The Automatisation and Its Impact on the Swedish Labour Market

A Qualitative Study on how Automatisation within the Retail Market Contributes to the Job Polarisation in Sweden
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**Abstract**

The automatisation process that occurs within the Swedish retail market today is taking place at a higher rate than ever before. Previous research show how automatisation leads to both higher efficiency and productivity within the industry. Increasing numbers of stores are increasing their turnover and, as a result, higher demands are placed on the employees. A gap in the literature has been identified regarding how this technological development affects the job polarisation that takes place in Sweden. This thesis aims to explain the impact of the automatisation process on the Swedish labour market. The authors' theoretical position is intended to explain how automatisation forces employees to move from middle-wage occupations to either low- or high-wage occupations, and thus contributing to the job polarisation.

The empirical findings are based on five semi-constructed interviews with managers at FMCG stores in the Jönköping region, who are seen as key players in the subject being explored. Through the empirical findings, the authors were able to understand how technological developments affect the labour market in the retail sector and later also the job polarisation. The results show that the automatisation affects the labour market to the extent that people move from middle-wage occupations to either low- or high-wage occupations and thus affect the job polarisation. On the other hand, the direct effects of automatisation were not as drastic as the authors had predicted in advance, mainly because of the strict laws and regulations in Sweden regarding termination of employee contracts.
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1. Introduction

This chapter introduces the subject of automatisation, a brief historical development of automatisation and its relation to the Swedish retail market and the job polarisation. This is followed by a problem formulation and the purpose of this exploration. Furthermore, this chapter will introduce the research question that the authors aim to answer as well as limitations.

1.1 Background

In the 1930s, in the article *Economic Possibilities for Our Grandchildren* (1930), the economist John Maynard Keynes suggested that the human society in the coming century could perform the total necessary work in agriculture and industry with only one fraction of the labour force that was required at the time. This phenomenon was referred to technological unemployment, something that Keynes described as a social disease, but would only mean a temporary mismatch between working duties and labour force.

Brynjolfsson and McAfee (2013) argue that technology that replaces human labour is not something new. In 1965, the political scientist and economist Herbert Simon predicted that "machines will be able, within twenty years, of doing any work a man can do" (Brynjolfsson & McAfee, 2013. p. 80). In other words, the discussion that technology replaces our jobs is not a new phenomenon. However, what is presented as a new argumentation in the debate is the rate of change. Digital technology is currently developing much faster than previous technological development since the power of data is growing exponentially (Brynjolfsson & McAfee, 2013).

As the technological development goes faster today than ever before, the issue of technological unemployment is still of high relevance. In 2013, a study at Oxford University was published which in detail reviewed the work of 702 US occupations and related these to developments in automatisation and robotisation. Based on this report, it is found that as much as 46 percent of all jobs will be replaced by digital and automated technology within 20 years (Frey & Osborne, 2013). In 2014, a similar survey in Sweden was conducted by Stefan Fölster, where one of the results was that Sweden is even more sensitive to automatisation than the US. A total of 53 percent of today’s employees are expected to be replaced by digital technology over the next two decades, versus 46 percent in the US. This means that 2.5 million jobs in Sweden are
affected. The difference is, among other things, that Sweden still has a higher percentage of routine jobs that can be automated when compared to the US (Fölster, 2014).

Automatisation is a multifaceted concept that is part of several research areas, and hence defined in several ways. In a broad perspective, the definition of automatisation means using machinery or other technology to allow processes to take place without human input or work (Rouse, 2011). According to Manyika, Chui, Miremadi, Bughin, George, Willmott and Dewhurst (2017, p. 3), “automation of activities can enable businesses to improve performance, by reducing errors and improving quality and speed, and in some cases achieving outcomes that go beyond human capabilities”. This definition is also the one that the authors will utilise throughout this thesis.

Industries with potential benefits in automatisation are industries that include low-skilled professions, often found as routine based occupations. In these cases, automatisation will lead to fewer errors within the production line, higher efficiency, higher quality, and lower product costs in the long run (Manyika et al. 2017). A good example of such an industry is the Swedish retail market, where many of the occupations nowadays are highly routine based. Routine based occupations are easy for robots and computers to take over and the professions in these areas therefore run the greatest risk of being automated in the future. The retail market in Sweden is an important industry in several ways. The physical retail market alone generated almost 655 billion SEK in 2016 (Andersson & Johansson, 2017) and employs over 250,000 employees in Sweden (Andersson, Kazemi & Wickelgren, 2016). Further, in Fölster’s (2014) forecast regarding the likelihood over what kind of occupations that will be automated in the next 20 years, it is projected that cashiers, which is considered to be a highly routine based occupation, run a 95.3 percent risk of being automated and that approximately 21,000 job opportunities in that particular sector will disappear in connection to this. This makes the Swedish retail industry a very interesting industry to explore, not least because many occupations within the industry, like cashiers, are routine intensive and thus highly sensitive to automatisation (Fölster, 2014).

Goos and Manning (2007) describe that routine intensive occupations are concentrated in the middle of the wage distribution. Furthermore, the authors explain that the lowest paid professions need a higher degree of non-routine manual skills while the highest paid professions of higher complexity require skills gained through, for example, a higher education level. During this thesis, the authors similar to scientists and researchers within the field, will treat
occupations within the retail industry as a routine based professions and these workers are therefore categorised in the middle of the wage distribution.

The labour market in Sweden has for a long period of time been characterised by an increase in high-wage occupations and a decrease in low-wage occupations. Analysis based on wage structure statistics however show that the trend has changed after the millennium into a polarised direction, which means that also the low-wage occupations have increased while the middle-wage occupations have decreased. This pattern does not differ from the reality in many other countries despite the relatively high payroll for low-wage occupations in Sweden. What has driven this development is a combination of factors that has affected different parts of the economy differently, for example the globalisation and mainly automatisation, which overall generated a job structure change into a polarised direction (Åberg, 2015).

While automatisation in industry has so far been made up of almost completely unintelligent machines, which can often be handled by a low-skilled worker, the technological change that is now taking place can affect the labour market in a much more dramatic way. Routine based middle-wage occupations that have been perceived as safe and reasonably well-paid are nowadays managed by machines. Left are highly specialised and well-paid occupations since the machines provide increased productivity and globalisation in turn provides larger markets, as well as simple service jobs with high competition which in turn squeeze down the wages of these jobs. Many occupations in the middle of the income distribution disappear throughout the whole western world. At the same time, many new jobs arise, and it is not obvious that employment and distribution are particularly affected in the end. In many ways we see how the highest wages or capital income rises, but at the same time we see that middle-wage jobs disappear (Kernen & Liss, 2016).

Emerging literature suggests that the pattern of what type of occupations that arise and what type of occupations that disappears has changed in recent decades. Increased digitalisation and automatisation have contributed to the fact that jobs generally disappear in the middle layer of the income distribution. This means that there is a polarisation of the labour market where jobs are created at the bottom and at the top of the income distribution but relatively few in the middle. This pattern has been noted in many developed countries (Goos & Manning, 2007). One reason why it is primarily the middle-wage jobs that disappear are that they are more routine-based, which means that it is relatively cost-effective to replace them with machines (Adermon & Gustavsson, 2015).
1.2 Problem
Since the phenomenon of automatisation and its relation to the job polarisation in Sweden has accelerated in recent years, the subject has also increased in terms of research. Literature shows that automatisation not only affects the productivity and efficiency of an industry but also that it has an impact on the labour market (Åberg, 2013; 2015); (Fölster, 2014). Although the topics of automatisation and job polarisation has previously been discussed between researchers and scientists, there is a gap in the research on how the automatisation affects the job polarisation. In addition, the authors have identified a gap in literature regarding how an increased productivity and efficiency in the Swedish retail market affects the labour market and thus also the job polarisation. This means that it is difficult for managers and employers within the industry to understand how to tackle the technological development, not only in terms of increased profits, but also with regard to the labour market.

1.3 Purpose
This thesis aims to provide insight in how the automatisation of the retail market contributes to the job polarisation in Sweden. While considering the previously identified effects of automatisation in terms of productivity and efficiency, the authors aims to explore additional effects on the labour market which has not been identified in previous literature. Hence, the purpose applies an exploratory approach. Furthermore, the authors aim to contribute to the ongoing discussion by adding the aspect on how the job polarisation is affected by the automatisation within the Swedish retail market. The authors will analyse and discuss the different causes and their relationships by answering the proposed research question in an attempt to explain this phenomenon.

1.4 Research Question
The purpose is narrowed down to this specific research question that will function as a guideline for this thesis. The authors aim to answer the research question mainly based on the gathered data from the literature review as well as the empirical findings, conducted through interviews with key players within the retail industry in the Jönköping region. The research question is therefore the following:

How does the automatisation of the Swedish retail market contribute to the job polarisation?
1.5 Limitations

In the discussions, the authors have chosen not to include any historical results of automatisation as one of the variables. This decision is based on the fact that major researchers within the subject have been clear that the automatisation we are seeing today is not similar to what we previously had. Fölster (2015) describes it as “one who looks at automatisation over the past two hundred years and extrapolates to the future, will end up really confused”. Small differences in the characteristics of different technologies can create very dissimilar consequences for people. The technology shift that we see today is totally different from the previous ones. This thesis will not explore or aim to derive a possible solution to the issue of job polarisation. The problem is vast and contains complex societal issues where more parameters are affecting the solution, not only automatisation.

Through this thesis, the new technology wave will be called automatisation, digitalisation, automation, or robotisation without distinguishing between the concepts. This is based on the fact that previously well-known authors of the subject, such as Stefan Fölster (2015), chose to treat the concepts in the same way.
2. Conceptual Framework

This chapter will explain the theories and concepts that lay the foundation of this thesis. These theories and concepts, developed by well-known social society scientists within the subject, made it possible for the authors to gather facts, analyse these and finally reach a conclusion.

2.1. Job Polarisation

Smart computer programs, mobile apps and robots change our lives and the structure of the labour market. In recent years, there has been a clear trend that the professions most vulnerable to competition from computers and robots are decreasing, while service and some more skilled professions grow. This is usually described as a job polarisation. The American economist David Autor (2010) describes several contributions to the phenomenon, which includes; routine tasks replaced by technological change, international trade and offshoring of goods and services, declining private sector labour union penetration and the falling real value of the minimum wage. Through this thesis, focus will be put only on the first concept, namely routine tasks replaced by technological change.

2.2 Skill-Biased Technological Change

Skill-Biased Technological Change (SBTC thereafter), means that the technical development benefits the highly qualified part of the labour force, which is generally characterised by its relatively high degree of human capital. Human capital is the level of education, skills and competences people have. The technology complements highly qualified workers by increasing productivity and thus demand for this part of the labour market in relation to workers with lower human capital (Tinbergen 1974). Traditionally, in the previous literature regarding this field, technological development is associated with improvements in the productivity, something that was beneficial for most workers. Nowadays, with the present literature in set, the notion of skill-bias has brought along the theoretical possibility that technological progress only will be beneficial for a certain group of workers. Hereby placing the technical change in the limelight of the polarisation debate (Violante, 2016).

2.3 Task-Biased Technological Change

A relatively new phenomenon that could not be satisfactorily explained in terms of skill bias was the increasing polarisation of the labour market during the 1990s in the US (Autor, Levy and Murnane, 2003). Autor et al. (2003) create from this an alternative framework in order to
understand developments in the labour market. In this model, the tasks determine the effect on employment. Hereafter, task-biased technological change will be referred to as TBTC.

Working tasks can broadly be divided into three main groups: abstract, routine and service. Service jobs are located far down on the wage scale and are difficult to automate. This is because people have so-called silent knowledge which means we can do more things than we think and can articulate (Autor, 2015). We can read both people and situations in a way that computers today cannot. Humans also have a review and a flexibility that allows us to adapt to changes during work processes. These things are examples of silent knowledge and are qualities that are often needed to perform simpler work but as robots and machines are not yet capable of. Higher paid occupations are also difficult to automate, but instead, these professions consist of abstract tasks that generally require broad knowledge combined with creativity and ability to vary. This is something computers today cannot do as effectively as a human being with high human capital (Adermon and Gustavsson, 2015). The professions where workers can be replaced successfully by machines are those who are highly routine, which means that the tasks performed are clearly structured and in a repetitive way. Routine work is something that computers handle in an efficient way and if the knowledge required to perform a task can be coded, a computer can often perform them faster and better than a human being regardless of the level of human capital. These types of professions are generally in the middle of the payroll and qualification scale, which means that when computers and robots replace routine based jobs, these occupations are mostly reduced in the middle of the payroll and qualification scale, which polarises the labour market.

Both of the theoretical concepts SBTC and TBTC are highly applicable to the Swedish retail labour market, as many of these jobs are highly routine based. This allows machines to easily and efficiently take over this type of occupations, which means that workers are forced to relocate or look for new jobs, either higher or lower down on the income scale, which in turn leads to a polarisation in the labour market.
3. Literature Review

In the following chapter, the authors will present and discuss the current literature within the field of research. This will be done in order to establish a frame of reference which will work as a foundation for the empirical research. The first part of the literature review will focus on automatisation and the retail market. The second section will focus on job polarisation, task- and skill-biased technological change.

3.1 General View of Automatisation

The overall discussion regarding automatisation and its impact on the working life focuses on how machines can replace human labour and capital in the future. Roine (2016) highlights the role of machines as a complementary rather than as a replacement of workers, stating that most machines and apparatuses cannot do anything at all if there are not controlled by human labour. Autor (2015) enhance this by arguing that the automatisation of a task is a supplementary which increases production and, in the long run, demand for labour. He believes that it is important to consider the value of the comparative advantage human labour brings in the form of problem solving, adaptability and creativity. Further, the professions in question contain tasks that cannot simply be replaced by computers or machines, although parts of the tasks may be substituted to streamline the productivity. Autor (2015) continues by explaining that journalists and experts tend to overestimate the extent to which people can be replaced by machines, and underestimate the complementary aspects automation generates for co-operation, in terms of productivity, wage increases and increased labour demand.

Moreover, as has been described in The Economist (2016), usually pessimists see the increasing automatisation as the end of human labour while optimists on the other hand refer to it as a job creation process. Further, Bessen (2016) claims that these fears are misplaced since the trends with automatisation is neither simple nor obvious. He presents the assumption that workers will receive greater employment opportunities if their working tasks undergoes some degree of automatisation as long as they can utilise the new tools. However, Bergström and Roine (2016) argue that just because a job or a certain task could be automated, does not necessarily mean it will be. If human labour is considered cheaper and could supply with values that machines cannot offer, then there will be an absence of change regardless if the technology is well-developed and suitable for the specific occupation.
3.2 The Automated Retail Market

Retail is an important link in the value chain from manufacturer to consumer. One problem that characterises the retail trade is that goods that are traded too slowly are destroyed (Broekmeulen & Donselaar, 2009). Competition in the retail trade has hardened, to a large extent due to the technological development. Therefore, focus has been on improving productivity and thus automating parts of the supply chain (Dubelaar, Bhargava & Ferrarin, 2002). For retail companies, it is a great danger not to adopt new technology solutions. If some players embrace the new technology while others do not, the risk is that they will fall behind. In turn, this may lead to a reduction of market shares and competitive advantages. An important point of view that Ellram, La Londe & Weber (1999) highlight is that it is essential to invest in the right technology, otherwise there may be huge costs for the stores (Ellram et al., 1999).

In 2016, Manyika et al., from the global management consulting firm McKinsey published an article describing the current situation in the labour market in the US and discusses the potential applications of automatisation. In the article the authors analyse and display figures on the potential possibility of an occupation being automatised in the coming years. As Fölster (2014) is discussing in his analysis of the Swedish labour market, McKinsey also draws the conclusion that middle-wage occupations are in the biggest risk zone. In the US, one third of the jobs across all sectors involves collecting and processing data, and according to McKinsey these sort of routine jobs have a 60 percent risk of being automated. Within these jobs, employees in the retail industry could face a difficult time ahead. The number of cashiers, a routine intensive occupation, has grown by 2 percent in the years 1980-2013, however, this will change due to the trends of automatisation. These roles have, according to McKinsey, a 73 percent risk of being negatively affected by the technological development in terms of number of employees. The risk of a job being removed is often due to the level of routine and if the environment is changing or constant. Frey and Osborne (2013) discuss this topic as well, and in the article from McKinsey, they imply that retail labour has these variables and is more susceptible to being automatised. However, the authors discuss the implication of automatising salespersons within the retail industry and provides evidence that it will be difficult to replace these roles. Salespersons can provide detailed and explicit offerings to different customers, changing the routine and constantly adapting to a dynamic environment.

The Swedish retail labour market is most likely to be affected more by technological change than other comparable countries, as Sweden still has relatively more routine intensive jobs that
can be automated (Blix, 2015). The fact that Sweden has a wage structure system which makes the lowest wages relatively high increases the incentives for replacing labour with robots. Other factors that may affect the rate of automatisation are an aging population and lack of skilled labour in certain areas (Blix, 2015). The effects of automatisation in Swedish professions in 2006-2011 corresponded to the expected rate of change, which means that if automatisation would continue at the same rate, it would generate 36-60 percent job losses in 20 years in Sweden (Fölster, 2014). A large part of the Swedish labour market is employed in the public sector, which means that rationalisation and efficiency through public sector can result in major changes (Schermer, 2018). According to Digitaliseringskommissionen (2015), some occupations will be automated, digitalised or executed by robots, providing better service at a lower cost, and releasing labour to other sectors that cannot be automated. Hence, contribute to the job polarisation. What is important to understand concerning the Swedish labour market is that it is heavily regulated and the employees are well protected against unexpected termination of contracts, referring to the employment protection act (Swedish: Lag om anställningsskydd), and it is present to protect the workers within the labour market (Government, 2016).

3.3 Polarisation of the Labour Market

In one of the most noted books regarding automatisation, The Second Machine Age, Erik Brynjolfsson and Andrew McAfee (2013) paint a rather depressed picture of a declining employment, stating that that we need to stimulate job creation to reduce the damage of automatisation. They describe how life appears to be brighter for a well-educated person whose income has increased on average in contrast to persons without post-secondary education. The authors’ assumptions find support in Stefan Fölster’s book Robotrevolutionen (2015), where he claims that the authors’ description could be strengthened from the overall effects on wage formation over the past 20 years caused by automatisation. According to Brynjolfsson and McAfee (2013), the overall pie of the economy is expanding, however, for the majority of people the effects of technological advances could be referred to as negatively correlated. Technological changes will have an increasing effect on individuals and organisations, changes that might give rise to a more polarised labour market. Both Brynjolfsson and McAfee (2013), and Fölster (2014), suggest the fact that income differentials appear to have increased in most countries and if this trend continues, then concerns should be raised. However, Bergström and Roine (2016) corresponds to this scepticism by referring to it as excessive alarmism. Stating that automatisation has not led to labour exclusion and that there is no clear link to the increased income disparities. Instead, their focus is based on the assumption that the increasing wages in
Sweden is evenly distributed and that these differences cannot be systematically connected to the extent a task could be automated. Yet, they do not rule out the circumstance that technological changes could be one of the major forces to explain the increased gaps in Sweden.

Several authors are describing a structural change in the labour market. Labour are nowadays moving in two different directions according to Autor and Dorn (2013). There is a growing trend where labour is moving away from middle-wage routine based occupations and these employees are moving towards low-wage service labour. Autor and Dorn (2013) describes the situation by explaining that the manual tasks of service jobs are not as susceptible to automatisation. This is because some of these jobs requires physical adaptability and a higher degree of flexibility. In correlation to this, Frey and Osborne (2013) and the article published by Manyika et al. (2017), are as previously mentioned discussing the adaptability of service occupations and the effect automatisation has on these sectors. Further, one occupation which is highly routine based and with clear guidelines on how to operate is the cashiers within the retail industry. According to Frey and Osborne (2013) and Fölster (2014) these jobs are considered highly susceptible to automatisation since self-checkout systems, auto orders and e-commerce has changed the current retail market.

The shift of labour force leads to a change in the landscape of the labour market. Employees moves towards either low-wage service occupations or high-wage cognitive labour. Goos and Manning (2007) describes the problem as well when they are discussing how automatisation is hollowing out middle-wage jobs. These middle-wage jobs, such as cashiers, are occupations that according to Goos and Manning (2007), will see an exponential decrease due to the increasing trend of automatisation.

In the report by Frey and Osborne (2013), they, as previous mentioned authors, are indicating an alarming pattern within the labour market. Their predictions regarding the future labour landscape shows a trend with growing employment in high- and low-wage occupations accompanied by a decline in middle-income jobs. In accordance, Autor (2010) presents evidence that the demand for work has been diminishing drastically for routine jobs regardless whether the specific task is cognitive or manual. Routine tasks as described by Autor (2010), are well defined job activities that can be carried out successfully by either a computer or, alternatively, by a relatively less-educated worker carrying out the job with minimal discretion. This collapse in demand for middle-income jobs leads to a polarised labour market, where the
current state of automatisation leads to elimination of a large amount of middle-wage jobs. In what several authors describe as a changing job structure where automatisation is considered one of the key forces behind this shift, Autor (2010) suggests that automatisation of routine work is one of the key contributors to polarisation of the labour market. Frey and Osborne (2013), discuss the broad consensus that computers are replacing workers in routine tasks, and it has driven the labour market into a more polarised state. Hence, like most other authors, they do not indeed exclude alternative explanations. Further, Bergström and Roine (2016), explains how technological developments have changed the composition of duties in a similar way throughout the US as well as Western Europe. The emergence of new jobs has grown largest at the bottom and the top of the wage distribution while at the same time middle-wage jobs have disappeared. For Sweden, however, this connection is not as obvious. Although job polarisation has been a circumstance, even in Sweden, wage spread has not increased as much as in the US (Bergström & Roine, 2016). In contrast, Åberg (2013) in the article Tjugohundratalets arbetsmarknad, presents his view over the Swedish labour market based on registry data derived from statistics over the Swedish wage structure (Swedish: Lönestrukturstatistiken). He argues, with support from the statistics, that the Swedish labour market since the start of the millennium has moved towards a more polarised direction. Like several authors within the field, Åberg (2013) claims that there has been a significant increase in the low-wage segment of occupations, a fact that could be outlined as a consequence of the strong technological progress hitting the labour market and especially the middle-wage occupations.

Further, according to Adermon and Gustavsson (2015), in their analysis over the developments of the Swedish labour market between the years 1975-2005, automatisation has led to a reduction in the middle-wage occupations. The authors highlight the question of how computerisation and robotisation affect the labour market, and how this phenomenon purportedly contributes to a polarised Swedish labour market. With regard to the study, between the years of 1975-2005, Sweden exhibited a pattern of job polarisation with growth in the high- and low-wage occupations in contrast to the decline in the middle-wage sector. Meanwhile, Beaudry, Green and Sand (2013) argues that the polarisation leads to that higher skilled employees are forced to take on lower skilled occupations, historically performed by low skilled labour. This change in occupations in turn leads to lower skilled labour moving further down the occupational ladder and in some cases, out of the labour force. However, Goldin and Katz (2009) argue that a reason for why the employment rate has prevailed so far, relates to the employees’ ability to adopt and acquire new skills through education. The level of education is
a subject frequently mentioned when discussing where the employees of these sectors will find new occupations.

3.4 SBTC and TBTC

A theoretical framework, created by Autor et al. (2003), offers a theoretical model of task-biased technological change. This model predicts a hollowing out of the middle-wage jobs because of the automatisation of repetitive cognitive and manual tasks. Furthermore, Goos and Manning (2007), among other authors, documented a job polarisation of employment opportunities across the United Kingdom, the US and the OECD. Autor and Dorn (2013), enhance the discussion by describing the critical role played by low-wage, low-skilled service occupation in the growth of employment opportunities.

Autor et al. (2003) find that the proportion of labour employed in professions with a high degree of non-routine tasks has increased dramatically in the US for a long period of time, in fact since the 1950s. The trend has tended to increase the demand for some skills that are complementary to the new technology, and have historically been present in the well-educated parts of the labour force. At the same time, it has reduced labour demand with less advanced skills and lower education, which could not benefit from the new technology in the same way. In 1999, Daron Acemoglu described the phenomenon of skill-biased technological change when he researched the role of rising supply of educated employees on job creation by skill. Models for the SBTC assume that technological development tends to benefit all workers with large human capital. The fact that this process dominated the development during a great part of the post-war period is hardly surprising to the most. More importantly is the fact the shift towards higher demand for analytical skills and well-trained labour not only took place between professions, but also within professions. In this new process, it seems that the content of the work, rather than formal education, is important. While some professions are complementary to the technological advances, parts of other professions can be more easily replaced by computers, despite high formal education. In such a process, technological development influences the demand for specific professions performing certain tasks, rather than all trained professionals. Therefore, this development has come to be referred to as task-biased technological change.

Per to the authors Berman, Bound and Machin (1998), SBTC “tends to increase the domestic supply of unskilled intensive goods by releasing less skilled labour”. In accordance with the existing literature, the authors propose reasons for the phenomenon of reduction of demand for
unskilled labour. As there are no clear consensus in the field, then their reasoning is based on the SBTC theory and the general belief that it should be considered as the principal denominator in the case of labour decline.

### 3.5 Automatisation of Cognitive Labour

The automatisation of cognitive labour is previously something which was not considered to be possible, but several highly cognitive occupations are now being transformed (Cohn, 2013). There has been a trend in cognitive occupations to move towards automatisation in the recent years. Several authors such as Cohn (2013); Markoff (2011); and Woolf (2010), describe the uses for automatisation in previously cognitive occupations such as education, healthcare and regulatory work. They argue that when automating these occupations they remove several human factors which affected the productivity and result. One of the main factors why some choose to automate cognitive labour is due to the removal of human biases. Automatisation and the technology behind can fulfil a range of tasks and is programmed to do it unbiased and efficient (Kahneman, Slovic & Tversky, 1982). In 2016, James Bessen wrote “Automation is not just for blue-collar workers anymore”, further emphasising that automatisation is no longer affecting only middle- and low-wage occupations. The Economist (2016) supported these ideas by writing “what determines vulnerability to automation is not so much whether the work is concerned manual or white collar, but whether or not it’s routine”. It is an interesting trend in the discussion regarding automatisation since it has during the recent years moved away from only concerning blue-collar jobs to include several types of occupations. In accordance, Jerry Kaplan (2015) suggests that “Automation is now blind to the colour of collar”, strengthening arguments made by other authors saying that automatisation is now becoming a concern for the many rather than just for the few.

A problem arising from this argumentation is discussed by Autor and Dorn (2013), as they are comparing the price of automatised technology and its capabilities. The authors are discussing the impact an expansion of capabilities in existing technology has on the wide range of low-wage service occupations. This is one of the sectors where job opportunities has expanded and it is threatened by technological advancement, where it previously was protected. Roine (2016) is mentioning this aspect and discusses the potential application. The author states that the new technology and its overall effect is hard to predict, since it both replaces certain tasks but at the same time supplementing others.
3.6 The Automatisation Paradox

As technology substitutes for labour, there is a destruction effect, requiring workers to reallocate their labour supply. On the other hand, there is the capitalisation effect, as more companies enter industries where productivity is relatively high, leading employment in those industries to expand (Frey & Osborne, 2013).

Fölster (2015) describes three reasons why new jobs has been created due to automatisation; 1) due to an overall increased income, 2) due to higher complexity, and 3) due to an increased amount of computer geniuses. However, Fölster explains that although the automatisation in recent years has led to the creation of a number of new jobs, they do not weigh up on the jobs that have been lost (refer to Appendix 1). Overall, approximately 50,000 employees have been employed as computer specialists and other related professions in the years 2006-2011. Although the professions increase rapidly as a percentage, they are, in fact, still a small part of the labour market (Fölster, 2015). The fact that new jobs within the field of digital creation only replace just over a tenth of the jobs being automated is also confirmed by a more sophisticated empirical methodology that combines computer and labour market assessors with the impact of technology with statistical analysis of actual development. Digitalisation driven complexity can be both nurturing and dying for a society. Today's digitalisation enables increased complexity in many professions in different industries, which in turn creates new jobs. Increased complexity is thus an unexpected and important job engine. But again, the complexity and the new computer geniuses together have not replaced more than one of four jobs that have disappeared due to automatisation. The fact that increased income creates more jobs is well-known among labour market scientists. Increased income has compensated in Sweden for about half of the jobs that have been automated. Fölster's (2015) report is also supported by Swedish employment service’s (Swedish: Arbetsförmedlingen) report on future professions, which in turn is based on employers' own forecasts. As we can see, Fölster's calculations do not add up. The new jobs that are created do not weigh up against the jobs lost due to automatisation advancement. For Fölster’s (2015) calculations, refer to Appendix 1.
4. Data, Method, and Methodology

*In this chapter the authors will discuss the method, methodology and data collection process. Further, the reasons behind the chosen research path and possible limitations will also be explained.*

4.1 Research Approach

Through this thesis, a qualitative research methodology is used since the answers that will be expressed relate to people's experiences of different things and their views on the situation and reality. The main interest lies in describing, interpreting and analysing responses from interviews, and comparing these with theories of the subject concerned. Hence, an inductive approach will be utilised. The authors assume that reality can be perceived differently and that there is therefore no absolute or objective truth about the issues discussed. The authors therefore, as researchers, cannot formulate relevant questionnaires about the research area that can then be answered and provide quantitative information. The qualitative method is therefore used in an explorative way, since the information about the phenomenon and the research question in advance is short (Hedin, 1996).

In this qualitative study, the authors play an important role as it involves collecting and interpreting data. The method therefore becomes subjective in this sense and the conclusion can thus be interpreted in any particular direction. When the respondents were selected, the authors utilised theoretical sampling, meaning that the respondents were chosen by their subjective ability to contribute to the results of this exploration.

4.2 Implications of the Chosen Method

The authors are aware that any chosen method will inherit flaws and implications. In this section, a chosen number of limitations will be presented in order to show awareness when conducting the qualitative research. Limited sample size, in comparison to a quantitative research method, where the amount of data is greater, is considered to be costly and more time consuming to gather and analyse quantitative data. The authors are certain that the data gathered will be sufficient to gain valuable insight into the chosen research field. Another possible weakness could be sampling bias since the interviewees have been chosen by the authors, hence there is a sampling bias. Moreover, the authors are aware of the chosen representatives and have excluded others in order to complete the qualitative research. The Hawthorne-effect is described as “Participants in behavioural studies change their behaviour or performance in response to
being observed” (Adair, 1984). The interviewees are aware that their responses are being collected and hence, their responses could be altered accordingly. The authors will be aware of this effect when analysing the data and drawing conclusions.

The primary data will be used to explain the developments in the retail industry due to automatisation and its impact on job polarisation. However, the authors are aware that the sample size is too small in order to generalise and apply the results across the whole Sweden. In order to justify a generalisation, more interviews with major industry actors would have had to be conducted throughout Sweden.

### 4.3 Theoretical Sampling

In terms of the empirical findings, the authors of this thesis have utilised theoretical sampling. Bagnasco, Ghirotto and Sasso (2014) explains that theoretical sampling indicates that the researchers decide which data to be collected based on which data that will provide the most useful information to build and expand the theories under exploration. This is because qualitative research aims at exploring and expanding theories rather than validating these. Further, the purpose of theoretical sampling is to gather data from places, people and events that would later on be used when identifying relationships between concepts and theories found within the specific data. However, as authors, it is important to understand that in qualitative research, size does not necessarily mean significance. Possessing significant data leads the authors to test participants based on the participants’ knowledge and experiences regarding a specific phenomenon. Thus, theoretical sampling provides additional data collection as the researcher strives to develop conceptual ideas instead of collecting general information (Bagnasco et al. 2014).

### 4.4 Trustworthiness and Quality of Research

When conducting a study, it is of importance for the authors to keep in mind the aspects of trustworthiness and the quality of research since it is to ensure that the research will be realised as credible and reliable by others. It may be argued that the concepts of validity and reliability are harder to find trustworthy in a qualitative study compared to a quantitative, since of the assumption that the interpretivistic nature is seen as being more complex and socially constructed (Saunders, Lewis, and Thornhill, 2012).
Due to the questions regarding the validity and reliability of a qualitative study, there have been attempts to fully integrate these concepts into the qualitative research in order to ensure the credibility of researchers work. As a result, Saunders et al. (2012) have stated the four criteria of authenticity, credibility, dependability and, transferability to aid and enhance the authors research quality and trustworthiness when conducting a qualitative study. Moreover, in order to aid the interpretation, the aspect of contextualisation will also be highlighted below.

4.4.1 Authenticity
As both Saunders et al. (2012) and Collis and Hussey (2014) suggests, then the interpretivistic paradigm seeks to understand and explain the complexity of different social phenomenon, which is also the scenario in this thesis. As authors, the objective of achieving authenticity is best satisfied by representing all views of the research and by promoting fairness towards the body of data (Saunders et al., 2012). The authors therefore strived to contribute to a more authentic representation by including data that both strengthened and contradicted their conclusion. Moreover, to maintain the authenticity, the research was also conducted in stores where the degree of automatisation differed, mainly determined by the authors’ own observations.

4.4.2 Credibility
To ensure credibility, it is of highest importance that the gathered data is interpreted and used in the way in which it was intended by both the participants as well as the researchers (Saunders et al., 2012). The authors of this thesis put emphasis on the triangulation technique where several sources have been used simultaneously to evaluate and thematise the findings and to enhance the credibility of the exploration. By using semi-structured interviews, it permitted the authors to ask follow-up questions which allowed the respondents to further elaborate as well as improving the likelihood of more accurate understanding and clarification of the empirical findings.

4.4.3 Dependability
The aspect of dependability entails that the researcher should record and register the changes to create a reliable account of an emerging research focus that can be understood and assessed by others (Saunders et al., 2012). The authors of this thesis ensured the idea of dependability by transcribing all the interviews with the store managers directly after the interviews was conducted. This was conducted to achieve a more accurate comprehension of the interviews which would generate a better understanding of the context as well as increasing the trustworthiness.
4.4.4 Transferability
According to Saunders et al. (2012), transferability refers to the assumption that qualitative research is typically performed on small samples, where data is collected from the participants' own perceptions, knowledge, and biases. Therefore, if the research were to be replicated, then that research does not necessarily have to generate the same result as the previous one. However, for the authors to meet the principle of transferability, this thesis thoroughly describes the course of action in terms of research question, interview questions, potential implications, empirical findings, and interpretation. Thereby, wishing to provide the reader with sufficient data that support the conduction of a similar study within the field.

4.4.5 Contextualisation
Since qualitative data are normally transient and best understood within context, it is also associated with an interpretivistic methodology resulting in findings that generates a high degree of validity (Collis & Hussey, 2014). By using qualitative data and in order to find relevance in this study, contextualisation of the subject was of highest importance to understand the findings within the accurate context.

4.5 Primary Data
The qualitative study encompasses a small number of people, but in return they are examined in deep - "the less is more" (McCracken, 1988). The interviewees are all store managers at five major grocery stores in Jönköping County. The interviews were conducted by using open questions that required longer developed answers. Since this exploration is based under an interpretivistic paradigm, the interviews were concerned with exploring data, subjective understanding, opinions, personal attitudes, and feelings towards the proposed subject of automatisation (Collis & Hussey, 2014). All interviews were conducted under a semi-constructed circumstance, where the prepared questions could encourage the interviewee to elaborate and develop their answers and by so answering several critical questions at the same time. The interviews were open, allowing the authors to explore and develop new ideas during the conversation, based on the responses of the interviewees. By conducting semi-structured interviews, the purpose for the authors was to develop an understanding of the interviewees’ reality and to some extent might influence it. All interviews were performed face-to-face since the benefit of performing them in this way gave the authors the advantage in which vital comprehensive data was collected.
4.5.1 Research Ethics

When involving people as participants in a study, then research ethics is essential in order to ensure integrity and confidentiality. Walton (2018) suggests that ethics within research could be sorted into three main subcategories, namely; 1) protection of the human participants, 2) ensuring that the research is conducted in a way that serves the society as a whole (including individuals and groups of people), and 3) the examination of specific research activities including protection of confidentiality and the process of informed consent. To comply with these constraints, and since this thesis uses interviews as primary data, then these issues were of high relevance for the authors in the conduction of their study. All the respondents were asked if they wanted to be portrayed as themselves or remain anonymous. Due to the sensitivity of the questions, all of the respondents, along with the authors, requested to remain anonymous in the purpose of protecting the integrity of respondents and their employees. Further, all of the conducted interviews were set up at desired locations on the interviewees’ behalf. Besides that, the authors have offered all of the interviewees to examine the paper to ensure that all the data were interpreted in the right context.

4.6 Secondary Data

The main purpose of the literature search was to collect as much relevant items of literature as possible. This is in order to detect methods that has previously been used and gather information in a critical way, then analyse the facts to reach a conclusion and discover potential gaps and differences in the existing knowledge. Since there is a vast amount of content on the internet within the subject that the authors explore, it has been important to distinguish what sources that are reliable and which are not. The authors have therefore primarily chosen to use peer-reviewed articles from various well-know and accepted journals, such as The Scandinavian Journal of Economics, The Quarterly Journal of Economics and the Academy of Management Journal. The articles have mainly been found by using Google Scholar and Primo as online databases for the desired academic journals. The authors formulated key searching terms, determined by relevance for this study, in order to gather information (e.g., job polarisation, automatisation, retail market, skill-biased technological change, task-biased technological change, and labour market).

4.7 Interview Design

Interview questions were formulated in regard to Collis and Hussey's (2014) guidelines. Closed questions were used to obtain answers to actual and concrete information, such as "What is the
average age of your employees?”, "What is the average salary?" and "What has happened in your store regarding automatisation?”. Open questions were asked in order to explore broad and underlying information, such as "What is your take on technical developments in the Swedish retail industry?", "Do you see technological development as an opportunity for increased productivity or rather as a threat to employees?", and "Do you feel that there is any concern with the employees?". Probing questions were used to get the interviewee to develop his answers and provide a more nuanced image of the reality, such as "Can you develop this?" and "What factor would you say is the most important?". Also hypothetical questions were asked where we gave an example of Fölster's (2014) prediction regarding the Swedish labour market to see how the interviewee reacted to this statement. Finally, the authors also used comparison questions. This was in order to understand different angles of the phenomenon of automatisation. One of these questions was "How would the situation in your store be if you did not choose to follow the trend of increased automatisation?". At the end of the interviews, summarising questions were asked in order to double-check that the answers were correctly interpreted and to make the interviewee develop further. All interview questions can be found in Appendix 2.

4.8 Analysing the Data

When analysing the data, Miles and Huberman (1994) analysis method is a well-known used general procedure that a great number of researchers have utilised in order to interpret qualitative data. Its usefulness comes from the fact that it is not tied to any specific data collection method and that it helped the authors of this thesis to conduct their analysis in a systematic way. By following the three simultaneous flows of activities of; 1) reducing the data, 2) displaying the data, and 3) drawing conclusions and verifying those. Miles and Hubermans’ (1994) procedure and guidelines functioned as a blueprint for the authors. This analysing procedure, like others, according to Collis and Hussey (2014), is based on the four elements of comprehending, synthesising, theorising and recontextualising. These four elements where then thought of during the analysing process, where some of them were emphasised more than the other. By using a general analytical procedure and by coding the data, it allowed the authors to group and categorise a common set of characteristics found within the data. This in order to gradually develop a set of concluding patterns within the gathered data that later on built the foundation of the interpretation part and aided the thematising process.
4.8.1 Implications of the chosen analysis method

By making use of Miles and Hubermans’ (1994) general analytical procedure when analysing the data, there are some implications that will arise from doing so. Firstly, in the data reduction process, anticipatory data reduction may occur since the authors tend to ignore certain data with regard to the conceptual framework. However, the relevance of the data is often determined by the authors’ current state of familiarity towards the subject. Logically, the more time the authors spend on analysing the data, the more familiar they will be with it. Thus, there is always a risk of ignoring data that subjectively seems redundant, but for the unbiased reader might seem important for the context. The importance of analysing the reduced data and not the raw data is also worth mentioning when it comes to displaying the data and drawing conclusions out of it. Collis and Hussey (2014) also explains the implications of gathering too much data, since there is a time constraint for when the work should be presented, then it is important to use a systematic approach to keep track of the data. Also, since the analysed sample size is small, then the generalisations made in the interpretation part should not be applied on the whole population. All generalisations found in the conclusion drawing process should be tested for their authenticity, reliability and validity.
5. Empirical Findings

In the following chapter, the collected data from the interviews will be presented. The findings will be compared and presented in order to create a foundation for the discussion and analysis.

The authors have conducted five semi-constructed interviews with retail market companies operating in the Jönköping region. The interviews were all focused towards fast-moving-consumer-goods stores (hereafter referred to as FMCG stores) within the region, stores that differed both in size and personnel where the smallest one employed approximately ten employees and the largest one around 50. Throughout, the authors have exclusively chosen store managers as their interviewees due to their operational overview as well as their authority to address any changes within the labour structure. Further, the authors carefully selected stores where the automatisation have been both apparent as well as progressive, mainly determined from the authors’ own observations. All interviews were conducted under the same time limit, which gave the respondents the same amount of time to reflect and answer upon the same given open questions. As aforementioned, by conducting semi-structured interviews, the purpose for the authors was to develop an understanding of the interviewees’ reality. In this case, to get an insight on how the different store managers handle the authors proposed scenarios regarding the research question and purpose.

In the coming sections, the authors will present a short and concise overview of the Swedish retail market in the area surrounding Jönköping. Following this brief overview, the authors will present the findings from the interviews. This data will later be interpreted and analysed in the succeeding chapters. As previously mentioned, the interviewees will be anonymous in this thesis due to the sensitive nature of the questions. This decision was made in consultation with all parties to get as honest and comprehensive answers as possible. All interview questions will be available in Appendix 2.

5.1 The Retail Market in the Jönköping Region

The empirical findings presented in section 5.1 relates to the questions regarding the demographic aspects found in Appendix 2.

Similar to other parts of the Swedish market, the retail market in Jönköping County has experienced a digitalised development during the last decades. Self-scanning, automated
ordering systems, and also e-commerce to some extent has changed the current situation for the competing FMCG stores within the region. Thus, the progress has led to tougher competition in which some stores face themselves in the forefront of this development but also some that are in the other end of the same spectrum. However, the explored stores are all in some sense contributing to the development, yet not lagging behind their fellow competitors. With an employee’s average age of 30 years, the retail market employees within the region could, according to the interviewees, be considered young in relation to other regions and stores.

The gender balance is distributed towards a predominance of female workers which estimates for approximately 60-70 percent of all employees. Most of these workers possess secondary education, workers that are either to further educate themselves seeing the profession as just as a passage or, as been described, establish themselves, start a family, and by so remain within the retail market.

The wage structure, like for the rest of the Swedish retail market, has changed through the introduction of the Swedish supplementary pay for inconvenient working hours (Swedish: OB-tillägg). From being a relatively low paid occupation in the start of this millennium, now the occupations within the retail market is referred to as middle-wage occupations, according to the respondents, since a large amount of the working hours are scheduled during evening and weekends. Moreover, the employees could broadly be categorised into three different categories. The first obtains no higher education and lacks ambitions to climb within the organisation. The second has no higher education but has ambitions to climb within the organisation. The third is often young people, using the employment as a platform to gain experience and income as they study.

5.2 Technological Development within the Industry

The empirical findings presented in section 5.2 relates to the questions regarding automatisation and technological development found in Appendix 2.

Overall, the respondents mutually agreed that the future of technological development is hard to predict. However, all of the interviewees answered that much has happened in the field of technological development in their respective stores since the automatisation gained momentum on the retail industry. Common to all stores is that they have chosen to focus mainly on two areas of automatisation at an organisational level; self-scanning and automated ordering
systems. Self-scanning means that the customers themselves scan their goods and therefore does not have to go through a cash register to complete the payment. Automated ordering systems mean that after the products have been scanned, the store itself recognises what products that need to be ordered and thereafter places an order without the need for any human input. One of the interviewees continued to evaluate the process of automatisation and explained that "the automatisation has already affected our way of working in many different ways, and I am sure it will mean even greater changes in the near future".

At the same time, the interviewees argue that self-scanning has not lead to any increase in sales and thus no increased revenue. However, automated ordering systems will accordingly lead to increased sales, since you no longer have to worry about missing some products in the assortment.

What is also the case in all interviews is that the respondents highlight E-commerce as an important part of automatisation in the future. However, this segment has so far accounted for a very small proportion of all stores' turnover. One of the interviewees says that E-commerce on a good day accounts for about 10 percent of total sales.

5.3 Employment Situation

The empirical findings presented in the section 5.3 relates to the questions regarding the employees and job polarisation found in Appendix 2. The following sections are the results of the open discussions during the interviews.

An important aspect to investigate is the employment situation in relation to an increased amount of technological development. How has the employees reacted, what has been the consequences and how have the companies dealt with the situation?

5.3.1 Automatisation in Relation to Employees

The different interviewees all agreed that the technological development and the automatisation has had a large impact on the working conditions for the employees. There has been an extensive change in the level of work regarding the developed ordering system. It is all agreed that the new automated ordering system has cut down on time spent previously on manually checking and ordering products. This has led to an internal restructure of the labour force, since the requirement for hours spent on these tasks has rapidly dropped. Thus, the representatives
all agree on the consensus that this has not yet led to anyone losing their job but it has thereof led to a challenge in finding new job opportunities within the existing organisation. The store managers work hard to find new job opportunities within the store and to mobilise their workforce within the organisation, since dismissing employees could potentially lead to a worsened reputation both for the company as well as for themselves; an “unthinkable circumstance” according to one of the respondents. Further, when discussions were brought into if the number of employees had seen an increase or a decrease, the respondents all agreed that they had not seen a direct change in the number of employees in relation to the level of automatisation. However, what they all agreed upon was that they had not increased the number of employees even though the revenues have increased. Relatively speaking, the interviewees all indicated that the demand for personnel as well as the stimulation of job creation has stagnated in terms of an increased efficiency caused by automatisation.

5.3.2 Structural Changes
The number of employees, hired mainly to be operating the manual cash registers, has seen a significant drop since these employees are now occupying other types of working tasks. Previously, the stores had to have employees manually operating these workplaces but now these employees are being remobilised within the organisation. The representatives state that even though the work tasks have changed, they have not seen a decrease in wages. However, the employees might not work as much as before or at the same time, which in turn leads to a reduction of income. When the self-serving cash registers were first introduced, there was a melancholy within the labour force as they were worried about losing their jobs due to the technological changes. However, the employees soon learned that this was not the case and started to embrace the changes, instead of working against it. The representatives agree that there is a difference depending on which employee one focus on. The younger ones are used to technological development, but the older ones are more resistant towards it.

5.3.3 Decreasing Job Opportunities
Per to the respondents, then it is obvious that the demand for labour have relatively decreased during the last years. So far, the stores have not been forced to release any personnel but this might change. One of the representatives claim that the change we see today will result in a decrease of employees, it is inevitable that this will happen.
“The technological progress and the level of automatisation will definitely in the long run have an effect on the number of our employees.”

However, this is from a dystopian point of view and so far people are being moved internally and there is a constant restructuring of working tasks. In contrast, one of the interviewees had a different approach and did not think that the amount of employees would decrease due to the internal processes of automatisation. A trend in the discussion about the potential risks of jobs disappearing it that the jobs themselves are not actually disappearing, the profession might, but the people remain and it is up to the store to enable these persons to find new tasks. One respondent claimed that an important aspect when it comes to technological development, is that some employees tend to practise “self-destruction”. In other words, these employees do not keep up with the technological change and these people will eventually be left without a job. There is also an indirect way of removing jobs, simply by not hiring new personnel. If an employee is employed at 100 percent and their employment due to age, new occupation or something else, is terminated, then the employer will most likely not hire someone to replace this employment. However, if the employer does hire someone new, it will be with less hours in the contract. This is in order to lower the number of employees without having to terminate someone’s contract. One representative states that he is feeling constant pressure from the headquarters to keep the wage-costs down. He describes it as keeping costs down “is the only thing that matters today”. Management want to lower labour hours and keep costs down, and the effects of automatisation have contributed to these objectives. Nowadays, the number of total working hours have decreased in comparison to the beginning of the millennium. One interviewee state that “In relation to revenue, the number of employees have not increased, and we can definitely relate it to automatisation within the retail market” and this pattern is repeatedly seen when one other respondent phrase that “Over the last decade, sales have risen, but in relation to this, labour has not increased, then in relative terms, labour demand must have decreased in relation to the revenue”.

5.3.4 Contract Termination
In Sweden it is described as difficult, costly and time-consuming to terminate someone’s employment. Among the representatives there was a difference regarding the difficulty to terminate someone’s employment or not. One representative did not find it challenging, and stated that “It might leave me with no choice than to terminate someone’s contract, an operational requirement, it is nothing strange nor difficult about that”. Another representative had a different opinion and stated that it is very difficult and it is the last thing that would
happen. It often means risking the local reputation and it can be harmful for the revenue. The majority of the respondents specifically mentioned the strict laws and regulations in Sweden regarding termination of contracts. In particular, the employment protection act (Swedish: Lag om anställningsskydd), a law existing to protect employee rights, was highlighted as an obstacle in the process of contract termination.

5.3.5 Job Polarisation
The majority of the employees within the retail market lack extensive education, which means that these people often seek to climb the hierarchical ladder within the organisation. The employees within the retail market who lack extensive education are described as the ones most threatened by the consequences of automatisation. Several of the respondents claimed that these persons run the greatest risk of contract termination and explains that these employees, in the future, will potentially have to change profession to a lower paid service occupation. Thus, middle-wage occupations decrease and low-wage occupations increase.

“The automatisation we see today within the retail market will most likely have an effect on the job polarisation we see in Sweden”.

In accordance with this, one other respondent stated that "My gut feeling is that we will see and experience this pattern in the future”. However, none of the respondents acknowledged that their way of handling the current labour situation within their store should be directly connected to the indicated job polarisation. Thus, the overall reflection from the interviewees was that the amount of personnel they distributed over had been the same or even decreased over the last decade. One respondent also hinted that "If our sales had not increased, then we might have been forced to cut down on staff", indicating that the well-being has been an important parameter which undoubtedly contributed to the fact that no drastic termination decisions have been taken due to automatisation. The demand for labour has remained, however finding the competent staff has become less simple. “The tendency is that we move towards a more developed retail market where human capital will be an increasingly important building block”.

5.4 Summary of Empirical Findings
In this section, a summary of the empirical findings will be presented. This section includes data related to demographics, the automatisation processes, the technological development and how these variables affect the employee situation and later also the job polarisation according to the respondents.
The average age of workers within the retail market in Jönköping is said to be around 30 years, which is seen as relatively young in comparison to other regions. The distribution of people of different age is large, since part of the employees work part-time in addition to studies while others are older and have been working in retail throughout their whole lives. The retail market is dominated by women, where women account for about 60-70 percent of all employees. The occupations in the retail market has gone from a low-wage occupation to a middle-wage occupation since the introduction of supplementary pay for inconvenient working hours.

Since the advancements in automatisation in recent years, a lot has happened in all stores in terms of technological development. Two areas of automatisation are mentioned in particular: self-scanning and automated ordering systems. The respondents explained that much has already changed and developed because of automatisation within the stores, but at the same time they expect an even greater development in the near future. The interviewees agreed that the technological development has had an impact on the working conditions for the employees. The answers explained that automatisation has led to a redistribution of tasks within the stores, since the workers no longer need to place orders and charge customers manually. Instead, the importance of customer service has become an increasingly important part of the work. Moreover, the respondents explained that they have not cut down on staff, but rather redistributed the employees within the store. However, in line with increased sales, it was explained that there was no need to look after new staff, and consequently, the demand for staff has decreased in relation to increased sales. Seen from a purely economic point of view, the respondents gave indications that the best way would be to renounce staff. The reasons for not choosing this alternative were explained by the strict laws and regulations in Sweden and that the management of the stores has a reputation to take into consideration. Lastly, the respondents suggested that the effects of automatisation will affect different types of workers in different ways. Relying on whether you have an academic background, previous experience or not, the effects of automatisation may look very different.
6. Analysis

In the following chapter, the authors will analyse and discuss the empirical findings gathered from the conducted interviews. The results will be analysed and presented with relation to the conceptual framework regarding job polarisation, SBTC and TBTC.

6.1 Automatisation

One of the main aspects taken from the empirical findings regarding automatisation is that it is a difficult area to predict. The interviewees were cautious when answering questions regarding future trends of automatisation. The authors might then consider the question whether it is possible to automate 53 percent of the labour market. When Fölster did his study in 2014 he stated that it is not only a possibility, it is likely. According to the author, Sweden is more at risk than the US, and this technological development could show its effects on the labour market in the two coming decades. This point is strengthened by the empirical findings. The findings describe a future situation where there might be more uncertainty where the workforce will reallocate. This however does not mean that the workers disappear, the professions will change but the workers will remain.

Roine (2016) discusses this subject and comes to the conclusion that most machines and apparatus do not function if humans are not present to either manage or service them. The automated ordering systems in the retail market has significantly reduced the amount of hours spent on ordering these products, however there is still a need for human labour to operate and support these technological systems. This technological development will lead to a shift in how employees are proportioned in the labour market and the working roles will differ in the future. The literature and the empirical findings find correlation as they both discuss how the professions will differ and change in the coming years because of the influences of automatisation. As Autor (2015) suggests, what it is crucial to understand about technological development is that people tend to overestimate to which extent it can replace human labour and underestimate to which extent human labour can benefit from the development. It is not possible to predict how the technological development will impact the labour market in the future. The technological changes that is happening today has an exponential growth and it is not possible to compare to historical data (Brynjolfsson and McAfee, 2013). This was something which worried the respondents since their job is to organise and plan how to distribute their workforce. Moreover, the question is when automatisation stop to function as a
support for human labour and more as a replacement for human labour. This according to the respondents, is when the true effects of automatisation will take its toll on the labour force to a larger extent.

Also Fölster (2015) describes the situation as those who run the greatest risk of losing their jobs due to automatisation are those who have routine work. Especially mentioned are cashiers, salesmen, machine operators and accounting staff. This type of automatisation is under way and thousands of employees across the country will be affected in a few years when everything will happen at the same time. When asked upon, this prediction was something that the interviewees agreed with. They see the change happening in the industry due to automatisation and technological development and all agreed that routine tasks are easy and cost-efficient to automate. Even if you are optimistic and believe that not all jobs that could be automated actually will be, and that new jobs are also created in the future, Fölster (2015) raises two main issues that an employer has to struggle with. The first is that the knowledge you invest in loses its value when a technology takes over. It takes time and money to get a new education. Therefore, many people will remain unemployed because they have incorrect skills. All over the world, countries struggle with increased "mismatch" between what workers can and what employers need. The second problem is that employees are not irreplaceable when a technology takes over. In fact, few employees today are irreplaceable for their employers. A pattern in the empirical findings support these statements, and one of the respondents even state that he has no choice than to dismiss employees if the revenue is affected due to their lack of skills or ability to follow the technological development.

In Fölster’s (2014) analysis, it was calculated that approximately 21.000 job opportunities as cashiers will disappear within the two coming decades and the data from the empirical findings support this argument. The connection to an increasing trend of automatisation is not farfetched, and gathered from the empirical findings it is one of the main reasons why cashiers will decrease in numbers in the future. There has been a noticeable technological development within the retail sector that has reduced the demand for manual labour, since it is now more efficient and cost-saving to let machines handle the tasks at hand. The self-scanning is only a part of the computerisation. Automated ordering systems is a new technology which will rapidly change the way employees work within the retail stores. The new technology does not only affect the cashiers, it affects those who previously were in charge of the logistics. Gathered from the empirical data, it was clear that there has been a remobilisation within the stores. Thorse who
are no longer needed at the cash registers are being moved to packaging sections or more customer oriented tasks. The interviewees agreed that there has been a remobilisation within their stores in the last years. As a consequence, it is uncertain how the retail industry develops in terms of labour opportunities in the future.

A common theme between the literature and the empirical findings shows that, with an increase in sales at retail companies in Sweden, demand for labour has shown to be intact, and thus a decrease in labour demand in relation to an increase in revenue. In many cases, the theory explains that it would be profitable for many retail companies to cut back on staff in line with increased automatisation and thus a higher turnover, but in Sweden we have not seen this kind of change in concrete figures. The reasons for this are many, but the clearest identified are the strict laws and regulations in Sweden regarding redundancies. The empirical findings support this statement and develop the explanation of referring to various labour unions, which in turn protects their members against redundancies (Government, 2016). This is the main reason why the consequences regarding labour turnover in Sweden probably will differ from other countries in the future regarding automatisation. Although Fölster's (2014) prediction of the Swedish labour market to a large extent is similar to Frey and Osborne (2013) prediction of the US labour market, ultimately, the outcome is most likely to look very different. The reason for this is because of laws and regulations that apply in various countries. Strict laws and regulations in Sweden will reduce staff turnover in Sweden, while a very high turnover in personnel in the US can be expected due to a system that makes it easier for employers to get rid of their employees (Frey and Osborne, 2013).

6.2 Polarisation of the Labour Market

In a time of high growth and declining unemployment in Sweden, the pattern of a polarised labour market could at a first glance seem highly unexpected. Thus, as both Frey and Osborne (2013) and Fölster (2014) highlight, if an extensive automatisation would occur, then a large amount of people in a short period of time could end up in unemployment. Meaning that these individuals would find themselves in a precarious situation, where these individual problems consequently could lead to major financial constraints on the Swedish social security network. Some authors, (Åberg, 2013); and (Adermon and Gustavsson, 2015), suggest that Sweden has experienced this pattern of polarisation during the last decade and that it most probable will accelerate in the forthcoming. A polarisation with a projected cavity of the middle-waged jobs accompanied with an increase in low- and high-wage jobs that will change the Swedish labour
structure. Even though authors like Bergström and Roine (2016) is referring to their assumption that the ongoing polarisation in Sweden cannot easily be traced to automatisation, all the respondents are highlighting the suggestion that it actually does in some sense. Thus, finding significant evidence might be insufficient in this case, however one cannot exclude the fact that the labour structure has changed during the last decade in the Swedish retail market. A majority of the respondents are indicating that there has been a large mobilisation within the labour force which has withdrew the consequences of cutting hours and in some cases terminated some working roles within the store. Here, the self-scanning could to a wide extent portray and visualise the impact automatisation has had on the retail market and especially the cashier occupation. This routine based occupation was starting to get automated during the last decade and has rapidly evolved since then, and by so, displaying how computers could replace a profession traditionally performed manually by human beings, as been described in most of the literature examined. The automatisation of the cashier occupation has led to that the persons obtaining this occupation has been mobilised within the store. Regarding this, one of the most notable findings from the gathered empirical data was that not a single respondent had terminated any workers due to automatisation and technological improvements. In accordance to several studies concerning the subject, the automatisation within the Swedish retail market has led to increased efficiency and productivity and thus, in the cases where the authors have explored their study, then the technological changes has not led to any significant negative effects on the individuals nor the organisation as Brynjolfsson and McAfee (2013) suggests.

6.2.1 Contribution to Job Polarisation

Technological development enables retail companies to streamline employee efficiency and productivity. This may cause the number of employed to decrease or stagnate in the retail market. It is evident in the empirical findings that the respondents are doing their utmost to maintain the current labour structure. Although there appears to be pressure from upper management to cut down on wages and to streamline the performance of each store, most of the respondents seem to treat this risk as their obligation to society not to make any operational cut downs that would hurt their staff. The automatisation has brought along consequences and the store managers are those who need to handle these and so far, based on the findings, their decisions have been to mobilise and allocate their labour even though their stores have found themselves in less lucrative times. Thus, what the authors found interestingly to analyse with these findings is whether these decisions have been to greater or worse for the Swedish labour market in terms of unemployment and how it have contributed to the job polarisation.
As Brynjolfsson and McAfee (2013) believe that we need to stimulate job creation to reduce the negative impact of automatisation, then in regard to the mobilisation of labour within the retail stores, it could be argued that this is an ongoing process since the available staff is allocated into different tasks and consequently creating new working roles. Thus, from a more critical perspective, the authors suggest that it has not led to the creation of more job opportunities since the same labour has shifted from one position to another and therefore the demand for new labour has remained unchanged. Consequently, since the overall theme for all stores was that revenue had steadily increased during the last decade and that the amount of labour had remained unchanged irrespective to the stores profitability, the automatisation of the Swedish labour market has had an indirect impact on the job polarisation. With Autor's (2015) concept of routine tasks and labour replaced by technological change in mind, the authors argue that the indirect impact on the job polarisation could be derived from the automated retail market since the amount of labour has remained unchanged during the last decade which indicates a dilution of these middle-wage jobs. Implying that persons who have been able to work in the retail market must have applied to other professions, since the retail market itself could be referred to as one of the respondents described it, “congested”. Therefore, the consequence may or may not be that these people received low-paid jobs and thus reinforced the job polarisation in Sweden.

6.2.2 Future Impact of Automatisation

With regard to Brynjolfsson and McAfee (2013) nearly dystopian picture of a declining employment and polarised labour market, thus by judging from the respondents’ answers then it is calmative that reality is perceived as different in contrast to the reports. An overall pattern found within the primary data is that the retail market in Jönköping County seems to stand strong. The ongoing automatisation in the Swedish retail market is extensive however, it has not reached those dystopian levels as the authors mentioned above predicted. Yet, as described by Brynjolfsson and McAfee (2013), the development we see today is without parallels, it is exponential and it could take on unexpected speed at any time. The idea of this clearly creates an anxiety, and according to one of the respondents this exponential development could to a wide extent be referred to as terrifying since “who knows what tomorrow looks like?”. It could be thematised from the empirical findings that the responding store managers are all aware over the challenges the retail market faces in the near future. By taking this into consideration and when connecting it with the projections of Frey and Osborne’s (2013) and Fölster’s (2014) indications of a mass unemployment as consequence of an extensive automatisation, then by analysing the data one alarming pattern arise. As Bergström and Roine (2016) intimation on an
“excessive alarmism” regarding the present job polarisation in Sweden might find substance in some sectors of the Swedish labour market, the responses gathered from the interviews are indicating that a potential exponential automation of occupations within the retail market could strike the labour forces and its structure hard. Leading this sector into an uncertain future where most of the routine based occupations face an even greater risk of being replaced due to automatisation. By judging from the data, there are several fragments indicating that the retail market faces a challenging time ahead. Will labour supplement the raging automatisation or will it replace large parts of the labour force? Even though the empirical findings is not suggesting any significant contribution to the job polarisation in present time, it cannot be unspoken that all the respondents admits that the Swedish retail market most likely will face an extensive transformation in a near future that will most possibly have a negative impact on the labour structure. Then, if this extensive automatisation would to occur, it is plausible that the automatisation of the Swedish retail market would contribute to a higher degree on the ongoing job polarisation.

6.3 SBTC and TBTC

Task-biased technological change is described in the literature review as a phenomenon that explains what type of tasks an employee has, and which of these tasks that disappears through automatisation. In consideration of the empirical findings, this phenomenon is something that is supported by the interviewees. The majority of the respondents believe that simple routine jobs will eventually disappear, while pointing out that the work regarding customer contact will increase, and thus the importance of human capital will increase. "Simple" tasks will therefore decrease, while more service oriented tasks with a high degree of human capital will increase, mainly due to increased importance when it comes to customer service. The interviewees suggest that few employee contracts, or even no employee contracts will need to be terminated, but that they instead are mobilised within the store. The trend shows that the importance of human capital becomes more and more important among employees in the retail industry in Sweden.

“Unless the employees possess the high degree of human capital that is needed, we may have to terminate these contracts due to a lower demand for routine workers”.

Skill-biased technological change, on the other hand, is described in the literature review as a phenomenon that only benefits one part of the labour market, namely the part that possesses
high complex knowledge and which can benefit from the new jobs that appear due to increased productivity through automatisation. A clear example is highlighted by all the interviewees in the section of empirical findings, namely that self-scanning leads to a reduced demand for cashiers. As a result of reduced demand for cashiers and other routine based occupations, this phenomenon causes workers to look for new tasks within the store, and if they do not possess the complex knowledge that is needed for the new tasks, they may be forced to look after new jobs.

What we also learn from the literature review is that Autor et al. (2003) explain that the number of workers holding routine based occupations has fallen dramatically in recent years, in fact since the 1950s. Autor et al. (2003) continue to explain that the demand for staff with complemented skills to the new technology has increased. The authors can therefore find that Autor et al. (2003) prediction are in line with the views of the interviewees. SBTC affects the labour market in the way that it benefits the more skilled labour force, due to an increased productivity and that these kind of employees do not run a great risk of their jobs being automated.

6.3.1 A Practical Example from the Perspectives of SBTC and TBTC

During the thesis, the authors have been made aware that the problems arising through automatisation can be presented in several different ways and do not have the same implications on all employees. In order to provide an understanding about how job polarisation, skill-biased technological change, and task-biased-technological change, it facilitates to imagine two different employees working at a local retail store. Employee A is 25 years old and employee B is 55 years old. Employee A is doing his/hers bachelor at university level and during the semesters, this person works at the local retail store in order to gain some much needed cash for the studies. Employee A is not planning to pursue a professional career within the retail market, the employment is used to gain extra money as well as to gain experience about working. This employment is being used as a stepping stone for Employee A and he/she is planning to obtain a cognitive and well-paid job in the future. At the other end of the spectrum, there is Employee B. This employee has worked at the local retail store during his/her whole life. Employee B has no other job experience and lacks further education. This employee has been working at the same place for a long period of time and still got several years left of working. Now imagine if automatisation and technological development suddenly removes the demand for Employee B’s service. The new technology is more efficient and cost less for the branch. This employee still has several years before it is time to retire and he/she might not
have the right set of skills to obtain another job, where the wage is equal or better. All the knowledge is connected to the retail market and the employment there. How does Employee B deal with this situation?

As the authors have discussed previously, skill- as well as task-biased technological change could in cases like Employee B have severe consequences. Job polarisation is linked with these changes and as illustrated in the scenario above, there is a clear difference in how the different employees are affected by the new technological advances. As mentioned in one of the conducted interviews, one interviewee stated that there is generally three different categories of employees. The first category is those who do not possess any higher education and has no plans of obtaining one, these employees often becomes an integrated part of the retail labour market and continues to work their without any further ambitions. These employees are described to be similar to Employee B in the example. The second one is similar to the first, but have higher ambitions and aims to rise within the organisational hierarchy and possibly becoming a future store manager. The third one, and according to the representative, one of the most common, is the one who sees the employment as a stepping stone. These employees are described to be similar to Employee A in the example. They see the employment as a way to achieve valuable experience and earning some income. As the theory of job polarisation is described, employees are moving towards either service or cognitive and complex occupations. This example aims to explain how the technological changes can develop and contribute to a polarised labour market.

6.4 The Automatisation Paradox

The automatisation paradox, described by Frey & Osborne (2013), explains how there are cases where automatisation does not lead to a job polarisation. As mentioned previously, when technology substitutes for labour, there is a decrease in demand for labour, hence labour has to reallocate their supply. Following this, there is a capitalisation effect, leading to an increase in employment when revenue increase and companies feel the need to expand. What is interesting about this is what the authors found in the empirical findings regarding this subject. The interviewees’ state on multiple occasion that even though revenue has increased due to automatisation, there has not been an increase in demand for labour. The stores have expanded and been more profitable but the employees have remained at the same level and in some cases even dropped. The amount of employees has relatively decreased in relation to an increased revenue and the automatisation paradox has not been able to hinder this development towards
an increased job polarisation due to automatisation within the Swedish retail market. The
automatisation paradox has been seen as a tool to hinder job polarisation and has been seen as
a phenomenon which decreases it. If the empirical findings does not support the paradox, what
could then be the implications? If automatisation is leading to a technological substitution for
labour, where will the labour reallocate their work efforts? When the demand for labour
stagnate, as the paradox indicates, the workforce are in the need of relocation to other areas
where labour is needed. The patterns found in the empirical findings are carefully supporting
this hypothesis. The interviewees were careful when facing difficult questions regarding loss
of jobs but a clear pattern was displayed. There is a worry within the workforce of what will
happen if technology replaces labour. So far the technology has worked as a compliment for
human labour, the question which the interviewees had to ask themselves is when it is starting
to become a substitution for human labour instead. As they discussed, the service aspect of the
employees are becoming increasingly important. This correlates to the theory of job polarisation
as it indicates that when technology is substituting the middle-wage routine jobs, the employees
has to reallocate their efforts to either service or cognitive labour.

As mentioned previously, Sweden has a well-protected workforce that is in most cases protected
against unexpected loss of employment. How will the different unions act against a job
polarisation and will they accept that jobs are disappearing due to technological changes? These
are patterns seen throughout the thesis, and contradicts to an increased job polarisation. The
data in the empirical findings differed, and according to some the employees are very well
protected, while others claimed that the process of reducing human labour is not as difficult as
others might think. Is there a paradox in this and are there loopholes in the Swedish regulations
which will enable employers to decrease personnel in the process of increasing profit. The
pattern is difficult to interpret as this thesis do not focus on the regulation regarding the labour
market but it is not wise to neglect the implications it has on job polarisation.
7. Conclusions

The following chapter will present the main findings of this thesis together with the authors’ final conclusions.

The purpose of this thesis has been to explore the way in which automatisation within the Swedish retail market affects the job polarisation we currently see in Sweden. By using secondary data from well-known and cited researchers and by conducting a qualitative study, different results have contributed to the conclusion regarding this exploration. The first thing that can be concluded is that the majority of all retail stores in Sweden have increased their turnover in recent years due to automatisation, but the number of labour has not decreased in a concrete way. What is important to include in this calculation is that staff have also not increased in numbers, and that the demand for labour has thus reduced in relation to the increased sales. The reason why stores have not chosen to cut down on staff depends largely on the strict laws and regulations in Sweden regarding the termination of staff. The majority of the respondents from the primary data suggest that for purely profit purposes the best choice would have been to cut down on personal, but this is not done, partly because of the reason as described above, but also because of a reputation and well-being that the stores has to take into consideration.

What can also be concluded is that if the extensive projected automatisation would develop to the extent that many researchers believe is possible, the retail market in Sweden is extremely sensitive to this evolution. This is because the majority of the occupations in this market are highly routine based, and therefore run a high risk of being automated. This in turn would lead to an increased contribution to the job polarisation.

In regard to the research question on how the automatisation within the retail market affects the job polarisation in Sweden, the authors of this thesis find that the current automatisation in the retail sector has affected, and at this stage, is in the process of influencing the job polarisation in Sweden, in the way that automatisation primarily affects highly routine based occupations, which accounts for the majority of the jobs in the retail industry. Employees possessing middle-wage occupations that are routine based are influenced by the automatisation process and are forced to look after new jobs, or at least other tasks within the same type of work. This is linked to both skill-biased technological change as well as task-biased technological change when
these workers either has to seek for service-minded occupations with a lower payroll, or higher-paid occupations including more complex working tasks. This in turn affects the job polarisation in Sweden.

While the authors have discussed the current state of automatisation and its potential impact, they in accordance with the respondents agreed on the consensus provided in the literature that the technological development we see today is something without parallels. If an identical study had been conducted in ten years from now, then the authors feel confident that the results would have been far more notable and significant. An assumption that correlates well with the examined literature and empirical data regarding the exponentially increasing trend of automatisation.
8. Discussion and Proposals for Further Research

This chapter will discuss and interpret the empirical findings in relation to the main purpose and methodology of this thesis. The first section will discuss the constraints and limitations that exist regarding the design of this thesis. The second section will deal with the practical problems that can be deduced from the empirical findings. The last sections will address implications regarding the research as well as provide suggestions for future studies.

8.1 Limitations

Throughout the investigation process, the objective has always been to understand in which way the ongoing automatisation in the Swedish retail market affects the job polarisation in Sweden. The exploration was made possible through secondary data, mainly derived from peer-reviewed articles, as well as primary data derived from interviews with key personnel in the retail market in the Jönköping region. However, the purpose of this thesis is not to explore where potential new jobs are emerging and whether the new jobs created are weighing up against the expected lost occupations, which could be further explored. Furthermore, the authors of this thesis did not have enough resources or time to conduct a sufficiently large survey to properly generalise and apply the results across the whole Sweden.

Another limitation is that this thesis does not take into account the developments in other countries regarding automatisation. This is because the automatisation process looks very different depending on where in the world one chooses to put focus. Laws, rules and regulations play a major role in what is acceptable and what is unacceptable. The automatisation process looks very different depending on whether one focus for example on developing countries or developed countries and because this thesis focuses on Sweden, the authors have chosen not to draw parallels to other countries. Yet another limitation is that the authors do not take into account historical results regarding automatisation. This is since well-known researchers within the subject believe that automatisation is increasing exponentially, and the rate at which automatisation is taking place today is something we have never seen before.

The authors have deliberately chosen to limit the exploration to retail stores, mainly due to the fact that observations have been made that predicted that automatisation has played a major role in this industry in recent time. Whether the outcome had been different if the authors had chosen to include other industries is hard to predict, but as the aim is to investigate the retail
market because of observations, this concentration was found suitable. Additionally, the authors have chosen to only conduct five interviews in the immediate area. This is primarily due to the fact that time provided for this specific exploration simply was not enough to work with a larger sample. However, the authors are convinced that a sample of five key representatives from the Jönköping region is sufficient to gain a broad perception of the current situation.

Qualitative research is subject to contextualisation, where the researcher needs to understand results in context, which allows for misinterpretation and misunderstanding (Collis & Hussey, 2014). Furthermore, since the subject of the automatisation impact on job polarisation is a relatively new and unexplored research topic, the secondary data collected is mostly based on scientific peer-reviewed articles that do not focus on any specific approaches, but rather the topics of automatisation and job polarisation in general. This allows for misinterpretation, where the authors have chosen to treat these findings as applicable to the specific area being treated.

Considering the choice of the authors' research method, an exploratory and inductive approach, the authors are aware that it is important to acknowledge that a particular exploration can be described in different ways, taking account of purpose, process, logic and outcome. Hence, the exploration can sometimes overlap between an exploratory and explanatory approach (Collis & Hussey, 2014).

8.2 Implications for Practice

The authors argue that automatisation in the Swedish retail market has affected the job polarisation in Sweden to some extent, but not as much as it could have done. This is because the majority of retailers listed in this thesis have increased their turnover in recent years due to automatisation. The authors also draw the conclusion that the technological development has led to the fact that demand for routine jobs has fallen and that stores should therefore, for purely profit purposes, terminate this kind of personnel instead of restructuring these workers within the store. The authors suggest that the main reasons why staff has not decreased in real numbers are the strict laws and regulations in Sweden regarding contract terminations and that the key persons in question have a reputation to maintain.

Similar to the author's suggestions, literature suggests that employee turnover within the Swedish retail market should be greater due to the automatisation process in recent years than
it proved to be. On the contrary, the literature addresses other aspects such as globalisation and increased immigration as reasons why the number of persons employed in this industry has not reduced in real numbers. These aspects are something that the authors deliberately chose to ignore, and instead chose to focus only on technological development and its impact on restructuring in the labour market.

From the results, proposals for managers and employers in the retail market are designed to devote staff, purely for an economic purpose. Due to the fact that automatisation deletes large parts of the routine based occupations within the industry, there is a possibility of cutting down staff, and thus increasing profits. Again, this proposal is based on a purely economic purpose.

8.3 Implications for Research

The qualitative and exploratory nature of this thesis has allowed the authors to search for patterns regarding how automatisation within the retail market affects the job polarisation in Sweden. Furthermore, the exploratory approach allowed the authors to validate existing theories and frameworks while contributing with new opinions and suggestions that were previously unexplored. Previous literature has described skill-biased technological change, task-biased technological change and job polarisation as general theories, but very limited research have previously been done on how automatisation within the Swedish retail market affect these concepts. In this regard, the authors of this paper have contributed in a way that led the research regarding this subject to move forward.

8.4 Proposals for Further Research

Regarding proposals for further research, the authors want to highlight the importance of if, and if so, what type of new jobs that will appear because of the phenomenon of automatisation. Although described narrowly in this thesis that new jobs are most likely to emerge due to automatisation, this investigation do not treat what kind of occupations that are concerned, what will be required by people who eventually take these occupations and whether the new occupations weigh up against those who are obviously lost. Here, a new problematisation emerges. Is Sweden ready for an increased automatisation in the future? What kind of new jobs will emerge? Will these new occupations weigh up against those who are lost? What also may be interesting to investigate further is how to adapt to a situation where more and more routine based occupations disappear. Several researchers and authors believe that education policy will be at the heart of solving such a situation. There is a trend in written literature to view the
automatisation trend as a problem and many authors are providing a wide range of worst case scenarios. Both Fölster (2014) as well as Brynjolfsson and McAfee (2014) believe that we need to stimulate job creation to reduce the negative impact of automatisation. The best way to promote technology development and make the most of it is to invest in the economic growth of society. Growth can be promoted by investing in education, making it more accessible independent of demographic variables. Several authors, like Fölster (2014) and Brynjolfsson and McAfee (2013), argue that students from an early age should be introduced to topics such as entrepreneurship and self-employment in order to avoid a situation where unemployment reaches unhealthy and unexpected heights.

This thesis has mainly addressed how internal development regarding automatisation has affected the employment situation within the retail market in Sweden. What should be added is the external approaches that may have an effect on the long-term situation. Many researchers, as well as respondents from the primary data pointed at e-commerce, and described this concept as a potential threat to routine based occupations in a near future.
Reference List


Appendices

Appendix 1: Stefan Fölster’s calculation
Stefan Fölster (2015) explains that new jobs arise due to automatisation, mainly due to an overall increased income, higher complexity, and an increased amount of computer geniuses. However, according to Fölster's calculations, the new jobs do not outweigh those which are lost.

![Bar chart showing Automated Jobs and New Jobs due to Increased Income, Complexity, and Computer Geniuses]

Appendix 2: Interview Questions

Demographic Questions
Question 1: What is the average age of your employees?
Question 2: How does the gender diversity look within your workforce?
Question 3: What is the average wage?

Questions regarding Automatisation
Question 4: How do you view the technological development within the FMCG-market?
Question 5: What changes has been made in your store and what changes will happen in the future?
Question 6: Do you view the technological development as a possibility for increased growth and revenue or do you view it as a threat against the employees?
Question 7: How would the situation in your store be if you did not choose to follow the trend of increased automation?

Questions regarding the Employment Situation
Question 8: What has the consequences of automation been so far? Seen to the amount of employees, work tasks, and so forth.
Question 9: Have you experienced any concern or growing concern within the workforce?
Question 10: Do you see technological development as an opportunity for increased productivity or rather as a threat to employees?

Questions regarding Job Polarisation
Question 11: What happens to the employees which possibly are in the risk zone of losing their jobs?
Question 12: Will your employees have to lower their working hours in relation to an increased automation?
Question 13: In which way does it look different if comparing younger and more senior employees?

General Questions for Open Discussions
Question 14: Stefan Fölster (2015); claims that 21,000 cashiers will disappear within 20 years, is this statement possible?
Question 15: Will the market survive this technological development?
Question 16: If the demand for labour decreases in relation to an increased automation, how do you deal with this situation?