Physical or Digital Payments - Towards a Dominant Design?

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Fysiska eller digitala betalningar –
Mot en dominant design?

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Abstract

Rapid digitalisation development has been stampeding widely across today’s societies, and not least in the payment industry. Though, the digitalisation in the payment industry has been very deviating, even between similar well-developed countries, and while there are positive and negative effects with both digital- and physical payment means, there is little knowledge that highlights the influencing factors and accompanied problems. This study therefore explores which, and how, different factors influence a country’s degree of digital payments, and creates further understanding of where the payment markets are heading in the future. It is done through a case study of four different industrialised countries, Sweden, Italy, Canada, and Switzerland which involves mapping the countries’ payment markets, as well as potential factors influencing a population’s payment habits, through a perspective of innovation theory in terms of dominant designs and technological discontinuities. Theory of network externalities and two-sided platforms are further used to explain and discuss how a two-sided market, like the payment market, is affected by changes and other circumstances in different ways. Conclusions are then drawn from the used theories together with a comparison of the findings, and identifies certain influencers to a country’s distribution of payments, as well as provides indications of where the different payments markets are heading in the future. Data is mainly gathered through written material and credible databases, but also from semi-structured interviews.

Keywords: Digital payments, Physical payments, Cashless society, Retail payments, Cash usage, Card usage, Dominant design, Technological discontinuity, Technology cycle, Network externalities, Two-sided platforms, Two-sided markets
Sammanfattning

Den snabba digitaliseringen har slagit sig fram i dagens samhällen, och inte minst i betalningsindustrin. Dock har digitaliseringen i betalningsindustrin varit mycket avvikande mellan liknande välutvecklade länder, och medan det finns positiva och negativa effekter med både digitala och fysiska betalningsmedel, finns det inte mycket kunskap om påverkande faktorer och medföljande problem. Denna studie undersöker därför vilka, och hur, olika faktorer påverkar ett lands grad av digitala betalningar, och vidare skapar ytterligare förståelse för var betalningsmarknaderna är på väg framöver. Detta görs genom en fallstudie av fyra olika industrialiserade länder, Sverige, Italien, Kanada och Schweiz, som innebär en kartläggning av ländernas betalningsmarknader, och av potentiella faktorer som påverkar befolkningens betalningsvanor, genom ett perspektiv från innovationsteori i form av dominerande design och tekniska diskontinuiteter. Teori om nätverksexternaliteter och tvåsidiga plattformar används vidare för att förklara och diskutera hur en tvåsidig marknad som betalningsmarknaden påverkas av förändringar och andra omständigheter. Slutsatser dras sedan från de använda teorierna tillsammans med en jämförelse av resultaten och identifierar påverkande faktorer till ett lands betalningsdistribution, samt ger indikationer på var de olika betalningsmarknaderna är på väg framöver. Data samlades huvudsakligen in genom skriftligt material och från tillförlitliga databaser, men även från semistrukturerade intervjuer.

Nyckelord: Digitala betalningar, Fysiska betalningar, Kontantanvändning, Massbetalningar, Kortanvändning, Dominant design, Teknologiska diskontinuiteter, Nätverksexternaliteter, Teknologicykel, Tvåsidiga marknader, Tvåsidiga plattformar
Table of Contents

Abstract ........................................................................................................................................... I
Sammanfattning ................................................................................................................................. II
Acknowledgements .......................................................................................................................... IX
Nomenclature ..................................................................................................................................... X

1 Introduction .................................................................................................................................. 1
  1.1 Background .............................................................................................................................. 1
  1.2 Problem Formulation .............................................................................................................. 3
  1.3 Purpose and Research Questions .......................................................................................... 3
  1.4 Delimitations and Limitations ............................................................................................... 3
  1.5 Contribution ............................................................................................................................ 4

2 Theory .......................................................................................................................................... 6
  2.1 Dominant Design .................................................................................................................... 6
     2.1.1 How does a Dominant Design Emerge? ....................................................................... 6
     2.1.2 Dominant Design, Competition and Industry Structure ........................................... 9
  2.2 Network Externalities ............................................................................................................. 10
     2.2.1 Two-Sided Platforms ................................................................................................. 10
     2.2.2 Digital Payment Systems as a Two-Sided Platform ................................................. 12
  2.3 Using Theories of Innovation to Analyse and Predict an Industry ..................................... 13
     2.3.1 The Payment Industry - Towards a Dominant Design? ........................................... 13
     2.3.2 The Payment Industry Design Hierarchy ...................................................................... 14

3 Payments and Money .................................................................................................................. 16
  3.1 Purpose of Money ................................................................................................................... 16
  3.2 Different Payment Methods .................................................................................................. 17
  3.3 Physical vs. Digital Payments ............................................................................................... 18
     3.3.1 Cards vs. Cash: Pros and Cons .................................................................................... 19
  3.4 Remote vs. Point-of-sale Payments ....................................................................................... 20

4 Methodology .................................................................................................................................. 22
  4.1 Research Approach ............................................................................................................... 22
  4.2 Case Study of the Payment Markets ...................................................................................... 22
     4.2.1 Pre-Study ...................................................................................................................... 23
     4.2.2 Firm Activity Analysis ................................................................................................. 23
     4.2.3 Country Investigation ................................................................................................. 23
  4.3 Country Comparison ............................................................................................................. 25
  4.4 Data Gathering ...................................................................................................................... 26
     4.4.1 Literature Review and Databases ................................................................................. 26
     4.4.2 Interviews .................................................................................................................... 26
  4.5 Research Quality ................................................................................................................... 27
     4.5.1 Validity and Reliability ................................................................................................. 27
4.5.2 Generalizability ................................................................................................. 28
4.5.3 Source Criticism ............................................................................................... 29

5. Case Study of the Payment Markets ........................................................................ 30
5.1 Interviews ............................................................................................................ 30
5.2 Number of Firms in the Payment Industry ............................................................... 33
5.3 Sweden .................................................................................................................. 34
  5.3.1 Cash in Circulation and Distribution of Payments .............................................. 34
  5.3.2 Population ...................................................................................................... 36
  5.3.3 Financial Consumer Technology ..................................................................... 38
  5.3.4 Trust .............................................................................................................. 39
  5.3.5 Cost of Card Payments ................................................................................... 40
  5.3.6 Central Bank’s Role and Other Influencing Variables ........................................ 41
5.4 Italy ...................................................................................................................... 42
  5.4.1 Cash in Circulation and Distribution of Payments .............................................. 42
  5.4.2 Population ...................................................................................................... 45
  5.4.3 Financial Consumer Technology ..................................................................... 46
  5.4.4 Trust .............................................................................................................. 47
  5.4.5 Cost of Card Payments ................................................................................... 49
  5.4.6 Central Bank’s Role and Other Influencing Variables ........................................ 49
5.5 Canada ................................................................................................................ 50
  5.5.1 Cash in Circulation and Distribution of Payments .............................................. 51
  5.5.2 Population ...................................................................................................... 53
  5.5.3 Financial Consumer Technology ..................................................................... 55
  5.5.4 Trust .............................................................................................................. 55
  5.5.5 Cost of Card Payments ................................................................................... 57
  5.5.6 Central Bank’s Role and Other Influencing Variables ........................................ 57
5.6 Switzerland ......................................................................................................... 58
  5.6.1 Cash in Circulation and Distribution of Payments .............................................. 58
  5.6.2 Population ...................................................................................................... 60
  5.6.3 Financial Consumer Technology ..................................................................... 62
  5.6.4 Trust .............................................................................................................. 63
  5.6.5 Cost of Card Payments ................................................................................... 63
  5.6.6 Central Bank’s Role and Other Influencing Variables ........................................ 64
6 Country Comparison ............................................................................................... 65
  6.1 Cash in Circulation and Distribution of Payments .................................................. 65
  6.2 Population .......................................................................................................... 68
  6.3 Financial Consumer Technology ......................................................................... 70
  6.4 Trust .................................................................................................................. 71
  6.5 Cost of Card Payments ....................................................................................... 72

7 Analysis and Discussion ......................................................................................... 73
  7.1 Towards a Dominant Design? ............................................................................. 73
  7.2 Factors Influencing the Degree of Digital and Physical Payment Usage .............. 75
8 Conclusion .............................................................................................................. 78
  8.1 Research Questions .......................................................................................... 78
  8.2 Evaluation of the Study ..................................................................................... 81
  8.3 Suggestions for Further Work .......................................................................... 82

References .................................................................................................................. 84
List of Figures

Figure 1. The technology cycle........................................................................................................7
Figure 2. Simplified design hierarchy of the Typewriter Industry and the emergence of the QWERTY layout ................................................................................................................. 8
Figure 3. Design hierarchy of a dominant design............................................................................... 8
Figure 4. Market behaviour according to the dynamics of innovation ................................................. 10
Figure 5. Two-sided platform .......................................................................................................... 11
Figure 6. Network effects of a two-sided platform .............................................................................. 12
Figure 7. Number of firms in the U.S. typewriter industry................................................................. 14
Figure 8. Illustrative example of the design hierarchy in payments .................................................... 15
Figure 9. Number of firms in Sweden, Italy, Canada, and Switzerland ............................................... 33
Figure 10. Sweden’s demography by age ......................................................................................... 37
Figure 11. Italy’s demography by age ................................................................................................ 45
Figure 12. Canada’s demography by age .......................................................................................... 53
Figure 13. Switzerland’s demography by age .................................................................................... 61
Figure 14. Comparison between the countries’ age demography ......................................................... 69
Figure 15. The investigated industries’ firm activity compared with the dynamics of innovation .......................................................... ........................................................................... 73
Figure 16. The current payment market in the technology cycle ......................................................... 75
List of Tables

Table 1. Classification types of monetary instruments ................................................................. 19
Table 2. Interviewees ...................................................................................................................... 27
Table 3. Sweden basic data .......................................................................................................... 34
Table 4. Sweden’s banknotes and coins in circulation .............................................................. 35
Table 5. Sweden’s change of banknotes and coins in circulation ........................................... 35
Table 6. Sweden’s distribution of transactions .......................................................................... 36
Table 7. Sweden’s Education Index rating ................................................................................ 37
Table 8. Sweden’s Networked Readiness Index ...................................................................... 37
Table 9. Swish statistics January 2018 ...................................................................................... 38
Table 10. Card, transaction and fraud levels in Sweden ............................................................ 39
Table 11. Transaction fraud in Sweden .................................................................................... 40
Table 12. Transaction fraud in Sweden .................................................................................... 40
Table 13. Payment card interchange fees in Sweden .............................................................. 41
Table 14. Italy basic data ............................................................................................................ 42
Table 15. Italy’s banknotes and coins in circulation................................................................. 43
Table 16. Italy’s change of banknotes and coins in circulation ............................................. 44
Table 17. Italy’s distribution of transactions .......................................................................... 44
Table 18. Italy’s Education Index rating .................................................................................. 46
Table 19. Italy’s Networked Readiness Index ....................................................................... 46
Table 20. Card, transaction and fraud levels in Italy ............................................................... 48
Table 21. Transaction fraud in Italy ........................................................................................ 48
Table 22. Transaction fraud in Italy ........................................................................................ 49
Table 23. Payment card interchange fees in Italy ................................................................. 49
Table 24. Canada basic data ...................................................................................................... 50
Table 25. Canada’s banknotes and coins in circulation .......................................................... 51
Table 26. Canada’s change of banknotes and coins in circulation .......................................... 51
Table 27. Canada’s distribution of transactions ..................................................................... 52
Table 28. Canada’s Education Index Rating .......................................................................... 54
Table 29. Canada’s Networked Readiness Index ................................................................. 54
Table 30. Payment card interchange fees in Canada ............................................................. 57
Table 31. Switzerland basic data .............................................................................................. 58
Table 32. Switzerland’s banknotes and coins in circulation ................................................... 59
Table 33. Switzerland’s change of banknotes and coins in circulation .................................... 59
Table 34. Switzerland’s distribution of payments .................................................................... 60
Table 35. Switzerland’s Education Index rating .................................................................... 61
Table 36. Switzerland’s Networked Readiness Index ............................................................. 62
Table 37. Payment card interchange fees in Switzerland ...................................................... 64
Table 38. Comparison between the countries cash in circulation, cash intensity and ATM cash withdrawals in 2016 ................................................................. 65
Table 39. Comparison between the countries’ change in cash in circulation, cash intensity and ATM cash withdrawals between 2012-2016 .......................................................... 66
Table 40. Comparison between the countries’ transaction volume per inhabitant in 2016 .......... 67
Table 41. Comparison between the countries’ transaction volume change between 2012-2016 per inhabitant ............................................................................................................. 68
Table 42. Comparison between the countries’ average population density in 2016 ........... 68
Table 43. Comparison between the countries’ Education Index rating .............................. 69
Table 44. Comparison between the countries’ Networked Readiness Index ranking .......... 70
Table 45. Comparison between the countries’ biggest mobile payment applications .......... 70
Table 46. Comparison between how the residents in the countries are experiencing their banks .......................................................................................................................... 71
Table 47. Comparison between Sweden and Italy’s card frauds in 2015 ............................ 71
Table 48. Comparison of standard interchange fees for 2018 .......................................... 72
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Nomenclature

**BIS** - Bank for International Settlements
**CAD** - Canadian Dollar
**CAFC** - Canadian Anti-Fraud Centre
**CHF** - Swiss Franc
**CIC** - Cash in Circulation
**CNP** - Card Not Present
**CSI** - Cashless Society Index
**ECB** - European Central Bank
**EU** - European Union
**EUR** - Euro
**GDP** - Gross Domestic Product
**ICT** - Information and Communication Technology
**IMF** - International Monetary Fund
**ISTAT** - Italian National Institute of Statistics
**KTH** - The Royal Institute of Technology
**NFC** - Near Field Communication
**P2B** – Person-to-Business
**P2P** - Peer-to-Peer
**POS** - Point of Sale
**SBA** - Swiss Bankers Association
**SEPA** - Single Euro Payments Area
**SEK** - Swedish Krona
**SNB** - Swiss National Bank
**UNDP** - United Nations Development Programme
**WEF** - World Economic Forum
1 Introduction

This chapter introduces the reader to the phenomenon of cash digitalisation. It presents a background to the subject which is followed by the defined problem formulation. Further, the purpose of the investigation is defined together with the research questions. The chapter ends with the delimitations and expected contribution of the thesis.

1.1 Background

Coins and paper money has been around in our societies for many centuries, and even though there have been many changes in how we live our lives, i.e. how we produce, buy, and sell goods, cash has managed to stick around. As technology is changing the circumstances of the world, and for societies and people, industries are becoming more and more digitised. Consequently, so is also the payment industry, and many countries have set goals of becoming cashless societies in the future (Chakravorti et al., 2016).

Even though many policy makers and economists have made clear arguments for the benefits of a cashless society, cash has managed to resist a digital extinction. Despite the facts and arguments of the benefits of more digital payments, cash is still a huge part of the society in many countries. This includes not only underprivileged developing countries, but rich and modern industrialised countries as well (Chakravorti et al., 2016). This is a very interesting phenomenon and raises many questions of the causes and factors affecting a country’s cash usage, but is at the same time also concerning, because there are also disadvantages that comes with a cashless society, which in turn can create problems and boundaries in the society. If there were more knowledge and understanding in this field, a lot of these problems can potentially be avoided, or at least better be planned for (Riksbanken, 2017).

Digital payment systems are subjects to network externalities and two-sided platforms (Rochet and Tirole, 2002). There are two sides of the market, the buyers and the sellers, which both benefit from an increase in the other end. The buyers do not want to use a digital payment alternative if no sellers accept it, and a seller do not want to accept a digital payment alternative if no buyers are using it. Low degree of usage often results in high costs of the platform which creates a problem of overcoming switching cost, which in turn leads to the “chicken and egg problem”. Neither side wants to enter first since it would imply too high costs in term of either money, efficiency, or both. It is the platform’s, or market’s, access value which “determines” if it is profitable for one sides to enter or not, which is based on present members on the other side among other factors. In different countries and markets, the prerequisites and access values of the markets are different, making the development of the entire market different, even though the countries could be well-developed and similar in many other ways (Hagiu, 2009).
There are many studies of that digital payments are more convenient and cost less money per transaction than cash payments (Schmiedel et al., 2012). However, a transition from cash to cards, or any other type of digital payment, could entail problems. There is a high risk of a digital divide in the society, leaving certain groups disadvantaged. Old people, disabled persons, and newly arrived might have trouble adapting to digital payments. Even younger kids could have difficulties paying in a cashless society. Inhabitants and small businesses on the countryside are also exposed as the banks reduces their banking offices and cash services (Riksbanken, 2017).

There is a scarcity of models for analysing and understanding technological change, but research from different fields propose a number of various themes that assist to address and tackle the depth of technological change (Rosenberg, 1982). The different themes and research have been done by several different researchers, and have been anchored in different concepts (Anderson and Tushman, 1990). Anderson and Tushman (1990) refers to Basalla (1988), who’s research of technological evolution took starting point in diversity, continuity, novelty, and selection, while studying the evolution of the wheel, steam engine, and automobile among other. In addition, Bijker and Pinch (1987), studied and described the evolution of bicycles, using a similar evolutionary orientation, who’s approach of technological variation and retention, via incremental technical change that extends the technical standard, has also been reproduced in empirical studies by Van den Belt and Rip (1987) in the synthetic dye industry, as well as in the theoretical work of Nelson and Winter (1982). Furthermore, research and work by David (1985, 1987), Abernathy and Utterback (1975), and Hughes (1983, 1987), in various industries have provided theories of how technological variation is closed by the emergence of dominant designs or industry standards, which this study emanates from (Anderson and Tushman, 1990).

Since cash still is a widely used payment method in many countries, despite the facts that digital payments have been around for a while, questions arise around where the payment market eventually will wind up. Suarez and Utterback (1995), defined the concept of a dominant design, as “a specific path, along an industry’s design hierarchy, which establishes dominance among competing design paths”. A dominant design takes form of a new product, new set of features, risen from individual innovations and features introduced independently in prior product variants (Utterback, 1994). A related subject to dominant designs is the phenomena of path dependency, lock-in effect, and switching costs. An example of this is the QWERTY keyboard layout, which is still up until today the standard layout, even though there are other faster layouts. The switching cost of learning a completely new keyboard layout is simply too high for the majority of us in terms of time efficiency. The QWERTY keyboard layout became the dominant design in its design hierarchy and trajectory, creating a lock-in effect, which has in turn created too high switching costs for us to overcome (Shapiro and Varian, 1998). The payment industry is similar, and one of its many trajectories, or pathways, is the category of digital payments. Is the payment industry perhaps moving towards the establishment of a new dominant design in this trajectory?
1.2 Problem Formulation

Today, we are facing the impending “decline of cash”, and the old habit of using cash as a payment instrument is generally decreasing around the globe (Dyson and Hodgson, 2016). However, even though less cash usage equals less costs in general, the development of payments is, and has been, very deviating, both within as well as between different countries, and when people have different prerequisites, lifestyles, and habits in a time of change, problems and concerns tend to arise (Segendorf and Wretman, 2015). As the general public is moving towards more digital payments, the risk of a digital divide for old people, underprivileged people, and minorities increases. Other exposed groups are disabled people, small businesses, and people and associations in the countryside. Furthermore, central banks slowly lose more and more control, since it is becoming more difficult to control monetary policies when the cash usage decreases (Riksbanken, 2016). Due to the fact that the payment industry and cash usage within different industrialised countries are very different, and is continuously changing, it is difficult to really understand all the factors affecting and influencing a country’s payment habits, which potentially could help to assist with the problems emerging from a move towards a cashless society.

1.3 Purpose and Research Questions

The purpose of this thesis is to investigate four different industrialised countries with different degrees of cash usage, with the aim to answer questions regarding the occurrence of a dominant design within the digital payment trajectory in respective country, as well as providing an understanding of factors affecting and influencing a country’s payment habits.

To explore and achieve the purpose, one main research question, together with two sub-research questions are formulated. The sub-research questions are needed to be investigated and answered in order to answer the main research question.

RQ1: How does the retail payment landscape look like in the investigated countries?

RQ2: Why do some industrialised countries have a higher degree of digital payment usage than other?

Main RQ: Is the digital payment trajectory in the investigated countries moving towards an establishment of a dominant design?

1.4 Delimitations and Limitations

Since the thesis is set out to investigate four industrialised countries with different degrees of cash usage (which were chosen from a pre-study, see chapter 4.2), a geographical delimitation has been set. The four chosen countries are Sweden, Italy, Canada, and Switzerland, and thus the study is delimited to these countries.
The payments studied in this thesis are retail payments, which involve “everyday” transactions between consumers and businesses. Retail payments are often of relatively low value, and typically not of time critical-nature. Example of retail payments are consumer to retail payments, peer-to-peer (P2P) payments, salary-, and tax payments. The most used retail payment methods are payment cards, cash, credit transfers, and direct debits (ECB, 2018b).

Moreover, when it is referred to “digital payments” in this thesis, it implies all payment methods carried out using a digital monetary instrument, while “physical payments” refers to payment methods carried out using a physical monetary instrument. Since cash is dominating the physical payment category, cash payments and physical payments are two very closely related concepts. In the digital payment category, payment cards are the dominating payment method. The data also only treats payments with a sovereign reference unit, meaning it is backed by a government and central bank, hence payments with digital currencies such as bitcoins are excluded. However, two interviews were done regarding Bitcoin and other cryptocurrencies to investigate its present impact, as well as in the near future, which was afterwards judged to be minimal, and hence to be delimited. This is further elaborated on and explained in chapter 3.3, “Physical vs. Digital Payments”.

The time perspective of the presented data on cash usage and distribution of payments, have in most cases been five years, since older payment data is argued to be somewhat outdated. In the majority of the presented historical data, the most recent data is presented, which is from 2016 and backwards. In the case of Italy, data for 2016 was unfortunately missing, and is thereof only presented from 2015 and backwards. In some other cases where it was estimated that earlier years could have had an effect, data from earlier years is also presented. Examples of this is the data presented of education and technology adoption.

The limitations of the study were aspects of time, cost, social network and geography. The time period was limited to five months, from January to May, 2018. Another limitation has also been the costs. Since it was a detached master thesis, there was no budget that stood behind the study. The last limitation has been the social network of us, the authors, together with the geography of the different countries. We are from Sweden where the majority of our social network is based, and the study was conducted in Sweden, which led to that it was easier to find information and interviews regarding Sweden. It further led to that it was more difficult to obtain and interpret the information and data from other countries, as well as finding suitable interviewees.

1.5 Contribution

Due to that the society is constantly changing and becoming more and more digitised, so is also the payment industry, which results in that previous studies in the field can quickly become outdated. Therefore, this thesis and study aims to contribute to existing research within the field of payments, as well as to scholarly literature on payments, with the newest information and data available. The theories about dominant design, technological discontinuities, and network externalities are strengthened, and are shown through this thesis, that they still are relevant and
applicable to the payment industry. Furthermore, the study’s ambition is also to contribute to and provide the national central banks of the investigated countries with valuable information. The thesis is categorized as an empirical contribution.
2 Theory

This chapter presents the chosen theories for this study. The first presented theory is about dominant design, how it emerges and establishes in an industry or market. Theory about network externalities is presented after, which generally describes the positive effect an additional user of a good or a service has on the value of that product to others. Related to network externalities, the concept of two-sided platforms and markets are also defined, which is common in today's economy and industries, and not least the payment market. Lastly, a subchapter about how the theory can be used in order to analyse and predict the payment industry is presented.

2.1 Dominant Design

As discussed in the background, there are a number of different models for analysing and understanding technological change, all with different themes and starting points. One of the oldest and most recognised of these models and theories, is the theory about dominant design, which many of the other models are related to (Anderson and Tushman, 1990). The term dominant design was first defined by Abernathy and Utterback, and refers to a model or design that includes most features and user requirements which have been developed and emerged through a market growth of a new innovation (Utterback, 1994). Suarez and Utterback (1995, p. 416) and Utterback (1994, p. 24) defines a dominant design as:

“A dominant design is a specific path, along an industry's design hierarchy, which establishes dominance among competing design paths. It is the design that wins allegiance of the marketplace, the one that competitors and innovators must adhere to if they hope to command significant market following”

The technological key features of a dominant design often become the de-facto standard of that product or industry (Suarez and Utterback, 1995). A dominant design usually takes form of a completely new product, or a new set of features, risen from individual innovations or features introduced independently in prior product variants (Utterback, 1994).

2.1.1 How does a Dominant Design Emerge?

All the different research discussed in earlier chapter has different starting points, foundation and orientations, but a common denominator is that they all eventually suggest that technological change can be characterised as a sociocultural evolutionary process of variation, selection, and retention. Changes and variations are driven by stochastic technological breakthroughs. These are called technological discontinuities, and initiate significant rivalry and competition between formerly dominating technologies. Innovation dynamics such as social, political, and organisational aspects eventually select the industry standard or dominant
design from the new technological conditions. Favourable variant selected by the dynamics of innovation then evolve through relatively long retention periods, characterised by incremental technical change, and increased interdependence and improved competence within, as well as between the parties of practitioners (Anderson and Tushman, 1990).

Anderson and Tushman (1990) presents the technology evolution as a continuous technological cycle of technological with various events and eras (Figure 1). They argue that the era of ferment, the time period between the event of a technological discontinuity and the emergence of a dominant design, is characterised by a high rate of variation, reflected in the number of variants of old and new technology competing in the market. As a result of this, the mean number of new designs introduced in the era of ferment is greater than during the following era of incremental change (Anderson and Tushman, 1990). It is argued in this study that this is also related to, and reflected by the number of firms in the industry, which also Utterback (1994) argues for in his studies. Furthermore, they argue that the era of ferment is much longer if it follows a competence-destroying discontinuity, than if it follows a competence-enhancing discontinuity (Anderson and Tushman, 1990).

Utterback (1994) argues that the emergence of a dominant design is a landmark event for an industry, hence affected parties in the industry need to understand how and if a dominant design occurs to be able to capitalize on it. A dominant design is not very often predetermined, but so is the result of the interplay between technical and market choices at the time. Utterback (1994) explains and illustrates this with the case of the standard keyboard (see Figure 2), which was used in the first Remington typewriters, and almost all of its successors, as well as computers, laptops, and keyboard up until today. There were perhaps more than hundred different keyboard layout developed, some more ergonomic than others, but what Sholes, Remington and the public settled on was the product of experiments, technical possibilities, individual choices, proprietary positions, and to some extent even inertia. Similarly, the persistence of a dominant design explains the momentum of both already established practice of the design, and complementary assets such as typing skills, training and habits (Utterback, 1994).
The simplified design hierarchy in Figure 2 consists of, in this case, two so called “technological trajectories”, which is the path of progress established by the choice of a core technical concept at the beginning. There are several factors and constraints influencing these trajectories, such as prior technical- and customer choices (Utterback, 1994). With starting point in the case of the evolution of the QWERTY keyboard, together with other illustrating examples of emerging dominant designs, and Kim Clark’s “design hierarchies”, a more general design hierarchy for dominant design was developed (see figure 3). It is also important to have in mind that the idea of a dominant design is often conceptually broader than technical competition and technical progress. Others factors that come into play are e.g. regulations, government intervention, communication, and collateral assets (Utterback, 1994).

Figure 2. Simplified design hierarchy of the Typewriter Industry and the emergence of the QWERTY layout (Utterback, 1994, p. 27)

Figure 3. Design hierarchy of a dominant design (Suarez and Utterback, 1995, p. 416)
2.1.2 Dominant Design, Competition and Industry Structure

A new product or feature innovation by one or a few firms in a market sometimes results in a monopoly or oligopoly situation with high profits, and sales in those few market niches where it possesses the greatest performance advantage over other alternatives. However, as both supply and demand grow, and as more application areas are found, more firms enter the market with different variations of the product. The curve of innovation rate and change in a market for a new innovation, and the emergence of a new dominant design looks according to Utterback, and the dynamics of innovation, usually the same (Utterback, 1994). In the beginning of the new industry or market, created by a new innovation, firms (mostly small and entrepreneurial firms) enter at moderate pace. One or several technological trajectories are created and a design hierarchy is formed gradually. After this, a rapid wave of entry occurs, raising the number of firms in the market substantially, continuously adding on new designs or features to the design hierarchy. During this so called “fluid phase”, the rate of innovation is very high, and a great deal of experimentation is done with new products, features and designs, and operational characteristics takes place among competitors (Utterback, 1994). The “fluid phase” is similar to what Anderson and Tushman (1990) calls the era of ferment. Eventually, a dominant design is established, and the market moves into a “transitional phase”, where the total number of firms will start to decline steadily until the market stabilizes with a few number of large firms. In this phase the rate of innovation slows down, and the rate of major process innovations speeds up. Ultimately, this results in product designs that have proven themselves in the marketplace in terms of satisfying user needs, or designs that have been dictated and formed by legal or regulatory constraints (or often in a combination of both). In the end of the curve, when the number of firms stabilizes, some industries enter a so called “specific phase”, where the focus is centred on costs, volume and capacity, while the product and process innovation takes place in small incremental steps (Utterback, 1994). Utterback’s “transitional phase”, together with the “specific phase”, is similar to what Anderson and Tushman (1990) calls the era of incremental change. It is very often the firms that entered the new market in its early stages that succeed. Abernathy and Utterback (1978) have proved this kind of market behaviour with a number of evidences and examples, such as studies of the typewriter-, automobile-, television-, and electronic calculator industry among others. As a result and conclusion of this, they created a graph according to the dynamics of innovation, of how a new industry or market segment changes over time, with the number of firms on the y-axis (Utterback, 1994).
2.2 Network Externalities

To understand the changes in the payment industry and its technological discontinuities, one must also understand the concept of network effects. A network effect is defined in microeconomics as the effect that an additional user of a good or a service has on the value of that product to others, while a network externality only refers to the positive network effects of that additional user of a good or a service. It was first popularized through Metcalfe's law, named after one of the co-inventors of the Ethernet, stating that the value of a network is proportional to the number of connected users of the system, while the costs would at most grow linearly (Briscoe et al., 2006). To explain a network externality further and more trivially, the internet is a good example. Initially when the internet was invented, it had a low number of users, and were of relatively little value to anyone outside the U.S. military. Gradually, as the number of users grew and gained access, so did the content, services and information on the internet, making it more valuable to its users. Today, when the majority of the world’s population have internet access, it has become one of the most important inventions of all time. The same principle of the value of the internet can be applied to other inventions, products, and joint networks such as telephones, social media, and different kinds of payments methods. If the user base of digital payments would grow, so would also the value of the network, and it would bring on e.g. cost reductions, faster technological development, more acceptance and probably more comfortability (Metcalfe, 2013).

2.2.1 Two-Sided Platforms

Network externalities together with digital payments involves the related concept of two-sided platforms and markets. Platforms, which can be used inside firms, across supply chains, markets or industries, acts as an innovation catalyst, and the theory behind it can explain a great deal about a network and its effects on its different parties (Gawer, 2011). In industrial economics, the terms platform is used to characterize products and services that mediate
relationships or transactions between two or more groups. This literature accentuates a network effect situation of the two-sided platform which creates a “chicken and egg problem”, since neither side wants to enter if the access value is too low (Rochet and Tirole, 2003).

In today’s economy, there is a continuous increase in the numbers of industries that are organized around platforms, and more precisely around two-sided platforms, also called two-sided markets. The classic example of a two-sided platform is a shopping mall. The mall (platform) wants to attract both retailers (side 1) and shoppers (side 2), which both benefit from an increase in the other. It is a “two-sided” platform in the sense that both sides, retailers and shoppers, need to gain access to the same platform in order to interact (Hagiu, 2009). The two sides of the platform are dependent of each other and the platform, but co-exist and create a stronger value proposition together across the platform. Examples of other similar, and more modern platforms are Facebook, iOS, AirBnB, eBay, and payment systems (Parker and Van Alstyne, 2014). If the access value of the platform is higher on one side, the more members are present on the other side (Hagiu, 2009). E.g. in the shopping mall example: a lot of shoppers coming to the mall (many present members on side 2), would result in a high value of platform access for the retailers (side 1), since there are many potential customers. This case of two-sided platforms creates a crucial problem of how much to charge each side of the platform for their access in order to maximize profits (which often is the case), and consequently the side with the highest value of platform access is willing to pay the highest (Hagiu, 2009).

![Figure 5. Two-sided platform (Gawer, 2011 and Bengtsson et al, 2017, p. 10)](image)

In this simplified model of a two-sided platform, side 1 is called the consumer (buyer or user), and side 2 is called the developer (seller or provider). The value of the collective value of the network is created from a triangular network externality between the two sides and the platform, emerging from the network of dependencies on each sides, and across the sides (Gawer, 2011). This network effect makes it more profitable for each side to attract more actors on the other, since it will indirectly benefit the side doing it (Parker and Van Alstyne, 2014).

To elaborate on the two-sided platform and its network effects even further, Figure 6 is presented. As can be seen in the illustration, the platform can be considered as a connection or bridge, which allows the buyers or users to transact with the sellers or providers. More buyers or users make the platform attract more sellers or providers, since it creates more demand, and
similarly more sellers or providers attract more buyers or users since it creates more and better supply. All involved parties benefit from different network externalities across the network, and the only negative effect is that an increase in sellers or providers create more competition for themselves (YSH, 2015 and Bengtsson et al., 2017).

Figure 6. Network effects of a two-sided platform (YSH, 2015 and Bengtsson et al, 2017, p. 11)

Though, as stated before, the network effects of a two-sided platform can make for a “chicken and egg problem”, since the sellers might not want to enter the platform if there are not enough buyers or users, making it unprofitable. In other words, the platform access value is too low. Similarly, the same case goes for the other way around, buyers or users do not want to enter or access a platform with low or bad supply (Hagiu, 2009). Related to this, is the problem of switching costs. When there is a new introduction of an incompatible technology into a market, a big challenge is to overcome the collective switching costs (Shapiro and Varian, 1998). The story about the keyboard layout QWERTY is again a very interesting and good example of how collective switching costs and related difficulties can work. The up-to-date QWERTY standard was picked up in the 1870s to intentionally slow down the writing speed, and by doing so reduce the incidence of jamming, which was a big problem back then. Soon after the QWERTY layout was adopted, the advances of technology in typewriters escalated, and gradually got rid of the jamming problem. As a result of this, the DVORAK layout was patented in 1932, which was proven to increase the writing speed, but yet until today, the majority of us are using the QWERTY layout. Why? The costs of learning a completely new keyboard layout is too high (in terms of time and efficiency), and it would take much time to make the transition worthwhile (Shapiro and Varian, 1998)

2.2.2 Digital Payment Systems as a Two-Sided Platform

A digital payment system is a perfect example of a two-sided market or platform, and incorporates precisely the two earlier discussed sides of buyers/users and sellers/providers, as well as the problems it brings on. For a platform to succeed in an industry like the payment
industry, it needs to “get both sides of the market on board” (Rochet and Tirole, 2003), and the merchant (seller) requires the customer (buyers) to carry and use a payment card, and the customer requires the merchant to accept his/her payment card (Carlton, nd). The same principles go for other digital payment such as invoicing, giro-, and mobile payments. The “chicken and egg problem” is in utmost degree present, since there are initial setup costs to get one side or the other to participate in the system. Of course, the platform of digital payments has already paved some way here, and has perhaps overcome some of these costs in some countries and markets, but cash is however still used to a great extent. The prerequisites of a network’s effects are often different from market to market, as well as if and how different factors are influencing, which makes it hard to understand the development. For example, even though different countries are similar both economically and industrially, the nature and prerequisites of their two-sided digital payment market are different. An example of this is the various interchange fees paid by the merchants’ bank (acquirer), which is the platform “access charge”. The interchange fee and other platform rules are set by MasterCard and Visa, which in the majority of the digital payments today are the platform “owners”, governing the platform (Rochet and Tirole, 2002).

2.3 Using Theories of Innovation to Analyse and Predict an Industry

To predict which design that ultimately will dominate the market is a very uncertain process, maybe even impossible. What can be done though, is to identify trajectories, where a dominant design is likely to diverge and emerge from (Echols et al., 1999). E.g. Koski and Kretschmer (2007) are two among other scientists that used the dynamics of innovation and dominant design to analyse the change and innovation in the mobile industry. They identified certain phases and market development, which were similar to the development model that Utterback and Abernathy identified in new innovative markets.

2.3.1 The Payment Industry - Towards a Dominant Design?

If similarities to Abernathy’s and Utterback’s innovation model and phases can be identified within the development of the up-to-date digital payment market, it is argued that conclusions can be drawn about the current innovation phases, technological trajectories, and the occurrence of a dominant design. To do this, one can analyse the current market over time, together with firm entries, firm exits, and total number of firms. In Figure 7, it is shown how Utterback, based on data from George Nichols Engler, analysed the U.S. typewriter industry, in order to identify if and when a dominant occurred, as well as the different phases of innovation (Utterback, 1994).
Since the typewriter industry was an old industry when this study was conducted, the entire curve could be identified, from “fluid phase” to “specific phase”, with a peak where the dominant design was established. However, in the case of this study and the digital payment industry, the market is up-to-date and continuously changing, with new regulations, features, and product designs, and a dominant design has perhaps not yet emerged. But by analysing the industry and its firms up until today, it is argued that conclusions of the dynamics of innovation can be drawn about the present development. If for example, the digital payment market has recently gained a rapid wave of new entrants, it could be evidence of a “fluid phase”, with high rate of innovation, and an industry eventually generating a dominant design.

2.3.2 The Payment Industry Design Hierarchy

Digital payments, as well as physical payments such as cash, can be seen as technological trajectories in the payment industry’s design hierarchy. In these trajectories, new designs and features are continuously developed, such as debit cards, mobile payments, digital wallets, among a lot of other payment solutions, providers or innovations (Figure 8). There are probably more things happening with digital payments than with physical cash, but does it mean that the dominant design can be found within the technological trajectory of digital payments? And has the dominant design yet been established? With the technological trajectory of digital payments categorised, it will be analysed with focus on the firm activity and the dynamics of innovation to draw conclusions to these questions.
Figure 8. Illustrative example of the design hierarchy in payments
3 Payments and Money

This chapter provides a comprehensive and thorough presentation about payments and money. The chapter begins with a description of money and currencies, what it is, and its purpose. Thereafter, different payment methods are described and presented, followed by a definition of physical- and digital payments. The chapter ends with a comparison of remote and point-of-sale payments.

3.1 Purpose of Money

The nature of money has evolved over time. Today, the majority of the world’s currencies are so called fiat currencies or fiat money (often issued by the government), meaning it has no intrinsic value. Unlike representative money, fiat money cannot be converted into e.g. a fixed weight of gold (ECB, 2018d). It has an assigned value only because the government uses its power to enforce the value of a fiat currency or because the exchanging parties agree to its value (Goldberg, 2005). If the central banks around the world were to fail in this endeavour, fiat money would lose its general acceptability and functions (ECB, 2018d). Fiat money was created as an alternative to commodity money (e.g. gold), which in contrast to fiat money, has other uses than being a medium of exchange. According to macroeconomics, money should fulfil three key functions (Mankiw, 2009):

- **Store of value** - Money is a way to transfer purchasing power from the present to the future. If money is earned today, it can be held and be spent next week, next month or next year. Since prices can either go up or down money is an imperfect way of storing value, but nonetheless people hold money because they can trade it for goods and services at a chosen time in the future (Mankiw, 2009).

- **Unit of account** - Money provides the terms in which prices are quoted and debts are recorded. According to microeconomics, resources are allocated by relative prices, implicating prices of goods relative to other goods. A store will always tell you that e.g. a jacket costs 100 Euro, not four sweaters, even though it amounts to the same thing if the sweaters costs 25 Euro each. Similarly, debts and other goods and services should be expressed in a certain currency and not a specified amount of some commodity. Money is the measure of economic transactions (Mankiw, 2009).

- **Medium of exchange** - Money is what we use in order to buy goods and services. It is the economy’s most liquid asset. It should ease with how an asset can be converted into the medium of exchange and used to buy other things. This requires that the medium of exchange is widely accepted, and that there is a consensus of the value of a currency. As an example, we are always very certain of that a shop or vendor will accept our money in exchange for the items they are selling (Mankiw, 2009).
3.2 Different Payment Methods

There are several different payment methods available for individuals today when performing payments. Different payment methods have different implications, as well as advantages and disadvantages. The different natures of the payment methods are further explained below.

Cash

Cash is money in the physical form of a currency, such as banknotes and coins, and works like a bill of debt to the central bank that has issued it. If a bill or coin is destroyed, so is also the claim to the central bank. The monetary value of cash is adjusted in real time between a buyer and seller, as soon as the cash is handed over. There are many different currencies around the world, some which are specific for different countries, and some which are shared between certain countries. Prior to the digitalisation era, cash was used as the dominant payment tender (Riksbanken, 2013).

Debit and Credit Cards

Card are most commonly used for point-of-sale (POS) payments, when a consumer meets the seller in person, but can also be used remotely. The payment is initiated electronically by the seller’s card terminal. Cards can also be used for more distant payments or transactions, e.g. buying goods online, as well as cash withdrawals in stores or at ATMs. Card payments are usually pull transactions, meaning that the seller’s bank requests the payment from the consumer’s bank (Riksbanken, 2013).

Payment cards are issued by authorized intermediaries, and the most common one is the debit card, which is distributed by a bank, and connected to an account. A debit card provides two functions or services for the card holder. It can be used as a direct payment method when doing a purchase, and it can also be used as a cash withdrawal tool (Bounie et al., 2016). Another common payment card is the credit card, which gives the consumers the potential to use credit. The issuer of the card collects the cardholder’s transactions over a period (usually one month), and then charges the total amount of all transactions over that period, often through invoicing. The cardholder can choose to pay the whole amount, parts of it, or none of it, and the remaining (if not the full amount has been paid) debt will get transferred to the next period, with an ongoing interest. Another payment card alternative is a debit card with delayed payment function (charge card). It works like a credit card, without the possibility to use credit and postpone payments to future periods. Payment cards are almost at all times connected to an international card infrastructure system, where Visa and MasterCard are most common (Riksbanken, 2013).

The majority of the payment cards today uses the global commercial EMV-standard (Europay, MasterCard, Visa), often called chip and PIN card. The relatively new standard of chip and PIN cards were developed a couple of years ago as the card fraud increased and became more popular for fraudsters. The difference from the earlier card standard is that the magnetic track
has been replaced by a chip, making it more difficult for fraudsters to use counterfeit cards in ATMs and card terminals. The introduction of EMV-card is driven by the market but is promoted by authorities. E.g. the card issuing companies introduced (in the EU between 2005 and 2008) a rule that merchants that have not adopted their systems to the EMV-standard will carry the risk of fraud, instead of the card issuer (Riksbanken, 2013).

**Mobile Payments**

Mobile payments refer to payments performed from, or via a mobile device. There are many different companies providing different mobile payment solutions today. The solutions can either be centralized by banks, payment cards or tele operators. In a bank centralized solution, the user links his account number to his mobile device, making it possible to transfer funds between accounts through the phone. In a payment card centralized solution, the user links his debit card to his mobile device, making it possible to perform card payments through the phone. A solution centralized by a tele operator is less common than the two others, and work in the way that a user’s tele operator charges the payments done by the user’s mobile device on the user’s phone bill (e.g. SMS-payments). Mobile payments can be initiated differently by the user. Transactions can be done manually by typing in an account-linked phone number or in applications of which a payment card is linked to. They can also be initiated by e.g. scanning QR codes (Quick Response) or using NFC technology (Near Field Communication) to perform contactless payments (Riksbanken, 2013).

**Credit transfers and giro payments**

A credit transfer or a giro payment is a push payment account-to-account, meaning the transaction is initiated by the payer and is carried out by the payer’s bank without any requests from the receiver’s bank. A giro payment differs from a credit transfer in the sense that it uses a certain bank- or giro number, instead of the receiver’s bank account (Riksbanken, 2013).

**Direct debits**

In a direct debit, the payer and receiver have agreed of an automatic debit from the payer’s account to the receiver’s. A direct debit is basically an automatic credit transfer, but differs in the way that it is initiated by the receiver’s bank, hence it is a pull payment (Riksbanken, 2013).

**Cheques**

A cheque is a written money order, from an issuer of the cheque to a redeeming bank, of paying a certain amount of money, either to the issuer or to a third person decided by the issuer of the cheque (Riksbanken, 2013).

**3.3 Physical vs. Digital Payments**

There are many different ways in classifying money, payments, and monetary instruments. Camera (2017), divides monetary instruments into two different types, physical and digital.
According to Camera’s classification, physical monetary instruments are notes and tokens (central bank coins and notes), while digital monetary instruments are e-money (central bank reserves and commercial bank money). Furthermore, he also classifies the monetary instruments if they have a sovereign reference unit or another reference unit (Camera, 2017).

Table 1. Classification types of monetary instruments (Camera, 2017)

<table>
<thead>
<tr>
<th>Denomination:</th>
<th>Physical</th>
<th>Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sovereign reference unit</td>
<td>Notes and tokens (central bank coins &amp; banknotes)</td>
<td>E-money (central bank reserves, commercial bank money)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E-cash (e.g. M-Pesa)</td>
</tr>
<tr>
<td>Other reference unit</td>
<td>Notes and tokens (e.g. Ithaca HOURS)</td>
<td>Abstract currencies (e.g. Bitcoin)</td>
</tr>
</tbody>
</table>

This study uses a similar categorisation, but instead refers to it as physical- or digital payments. A physical payment refers to a payment carried out with a physical monetary instrument, which in almost all cases is cash but could also be e.g. a cheque payment, while a digital payment refers to a payment done with a digital monetary instrument, which often is a card payment. In this study, a physical payment is therefore not a physically carried out payment (point-of-sale payment), but a payment carried out by a physical monetary instrument. Other digital payments are e.g. credit transfers, mobile payments, and direct debits. The absolute majority of monetary instrument in the two different categories are cash for physical payments, and cards for digital payments. Hence, when digital payments are discussed, card payments are discussed in large part, and the same goes for physical payments and cash. This classification is also illustrated in the payment market’s design hierarchy and its technological trajectories (Figure 8) in chapter 2.3.2. Furthermore, this study only treats payments done by a sovereign reference unit, and not cryptocurrencies, except for two of the interviews.

3.3.1 Cards vs. Cash: Pros and Cons

Recent research on cost of payments has concluded that cash payments in general is the costliest payment method out there today (Bounie et al., 2016). The costs are many with cash, and they are generally difficult to identify for individuals. Cash involves a lot of social costs for individuals, businesses, and governments, e.g. distribution costs (Riksbanken, 2016). Furthermore, cash usage for individuals entails a regressive tax which affects the unbanked the most. For business, it is mainly about the management of the paper-based money, i.e. storage, guarding, accounting etc. For the government, common costs are underreported tax values from taxpayers (Chakravorti, 2014).
The reduction of costs that card payments provides is just one of many benefits that comes with digital payment methods instead of using the classic cash payments. Other prominent benefits that the digital payments pave the way for are for instance, surfacing of the underground economy, transaction security and transparency, a digitalisation of the economy as a whole which in turn promotes new innovation- and competition opportunities. The ability to perform remote payments with cards and digital payments is an additional benefit. (Ambrosetti, 2017). Regarding the underground economy, cash payments facilitates to get away with such trading unnoticed since they are not traceable, but card payments are (Segendorf, 2018).

More obvious disadvantages with cash are, for instance, that individuals have to travel in order to get cash. According to Chakravorti (2014), Americans travel on average 28 minutes each month in order to get cash. Furthermore, the travel aspect is not only costly from a time perspective, but can also be costly depending on the type of travel it requires, if the travel itself cost money. Travel costs could for instance be money for gas if going by car, or money for bus ticket. Another disadvantage with cash is that they easily can be destroyed. A card can of course also be destroyed, but it is only the physical card that gets destroyed, not the money itself (Riksbanken, 2013).

There are also advantages with cash, and disadvantages with cards. Cards are totally dependent on the digital and electronic technology, which cash is not. If the technology does not work, the card cannot be used and is more or less useless. For instance, if the terminal is down, one cannot access the money on the card. Another thing is interchange fees with cards. Retailer does not charge fees with cash, and cash offers complete anonymity upon payments. Cash is also, because of its independence of digital and electronic technology, completely safe from hackers, cyber frauds, and skimming. However, cash usage can increase the risk of robberies, since it is easier to, in the end, get hold of the money when stealing actual cash rather than a payment card (Chakravorti, 2014).

3.4 Remote vs. Point-of-sale Payments

Remote payments are all types of payments done at a distance between individuals, while point-of-sale (POS) payments are more of a traditional type of payment method where the money is exchanged on the spot between individuals. I.e. in order to perform a POS payment, both parties, the payer and the payee, needs to be physically present in the same location. For example, cash is a typical payment method that belongs to the POS payment category (ECB, 2018c). Card payments belongs to both the remote- and POS payment categories, since it can be used to pay with over desk in stores, and the card’s card number can also be used to pay more remotely, at e.g. websites (Riksbanken, 2013).

Technology such as the internet, computers, smartphones and financial applications have made it a lot easier for people to move more and more from POS payments to remote payments. As the society is becoming more digitised, people’s convenience for purchasing remotely is successively increased, but when it comes to international statistics of remotest payments, there is no available data that distinguishes between the use of card payments in respect to either
being conducted as a remote payment, or a POS payment (Riksbanken, 2013). However, the move towards more remote payments is reflected in the statistics anyway, and can be identified by an increased trend overall in credit transfers, giro-, card-, and mobile payments, which all falls entirely, or partly under the remote payment category (BIS, 2017).
4 Methodology

This chapter presents the chosen methods for how the empirical data was gathered in order to answer the research questions, as well as to fulfil the purpose of the thesis. The conducted case study is introduced, followed by more in depth explanation of which areas that have been investigated. The research approach, data gathering, and research quality, is described and critically discussed.

4.1 Research Approach

The purpose of this thesis is to investigate four different industrialised countries with different degrees of cash usage, with the aim to answer questions regarding the occurrence of a dominant design within the digital payment trajectory in respective country, as well as providing an understanding of factors affecting and influencing a country’s payment market and degree of cash usage. In order to achieve the purpose, mainly a qualitative methodology with an abductive approach has been used, based on interviews, secondary databases, literature review, and benchmarking. The majority of the sources used are secondary databases, since the thesis sets out to investigate and compare different countries, and the desired exact data was impossible to find elsewhere. A qualitative study was preferable since the advantage of a qualitative study is that it can provide a good overview of a phenomenon, and can thus be used to answer questions of who, which, how and why (Blomkvist and Hallin, 2015). A qualitative approach is also especially useful for subjects of which the important variables are not known beforehand (Creswell, 2013), which is the case of this study. Furthermore, an abductive approach entails switches between theories and ideas in the literature and empirical material being studied, as well as how the way in which we read the literature is influenced by our understanding of the empirical material and vice versa. The character of this approach is preferable in this study, since the empirical findings could potentially change the understanding of the method and theory (Blomkvist and Hallin, 2015). However, the first and less extensive part (firm analysis) of the case study is quantitative, and provides a more holistic view of the payment industries.

4.2 Case Study of the Payment Markets

To explore and seek answers to questions and influencing factors regarding different countries degree of cash digitalisation, an exploratory case study of Sweden, Italy, Canada, and Switzerland was done. It was found appropriate, since case studies are the preferred strategy when doing a qualitative study, answering questions of how and why, when the investigator has little control over events, and when focus is concentrated on a present phenomenon within some real-life context (Yin, 2013). The four countries of investigation were decided from a pre-study, and was chosen due to their similar industrial level, but difference in the degree of cash usage. It took starting point in Sweden, due to the country’s low cash usage. Thereafter, one more country with low cash usage, and two with high usage were sought, but it should also
be countries with similar payment needs to make the study as illuminating as possible. Italy, Canada, and Switzerland were then chosen, which all are open, industrialised and developed countries in which the majority of the households has access to bank accounts. It was also in the interest to have four countries with different currencies to make the study more generalizable, and the supervisor also had an influence in the choice. The case study was done in three different steps further explained below: a pre-study, a firm activity analysis, and a country investigation. These three steps constitute the results of this thesis, which is later on analysed for conclusions and answers to the research questions.

4.2.1 Pre-Study

A pre-study was done to get a better understanding of the current situation of cash management- and payment markets on a global scale, and helped to decide which countries to investigate further. It also provided a synoptically view of the payment markets within the chosen countries. Moreover, it primarily served as a tool to get more and better understanding about the field of study, and to give guidelines of where to start the more comprehensive study, as well as to provide knowledge of which areas to investigate.

For the most part, the pre-study involved market research in terms of literature reviews and interviews. Reviewed literature included database searches, academic papers, news-, and other relevant articles, and the interviews was used as expert opinions, and help of where to search and find the wanted data.

4.2.2 Firm Activity Analysis

After the pre-study, a firm activity analysis was conducted based on the theories of dominant design by Utterback (1994), and Anderson and Tushman (1990). The number of active firms, as well as entries of new firms in the digital payment industry were analysed over time with the aim to identify similarities to other historical cases of industries where a dominant design has been established. The companies in the analysis was taken from the database about-payments.com, the world’s largest searchable database of over 300 payment service providers (Crunchbase, 2018). Other companies working with digital payments that were not registered in the database were also added subsequently. Many of the companies in the database were active in two or more of the countries. Even though this analysis did not include all the optimal companies for an analysis like this, nor it included company exits over the analysed time period, it is still a good illustrative example of what is happening in the payment industry and market. The result is presented in four different graphs in Figure 9, one for each country, with the number of firms on the y-axis, and time on the x-axis.

4.2.3 Country Investigation

Since the firm activity analysis only looks at the payment industry on a holistic level, and could be argued to not provide enough evidence on its own, a more comprehensive investigation of Sweden’s, Italy’s, Canada’s, and Switzerland’s payment markets and payment habits has been
conducted. In this investigation the countries’ cash usage, payment habits and potentially influencing factors (found from the pre-study) are mapped out and presented. The interviews were used as a guideline here, but as much of the sought data were statistical, they mainly provided assist in finding and confirming relevant sources and data. The majority of the data were taken from the Bank for International Settlements’ (BIS) red book, which provides data on payments, payment-, clearing-, and settlement systems. The latest data from this source is used, which is from 2016. Unfortunately, this database did not provide data for Italy, since they are a member of the Eurozone, and the data was thereof strictly presented on a Eurozone level. However, sufficient data and information was found of Italy from another source, The European House - Ambrosetti. Furthermore, other data and facts were found from other secondary sources and institutes, such as databases, literature, and studies from e.g. the European Central Bank (ECB), Riksbanken, Banca d’Italia, Bank of Canada, and the Swiss National Bank. In the subchapters where data not directly related to payments was needed, e.g. population density and age demography, other secondary sources were used but thoroughly review before used. In some cases, it was impossible to find the exact same data categories for all countries, e.g. for trust and fraud, and in these cases data is presented as much as possible, and as good as possible for the other countries.

The carefully chosen areas of investigation within the countries intended to lay ground for, and answer questions regarding why some countries are using less cash than others, and further be linked to the question regarding an establishment of a dominant design in the payment market. Below is a presentation and explanation of the different parts in the country investigation, what it is and why it was look into.

**Cash in Circulation and Distribution of Payments**

First, the current and recent payment landscape is investigated. The most up-to-date data and information on cash in circulation and distribution of different payment methods is presented from the years of 2012 to 2016. When it comes to cash usage there is no exact data available, but there are ways of measuring and estimating it. The two most common ways are to look at the cash intensity (CIC divided by GDP) in a country, or to look at the number of ATM cash withdrawals, wherefore numbers for both these categories are presented in this section. Unfortunately, there are no exact data and statistics for cash withdrawals over desks, but some studies have tried to estimate it (Riksbanken, 2013).

**Population**

Population density, education, demography and technology usage are investigated and presented. Population density has a strong correlation with cash management cost, since distribution costs for cash is relatively high for sparsely populated countries (Riksbanken, 2016). The countries’ *Education Index*, published by the United Nations, is presented from 1980 to see if there are any correlations with cash digitalisation. The index is based on, and calculated from mean years of schooling, and expected years of schooling. Age demography and technology usage is also presented to investigate potential correlations to payment
methods. Technology adoption and usage is based on the *Networked Readiness Index*, which is a yearly publication from the World Economic Forum (WEF), which ranks how well different countries uses the possibilities of information- and communication technology, and the rating scale consists of the values 1-7 where one is the worst and seven is the best. It is basically an indicator of how well different countries are doing in the digital world (WEF, 2016).

**Financial Consumer Technology**

In this section the country’s financial consumer technology is investigated and presented. There are possibly differences in this kind of technology from country to country, which potentially affects the distribution of payments and cash usage. The focus is on financial consumer technology developed directly, or indirectly by the government.

**Trust**

Trust for banks and monetary financial institutions is studied, as well as inhabitants’ safety perspective on different kinds of payments. Data on fraud is also presented as far it goes to see if there are any direct correlations between this and the countries’ distribution of payments. Unfortunately, fraud data is only presented for Sweden and Italy, since no fraud data for Canada and Switzerland were found.

**Cost of Card Payments**

The costs of card payments are investigated and presented for all the involved countries. In this study we seek the interchange fee paid, which is the fee that an acquiring bank pays an issuing bank. It is in other word the fee that a merchant pays to accept each card transaction, which is reflected on the cost for the customer, as well as if a merchant is able to accept card payments of different amounts. If it is too expensive for a merchant to access the platform, it results in less users on the other side.

**Central Banks Role and Other Influencing Variables**

Central banks can have different agendas and different degrees of influence when it comes to monetary policies and cash usage. To find out if this has any impact on a country’s payment habits, these are investigated and presented in this section. Furthermore, if there are any other influencing variables, data or information which could have an impact on the countries’ payments, these are also presented here. An example of this is directly related domestic regulations, which differs between the countries, and probably affects both the buyer/user side, as well as the seller/provider side.

**4.3 Country Comparison**

As the case study of Sweden’s, Italy’s, Canada’s, and Switzerland’s payment markets were completed, a benchmark was conducted. It was done based on findings from the case study, to
compare the investigated countries with each other, with the purpose to find correlations and differences related to the countries’ different degree of cash usage and digital payments. In the comparison, the data and findings of the different countries in the case study was arranged, aligned and compared with each other, to be able to discover similarities and differences, both in terms of distribution of payments and potentially influencing factors. The payment data was recalculated and presented in the same currency, USD, to make the comparison more just and easy to follow. The exchange rate used was each countries’ exchange rate at the end of the given year. It is also presented per capita to remove the factor a country’s total population, and to further make the country comparison more just. The result of the comparison was later analysed in a succeeding chapter to draw the final conclusions and to answer the research questions.

4.4 Data Gathering

Data in this study was collected through both primary and secondary sources. The primary sources were interviews while the secondary sources were databases, and reviewed literature and articles, further described below.

4.4.1 Literature Review and Databases

A thorough and comprehensive literature review was done in order to get deep and profound knowledge about the subject of the thesis, and the situations regarding the areas of investigation within the countries. The review involved searches in credible literature databases such as Google Scholar, KTHB Primo and Harvard Business Review. Furthermore, it also involved reviewing news articles, reports from consulting firms, as well as data and publications from state- and central banks, since a key part of the study is to investigate present domestic circumstances and conditions.

A major part of this study is based on statistical data and information. To find the required data, mainly three big data bases have been used. The first one is the Bank for International Settlements, acronym BIS, which was used to provide adequate data on the countries’ payment habits. The second one is the European Central Bank, acronym ECB, which was used to provide data and information about payments in general, mainly for Sweden and Italy. The third one is about-payments.com, which provided companies active in the digital payment industry.

4.4.2 Interviews

To complement the literature review and statistical data, semi-structured interviews were conducted. The interviews were recorded and summarized afterwards (chapter 5.1), but no precise transcription has been done, since it was considered to be redundant. As a result of the frame of the study, the interviews was used mainly as a supplement to the data collected from secondary sources, and primarily had three functions:

- To assist the pre-study and provide holistic information about the payment market.
- To help with finding sources and data required for the study.
- To somewhat verify the data and information found from secondary sources.

The first interview with Christoffer De Geer and Joakim Herlin-Ljunglöf, was done in the beginning of the study to investigate if focus needed to be put on cryptocurrencies, but it was determined to exclude cryptocurrencies because of its uncertainty and irrelevance (in proportion to other payment methods) in the near future of the payment market. Even though the focus of cryptocurrencies was excluded in this study, the interviews regarding cryptocurrencies are presented in chapter 5.1 to give the reader an understanding of why it was excluded. Furthermore, throughout the work, the goal was to interview four different payment expert, one of each investigated country. However, unfortunately no appropriate interviewees were found (or did not want to participate) for either Canada or Switzerland, which made it more difficult and time consuming to study these countries.

Table 2. Interviewees

<table>
<thead>
<tr>
<th>Name:</th>
<th>Role:</th>
<th>Date:</th>
<th>Duration:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christoffer De Geer</td>
<td>Chief Business Development Officer (CBDO) and Vice President at Goobit/BTCX</td>
<td>13/2-18</td>
<td>1 hour</td>
</tr>
<tr>
<td>Joakim Herlin-Ljunglöf</td>
<td>Head of Marketing and Communication (CMO) at Goobit/BTCX</td>
<td>13/2-18</td>
<td>1 hour</td>
</tr>
<tr>
<td>Björn Segendorf</td>
<td>Adviser at Sveriges Riksbank</td>
<td>14/2-18</td>
<td>1 hour</td>
</tr>
<tr>
<td>Eric Marini</td>
<td>Consultant for Business Sweden. Responsible for the International and scientific department, Italian Association of Payments &amp; Service Providers</td>
<td>11/5-18</td>
<td>1 hour</td>
</tr>
</tbody>
</table>

4.5 Research Quality

In order to enhance the quality and credibility of the thesis, the validity and reliability of the gathered data is analysed and discussed. In addition, a discussion of the generalisability and source criticism of the gathered data is also provided.

4.5.1 Validity and Reliability

Validity simply explained, entails studying the right thing such as appropriate literature and theory, models etc. (Blomkvist and Hallin, 2015). Thus, it is a measure of how well the research has fulfilled the purpose of the study, or in other words, how relevant the gathered information and data are in relation to what it was meant to be (Creswell, 2013). Reliability is a fairly close
related term to validity, but instead refers to studying the material and data in the right way (Blomkvist and Hallin, 2015). Hence, it refers to how a similar performed approach and study would have led to the same results, if it had been done again (Creswell, 2013).

The studied and used literature in this thesis is considered as appropriate, valid, and reliable, and this statement is partly based on the credible databases where the literature were found, but also due to the amount of citations the sources have had in other theses and studies. The empirical data obtained and presented in the case study of the countries, are also considered to be appropriate, valid, and reliable, and this is because the majority of the data are from sources such as BIS, ECB, the countries' national central banks, United Nations, and World Economic Forum. Furthermore, the chosen subchapters in the case study of the countries are also considered as relevant topics to study in order to fulfil the purpose of the thesis, as well as to answer the research questions. However, chapter 5.2 can possibly be discussed if it really studies the right things, since the studied firms mainly provides services to the digital payment industry, and not physical products, which the latter is the one studied in the majority of the cases by Abernathy and Utterback. Though, it is argued in this thesis that these are related, and can also be analysed. Furthermore, the second part of the study where Sweden, Italy, Canada, and Switzerland are analysed thoroughly, further validates the study.

Throughout the study, there are in some places missing data for some of the countries (since different countries were analysed, and the same studies did not involve all countries). It would have been further beneficial for the study’s validity to have the same data, as well as data of every researched aspect, but the obtained data is treated as good as possible where it happened. Furthermore, it is also believed that more interviews (one for Canada, and one for Switzerland), would make the study more valid and reliable. However, it was constantly tried to find good and suitable interviewees, but no one were found or did not want to participate.

4.5.2 Generalizability

Generalizability, sometimes also known as external validity, entails to which extent the findings of a particular study can be generalized and be applied to other studies, research settings, phenomenon, or problems in similar contexts (Saunders et al., 2009 and Leung, 2015).

Since the structure and approach of this study is fairly broad, i.e. many different aspects of the chosen countries are studied, it can be generalized and applied to more or less all payment studies about the countries Sweden, Italy, Canada, and Switzerland. However, the data in the case study in the thesis is not particularly useful to other countries, since the data is specific for the investigated countries, but the topics can still be used for investigating other countries. The analysis and discussion part of the thesis though, together with the conclusions, are considered as useful information for all payment studies in all countries, but especially in countries with similar circumstances. Common denominators for such countries are to be open, industrialised, and developed, in which the majority of the households has access to bank accounts. Furthermore, since the study involves four countries with difference currencies, it strengthens the generalisability between countries with different currencies.
4.5.3 Source Criticism

To evaluate the sources from where the gathered data is collected, constitutes an important part of scientific research. There are many different ways of classifying and categorizing sources, but an appropriate division to make is to divide the sources to either be of primary or secondary nature (Blomkvist and Hallin, 2015). In order to critically evaluate, analyse, and discuss the sources, the framework that Blomkvist and Hallin (2015) presents of source evaluation and criticism, has been used. The framework consists of four parts: authenticity, proximity and dependence, tendency, and representativitv. These implies an evaluation of the author, if the data is up to date, if the source has a tendency to portray the information in a certain way, and if the material is representative of the phenomenon, respectively (Blomkvist and Hallin, 2015).

The primary sources consisted of semi-structured interviews. When performing semi-structured interviews, it is important to be aware of the risk that the interviewee might provide biased answers. This was always thought of during the interviews, and tried to be avoided by asking follow-up questions to potentially biased and unclarified answers. After the interviews, the answers and information gathered were also checked with other sources as carefully as possible.

The secondary sources have been carefully selected and are mainly gathered from credible databases such as Google Scholar, KTHB Primo, and Harvard Business Review, as well as from reliable financial institutions and organisations such as BIS, ECB, the countries' national central banks, United Nations, and World Economic Forum. The used literature in the thesis from the databases is mainly peer-reviewed. When non peer-reviewed literature have been used, which it occasionally has, e.g. news articles, they have always been verified with other sources to the best possible extent.
5. Case Study of the Payment Markets

This chapter presents the extensive empirical data obtained about the countries in this thesis. Firstly, the conducted interviews are presented, which provided information and knowledge about the payment industry, as well as suggestions on additional sources and databases, and helped with the delimitation of excluding cryptocurrencies in the study. Furthermore, the number of firms in the payment industry is presented, along with an illustrative figure of the firm activity. Afterwards, the more in depth part of the case study is presented, involving a more thorough investigation of the countries.

5.1 Interviews

To clarify the conducted interview once more, the first two were about cryptocurrencies (which in this chapter is merged to one interview), and helped with the decision of excluding, and delimiting cryptocurrencies from the study, due to its insignificance in the near future. Parts of the interview with Björn Segendorf also involved cryptocurrencies, and further encouraged the decision of exclusion. However, these parts of the interviews are still chosen to be presented, since they contributed to the delimitation.

Christoffer De Geer, VP and Chief Business Development Officer, and Joakim Herlin-Ljunglöf, Head of Marketing and Communication at BTCX

The future looks bright for cryptocurrencies according to Christoffer De Geer, especially Bitcoin. He argues that Bitcoin is today far from perfect, but it is here to stay and it will become much more stable and better in the future. He makes the resemblance to the internet, that Bitcoin today is like internet was in 1985. Christoffer believes that the payment market in the future will only consist of cryptocurrencies, since it will become much better than today’s available payment methods. This will however take many years, because there are several things that needs to be fixed with Bitcoin today. It will also take a lot of time due to the adoption aspect, both from a user perspective, but also from a bank perspective, he says. Examples of things that Christoffer mentions that needs to be fixed are transaction fees and the transaction speed, but these thing are already in the process of being fixed, he argues. For instance, BTCX recently introduced “lightning networks” which allows for instant payments that are more or less free. Regarding the security aspect of Bitcoin, it is already secure enough today, he says. Christoffer would estimate the time span to approximately 20 years for Bitcoin to work well and have a great impact. For it to happen in the next few weeks or even years however, as some have hopes for, is not that likely, he says.

When it comes to whom and where cryptocurrencies, in this case Bitcoin, really would benefit and get a breakthrough, is for the simple workers in developing countries who do not have that much of an economic freedom nor any access to successful payment methods. Christoffer argue, for Sweden to completely switch to Bitcoin is not that big of an improvement to what
the payment market today offers. For instance, the mobile application Swish in Sweden, together with the Swift Network Sweden is a part of when it comes to doing money transactions between countries, works really well. Thus, the marginal benefit of a complete transition to Bitcoin today for individuals in Sweden is not that great or remarkable, in comparison to the simple worker in a developing country, Joakim Herlin-Ljunglöf comments. I.e. countries that are at the bottom of the scale of economic freedom, such as Venezuela or North Korea for instance, should be the first countries to be taken to Bitcoin. These countries would benefit both on a personal- and global level. Sweden is very high up on the scale, and are therefore not really in a need of Bitcoin today.

Even though different cryptocurrencies solve different things, Christoffer cannot really see other uses for other cryptocurrencies than Bitcoin. He also argues that other cryptocurrencies cannot outrival or really competed with Bitcoin today, since it is the most safe and decentralised cryptocurrency on the market. He believes it is too late for the competitors now since Bitcoin is the most established cryptocurrency out there today with the most amount of developers, most number of stores that accepts it, etc. Again, the resemblance between Bitcoin and the internet, internet is still today far from perfect, and has a lot of improvement potential. With that said, we still do not replace the internet, because that would be extremely complicated, he says.

**Björn Segendorf, Adviser at Sveriges Riksbank**

The interview with Björn Segendorf gave a lot of good insight into Sweden's payment market in general, along with many tips on valuable sources and publications for the thesis as a whole. Examples of sources that Björn suggested that has been frequently used in the thesis are The Bank for International Settlement, and various articles from both ECB and Riksbanken, including some which he has written himself. The interview also touched upon cryptocurrencies and its potential future, to get another view of it since the subject often is slightly subjective. He believes that cryptocurrencies in the future will be a niche product, and one reason for this is that he believes it will be difficult for the cryptocurrencies to compete or to completely outrival the existing and well established payment services and systems. He argues that the existing payment services have advantages in today’s payment systems, and as long as there are large volumes there, the average cost will be very low. Also, today’s payment systems are well integrated into companies accounting systems, cash systems etc. These are some reasons why Björn believes it will be difficult for the cryptocurrencies to compete with the existing payment services and system. However, he believes that it could possibly exist niches where today’s systems do not meet the needs, as well as new needs may arise where the older systems are not suitable for.

Furthermore, regarding the cryptocurrencies, their common problems today with exchange rate volatility, high transaction fees etc., needs to be fixed before we could see a potential major breakthrough. Björn also believes that for a cryptocurrency to get a breakthrough, it needs to enter the regulatory financial sector, and does not work with an anonymous publisher or an unregulated publisher, as Bitcoin for instance have today. Björn believes that in order for
cryptocurrencies to have a market share on the payment market, they need to be within regulatory circumstances with a regulated provider or institution, such as a central bank for instance, who can support the value of the currency. At the same time, Björn also argue that money has in general three roles which are a means of payment, a counting unit, and a store of value, and today’s cryptocurrencies are not really appropriate for any of these three.

When it comes to how the payment market in general will look like in the future, approximately ten years from now, Björn is convinced that the banks will still be around since these account-holding institutions are irreplaceable. People want to have their money in banks due to deposit guarantees and all the other financial services that they provide. The banks will still be the place where a payment starts and ends, since the individuals have their bank accounts at the banks. The initiation of the payments will to an increasing extent happen through companies that are specialised in helping the customers with payment initiation, such as the Swedish companies Trustly, Klarna, iZettle etc. which exists today. Regarding how the payment infrastructure will look like in the future, Björn believes it will resemble the one we have today, partly because of the sunk costs that exists, but also due to all the advantages the centralised platforms today contains. Lastly, when it come to the average consumer and company’s view on digital- and mobile payments, both today and in the future, Björn believes that they see it as a necessity in order to do the payments they have to do. They only see the surface of the payment transaction, and not really what happens when it is initiated, which is a very complicated process. Thus, how comfortable and easy a digital payment is perceived, will be a very important aspect in the future.

Eric Marini, Consultant for Business Sweden. Responsible for the International and scientific department, Italian Association of Payments & Service Providers

Eric Marini provided valuable information about the payment market in Italy, together with the Italian inhabitants’ thoughts on payments, as well as their everyday payment behaviours. He argues that the cash usage is still very high in Italy today, and the distribution of cash- and card transactions done are around 80 percent cash, and 20 percent cards. I.e. Italy has a clear majority of cash transactions, and cash could therefore today be argued to be the dominant design in Italy regarding payments, according to Eric. Why this is the case is not completely obvious, because the technology and infrastructure for a higher amount of digital payments exists in Italy, he says. He believes influencing factors to this might be culture and tradition, trust for politicians and banks, as well as the cooperation between the banks, where the latter have not been particularly successful in Italy.

When it comes to the financial consumer technologies and mobile applications in Italy, there are many, such as Apple Pay, Satispay, Jiffy, PosteMobile, and Samsung Pay is on the way etc. However, Eric argue that this market has not yet really got a clear leader in Italy. Furthermore, regarding electronic identification in Italy, he mentions SPID, which is like the Italian equivalent of Sweden’s BankID. However, SPID is far from the same size or as frequently used as BankID is in Sweden. Further, he also mentions PagoPA (Payment interface towards the
Public Administration). Since car- and bike sharing is very big and popular in Italy, all these mobile applications and financial technologies facilitates carrying out such activities.

Eric would argue that Italy’s Central Bank, Banca d’Italia, as well as the other banks, are actively working towards increasing Italy’s card usage, as well as the digital payments as a whole in the country. The cash management is expensive, and especially the missed tax revenues, which is a large problem in Italy, according to Eric. At the same time regarding the digital payments, he believes that the desire to increase the digital payments is actually a two-piece wish, since corruption is a large problem in Italy, and mentions the 500 EUR banknote.

Even though cash is undoubtedly the dominant payment method today in Italy, Eric is convinced that the card payments will continue to increase in the future. If cards and digital payments have the potential of becoming the dominant design in the future, is difficult to predict, but probably, due to how all countries are moving towards completely digital societies.

5.2 Number of Firms in the Payment Industry

The result of the firm activity over time in the digital payment industry (digital payments trajectory) appears to be similar for all the investigated countries. Even though the numbers and curves are not exactly the same, the shape of the curves are similar, which also constitutes an important part of this analysis. As shown in Figure 9, the first established firm in the digital payment industry or trajectory in any of the countries was established in 1971. In the early years there were only a few companies establishing in the market, as it around the late 90’s, received a large and rapid wave of new entrants. However, during the past 2-3 years the entry of new firms seem to have stagnated, but it could also be explained by that such new firms have not yet made their way into the database of where the data were taken from. The curve should possibly more rightfully continue to increase the last years also.

![Graph showing number of firms in Sweden, Italy, Canada, and Switzerland](based on data from about-payments.com)
5.3 Sweden

Sweden is a large country seen to its area in northern Europe, but relatively small seen to its population. It has been a member of the European Union since 1995, but not the monetary union of the euro area, thus it has its own currency, the Swedish Krona (SEK). The Gross Domestic Product (GDP) per capita is high compared to other countries, and is ranked very high in the Human Development Index (an index of the human development in all countries) by the United Nations Development Programme (UNDP) (UNDP, 2016). Basic data about Sweden is presented in Table 3.

Table 3. Sweden basic data (BIS, 2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (thousands)</td>
<td>9 521</td>
<td>9 603</td>
<td>9 702</td>
<td>9 851</td>
<td>9 995</td>
</tr>
<tr>
<td>GDP (SEK billions)</td>
<td>3 684.8</td>
<td>3 769.9</td>
<td>3 936.8</td>
<td>4 199.9</td>
<td>4 404.8</td>
</tr>
<tr>
<td>GDP per capita (SEK)</td>
<td>387 018</td>
<td>392 576</td>
<td>405 776</td>
<td>426 338</td>
<td>440 694</td>
</tr>
<tr>
<td>Consumer price inflation</td>
<td>0.9%</td>
<td>0%</td>
<td>-0.2%</td>
<td>0%</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

5.3.1 Cash in Circulation and Distribution of Payments

Sweden is, together with Finland and Denmark, ranked in the absolute top of the Cashless Society Index (CSI) and speedometer, an index and measurement of the degree and pace of cashless development in the 28 different EU countries (Ambrosetti, 2017). As Table 4 and 5 shows, Sweden had in 2016 a cash intensity (banknotes and coins in circulation divided by total GDP) of only 14 percent. There has been a constant decline of cash during the last couple of years, and the total value of banknotes and coins in circulation has decreased with 35.3 percent between 2012 and 2016.
Table 4. Sweden’s banknotes and coins in circulation (BIS, 2017)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banknotes &amp; coins in circulation</td>
<td>96.4</td>
<td>85.7</td>
<td>83.2</td>
<td>73.5</td>
<td>62.4</td>
</tr>
<tr>
<td>Banknotes in circulation</td>
<td>91.1</td>
<td>80.3</td>
<td>77.9</td>
<td>68.2</td>
<td>57.5</td>
</tr>
<tr>
<td>Coins in circulation</td>
<td>5.4</td>
<td>5.4</td>
<td>5.3</td>
<td>5.3</td>
<td>4.9</td>
</tr>
<tr>
<td>Cash Intensity (Cash in circulation/GDP)</td>
<td>2.6%</td>
<td>2.3%</td>
<td>2.1%</td>
<td>1.7%</td>
<td>1.4%</td>
</tr>
<tr>
<td>ATM Cash Withdrawals (Value)</td>
<td>182.5</td>
<td>218.5</td>
<td>207.7</td>
<td>153.3</td>
<td>110.2</td>
</tr>
<tr>
<td>ATM Cash Withdrawals (Volume, Millions)</td>
<td>207.0</td>
<td>229.0</td>
<td>216.0</td>
<td>154.0</td>
<td>139.0</td>
</tr>
</tbody>
</table>

Table 5. Sweden’s change of banknotes and coins in circulation (BIS, 2017)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banknotes &amp; coins in circulation</td>
<td>-11.1%</td>
<td>-2.9%</td>
<td>-11.7%</td>
<td>-15.1%</td>
<td>-35.3%</td>
</tr>
<tr>
<td>Banknotes in circulation</td>
<td>-11.8%</td>
<td>-3.0%</td>
<td>-12.4%</td>
<td>-15.6%</td>
<td>-36.8%</td>
</tr>
<tr>
<td>Coins in circulation</td>
<td>0.4%</td>
<td>-1.3%</td>
<td>-1.5%</td>
<td>-7.6%</td>
<td>-9.8%</td>
</tr>
</tbody>
</table>

At the same time as the cash in circulation has decreased, the digital payments and transactions have increased, paving a way for a cashless revolution (see Table 6). Among the roughly 10 million inhabitants in Sweden, 97 percent of them have access to a debit card, while 89 percent have access to cash (Riksbanken, 2018). 61 percent also have access to Swish, a mobile application for transactions and payments. Even though cash in Sweden is decreasing, which generally is seen as a positive phenomenon, three out of ten citizens have a negative attitude to the decrease (Riksbanken, 2018). Riksbanken thinks that the Swedish banks are decreasing the cash in circulation too fast, leaving some customer groups underprivileged. These are especially elderly, disabled persons, back-country people, associations established in the backcountry, and newly arrived people (Riksbanken, 2017).
Table 6. Sweden’s distribution of transactions (BIS, 2017)

<table>
<thead>
<tr>
<th>Total transaction volume (Millions)</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2016, per inhabitant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card Payments</td>
<td>2 190.0</td>
<td>2 398.0</td>
<td>2 619.9</td>
<td>2 845.0</td>
<td>3 166.0</td>
<td>316.8</td>
</tr>
<tr>
<td>-Debit Cards</td>
<td>1 853.0</td>
<td>2 029.4</td>
<td>2 214.2</td>
<td>2 404.0</td>
<td>2 665.0</td>
<td>266.6</td>
</tr>
<tr>
<td>-Credit Cards</td>
<td>380.0</td>
<td>411.2</td>
<td>450.4</td>
<td>502.0</td>
<td>562.0</td>
<td>50.1</td>
</tr>
<tr>
<td>Credit Transfers</td>
<td>859.0</td>
<td>894.0</td>
<td>957.0</td>
<td>1 074.0</td>
<td>1 303.0</td>
<td>130.4</td>
</tr>
<tr>
<td>-Paper based</td>
<td>70.0</td>
<td>67.0</td>
<td>69.0</td>
<td>58.0</td>
<td>59.0</td>
<td>5.9</td>
</tr>
<tr>
<td>-Non paper based</td>
<td>789.0</td>
<td>827.0</td>
<td>888.0</td>
<td>1 016.0</td>
<td>1 244.0</td>
<td>124.5</td>
</tr>
<tr>
<td>Direct debits</td>
<td>297.0</td>
<td>312.0</td>
<td>323.0</td>
<td>279.5</td>
<td>301.0</td>
<td>30.1</td>
</tr>
<tr>
<td>Cheques</td>
<td>0.2</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>3 346.2</td>
<td>3 604.1</td>
<td>3 899.9</td>
<td>4 198.6</td>
<td>4 770.1</td>
<td>477.3</td>
</tr>
</tbody>
</table>

5.3.2 Population

The population in Sweden passed in 2017 the barrier of 10 million inhabitants. The growth rate the same year was not more than 0.81 percent, ranked on the 128th place in the world. The population increases relatively slow but steadily, and even though there are much uninhabited land areas where people could live, many lives in urban areas (CIA, 2018a).

Population Density

Sweden is a very sparsely populated country with only around 23 inhabitants per square kilometre. Furthermore, 86 percent of the population lives in urban areas, leaving some parts of the big country landscape very sparsely populated (CIA, 2018a). For example, the land area of Norrland, which covers approximately 60 percent of Sweden’s total area, has a population density of below 5 inhabitants per square kilometre (SCB, 2018). According to Riksbanken (2013), this is a significant driver to Sweden’s cash digitalisation and high usage of digital payments, since the costs for cash distribution is relatively high in proportion to using cards in sparsely populated countries.

Age Demography

The inhabitants in Sweden are very young compared to other countries. The biggest age group in Sweden are 20-29 years, a result of a baby boom in the late 80s and 90s, but then declined in the past two decades. It is interesting to see that almost 50 percent of the population is under 40 years of age, which is a big share compared to other countries (SCB, 2018).
Education

Sweden is considered to have good educations and well educated inhabitants. In 2013, the country was ranked on 12th place in the *Education Index* by the UNDP (UNDP, 2013).

Table 7. Sweden’s Education Index rating (UNDP, 2013)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>0.659</td>
<td>0.665</td>
<td>0.692</td>
<td>0.792</td>
<td>0.866</td>
<td>0.830</td>
<td>0.833</td>
<td>0.830</td>
<td>0.830</td>
<td>0.830</td>
</tr>
</tbody>
</table>

Technology

Sweden is one of the most technology friendly country in the world, and has been ranked top 3 in WEF’s *Networked Readiness Index* for more than ten consecutive years (WEF, 2016).

Table 8. Sweden’s Networked Readiness Index (WEF, 2016)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>5.66</td>
<td>5.72</td>
<td>5.84</td>
<td>5.65</td>
<td>5.60</td>
<td>5.90</td>
<td>5.90</td>
<td>5.90</td>
<td>5.80</td>
<td>5.80</td>
</tr>
<tr>
<td>Ranking</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
5.3.3 Financial Consumer Technology

Sweden has several big companies that improves the financial consumer technology with its products and services. Many of the products have also made an impact on the consumers, and made breakthroughs in terms of usage and choice of payment. Some of the most important companies, products and services are presented below.

Swish and Mobilt BankID

Swish is a mobile phone application, originally used for money transactions between private persons, but can now also be used as a payment system by companies. It works on the platforms iOS, Android and Windows Phone. It is free for private persons, but costs around two-three SEK per transaction for companies. Swish was launched in late 2012 and is owned by Getswish AB, a company which in turn is owned by the eight largest banks in Sweden. The system is administered by Bankgirot, the largest clearing house in Sweden, which is also owned by some of the largest Swedish banks. Swish is built upon a system developed by Bankgirot called “Betalningar i realtid”, and work in such a way that two users can transfer money between their accounts by typing their phone numbers. A user’s bank account is linked to his phone number through his internet bank, and can set limits for each transfer, or monthly amounts. To be able to send money through Swish, it is also obligatory to have, and identify yourself with Mobilt BankID, an electronic identification solution for smart phones and applications. Mobilt BankID can also be used to identify yourself to carry out other online payments done by e.g. a debit or credit card (Swish, 2018b and Mobilt Bank ID, 2018).

Since the launch in late 2012, Swish has acquired over six million unique customers and turns over almost 14 billion SEK through over 24 million transactions each month (Swish, 2018b). 68 percent of the connected Swish users are performing at least one transaction through Swish each month. In a study conveyed by Riksbanken in 2016, 61 percent of approximately 2 000 random Swedish citizens between the ages 16 and 85, answered that they had access to Swish, and 52 percent had used it for private use during the last month. Only 17 percent answered that they had used Swish for online payments (Riksbanken, 2018).

Table 9. Swish statistics January 2018 (Swish, 2018a) *Commerce not included

<table>
<thead>
<tr>
<th>SEK</th>
<th>Customers</th>
<th>Transactions</th>
<th>Compared to previous year</th>
<th>Transactions per customer</th>
<th>Value of transactions</th>
<th>Compared to previous year</th>
<th>Average amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>6 163 294</td>
<td>19 862 843</td>
<td>+36 %</td>
<td>3.22</td>
<td>11 982 983 092</td>
<td>+43%</td>
<td>603</td>
</tr>
<tr>
<td>Company</td>
<td>148 278</td>
<td>2 407 427</td>
<td>+92%</td>
<td>0.39</td>
<td>1 055 232 301</td>
<td>+103%</td>
<td>438</td>
</tr>
<tr>
<td>Commerce</td>
<td>1 819</td>
<td>2 318 258</td>
<td>+4 999%</td>
<td>0.38</td>
<td>698 955 065</td>
<td>+2 888%</td>
<td>302</td>
</tr>
<tr>
<td>Total</td>
<td>6 313 391</td>
<td>24 588 528</td>
<td>+54%*</td>
<td>3.99</td>
<td>13 737 170 457</td>
<td>+54%</td>
<td>559</td>
</tr>
</tbody>
</table>
iZettle

iZettle is a Swedish FinTech company founded in 2010, providing payment solutions for small business owners. They provide a smartphone application together with a portable card-reader, which lets individuals and smaller companies accept card payments through iOS or Android on their smartphone or tablet. The application also solves a business owner’s problem of being forced to have a cash registers, providing a cloud based register online. iZettle’s technological solutions have helped out smaller businesses to be able to accept cards without any larger costs. Today they are providing their solutions in nine different EU countries (iZettle, 2018).

5.3.4 Trust

The banks in Sweden are very modern, up-to-date and user friendly. Their customers rarely have any problems, and if they do, the banks usually take care of their customers very well with a good customer service (Segendorf, 2018 a and De Geer, 2018). According to a survey from 2017 conducted by Trustly, 79 percent of the participants answered five or higher on a seven-point scale that they trust their main bank, and 77 percent answered that they were satisfied with their bank (Trustly, 2017).

Fraud

The card fraud in Sweden is classified as intermediate between the 28 countries of the EU (ECB, 2015). The level of card fraud is in many EU countries proportional to the value and the volume of the card transactions, and both these numbers in Sweden are within the EU average. Though, a number which is not presented by the ECB is the average number of transaction per inhabitant, where Sweden would place in the top. This could possibly indicate that the card fraud market in Sweden is somewhat saturated and will not increase, since the amount of card payments are already very high in proportion to the population (ECB, 2015).

| Table 10. Card, transaction and fraud levels in Sweden (ECB, 2015) |
|---|---|---|---|---|---|---|
| Cards per inhabitant | Transactions per card | Transactions per inhabitant | Fraud per transaction | Fraud per 1000 cards | Fraud per 1000 inhabitants |
| | Value | Volume | Value | Volume | Value | Volume | Value | Volume |
| 2.3 | 4 562 | 112 | 10 438 | 256 | 0.022% | 0.006% | 1 121 | 6.8 | 2 565 | 15.6 |

The changes in value of fraud as a share of value of transactions have been irregular the last couple of years. The last two years of available fraud data the share value of fraud has increased,
and so has the total value of transactions. A bigger proportion of card frauds have also moved to CNP-frauds (ECB, 2015).


<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>ATM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value of fraud as a share of the value of transactions</td>
<td>Change from previous year</td>
</tr>
<tr>
<td>2015</td>
<td>0.0022</td>
<td>6%</td>
</tr>
<tr>
<td>2014</td>
<td>0.00021</td>
<td>11%</td>
</tr>
<tr>
<td>2013</td>
<td>0.00019</td>
<td>-30%</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Year</th>
<th>POS</th>
<th>CNP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value of lost + stolen fraud as a share of all transactions</td>
<td>Change from previous year</td>
</tr>
<tr>
<td>2015</td>
<td>0.000018</td>
<td>18,8%</td>
</tr>
<tr>
<td>2014</td>
<td>0.000017</td>
<td>-2%</td>
</tr>
<tr>
<td>2013</td>
<td>0.000017</td>
<td>-28%</td>
</tr>
</tbody>
</table>

5.3.5 Cost of Card Payments

The interchange fees of card payments are today very low in Sweden. Sweden falls under the new EU regulation from 2015, which caps the interchange fee of personal VISA and MasterCard debit and credit cards to 0.2 percent, respectively 0.3 percent. However, the cap only applies to personal cards where there is an intermediary, and not to cards issued to businesses or to cards issued by American Express (Regulation (EU) 2015/751). For businesses payment cards the interchange fee varies from 0.8 percent (for transactions less than or equal to 25 EUR) to 1.9 percent. The average or most common interchange fee for business card is 1.5 percent (MasterCard, 2018).
Table 13. Payment card interchange fees in Sweden (MasterCard, 2018)

<table>
<thead>
<tr>
<th>Type of payment card</th>
<th>Interchange fee range</th>
<th>Standard interchange fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debit</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Credit</td>
<td>0.3%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Business/Corporate</td>
<td>0.8% to 1.9%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

5.3.6 Central Bank’s Role and Other Influencing Variables

The Swedish Riksbank is positive to a decrease of cash usage, and an increase of digital payments (Riksbanken, 2017). The Swedish payment market has mainly worked very well without any involvement from the government. There are no regulations that sets demands on how the Swedish banks are handling cash. This leads to that the banks set the standard, and perhaps do what is best for them, especially economically, which has left some groups of people uncared for (Riksbanken, 2017). Ergo, it is mainly the Swedish credit institutes that controls the cash in circulation. Because of this, it is natural that the banks want to streamline their cash and payment services, and their freedom in this area makes it unlimited (Riksbanken, 2017). The cash’s status as legal tender is not either very significant, since Swedish contract law allows, not only businesses, but also banks, to refuse cash. Furthermore, Riksbanken believes that the decrease of cash has happened too fast, and that cash is still a very important part of the payment market, even if its usage has decreased, and probably will continue to decrease. As a result of this, Riksbanken has proposed that the Swedish credit institutes should offer all their customers bank accounts with fundamental functions such as cash deposit and withdrawal functions (Riksbanken, 2017). When it comes to financial guarantees, the Swedish national debt office offers a guarantee on deposits to bank accounts in almost all the Swedish credit institutions, of up to 950 000 SEK (Around 95 000 EUR).

In 2007, the Swedish government passed a law called Kassaregisterlagen (SFS 2007:592). The purpose of this law was to reduce the amount of illegal sales in terms of black payments, which is not registered and taxed for. It comprises all business owners that sells products or services and accepts cash or card payments, and implicates that these business owners must have a legitimate and certified cash register. All sales must be registered and a receipt must be written and offered to the customer (SFS 2007:592). From 2017, the law also applies to foreign companies selling products or services in Sweden. This made cash and card payments more “equal”, since it is now more difficult for business owners to receive black cash payments, and made it more irrelevant, in terms of costs, of whether a business owner receives a cash or card payment since both are taxed for. Now, the only difference in terms of cost is the interchange fee of the card payments, unlike before the law was passed, when a cash payment could go unregistered and untaxed for (SFS 2007:592).
5.4 Italy

Italy is located in the middle of the Mediterranean Sea and is a fairly small country in terms of total area. When it comes to the population however, Italy has a lot of inhabitants. The population was estimated to amount to just over 60 million in 2016 (BIS, 2017). Furthermore, Italy is a member of the EU and the Eurozone, hence their national currency is EUR. Its economy is one of the largest national economies in the euro area, and their nominal GDP was ranked to be the eight largest in the world in the beginning of 2018, according to estimates done by the International Monetary Fund (IMF) (IMF, 2018). Basic data about Italy is presented in Table 14.

Table 14. Italy basic data (BIS, 2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (thousands)</td>
<td>59 898.0</td>
<td>60 224.8</td>
<td>60 448.0</td>
<td>60 441.0</td>
<td>60 326.0</td>
</tr>
<tr>
<td>GDP (EUR billions)</td>
<td>1 613.3</td>
<td>1 604.6</td>
<td>1 621.8</td>
<td>1 652.2</td>
<td>1 680.5</td>
</tr>
<tr>
<td>GDP per capita (EUR)</td>
<td>26 934</td>
<td>26 644</td>
<td>26 830</td>
<td>27 335</td>
<td>27 857</td>
</tr>
<tr>
<td>Consumer price inflation</td>
<td>3.3%</td>
<td>1.2%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>−0.1%</td>
</tr>
</tbody>
</table>

5.4.1 Cash in Circulation and Distribution of Payments

When it comes to digital payments and the pursuit of becoming a cashless society, Italy is improving and gradually making progress within this field, but the progress is slow (Ambrosetti, 2017). A large part of the consumers in Italy seem to still prefer to bank in person or by phone, instead of using all the digital services that the Italian banks today offers, i.e. performing money transfers, paying bills, manage accounts etc. However, digital banking is still something the majority of the Italian citizens are using when it comes to checking their own account balance, but in terms of embracing the whole selection of online services available, they are far behind many of the other European countries (Trustly, 2017). The CSI can further confirm that Italy is today far behind many of the European competitors of becoming a cashless society, especially in comparison to Sweden and some of the Nordic countries which are very successful within this domain. If not Italy’s progress speed increases in the near future, they are at high risk of falling even further behind the most successful countries with time (Ambrosetti, 2017).
Italy’s economy is still highly dependent on cash payments, and the cash in circulation continues to increase (Ambrosetti, 2017). Italy’s inhabitants were in 2016, together with Spain and Greece inhabitants, the ones that were using cash payments to the greatest extent in the EU. The consumers had an average of 1.7 cash transactions per day which corresponds to almost 12 transactions per week. This can be compared to the average number in the euro area that year which was 1.2 cash payments per day, i.e. 8.4 cash payments per week. It is not unusual for inhabitants in Italy to pay e.g. electricity bills, taxes, insurance, rent, and medical bills in cash, which indicates how dependent Italy still is on physical payments (Esselink and Hernández, 2017).

The impact of cash on Italy’s economic system is one of the worst (with low cash usage seen as good, and high cash usage seen as bad) in the world in comparison to other countries. In 2015, Italy ranked 25th in the world regarding cash intensity, with a value of 11.2 percent, which is the second worst of the 28 EU countries (Ambrosetti, 2017). Table 15 shows Italy’s cash intensity and how it has changed during a couple of years, together with cash in circulation and ATM cash withdrawals. Unfortunately, values of their cash in circulation and cash intensity for 2016 are missing in the table.

Table 15. Italy’s banknotes and coins in circulation (BIS, 2017 and Ambrosetti, 2016 and 2017)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banknotes &amp; coins in circulation</td>
<td>154.9</td>
<td>162.1</td>
<td>171.9</td>
<td>182.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Banknotes in circulation</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Coins in circulation</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Cash Intensity (Cash in circulation/GDP)</td>
<td>9.6%</td>
<td>10.1%</td>
<td>10.6%</td>
<td>11.2%</td>
<td>N/A</td>
</tr>
<tr>
<td>ATM Cash Withdrawals (Value)</td>
<td>136.4</td>
<td>146.2</td>
<td>178.4</td>
<td>181.3</td>
<td>193.6</td>
</tr>
<tr>
<td>ATM Cash Withdrawals (Volume, Millions)</td>
<td>744.0</td>
<td>794.2</td>
<td>952.7</td>
<td>795.3</td>
<td>1 007.7</td>
</tr>
</tbody>
</table>

The reason that there is no data on Italy’s banknotes and coins in circulation for the years 2012 to 2016, is because that they are a member of the Eurozone, and thus, data from BIS is only booked and presented on a Eurozone level. However, Ambrosetti presents data for Italy’s cash intensity between 2012 and 2015, which together with the known GDP from Table 14, makes it possible to calculate the total cash in circulation. I.e. the presented banknotes and coins in
circulation in Table 15 for the years 2012 to 2015 are calculated backwards from the presented GDP in Table 14, and Ambrosetti’s numbers of Italy’s cash intensity.

Table 16. Italy’s change of banknotes and coins in circulation (BIS, 2017 and Ambrosetti, 2016 and 2017)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banknotes &amp; coins in circulation</td>
<td>4.6%</td>
<td>6.0%</td>
<td>5.9%</td>
<td>N/A</td>
<td>17.5%</td>
</tr>
<tr>
<td>Banknotes in circulation</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Coins in circulation</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Even though the inhabitants in Italy are using cards as a payment method slightly more today than what they did ten years ago, they are still one of the worst countries within this category. They ended up having a value of 37 transactions per capita in 2015, which was far below the European average of 104 transactions per capita (Ambrosetti, 2017). Table 17 presents Italy’s distribution of transactions during the years 2012-2016.

Table 17. Italy’s distribution of transactions (BIS, 2017)

<table>
<thead>
<tr>
<th>Millions, total volume for the year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2016, per inhabitant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card Payments</td>
<td>1 629.0</td>
<td>1 813.2</td>
<td>2 034.0</td>
<td>2 269.8</td>
<td>2 612.9</td>
<td>43.3</td>
</tr>
<tr>
<td>-Debit Cards</td>
<td>1 091.5</td>
<td>1 225.8</td>
<td>1 390.1</td>
<td>1 617.1</td>
<td>1 836.5</td>
<td>30.4</td>
</tr>
<tr>
<td>-Credit Cards</td>
<td>537.5</td>
<td>587.5</td>
<td>644.0</td>
<td>652.6</td>
<td>776.4</td>
<td>12.9</td>
</tr>
<tr>
<td>Credit Transfers</td>
<td>1 261.3</td>
<td>1 261.1</td>
<td>1 347.2</td>
<td>1 471.0</td>
<td>1 410.6</td>
<td>23.4</td>
</tr>
<tr>
<td>-Paper based</td>
<td>743.9</td>
<td>720.0</td>
<td>766.0</td>
<td>859.5</td>
<td>762.3</td>
<td>12.6</td>
</tr>
<tr>
<td>-Non paper based</td>
<td>517.4</td>
<td>541.1</td>
<td>581.2</td>
<td>611.5</td>
<td>648.3</td>
<td>10.7</td>
</tr>
<tr>
<td>Direct debits</td>
<td>602.3</td>
<td>624.3</td>
<td>608.1</td>
<td>682.3</td>
<td>790.7</td>
<td>13.1</td>
</tr>
<tr>
<td>Cheques</td>
<td>275.7</td>
<td>252.4</td>
<td>231.5</td>
<td>208.6</td>
<td>186.2</td>
<td>3.1</td>
</tr>
<tr>
<td>Other payment instrument</td>
<td>303.6</td>
<td>292.1</td>
<td>280.5</td>
<td>282.5</td>
<td>284.6</td>
<td>4.7</td>
</tr>
<tr>
<td>Total</td>
<td>4 071.8</td>
<td>4 243.1</td>
<td>4 501.4</td>
<td>4 914.2</td>
<td>5 285.0</td>
<td>87.3</td>
</tr>
</tbody>
</table>
5.4.2 Population

The population number for Italy varies slightly between different sources, but they all indicate an estimation of around or just over 60 million inhabitants in 2016. The population growth rate was in 2017 estimated to 0.19 percent, which can be considered as fairly low (CIA, 2018b).

Population Density

Considering that Italy has a fairly small total land area of roughly 302 square kilometres, it is a moderately population-dense country with its 60 million inhabitants. According to the Italian National Institute of Statistics (Istat), the latest population density data available for Italy, shows an average population density of 201 inhabitants per square kilometre in 2016, and this number can be considered as high in comparison to most of the Western European countries (Istat, 2017).

The distribution of the population in terms of where people live in the country, is quite even despite the industrial north and agricultural south. 69.3 percent of the total population were in 2017, estimated to live in urban areas, and the rate of the urbanisation at that time were estimated to be 0.32 percent annually (CIA, 2018b). Both these numbers can be considered as relatively low in comparison to other equally developed countries (Istat, 2017).

Age Demography

Italy can be considered to be a relatively mature country in comparison to others in terms of the age of the inhabitants. As can be seen in Figure 11, the largest age group in Italy in 2018, was people aged from 40 to 49, which constituted 15.7 percent of the population. Almost 60 percent of the population is 40 years old or older.

![Figure 11. Italy’s demography by age (CIA, 2018b)](image)
Education

Italy was ranked on 26th place in 2013 in the Education Index, done by the UNDP, and the country’s education can therefore be considered to be on an intermediate level. (UNDP, 2013). Italy’s educational rating is presented in Table 18 together with its changes since 1980. The trend for Italy’s educational rating and what the index shows is that the rating constantly increased until the year 2011 where it stagnated (UNDP, 2013).

Table 18. Italy’s Education Index rating (UNDP, 2013)

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>0.542</td>
<td>0.556</td>
<td>0.592</td>
<td>0.650</td>
<td>0.695</td>
<td>0.762</td>
<td>0.784</td>
<td>0.790</td>
<td>0.790</td>
<td>0.790</td>
</tr>
</tbody>
</table>

Technology

Out of a total of 139 economies included in the WEF’s ranking of Networked Readiness Index, Italy finds themselves on a 45th place in 2016. As Table 19 shows, Italy’s rating value at the latest measurement in 2016 was 4.4. Furthermore, the rating shows an ascending pattern in utilising ICT in recent years. (WEF, 2016).

Table 19. Italy’s Networked Readiness Index (WEF, 2016)

<table>
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<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>4.2</td>
<td>4.2</td>
<td>4.2</td>
<td>4.0</td>
<td>4.0</td>
<td>4.2</td>
<td>4.2</td>
<td>4.2</td>
<td>4.3</td>
<td>4.4</td>
</tr>
<tr>
<td>Ranking</td>
<td>38</td>
<td>42</td>
<td>45</td>
<td>48</td>
<td>51</td>
<td>48</td>
<td>50</td>
<td>58</td>
<td>55</td>
<td>45</td>
</tr>
</tbody>
</table>

5.4.3 Financial Consumer Technology

There are several big financial companies in Italy that provide financial services and technologies to the inhabitants. To name a few, there is SPID, PagoPA, Apple Pay, PosteMobile, Jiffy, and Satispay. Samsung Pay is also on the way to be launched in Italy soon (Marini, 2018). The smartphone application Jiffy, developed by SIA Group, is the biggest digital payment application in Italy today (SIA, 2017). A more in-depth description of Jiffy is presented below.
Jiffy

Jiffy is a digital P2P payment service application for smartphones in Italy which was introduced in 2014 (SIA, 2017 and BIS, 2016). It is the second largest P2P payment service application in the EU after Sweden's Swish, and it had in March 2017 around 4.2 million users (SIA, 2017). To use Jiffy, the user needs to activate the application via their bank where the user’s mobile telephone number gets connected to their bank account (SIA, 2018b). By doing this, the user can send money to recipients by simply entering the recipient's phone number, the desired amount of money to be sent, as well as a voluntary message. The money sent can be used by the recipient immediately after the transaction has been done (SIA, 2018c).

More than just P2P transactions, Jiffy also provides a person-to-business (P2B) function where the users can perform purchases at stores by either scanning a QR code by photographing it, through NFC technology, or simply by entering the stores phone number. In addition, Jiffy can be used as a donation tool too to non-profit organisations who also uses the service (SIA, 2018c).

Jiffy was developed by SIA which is the European leader within the area of payments, cards, networks etc., and provides financial services to central banks, financial institutions, and companies in 48 countries (SIA, 2018a). In March of 2017, around 23 bank groups had joined SIA’s app Jiffy since the Italian market introduction, corresponded to approximately 32 million or 80 percent of the bank accounts in Italy at that time. Furthermore, Jiffy is accessible to all the banks operating in the single euro payments area (SEPA), and this makes Jiffy potentially working with over 400 million accounts in the EU (SIA, 2017).

5.4.4 Trust

Trust is generally a difficult thing to measure and to obtain a representative result from, but according to a recent Bloomberg article from November 2017, the inhabitant’s trust for the central bank of Italy is decreasing. According to the SWG research group of Trieste, which did research on this matter, only 24 percent of the residents showed trust for Banca d’Italia, a number which has decreased from 36 percent since June the same year. Moreover, only 16 percent of the inhabitants have faith in the country’s lenders, which also is a decrease of one percent since June the same year. The recent decrease and weak numbers can probably, according to Salzano and Tataro (2017), be blamed on the bank crisis that prevailed which caused losses for the savers etc.

However, according to another study done by Nepa in 2017 which was commissioned by Trustly, the Italians showed high trust for their main banks. On a seven-point scale, 84 percent of the participating individuals in the study answered 5 or higher, i.e. 84 percent of the participating individuals in Italy answered that they trust their main bank (Trustly, 2017).
**Fraud**

Transaction security and frauds is a related issue to people’s trust in the financial players on the market, and another highly important aspect to also take into consideration when it comes to digital payments. Table 20 illustrates some data on frauds in Italy in 2015.

Table 20. Card, transaction and fraud levels in Italy (ECB, 2015)

<table>
<thead>
<tr>
<th>Cards per inhabitant</th>
<th>Transactions per card</th>
<th>Transactions per inhabitant</th>
<th>Fraud per transaction</th>
<th>Fraud per 1000 cards</th>
<th>Fraud per 1000 inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Volume</td>
<td>Value</td>
<td>Volume</td>
<td>Value</td>
</tr>
<tr>
<td>1.2</td>
<td>4387</td>
<td>43</td>
<td>5158</td>
<td>51</td>
<td>0.022%</td>
</tr>
</tbody>
</table>

What can be seen from Table 20 is that the transaction security in Italy is intermediate (ECB, 2015). For instance, Italy was on average in 2015 subjected to 5.9 fraudulent card transactions for every 1000 card payments made, and this can be compared to the value of 14.9 fraudulent transaction that the SEPA was subjected to on average (Ambrosetti, 2017). The only value that ECB point out for Italy to be the closest of reaching some sort of a poor level, is the volume of transactions per inhabitant, stated as 51 in the table (ECB, 2015). Table 21 and 22 below illustrate some additional fraud statistics in Italy, but with more of a comparative nature and how it has changed during the years 2013 to 2015, which is the latest fraud data available (ECB 2013, 2014, 2015).


<table>
<thead>
<tr>
<th>Year</th>
<th>Value of fraud as a share of the value of transactions</th>
<th>Change from previous year</th>
<th>Value of lost + stolen fraud as a share of all transactions</th>
<th>Change from previous year</th>
<th>Value of counterfeit fraud as a share of all transactions</th>
<th>Change from previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>0.00022</td>
<td>38%</td>
<td>0.000013</td>
<td>42%</td>
<td>0.0002</td>
<td>83%</td>
</tr>
<tr>
<td>2014</td>
<td>0.00016</td>
<td>-24%</td>
<td>0.0001</td>
<td>-3%</td>
<td>0.000011</td>
<td>-63%</td>
</tr>
<tr>
<td>2013</td>
<td>0.00021</td>
<td>-13%</td>
<td>0.00001</td>
<td>-28%</td>
<td>0.000029</td>
<td>-33%</td>
</tr>
</tbody>
</table>
Table 22. Transaction fraud in Italy (ECB, 2013, 2014, 2015)

<table>
<thead>
<tr>
<th>Year</th>
<th>POS Value of lost + stolen fraud as a share of all transactions</th>
<th>Change from previous year</th>
<th>Value of counterfeit fraud as a share of all transactions</th>
<th>Change from previous year</th>
<th>CNP Value of CNP fraud as a share of all transactions</th>
<th>Change from previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>0.000016</td>
<td>9%</td>
<td>0.000031</td>
<td>-1%</td>
<td>0.000134</td>
<td>58%</td>
</tr>
<tr>
<td>2014</td>
<td>0.000017</td>
<td>-30%</td>
<td>0.000031</td>
<td>-51%</td>
<td>0.000085</td>
<td>-9%</td>
</tr>
<tr>
<td>2013</td>
<td>0.000025</td>
<td>-10%</td>
<td>0.000063</td>
<td>-36%</td>
<td>0.000078</td>
<td>49%</td>
</tr>
</tbody>
</table>

5.4.5 Cost of Card Payments

The interchange fees of card payments are today very low in Italy. Italy, as well as Sweden, falls under the new EU regulation from 2015, which caps the interchange fee of personal VISA and MasterCard debit and credit cards to 0.2 percent respectively 0.3 percent. However, the cap only applies to personal cards where there is an intermediary, and not to cards issued to businesses or to cards issued by American Express (EU, 2015). For businesses payment cards the interchange fee varies from 0.5 percent plus a 0.02 EUR incentive (for transactions less than or equal to 25 EUR) to 1.9 percent. The average or most common interchange fee for business card is 1.5 percent (MasterCard, 2018).

Table 23. Payment card interchange fees in Italy (MasterCard, 2018)

<table>
<thead>
<tr>
<th>Type of payment card</th>
<th>Interchange fee range</th>
<th>Standard interchange fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debit</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Credit</td>
<td>0.3%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Business/Corporate</td>
<td>0.5% + 0.02 EUR to 1.9%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

5.4.6 Central Bank’s Role and Other Influencing Variables

Banca d’Italia, also called Bank of Italy, is the central bank of Italy, and is a public-law institution regulated by both national and European legislation. It is part of the Eurosystem, which is made up of other central banks in the euro area and the ECB. Its objectives (among other), as many other central banks, are to ensure monetary and financial stability, and to issue banknotes and coins (Banca d’Italia, 2018a). Hence, they control the cash in circulation in Italy,
but the banknote issuing is done in accordance with the principle and rules within the Eurosystem. As part of the Eurosystem, Banca d’Italia produces and issues the quantity of euro banknotes assigned to them, as well as withdrawing worn banknotes (Banca d’Italia, 2018b).

Each national central bank in the Eurosystem has legal personality under its national legislation. As a result of this, they may perform tasks not related to the Eurosystem if the Governing Council considers they do not conflict with the objectives and tasks of the Eurosystem (Banca d’Italia, 2018c). The Eurosystem and the Governing Council have no other specific task or goal with the cash in circulation other than to ensure a smooth and efficient supply of euro banknotes and to maintain their integrity (ECB, 2018a). The Governing Council of the Eurosystem decided in 2016 to stop the production of the 500 EUR banknote, since they claim that this banknote could facilitate illicit activities. The production and issuance of the banknote will stop in the end of 2018, but already issued 500 EUR banknotes will remain as legal tender, and can therefore continue to be used as means of payment and/or store of value (ECB, 2016). Furthermore, Italy has a cap limit on cash payments of 3000 EUR, a limit with which was fairly recently raised from 1000 EUR by the current government. The cash cap retort has received diverse critique, and many experts argue that it sends the wrong signals to the country’s corruption fight (Capussela, 2015). The earlier cap was set in 2011, with the aim to reduce untaxed payments. Another reason of the cap was to try to reduce the cash reserves in local banks and post offices. According to a report by the banking union FIBA, almost half of the bank robberies in the EU in 2009 occurred in Italy (Migliaccio and Sirletti, 2011).

5.5 Canada

Canada is the second largest country in the world after Russia in terms of total area, and the country is located in the northern part of North America. Given its large total area, it is a sparsely populated country with a population of roughly 36 million in 2016 (see Table 24). The country has its own currency, the Canadian Dollar (CAD). Furthermore, Canada's economy is a highly developed economy that grew rapidly in 2017, and the country’s nominal GDP ranked to be the tenth largest in the world in the beginning of 2018, according to estimates done by the IMF (Bank of Canada, 2018a and IMF, 2018).

Table 24. Canada basic data (BIS, 2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population (thousands)</strong></td>
<td>34 536</td>
<td>34 936</td>
<td>35 334</td>
<td>35 689</td>
<td>36 018</td>
</tr>
<tr>
<td><strong>GDP (CAD billions)</strong></td>
<td>1 839.6</td>
<td>1 928.4</td>
<td>2 009.3</td>
<td>2 000.2</td>
<td>2 079.1</td>
</tr>
<tr>
<td><strong>GDP per capita (CAD)</strong></td>
<td>53 265</td>
<td>55 196</td>
<td>56 866</td>
<td>56 046</td>
<td>57 724</td>
</tr>
<tr>
<td><strong>Consumer price inflation</strong></td>
<td>1.5%</td>
<td>0.9%</td>
<td>1.9%</td>
<td>1.1%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>
5.5.1 Cash in Circulation and Distribution of Payments

The payment market in Canada in terms of the number of consumer and business transactions done in 2016, grew to 21.3 billion, which was worth more than 9.2 trillion CAD (Galociova and Tompkins, 2017). According to Galociova and Tompkins (2017), the main reasons for this growth was probably due to the continued transition from paper based payments and transactions, the increased use of card payments, especially credit cards, as well as the influence of FinTech providers. Table 25 and 26 shows Canada’s banknotes and coins in circulation, cash intensity, and ATM cash withdrawals during the years 2012 to 2016.

Table 25. Canada’s banknotes and coins in circulation (BIS, 2017)

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banknotes &amp; coins in circulation</td>
<td>69.2</td>
<td>72.2</td>
<td>75.7</td>
<td>81.4</td>
<td>86.5</td>
</tr>
<tr>
<td>Banknotes in circulation</td>
<td>63.7</td>
<td>66.6</td>
<td>70.0</td>
<td>75.5</td>
<td>80.5</td>
</tr>
<tr>
<td>Coins in circulation</td>
<td>5.5</td>
<td>5.6</td>
<td>5.7</td>
<td>5.7</td>
<td>6.0</td>
</tr>
<tr>
<td>Cash Intensity (Cash in circulation/GDP)</td>
<td>3.8%</td>
<td>3.7%</td>
<td>3.8%</td>
<td>4.1%</td>
<td>4.2%</td>
</tr>
<tr>
<td>ATM Cash Withdrawals (Value)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>ATM Cash Withdrawals (Volume, Millions)</td>
<td>573.4</td>
<td>558.3</td>
<td>531.5</td>
<td>510.0</td>
<td>483.5</td>
</tr>
</tbody>
</table>

Table 26. Canada’s change of banknotes and coins in circulation (BIS, 2017)

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banknotes &amp; coins in circulation</td>
<td>4.3%</td>
<td>4.8%</td>
<td>7.4%</td>
<td>6.3%</td>
<td>24.9%</td>
</tr>
<tr>
<td>Banknotes in circulation</td>
<td>4.6%</td>
<td>5.1%</td>
<td>7.8%</td>
<td>6.6%</td>
<td>26.3%</td>
</tr>
<tr>
<td>Coins in circulation</td>
<td>1.6%</td>
<td>1.6%</td>
<td>0.4%</td>
<td>4.5%</td>
<td>8.2%</td>
</tr>
</tbody>
</table>
Even though there is a continuous migration away from paper based payments and transactions in Canada, and the card payments are increasing (which is further shown in 27), Table 25 and 26 indicates that Canada’s total value of banknotes and coins in circulation as well as the percentage of cash intensity, has increased in recent years. The total value of banknotes and coins in circulation increased with 24.9 percent over this four-year period, at the same time as the total volume of ATM cash withdrawals decreased (BIS, 2017).

Table 27 below shows Canada’s distribution of transactions between 2012 and 2016. The card payments have increased in recent years, both the debit- and credit card transactions (BIS, 2017). According to Galociova and Tompkins (2017), the card transactions in Canada corresponded to 48.1 percent of the total transaction volume in 2016, and this can be compared to the transaction volume of cash on 31.2 percent of the total volume the same year. In terms of the card payments, it is the credit card transactions that have increased the most in recent years, as 27 indicates, and Galociova and Tompkins (2017) argue that Canada can be considered as one of the global leaders today in the use of credit cards. In fact, based on data from BIS, the country was in 2016 the second largest user of credit cards per capita in the world, after South Korea. The number of adults in Canada who owned a credit card that year was estimated to around 90 percent, of which roughly 47 percent could be considered as heavy credit card users i.e. people who use their credit cards for more than half of their monthly purchases (Galociova and Tompkins, 2017). Moreover, Table 27 further shows that the credit transfers and direct debits have increased in recent years, and the cheques have decreased (BIS, 2017).

Table 27. Canada’s distribution of transactions (BIS, 2017)

<table>
<thead>
<tr>
<th>Millions, total volume for the year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2016, per inhabitant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card Payments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Debit Cards</td>
<td>4 357.3</td>
<td>4 518.9</td>
<td>4 899.0</td>
<td>5 169.0</td>
<td>5 428.0</td>
<td>150.7</td>
</tr>
<tr>
<td>-Credit Cards</td>
<td>3 127.5</td>
<td>3 580.3</td>
<td>3 897.8</td>
<td>4 072.9</td>
<td>4 502.6</td>
<td>125.0</td>
</tr>
<tr>
<td>Credit Transfers</td>
<td>1 136.0</td>
<td>1 225.3</td>
<td>1 262.4</td>
<td>1 317.6</td>
<td>1 350.5</td>
<td>37.5</td>
</tr>
<tr>
<td>-Paper based</td>
<td>8.6</td>
<td>7.4</td>
<td>5.9</td>
<td>4.0</td>
<td>2.2</td>
<td>0.1</td>
</tr>
<tr>
<td>-Non paper based</td>
<td>1 127.4</td>
<td>1 217.9</td>
<td>1 256.6</td>
<td>1 313.6</td>
<td>1 348.3</td>
<td>37.4</td>
</tr>
<tr>
<td>Direct debits</td>
<td>699.3</td>
<td>728.4</td>
<td>762.3</td>
<td>791.3</td>
<td>825.9</td>
<td>22.9</td>
</tr>
<tr>
<td>Cheques</td>
<td>805.5</td>
<td>761.1</td>
<td>708.9</td>
<td>648.2</td>
<td>502.7</td>
<td>14.0</td>
</tr>
<tr>
<td>Total</td>
<td>10 126.3</td>
<td>10 814.8</td>
<td>11 530.9</td>
<td>11 999.5</td>
<td>12 610.1</td>
<td>350.1</td>
</tr>
</tbody>
</table>
5.5.2 Population

Canada is estimated to have around 36 million inhabitants today (Table 24), and this is a figure that has been roughly the same for a couple of years. The annual population growth rate in 2017 was estimated to be 0.73 percent, and that can be considered as an intermediate rate (CIA, 2018c).

Population Density

Since Canada is the second largest country in the world in terms of total land area, the country is also sparsely populated. The population density in Canada was in 2016 estimated to around 4 persons per square kilometre, which can be considered as a very low number. This is largely due to the fact that large parts of Canada consist of forest and wilderness, but also due to the cold northern climate (CIA, 2018c). This leads to the majority of the population lives in the south in urban areas and in big cities (Statistics Canada, 2017). Canada is a highly urbanised country, where 82.2 percent of the total population was estimated to live in urban areas in 2017, and the annual rate of urbanisation at that time was estimated to be 1.16 percent (CIA, 2018c).

Age Demography

The median age in Canada was in 2017 estimated to be 42.2 years, which is a number that has increased in recent years (CIA, 2018c and Statistics Canada, 2016). Looking at the Canadian age distribution in Figure 12 below, it shows that the country has a relatively even age distribution.

Figure 12. Canada’s demography by age (CIA, 2018c)
Almost 49 percent of Canada’s population is under the age of 40, which indicates that the population is young. However, Statistics Canada (2016) argue that Canada’s population is aging today, which the increase in median age also indicates. A contributing factor to this is probably due to the baby boom generation, i.e. people born up until the early and mid 1960s, are getting older today (Statistics Canada, 2016).

**Education**

Canada ranked 8th in the *Education Index* done by the UNDP in 2013, and the country can therefore be considered to have high levels of education and well educated inhabitants (UNDP, 2013). Table 28 shows Canada’s rating during a few selected years from 1980. As can be seen, the rating has increased over the years, but with one small exception between the years 1995 and 2000 where it slightly decreased. The value has stagnated on the fairly high rating of 0.85 since 2010 (UNDP, 2013).

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Education rating</td>
<td>0.749</td>
<td>0.763</td>
<td>0.809</td>
<td>0.826</td>
<td>0.808</td>
<td>0.853</td>
<td>0.850</td>
<td>0.850</td>
<td>0.850</td>
<td>0.850</td>
</tr>
</tbody>
</table>

**Technology**

According to WEF’s *Networked Readiness Index*, Canada can be considered as a technology friendly country, where they ranked on the 14th place in 2016. As Table 29 illustrates, they have placed 7th as best during the past ten years, and 17th as worst. Their rating has never been under 5.2 since 2007, which can be considered as maintaining a high standard of rating.

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>5.4</td>
<td>5.3</td>
<td>5.4</td>
<td>5.2</td>
<td>5.2</td>
<td>5.5</td>
<td>5.4</td>
<td>5.4</td>
<td>5.5</td>
<td>5.6</td>
</tr>
<tr>
<td>Ranking</td>
<td>11</td>
<td>13</td>
<td>10</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>12</td>
<td>17</td>
<td>11</td>
<td>14</td>
</tr>
</tbody>
</table>
5.5.3 Financial Consumer Technology

When it comes to financial mobile phone applications in Canada, there is PayMeTap, developed by the FinTech company Mobeewave. A more comprehensive presentation of PayMeTap follows in this subchapter.

PayMeTap

Mobeewave is a payments software company in Canada who has developed a mobile payment application called PayMeTap (Mobeewave, 2018a). It is a free application for Android phones in the Google Play Store and it has been available to individuals in Canada since 2016. PayMeTap is based on NFC technology which means that the devices that are going to communicate needs to be NFC compatible (Mobeewave, 2016). The application allows individuals to perform payments or collect donations with their NFC mobile phone by simply entering the amount of money that wants to be received, and then just bringing the payer's payment device, e.g. a payment card or NFC phone, close to the receiving phone, and the payment is made. The recipient's money will be deposited into their account within 48 hours after the transaction was made (Mobeewave, 2016 and Mobeewave, 2018a).

Transactions made with PayMeTap are done in a safe and secure manner since the application does not store any card information about the payer, the transactions are encrypted. In addition, Mobeewave also uses random manual verifications to detect, prevent, and block suspicious activity. Furthermore, due to the encrypted transactions and that the application does not store any information about the payer, the individual that is going to perform the payment does not even have to be signed up to the PayMeTap service. Only the receiver needs to have PayMeTap in that case, and this makes the application highly flexible (Mobeewave, 2016).

In February of 2018, Mobeewave announced that they signed a global partnership agreement with Samsung Electronics Co. Ltd., which implies that their application will be offered and allowed on Samsung devices (Mobeewave, 2018b).

5.5.4 Trust

The millennials in Canada is the generation that is most likely to stick with a single bank, according to a credit card survey in 2017 done by Ipsos, requested by LowestRates.ca (2017). The survey showed that 77 percent of the millennials preferably wants to have all their credit cards and financial products within one and the same bank. This percentage can be compared to generation X’s 60 percent, as well as 55 percent of the baby boomers, which also were included in the survey1 (LowestRates.ca, 2017).

1 The study did not distinguish millennials, generation X, and baby boomers by yearly spans
According to Bain & Company’s customer loyalty report from 2012, the customers’ loyalty of the Canadian banks varied greatly. The President’s Choice Bank and credit unions scored the highest in the net promoter score in this report. Among the big five Canadian banks, TD Canada Trust turned out to be the most successful one in terms of loyal customer in 2012, but the report showed that the loyalty gap between these banks has decreased in recent years, and the overall trust for Canadian banks has increased. An interesting note that the report showed was that, the Canadian customer group that gave the banks the lowest scores were the wealthy individuals (Bain & Company, 2012).

Bain & Company (2012) further argues that Canadians most popular and used way of interacting with their bank, was through ATMs and online interactions. In addition to that, Payments Canada saw the same thing in a more recent study, that the online and mobile banking category have gained a specifically increased trust in recent years, since digital options have overtaken the corresponding paper alternatives (Galociova and Tompkins, 2017).

**Fraud**

Canada has a central agency called the Canadian Anti-Fraud Centre (CAFC) who gathers and provides information about all types of frauds in Canada. The CAFC aims to help citizens, businesses, law enforcement, and governments with issues regarding frauds and how to prevent them from happening through education and awareness (Canadian Anti-Fraud Centre, 2018). As part of the Fraud Prevention Month that is happening every year, the CAFC worked together with the independent law enforcement agency Competition Bureau Canada and the Royal Canadian Mounted Police in 2017, and they released a publication together about frauds in Canada called Fraud Facts 2017. According to this publication, it was estimated that Canadians lost a total amount of 290 million CAD to fraudsters during the time interval January 2014 to December 2016. The fraudsters used all sorts of different methods when performing the frauds in order to reach out to as many people as possible, i.e. phone calls, emails, social media, P2P etc. (Competition Bureau Canada, 2017). In addition, according to another report conducted by PaymentCM LLP (2015) called the Card Fraud Report 2015, Canada had in 2013 fairly high card fraud losses, especially in the credit card category. The authors argue that this was due to Canada’s high CNP frauds in 2013, as well as the counterfeit domestic and cross-border frauds, which amounted to 64 and 24 percent respectively (PaymentCM LLP, 2015).

A common problem with frauds in Canada is, however, that only about five percent of the affected individuals are reporting them. Hence, this complicates the law enforcement agencies work in terms of catching the perpetrators as well as to warn the public in time about frauds. Also, the amount of frauds in Canada, according to the statistics, indicates that they have increased in recent years. If it really is the frauds that have increased, or if it is the number of individuals reporting the frauds that have increased, is not obvious. In any case, the amount of reported frauds in 2016 that the Competition Bureau Canada and CAFC received, was around 90 thousand, which can be compared to roughly 70 thousand the year before. The online scams accounted for more than 20 thousand in 2016, which corresponded to around 40 million CAD
losses. A conclusion that the Competition Bureau Canada and CAFC can draw are that the cyber frauds are increasing in numbers (Competition Bureau Canada, 2017).

The relatively new polymer-based bank notes which represented about 86 percent of the bank notes in circulation in 2017, are something that contributes to fewer bank note frauds in Canada since they are very difficult to counterfeit. The counterfeit rate was estimated to be eleven parts per million in the end of 2017, which can be considered as a low counterfeit number (Bank of Canada, 2018a).

### 5.5.5 Cost of Card Payments

The interchange fees in Canada are fairly low compared to other countries. Visa and MasterCard in Canada has a special scheme for interchange fees, which sets the fees differently for each type of industry. For example, gas and grocery stores pay a fee of 0.15 percent plus an incentive of 0.05 CAD, and electronics and clothing stores pay a fee of 0.25% plus and incentive of 0.05 CAD. Today, the overall interchange fees vary between 0 percent plus an incentive of 0.02 CAD to 2.45 percent, depending on the type of payment card and type of payment. For a regular debit card, the interchange fee in general varies from 0.15 percent plus an incentive of 0.05 CAD 1.15 percent, and for credit cards 0.98 percent to 2.45 percent. The business payment card interchange fees, range from 1.4 percent to 2.25 percent (MasterCard, 2017).

<table>
<thead>
<tr>
<th>Type of payment card</th>
<th>Interchange fee range</th>
<th>Standard interchange fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debit</td>
<td>0% + 0.02 CAD to 1.15%</td>
<td>0.15% + 0.05 CAD</td>
</tr>
<tr>
<td>Credit</td>
<td>0.98% to 2.45%</td>
<td>1.26%</td>
</tr>
<tr>
<td>Business/Corporate</td>
<td>1.4% to 2.25%</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

### 5.5.6 Central Bank’s Role and Other Influencing Variables

The Bank of Canada has four strategy pillars regarding cash in circulation. Firstly, they want to develop bank notes that are difficult to counterfeit and easy to authenticate. Secondly, they strive to increase the routine of verification of bank notes by the public and retailers. Thirdly, they promote the deterrence of counterfeiting, and fourthly, they focus on quality throughout the life cycle of a bank note, from production and distribution to destruction and replacement. When it comes to the distribution of bank notes, they strive to supply and satisfy the public demand (Bank of Canada, 2018b).
5.6 Switzerland

Switzerland is a fairly small country seen to its land area, with a population of approximately 8.4 million people. It is located in the western-central Europe, and has borders to Italy, France, Austria, Germany and Liechtenstein. Since a big part of the country is occupied by mountains (the alps), the population is somewhat concentrated on the plateau where the country’s biggest cities can be found. Within Switzerland, there are four different cultural regions where different languages are spoken: French, German, Italian, and Romansh (CIA, 2018d).

Furthermore, it is one of the most developed and wealthiest countries in the world seen to its GDP per capita and nominal wealth per adult. In the UNDP’s Human Development Index, it is ranked as the second best developed country in the world (UNDP, 2016). It is not part of the European Union, nor the Eurozone, though they participate in a number of European collaborations such as the Schengen Area, European Single Market and SEPA. Their national currency is Swiss Franc (CHF) (CIA, 2018d). Looking at the latest years of economic development in the country, Switzerland’s population have grown more in relation to its total GDP, making the GDP per capita relatively unchanged, see Table 31.

<table>
<thead>
<tr>
<th>Table 31. Switzerland basic data (BIS, 2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
</tr>
<tr>
<td>Population (thousands)</td>
</tr>
<tr>
<td>GDP (CHF billions)</td>
</tr>
<tr>
<td>GDP per capita (CHF)</td>
</tr>
<tr>
<td>Consumer price inflation</td>
</tr>
</tbody>
</table>

5.6.1 Cash in Circulation and Distribution of Payments

Catherine Bosley (2016), a Bloomberg journalist, writes that “cash is still king in Switzerland”, in her article about the cash usage in the country. Compared to its degree of development and wealth, a cash intensity share of 12.3 percent is very high, and the cash intensity has increased almost linearly with a couple of percentage points the past five years. However, a more recent study performed in 2017 by Deloitte, indicates that cash is decreasing in the retail sector, and that the country moves towards using more digital payments methods, at least in physical stores (Grampp and Zobrist, 2017).
Table 32. Switzerland’s banknotes and coins in circulation (BIS, 2017)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banknotes &amp; coins in</td>
<td>64 703.9</td>
<td>68 720.9</td>
<td>70 606.6</td>
<td>75 943.3</td>
<td>81 179.0</td>
</tr>
<tr>
<td>circulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banknotes in circulation</td>
<td>61 801.4</td>
<td>65 766.4</td>
<td>67 595.8</td>
<td>72 881.9</td>
<td>78 084.4</td>
</tr>
<tr>
<td>Coins in circulation</td>
<td>2 902.6</td>
<td>2 954.5</td>
<td>3 010.8</td>
<td>3 061.4</td>
<td>3 094.6</td>
</tr>
<tr>
<td>Cash Intensity (Cash in</td>
<td>10.3%</td>
<td>10.8%</td>
<td>10.9%</td>
<td>11.6%</td>
<td>12.3%</td>
</tr>
<tr>
<td>circulation/GDP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATM Cash Withdrawals (Value)</td>
<td>27 390</td>
<td>27 780</td>
<td>28 070</td>
<td>30 640</td>
<td>30 270</td>
</tr>
<tr>
<td>ATM Cash Withdrawals (Volume)</td>
<td>128.2</td>
<td>130.4</td>
<td>131.5</td>
<td>136.6</td>
<td>134.7</td>
</tr>
</tbody>
</table>

Table 33. Switzerland’s change of banknotes and coins in circulation (BIS, 2017)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banknotes &amp; coins in</td>
<td>6.2%</td>
<td>2.7%</td>
<td>7.6%</td>
<td>6.9%</td>
<td>25.5%</td>
</tr>
<tr>
<td>circulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banknotes in circulation</td>
<td>6.4%</td>
<td>2.8%</td>
<td>7.8%</td>
<td>7.1%</td>
<td>26.3%</td>
</tr>
<tr>
<td>Coins in circulation</td>
<td>1.8%</td>
<td>1.9%</td>
<td>1.7%</td>
<td>1.1%</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

According to Riksbanken (2013), one explanation to Switzerland’s high cash intensity is that parts of this cash is probably kept outside the country. Consequently, the cash intensity should perhaps be somewhat lower than what Table 32 shows, but the numbers are nonetheless high compared to other countries, since the cash kept outside Switzerland only amounts for a small part of the total cash in circulation (Riksbanken, 2013). The 1000 CHF banknote, which is the highest valued banknote in Switzerland, constitutes for almost 60 percent of the total value of all cash in circulation (BIS, 2017). According to The Swiss National Bank (SNB), it is also a sign that the banknotes are not solely used as means of payments, but also to a considerable degree as a store of value. Further, they argue that the reasons for this is probably the financial crisis in 2007, followed by persistently low interest rates (SNB, 2017a).

Even though cash in circulation and cash intensity have increased, recent studies argue that cash has become less common in terms of POS payments. In 2000, 75 percent of the POS
payments in physical retail stores were conducted through cash payments, while this number has decreased to 50 percent in 2016. During this period, debit- and credit cards are the payment methods that have gained the most market shares (Grampp and Zobrist, 2017). The Swiss National Bank launched in 2017, for the first time in history, a comprehensive study of the payment methods in Switzerland. Unfortunately, the time limits of this thesis limits the possibility to make use of the result of that study (SNB, 2017b).

Table 34. Switzerland’s distribution of payments (BIS, 2017)

<table>
<thead>
<tr>
<th>Millions, total volume for the year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2016, per inhabitant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card Payments</td>
<td>651.3</td>
<td>701.1</td>
<td>778.5</td>
<td>965.3</td>
<td>1 082.1</td>
<td>129.2</td>
</tr>
<tr>
<td>-Debit Cards</td>
<td>435.6</td>
<td>460.9</td>
<td>508.8</td>
<td>668.9</td>
<td>737.5</td>
<td>88.1</td>
</tr>
<tr>
<td>-Credit Cards</td>
<td>215.7</td>
<td>240.2</td>
<td>269.7</td>
<td>296.5</td>
<td>344.7</td>
<td>41.2</td>
</tr>
<tr>
<td>Credit Transfers</td>
<td>928.0</td>
<td>950.3</td>
<td>961.3</td>
<td>976.0</td>
<td>973.9</td>
<td>116.3</td>
</tr>
<tr>
<td>-Paper based</td>
<td>291.5</td>
<td>280.2</td>
<td>265.0</td>
<td>251.6</td>
<td>235.4</td>
<td>28.1</td>
</tr>
<tr>
<td>-Non paper based</td>
<td>636.5</td>
<td>670.1</td>
<td>696.3</td>
<td>724.4</td>
<td>738.5</td>
<td>88.2</td>
</tr>
<tr>
<td>Direct debits</td>
<td>55.4</td>
<td>56.8</td>
<td>57.7</td>
<td>58.5</td>
<td>59.7</td>
<td>7.1</td>
</tr>
<tr>
<td>Cheques</td>
<td>0.3</td>
<td>0.2</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>1 635.0</td>
<td>1 708.4</td>
<td>1 797.5</td>
<td>1 999.9</td>
<td>2 115.8</td>
<td>252.7</td>
</tr>
</tbody>
</table>

5.6.2 Population

The population in Switzerland was in 2017 estimated to be around 8.4 million people, and the population growth was low, estimated to 0.69 percent. Even though 8.4 million inhabitants do not seem to be much, the country’s population density is rather high, since it is a small country seen to its land area (CIA, 2018d).

Population Density

Switzerland is a fairly small country, and somewhat heavily populated compared to its size. Since a big part of the Swiss landscape consists of mountains, the population density varies a lot between different regions. The average population density is around 200 inhabitants per square kilometre, but the varying landscape and urbanisation has resulted in bigger and more densely populated cities, while some of the mountain areas are much more sparsely populated. The estimated proportion of residents living in urban areas in 2017 amounted to 74.1 percent, and the annual rate of urbanisation was 1.1 percent (CIA, 2018d).
Age Demography

The age demography in Switzerland is rather average, but slightly towards an older majority. 46.5 percent of the population is under 40 years of age. Furthermore, Switzerland has one of the biggest proportion of foreign residents in the world, to the extent of around 23 percent of the total population (CIA, 2018d).

![Figure 13. Switzerland’s demography by age (CIA, 2018d)](image)

Education

The Education rating in Switzerland is today high according to UNDP’s Education Index. It is especially between the years of 1990 and 2010 that Switzerland’s increased a lot, and is today, based on this rating, one of the most educated country in the world. Furthermore, their education system is ranked as the best in the world (UNDP, 2013).

Table 35. Switzerland’s Education Index rating (UNDP, 2013)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Education rating</td>
<td>0.678</td>
<td>0.675</td>
<td>0.695</td>
<td>0.726</td>
<td>0.804</td>
<td>0.822</td>
<td>0.841</td>
<td>0.844</td>
<td>0.844</td>
<td>0.844</td>
</tr>
</tbody>
</table>
Technology

Switzerland ranks very well in WEF’s *Networked Readiness Index*. However, the conclusive ranking is based on rankings within a few different pillars, or areas, and Switzerland only ranks on 43th place in *government usage*, since the Swiss government has been a less eager adopter and promoter of digitalisation. Furthermore, the country also ranks low in *social impact* (33th place), the pillar which measures and ranks the extent to which governments are becoming more capable and efficient in the use of ICT and providing increased service to their citizens (WEF, 2016).

Table 36. Switzerland’s Networked Readiness Index (WEF, 2016)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td>5.6</td>
<td>5.5</td>
<td>5.6</td>
<td>5.5</td>
<td>5.3</td>
<td>5.6</td>
<td>5.7</td>
<td>5.6</td>
<td>5.7</td>
<td>5.8</td>
</tr>
<tr>
<td>Ranking</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

5.6.3 Financial Consumer Technology

There are a number of different application payment solution providers in Switzerland, with varying services and customer base. The biggest one, Twint, is focused on in this chapter, which similarly to Swish, is owned and developed by the country’s traditional banks (Twint, 2018).

Twint

Twint, introduced in 2015, is Switzerland's most popular digital wallet and payment smartphone application, compatible with Android and iOS. It is owned by SIX Group, which in turn is owned by around 130 national and international banks in Switzerland. Through Twint, one can perform both POS payments at e.g. cash registers and payment terminals, as well as remote payments such as online- and P2P payments. When performing POS payments, a Twint beacon or a QR code is scanned. If a Twint beacon is used, the payment is confirmed by fingerprint recognition or a PIN code. It is possible to save both loyalty- and membership cards in the application, as well as credit- and debit cards to perform payments, but transactions can also be performed directly to/from one’s bank account (if the user is a customer to one of the collaborating banks). The majority of the Swiss banks are currently collaborating with Twint (Twint, 2018).

In April of 2018, Twint had over 750 000 registered customers (Twint, 2018). Out of the third party mobile payment providers in Switzerland in 2017, Twint was the most popular, used by 40 percent of all the mobile payments users. Other mobile payment providers in the country are Samsung pay and Apple pay, but also retailer’s own applications (Grampp and Zobrist,
2017). However, according to Grampp and Zobrist (2017), Twint’s big advantages lies in that it does not require a debit- or credit card, which is not the case for the other solutions. They further argue that this advantage could possibly prove decisive among young people in particular.

### 5.6.4 Trust

The Swiss Bankers Association (SBA) argue that the residents in Switzerland have shown an increased trust for the banks, which reached a record high level in 2017. According to SBA’s survey results, the Swiss banks are perceived as highly reliable with very competent banking employees. Overall, 85 percent of the participants in the survey gave their main bank a good or very good grade, and approximately 95 percent of the participants considered their bank as trustworthy. Only 2 percent of the participants answered that they were unsatisfied with their main bank (SwissBanking, 2017).

### Fraud

Unfortunately, no data of card frauds in Switzerland were found. However, KPMG presented in 2015 a study of fraud cases convicted by Swiss courts. According to this study, the Swiss court had 91 major fraud cases. KPMG compares this to 77 major fraud cases the year before, and 58 major fraud cases in 2013. I.e. bigger frauds have increased in numbers in recent years. 91 cases in 2015 were the highest amount of fraud related cases since KPMG Switzerland started to measure major frauds in 2008. The money value of these frauds in 2015 was estimated to around 280 million CHF, but it actually constituted the lowest value since KPMG Switzerland started to measure major frauds in 2008 (Fleury, 2016).

According to Fleury (2016), it is difficult to see a trend regarding the frauds in Switzerland since the number of major frauds have increased, but the total value of them the opposite. Furthermore, even though the bigger frauds that are taken to court have increased in recent years, it is not entirely obvious that the total amount of frauds, i.e. minor frauds included, have increased. For instance, not all frauds are reported to the law enforcement, and some frauds might not even be detected at all (Fleury, 2016).

### 5.6.5 Cost of Card Payments

In mid 2017, the interchange fees, paid by the receiving part, for payment cards were almost reduced by half in Switzerland. Today, the interchange fee varies between 0.35 and 0.6 percent or between 0.05 and 0.55 CHF, depending on type of payment card and type of payment. For a regular debit card, the interchange fee in general varies from 0.05 to 0.5 CHF, and for credit cards 0.35 to 0.6 percent. However, the business payment card’s interchange fee is fairly low, ranging from 0.35 to 0.6 percent (MasterCard, 2017).
Table 37. Payment card interchange fees in Switzerland (MasterCard, 2017)

<table>
<thead>
<tr>
<th>Type of payment card</th>
<th>Interchange fee range</th>
<th>Standard interchange fee</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Up to 12 CHF</td>
</tr>
<tr>
<td>Debit</td>
<td>0.05 to 0.5 CHF</td>
<td>0.03 CHF</td>
</tr>
<tr>
<td>Credit</td>
<td>0.35% to 0.6%</td>
<td>0.44%</td>
</tr>
<tr>
<td>Business/Corporate</td>
<td>0.35% to 0.6%</td>
<td>0.44%</td>
</tr>
</tbody>
</table>

5.6.6 Central Bank’s Role and Other Influencing Variables

The Swiss National Bank’s primary responsibility is to conduct its monetary policy in a way that keeps the value of money steady, and enables the economy to prosper. Furthermore, SNB is entrusted with the note-issuing privilege, and issues banknotes and coins “commensurate with demand for payment purposes” (SNB, 2017a). SNB places the cash in circulation, but they are at the same time required to take back coins and banknotes against reimbursement without any restrictions. SNB undertakes the large-scale distribution of banknotes and coins, while retail distribution is handled by commercial banks, Swiss Post, and cash processing operators. Consequently, SNB is the only actor that has the possibility to change Switzerland’s cash in circulation, but the change is driven by the demand. Apart from this, and among other tasks, SNB will also facilitate and secure the operation of cashless payment systems and shall contribute to the stability of the financial system (SNB, 2017a).

Cash is not only used frequently for smaller payments in Switzerland, but also for larger payments such as e.g. for cars, works of art or jewels. Since parts of the cash used in these kinds of transaction could potentially be untaxed for, the Organisation for Economic Development’s (OECD) anti-laundering task force urged countries like Switzerland to tighten their regulation. As a result of this, Switzerland implemented a cash payment cap in 2016, of 100 000 CHF (which still is very high). In cases of transaction over 100 000 CHF, the money has to be wired by a bank, and the seller has to identify and register the buyer (Keiser, 2014).
6 Country Comparison

_This chapter illustrates a number of comparative tables between the investigated countries regarding the empirical data obtained and presented in the previous chapter. It aims to identify and show important similarities and differences between the countries, since the previous chapter only concerned each country individually. These similarities and differences are based on observations and are highlighted in text throughout the chapter. The subheading structure in this chapter is structured in the same way as in the country chapters to facilitate for the reader. However, the last subchapters of each country are not compared, since they comprise very specific data which is not comparable._

6.1 Cash in Circulation and Distribution of Payments

Sweden and Canada show similarities in their payment habits, and so does Italy and Switzerland. According to the data, Sweden and Canada are using cash in relatively small quantities, while Italy and Switzerland have a higher cash usage.

Table 38. Comparison between the countries cash in circulation, cash intensity and ATM cash withdrawals in 2016 (BIS, 2017 and Ambrosetti, 2016, 2017) *Numbers are from 2015

<table>
<thead>
<tr>
<th>2016 (USD)</th>
<th>Sweden</th>
<th>Italy</th>
<th>Canada</th>
<th>Switzerland</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP per capita</td>
<td>51 476</td>
<td>30 819</td>
<td>43 571</td>
<td>79 877</td>
</tr>
<tr>
<td>Banknotes &amp; coins in circulation per capita</td>
<td>688.8</td>
<td>3 141.1*</td>
<td>1 788.0</td>
<td>9 516.0</td>
</tr>
<tr>
<td>Cash intensity</td>
<td>1.4%</td>
<td>11.2%*</td>
<td>4.2%</td>
<td>12.3%</td>
</tr>
<tr>
<td>ATM cash withdrawals per capita (Value)</td>
<td>1 216.2</td>
<td>3 180.2</td>
<td>N/A</td>
<td>3 548.3</td>
</tr>
<tr>
<td>ATM cash withdrawals per capita (Volume)</td>
<td>13.9</td>
<td>16.7</td>
<td>13.4</td>
<td>16.1</td>
</tr>
</tbody>
</table>

Some similarities that can be observed about the countries in Table 38 are that Sweden and Canada’s both had single digit percentages of their cash intensity in 2016, which can be compared to Italy and Switzerland percentages that both were above ten percent. Sweden and Canada’s ATM cash withdrawals in terms of volume were also about the same in 2016, and they had clearly lower volumes per capita than Italy and Switzerland, which also had similar numbers to each other in this category. Even though Italy and Switzerland had a lot in common in terms of their cash intensity and ATM cash withdrawals (which are indicators of cash usage), their GDP per capita differed a lot. Switzerland had the highest GDP per capita in 2016 of the
investigated countries, while Italy had the lowest, but the numbers that actually are indicators of the cash usage are cash intensity, as well as value- and volume of ATM cash withdrawals.


<table>
<thead>
<tr>
<th>Change 2012-2016</th>
<th>Sweden</th>
<th>Italy</th>
<th>Canada</th>
<th>Switzerland</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP per capita</td>
<td>13.9%</td>
<td>3.4%</td>
<td>8.4%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Banknotes &amp; coins in circulation per capita</td>
<td>-38.4%</td>
<td>16.7%*</td>
<td>19.8%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Cash intensity</td>
<td>-1.2%</td>
<td>1.6%*</td>
<td>0.4%</td>
<td>2.0%</td>
</tr>
<tr>
<td>ATM Cash Withdrawals per capita (value)</td>
<td>-42.5%</td>
<td>40.9%</td>
<td>N/A</td>
<td>5.5%</td>
</tr>
<tr>
<td>ATM Cash Withdrawals per capita (volume)</td>
<td>-36.0%</td>
<td>34.5%</td>
<td>-19.1%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

The change presented in Table 39, is similarly to Table 38, showing similarities between Sweden and Canada, respectively Italy and Switzerland. The cash intensity has decreased or been or almost unchanged in Sweden and Canada, while it has increased a lot in Italy and Switzerland. The same goes for the value and volume of ATM cash withdrawals (if the one assumes that the value and volume correlates for Canada, as it does for the other countries). However, the cash in circulation has increased in Canada, which differentiates from Sweden.
Table 40. Comparison between the countries’ transaction volume per inhabitant in 2016 (BIS, 2017)

<table>
<thead>
<tr>
<th>Transaction volume per capita in 2016</th>
<th>Sweden</th>
<th>Italy</th>
<th>Canada</th>
<th>Switzerland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card Payments</td>
<td>316.8</td>
<td>43.3</td>
<td>275.7</td>
<td>129.2</td>
</tr>
<tr>
<td>-Debit Cards</td>
<td>266.6</td>
<td>30.4</td>
<td>150.7</td>
<td>88.1</td>
</tr>
<tr>
<td>-Credit Cards</td>
<td>50.1</td>
<td>12.9</td>
<td>125.0</td>
<td>41.2</td>
</tr>
<tr>
<td>Credit Transfers</td>
<td>130.4</td>
<td>23.4</td>
<td>37.5</td>
<td>116.3</td>
</tr>
<tr>
<td>-Paper based</td>
<td>5.9</td>
<td>12.6</td>
<td>0.1</td>
<td>28.1</td>
</tr>
<tr>
<td>-Non paper based</td>
<td>124.5</td>
<td>10.7</td>
<td>37.4</td>
<td>88.2</td>
</tr>
<tr>
<td>Direct debits</td>
<td>30.1</td>
<td>13.1</td>
<td>22.9</td>
<td>7.1</td>
</tr>
<tr>
<td>Cheques</td>
<td>0</td>
<td>7.6</td>
<td>14.0</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>477.2</td>
<td>92</td>
<td>350.1</td>
<td>252.7</td>
</tr>
</tbody>
</table>

In Table 40, similarities between Sweden and Canada, as well as between Italy and Switzerland, are again observed, where Sweden and Canada turned out to have a high number of card payments in 2016, and Italy and Switzerland had a low number. Noteworthy is Italy’s extremely low card payments compared to the other countries in the investigation, as Table 40 shows. Another interesting observation is that credit transfers are most popular in Sweden and Switzerland. However, the volume per capita of paper based credit transfers is highest in Italy and Switzerland. Looking at the total amount of digital payments, again Sweden and Canada have the most, while Italy and Switzerland are lagging behind. Worth mentioning is that Switzerland uses more digital payments than Italy, even though they still are behind Sweden and Canada.

Cheques are still used as a payment method to a small extent for the inhabitants in Canada in 2016, especially in comparison to the other countries cheque use. This volume is, however, on a decline in Canada, just as for the other countries in this study (see Table 41).
Table 41 indicates that the card payments have increased in all the countries, and most in Italy and Switzerland, which use card to the least extent. The credit transfers have also increased in all countries between 2012 and 2016, and in Sweden the most. An interesting observation is that Italy’s paper based credit transfers have increased, which separates them from the other countries. The overall digital payments are increasing in all countries, ranging from an increase of 19.4-36 percent the past years.

6.2 Population

Population Density

A comparison of the countries’ average population density of 2016 in presented below in Table 42. Once again, Sweden and Canada shows similarities, as well as Italy and Switzerland, shows similarities with each other. Sweden and Canada both had a low average population density in 2016, and Italy and Switzerland had a significantly higher average population density. In addition, Sweden and Canada had a higher proportion of people living in urban areas than Italy and Switzerland.

Table 42. Comparison between the countries’ average population density in 2016 (CIA, 2018a, 2018c, 2018d and Istat, 2017)
Age Demography

As can be seen in Figure 14, Sweden and Canada are younger countries than Italy and Switzerland. When comparing the percentage of inhabitants under 40 years of age, it shows that Sweden’s and Canada’s shares are 49.2, respectively 48.8 percent, while the percentage of inhabitants in Italy and Switzerland are 40.2, respectively 46.5 percent.

![Figure 14. Comparison between the countries’ age demography (SCB, 2018 and CIA, 2018b, 2018c, 2018d)](image)

Education

Table 43 shows the countries Education Index during a few years between 1995 and 2013. Overall, Sweden and Canada have had a higher rating during these years, but Switzerland has caught up in the recent years. However, important to notice is that Switzerland have had a significantly higher rating than Italy during all these years, which have been behind all the countries during all the years. In addition, Switzerland actually had a higher rating than Sweden in 2013, which really shows how close Switzerland has come.

Table 43. Comparison between the countries’ Education Index rating (UNDP, 2013)

<table>
<thead>
<tr>
<th>Education Index rating</th>
<th>Sweden</th>
<th>Italy</th>
<th>Canada</th>
<th>Switzerland</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>0.792</td>
<td>0.65</td>
<td>0.826</td>
<td>0.726</td>
</tr>
<tr>
<td>2000</td>
<td>0.866</td>
<td>0.695</td>
<td>0.808</td>
<td>0.804</td>
</tr>
<tr>
<td>2005</td>
<td>0.830</td>
<td>0.762</td>
<td>0.853</td>
<td>0.822</td>
</tr>
<tr>
<td>2013</td>
<td>0.830</td>
<td>0.790</td>
<td>0.850</td>
<td>0.844</td>
</tr>
</tbody>
</table>
Technology

As Table 44 illustrates, Sweden has during all the presented years ranked the highest in the Networked Readiness Index among the investigated countries. Thereafter, Switzerland has ranked the second highest after Sweden, Canada third, and Italy on fourth place. Even though Switzerland has ranked higher than Canada, an important observation is that Italy is lagging behind all the other countries by a lot.

Table 44. Comparison between the countries’ Networked Readiness Index ranking (WEF, 2016)

<table>
<thead>
<tr>
<th>Networked Readiness Index Ranking</th>
<th>Sweden</th>
<th>Italy</th>
<th>Canada</th>
<th>Switzerland</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>2</td>
<td>38</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>2010</td>
<td>1</td>
<td>48</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>2013</td>
<td>3</td>
<td>50</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>2016</td>
<td>3</td>
<td>45</td>
<td>14</td>
<td>7</td>
</tr>
</tbody>
</table>

6.3 Financial Consumer Technology

When it comes to comparing the countries financial consumer technologies in terms of smartphone application, they all roughly offers the same financial services. How the financial transactions can be performed are also similar in these applications, as both remote- and POS payments can be performed. However, in difference from the other, PayMeTap can only perform money transactions through the NFC technology, which means it cannot handle remote payments. Below in Table 45, is a comparison of the application, involving their launch year and estimated number of users.

Table 45. Comparison between the countries’ biggest mobile payment applications (Swish, 2018b, SIA, 2018, Mobeewave, 2016 and Twint, 2018) *Numbers are from 2017

<table>
<thead>
<tr>
<th>Mobile payment apps</th>
<th>Launch year</th>
<th>Estimated number of users 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swish</td>
<td>2012</td>
<td>6.3 million</td>
</tr>
<tr>
<td>Jiffy</td>
<td>2014</td>
<td>4.2 million*</td>
</tr>
<tr>
<td>PayMeTap</td>
<td>2016</td>
<td>N/A</td>
</tr>
<tr>
<td>Twint</td>
<td>2015</td>
<td>750 thousand</td>
</tr>
</tbody>
</table>
6.4 Trust

Since it was difficult to obtain data for the trust for banks in the respective countries, this subject has also been difficult to compare. In the comparison below in Table 46, the data of trust is obtained from two different sources (Sweden and Italy from one source, and Switzerland from another), while no data was found for Canada.

Table 46. Comparison between how the residents in the countries are experiencing their banks (Trustly, 2017 and SwissBanking, 2017)

<table>
<thead>
<tr>
<th>2017</th>
<th>Gave their bank a good or very good grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>79%</td>
</tr>
<tr>
<td>Italy</td>
<td>84%</td>
</tr>
<tr>
<td>Canada</td>
<td>N/A</td>
</tr>
<tr>
<td>Switzerland</td>
<td>85%</td>
</tr>
</tbody>
</table>

As Table 46 shows, all countries with obtained bank trust data have high trust for their main bank, resulting in that obvious similarities or difficulties can be observed. However, according to Salzano and Totaro (2017), only 24.4 percent of the Italian citizens showed in 2017 trust for the central bank Banca d’Italia. Unfortunately, no data of trust for the central banks in the others countries were obtained in the study.

Fraud

As Sweden and Italy were the only EU countries in the study, they were the only countries of which comprising card fraud data could be found, since it was presented by the ECB. The fraud data found of Canada and Switzerland are judged to be inconsiderable in relation to the data of Sweden and Italy, and it is therefore chosen to only compare the two latter.

Table 47. Comparison between Sweden and Italy’s card frauds in 2015 (ECB, 2015)

<table>
<thead>
<tr>
<th>2015</th>
<th>Transactions per card</th>
<th>Transactions per inhabitant</th>
<th>Fraud per transaction</th>
<th>Fraud per 1000 cards</th>
<th>Fraud per 1000 inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cards per inhabitant</td>
<td>Value</td>
<td>Volume</td>
<td>Value</td>
<td>Volume</td>
</tr>
<tr>
<td>Sweden</td>
<td>2.3</td>
<td>4 562</td>
<td>112</td>
<td>10 438</td>
<td>256</td>
</tr>
<tr>
<td>Italy</td>
<td>1.2</td>
<td>4 387</td>
<td>43</td>
<td>5 158</td>
<td>51</td>
</tr>
</tbody>
</table>
Sweden shows a higher number or percentage in roughly all sections in Table 47, which can be interpreted as Sweden is exposed to more frauds than Italy. However, the single most important number in the table are the fraud per transaction, since it represents the total number of transactions in respective country, and removes the aspects of cards per inhabitant. As Table 47 shows, the fraud per transaction value is the same for both countries, but the fraud per transaction volume is twice as high in Italy than in Sweden.

### 6.5 Cost of Card Payments

In Table 48 below, the countries’ standard interchange fees are presented and compared. As Sweden and Italy are affected by the same EU regulation, both countries have low interchange fees today for debit and credit cards. When it comes to the interchange fee for debit cards, which is used in majority of the card payments in all the countries, Canada places around the same as Sweden and Italy, but it is divided into a flat fee and a percentage fee. The interchange fee for debit cards in Switzerland is slightly higher than in the other three countries. However, the interchange fee for businesses is very low in Switzerland, while the fee for credit cards is the highest in Canada.

<table>
<thead>
<tr>
<th>Standard IFs</th>
<th>Debit</th>
<th>Credit</th>
<th>Business/Corporate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>0.2%</td>
<td>0.3%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Italy</td>
<td>0.2%</td>
<td>0.3%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Canada</td>
<td>0.15% + 0.04 USD</td>
<td>1.26%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>0.34 USD</td>
<td>0.44%</td>
<td>0.44%</td>
</tr>
</tbody>
</table>
7 Analysis and Discussion

This chapter contains an analysis and discussion of the obtained empirical data presented in the case study of the payment markets, and the country comparison, along with drawn connections and parallels to the used theory in the thesis. The identified connections and conclusions drawn from the analysis are discussed throughout the chapter, as well as argued about their validity.

7.1 Towards a Dominant Design?

When the market development of the digital payment industry is compared with Abernathy and Utterback’s innovation dynamics model of firm activity in a new dominant design industry, one can distinguish very similar patterns to the “fluid” and/or “transitional phase”. Analysing the number of firms and their entry date, the industry appears to be in the “fluid phase”, or perhaps even entered the “transitional phase”. The implication of this is that the product variety is slowly beginning to pave way for standardised designs, proven to satisfy user needs in the marketplace the best, which also accords with what is currently happening in the industry. Examples of new standardised design in the digital payment market are card mobile payments (Apple Pay and Samsung Pay), NFC technology in debit and credit cards, and integrated billing (Uber and Foodora). Furthermore, the identified curves in all countries indicates that a dominant design has yet not been established, since the curve’s derivative has not yet reached zero, but probably will be in the near future (up to 15 years by looking at other examples). Thereby, the firm activity demonstrates that the payment industry in the investigated countries is heading towards a dominant design.

![Diagram of firm activity](image)

Figure 15. The investigated industries’ firm activity compared with the dynamics of innovation (Adopted from Abernathy and Utterback, 1978)
When analysing the countries’ cash in circulation and payment distribution, one can identify both similar and different observations. After investigating all four countries, one could argue that digital payments already are dominating the payment market in Sweden, and perhaps also Canada, but cash is still king in Italy and Switzerland. Canada is double-faced, since it has relatively low cash intensity and high digital payments usage, but in the last couple of years they have increased their cash usage, and have not increased as much as the other countries in digital payments. An answer to this could be a bounce back from a too fast transition from physical to digital payments, leaving some groups of people exposed.

The digital payments per capita have increased in all countries with percentages ranging from 19.4 to 36 percent with Sweden and Italy in the top. Looking at only card payments, Italy and Switzerland have increased the most with almost 60 percent each, but at the same time a small increase is percentually bigger for these countries since the total amount of digital payments and card payments are lower. But even though the digital payments have increased in all countries, Sweden is the only country which has decreased both its cash in circulation and cash intensity. All other three countries have increased the cash in circulation with 16.7-19.8 percent which leads to a somewhat ambiguous result.

A dominant design is defined by Suarez and Utterback (1995) as “a specific path, along an industry’s design hierarchy, which establishes dominance among competing design paths”. For Sweden, the digital payments trajectory is the dominant design today, but it will probably develop much further in the near future, eventually creating an ultimate dominant design, further down the technological trajectory of digital payments. One could also draw the conclusion that digital payments probably is the dominant design in Canada as well, but the recent trend is alarming, since the cash in circulation has increased a lot. In Italy and Switzerland, cash and physical payments is still king, and is still dominating over digital payments and cards. However, there are positive trends showing that the digital payments are increasing (even though the cash in circulation and cash intensity is increasing), indicating that the payment market is slowly becoming more digitised, but they are much further behind Sweden and Canada on the curve in Figure 15. There is still a long way to go, and while network externalities in the two-sided market will play a big role, more incentives for digital payments will be needed, as the payment market is gradually moving towards a future dominant design.

When looking at the current situation from Anderson and Tushman’s theories about dominant design, technological discontinuities, and the technology cycle, the industry is in the era of ferment, indicating a lot of competition and rivalry in the market, which also matches up with the reality and today’s industry. Digital payments, with card payments in the front, has created a technological discontinuity followed by the just mentioned era, and the next event is the emergence of a dominant design, which is further followed by an era of incremental change. These are also further signs that the payment industries in all the investigated countries are currently exposed to a great deal of experimentation with product design and features, as well as that the markets are moving towards a dominant design (even though the countries are on different places in the cycle, with Sweden in pole position).
7.2 Factors Influencing the Degree of Digital and Physical Payment Usage

In this study a number of different potential influencing factors on the distribution of payment has been investigated and mapped out. Some of the factors have shown result of influencing a lot, while other has shown to have less impact than first thought of. The results are based on correlations, which are argued to be causalities. However, since only four countries are investigated in this study, further work and similar investigations of other countries would make the result even more valid.

The first influencing factor found is a country’s age demography. Both Sweden and Canada showed to have younger population than Italy and Switzerland (Sweden with the youngest population) which indicates that a younger country uses more digital payments than a country with an older population. Perhaps related to this is the correlations shown from looking at a country’s exploit of information and communication technology (one could argue that younger people uses ICT to a greater extent). Sweden places in to p of the countries here also, closely followed by both Switzerland and Canada. However, the presented Networked Readiness Index shows an overall ranking, which is based on different pillar, and Switzerland ranks low in the government usage and social impact of ICT, indicating that the government could do more to improve digital payments. Italy places bad overall in this ranking, which overall indicates that a higher use of ICT in a country implies higher degree of digital payments. Another, more obvious influencing factor is the size of a country together with its total population. A country with lower average population density uses more digital payments as both Sweden and Canada are sparsely populated while Italy and Switzerland are relatively densely populated. This has to do with that the cost for cash distribution is relatively high in proportion to using cards or any other digital payment method in a sparsely populated country. Furthermore, a correlation regarding the countries’ education were also found. When looking at the present education ratings, Italy ranks worst, while Switzerland ranks better than Sweden which is hard to draw conclusions from. However, when looking at older education data (1995-2005), Sweden and Canada have always ranked high, while Italy and Switzerland ranked lower, with Italy in the
rock bottom. This could potentially indicate that countries with higher overall education adopted digital payments earlier in the digitalisation era, which reflects on the payment habits of today. If this is correct, it is a further indication, based on their present education rating, that Italy and Switzerland will continue to increase their digital payments and move towards a dominant design in the payment market.

When it comes to the supply financial consumer technology, it is hard to see any obvious correlation to the countries’ distribution of payments. All four countries each have their own digital mobile payment application, for both P2P and POS-payments, working in similar ways, with similar transaction technology. Their launch year could be argued to have a small effect though, since Swish (Sweden) and Jiffy (Italy) have the most users. However, Jiffy’s 4.2 million users is only around 7 percent of their population, compared to Swish’s 6 million, corresponding to 60 percent of the population. Swish’s high usage rate is probably also reflected by their high ranking in the Networked Readiness Index.

Another identified influencer to a country’s degree of digital payment usage are laws and regulations. These could be different extensive and have different impact. The obvious example identified is the Swedish Kassaregisterlagen, which implicates that all business owners, big or small, that sell products or services, must have a legitimate and certified cash register, and all sales must be registered and a receipt must be written and offered to the customer. Of course regulations like this has had a big impact on Sweden’s distribution of payments, since cash payments become less attractive. A regulation like Kassaregisterlagen, which makes cash less attractive, actually lowers the platform access value for cash, at the same time as it increases the access value for digital payments, which eventually results in an increased use of digital payments, and a decrease in cash usage.

When analysing the countries’ present interchange fee, it is hard to draw any direct good and relevant conclusions, since Sweden and Italy have the lowest fee which is contradictory to Italy’s cash usage. On the other hand, Switzerland’s high interchange fees are in line with their low degree of digital payments. However, the interchange fee has of course a great impact, because no one wants to pay high fees. The answers probably lie in that Italy’s interchange fees were higher before the EU regulation introduced in 2015, capping the fees to 0.2 percent for debit cards and 0.3 percent for credit cards, while they still were fairly low in Sweden. This explains Italy’s high cash usage, together with their “new” low interchange fee, as well as coincides with the other countries’ fees and degree of digital payments. The new interchange fee can also be seen as an incentive for both sides to “enter” the platform in the two-sided market of payments, since it raises the access value of the platform, and is furthermore another indication of that Italy is moving towards more digital payments and a new dominant design.

The last factor that was investigated is the trust for banks in each country, which was very difficult to investigate, measure and compare. However, we found studies measuring the inhabitants experience their main bank (except for Canada), and all countries rated their main bank well. Ranging from 79 to 85 percent, Sweden’s, Italy’s, and Switzerland’s population gave their main bank a grade of 5 or higher on a scale from 5 to 7, and based on this it is
difficult to draw any conclusions more than it does not have any impact. However, this can be argued to not measure the population’s entire trust for the countries’ banking system, and other findings showed that only 24 percent of Italy’s population have faith in their central bank, and that there is low faith in their government. This kind of information is as mentioned difficult to measure and codify, and even though the main bank numbers did not reflect any correlations, it is believed that trust also has an impact on a country’s cash usage. Looking at the fraud numbers (only for Sweden and Italy), one can identify that the fraud per 1000 cards and fraud per 1000 inhabitant is higher in Sweden, which is not so odd since cards are used to a greater extent. However, the fraud per transaction volume is two times higher in Italy than in Sweden, which probably is a contributing factor the countries’ cash usage. A higher fraud per transaction rate could be seen as a higher platform access value, hence more people might access the platform and use more cards if this rate is decreased.

All these factors are connected to the theory of network externalities and two-sided platforms. It is shown that some values and findings decrease the digital payment platform’s access value, which brings on high cash usage, while other increase the access value, also increasing the number of digital payments. There is the question of the “chicken and the egg”, and somebody always has to be first, one just have to raise the platform’s access value enough for the specific circumstance. Regarding the countries with high cash usage, Italy and Switzerland, it is important for institutions and companies, to create incentives that lowers the access value and invites both sides of the platform if they want to increase their degree of digital payments even more. However, it has shown that some incentives have already been created, e.g. the lowered interchange fee in Italy, which promotes these countries transition to digital payments and a dominant design.
8 Conclusion

This chapter concludes the thesis, and conclusions about physical and digital payments, as well as dominant designs in the payment industries in the investigated countries, are presented. The chapter is structured according to the defined research questions, where they constitute headings in the chapter. Furthermore, an evaluation of the study is presented, as well as suggestions for further work.

8.1 Research Questions

The purpose of this thesis has been to investigate four different industrialised countries with different degrees of cash usage, with the aim to answer questions regarding the occurrence of a dominant design within the digital payment trajectory in the respective country, as well as providing an understanding of factors affecting and influencing a country’s payment market and degree of cash usage.

RQ1: How does the retail payment landscape look like in the investigated countries?

A detailed mapping of the countries’ cash- and retail payment landscape can be found in respective country chapter, but below follows a briefer summary.

Sweden uses a high degree of digital payments and a low degree of physical payments. Related to this, they also have low amount of cash in circulation per capita, which together with a relatively high GDP results in one of the world’s lowest cash intensity of 1.4 percent. Looking at ATM cash withdrawals which is another indicator of cash usage, both in terms of value and volume, it is also very low in relation to other countries. The development of digital payments between 2012 and 2016 has increased, while the cash intensity has decreased, which are optimal signs of a stable decrease in physical payments, and a stable increase in digital payments.

Canada, similarly to Sweden, uses a high degree of digital payments and a low degree of physical payments. Their cash in circulation per capita, their cash intensity, and their ATM cash withdrawals are low. They are however not as fully digitalised in their distribution of payments as Sweden, but they have come a long way. Comparing Sweden’s and Canada’s cash intensity in 2012, it only differed 1.2 percent, but since then Canada has had a bit of worrying development with their payment distribution. They have increased their amount of digital payments per capita, but they have also increased their cash intensity as well as their cash in circulation, indicating a small bounce back or settlement towards slightly more cash usage. However, the increase in cash intensity has not been as substantial as the increase in cash in circulation, which means that the increase of cash in circulation mainly can be explained by an economic growth and an increase in GDP.
Italy, in contrary to Sweden and Canada, uses a low degree of digital payments and a high degree of physical payments. They have instead a very high amount of cash in circulation per capita, cash intensity, and ATM cash withdrawals. These categories have also increased the last couple of years, which indicates more cash usage. But as the cash usage has increased, so has also the digital payments, with card payments in top with an increase of 59.3 percent, which is the most of any of the investigated countries. However, since Italy has a lower overall amount of digital payments, an increase is reflected more percentually, but is it a good representation the current changes in the country’s payment market.

Switzerland, which is famous for its old and successful banking industry, could be imagined to use a high degree of digital payments, but that is not the case and instead uses a high degree of physical payments. Similarly, to Italy, the cash in circulation per capita, cash intensity, and ATM cash withdrawals are high. One can also see the almost exact same changes as Italy between 2012 and 2016, an increase in cash in circulation and cash intensity, but at the same time an increase in digital payments, which is both good and bad from a digital payment perspective.

RQ2: Why do some industrialised countries have a higher degree of digital payment usage than other?

There are a number of factors influencing the degree of digital payment usage in an industrialised and well developed country, some which are obvious, and some which are more ambiguous. All these factors together create unique situations in each country’s payment market. The first identified factor is the age demography. A country with a younger population uses more digital payments than a country with an older population. Perhaps related to this is also the influence of the use and extent of information and communication technology. Countries ranking high on ICT ratings uses a high degree of digital payments. Another factor with big influence is the population density. Since the cost of cash distribution is much higher per capita for sparsely populated countries, sparsely populated countries use more digital payments than more densely populated countries. Furthermore, the analysis also indicates that a country’s education level has an impact. A population with an overall higher education level, especially when analysing the ratings 10 to 20 years back in time during the start of the digitalisation era, uses a high degree of digital payments. However, this hypothesis would be good to verify or falsify with further work and analysis of more countries.

Regulations are another influencer to a country’s distribution of payments, but they are impossible to rate and must be analysed and evaluated individually, and can either increase or decrease the degree of digital payments. E.g. Kassaregisterlagen in Sweden has had a great impact, decreasing the attraction to cash and increasing the amount of digital payments. However, regulations such as the increased cap for cash payments in Italy (1000 EUR to 3000 EUR), has a negative effect on digital payments.

The most obvious influencer identified is probably the cost of card payments, in terms of an interchange fee paid by the acquiring bank (merchant) to the issuing bank. Countries that
charge a higher fee (i.e. banks in the countries), use less digital payments. However, Italy has low interchange fees today due to an EU regulation introduced in 2015, and still performs few digital payments, but it will probably increase in the upcoming years.

The trust and fraud levels in the different countries have shown to not have a great impact on the countries’ degree of digital payments, at least when it comes to trust for their main banks, which the inhabitants can choose themselves. However, when it comes to trust for the central bank and fraud levels, it influences people payment choices. Low trust for the central bank and high level of fraud per transaction, signifies less digital payment usage. Another investigated factor which did not have as big influence as imagined was the supply of financial consumer technology. All countries have good smartphone and digital technology which enable both digital POS and remote payments. The adoption rate of this technology differed very much though, with Swish (Sweden) superiorly dominating with number of users, which could be argued to be related to the country’s adoption and use of ICT.

**Main RQ: Is the digital payment trajectory in the investigated countries moving towards an establishment of a dominant design?**

In this thesis, two different studies were conducted to complement each other, one more holistic and one more thorough, and both studies showed very similar results. To answer this research question, it is first important to state the definition of a dominant design. “A dominant design is a specific path, along an industry’s design hierarchy, which establishes dominance among competing design paths” (Suarez and Utterback, 1995). For many years, it has been safe to say that cash has been the dominant design in the payment market, but is it today? And where is the payment market heading towards? For Italy and Switzerland, cash is still king, while the degree of digital payments is low, indicating that cash still is the dominant design in these countries. However, there are signs and indicators that both countries are adopting more and more card payments and other digital payments, and will continue to do so in the future. The signs are based on statistical trends in the countries’ payment distribution as well as from e.g. education rating and payment costs among other things. The pace of the increase is difficult to estimate though, but roughly based on previous research, a substantial change should be seen in the next coming 15 years. In Sweden and Canada, one could argue that the results point towards that the digital payment trajectory already has become the dominant design in the payment market. They both already have a very high degree of digital payments, and Sweden continues to increase even more. However, Canada shows some worrying signs with a small increase in in their cash intensity, and an even bigger increase in their cash in circulation. The increase in cash in circulation can though be explained by an economic growth and an increase in GDP. To conclude, the digital payment trajectory has already been established as a dominant design in Sweden and Canada, while cash is still dominating in Italy and Switzerland, but they are also moving towards more digital payments, and an establishment of a new dominant design in the payment market.
8.2 Evaluation of the Study

In order to fulfil the purpose of the thesis, a qualitative methodology with an abductive approach was applied, based on secondary databases, literature review, a country comparison, and interviews (the firm activity analysis however was more of quantitative nature). This approach was preferable since it provides a good overview of a phenomenon, according to Blomkvist and Hallin (2015). An overall comment about the chosen method is that it has provided good and useful knowledge to the thesis in order to answer the research questions. Despite this, it is important to evaluate how the applied method went, and how changes and different approaches possibly could have change the result and conclusion.

The first thing to discuss is the number of interviews, which only amounted to four (not counting minor interviews and contacts that also have provided useful information and help to the thesis about sources etc.). It could be argued that if more interviews had been made, the validity of the results might have been slightly higher. By this means, firstly, more information about the payment industry and the countries payment habits could possibly have been obtained since there is a risk that important information has been missed. Secondly, the information obtained from the secondary sources about the countries could also have been further checked with knowledgeable people within the industry, in order to make sure that the information is correct as well as interpreted correctly. However, due to the time limit of the thesis, as well as no further suitable interview objects were found (or did not want to participate), only four interviews were made.

A related aspect to the few interviews, as well as the chance of important information may have been missed, is missing data. That is, the exact same data and information about all countries were not found, and this could potentially have had an effect on the outcome of the study. For instance, the card fraud data for Canada and Switzerland is limited or completely missing in the thesis, and this makes this particular aspect very difficult to compare and see similarities from. In addition, data on the inhabitants trust for the banks and other financial institutions has also been difficult to find similar data on for the countries. At the same time, it is considered that this missing data has no major impact on the result and final conclusion of the thesis, but it would obviously have been more optimal with similar data for all countries.

Another thing to evaluate and discuss, is the conducted firm activity analysis in chapter 5.2 about how the firm activity in the payment industry is consistent with Abernathy and Utterback (1978) graph on market behaviour, according to the dynamics of innovation. The firm activity analysis in Figure 9 is similar to Utterback’s analysis of the U.S. typewriter industry (Figure 7), which gives a good indication of where the industry is today, but what is missing from the firm activity analysis though is the firm exits. This missing data has an effect on the validity of the resulting graphs, but as it is argued in the chapter, it still gives a good overview of how the payment markets are changing holistically. Furthermore, one can also see that the derivate of the curve has not yet stagnated and reached zero, meaning there are still firms entering the market, which often correlates with few firms exits.
The chosen countries in this investigation constitute another topic to evaluate. It would probably have been a lot easier if the thesis studied and compared four EU member countries instead, due to the convenience of being able to find similar data on all countries from the same sources (from ECB for instance). This in turn could arguably also have led to a more accurate result and conclusion, but at the same time a result and conclusion with lower generalizability. The four chosen countries in this thesis were conscious choices, hoping to make conclusions as generalizable as possible. That is, two countries are member of the EU, and two are not. One of the EU member countries has a high degree of digital payments, while the other has a low degree, and the same goes for the countries that are not members of the EU. Further, one of the EU member countries has a domestic currency, while the other one uses the international EUR currency, and so on.

If an alternative method and approach had been done instead of the qualitative method (and the quantitative firm analysis), and if that would have led to the same result and conclusion, is also an aspect worth evaluating and discuss. For instance, one alternative approach could have been to do a complete quantitative study instead by sending out a questionnaire in each country the case study concerns. If the result would have been the same, is difficult to know, but similar results would probably have been obtained. However, such an approach was considered to be more challenging and not as accurate, and this is because it was perceived to be difficult to be able to reach out to a representative number of people in order to draw conclusions about cash digitalisation in a country. It simply did not feel feasible since the expected sample size of respondents in any of the countries, would probably not have been sufficient. Furthermore, which networks to use in order to reach out to the same number of people in all countries, was also seen as a challenge.

8.3 Suggestions for Further Work

Today’s society is rapidly changing due to the technological and digital evolution that is today, and it affects how people live and work. The payment industry is no exception to these changes, and in the pursuit of becoming cashless societies, the consumers are more or less forced to change their payment habits. During the time of this study, the payment industry, as well as the payment landscape in different countries, is undergoing many changes. Why some countries have come further than others in their use of digital payment means, is not obvious. Therefore, there are many aspects and potential influencing factors within this research field that needs to be investigated in order to try to understand this revelation. In this study, it was also chosen to exclude the perspective of cryptocurrencies, since it was after conducted interviews, judged to have an insignificant influence in the present and closest time period of the payment market. However, if the trend of cryptocurrencies continues to grow, it would be interesting to include this in a similar study to find out more about its potential influence and impact.

Thus, the first suggestion for further work within this field of research is therefore to conduct a similar study within a couple of years, due to the rapidly changing digital market and society. A lot of data in this study is from 2016, which is now the latest data available, but this data can probably within a few years be considered as outdated. It is also interesting to do a similar
study to check if the identified trends still exist, and if the markets are changing as the results and conclusions hypothesises.

Furthermore, to investigate more factors that potentially could affect the payment habits and landscape in different countries, than what this thesis has investigated, is another suggestion for further work. It would also be good to study more countries than the four chosen ones in this case study, in order to get an even broader view of countries similarities and differences in payments. To study more potential influencing factors and countries, would also further either strengthen and validate, or falsify the results of this thesis, since some of the results and correlations in this investigation can be considered to only be hypotheses.
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91


