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**THE EFFECT OF ELECTRONIC PAYMENT INSTRUMENTS  
ON CONSUMER BEHAVIOUR**

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I hereby declare that I have compiled the thesis independently and all works, important standpoints and data by other authors have been properly referenced and the same paper has not been previously presented for grading. The document length is 8032 words from the introduction to the end of conclusion.

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## **ABSTRACT**

Transition in a payment methods and the following decrease of cash usage has been a topic in this decade. At the moment payment cards has a strong position as a payment instrument, but new payment innovations are introduced every year.

The purpose of the study is to analyse how consumers payment habits have changed in Finland in between 2014 and 2019 regarding the competitive scheme of a different payment methods. This study looks at the most common current payment methods in use and the factors influencing the choice of payment method and how the payment scheme has changed in Finland and how Finland is comparing to Estonia and to EU in past years.

In the factual sector, this study focuses on analyzing and interpretation the payment transaction statistics and consumer surveys published by the European Central Bank and Bank of Finland. By setting statistics as tables and figures, the study has been able to detect changing trends in people's payment behaviour.

The research shows that new payment method innovations, such as contactless payment cards has been adapted quickly by consumers. Consumers have begun to prefer payment instruments which are effortless to use comparing to traditional cash.

Keywords: Payment methods, Cash, Card payments, Electronic payments, Consumer behaviour

## **INTRODUCTION**

The transition in payment methods caused by evolving payment methods and the consequent reduction in the use of cash has been the subject of talk around the world for decades. Cash has been a form of payment in its various forms for thousands of years, but recent trends and technological developments have brought with it numerous new payment methods. At the moment different payment cards have a big share of the business but new innovations are released all the time. The European Central Bank has also noticed this and has updated its legislation to reflect these future developments with various directive and shows its support. At the same time when new payment innovations are breaking through, also older payment methods such as cash have its supporters. Cash is still the main payment method around the world, and also in the euro area, there are many countries where over half of the responders are using cash as the main payment (Esselink, Hernandez, 2017). At the same time, there are societies like Sweden who are planning to move into a cashless society and looking for opportunities to implement E-Krona currency and stop using cash at all (Riksbank.se). In principle Finland could also be in the same situation as Sweden, but Finland is part of the Eurozone and as long as cash is used in Central Europe cash usage is not ending in Finland. Also, the Bank of Finland has publicly given its support to the people's right to use cash as payment and reminds that around 10% of the Finns are still using cash as their daily payment method (Bank of Finland). The world is still inevitably moving closer to immaterial payment methods rather than going back to use physical money.

Payment cards provide an alternative method to cash for making transactions. They also often provide benefit programs and other services for credit users. The four major payment card providers are Visa, Mastercard, Discover, and American Express. In the US, Canada and Europe the cash payments are still most common payment methods for purchases less than 25 euros (Wakamori, Welte, 2013). It is partially supply driven because merchants do not accept payment cards because merchants want to avoid interchange fees for small-value transactions. At the same time, however, it is also demand driven. Consumers use to prefer cash for small-value transactions because it has been fastest way to pay (Wakamori, Welte, 2013). However, this consumer

behaviour has been in transition because of the contactless payments which have had an impact for less than 50 euros transactions (Bank of Finland, 2019).

The aim of this thesis was to analyse how consumers payment habits have changed in Finland in between 2014 and 2019 regarding to the competitive scheme of a different payment methods and how Finland compares to Estonia and Euro area. The phenomenon was addressed from the perspective of the development of cash and card payments. The material used in the work consisted of data retrieved from the payment transaction statistics of the Bank of Finland and the European Central Bank. With analysing the collected data, we looked for similarities and differences in the development of payment methods in Finland, Estonia and Euro area.

In this study the author has analysed the transition in payment behaviour. The first chapter contains general information about different payment methods in euro area, and what consumer behaviour means and consists. In this chapter the author has taken a cursory view on changed European payment legislation, most importantly Payment Service Directive 2.

The study has been prepared using a quantitative research method for collecting and analysing the collected data. With qualitative research methods the author has wanted to try to understand the phenomenon under study. In the second chapter the author has included detailed information of the used data and methodology. The author has tried to clarify the study by asking questions such as, which payment methods are most used in Finland? How have consumers payment habits changed in Finland in between 2014 and 2019? And how the scheme of payment methods in Finland differs from Estonia and Euro area?

In the third chapter, the collected data is analysed and explained. The results are shown in figures and tables which has a descriptions to make them easier to understand. By setting statistics as a tables and figures, the study has been able to detect changing trends in people's payment behaviour.

# 1. PAYMENT METHODS AND CONSUMER BEHAVIOR

## 1.1 Money and payment methods

Every euro, pound, dollar, krona, or yen is someone's wealth but at the same time, it is someone's debt. When somebody is having a banknote in his wallet, he might not think that he is a lender but the banknote is Central Banks owed money for owner of the banknote. A regular bank deposit into a private bank is banks owed money to the customer (Bank of Finland).

Money is something that has value and is widely accepted and people are willing to change its goods for that. A. Mitchell Innes describes money as following: "That as life becomes more complex barter no longer suffices as a method of exchanging commodities, and by common consent, one particular commodity is fixed on which is generally acceptable, and which, therefore, everyone will take in exchange for the things he produces or the services he renders and which each, in turn, can equally pass on to others in exchange for whatever they want"(Smithin John, 2002).

Humans have had various exchange tools which could be considered as money, such as cattle, iron, salt, shells, dried cod, tobacco, sugar, nails, etc. Later on, the value of the money has been evaluated as equal to the weight of an object, as gold, silver, and copper (Smithin John, 2002).

Later on, money is moving from the material closer to immaterial. Korhonen (2007) describes that money is immaterial numbers in the data of banks. Money is based on the counterparty's ability to pay the credit because money is always someone's debt (Korhonen, 2007).

Payment cards provide an alternative method to cash for making transactions. They also often provide benefit programs and other services for credit users. The four major payment card providers are Visa, Mastercard, Discover, and American Express (Marc Rysman, 2007).

There is a lot different payment cards where to choose from and banks have a different selection of cards available. The Bank cards which are suitable for cash payments include, for example, online debit cards such as Visa Electron and offline debit cards such as Mastercard Debit, and

various so-called prepaid cards. For using bank cards you must have an equal amount of money in your bank account as the transaction are because the money is debited instantly. (Bank of Finland)

Delayed debit cards have been often confused with the credit cards. A card holder is allowed to make purchases and withdrawal cash and have these transactions charged to an account which is held by the card issuer company, up to an authorised limit. An example of a delayed debit card provider is the American Express who offers 46 days of payback time. The American Express is not offering a credit function so there is not an interest to be paid back.

For the consumers, cash usually means physical banknotes and coins but it could also mean assets that can be easily transferred into available money. By cash in this study, we will be focusing on consumer's relations to physical cash.

There are various reasons why people are keeping using cash. Cash is a memory and a simple way for monitoring budget (Kalkreuth, Schmidt, Stix, 2014, p. 46). Kalkreuth, Schmidt, and Stix (2014) sum using of cash as following: “Meeting liquidity targets may be important for many consumers, either because of high costs of overdraft or because this would violate some rule they have set themselves to avoid overspending”(Kalkreuth, Schmidt, Stix, 2014, p. 46)

Paying with cash is usually considered as easy and safe. It is easy way to stay in budget and popular payment method when abroad. With paying cash there is no third parties between buyer and seller so consumer have nothing to worry about interest to be paid to creditor. It becomes more difficult to perceive the value of money when money is “electronic” and it can be easily noticed when watching increased number of people with errors in credit ratings. At the end of 2019 there were 386 000 Finns with a error in their credit ratings (Asiakastieto.fi).

Cash has been as a topic also of its reliability. If there would be a crisis, it could mean that the electronic payment systems around the world doesn't work. In this scenario, it is very important to have a reliable payment system and there is not any better alternatives for cash. The Finnish National Rescue Association (SPEK) has also advises people to keep small cash reserves at homes if a crisis would occur (Avarnsecurity.fi).

Passas (2018) sees that one reason to protect cash usage in the future is privacy. “Despite the fact that anonymity and privacy may be used to engage in crime, there are legitimate interests and

reasons to protect those values. Privacy and informational privacy are basic rights”(Passas, 2018, p. 25).

Besides cash, payment can also be made with cards and debit cards are the most common payment card available. They are basically a payment card which are directly connected to your bank account. Instead of picking cash from the ATM or counter of the bank customer can pay with the bank card and money is automatically charged from his bank account. There are not any interest fees because there is no credit function. Usually there is yearly charged usage fee and open fee when you receive your card first time. Applying for a a debit card is usally required 16 year of age, regular income and a good payment history (Bank of Finland).

Debit cards has been the most popular payment instrument in the 2010’s. The popularity of debit cards has grown steadily in Finland. According to the Figure 7. There have been 8,6 million debit cards in Finland. There were 7,1 million debit cards in Finland in 2014, so the number of debit cards has increased by 21,12 % between 2014 and 2019 (Bank of Finland).

First this research focus on what credit really means. Credit is borrowed money so it means debt, and it must always be payed back. Credit card prices are usually bigger than paying with cash because there is also interest to be paid. With a credit card you are able to spread the payments of your purchase over a longer period of time but it should have been keep in mind that there is interest expense and other additional expenss to be paid also so the amount is bigger than the purchase price (Bank of Finland).

In order to get a credit card you must be at least 18 years of age. Since paying with a credit card always involves risk for the card companies, the lenders often wants to ensure their customers ability to pay their credits back. Cards are usually granted by companies specializing in it, for example, banks. There is also some customer-loyalty cards which could include credit function and you are able to get benefits for using that card in their stores. The price of credit cards consists of the amount of money borrowed, interest and other expenses related to the credit. Usually, credit are paid back in monthly instalments and therefore you will need a regular income to repay the credit. So before applying for credit card you should consider whether you are able to make the payments in the future (Bank of Finland, Nordea).

The contactless payment feature could be listed in the above payment methods as it is a separate feature of the payment card and not an own payment system itself. The money is still charged from the debit or credit from the customer depending on the consumer preference. In a debit and credit combination cards, contactless payment feature is considering debit in the first place but there are exceptions (Bank of Finland). The contactless payment feature can be considered as the most successful feature in the near future. The reception of the contactless payments feature has been really good and its popularity has grown really fast in a short of time. Because of lack of identification, for example, Pin-code, contactless payments has a limit for the purchase amount to avoid scams. Payment limits in contactless payments is depending of the country, but according to Figure 11 average limit was 22,93 € in 2019. For example in Poland it has been 12 € and in Denmark 47 € (DKK changed to euros). In Finland the limit was 25€ in 2019 but it was raised to 50€ in 2020 (Bank of Finland).

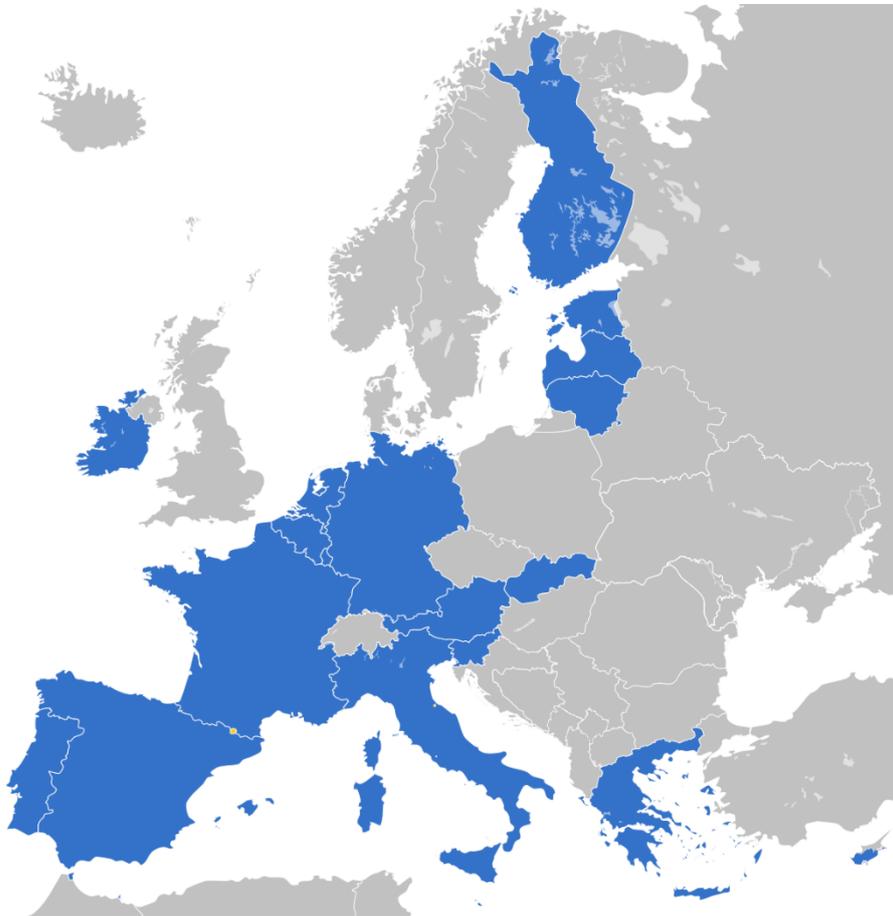
## **1.2 Payment methods in the Euro area**

The euro is a single currency of the European Union which was launched on 1. January 1999 and it became a currency for over 300 million people. For the first three years it was an invisible currency, only used for accounting purposes, e.g. in electronic payments (ECB).

The official euro area comprises 19 of 27 European Union Member states, including overseas departments, territories and islands which are either part of, associated with, euro area countries. Euro countries is shown in Figure 1. Also the European microstates Andorra, Monaco, San Marino and Vatican city use the euro. These microstates are not Member states of the European Union but they have a formal arrangement with the European Community. Montenegro and Kosovo likewise use the euro, but without formal arrangement. The euro has become one of the world's most important currencies and cash payments are now made in the same currency by 340 million people and euro banknotes and coins have become a tangible symbol of European integration (ECB).

Cash is by far the most widely used means of payment for retail transactions in the euro area in terms of the number of transactions. Although in terms of value it has a significantly smaller share. Since the introduction of euro cash in 2002, the value and the number of euro banknotes in circulation have risen steadily. However the role of has been gradually declining in recent decades, while the use of debit and credit cards has been growing, a trend is expected to continue (ECB).

Figure 1. European Monetary Union



Source: ECB

### 1.2.1 Payment Service Directive 2 (PSD2)

The first payment service directive was launched in 2007 by the European Parliament and of the Council. It was fully or partially transposed into national law by the member states by November 2009. In January 2016 European Union set up a new payment service directive which will be implemented officially in 2018. This directive is called Payment Service Directive 2 (PSD2) which main substance is to improve the existing rules and take new digital payment services into account. It included provisions to (Finanssivalvonta).

- make it easier and safer to use internet payment services
- better protect consumers against fraud, abuse and payment problems

- promote innovative mobile and internet payment services
- strengthen consumer rights
- strengthen the role of the European Banking Authority (EBA) to coordinate supervisory authorities and draft technical standards

Its purpose is also to classify regulations on multilateral interchange fees, like limit the fees for transactions based on consumer debit and credit cards. It also provides to ban retailers from imposing surcharges on customers for the use of these types of cards (ECB)

Payment service direct 2 has made the legislation to correspond with a development of the financial services. It will provide an access for third parties to provide their new innovations and solutions for the consumers which used to be provided by banks. This will create more opportunities for companies in a field of financial technology (Finanssivalvonta)

## **1.3 Consumer behaviour**

This chapter is about consumer behavior and its transition over time. First, the focus is on what is consumer behavior and what actions affect it. Secondly, it should orientate to the transition of consumer behavior over time and what actions affect consumer behavior. The end of this chapter will focus on consumer understanding and why it is important.

Kotler and Ketler (2019) describe consumer behavior as the study of how individuals or groups buy, use and dispose of goods, services, ideas or experiences to satisfy their needs and wants. The needs and wants of consumers often vary across different cultures, situations, and individual characteristics. The study of consumer behavior can be divided into three interdependent dimensions; The study of culture, the study of social groups, and the study of individuals (Kotler, Ketler, 2019 p. 195-196).

### **1.3.1 Factors affecting on consumer behaviour**

There are countless different definitions for culture and it could be observed from many points of views but all of them have in common that it's dependent on people. Culture is a combination of

values, behavior, attitudes, and procedures which are learned from the group and older generations. Culture is thus a learned behavior that contains the knowledge of customs, norms, and morals in the surrounding society. (Kotler, Keller 2019, 196-197)

Cultures consist of subcultures that define even more precisely what belongs to their behavior. Subcultures can be, for example, nationality, race, religions, or geographical location. As subcultures grow large enough, companies often design marketing strategies specially targeted at them to serve the needs and desires of a subculture(Kotler, Keller, 2019, 196-197).

As we can assume that culture influences what values and behavior we adopt for ourselves and that affects consumer behavior. The values in which a child grows up largely determine what kind of behavior adopts as a parent. Values are evident in the everyday life in school, family, and other loved ones. The environment has therefore great importance for what kind of consumers each develop (Kotler, Keller, 2019, 197-198).

A social factor could be, for example, different reference groups. Reference groups could mean all the groups which have a direct or indirect impact on a person's attitudes or behavior. They are a group that people don't belong to, but they would wish to belong to. Many small groups impact personal behavior. (Kotler, Armstrong 2014). Groups which has a direct impact or continuously impact personal behavior are called membership groups. Some of these are primary groups such as family, friends, neighbors, and co-workers (Kotler, Keller, 2019). Secondary groups are called those which are more formal and require less continuous interaction such as religious, professional, and trade union groups (Kotler & Keller). "Reference groups influence members in at least three ways. They expose an individual to new behaviors and lifestyles, they influence attitudes and self-concept, and they create pressures to conformity that may affect a product or and brand choices" (Kotler, Keller, 2019, p. 200).

The family members constitute the most influential primary reference group and are the most important consumer buying organization in society. The family means both parents and siblings and partners and children. From parents, a person acquires an orientation towards religion, politics and economics, and a sense of personal ambition, self-worth, and love. Parent's behavior influences the person even though they do not interact very much together. Partner and children have a more direct influence on personal behavior. This sector has been in transition considering the old believe that the wife usually takes care of food purchases and the husband takes care of cars for example (Kotler, Keller, 2019, p. 200).

Persons buying decisions are influenced by personal characteristics. These include persons age, life situation, occupation, economic circumstances, personality, self-concept, lifestyle, and values (Keller & Kotler 2019, p. 201-202).

It is usual that same age groups have common preferences in needs and wants. Clothes, furniture, and foods for example. Also, life situation has a big impact on consumer behavior. Especially when there are changes in life situations such as the birth of a child, getting married, illness, divorce, moving, or changing a workplace.

Occupation also influences consumption patterns. A CEO of the company will buy suits, travel bags and country club memberships and his employees might buy work clothes, work shoes, and lunchboxes. The economic situation tells how much there are savings, debts, and spendable income which affects the prioritization of consumer behavior (Kotler, Keller, 2019, p. 201-202).

Personality means a consumer's characteristics as he sees himself and which affects his buying decisions. This could include self-confidence, status, sociability, independence, and autonomy. Also, self-image impact on consumer behavior because people prefers brands which they identify themselves (Kotler, Keller p. 201-204).

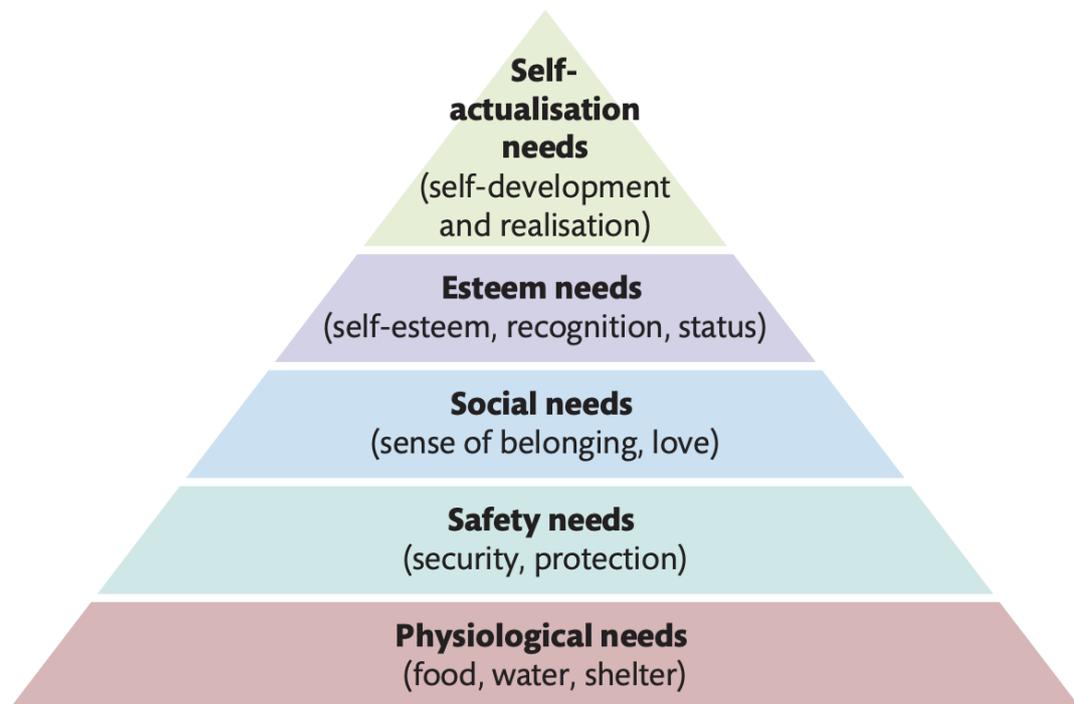
People who pay attention to climate would prefer sustainable brands and spend money to advance their health, development, and potential. They might be interested in green products, organic clothing and food, energy-efficient solar panels, public transport, recycling, personal care, and responsible investing. Lifestyles are taking shapes during the person is preferring and comparing money and time. Consumers which are saving money usually pay attention to cheaper products and prefer doing things themselves if it gives them savings. Consumers who give more value for free-time might prefer spending money on services from professionals to save their time (Kotler, Keller, 2019, 201-204).

Four key psychological processes that fundamentally influence consumer behavior are motivation, perception, learning, and memory. The marketer's task is to understand how psychological processes work and how marketing and environmental stimuli enter the consumer's consciousness. External stimuli influences together with a consumer's characteristics into consumer's purchase

decision making. Human behavior is mostly learned from the surrounding world and also most of it happens unintentionally. Information that people learn from their everyday life is stored in short-term or long-term memory. Memories which has been stored into long-term memory could activate through stimulus, for example, a familiar smell. The smell could have also other connections into different memories, for example, a vacation made a long time ago (Kotler, Keller 2019, p. 204).

According to Maslow's theory of needs, the consumer's needs are arranged in a hierarchy from most to least pressing needs. People will try to satisfy their most important needs first and when it is successfully satisfied, a consumer will focus on the next most important need. As we can see from the picture, Maslow's first satisfying needs are psychological needs, like food, water, and shelter. Secondly, the consumer would satisfy his safety and security. When all needs are satisfied step-by-step, the consumer can move to the top of the hierarchy where he will satisfy his self-actualization needs. When the last need is satisfied, a consumer could focus on self-realization, for example, self-development (Keller, Kotler, 2019, p.204).

Figure 2. Maslow's hierarchy of needs



Source: Kotler, Keller (2019, 206)

### **1.3.2 A change in a consumer behaviour**

Technology, digitalization and globalization, those are the three main factors which impacts on change in consumer behaviour. 20 years ago internet was just a static, one-way platform that transmitted text and images. And in the last century even that technique didn't exist. People have been send handwrote letters to each other and waited printed magazines every week to get updated news. Many people have born as "digital native" who have always lived with a digital technology and for them even imagine of living without them could be difficult (Solomon, 2019, p. 36-37).

It is marketer's task to follow ongoing and future trends to satisfy consumers needs. Due the globalization worlds demographics is also in transition and brands are all the time more aware of scale their marketing to impact every demographical groups for example, ethnicity and religion (Solomon, 2019, p. 41-42).

### **1.3.3 Behaviour measurement**

In this study, it is important to identify different ways to measure payment behaviour. One way to measure behaviour is a quantative methods such as (Ely-keskus, 2018);

- Number of cards
- Number of card transactions
- Value of card transactions
- Number of cash withdrawals
- Value of cash withdrawals
- Average value of cash withdrawal

Second way to measure behaviour is qualitative methods such as;

- Consumer surveys
- How effortless the transaction process is

Third way to measure consumer behaviour are technical methods such as;

- The duration of the transaction process

As measuring the duration of the transaction process is quite difficult and existing studies found are from a time before contactless payments or PIN-code identification, it is not used as a measurement method. This study will focus more on consumer's opinions on the effortlessness of the payment method (Ely-keskus, 2018).

## **2. DATA AND METHODS**

The material used in the work consisted of data retrieved from the payment transaction statistics and consumer surveys of the Bank of Finland and the European Central Bank. Payment statistics, for example, contains the number of ATM's, value of cash withdrawals, number of cash withdrawals, number of payment cards by function, value of card transactions, and number of card transactions. Consumer surveys contains detailed reasons for consumer preferences of the payment instruments. With analysing the collected data, the author looks for similarities and differences in the development of payment methods in Finland, Estonia and Euro area. The aim of this thesis was to analyse how consumers payment habits have changed in Finland in between 2014 and 2019 regarding to the competitive scheme of a different payment methods. The thesis also investigates how the scheme of payment methods in Finland compares to Estonia and other Euro countries. The phenomenon was addressed from the perspective of the development of cash and card payments.

By combining data, previous research and survey results, answers to following research questions are looked for:

1. Which payment methods are most used in Finland?
2. How have consumers payment habits changed in Finland in between 2014 and 2019?
3. How the scheme of payment methods in Finland differs from Estonia and Euro area?

### **2.1 Use of the euro**

Eurosystem central banks have a special responsibility for cash, as they are the official issuers of euro banknotes. The European Central Bank has announced that Eurosystem is neutral with regard to the different payment instruments so it does not favor one instrument over another. One of the basic tasks of the Eurosystem under the Treaty on the Functioning of the EU is to promote the smooth operation of the payment system. Therefore , the Eurosystem is committed to supporting cash as a generally available, easy-to-use, reliable and efficient means of payment for retail

transactions. The Eurosystem monitor ways to keep euro area payment systems competitive, safety, resilience and efficient (ECB, Use of the euro).

European Central Bank has announced the unique features of the cash as a payment instrument:

- It is the most widely usable and fastest payment instrument for retail transactions and it is the most important contingency payment instrument
- It is considered the cheapest instrument for small retail payments – the average overall cost per transaction for small payment is slower for cash than for comparable electronic payment instruments
- It is “inclusive”: people who have no bank accounts or limited access to them or who are unable to use electronic forms of payments can still make payments
- It enables people to keep a close check on their spending
- It is both a payment instrument and a store of value
- It has proved to be secure in terms of fraud/counterfeiting resistance (ECB, Use of the euro)

In view of these features, society is not ready to do without cash. Cash will remain indispensable as a payment instrument for many years to come (ECB, Use of the euro).

### 3. RESULTS AND DISCUSSION

In the first part of this section, we will look at the payment statistics of Finland, Estonia and Euro area and we will delve into a comparison between of them on differences and similarities. We will focus on the supply of the most used payment methods and how the scheme of it has changed. As the Finland's results have mostly already been reviewed, we will focus more on the euro area and Estonia.

In the second part, we will take a deeper look to the detailed payment statistics of Finland.

Table 1. Number of ATM's in Finland, Estonia and Euro area

	Finland		Estonia		Euro area	
	Number of ATM's	Change (%)	Number of ATM's	Change (%)	Number of ATM's	Change (%)
2014	1637		821		409136	
2015	1546	5,89 %	797	-2,92 %	411243	0,51 %
2016	1457	6,11 %	772	-3,14 %	420200	2,18 %
2017	1498	-2,74 %	748	-3,11 %	413414	-1,61 %
2018	1606	-6,72 %	751	0,40 %	406532	-1,66 %
2019	1685	-4,69 %	739	-1,60 %	391434	-3,71 %
<b>Total</b>	<b>48</b>	<b>2,93 %</b>	<b>-82</b>	<b>-9,99 %</b>	<b>-17702</b>	<b>-4,33 %</b>

Source: Payment statistics of ECB

In Table 1 we can see the declining trend in euro area that the number of ATM's has decreased with 17702 units which equals to -4,33% in total. The declining trend is going faster in Estonia where the number of ATM's has decreased -9,99% in total. This development is the result of ability to adapt new technologies.

Table 2. Cash withdrawals made in ATM's (number, millions)

	Cash withdrawals made in ATM's (number, millions)					
	Finland	Change (%)	Estonia	Change (%)	Euro area	Change (%)
2015	135,7		37,1		7921,2	
2016	123	-9,36 %	35,7	-3,77 %	7850,9	-0,89 %
2017	108,8	-11,54 %	35,1	-1,68 %	7703,3	-1,88 %
2018	98,9	-9,10 %	33,7	-3,99 %	7555,6	-1,92 %
2019	88,5	-10,52 %	31,6	-6,23 %	7208,1	-4,60 %
<b>Total</b>	<b>-47,2</b>	<b>-34,78 %</b>	<b>-5,5</b>	<b>-14,82 %</b>	<b>-713,1</b>	<b>-9,00 %</b>

Source: Payment statistics of ECB

The trend on declining cash use can be also seen in number of cash withdrawals, which has decreased in all three research subjects during the period considered (Table 2).

Table 3. Cash withdrawals made in ATM's (value, billions)

	Cash withdrawals made in ATM's (value, billions)					
	Finland	Change (%)	Estonia	Change (%)	Euro area	Change (%)
2015	14,3		3,6		1082,2	
2016	13,5	-5,59 %	3,6	0,00 %	1099,8	1,63 %
2017	12,5	-7,41 %	3,8	5,56 %	1107,7	0,72 %
2018	11,8	-5,60 %	3,9	2,63 %	1125,4	1,60 %
2019	10,9	-7,63 %	3,9	0,00 %	1118,3	-0,63 %
<b>Total</b>	<b>-3,4</b>	<b>-23,78 %</b>	<b>0,3</b>	<b>8,33 %</b>	<b>36,1</b>	<b>3,34 %</b>

Source: Payment statistics of ECB

If we look at the value of cash withdrawals made in ATM's in Table 3, we can easily see how cash is still very strong opponent for electronic payment instruments and cash has its supporters. Only

in Finland the value of cash withdrawals has decreased, while Estonia has withdraw cash more than Euro area in average.

Table 4. Average cash withdrawal in ATM's (value, euros)

	Average cash withdrawal in ATM's (value, euros)					
	Finland	Change (%)	Estonia	Change (%)	Euro area	Change (%)
2015	105,38		97,04		136,62	
2016	116,26	10,33 %	100,84	3,92 %	137,84	0,90 %
2017	131,43	13,05 %	102,56	1,71 %	140,49	1,92 %
2018	144,59	10,01 %	106,82	4,15 %	143,23	1,95 %
2019	161,58	11,75 %	113,92	6,65 %	150,14	4,82 %
<b>Total</b>	<b>56,20</b>	<b>53,33 %</b>	<b>16,89</b>	<b>17,41 %</b>	<b>13,52</b>	<b>9,89 %</b>

Source: Payment statistics of ECB

As we have noted earlier in the study, the amount of cash withdrawals per transaction has increased in Finland while payment cards have taken over part of the market. This same trend is following Finland's path also in Estonia and Euro area (Table 4 and 5) . According to the consumer survey of Bank of Finland, consumers are making less cash withdrawals, but they are withdrawing more at once. When we look at the other similarities of payment behaviour among these countries, we could make an assumption that this behaviour is not an exception.

Table 5. Number of cash withdrawals per card

	Number of cash withdrawals per card					
	Finland	Change (%)	Estonia	Change (%)	Euro area	Change (%)
2015	14,6		20,2		15,6	
2016	12,9	-11,64 %	19,4	-3,96 %	15	-3,85 %
2017	11,3	-12,40 %	18,9	-2,58 %	14,3	-4,67 %
2018	10	-11,50 %	17,9	-5,29 %	14	-2,10 %
2019	9	-10,00 %	16,8	-6,15 %	12,8	-8,57 %
<b>Total</b>	<b>-5,6</b>	<b>-38,36 %</b>	<b>-3,4</b>	<b>-16,83 %</b>	<b>-2,8</b>	<b>-17,95 %</b>

Source: Payment statistics of ECB

Table 6. Number of payment cards (number, millions)

Number of payment cards (number, millions)						
Year	Finland	Change (%)	Estonia	Change (%)	Euro area	Change (%)
2015	9,31		1,84		508,20	
2016	9,52	2,27 %	1,84	0,38 %	522,84	2,88 %
2017	9,64	1,30 %	1,86	1,09 %	535,42	2,41 %
2018	9,89	2,56 %	1,88	1,13 %	539,46	0,76 %
2019	9,79	-1,05 %	1,89	0,16 %	564,85	4,71 %
<b>Total</b>	<b>0,48</b>	<b>5,13 %</b>	<b>5,11 %</b>	<b>2,78 %</b>	<b>56,64</b>	<b>11,15 %</b>

Source: Payment statistics of ECB

The Table 6 shows how many payment cards there is in total per country and euro area. According to releases of Eestipank and SEB, in 2016 4% of the payment cards in Estonia had a contactless payment function. In 2017 contactless payment function was included in 17% of the payment cards and in 77% in 2019 (Eestipank, SEB). Finland and Estonia has been generally pioneers in digitalization and adapting new technologies so the growth has been moderate, but the number of payment cards has been risen 11,15% in euro area from which it can be concluded that other euro countries will follow.

Table 7. Total card payments (number, millions)

	Total card payments (number, millions)					
	Finland	Change (%)	Estonia	Change (%)	Euro area	Change (%)
2015	1419,9		264,1		29695,6	
2016	1536	8,18 %	285,9	8,25 %	32923,7	10,87 %
2017	1643,1	6,97 %	312,5	9,30 %	36508,5	10,89 %
2018	1828,7	11,30 %	340,4	8,93 %	41501,2	13,68 %
2019	1947	6,47 %	370,8	8,93 %	46623,6	12,34 %
<b>Total</b>	<b>527,1</b>	<b>37,12 %</b>	<b>106,7</b>	<b>40,40 %</b>	<b>16928</b>	<b>57,01 %</b>

Source: Payment statistics of ECB

Table 8. Total card payments (value, billions)

	Total card payments (value, billions)					
	Finland	Change (%)	Estonia	Change (%)	Euro area	Change (%)
2015	44,1		4,7		1438,2	
2016	45,8	3,85 %	5,2	10,64 %	1543,9	7,35 %
2017	47,4	3,49 %	5,8	11,54 %	1664	7,78 %
2018	51	7,59 %	6,4	10,34 %	1824,5	9,65 %
2019	54,1	6,08 %	7	9,38 %	1973,4	8,16 %
<b>Total</b>	<b>10</b>	<b>22,68 %</b>	<b>2,3</b>	<b>48,94 %</b>	<b>535,2</b>	<b>37,21 %</b>

Source: Payment statistics of ECB

In Table 7 and 8 we can see how number and value of card payments has grown among of Finland, Estonia and Euro area. In 2015 Estonians made 264,1 million card payments and combined terms of value was 4,7 billion euros. In 2019 the same numbers were 370,8 million card payments and 7 billion euros. In Estonia growth has been 48,94% which is slightly faster than in general in Euro area.

Table 9. Average card payments (value, euros)

	Average card payments (value, euros)					
	Finland	Change (%)	Estonia	Change (%)	Euro area	Change (%)
2015	31,06		17,80		48,43	
2016	29,82	-4,00 %	18,19	2,20 %	46,89	-3,18 %
2017	28,85	-3,25 %	18,56	2,04 %	45,58	-2,80 %
2018	27,89	-3,33 %	18,80	1,30 %	43,96	-3,55 %
2019	27,79	-0,37 %	18,88	0,41 %	42,33	-3,72 %
<b>Total</b>	<b>-3,27</b>	<b>-10,54 %</b>	<b>1,08</b>	<b>6,08 %</b>	<b>-6,11</b>	<b>-12,61 %</b>

Source: Payment statistics of ECB

In Estonia the average card payment has been almost the same for 5 years, but in Finland and Euro area consumers are started to prefer cards over cash in small purchases (Table 9). People are preferring cards over cash because contactless payments has made it more effortless (Bank of Finland).

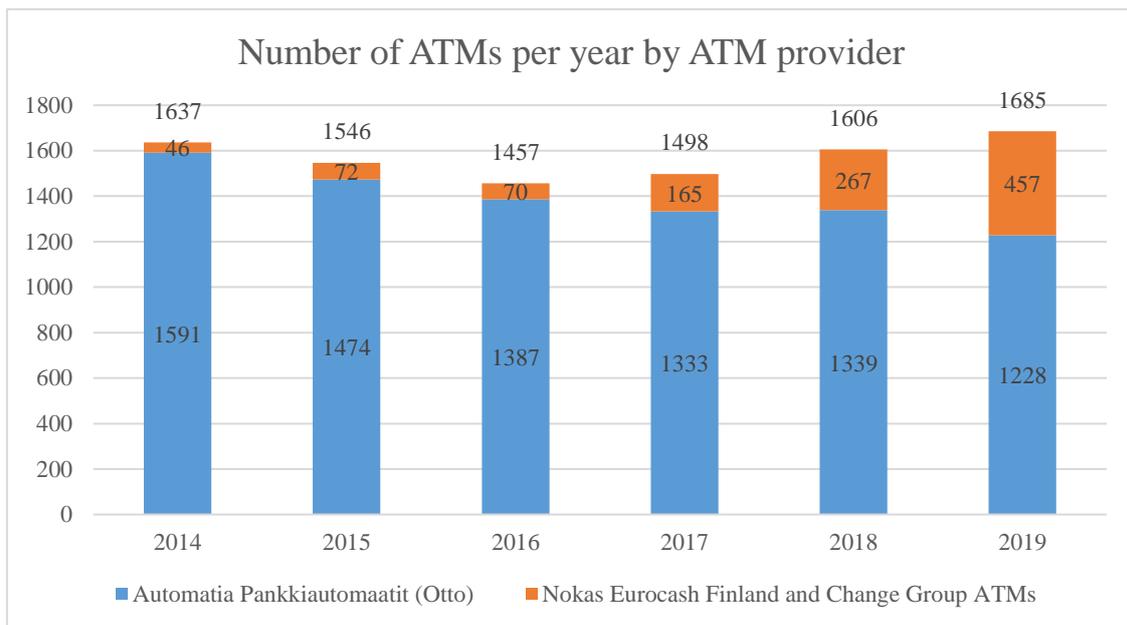
### 3.1 Cash usage in Finland

In 1994 the main biggest banks in Finland, SYP, KOP, Osuuspankki, and Postipankki, established an ATM network company called Automatia Pankkiautomaatit, more familiar as “Otto-automaatit”, to keep the cash distribution concerns in Finland. As a result of the merger of banks, owners of Automatia Pankkiautomaatit are today Nordea, Osuuspankki, and Danske Bank. Automatia Pankkiautomaatit had a monopoly in cash distribution until 2008 (Vihola, 2000, p. 201-202). After 2008 growth of the Change Group ATMs and Nokas ATMs has been small but since 2017 they have grown rapidly. Most of the growth has been happened because of the cooperation between S-Group and Nokas Oyj which started in 2017 (Eekoo.fi).

Figure 3 shows that between 2014-2016 total number of ATMs has been declining but since 2016 the number of ATMs has been increasing. The increase has happened mainly because the biggest

grocery chain S-Group has stopped cooperating with Automatia Pankkiautomaatit and they have started cooperation with Nokas Eurocash Group. S-Group has replaced previous Automatia Pankkiautomaatit ATMs with a Nokas Oyj ATMs. Automatia Pankkiautomaatit ATMs has declined -22,81% between 2014-2019 but the total number of ATMs has increased +2,93% at the same time. Even though the overall cash usage has been falling, the number of ATMs is increasing which has been possible through the increased competition.

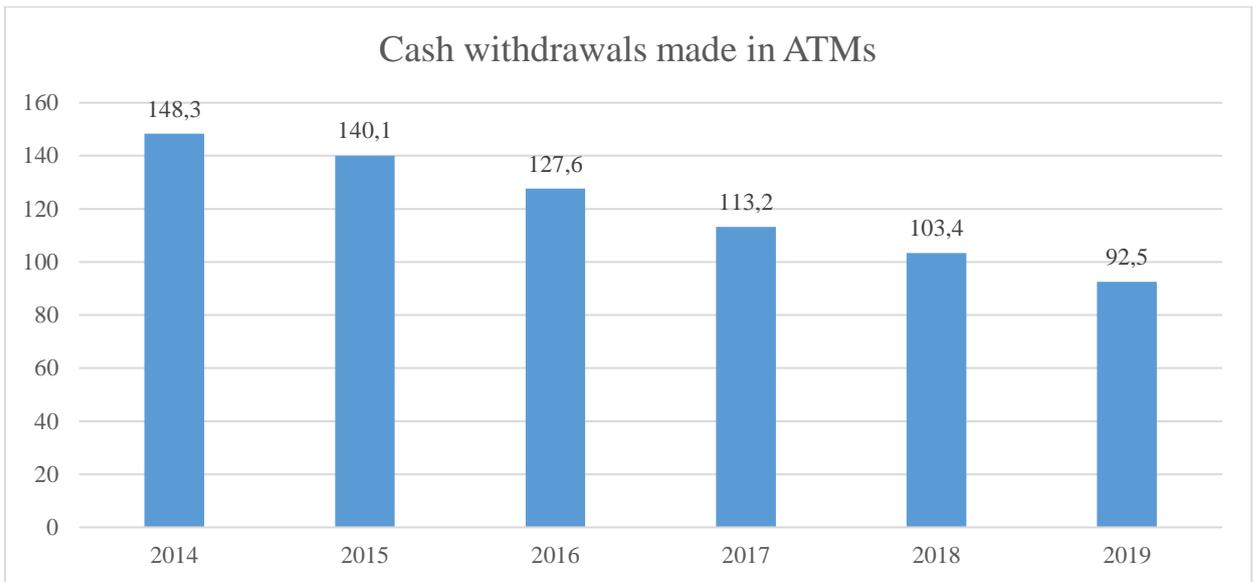
Figure 3. Number of ATMs per year by ATM provider



Source: Bank of Finland, Cash statistics, 2019

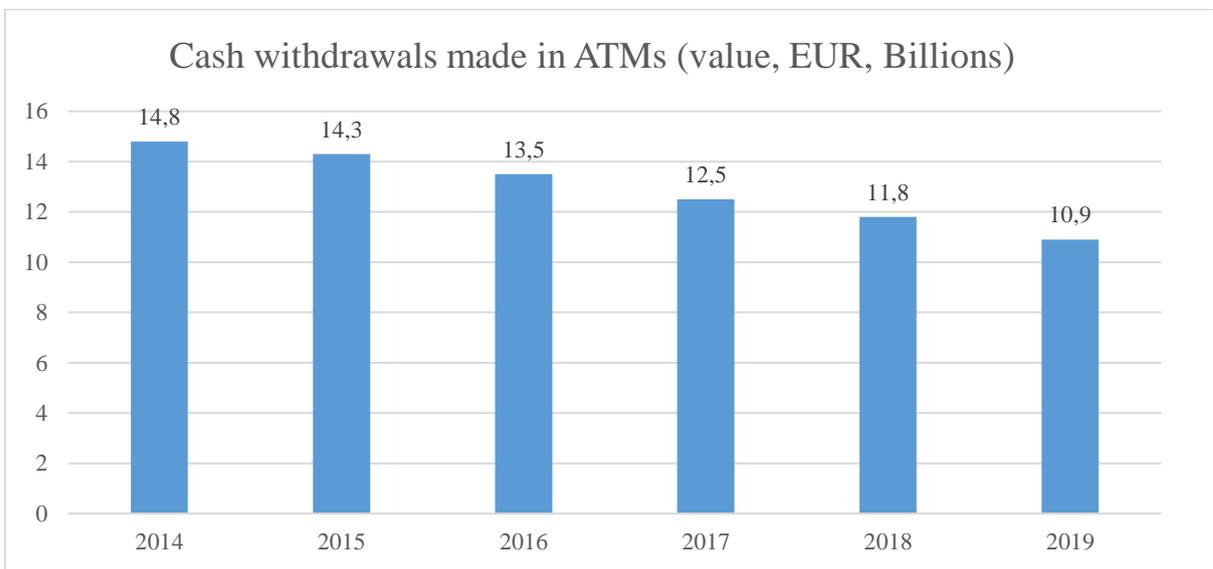
In Finland, the demand for cash has been steadily decreased for 20 years and it has also steadily decreased since 2014. According to the Bank of Finland's cash statistics (Figure 4&5), cash withdrawals by volume between 2014-2018 have decreased by -30,27%, and EUR value decrease by -20,27%. In the same period, the average cash withdrawal amount made in ATMs has increased +14,34% from 99,80€ to 114,12€ (Figure 5). There are fewer cash users year by year in Finland but their cash withdrawal amounts are getting bigger. Recently, private banks have adopted cash withdrawal limitations for their customers. For example, one to four free cash withdrawals per month and exceeded withdrawals could cost some fixed percentage or EUR amount. This is intended to guide consumer behaviour to prefer more profitable payment methods for banks.

Figure 4. Cash withdrawals made in ATMs (number, millions)



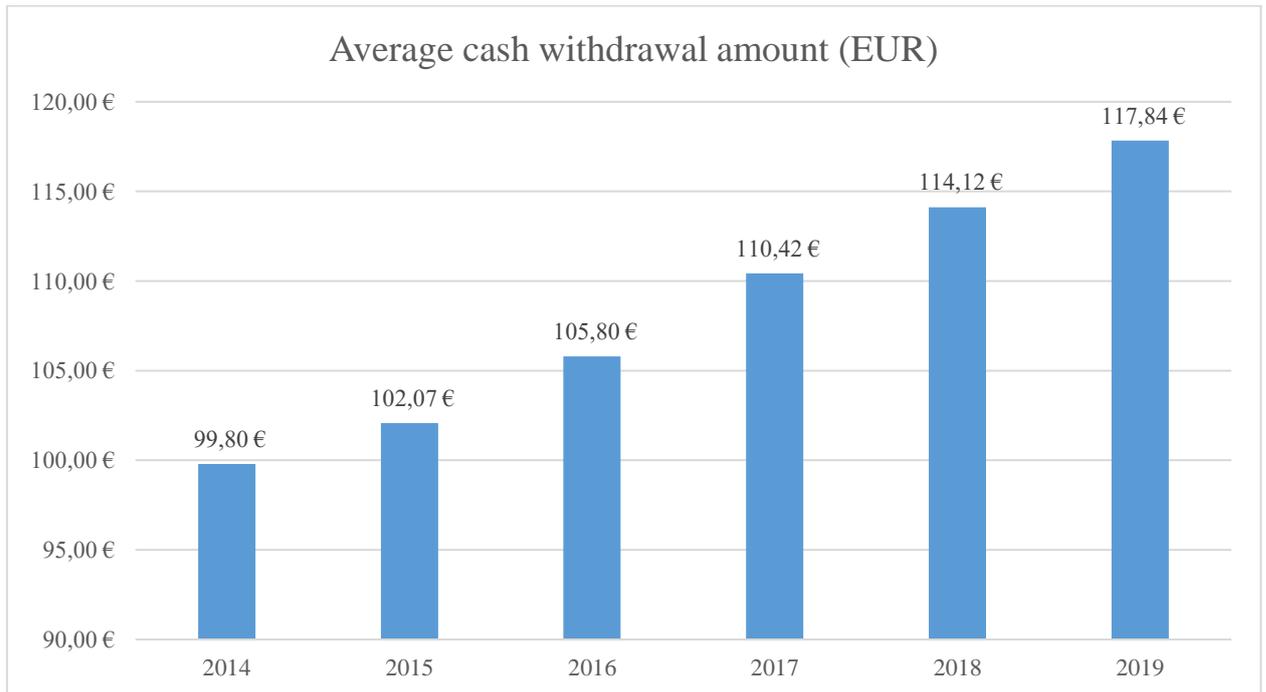
Source: Bank of Finland, Cash statistics (2019)

Figure 5. Cash withdrawals made in ATMs (value, EUR, billions)



Source: Bank of Finland, Cash statistics (2019)

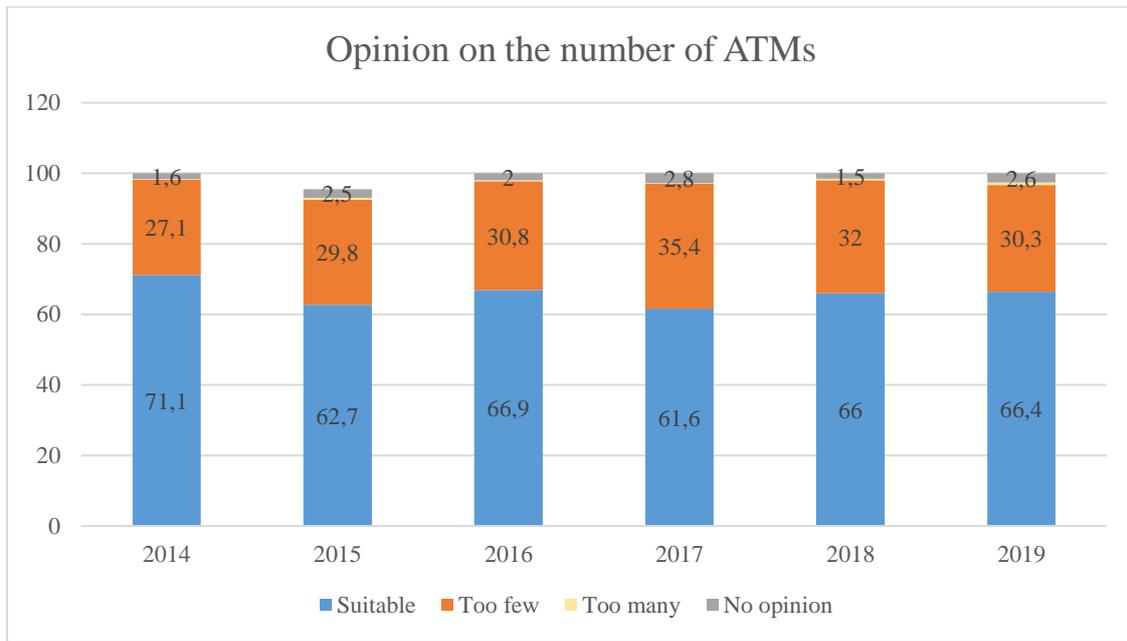
Figure 6. Average cash withdrawal amount in ATMs (EUR).



Source: Calculation is based on Bank of Finland cash statistics (2019).

Bank of Finland has shown its interest in cash and is always conducting research into the future trends of cash use. Bank of Finland is conducting an annual survey of consumers payment preferences and opinions of cash use. It is published annually, and it is public information. Bank of Finland's consumer survey includes a question regarding the opinions on cash. Consumers have been questioned their opinion on the number of ATMs around Finland. As we can see from the Figure 7, consumers opinions have not changed much and have been moderately positive. It is also difficult to make assumptions or hypothesis of has the actual number of ATMs been made any differences on consumers behaviour. In 2016 there has been least number of ATMs, but consumers opinion has been more positive than in 2019 when there has been the most ATMs between years 2014-2019.

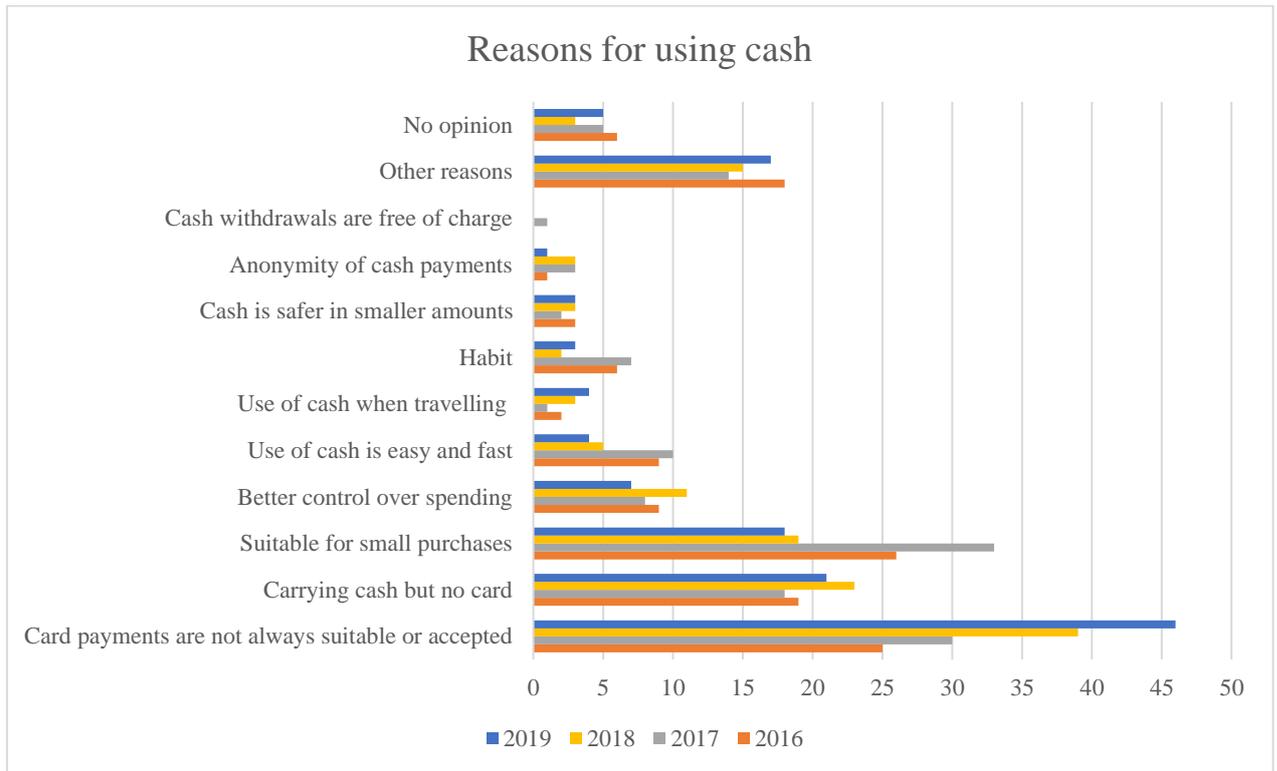
Figure 7. Opinion on the number of ATMs in Finland



Source: Bank of Finland, Consumer Survey (2019)

Bank of Finland has made a consumer behaviour survey for cash users which main target has been to scan reasons for cash use. The survey has been made since 2016 and the results can be seen in the Figure 8. There could be done conclusion that cash users are worried that card payments are not always suitable or accepted in places they visit. This reason has been most common recently among cash users even though the acceptance of card payments is on the rise. Option “Suitable for small purchases” has been also a popular reason but also on decrease. Popularity increase in contactless payment cards has affected on that reason’s decrease certainly. Previous studies have explained the use of cash as a good way to budget spending (Kalckreuth, Schmidt, Stix, 2014), but according to Bank of Finland’s consumer survey (Figure 8), it has been in fifth place as a most important reason for using cash. As a interesting note in Figure 8, some Finns carry only cash and no payment card at all.

Figure 8. Reasons for using cash

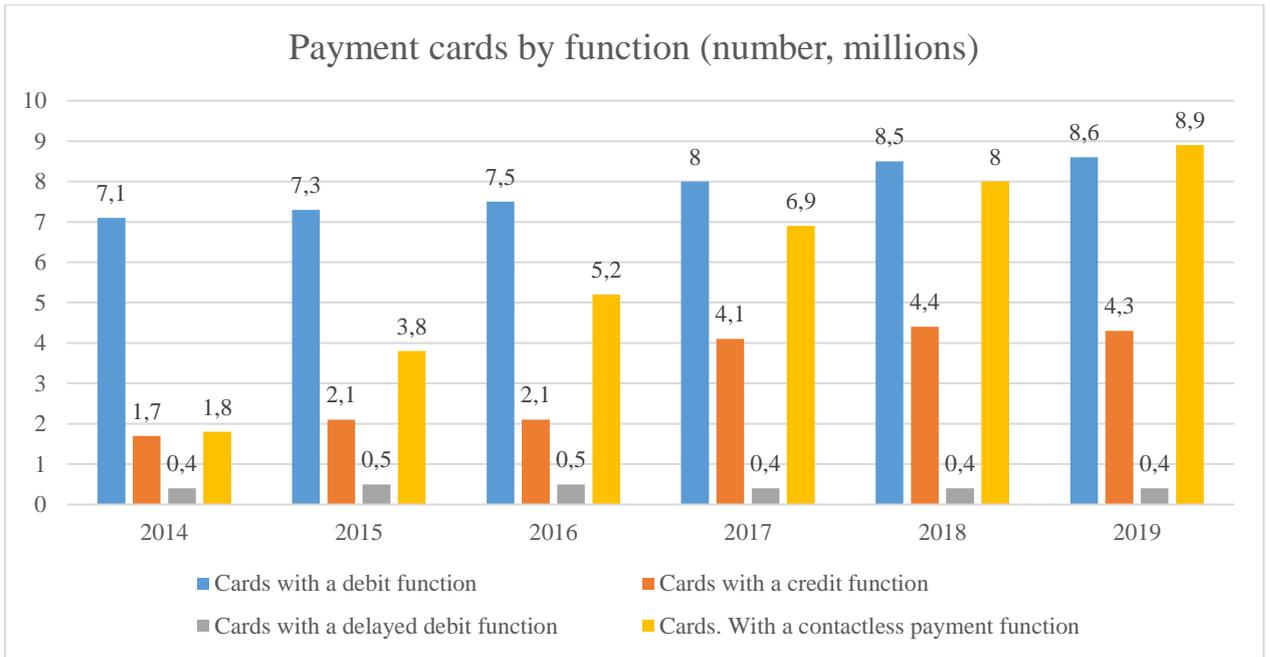


Source: Bank of Finland, Consumer Survey (2019)

### 3.2 Card payments in Finland

Figure 9 represents the number of payment cards by function. The number of payment cards has grown steadily. In 2013, contactless payment function was introduced in Finland and since then its popularity has grown rapidly. In 2019, almost every card issued also contains a contactless payment function. Also, popularity of credit cards has grown steadily during the period under review. Popularity of cards with a delayed debit function, for example, American Express, has remained the same.

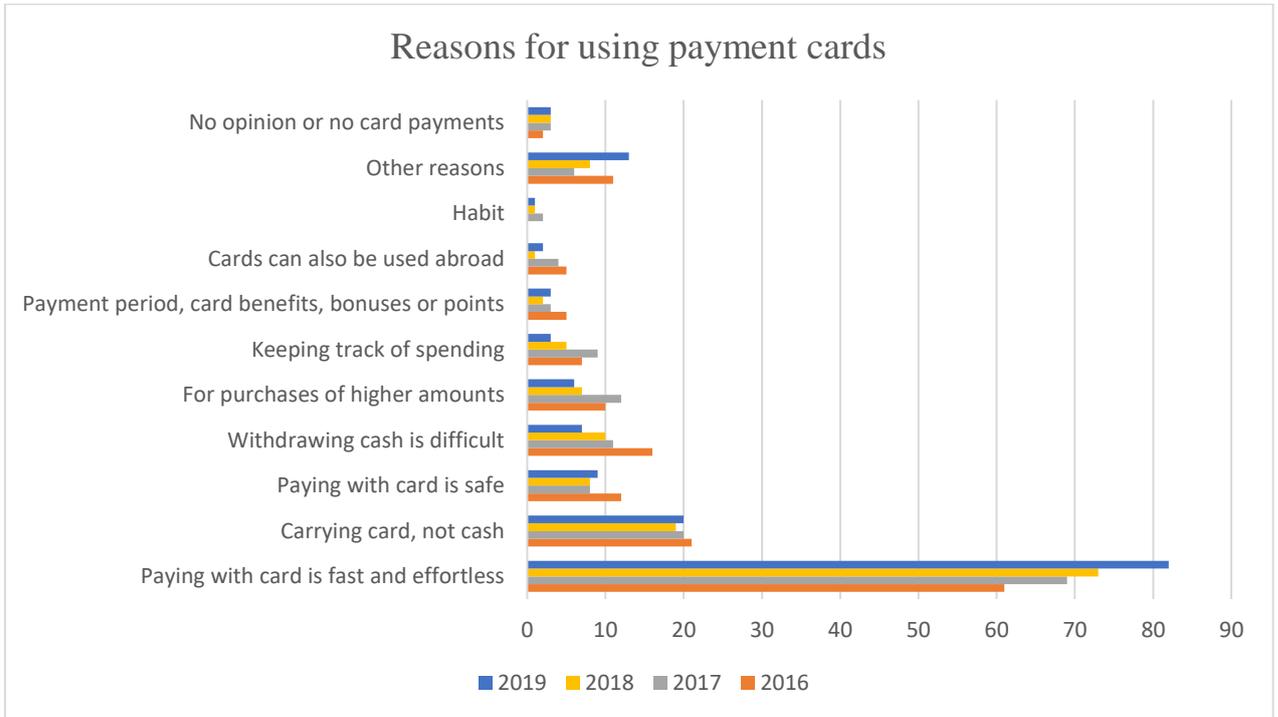
Figure 9. Number of payment cards by function (volume, million)



Source: Bank of Finland, Payment statistics, 2019

The Bank of Finland conducts an annual consumer survey, and during the years by far the most popular reason for using payment cards is its effortless and fastness.

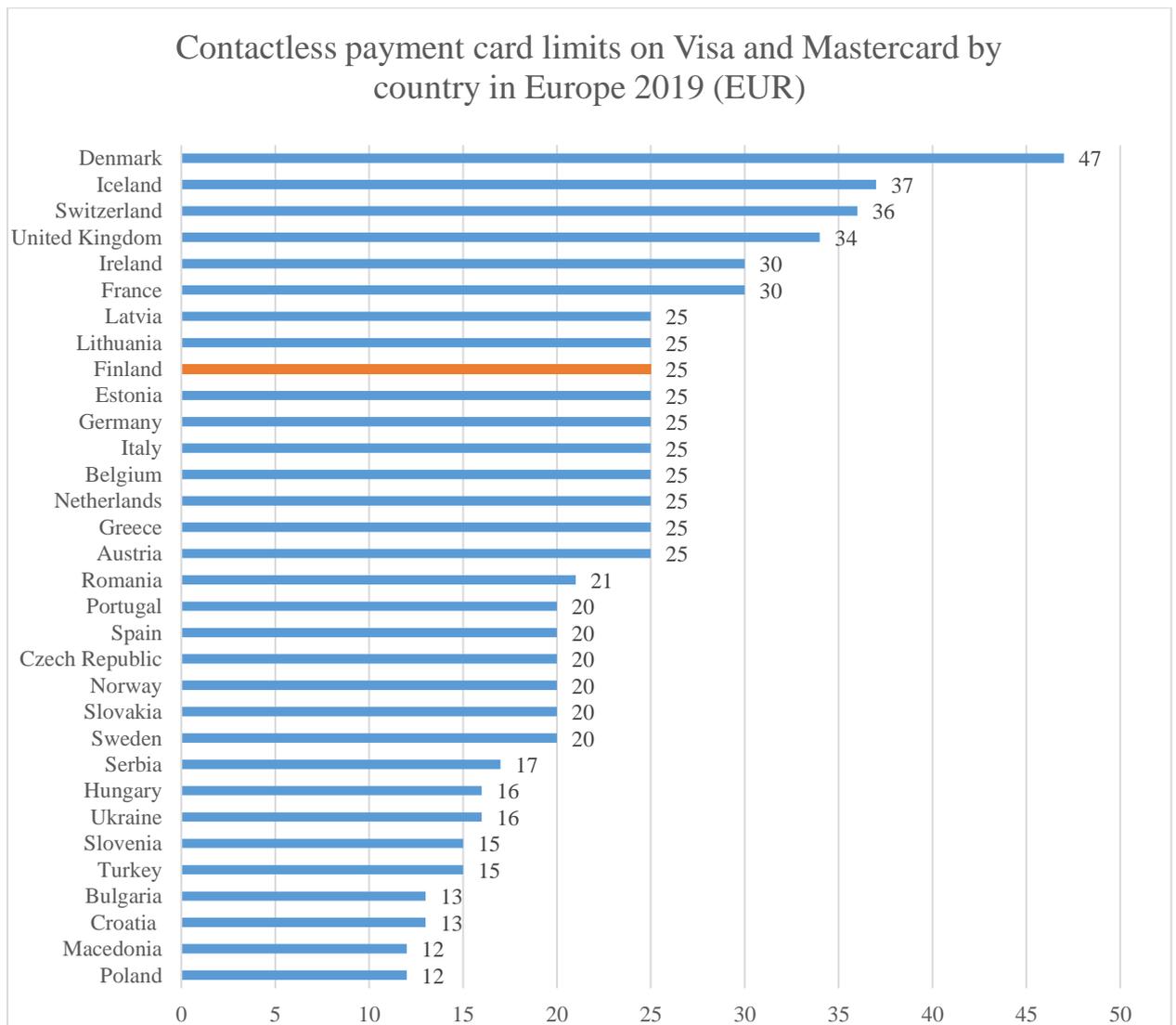
Figure 10. Consumer reasons for using payment cards



Source: Bank of Finland, Consumer survey, 2019

The figure 11 shows contactless payment limits in Europe in 2019. In Finland the limit was 25 euros in 2019, but the limit has been raised to 50 euros in 2020. The contactless payment limits in Finland can be considered as a average in Europe. (Bank of Finland).

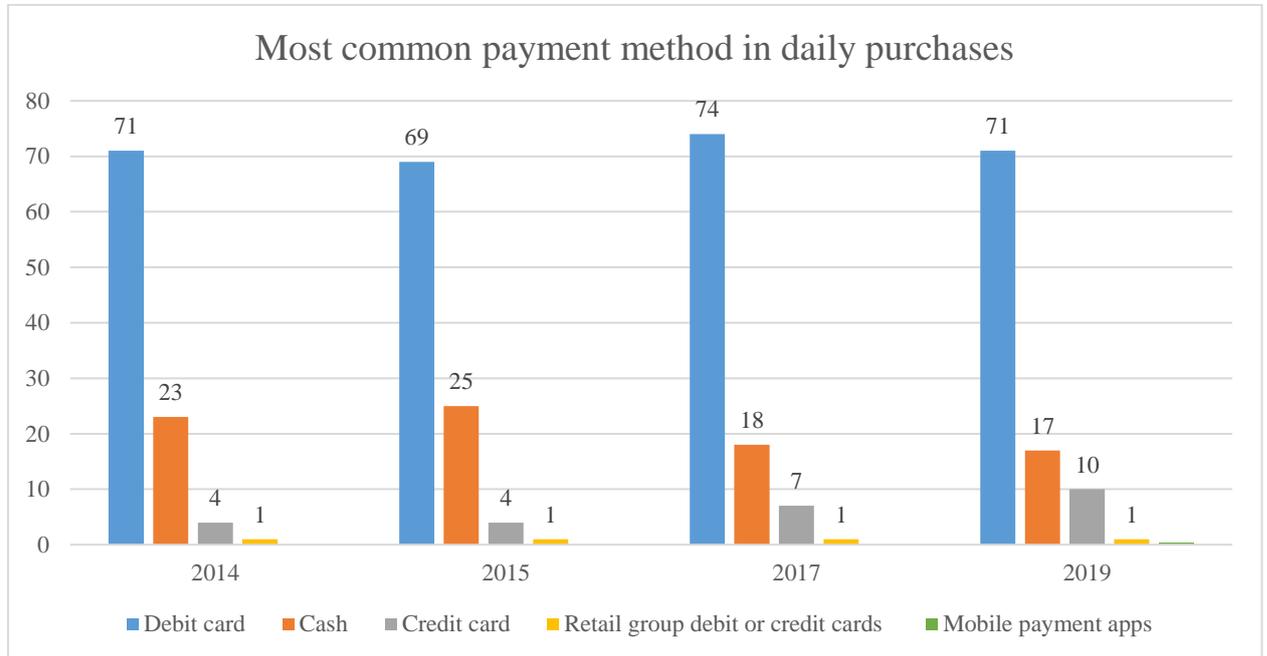
Figure 11. Contactless payment card limits on Visa and Mastercard by country in Europe 2019 (EUR)



Source: Statista.com

As we have observed earlier in this study, the prevalence of cash use has been steadily declining. In parallel, cash has received competing payment methods that are more usable than cash. In this case, an already existing payment methods has gained their popularity among consumers. According to the consumer survey (2019) made by Bank of Finland, can be noticed the card payments dominance in a field of payment instruments. Figure 12 shows how debit cards and credit cards together make up around 70-80% of the popularity among the audience. A great attention should be also paid to that credit cards popularity has raised among the audience from 4% to 10% between 2014 and 2019. At the same time popularity of cash use has declined from 23% to 17%. This decline could be explained with consumers attitudes towards the ease of the payment methods and how, for example, the proliferation of contactless payment cards has had the greatest impact on purchases of less than 25 EUR. This position is supported by the fact that in the Bank of Finland’s consumer survey, customers have justified their use of cash the most with its ease when making small purchases (Figure 8).

Figure 12. Most common payment method in daily purchases

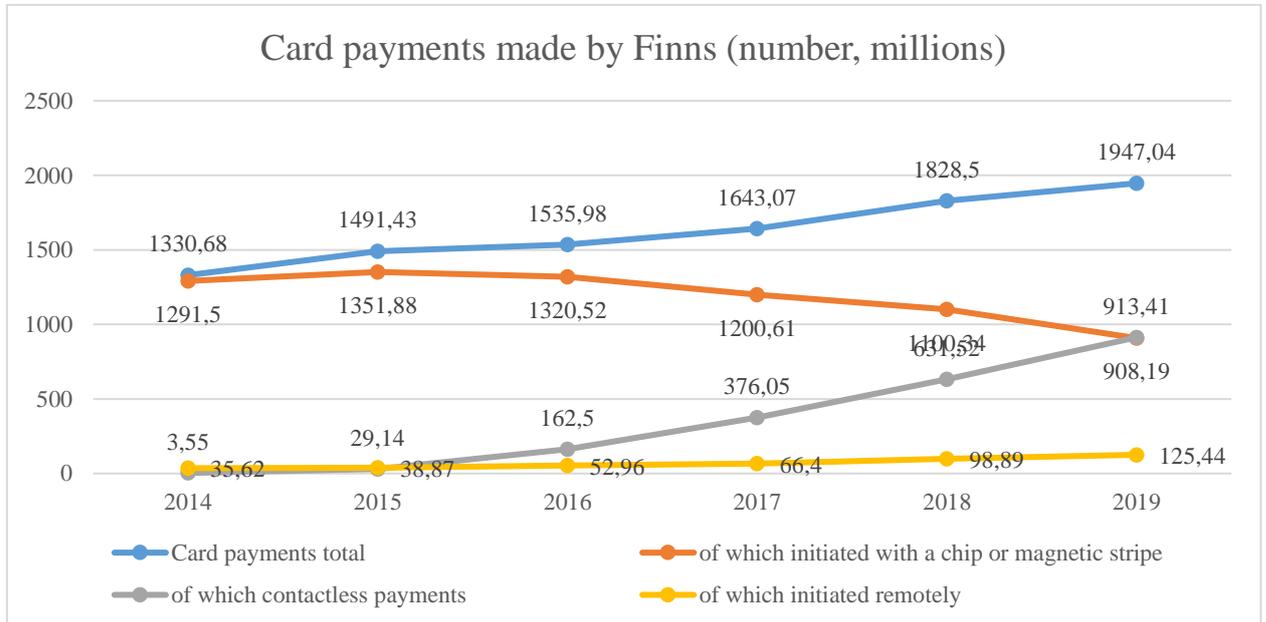


\*Since 2016 the survey has been conducted every other year

Source: Bank of Finland, Consumer survey, 2019

A Figure 13 illustrates well how cards with a contactless payment function has growth rapidly in six years. The number of card payments has grown from 1330 million to 1947 million which corresponds 46,39% growth. Cards with a pin code identification or a signature identification (magnetic stripe) has decreased in roughly the same proportion as the cards of the contactless payment feature have increased. From the Figure 14 we can observe how the 25 EUR limitation on contactless payment transactions affects the euro-denominated values of card payments, as the values of pin code identification cards and contactless payment cards do not flow in the same proportion as in the Figure 23 even though they are moving to same way. The popularity of contactless payments exceeded the pin code-based payment cards on the prevalence of payments among the consumers.

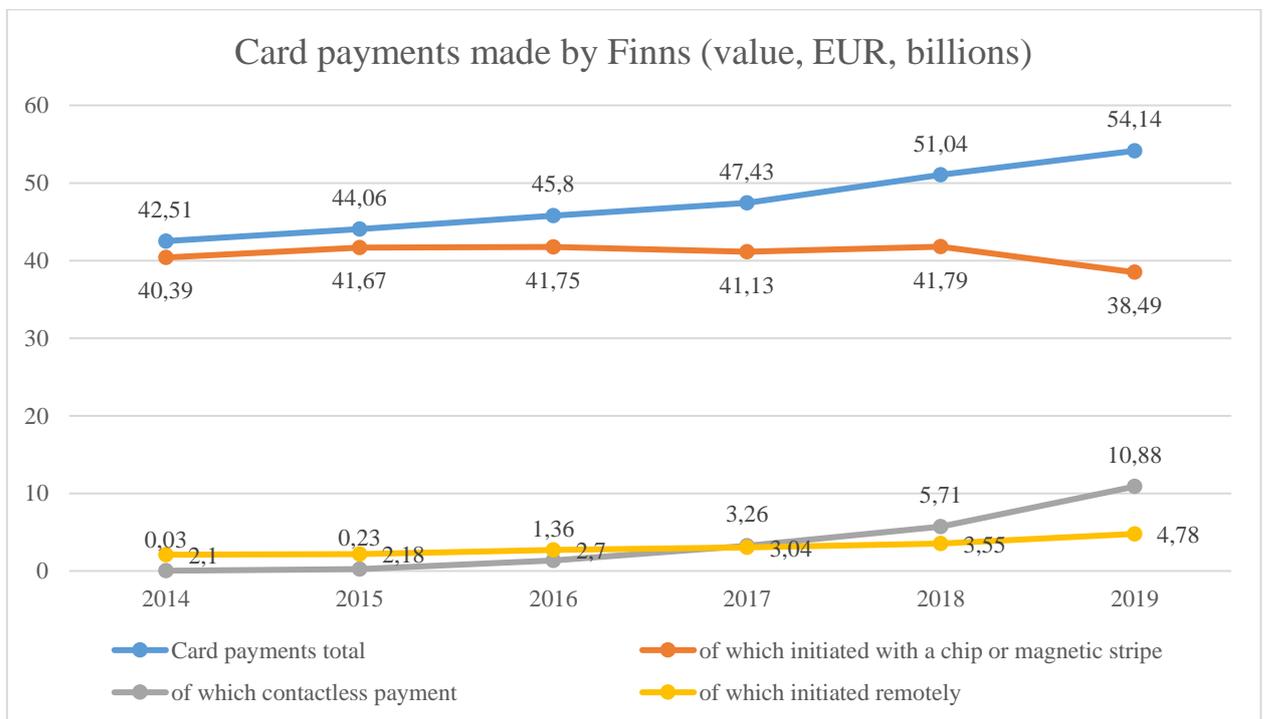
Figure 13. Card payments made by Finns (number, millions)



Source: Bank of Finland, Payment statistics, 2019

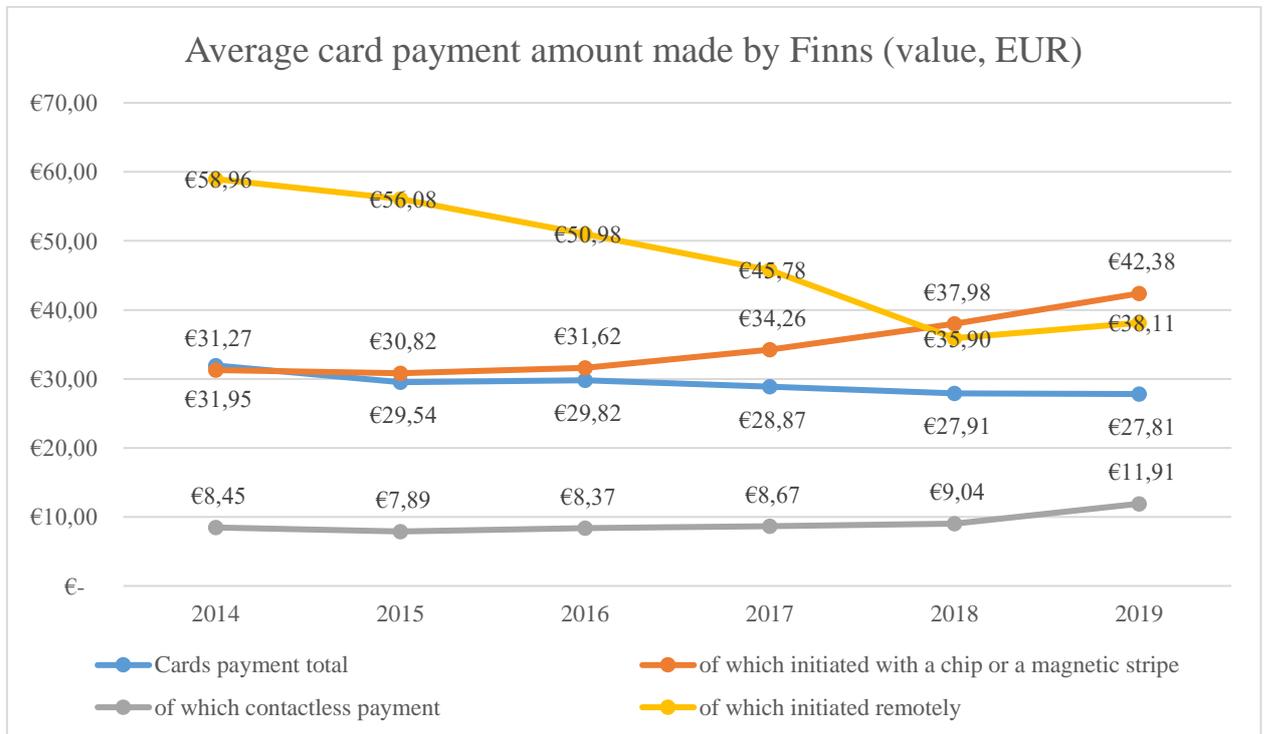
Bank of Finland’s card statistics also includes remotely initiated card payments which means the payments made in computer or mobile device. It excludes the “online bank” buttons which lead you to the online banking and has increased in popularity among the online stores in recent years. Card payments made in online has grown from 35,62 million to 125,44 million which corresponds 125,44% increase. Value of the online card payments has grown from 2,1 billion EUR to 4,78 billion EUR which is 127,61% growth.

Figure 14. Card payments made by Finns (value, EUR, billions)



Source: Bank of Finland, Payment statistics, 2019

Figure 15. Average card payment amount made by Finns (value, EUR)



Source: Calculations based on Bank of Finland payment statistics (2019)

In Figure 14 and Figure 15, we can see more detailed view of the card payments in Finland. In Figure 14 the average card payment for contactless payments are 11,91€ in 2019, but it can be expected to grow due the contactless payment limit will be raised from 25€ to 50€ in 2020 (Bank of Finland).

## CONCLUSION

It is common knowledge that the use of cash as a payment method has decreased in Finland, which can also be stated based on this study. Most of the cash money reaches consumers through ATMs, so the examination of cash payments looked in particular at changes in the use of ATMs. This study found that Finns are less and less withdrawing cash, but those users who withdraw, are withdrawing larger amounts at once. The study also looked at the number of ATMs and people's opinions regarding the use of cash. It was stated that the network of ATMs in Finland is extensive and growing, and that consumers are satisfied with the number of ATMs. Consumers also stated reasons for their cash use and responses raised concerns that card payment is not accepted everywhere and how easy cash is to make small purchases. In the euro area, on the other hand, there were no changes in cash payments as strong or consistent as in Finland. On the other hand, people's perceptions of declining access to cash have made people stronger to defend the importance of keeping cash as a payment option.

The study found that progressive trends can be found in the development of payments during the period under review. The study shows that the same trends are happening all over Europe, however, Estonia and especially Finland are pioneers in the introduction of electronic payment instruments. Southern Europe and Central Europe are still tightly tied to cash, and some of the behaviour can be explained by cultural differences and traditions.

The strong change in cash payments in Finland described above has already given indications of an increase in these of other payment methods. The research shows that number of Finnish card payments increased steadily, and a similar development was also observed in the euro area, where the volume of card payments grew even faster than in Finland. It is possible to explain with earlier adaption of payment cards in Finland. The research also shows a trend that the average card transaction has been decreasing in Europe and Finland, but in Estonia the development has been stable.

The above-mentioned change in cash payments in Finland already gave indications of an increase in the use of other payment methods. It was found that the number of debit and credit cards grew steadily, but above all the contactless payment feature grew exponentially. The number and value of the card payments increased throughout the period, but average payment transaction decreased

which can be explained by the increase of the contactless payments which has the transaction limitation of 25 EUR. It can also be said that the most common payment method in Finland has been debit card. Contactless payment function has brought the effortless to a new level which could explain the phenomenon. Alongside with the debit cards the number of credit cards has been increasing. There are probably many reasons for this phenomenon, but it may be that the credit cards provide safety benefits and reward benefits for its users.

As a summary it could be said that the change in payment methods has been fast in Finland and Europe. In Finland, the electronic payment instruments such as cards has taken the place as a daily payment method, while the cash usage has decreased. In euro area in the other hand, cash payments have remained strong, but at the same time the number of card payments has increased alongside with the cash. It is a common knowledge that the development of payments methods and habits differs widely in the euro area, but it remains to be seen whether the development of the euro area follows the guidelines similar to those in Finland or whether the course of development is something completely different.

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