is our contention that such a cognitive evolvement is on the rise. To the point, the success of AFVs is being restrained because it is not part of the common consumer's cognition that all other

possibilities than driving an AFV is in fact unfeasible and illogic. This conclusion naturally also implies that alternative arguments have swayed the general public to continuously invest in ICE-vehicles – perhaps because of its convenience and the existence of an industry platform for this technology – and thus far, the automotive market remains focused on and controlled by ICE-vehicles. Noticeably, however, the discourse that works in support of AFVs is still very much active and it seems in later years to have gained renewed and unprecedented strength.

Thus, we have shown that by analysing the various statements that are discursively related to the innovation of AFVs, one could effectively create a conclusive forecast that discursively will reveal both the origin of AFVs as a successful innovation and whether or not this innovation is in a position to sustain its success. In relation to the present case of EVs and AFVs, it could however be argued that traditional innovation theory frameworks revolve around the same fundamental analytical objects as our analysis of statements, i.e. how the public perceives the accessibility, efficacy, price, performance features, etc. of an innovation. Regardless of similarities in analytical objects, we nonetheless believe that our Foucaultian framework has more analytical depth than traditional innovation frameworks, and that we more accurately show what is in fact desired by customers; the reason being that the analytical gaze in our framework is widened by notions of accumulated knowledge to diagnose contemporary societies, which is discursively conveyed between humans, which can be proven to encompass the notions of the prudence, urgency, and efficacy of any given innovation.

Hence, from these reflections on the analytical power of the present framework, we conclude that the successful innovation of AFVs is irrefutably different from the ancient EVs. It is not even similar to its predecessors, such as CitiCar, Ellert, or EV1, but these innovations are nonetheless connected by virtue of societal connotations – i.e. knowledge – of sustainable consumption and intermittently shifting notions of what constitutes a desirable product. The innovation of a successful AFV is presently only imminent, although we in recent years have seen numerous AFVs being invented, i.e. we are yet to experience the origin of the one, true successful AFV-innovation. However, if the analysis of this section holds any practical bearing – and we fervently believe that it does – then the time for AFV-innovation is impending, and a major commercial breakthrough for this technology should theoretically be imminent. Additionally, the long-term commercial success for this product likewise seems to be solidly secured, when compared to the dynamics of the knowledge, archives, and statements that presently constitute its supporting discourse.

2.4 The Common Denominators of Innovations

The present and last section of part 2 investigates and presents the generic conclusions that can be made from a comparative analysis of the thesis' three cases and their preliminary conclusions. Thus, the subsequent sections propose that our analyses have generated three significant insights in regards to our understanding of innovations, their origin, and the economic theorisation upon innovations. Accordingly, in the succeeding sections it is proposed that by employing the thesis' framework to the three cases in question, we have learned that: 1) economic and innovation theory has unmistakable insufficiencies in regards to the analysis of the origin of innovations, 2) the origin of innovations are governed by discursively accumulated knowledge, and 3) the origin of innovations – i.e. the need that ultimately necessitates an innovation – is exterior to the economy.

The first generic conclusion, we can extract from comparing the conclusions made in our three cases is that the thesis' framework has exposed analytical insufficiencies of economic and innovation theory in regards to the origin and adoption of innovations. For instance, in the case of microcredit the discourse analysis showed that it is possible – and possibly attractive – to target customers that within an exclusively economic framework are not subject for analysis or perceived as a potential customer segment. Additionally, the analysis of AFV's showed how the adoption of an innovation is governed by the discourses of contemporary society, and that the analytical distinction within discourses between *connaissance* and *savoir* explicates the insufficiencies of what Foucault terms “rule-governed knowledge”, i.e. *connaissance*, scientific knowledge, economic theory etc. Accordingly, the first generic conclusion is not that the thesis' framework can completely explain all aspects of what we have termed discursively accumulated knowledge (*savoir*), but the thesis does – by including the Foucaultian framework in the analysis of innovation – shed light upon aspects that in our view are significant, and that emphasise that the innovations in question are not – as economic theory generally stresses – odd cases. These innovations are merely the outcome of circumstances of contemporary society that are just as important and “real” as *connaissance*, but which are not as rational, logic, reliable or foreseeable as science. Additionally, this insight entails that in order to analyse what governs human cognition and therefore the foundation of innovations, the analytical scope needs to be expanded from the economic and psychological to include the sociological, as the latter partly contains analytical tools more capable of analysing the abovementioned circumstances of contemporary society than economics; and partly has an ontology that is directly observable to businesses in

contrast to the psychological ontology. Ultimately, the first generic conclusion also proposes the need to conduct further research within a broader analytical scope if we are to understand innovations and their origin more comprehensively.

The second generic conclusion that can be derived from the analyses concerns how discursively accumulated knowledge governs human cognition. As briefly dealt with above, this conclusion is an accentuation of how the cognition and behaviour of individuals are not quite as inexplicable if the discursively accumulated knowledge of the individual in question is part of the analysis. For instance, the analysis of C.F. Tietgen's telegraph showed that if we consider the discourses at the time of the innovation, the telegraph was arguably an obvious opportunity of that time's society and the imperialistic *Zeitgeist*. In this regard, our framework has through analyses explicated that innovations are the outcome of discursively accumulated knowledge. This does, however, not imply that the innovation in question was the only possibility of the time, but merely that the analysed innovation, e.g. the telegraph, was a practical exploitation of a technological possibility that was opened by the discourses of the time, and which – for reasons that are more sufficiently described in traditional innovation theory – was subsequently sustained as an industry standard for a limited time. Thus, in accordance with the first and second axiom of the thesis, it should be stressed that the innovational “solution” is contingent, i.e. the successful innovation succeeded in influencing the relevant discourses in a – for the originator – profitable direction.

The third generic insight on innovations, relates to the origin of innovations and more specifically where the needs and the opportunities for innovations reside. Accordingly, all of our analyses have explicated that an innovational opportunity by definition do not originate within the economy as innovations as a commodity is the solution or “answer” to a need or opportunity that resides beyond the economic system *per se*. In this sense, the conclusion corresponds to Karl Marx' (1818-1883) notion of commodity fetishism. To explicate, when analysing innovations, it should be acknowledged that the economy is a societal condition that is not directly connected to “the real world”, i.e. the economic system and therefore innovations are ultimately social relations that create a form of “fetishism” for a (constructed) commodity (Marx 1970, Vol. 1, Ch. 1). The pivotal aspect here is that innovations constitute the economic system's response to a circumstance residing beyond the economy. Thus, the circumstance, entity or what it might be that sparks an economic response in the shape of an innovation must reside outside the economic system, as the economy in itself can only spur profits or deficits. Additionally, this correlates with the thesis' second axiom, which basically entails that innovations like every other object are receptacles for human categorisation.

Eventually, innovations are human categories and therefore entities that can be manipulated in order to increase their attractiveness to customers, i.e. what is eventually perceived as an innovation is contingent. Hence, in the forthcoming operationalisation, this insight infers an emphasis on the economy as merely a tool – albeit the most efficient one – to obey and satisfy the opportunities that discourses create exterior to the economy¹⁶. Consequently, this implies that innovators should look beyond the economy when searching for innovational opportunities.

3.0 Part 3: Operationalisation

In the last part of the thesis, the ambition is to operationalise the common denominators of innovations and the insights we have gained from the thesis' analyses. Thus, in the subsequent sections, we seek to transform the analyses' conclusions into tangible recommendations in regards to how companies strategically can observe, understand and economically exploit innovations.

In order to enter the field of business strategy and the significance of innovation to strategy, a few prerequisites need to be acknowledged. Accordingly, the thesis' strategic recommendations subscribe to a very broad definition of strategy, which accentuates that strategy deals with “[...] how firms achieve and sustain competitive advantage” (Teece et al. 1997:509), and that “Strategy is not a detailed plan or program of instructions; it is a unifying theme that gives coherence and direction to the actions and decisions of an individual or organization” (Grant 2005:4). Thus, given that the thesis' field of study concerns innovations and how a more comprehensive understanding of innovations can contribute to companies' competitive performance, the operationalisation, i.e. our strategic recommendations, is a mindset (or “unifying theme”) on how companies strategically can improve their competitive advantage by expanding their understanding of innovations, their origin, competitive environment, and contemporary society.

In general, we propose that the thesis' framework, conclusions, and insights are valuable to business strategy because: 1) the framework improves our understanding of innovations and their origin, and that it is beyond dispute that innovations are significant in achieving and sustaining competitive advantages; and 2) the framework represents an approach and mindset that by virtue of its cross-disciplinary foundation provides a perspective that in theory improves the understanding of business environments and what

¹⁶ Obviously, the economy is a discourse, but it is not necessarily omnipresent.

governs the developments of such environments. In the succeeding sections, we conceptualise and elaborate this twofold argumentation.

3.1 Improving Innovativeness

As stressed repeatedly, the fundamental idea of the thesis' framework is that instead of analysing innovations as solely an economically, technologically or psychologically phenomena, innovations should be perceived as the outcome of the contemporary society in which they originated. Thus, analytically we have strived to change the ontology of innovations in order to improve our understanding of innovation. In regards to innovativeness, this entails two pivotal insights that constitute the foundation for our recommendations: 1) the origin of an innovation becomes directly observable, when the ontology is social rather than individual/psychological; and 2) by ascribing the origin of innovations to discourses exterior to the economy, we improve our understanding of innovations and hereby the general ability to locate opportunities for successful innovation. On the basis of these insights, we unfold our recommendations below.

3.1.1 Searching for Opportunities

The ambition in the present section is not to roll out Foucault's system of terminology, as practitioners probably would not benefit from sociological abstractions. Instead, the terminology and the thesis' framework and conclusions constitute a frame of reference to a much more straightforward presentation of our reflections and recommendations.

The point of departure for our recommendations is the alleged high failure rate of innovative companies within product development, and the immense investments these companies make in market research and knowledge management (e.g. Christensen & Raynor 2003, Harryson 2008, Leonard-Barton 1995). Accordingly, with the thesis as our argumentative foundation, we propose that companies have the opportunity to improve their market research, product development and hereby innovativeness by employing the mindset presented below.

Firstly, the mindset stresses that a broader scope of sources of information and knowledge are included in the market research and that innovators, business developers, market researchers etc. are more reflexive when assessing the collected information. In this regard, we subscribe to the assertion made by Christensen & Raynor that

Companies that target their products at the *circumstances* in which customers find themselves, rather than at the *customers* themselves, are

those that can launch predictably successful products. Put another way, the critical unit of analysis is the *circumstance* and *not the customer* (2003:75).

Hence, what we aim at is a mindset that improves the understanding of the customers' circumstances (i.e. the discursive knowledge that governs their actions), which we – on the basis of the explanatory power we demonstrated in the analyses – contend can be achieved by distinguishing between *savoir* and *connaissance*. Thus, our overall approach has the same point of departure as Christensen & Raynor, but differs when Christensen & Raynor states “The way to get as close as possible to this target is to develop hypotheses by carefully *observing* what people seem to be trying to achieve for themselves and then to ask them about it” (2003:79). Contrary to this, our approach stresses that instead of focusing primarily on the individual, the emphasis should be on the discourses the customers are part of. Thus, we agree to the notion that the customers' circumstances are the pivotal aspects in regards to targeting innovations and improve product development, but we propose a different approach to assessing, analysing, and understanding the circumstances. Accordingly, our approach proposes discourse analysis as the prime analytical tool to assess customers' circumstances, which ultimately entails that the irrational, illogical, inexplicable etc. aspects that distinguish *savoir* from *connaissance* should be included when analysing the preferences of – i.e. what governs the behaviour of – the individual customer. For instance, it may prove valuable to squint at cultural indicators that are neither as quickly evolving nor objective as respectively mass media and scientific breakthroughs, e.g. contemporary literature, visual arts etc. Additionally, when assessing the innovation-revealing circumstances it is pivotal not to be prejudiced with a conviction of right and wrong, or progress and regress. Thus, as stressed by Foucault none of what we take for granted or develop should be perceived as the most desirable, enlightened or civilised outcome (Villadsen 2006), which entails that when we innovate, we need a level of reflections as the “realities” of the different customers differ. For instance, some customers may live primarily by the reality of the mass media (Luhmann 2002), some by religion, while others primarily lives in accordance to science etc. The pivotal aspect is, however, that a broad scope of these determinants of life is included when approaching the customer segments' circumstances and that an existing heterogeneity between these is acknowledged. Consequently, we stress that this can be achieved by utilising the distinction between *savoir* and *connaissance*, and by perceiving your customers as part of discourses. Having explained the former, the latter is elaborated below.

Thus, our mindset does secondly prescribe that to improve our understanding of the customers, the customers should be analysed as part of discourses. Accordingly, the idea to include additional sources of information to an already extensive information base may seem bewildering to practitioners, which eventually is difficult to refute. However, we propose that by perceiving the customers as part of discourses, whose accumulated knowledge governs the customers' behaviour, the market researchers, product and business developers etc. can obtain a tool for both organising the already collected information, and guiding the gathering of information in the future. Hence, we contend that if market information and the gathering hereof is founded on a discursive mindset then the practitioners can in fact improve their understanding of the customers' circumstances and hereby increase the success rate of product development¹⁷. In order to achieve this, we argue that practitioners can learn from Foucault's notion of statements and archives. Thus, when assessing market information as a part of a discourse, it should be acknowledged that what appears as information is a function of underlying rules that especially restrict the discursive development, but simultaneously create opportunities. To the point, there are reasons to why discourses (and markets) develop as they do, which can be disclosed if the market information is perceived as discursive statements that are governed by discursive archives. Ultimately, if the statements are efficiently used as the analytical object that can disclose the archives that determine what can be said and done within the discursive limits, then it is more likely that innovators and product developers can determine the possibilities and impossibilities within a specific group of customers' circumstances. For instance, if a product developer is introduced to a new technology by the R&D-department that either is superior to the existing technology or radically different, then the commercialisation should not be determined by technological difference or superiority, but whether the technology falls within the discursive limits of the desired customer group. Hence, the mindset behind statements and archives can improve our anticipation, but simultaneously the interdependence of statements and between statements and archives act as a guiding light to what is significant to the discourse and what is not. Additionally, the logic could be reversed, i.e. if previously unobserved statements are located they may explicate new rules of the discourse; this may then prove to be a hotbed for innovations, e.g. as exemplified by the case of climate discourse and AFV's. In the next

¹⁷ According to Leonard-Barton (1995) 46 % of all resources invested in product development is spent on either cancelled products or products that fail to yield adequate financial returns.

section, we turn to the climate discourse again; this time to explicate the innovation potential an that uneconomic perspective contains.

3.1.2 Exterior Needs – a Case Example

The ambition of the subsequent section is to exemplify our operationalised contention that human needs and the origin of innovation *a priori* are exterior to the economy. Our argument in this regard is that social problems (or challenges) possibly can spur successful innovations, as innovations developed on the basis of this contention *a priori* are aligned with the customers' circumstances. In continuation of this, we acknowledge that this is not a novelty to business development, innovations or product development in regards to the climate, social problems etc. (see e.g. Reinhardt 1999, Porter & Kramer 2006, Kolk & Pinkse 2005).

However, if we for instance quite naturally assume that solving global warming does not eliminate all of the world's problems, it must be assumed that innovational opportunities of similar character (and maybe proportions) will emerge, and it is our contention that by employing our framework such tendencies can be detected earlier than the lion's share of companies did in the case of the climate discourse. To explicate this, we briefly take a look at the development of CSR-theory and how the climate change has developed into being perceived as a hotbed for innovation.

As stated in the analysis of AFVs, the first scientific breakthroughs on global warming surfaced in the 1950's, while Carroll states "Formal writing on social responsibility [...] is largely a product of the 20th century, especially the past 50 years" (op.cit.:268), and Crane & Matten stresses that "Sustainability has become an increasingly common term in the rhetoric surrounding business ethics, and has been widely used by companies, governments, consultants, pressure groups, and academics alike" (Crane & Matten 2007:21). The above quotations are not included to indicate that there should be a significant level of causality between climate awareness and CSR-theory, as companies since the industrialisation generally have been engaged in some level of social activities ("early" examples includes C.F. Tietgen's completion of The Frederik's Church/"Marmorkirken" in Copenhagen and Carl Jacobsen (1842-1914) of Carlsberg donating his art collection to the Danish state and people). Instead, the quotes are included to emphasise that even though companies for a long time have been engaged in socially responsible activities, e.g. cultural-, climatic-, and social activities, the development towards a theoretical CSR-framework emphasising the innovation potential of global warming, poverty, famines etc. has been fluctuating and slow at best. Thus, companies have indeed been aware and acted upon a demand/expectation exterior to the economy, but have to a limited extent exploited the innovational and business developmental

opportunities these demands and expectations contain. An example is Milton Friedman's classic article *The Social Responsibility of Business is to Increase its Profits* (1970) where he sarcastically addresses whether a company has "[...] a 'social conscience' and takes seriously its responsibilities for providing employment, eliminating discrimination, avoiding pollution and whatever else may be the catchwords of the contemporary crop of reformers" (ibid.:1). Even though Friedman is not like the ordinary run of people, his article represents the dominating approach to (social) business at the time, and even more importantly he addresses how businesses have engaged in socially responsible business in the 1970's. Hence, companies' socially responsible activities from the 1970's until the late 1990's had either a glare of philanthropy or add-on to the core business (see also Porter & Kramer 2006, Djursø & Neergaard 2006, Roepstorff 2010). Accordingly, Porter & Kramer (2006) argue:

The fact is, the prevailing approaches to CSR are so fragmented and so disconnected from business and strategy as to obscure many of the greatest opportunities for companies to benefit society [...] While businesses have awakened to these risks they are much less clear on what to do about them. In fact, the most common corporate response has been neither strategic nor operational but cosmetic: public relations and media campaigns, the centrepieces of which are often glossy CSR reports that showcase companies' social and environmental good deeds (ibid.: 80-81)

However, as stated initially in the present section, awareness of social, climate etc. aspects at present is part of business strategy and has evolved into sources of innovations, which indicates that Porter & Kramer's argument at present should be solidified as self-evident. Thus, our argument concerns the somewhat fluctuating development of a mindset that perceives social and environmental problems/needs as a source of innovation. Accordingly, in the subsequent sections, we employ our framework to the above elaborated development of the CSR-theory and practice.

The above brief presentation of how companies have addressed and implemented social and climatic challenges and hereby needs into their core business functions as a powerful argument in regards to the thesis' conclusion that needs and opportunities, i.e. that the origin of innovation, is exterior to the economy. Additionally, the above exemplification has shown how economic and scientific reasoning throughout half a decade has been less efficient in

comprehending the full innovational potential of these uneconomic needs. Hence, the thesis' fundamental idea of economic theory's insufficiencies is here further underpinned, which leads us to how our framework could prove valuable in similar situations in the future.

Accordingly, it seems naïve to assume that discourses, which are similar to the climate discourse, the poverty discourse etc., albeit revolving around a different subject, should not surface in the future. In this regard, our framework in operationalised form may seem as an attractive instrument when companies decide the direction of their innovation strategy and business development. Thus, based on our conclusions it is our fervent contention that by utilising the strategic mindset we advocate for, companies can proactively handle the discursive developments, instead of being reactive as in the case of CSR. Hence, we propose that if companies back in the 1970's had assessed the institutional environment, i.e. discourses, with the mindset we proposed in the section "Searching for Opportunities", companies would have 1) been able to strategise more comprehensively as they would have a more thorough and confident understanding of the direction the discourses were headed, and 2) perceived these – external to the economy – needs as opportunities for innovations and business development, instead of institutional obstacles to conducting viable business, as in Friedman's case. To the point, in hindsight and through our framework the direction of the climate discourse does in no way appear as nonlinear as the business practice or the academic theorisation indicate. Furthermore, it is difficult to dispute the potential and – for some already experienced– success of clean tech¹⁸, which basically underpins the point.

The question that remains is how companies can operationalise the above. To address this question, we point to our framework's proposed ability to forecast the development of discourses, i.e. markets, competitive environments¹⁹, customers' circumstances etc., and the framework's ability to locate opportunities for, i.e. the origin of, innovations. In this regard, it should be emphasised that there are numerous discourses that should be taken into consideration, when searching for opportunities or trying to forecasting market development. In this regard, we subscribe to Markides (1997) who argues that companies have, "[...] to decide three basic issues at the strategic level: *Who* is going to be our customer? *What* products or services should we offer the chosen customer? *How* should we offer these products or services cost efficiently?" (1997: 11). We contend that our framework can

¹⁸ From 2001 to 2008, the investments in clean tech in North America, Europe, Isreal, China and India rose from US\$ 506,800.000 to US\$ 8,414.300.000 (WEB22).

¹⁹ We return to the implications for diagnosis of competitive environment in the next section of the operationalisation.

contribute significantly to the process of answering these questions. Thus, by observing and analysing through our framework, we contend that practitioners can address the *who* by reassessing their customer base by innovating (by analysing the discourse) and by transforming neglected and unprofitable segments into cash cows (e.g. as demonstrated in the case of microcredit). They can address the *what*, by searching for innovation opportunities in otherwise ignored or neglected discourses (e.g. the AFV case), while the *how* is addressed through the above, because “What business a company believes it is in determines who it sees as its customers, its competitors, its competitive advantage, and so on” (ibid.:13-14). Summing up, we contend that our framework can contribute significantly to innovativeness and business strategy, as the framework supposedly can 1) locate new attractive customer segments; 2) locate innovation opportunities in the shape of (un)disclosed needs; and 3) contribute to the understanding of what direction the targeted customers’ and markets’ discourses are heading. The prerequisites for this are the assessment of the company’s contemporary society through the mindset of our framework, and that the idiosyncrasies of every company and customer segments are acknowledged, i.e. different companies and customer segments may be part of the same overarching global discourses, e.g. climate discourse, but beneath these, other discourses influence consumer knowledge and preferences, and beneath these others influence, and so on. Hence, practitioners need to be aware of this, but dependent on what business their in, they can emphasise some discourses and neglect others when approaching the discursively accumulated knowledge that governs the cognition of their customers.

3.2 Diagnosing and Forecasting the Business Environment for Strategising

As mentioned initially in the thesis’ operationalisation, and briefly touched upon in the previous section, the second contribution to business strategy that can be extracted from our framework and conclusions is an improved understanding of a company’s competitive environment and the mechanisms that determines its development.

Strategy is often perceived as a process where companies strive to adapt to or shape its environment in order to reach its goals. Accordingly, the companies’ industry and environment is significant to strategising (Porter 1980, Håkansson & Snehota 1989), while Mintzberg & Waters (1985) as a result of this distinguish between “deliberate” and “emergent” strategies, by which they emphasise that the social environment and competitive environment always influence the realised strategy. Thus, in the strategy process, it must by all accounts be advantageous to have an understanding as thorough and comprehensive as

possible of what factors, mechanisms, institutional circumstances, *Zeitgeist* etc. may influence business strategy when realised. Once again, we point to our framework as a valuable tool in improving the understanding of contemporary society, which we addressed above, but more importantly, we want to emphasise how our framework may add to companies' assessment of whether they should adapt to or try to shape their environment.

The thesis' first axiom addresses the restrictive character of discourses, and how a limited number of discursive opportunities are made possible by the *savoir* of the discourse. Having demonstrated the argumentative power of our notion in regards to innovations, this fundamentally Foucaultian idea, can prove valuable to business strategy. Thus, presuming that a company has acted in accordance to our recommendations and conducted the necessary discourse analysis and hereby assessed the discursively accumulated knowledge and disclosed the discourses' archives, the decision maker is presented to a number of options and restrictions. These restrictions can be excluded from the basis for decisions, while the opportunities that analytically appear can be divided into two categories: adapting or shaping. Hence, discourses do not restrict in an absolute sense; instead, it is up to the individual company to strategically choose what opportunity they want to pursue, e.g. should the company choose the adaptive opportunity that might contradict their core competencies and entails the development of new competences (e.g. a merger or acquisition) because other companies have chosen that direction; or should they – based on their core competencies – choose the shaping opportunity, and seek to enforce their competitors to develop new competencies. Ultimately, it comes down to the discursively accumulated knowledge and the archives, what opportunity sustains the long term development, but as emphasised several times, it may not be the most desirable, enlightened or civilised outcome that succeed, which – as in the case of Great Northern Telegraph Company, Thomas Jefferson, the market for transportation, microcredit, or QWERTY – is why companies should act proactively within the discursive restrictions in regards to shaping the discourse to their advantage by introducing the innovation that the company in question located the opportunity for.

4.0 Conclusion

Throughout the present thesis' theoretical, analytical and empirical investigation of innovation both as a concept and a commercialised invention, it has surfaced that innovations generally are the outcome of their contemporary society. Concordantly, we believe that the thesis contributes with a perspective on innovations and their origin that significantly differs from existing knowledge on the field, and that we hereby have obtained new knowledge on an

aspect that undoubtedly is essential to companies' performance. Thus, we propose that both the tangible business recommendations made in the present thesis, and the foundation that our framework creates for companies to improve innovativeness, market insights, and strategising, ultimately contribute to how companies can improve their performance.

Naturally, these conclusions and propositions are based on the insights that the thesis' analyses have provided, but given the character of our analytical framework, research design, and empirical foundation, it is imperative to make a reservation in regards to these insights and conclusions. Thus, as touched upon in the section on "Methodological Remarks", we acknowledge that we methodologically and empirically take some liberties in order to prove our point. Overall, this correlates with the analytical strategy we presented and the ambition to question theoretical presuppositions, but it does not entail that we exhaustively describe and analyse innovations. Hence, as potent as we believe our perspective and contribution to be, we need to emphasise that we do not propose or believe that the present thesis in an absolute sense has uncovered the characteristics of innovations completely. Instead, we propose and believe that our framework and analyses have pinpointed insufficiencies of the present theorisation upon and understanding of innovations; insufficiencies and black boxes, which can be examined by including additional perspectives as demonstrated in our analyses. On the basis of this, we propose that the thesis' conclusions can contribute to companies' ability to be innovative and hereby improve performance.

In summation of traditional innovation theory, i.e. the thesis' economic pillar, our review enables us to extract key insights, which consequently reveal an explanatory gap in relation to obtaining a satisfactory understanding of the origin of innovations. Thus, it has continuously been shown throughout the thesis that the following theoretical blind alleys – in our view – must be uncovered for the betterment of the general comprehension of innovations:

Firstly, we have identified that the presumably most pivotal contribution to existing innovation literature, i.e. the work of Schumpeter, subscribes to the notion of a superhumanly gifted entrepreneur as the source of innovations. On this theoretical basis, we feel left with an impression that innovations enigmatically origin in the minds of a few "chosen" individuals. However, as science retains no conclusive insight into the mind of the individual, the Schumpeterian contribution to innovation theory – as opposed to our view – becomes a disincentivising testament to the fact that innovative talent is an extremely scarce resource in society.

Secondly, we have shown that many scholars have opted to treat the enigmatic Schumpeterian entrepreneur as a theoretical abstraction – and as a given. This has led to the emergence of distinct, but often interrelated, branches in economic innovation theory – none of which can be said to provide a satisfactory account of the origin of innovations. To clarify, one branch limits its focus to the evolutionary characteristics of specific innovations, i.e. the cultivation of technological features of innovations through the management of processes that are internal or external to the company. Another branch's limited focus is put on how industrial settings can be the occasion for innovation. A third branch focuses on how certain capabilities, assets, and relations, which contribute to a company's innovative effort, can be managed. And lastly, the thesis has uncovered a branch, which – in the spirit of Schumpeter – focuses on, how scarce innovative talent can be managed. Commonly, however, we identify that all these types of theoretical contributions either take for granted the theoretical abstraction of the innovative individual or employ an analytical gaze that render the origin of an innovation an indispensable truism. In this sense, the origin of innovations is effectively black-boxed in existing theory, and this fact is what constitutes the explanatory gap, which we subsequently contend can be bridged by keen awareness of the above insufficiencies of existing innovation theories and by the inclusion of other branches of social science.

In order to address and investigate the identified explanatory gap of innovation theory, we have turned to the work of the Michel Foucault. Especially in *The Archaeology of Knowledge*, Foucault addresses how human cognition – and therefore innovativeness – is restricted by discourses and knowledge. Thus, by employing a Foucaultian analysis to the field of innovation, the primary research object is relocated from the human mind to the discourses of society, i.e. innovations theoretically become the outcome of discourses, because discursively accumulated knowledge is believed to determine human cognition. Thus, the conclusions derived from employing a Foucaultian framework effectively answers the question of how knowledge affect the innovativeness of humans. Eventually, however, the Foucaultian analysis likewise necessitates that we – in order to analyse the discourses and discursive limits to human cognition – distinguish between *connaissance* and *savoir*, as human cognition is not solely determined by the logic, rationality, scientific evidence etc. of *connaissance*. Conversely, we recognise that the irrational aspects of the *savoir* such as habits, culture, religion, tradition, convenience etc. are indisutably pivotal in governing human cognition and behaviour. Lastly, the notions of discursive statements and archives infer that we perceive discourses as being governed by certain knowledge-bound rules (archives) that governs what can be said and thought (statements). Through these notions, we

are able to provide arguably persuasive answers to the question of why knowledge affect the innovativeness of humans.

Having developed an analytical framework and strategy that addresses the explanatory gap identified in the review of innovation theory, part 2 employed the framework to three different cases, whose conclusions confirmed the conviction developed in part 1 of the thesis. Ultimately, the analyses of Tietgen, Yunus, and the market for alternatively fuelled vehicles lead us to conclude that 1) innovation theories do have explanatory insufficiencies in regards to where innovations originate; 2) innovations are the outcome of discursively accumulated knowledge in the broadest sense of the concept (*savoir*); and 3) the origin of innovation is exterior to the economy, because human needs ultimately are exterior to the economy, and human cognition is also limited by other discourses than the economic. Collectively, these three conclusion amount to the uncovering of why it is possible to enhance our general understanding of innovations and their origin by including a framework, which examines contemporary societies by analysing discursively accumulated knowledge. In this, we explicitly argue that the three cases we have analysed explicated that innovations emerge due to a range of factors, which have neither been included nor analysed sufficiently in traditional innovation theories. Thus, by employing our framework that, besides analysing specific innovations, also analyses their contemporary society, we have been able to question some of the presuppositions of traditional and current innovation theory, and point to otherwise overlooked aspects of innovations and their origin, which arguably enhances our overall understanding of innovations.

Academically, then, we believe that the present thesis constitute a valuable contribution to the field of innovation, which provocatively can be perceived as an alternative to the *exact economics* that the monumental Schumpeter advocated for. Because Schumpeter prescribed it differently, we promote an unbiased employment of diverging scientific disciplines, which we believe amount to a more pertinent and more pragmatic framework than what has hitherto been accomplished by innovation scholars. Thus, based on the thesis' analyses and conclusions, we propose that companies can improve their performance by employing our framework, because it increases our understanding of innovations and their origin, and that the framework contributes significantly to the understanding of companies' environment. Accordingly, we have presented tangible recommendations and demonstrated how companies may improve performance by creating a better foundation for strategising and innovation. In summation, two paramount contributions to the field of innovation have been made: 1) We have exemplified how companies can innovate more efficiently by assessing

their customers' circumstances more thoroughly through our framework; and 2) we have exemplified how companies by perceiving needs as exterior to the economy and as part of discourses create an opportunity to detect and forecast short- and long-term market developments (including customers' needs) in an earlier phase and arguably more precisely. Hereby, companies also create an opportunity in which it becomes a discursively restricted but contingent strategic choice whether to shape or adapt to their market and the competitive environment.

5.0 Literature

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