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**FROM BARTER TO CASHLESS SOCIETIES: HOW THE WORLDWIDE
ECONOMY BENEFITS FROM THE IMPLEMENTATION OF E-PAYMENTS.**

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Introduction

This thesis outlines how the worldwide (Emerging and Developed) economies have benefitted, at different economic levels, from the insertion of technology into the means of payment. The payment methods have evolved throughout the centuries. Beginning with the barter and reaching the maximum level of expression of technological payments with the introduction of the Bitcoin. Throughout this evolution, there have been several milestones. These turning points include the introduction of banknotes in 1660, the possibility to create a bank account, the invention of credit and debit cards, and following the advent of mobile devices the opportunity to pay by using mobile applications. This dissertation mainly focuses on the Credit Card usage and its peculiar pros and cons. American Express Company, a non-bank institution, firstly invented the Credit Card in 1958. The first bank that issued a credit card was Bank of America exclusively in California in 1959. In 1966 Bank of America enlarged the range credit card usage to all the other U.S. States. The Credit Card is a technological tool that allows the consumers to borrow money up to a specified ceiling with the obligation that the holder of the card will pay the borrowed amount at the end of the billing period. The possibility to pay through credit card has drastically changed the habits of both consumers and merchants. That is, the higher accessibility to e-payments fosters the consumers to increase their consumption levels leading to a virtuous economic cycle. All the steps comprehended in this cycle allow a more robust growth of the overall economy.

Throughout the dissertation, a closer look has been given to the implementation of credit cards as the primary means of payment to fight the shadow economy. It has been shown that there exists a strong correlation between credit card usage in a country and its gray economy. Indeed, countries with a high rate of credit card utilization are linked to a paltry level of the shadow economy. In contrast, in states where credit card usage is at a minimum, the underground economy has an important role.

The decline of the shadow economy's level through the implementation of conspicuous electronic means of payment would increase the GDP level of a nation, and it is closely linked to the concept of cashless economies. Indeed, in Italy, a 10% increase in electronic means of payment transactions for at least four consecutive years can reduce the shadow economy by 5%, ensuring to the Government the recovery of 70 billion euros. By increasing the revenues, the Government can raise the public spending and the services that support the production expansion.

The thesis highlights the cashless situation in Sweden, and by comparison, it examines which steps, considering the cultural and historical differences, should the Italian Government take to turn cashless. The analysis of the Italian transition has been observed through the annual report of the European House Ambrosetti.

The theoretical part has been linked to a more concrete one in the third chapter of the thesis through the use of a survey. The study aims at analyzing how a heterogeneous group of people tend to use electronic means of payment in their daily life. The results of this survey have been compared to the study conducted by the Community Cashless Society.

Chapter 1

1.1 Payment systems: Historical evolution

Throughout the ages, people have been continually involved in commerce for the exchange of goods and services. These transactions have always been regulated by some forms of payment that have evolved during the centuries. These financial exchanges did not always involve the use of monetary payments. There was a period in which standard money did not even exist, and people used other means of payment to regulate the transactions. Payments entail the transfer of value from one party to another. When the two parties exchange goods or services directly, such transfers are achieved by barter. However, there are substantial frictions such as transferability and divisibility involved with the use of this medium of exchange. The Mengerian theory on the origins of money discusses this issue, arguing that the value of money is derived from how it relieves the frictions contained in the 'double coincidence of wants' that hinders barter trade¹. The theory developed by Menger recalls the idea expressed previously by Jevons that the existence of business in a barter economy is contingent upon a consumer needs to find someone who not only has the desired good or service but also agrees on the consumer's good or service in return. This means of exchange was efficient in a close economy in which everybody knows and trusts each other. In reality, it infrequently occurs that the two agents want each other's good or know and trust each other.

The introduction of commodity money has solved the lack of transferability of bartering. It consists of items that may be in common everyday use endowed with intrinsic value and used primarily as a medium of exchange - means of payment, store of value, and symbol of power - in the context of rural subsistence economies. In the first exchange, commodity money often consisted of highly ranked treasure items such as salt, gold, and shells. The commodities used for trade had specific characteristics such as they were widely desired and, thus, valuable, but they were also durable, carriable, and easy to store. Among the items treated as commodity money, the pieces of metal were found the most convenient because they presented all the required characteristics; therefore, they could be easily weighted. Initially, metals were used as money in the form of bars, bricks, and rings and valued by their bulk and weight. Afterward, metal bars were stamped to save the issue of measuring and weighing them. This process led to another milestone, which is the coinage. The first

¹ Javons (1875), Menger (1892)

form of coins was minted around 700 b.C in the Middle East and was made of the electron a combination of gold and silver. Ever since, coinage became a prerogative of governments and sovereigns immediately. The procedure of minting coins by the government had the aim to prevent falsification and counterfeiting. Different sorts of metal coins were used for various purposes. Gold coins were used for large and international transactions. They were valued according to their metallic constituents and were rarely debased. Silver, copper, and bronze coins were used for smaller and domestic payments and circulated at face value. Throughout the decades currencies have lost connection with the metal of which they are made. Thus, they flow at upper face value. This loss of connection enables the transition from commodity money to fiat currency, which is a representative money. Its value is set by supply and demand and people's faith in its worth. Fiat money is usually made of paper except in the case of small denominations. The first form of modern banknotes was an idea of a Swedish banker, Johan Palmstruch, who, in 1660, fearing a bank without assets asked for the permission to issue kreditivsedlar. A Royal Decree allowed the bank to issue notes. They were legal tender, and they were granted only to people who held cash deposits in the bank. These notes had a serial number, signature, and security safeties.

The State issues fiat money, but it is not convertible into anything other than itself. Both coins and banknotes are fiat currency, they are tangible, but without any connection to a valuable objective standard.

A massive turnaround in the improvement of the payment system occurred with the advent of the banks, which are institutions used to collect deposits, grant loans, and exchange money. Banks have been around for a very long time since 2000 b.C. Still, bank deposits began circulating when the new banks appeared around the fourteenth and fifteenth centuries, especially in the Italian cities mostly influenced by the Renaissance (Florence, Venice, and Genoa). Bank deposits consist of money placed into a banking institution for safekeeping. They have no physical dimension and represent a liability owed by the bank to the depositor. At any time, the holder of the account can convert the money on the account owned into fiat currency. Holding money on the account has many pros. It is convenient, which means that the carrying cost is low and of course it is safe because the money does not get lost. As these advantages have become popular, the bank money has become the first monetary instrument in most countries. In some economies, the circulation of scriptural money accounts for 80% of the total legal tender in circulation. Throughout the years banks have developed a wide variety of payment systems to allow their consumers to exploit the advantages of holding a

deposit account. This variety includes credit cards, debit cards, applications allowing the payments via mobile phone, and the ultimate frontier is the use of virtual currencies.

1.2 Financial Innovation: The electronic payment systems

Financial innovation concerns any financial instruments different from traditional shares and straight bonds, any financial institutions besides conventional banks, and any financial markets other than conventional markets for the straight bonds and shares.

Innovation is a crucial element for the economic development of a country and the competitiveness of an industry. Indeed, it is one of the most important competitive weapons, and it can be considered as a firm score value capability.

Financial innovation is an ongoing process through which firms experiment a more efficient way to produce their goods and services and especially work to differentiate their products from the once of the competitors to respond to unexpected and gradual changes in the economy.

Financial innovations can be classified based on their nature into three different categories: product innovation, process innovation, and financial services innovation. The former one is related either to the introduction of new products, or to substantial qualitative changes to an already existing product to improve the efficiency of the financial system. The process innovation covers the introduction of a new process for making or delivering goods and services to increase the efficiency and to expand the market. The latter can affect the financial sector in its totality, it includes all the changes related to the business structures, to the establishment of new types of financial intermediaries and changes in the legal and supervisory framework.

Financial innovation can also be classified on a functional basis in either aggressive or defensive. The aggressive innovation concerns the introduction of a new product or process due to perceived demand. Defensive innovation is related to the introduction of a new product or process, responding to a changing environment or transaction cost.

In the last decades, the worldwide economy has moved at a swift pace towards a technologically based one forcing the banks to implement remarkable changes to the payment methods. The electronic payments developed by the banks include the credit card. A credit card is a small plastic card with a unique number attached to the user's banking account. It is a tool that allows the customer to borrow money up to a specified ceiling from a bank or other issuers, with the obligation

that the owner of the card will pay the money back at the end of the billing period. Under this form of payment, the payee's bank account is credited with the amount of sale before the payer's account is debited. A non-bank institution, American Express Company, issued the first credit card in 1958. The Company charges an annual fee to its cardholders and bills them monthly. The merchants who allow the use of this service pay a service charge to the credit card company that lies between 4 to 7 percent of the total billings. The first bank which established a statewide credit card plan was Bank of America in California in 1959. It was the first universal credit card with widespread merchant acceptance. Bank of America decided to expand the credit card usage to other U.S. states starting from 1966. As most of the citywide or regional-based banks that have started a credit card program, Bank of America, as the range of included services increased, they blended with major national bank plans. Also, in 1966, a group of fourteen banks established the Interlink, which is a new bankcard processing association capable of exchanging information on credit card transactions. In 1967, four Californian banks found the Western States Bankcard Association. They instituted the Master Charge program, which was renamed as MasterCard in 1979, to compete with the Bank of America card program, renamed as Visa in 1976. Visa and MasterCard are both institutions that issue credit cards through member banks and set and maintain the rules for processing². As the bankcard industry increased, all the banks interested in issuing cards became members either of the Visa Association or the MasterCard Association. The growing reach of credit networks allowed people not only to make purchases on a national bases but to expand their purchasing power worldwide³. In 1996 Visa and MasterCard announced that they were collaborating to create a protocol that would have enabled bank credit cards on the Internet. This process has involved the use of highly secure encryption digital signature techniques, as well as digital certificates. A standard known disadvantage associated with the usage of credit cards is the high transaction fees⁴.

Credit and Debit cards may seem similar. They both allow the users to carry less cash; they use the same networks Visa and Mastercard; they both have a unique number attached to the user's banking account. The only difference between them consists in the way they deduct the money from the costumer's banking account. When a customer uses a debit card to store a purchase, the money spent is immediately deducted from the user's account. The debit card also allows the owner to withdraw cash from ATMs. Some banks require the payment of a fee if the customer withdraws money from another bank's ATMs. The first debit card was launched on the market by the Bank of

² Creditcard.com, (2016)

³ Encyclopaedia Britannica, (2019)

⁴ Tae-Hwan, (1998)

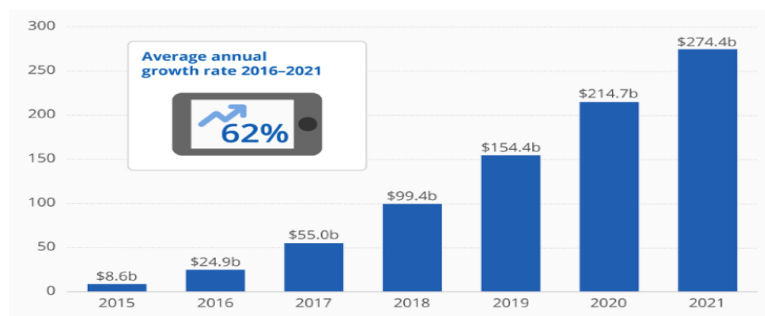
Delaware in 1966. In the 1970s, other banks decided to test this new payment system. The debit card usage increased during the 80s and 90s as more and more ATMs started appearing worldwide. In 1990, 300 million transactions were debit card-based. By 2009, 37.6 billion transactions were made by using either a debit or a prepaid card.

Technology has always played a significant role in the evolution of the banking sector. As a result, banks have to update their services to keep up with the technological revolution. These updates made by the banks aim to smooth the operations within the banking sector for their clients. A significant turnaround occurred when banks in the early 1980s started to develop an internet-based banking system. It enables the clients to conduct banking transactions from their personal computers rather than at branch locations. This new system started to become popular in the mid-1990s when the access to home internet became more popular. Since then, most of the banks began to offer this service to their clients. The popularity of the home banking has drastically changed the character of the banking system. This new way of doing banking enabled many people to execute their financial needs on their bank's online platform and rarely recur to a physical branch. As the home banking gained more and more appreciation, online-only banks have begun to rise. The absence of physical locations allows the online banks to offer advantageous interest rates and lower service charges to their customers. With the transition to online banking, all the client's information, such as balances, customer account information, and recent transaction which are stored on an electronic platform are vulnerable to theft. For this reason, online banks and banks with the service of home banking have created cybersecurity measures to prevent the danger of theft⁵.

As more people worldwide own a smartphone, which is considerably more comfortable to carry but has the same functions as a computer, banks had to develop applications for mobile phones, which allow the customer to exploit the financial needs as home banking but directly on the phone. Since many mobile phones are equipped with either touch or facial recognition, the bank's application uses it as a security measure to protect the sensitive information of the client. A meaningful example of the integration of the technology into the financial sector is the development of mobile payment. This form of payment became famous in Asia and Europe before spreading to the United States and Canada. The first type of mobile payments were text message-based. Later, the development of new technologies allowed for pictures of checks to be taken through the mobile phone camera and sent to the payment recipient. Nowadays, thanks to the development of Apple Pay and PayPal in 2014, mobile payment is a money transaction made for the purchase of goods or services through

⁵ Julia Kagan, (2019)

a portable electronic device. Mobile payment occurs by scanning a barcode on an application on the consumer's mobile phone. As soon as the transaction is complete, the money can be immediately deducted from a pre-loaded value on the card associated with the particular store, or paid by credit or debit card. Mobile payments are often used also to send money to friends and family members with the aid of additional applications such as Paypal. Mobile payment is considered a more secure form of payment compared to the credit card because of the technological features of the consumer's smartphone to access to the personal information of the owner; and because the mobile service generates individual codes for each transaction⁶. With 2.71 billion people owning a smartphone worldwide in 2019 and the forecasted increase to 7 billion owners of a mobile device by 2023 the purchases made via mobile payment in the United States according to Statista⁷ have been estimated to register an annual growth of 62%. The volume of mobile payment transactions in 2016 was around \$25 billion, and it is going to reach almost \$275 billion in 2021.



Source: Statista (2017), <https://www.statista.com/chart/7793/mobile-payment-transactionvolume/>

With the rising interest in electronic commerce, the evolution of technology has supported the development of online payment, which is a new form of electronic payment. A third-party payment interface between banks provides it for the fulfillment of real-time transactions. The third-party in the deal is an independent organization that works as a credit intermediary, which has the aim of supervising the correct completion of the payment between the online business and the bank. Online payment systems allow the customers to carry out payments faster, and they also prevent the risk of money transfer between the other two parties. The most common online payment system is PayPal, with over 137 million accounts and eight million transactions every day. It is an electronic commerce platform that eases transactions between the parties through online funds

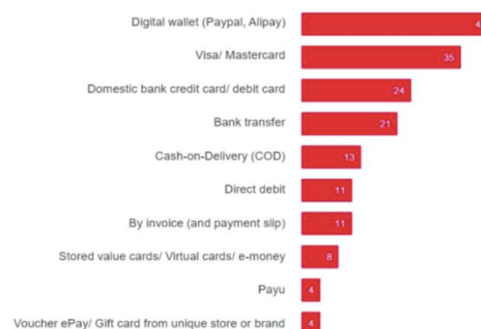
⁶ Mitchell Grant, (2019)

⁷ Statista, (2017)

transfers. PayPal allows any business or individual with an email address to establish an account on its website, which is connected to the user's credit cards or checking account. When the identification and the proof of funds have been confirmed, the user can start to transfer money to and receive payments from other PayPal users. PayPal aims at guarantying safer online purchases by providing a form of payment that does not require the payer or the payee to disclose credit card or bank account private information.

In 2015, Satispay, a new online payment system, was launched on the market. To create an account, the client needs to insert into the system the ID, the IBAN, the fiscal code, and the phone number. Therefore, it is very secure because it does not show any sensitive data while shopping. Once the account is settled, users have to establish a budget that represents the disposable money on the profile. The maximum ceiling imposed by the Company is 200 euros per week. To pay with Satispay in a shop is easy and convenient. The user needs to open the application, select the shop of the purchase, type the amount of the purchase, and confirm it. The transfer of money is immediate on the Satispay account; the merchant only needs to accept the request so that the payment ended to be successful. For online transactions, the customer needs to select the product, insert the phone number, and send the payment. Once the payment is sent, the user needs to wait for the confirmation of the successful transaction⁸.

As the graph shows, European customers, when they shop online, they prefer a means of payment that guarantees them more rights and thus they prefer to pay through a third-party platform. Visa and MasterCard follow this form of payment⁹.



Source: Ecommerce News (2017), <https://ecommercenews.eu/online-payment-methods-europe/>

The latest frontier of the payment system concerns the use of virtual currency, which is a specific type of electronic money used, especially for online transactions. The type of currency is divided into three groups depending on the purpose of its use:

⁸ Satispay.com

⁹ Ecommerce News, (2017)

1) The first group concerns virtual currency used, entirely for virtual goods and services, which cannot be transformed in any real economy money. An example of this kind of currency is the money used in the online games such as the Fruit Ninja money;

2) The second group embraces all the unidirectional virtual currencies from real economy money can be transformed into virtual money but not vice versa. This kind of money can be used to store both virtual and real purchases of goods and services. Example of this type of currency is when people purchase services on a game such as the Nintendo points;

3) The third group comprehends all the bidirectional virtual currencies. These allow the continuous transformation from real economy money to virtual money and vice versa. This type of currency can be used for virtual and authentic goods and services. The most famous example is the Bitcoin.

Bitcoin is probably the most successful virtual currency. It was invented by the Japanese programmer Satoshi Nakamoto in 2009. The scheme is based on a decentralized, peer to peer network and operates at a global level. It can be used as currency to store any kind of transaction, and for this reason, it competes with official legal tenders. The perk of the use of Bitcoins is that they are divisible to eight decimal places, which enables the user to utilize them in any kind of transaction regardless of its value. Bitcoins are not backed in any real-world currency. Indeed, their exchange rate is determined by supply and demand in the market. There exist several platforms where clients can buy and sell Bitcoins that operate in real-time. The most famous one is the "3 Mt.Gox" that is used for trading Us dollars for Bitcoins and vice versa. To start using Bitcoins, users need to download the free and open-source software. The Bitcoins purchased are stored in a digital wallet on the costumer's computer.

The usage of the Bitcoin virtual currency has several advantages. The transactions made using this type of virtual money are anonymous as the accounts are not registered, and the Bitcoins are directly sent from one computer to another. The transactions are carried out faster and more cheaply with respect to any other traditional means of payment. This occurs because the transaction fees are meager, and there are no bank account fees ¹⁰.

¹⁰ European Central Bank, (2012)

1.3 Electronic Payments: Less Frictions, More Efficiency

The presence of electronic means of payment in the economy is beneficial for all the parties involved in the transactions. The transition from cash and checks to electronics payments has changed the behavior of consumers and merchants. The availability of sophisticated electronic payment systems leads to a virtuous economic cycle. The increased accessibility to electronic payments encourage the clients to raise their consumption levels. The first step of the economic cycle leads the products stored in the inventory of the firms to decline. Thus, the companies face the need to increase their production levels. To match this higher demand for goods and services, they need more labor force. The rise in the use of e-payment added almost 2.6 million jobs in the time between 2011 and 2015. The creation of more jobs' opportunities leads to an increase in the income level of the population. This last step is an incentive to start the cycle again. All the steps in the cycle bring to the economy a more robust growth.



Source: Moody's Analytics (2016)

Between 2011 and 2015, according to Moody's Analytics¹¹, a higher credit card usage brought an additional \$296 billion to consumption, which represents a 0.1% cumulative increase in global GDP. Real use increased on an average of 2.3% throughout the sample period, of which 0.1% is attributable to a more substantial card penetration. These data suggest that the use of cards accounted for about 0.4% of the increase in consumption and an average raise of 2.6 million jobs between 2011 and 2015.

The evolution of the electronic payments has considerably helped the customers' capability to optimize consumption decisions by giving them secure and instantaneous access to all their funds on deposit through the use of debit cards or a line of credit via the credit cards. On the merchants' side, there are also benefits in the use of electronic means of payment. Indeed, they need to deal

¹¹ Moody's Analytics, (2016)

on one side with less cash and checks in the system, which are unsecured forms of payments, and on the other, they have access to a vast pool of clients with guaranteed payments.

The usage of electronic means of payment is a secure means of payment for both parties in the transaction. On the side of the consumers, the use of electronic payments gives them the right to recourse in case of fraudulent transactions. On the side of the sellers' payments via electronic means of payment guarantee them that the purchases are secured. This feeling of security of the merchants can also be extended to the consumers, who feel more comfortable with making purchases when they can pay with an electronic means of payment. This trust in the payment system reduces the frictions in the economy and boosts the consumption levels, and thus it leads to a significant GDP growth.

The improvement of electronic means of payments and their advent in the daily life of consumers have led to a reduction of the cost of providing banknotes and coins by central banks. This cutting cost improved the overall efficiency in commerce and bolstered a worldwide economic growth.

A significant pillar of the use of electronic transactions is the reduction of a large portion of the grey economy. Many retailers around the world prefer not to report some transactions or, in some cases, all the operations cash-based payments. In this case, those unreported transactions are exempted from tax payments. By using electronic means of payments, all the transactions are traceable, and thus the unreported transactions can be reduced. This operation raises the tax revenues of the State¹².

1.4 Electronic Payments: Emerging vs. Developed Economies

The nations around the globe are typically divided based on their economic activity into two categories: Emerging markets and developed economies. The formers are nations which are in the process of moving from their traditional economies, which were agricultural-based and characterized by the export of raw materials. These nations are distinguished by a fast industrialization and the adoption of a free or mixed market economy. One of the features to recognize an emerging market is the per capita income, which is generally lower than the average per capita income worldwide. This feature is essential because it provides incentives for faster growth. For instance, in 2018, the economic growth of most developed countries was less than 3% while in emerging markets such as India, China, and Vietnam reached a pick of almost 7%. Nations

¹² Moody's Analytics, (2016)

that are described as emerging markets are characterized by rapid social changes that depend on three factors: natural disasters, external price shocks, and domestic policy instability. These factors lead to higher volatility. Emerging economies are usually agricultural-based economies, and thus they are especially vulnerable to disasters. In some cases, such as in Thailand, these disasters can be considered a further step towards an additional commercial development. Emerging markets are also more inclined to volatility currency swings, especially those involving the U.S. dollar, and to commodities swings (oil and food). These swings occur due to the insufficient power that these countries have to influence these movements. Emerging nations present less mature capital markets compared to the ones in developed countries. They usually do not have an efficient track record of foreign direct investment. It is often challenging to find information about companies listed on their stock markets. All these features raise the risk. On the other side, they create a greater reward for all the investors capable of doing the ground-level researches. These features make emerging markets attractive to investors¹³.

In emerging nations, as it has occurred in developed countries, they had to face the development of the technology into the financial system. Both emerging and developed economies have experienced an increase in consumption due to the rise of electronic payments. These two factors are highly correlated. In developed economies, consumers are more likely to use electronic means of payment because of the more robust infrastructure that they have. Still, since in these economies the electronic payment system is matured, the increase in its usage is slower than in emerging economies, which in recent years presented a sharp rise in e-payments. According to Moody's Analytics¹⁴, the higher use of electronic means of payment added 0.2% to consumption in emerging countries compared to the 0.14% increase in developed economies in the period between 2011 and 2015. These data corresponded to a rise of 0.11% in GDP in emerging markets, while in developed countries, the corresponding raise was around 0.08%. The usage of e-payment can have a more significant impact on GDP in emerging economies due to a further increase in their card penetration rates. This increase could be accomplished by creating the retail payments infrastructure in emerging countries similar to the one of the developed economies and incentivizing merchants to accept electronic payments.

The results of the use of the e-payment were not uniform across all the regions in the world.

¹³ Kimberly Amedeo, (2019)

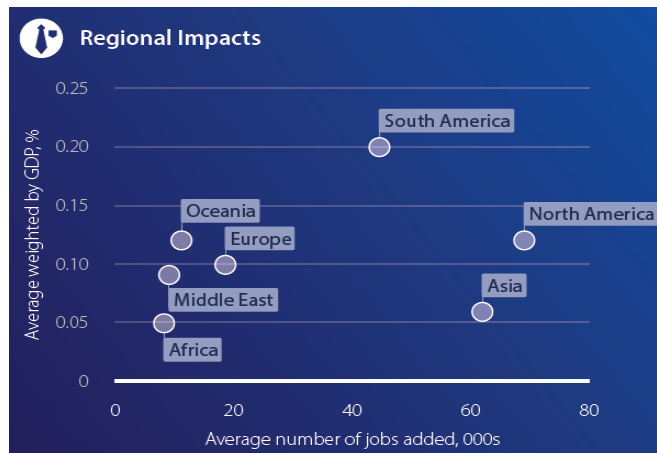
¹⁴ Moody's Analytics, (2016)

For instance, South America outperformed all the other regions with an average GDP increase of 0.2% due to the rise of electronic means of payment. This outstanding performance was supported mainly by two countries: Chile and Venezuela. The former faced a weighted average increase of 0.23% in GDP resulting from the improvement of the Chilean banking services that resulted in the higher e-payment usage. The latter experienced a 0.3% weighted average growth in GDP due to the increased electronic-based payments.

African countries experienced, on average, an increase in GDP of 0.05% thanks to the higher e-payment penetration. Most of the African countries are at an early stage in the development of their financial systems with the establishment of appropriate infrastructures capable of supporting electronic-based payments. Soon, the usage of new technologies to make transactions is expected to increase. However, South Africa, the most developed country in the African continent, experienced a 0.18% average increase in GDP from additional e-payment usage.

As stated in the previous paragraph, the higher use of electronic means of payment contributes to the increase in the number of available jobs across the globe. Between 2011 and 2015, the two countries which experienced the most substantial average job increase were Mainland, China, with 427,000 jobs added, and India, with 337,000 jobs added. Both of these countries faced this significant gain in employment due to the combination of fast-growing labor productivity and the increase in e-payment usage. These two countries outperform the average increase in jobs in emerging markets, which accounted for 43,600 per year, substantially more significant than in developed economies (14,800).

As it occurred previously for the GDP gains, the jobs increases also were not uniform for all the regions around the world. The graph shows that the area that was subjected to the highest average jobs increase per year was North America, with a contribution of 69,000 new jobs. Asia closely followed North America with an increase of 62,000 new jobs opportunities. As seen in the analysis for GDP gains, African had the lowest increase in additional jobs due to the higher usage of e-payments (8,000). This data is not surprising because of the scarce resources owned to develop financial infrastructures to allow the full acceptance of electronic payments.



Source: Moody's Analytics (2016)

As a result of all the countries regardless of the size of their economy, e-payment penetration and growth rate are subjected to a higher consumption level and thus GDP due to the increase of electronic payment instruments¹⁵.

¹⁵ Moody's Analytics, (2016)

Chapter 2

2.1 Credit Card

In past decades, the majority of consumers preferred to purchase goods and services using either cash or checks. The former was used prevalently for smaller transactions and the latter for more costly purchases. Cash has remained, for years, the most relevant form of payment in many areas around the world. As the usage of credit cards has started to dominate the financial sector, cash-based transactions became less frequent.

The increased awareness of the benefits of the usage of credit cards and the advent of electronic commerce have contributed to the rise of the popularity of credit cards and, consequently, to the growth of credit card accounts worldwide. As the graph demonstrates, after the significant contraction in the number of credit cards due to the Great Depression, which reached the lowest value in 2010 with 992 million credit cards in the United States. The number of credit cards has started to increase again; in 2017, the number of credit cards in the U.S. accounted for 1.06 billion; instead, 2.8 billion was the number of credit cards worldwide. This number does not correspond to the number of actual cardholders because a part of them could hold more than one credit card. For instance, the number of credit card owners in 2017 was 180 million in the U.S. This data demonstrates that the growth of holders from 2012 accounted for 11%. The projection reveals an increase in the credit card owners for 2022 is around 6%, which corresponds to 191 million holders. The number of credit cards in the U.S. will reach 1.2 billion¹⁶.



Source: Bianca Peter (2020), <https://wallethub.com/edu/cc/number-of-credit-cards/25532/>

The four most significant credit card companies both in the U.S. and worldwide are Visa, Mastercard, Discover, and American Express. Visa, with 335 million credit cards, overcomes the

¹⁶ Bianca Peter, (2020)

others for the number of credit cards in circulation; this corresponds to a 52.8% market share. MasterCard with 200 million credit cards and a market share of 31.6% closely follows it. As these two companies own the majority of credit cards in circulation in the United States, they do worldwide. America Express has the lowest credit card number, with 47.5 million and a market share of 7.5% ¹⁷.

Credit cards have become essential in the life of consumers because they serve daily activities such as online and offline payments, which guarantee the consumers dual functions as a payment option and a source of credit. On the base of the use, credit cards are divided into two categories: convenience users and revolvers. The first category comprehends all the users that employ credit cards as a smoother form of payment and that payout their full balance at the end of the grace period. It represents the time during which the owner of the credit card is allowed to pay the credit card bill without incurring interest rate fees. The second one includes the consumers who typically use the cards as a mode of financing for payments, which amount is equal to the monthly installment of the holder.

The size and the carriable features of credit cards enable the consumers to make purchases on credit, avoiding to carry a considerable amount of cash. That can be accomplished because credit cards allow users to store any purchase regardless of the amount. The technologies on which credit cards rely permit the users to record the transactions accurately and collect them into a single statement. Through the bank's mobile application, the user can check the spending periodically because they are recorded immediately after the purchase is completed. At the end of the billing period, the consumer receives a statement that comprehends the summary of all the transactions plus the total amount spent throughout the period. In recent years, people frequently travel abroad or order products online on foreign websites and thus often deal with different currencies. The use of credit cards removes the issue of exchanging currencies because they allow the users to store purchases regardless of the currency.

2.1.1. Credit Card: Pros and Cons

Credit cards are financial tools that, if used responsibly, lead the users to gain significant advantages. Simultaneously if users do not follow the correct path, they face the disadvantages of

¹⁷ Shiftprocessing.com

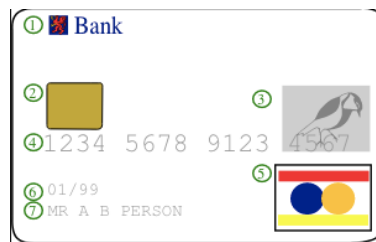
holding a credit card. Generally, the advantages outweigh the disadvantages because adverse outcomes are easily avoidable; thus, consumers are encouraged to hold at least one credit card.

Credit cards are a convenient means to build credit. Credit card issuer companies monthly report to major credit bureaus the users' account information such as the opening of a new credit card account, if either the client has missed a payment or if the holder frequently pays late the installments. This process constructs the users' credit history, which represents the track record of borrowing and payback of the money. The credit history determines the consumer's credit score. It consequently is the data that determines if the user is the right candidate for loans or open other credit card account at the same time it is used to evaluate what parameters such as interest rates and credit limit to assign to the consumer.

Credit cards are frequently used in instore purchases and primarily online because they are more secure than cash. If a consumer loses the credit card or someone steals the private information of the

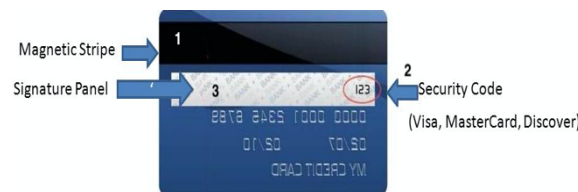
client account, the issuer company can block the card to avoid fraudulent transactions. Generally, credit card companies monitor the users' habits, and when suspicious activities are recorded, the company notifies the user. Throughout the years, improvements to credit card features have been made to avoid fraud. The modern smart credit cards present on the front side (1) Credit card issuer, this represents the bank to which the user applied to receive the card. Some credit card present the credit card name this is the name of the specific credit card, usually begins with the name of the issuer bank. (2) The chip EMV technology represents an additional way to store the holder's information, which is added to the magnetic strip on the back. It is a more modern and secure manner to store information which provides better protection against fraud. Credit cards with the EMV technology can be of two types: chip-and-signature cards that need the signature of the owner to proceed with the payment and chip-and-PIN cards that use the PIN to validate the transactions. (3) The hologram security feature prevents the card from being physically copied. (4) The credit card number is the identifying number associate with the card. It is stored in the magnetic strip so that when the consumer swipes the card at a terminal or reader, the number provides information about the credit card network and issuer. This number begins the Bank Identification Number, which consists of a sequence of digits, which determines the bank to which the card belongs. (5) The credit card network represents the circuit to which the card belongs and the level of services associated with the card. (6)The expiration date, the date in which the card will expire. This date does not mean that the credit card account is closed; this generally means that it is time to receive a new card,

which will be automatically mailed from the credit card issuer company to the user. (7) The cardholder name is usually printed or embossed and is the name of the owner of the card.



Source: Wikipedia, https://en.wikipedia.org/wiki/Credit_card

Instead, on the back, credit cards usually have (1) the magnetic stripe is the site in which all the personal information of the customer is stored; this information is used to process the transactions. (2) The CVV security code generally is a three-digit code except for American Express cards for which this code is on the front and is a four-digit code. It represents a fraud-prevention tool used when proceeding transactions online. (3) The signature box, another fraud protection tool. The cardholder must sign the card to turn it valid ¹⁸.



Source: Catherine Wade (2016), <https://slideplayer.com/slide/8847741/>

Many credit card companies offer rewards such as cash back or airline miles if the clients utilize the card regularly. If consumers use the card for daily purchases, the rewards add up quickly. These kinds of cards are called reward cards and usually impose annual fees but generally the benefits that a user can earn outperform the costs.

As was stated previously, the uncaredful use of credit cards can damage the consumer. For instance, credit cards often have higher costs of borrowing compared to traditional loans. Many credit cards impose high APRs, service fees, and penalties for late payments. Thus, if the consumer does not pay the entire balance at the end of the month, these additional financial charges quickly increase the client's existing debt. Depending on the credit limit, the consumers may have access to more substantial funds, and this makes it easy to overspend if the financial tool is not used carefully. Indeed, consumers must spend what they can pay back at the end of the month to prevent the

¹⁸ Brendan Harkness, (2020)

damaging of the credit. One of the most frequent issues that consumers face with credit cards is owning too many of them because it can hurt the client's credit score. Every time that a consumer applies for a new credit card account, the issuer company usually checks the user's credit report to access the creditworthiness. The lender might be suspicious if the consumer already has multiple credit cards and deny the client request.

Credit cards are great financial tools, but it is crucial to evaluate all the advantages and disadvantages before incorporating them into a personal financial plan¹⁹.

2.1.2. Credit Card processing

Credit card transactions are processed via a wide variety of platforms, which include brick-and-mortar stores, e-commerce stores, wireless terminals, and phone or mobile devices. Usually, the entire transaction cycle lasts for two or three seconds and involves many parties. Namely, the cardholder, the merchant (business), the acquiring bank (the business's bank), the issuing bank (the merchant's bank), and the card association (Visa and MasterCard).

The first step of the cycle concerns the authorization of the payment from the issuing bank to the merchant. The cardholder presents to the merchants the credit card at the moment of the purchase. The merchant swipes the card on the point of sale (POS) terminal. At this point, the cardholder's credit card information is sent to the acquiring bank (or its acquiring processor) through a phone line or an internet connection. After having received all the consumer's credit card details, the acquiring bank or processor forwards the information to the credit card network. The credit card network clears the payment and demands for payment authorization from the issuing bank, which incorporates credit card number, expiration date, billing address, card security code, and payment amount.

The second stage of the cycle is the authentication step, during which the issuing bank verifies the authenticity of the cardholder's credit card through fraud protection tools such as the address verification service (AVS) and the card security codes. After the issuing bank has received the request from the credit card network, it authenticates the credit card number, checks the funds available on the account, matches the billing address with the one on the file, and confirms the card security code. The issuing bank can approve or deny the payment and consequently sends the

¹⁹ Catherine Schnaubelt, (2019)

appropriate response back to the merchant utilizing the same channels credit card network and acquiring bank or processor as the merchant receives the authorization the issuing bank place a hold on the cardholder's account equal to the amount spent. The merchant provides the customer with a receipt to complete the purchase.

The cycle ends with the cleaning stage; the transaction is now recorded on both the cardholder's credit card monthly billing statement and on the merchant's statement. This process co-occurs with the settlement stage. At the end of the business day, the merchant sends all the approved authorizations to the acquiring bank or processor. The latter one routes all the received information to the credit card network for settlement. In turn, the credit card network forwards each approved payment to the right issuing bank. Within 24 to 48 hours from the transaction, the issuing bank transfers the amount less an interchange fee, which is a fee that the acquiring bank and processor pay to the issuing bank. It is market-based and set by each credit card network except for America Express. Visa and MasterCard adjust the rates twice a year. Most interchange fees are divided into two parts: a percentage to the issuing company and a fixed transaction fee to the credit card network. Interchange fees vary and are differentiated based on the interchange qualification, which establishes the rates based on different criteria. Namely, the physical presence or absence of the credit card during the payment, the processing method, the credit card company, the card type, and the merchant's business type. After receiving the money, the credit card network pays the acquiring bank and processor their respective percentage of the remaining amount. The acquiring bank credits on the merchant's account the amount purchased by the consumer less a merchant discount rate, which represents the fee that a merchant must pay to accept credit card payments and to receive services from acquiring processors. It is generally between 2% and 3% - except for online businesses that face a higher percentage fee - of the total purchase. The cycles ends when the issuing bank reports the transaction details on the cardholder's account.



Source: Fidelity Payment, https://www2.fidelitypayment.com/resources/what_are_merchant_services

It can occur that during the authentication process, the issuing bank denies the transaction. When this occurs, the point of sale terminal returns a response code that explains the reason. Sometimes, these codes do not explain the situation well. Thus, to have a full understanding of the reasons for the declined payment, the cardholder must call the customer service of the issuing bank to solve the issues.

2.2. Credit Card reduce Shadow Economy

The shadow economy is a sophisticated phenomenon that can have several causes and consequences. According to the European Commission, the gray economy refers to (1) illegal activities in which the parties are willing partners to comply with the economic transactions, (2) concealed and underground activities where the transactions themselves are not against the law but are unreported to avoid the tax payment and (3) informal transactions for which generally no records are kept. A common factor in all the categories of the shadow economy is that all the transactions are cash-based or recently Bitcoins based, which are difficult to trace. It enables the sellers to avoid the report of them if instead the transactions are carried through electronic payment, it would be difficult for the seller to do not report them.

Many are the sources that cause the presence of the shadow economy, depending on the historical periods and the geographic regions, and these have severe economic and social implications. The gray economy is closely linked with the willingness of individuals and companies to evade taxation; thus, an enlargement of its size denotes that the tax system uncovers a meaningful part of the worldwide economy, which leads to a dramatic decrease in government revenues. This decline in revenues negatively affects the provision of public goods (public infrastructure). Moreover, it can force the government to raise the tax rates to cover the expenses, and this would mostly impact the firms operating legally. Therefore, many firms are obliged to move to the shadow economy to survive. The implementation of the shadow economy leads to a distortion of the competition because firms operating in it avoid taxation and thus reduce their expenses. This process increases the competitiveness compared to companies that operate solely in the official market.

There are some controversial related to the shadow economy, such as the labor market. In periods of economic downturns during which the unemployment rate increases is frequent that people exclusively find jobs in the shadow economy; this can be considered not completely bad for the economy because workers employed in firms operating in the gray economy spend the majority of

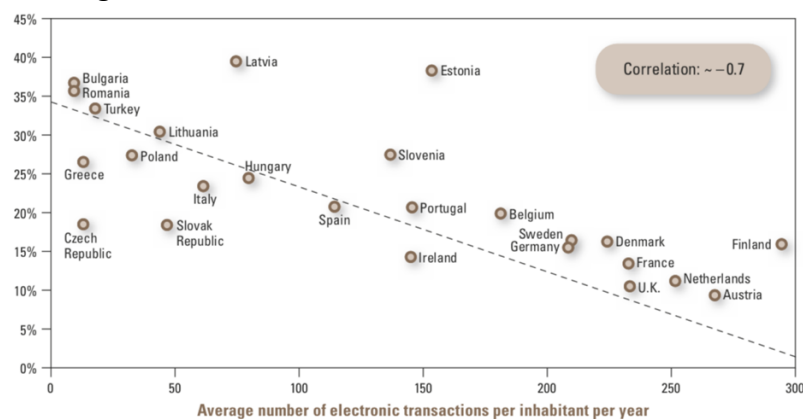
their income on goods and services provided by legal companies. This advantage for the economy on a large scale brings a consequent downturn. The decreasing cost labor due to the use of unreported employment provides some firms with an unfair competitive advantage over other companies that report all the employed workers and pay all the required taxes and social contributions. Thus, the overall result of the shadow economy is a reduction of the worldwide economic growth.

Governments are concerned about estimating the size of the shadow economy, the most accurate method to estimate it is the Currency Demand Approach (CDA). It measures the size of the gray economy in two stages: the econometric estimation of an aggregate money demand equation with a specific component related to cash transactions in the underground sector, and the computation of the value of these shadow transactions through the quantity theory of money ($MV=PY$). The main assumptions for the first stage estimation are that shadow transactions are placed in cash to avoid traceability and that the critical cause of the gray economy is the high tax burden. The CDA involves the estimation of the aggregate cash demand, including among the regressors, both standard explanatory variables of the preference for liquidity and specific variables identifying the determinants of the shadow economy. The demand for cash associated with shadow transactions is computed as the difference between the estimated demand for cash in the full model and the demand obtained by setting equal to zero all the determinants of the gray economy. The second stage concerns the estimation of the shadow economy compared to the GDP and is obtained by exploiting the Fisher equation $MV=PT$ (M is the stock of liquid assets, V is the velocity of money, P is the price level, and T is the volume of the transactions). The estimation process proceeds with the selection of a base year in which the contribution of the underground economy to GDP is assumed to be zero. The computation of the velocity of money as the ratio between the official GDP (PT) and the stock of liquid assets (M). The assumption is that this velocity is the same both for the regular economy and for the shadow sector, the value of the latter is obtained by multiplying the velocity of money for the estimated excess demand of cash.

The entire shadow economy can be divided into two categories: Passive and committed underground economy. The former can be reduced by promoting electronic payments and limiting the use of cash since cash does not leave any electronic trace, and thus it is relatively easy to prevent the report of the transactions. Cash payments incentive the merchants to do not report a transaction and evade the tax payment. This category tends to increase the volume of the shadow economy. It is called a passive shadow economy because the consumer is passive and does not

benefit from not reporting the transaction. In some cases, the customer is not even aware of the contribution to the shadow economy. The latter concerns the remaining part of the shadow economy in which it is not the cash payment that influences the decision not to report the purchase but the motivation on both sides of the transactions which are willing to evade the taxes or trade illegal goods and services. In this segment of the shadow economy, the use of cash is a consequence, and for instance, it is called a committed shadow economy. In this case, both parties of the transaction are aware of using cash to do not report the payment. Thus, they benefit from the lower stemming from the evasion of tax payments²⁰.

As it is shown in the graph, there exists a strong correlation between the prevalence of credit card payments in a country and its underground economy. Countries with a consistent level of credit card usage, such as the Netherlands and the United Kingdom, are characterized by a smaller shadow economy compared to countries with a minimal implementation of electronic means of payment such as Romania and Bulgaria²¹.



Source: Frederik Schneider (2013), The Shadow Economy in Europe

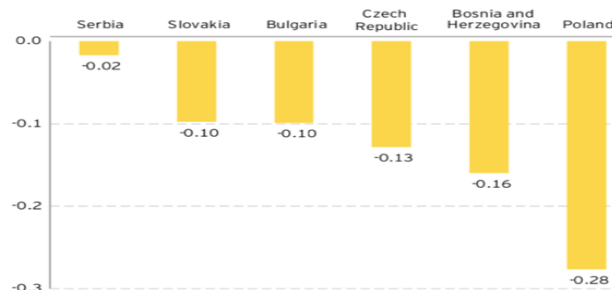
Worldwide governments have been working on policy measures that have as prevalent aims to replace cash with electronic payments or to increase the share of registered customers transactions. The first regulation implemented concerns the obligation to pay the employers wages and salaries through electronic payments; these payments can be performed either via bank transfer or in the form of prepaid cards, which can be used as standard credit and debit cards. In 2014, more than 70% of the employers across the globe received wages directly on the accounts. This data suggests that there is a substantial part of the population that still receive cash payments. As a consequence, often a significant part of this money is later spent also in cash, part of that may contribute to passive

²⁰ Ey

²¹ Frederik Schneider, (2013)

shadow economy transactions. Thus, the enforcement of this regulation contributes to shift most of the wages and salaries paid in cash, so far, to electronic payments. The implementation of this regulation forced employees to open bank accounts to receive their salaries. Simultaneously, the regulation increases the volume of electronic payments because people have to perform additional effort to use cash (ATM withdrawals) if they would like to continue to use it. Therefore, they would be more incentivized to make card payments. This whole process contributes to a decline in the passive shadow economy. It takes few steps to estimate the effect of this regulation on the value of cash transactions replaced by electronic payment ones.

The analysis begins with the calculation of the number of people receiving their wages in cash. The second step considers that all the unregistered workers receive their salary in cash and that conventionally all the cash recipients earn, on average, the minimum wage. The final step consists of using the data of people savings rate and the payment behavior of a usual card owner then estimate the amount of cash transactions replaced by card payments when all registered employees receive their remuneration through electronic payment. As shown in the graph, the obligation of paying wages and salaries through bank account has decreased the passive shadow economy of Southern European countries. All the countries have benefited from this implementation; Serbia is the one that has gained less because it accounts for a large number of unregistered workers. Thus, a significant part of the salaries paid in cash are remunerations earned by unregistered employees, and therefore there are not impacted by the implementation of this regulation. The policy has a substantial impact on the increase of government tax revenues. The nations that will enforce this regulation can perceive the majority of the estimated impact almost immediately; the rest of the benefits should arise within one or two years when the behavior of the new credit card holders will converge with the habits of typical card owners.



Source: Ey

Governments also implemented another regulation aimed at the decline of the shadow economy that establishes a specific monetary value (threshold) for every single cash purchase above which

cash payments are not permitted. So that, transactions above the established threshold will be solely placed with electronic payments. For each nation, the value of the threshold has been set according to the nominal GDP per capita. The lower is the value, the more transactions will be held with card payments, and therefore this will imply a more significant reduction of the passive underground economy. This regulation will have immediate benefits for the nations that implement it. In the long run, it can stimulate the increase in the value of cash transactions even below the threshold. The establishment of the threshold may encourage the merchants to purchase or lease a POS terminal and, therefore, a wider acceptance of the electronic payments. POS terminals are obligatory for some types of businesses primarily for sectors that contribute the most to the passive shadow economy and for business activities in which the presence of POS terminals is not widespread.

National Governments such as Poland, Italy, and Sweden have obliged several businesses to use cash registers or related fiscal devices to record any transaction, regardless of the payment method. The development of the introduction of cash is generally called transfer. It is described as a mechanism to provide tax administrations to manage the records of cash transactions and to prevent unconformities. The policy may take some time to be enforced due to the need to purchase and install new types of equipment and software both by the sellers and by the tax authority.

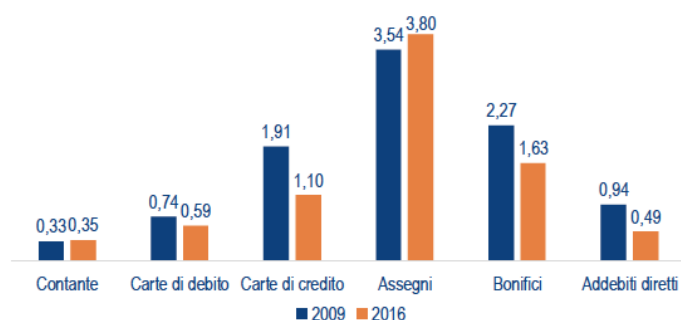
All the regulations aimed at reducing the shadow economy primarily through the rise of traceable means of payment; an indirect result of the of these policies is the stimulation of the economic growth because of the higher tax revenues which allow the governments to increase the public spending and the services that support production expansion ²².

2.3 Cashless Economies

The several downturns of holding and minting cash and the evolution of more sophisticated electronic means of payment have pushed the worldwide economies to shift to cashless societies, which allow consumers to store purchases solely swiping their cards or tapping on their mobile devices rather than use banknotes and coins. Having a cash-based society prevents the economies from performing at their full potential. Thus, the transition to cashless payments is associated with valuable and innovative benefits to the economy.

²² Ey

- 1) Reduction of the cost of cash: any means of payment is related to some costs, which are called "social costs" and comprehend transaction costs and commissions paid to intermediaries. Bank of Italy has calculated that the costs of cash are higher than 15 billion, which is equal to 1% of the GDP. Instead, the costs associated with credit and debit cards are estimated to be 18 euros per capita, which corresponds to 0.07% of the GDP. Cash remains the means of payment with the highest circulation costs that are faced mainly by banks and institutions around 60% and the remaining part by companies and consumers. It is interesting to observe the cost per operation of the different means of payment. Between 2009 and 2016, the only means of payment that have seen their cost to rise per operation are the paper ones, that is cash and checks, that have increased respectively from 0.33 euro and 0.35 euro and from 3.54 euro to 3.80 euro²³;



Source: The European House - Ambrosetti, 2020

- 2) Emersion of the shadow economy: the higher-level of cash circulation is often closely correlated with a higher level of the shadow economy. According to several studies conducted by the Bank of Italy, a 10% rise in the electronic transactions for at least four consecutive years can decrease the size of the underground economy by 5%. In Italy, the shadow economy accounts for 21% of the GDP. Thus, increasing the Italian level of electronic payments to reach the European average can allow the Italian government to recover around 70 billion and therefore reducing the missing VAT revenues;
- 3) Growth of the consuming cycle: the implementation of cashless payments has a substantial role in stimulating economic activity. For instance, it raises both the level of consumption and production. Thus, there exists a positive correlation between the increased number of card payments and consequently, the increase in the GDP level. Indeed, according to the

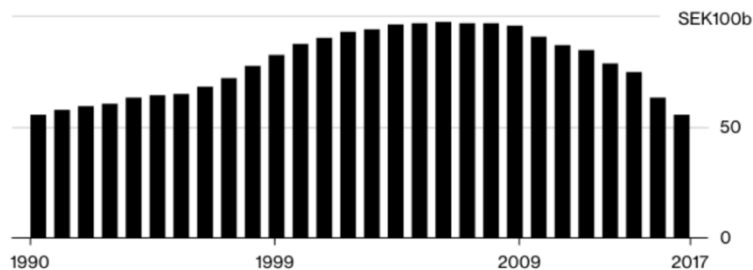
²³ Rapporto Community Cashless Society, (2020)

European Central Bank, a one million raise in purchases made through electronic payment would increase by 0.07%, which is equivalent to 6 million, the level of the Italian GDP;

- 4) Security of transactions: the use of electronic means of payment guarantees safer transactions both for the consumers and for the merchants. Purchases made via card payment are traceable, and in case of mistakes, an authority can always reach back to both the seller and the consumer.

2.3.1. Cashless Economies: The Scandinavian Case

Sweden is the pioneer nation that has experimented the implementation of a cashless society. The government aims to become a total cash-free economy by 2023, which will enable the state to stop the minting of banknotes and coins. Nowadays, the percentage of the cash-based payment for transactions between 100-500 SEK is 9%, instead of payments above 500 SEK in about 4%. Commercial activities have started to go cashless obliging clients to store purchases only through electronic means of payment. The graph visibly demonstrates the downward trend of the circulation of the Swedish Krona. In 2017 the cash in circulation reached the lowest value since 1990²⁴.



Source: Statistics Sweden

Throughout the years, the Swedish population has shown a raising trust in technology and innovation and, therefore, in the use of cashless payments. The well-rooted cash-free payment culture between the people and also in the legal system is confirmed by the fact that the national commercial law gives to the commercial activities the permission to overrule of accepting cash as a means of payment. Thus, when entering a shop, the consumer is entering into a legal agreement in which accepts to use cash-free payments²⁵.

²⁴ Statistics Sweden

²⁵ Quartz, (2018)

In 2012, seven well-known Swedish banks launched an innovative P2P system called Swish. It connects the bank account to the consumer's smartphone and allows instantaneous charge-free electronic exchange of money between private costumers or between a private consumer and a commercial activity if the business acknowledges the use of the service. To exchange money through the system, the payer only needs the phone number of the payee to proceed with the payment. In 2015, 52% of the Swedish population had already used the application by at least one month. By 2017, Swish gained more success and reached 5 million users²⁶. The application, nowadays, is used for either those transactions that previously were processed by cash or for transactions in which the use of the credit card is too expensive.

The rising of the cashless society in Sweden has alarmed the Swedish government and economists not only to discuss the benefits of it but also and especially the downturns that it can bring to the overall economy. The governor of the Riksbank is concerned that a few private banks would control the whole Swedish payment system. Another issue concerns the raise of technological security. Since any system based on a technology is vulnerable, it seems unreal to become a complete cash-free economy in the short run. The elderly Swedish population appears to be bothered by the inability to pay with cash, which is still a form of legal tender in several commercial activities²⁷. Many banks around the nation have stopped accepting cheques and have raised the fees for any bank transaction made with cash²⁸. Thus, most people belonging to this category do not own electric devices, and therefore they will be penalized by the introduction of cash-free payments.

Sweden is not the only Scandinavian country to believe in a cashless economy. (G4S, 2018)²⁹. The Danish government allows commercial activities to refuse cash payments, especially in the evening. A Danish company launched a mobile application, Nightpay, to implement the use of cashless payments. The application allows the users to create a virtual wallet which can be recharged with the credit card; once the user has transferred to money to the virtual wallet, each Danish Krona charged will be tripled so that the consumer pays just the 33% of the entire purchase. The purchase is secure; the client leans the mobile device on the POS, and the application will generate a unique code that will enable the transaction. The service can be used in several commercial activities around the nation before midnight.

²⁶ Medium, (2017)

²⁷ BBC, (2018)

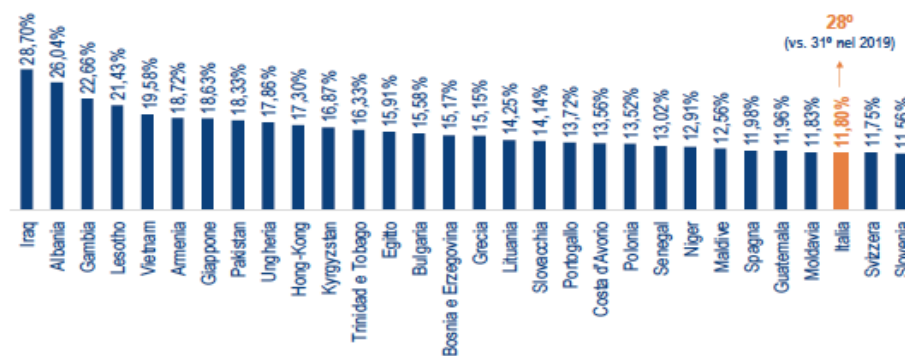
²⁸ Ibid.

²⁹ G4S, (2018)

The Danish Central Bank has forecasted that the circulation of cash will be subjected to a further reduction in the next years but that at the same time would be paltry to claim that the country is leading towards a cashless economy³⁰.

2.3.2. Cashless Economy: Italian transition

Based on historical and cultural features, the Italian population uses cash for the majority of the transactions. Thus, it is unlikely that the Italian economy will turn to a cashless one, at least in the short run. Indeed, in 2017, only 14% of the transactions were processed through an electronic means of payment. Furthermore, from 2016 and 2017, the cash in circulation has grown from 190,4 to 197,7 billion, which is equal to an increase of 3.8%³¹. Following the increasing trend, the cash in circulation in 2019 reached 208,4 billion euros³². In analyzing the international landscape, it can be shown that Italy is still one of the economies worldwide in which the bearing of cash on GDP is among the highest. Indeed, of 95 analyzed economies based on the Cash Intensity Index (CII), Italy is among the 30 worst economies worldwide for cash intensity. Nowadays, it is ranked in 28th place, which represents a worse position compared to the 31st in 2019.



Source: The European House - Ambrosetti, 2020

In this paragraph is analyzed how the Italian society can implement the transition from a cash-based economy to a cashless one. This process is explained through the reasoning exposed by Rogoff in

³⁰ G4S, (2018)

³¹ Il Sole 24 Ore, (2018)

³² Rapporto Community Cashless Society, (2020)

the "Course of Cash." The economist has broken down the steps that a nation must follow to become a cashless economy.

A preliminary stage is needed to prepare the economy for the transition. In this section of the process, the Bank of Italy should stop the production of the higher denomination banknotes. They generally work as a store of value as well as they are easy to collect, stock, and move since they store a high value in a relatively small item. They are nonessential for daily transactions and thus are not frequently used and owned by ordinary people. High denomination banknotes for all the previously listed features tend to facilitate the illegal transactions.

The European Central Bank has followed the path of ceasing the production of the 500 euros banknotes starting from the end of 2018; however, it has remained a legal tender even if it is out of production. This step is just the first of a long chain, which will end up with the circulation only of coins and the 5 and 10 euros banknotes, which will be useful for smaller transactions, especially in those regions where the technology and the appropriate infrastructures are still in the process of development.

After the implementation of the preliminary measures, the Italian government intervention is needed to provide the population with subsidies for the free opening of bank accounts, the purchase of smartphones or other electronic devices to submit and receive payments. This step is intended to enable the inclusion of the whole population and to reach a lower level of income inequalities. The cost of this financial measure will account for 4.2 billion euros considering 400 euros for each of the 10.5 million poor inhabitants recorded by Istat in 2016. The cost that the government will face would be in a second moment shifted to banks and then to taxpayers.

The second step concerns privacy and finding an appropriate balance between people rights and the need of the government to enforce the law³³. Pursue the path of a cashless society has for the government several benefits such as to discover potential threats and substantial unjustified payments. To reach a satisfying solution, the Italian government could guarantee that the bank accounts will remain confidential, but at the same time, the government would pretend a way to get into the account even if encrypted³⁴. The issue of how to manage the privacy of the population is something continuously debated by the pertaining institutions.

Having found a satisfying solution will enable the economy to move to the third stage of the transition, which concerns the real-time cleaning of the payments, which is a massive issue for the

³³ Rogoff, (2016)

³⁴ Ibid.

Italian population is used to deal with cash daily. This stage aims at the ability to conduct real-time transactions between bank accounts and use P2P systems daily. As the number of users increases, the required fees for money transfers between bank accounts will decline so that the transactions will be carried swiftly, aiming to reach the velocity of the cash exchange³⁵. Already in 2016, Poste Italiane created for the users of its mobile application a P2P system. The service was imagined for exchanging money up to 25 euros between private accounts; for transactions above 25 euros, the system charges 1 euro fee to the payer³⁶. However, the system appears to be of limited use and distribution, even if the application has been downloaded by 3.2 million consumers³⁷.

The Italian population seems reluctant to the implementation of a broader system of credit card payments. Indeed, the average credit card payments per person in Italy are 31 compared to the European average of 72 card payments per person³⁸. Almost all the commercial in Italy are equipped with the POS. Most of them do not allow consumers to pay with a credit card under a particular ceiling because fixed costs result in being too high for microtransactions.

From September 2017, every commercial activity which has direct contact with the consumers is obliged to have a POS terminal, decreasing the minimum receivable from 30 to 5 euros with consequent fines of up to 30 euros for those commercial activities which do not fulfill the law. Conditional to the implementation of the regulation, there will be a decline of the fixed costs of 0.3% for credit card transactions and 0.2% for debit card payments³⁹. These reductions will help both consumers and retailers to execute daily transactions more efficiently.

Financial innovation is a process that needs time to become active, especially in countries like Italy, where the population appreciates the use of cash because it is tangible, and it does immediately clear out. At the same time, the Italian population despises the use of e-money because using it is difficult to track the spending. Therefore to fill this gap, several applications have been developed which enable consumers to create personalized programs to track spending. An alternative to avoid the issue of tracking the expenses is to use independent cards that have a limited amount of money directly charged from the consumer's primary bank account.

The last stage of the transition is characterized by finding a path that ensures secure transactions for people who are reluctant to use electronic means of payments because of the possibility of thefts. Thus, according to many academics, a relevant innovation is the implementation of the

³⁵ Rogoff, (2016)

³⁶ PosteItaliane.it

³⁷ Ibid.

³⁸ European House Ambrosetti, (2016)

³⁹ Il Sole 24 Ore, (2017)

Blockchain. It enables instantaneous and 100% secure transactions carried out at a lower cost respect to a standard transfer commission. The transaction will be secure because the Blockchain is installed in thousands of devices around the globe so that to go back to the original transaction and modify it would cost billions of dollars, even though the transaction will be transparent and visible for everybody⁴⁰.

However, technological companies are developing several security preventive measures, such as facial recognition and fingerprints⁴¹. The issue regarding the protection of the people's savings is relevant because most of the electronic payments are made directly through credit and debit cards or with a personal account linked to it.

In the last years, according to the Ministero dell'Economia e delle Finanze, Italy has shown an increase in the thefts linked to online transactions. Indeed, between 2014 and 2015 has been registered a rise of 5.08%. Simultaneously, it has been demonstrated a positive trend for frauds connected with POS transactions (-26,54%) and with ATM withdrawals (-9,06%).

In 2015 the European House Ambrosetti has established the Community Cashless Society, which aims at developing knowledge and proposals to promote the cashless society. The Community Cashless Society intends to establish Italy as a digitalized and modern country by 2025. This process starts from the payment systems, and it includes the increased awareness that the digitalization of the payments, which is considered a crucial precondition for:

- having a fairer and honest country, which is capable of decreasing nearly to zero the effect of the VAT gap on the GDP;
- increasing the successful probability of contrasting the tax evasion and the underground economy retrieving up to 29.5 billion euros and guaranteeing more substantial income to the State nearly 10 billion euros if Italy will equalize the European average of e-payments;
- reaching the goal of halving the bearing of cash on the GDP from the actual 11.8% to around 6%.

In the 2020 edition of the Community Cashless Society has been developed and monitored the Cashless Society Speedometer (CSS). It is the indicator that measures the velocity at which the countries in the European Union are moving towards the cashless society. Differently from the Cashless Society Index, which allows the committee to portray the current condition concerning the implementation of e-payments in each Member State, the speedometer is a dynamic indicator

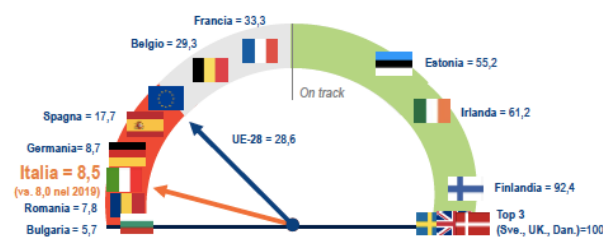
⁴⁰ IBM, (2017)

⁴¹ Rogoff, (2016)

that analyzes the velocity at which the European countries are transitioning towards a common goal. The aim is to reach by 2025 an average level of credit card transactions pro-capita equal to the best European performing countries (Denmark, Sweden, and the United Kingdom), which present an overall average of 351.9 pro-capita transactions per year.

The speedometer assigns a score based on a 0 to 100 scale. It depends on the velocity at which each State in moving towards the target in the prearranged time. The monitored timeframe is the period between 2012 and 2018. The European countries that have grown up throughout this period at a pace that will allow them to reach the goal by 2025 have earned a score equal to 100. Instead, those countries that have not faced this development have obtained a score equal to zero.

The result that emerges from this analysis shows that Italy does not have an appropriate velocity to reach the target by 2025. However, it is slightly accelerating its run towards the European best performers compared to the previous years. Indeed, Italy has earned a score equal to 8.5, which is higher than 0.8 obtained in 2019.



Source: The European House Ambrosetti

Confronting the results of the CSS of the previous analysis emerges that Italy has maintained constant the velocity gap than the EU average, which in 2020 (and 2019) has resulted equal to 20.1 points. Furthermore, according to a simulation at the same present conditions and hypothesizing that the countries will remain stationary at this velocity, Italy would reach the current European average by 2028, and the value would remain under the one of the European best performers. If instead also the other countries would move at the current velocity, Italy would reach the present European average by 2042⁴².

⁴² Rapporto Community Cashless Society, (2020)

Chapter 3

3.1. Analysis of the Survey

The primary research objective of the analytic survey is to analyze the consumers' behaviors concerning the implementation of a more significant usage of credit cards in Italy. Indeed, according to a study made by Statista, which examines the card payment annual value in Italy between 2001 and 2018; throughout the years 2001-2007, Italy experienced a substantial growth in the annual value of card payments reaching in 2007 128.93 billion euros. Not surprisingly, in 2008, due to the financial crises, there was a decrease, which brought the value to 116.74 billion euros. Ever since this drop, the trend has always been increasing, reaching the maximum value in 2018 with 200 billion euros.

The tool used to assess the analysis consists of the administration of a questioner containing close-ended questions to a random sample of consumers aiming to collect quantitative data. The type of survey chosen to gather the information is the cross-sectional because the questioner was administered just at one point in time.

The questions asked to the respondents aim to assess how a random sample of the Italian population uses the credit card. The questions concern:

- the age of the respondent;
- the activity of the respondent;
- how many credit card transactions each respondent makes weekly;
- for which types of operations each respondent uses the credit card;
- how many credit cards each respondent owns;
- reasons for the usage of credit cards;
- the amount of money for which each respondent uses the credit card the most to store purchases.

The types of questions used throughout the questioner, technically called the level of measurement, are mainly of two kinds:

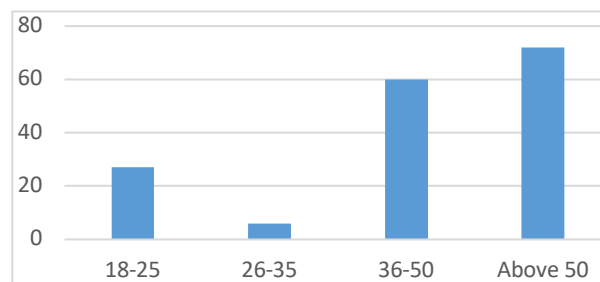
- 1) Ordinal type questions which are mutually exclusive questions, which means that only one category can be chosen at a time;
- 2) Continuous queries which comprehend interval scale ones are those where there is order, and the difference between the two value is meaningful;

The sampled population (165 respondents) has been chosen randomly, aiming at reproducing as well as possible a realistic society.

In the following sub-paragraphs it will be taken a closer look at each of the questions proposed to the respondents of the survey.

3.1.1. Age of the Respondents

Age	Frequency	Percentage
18 – 25 years old	27	16.4%
26 – 35 years old	6	3.6%
36 – 50 years old	60	36.4%
Above 50 years old	72	43.6%
Balance	165 Respondents	100%

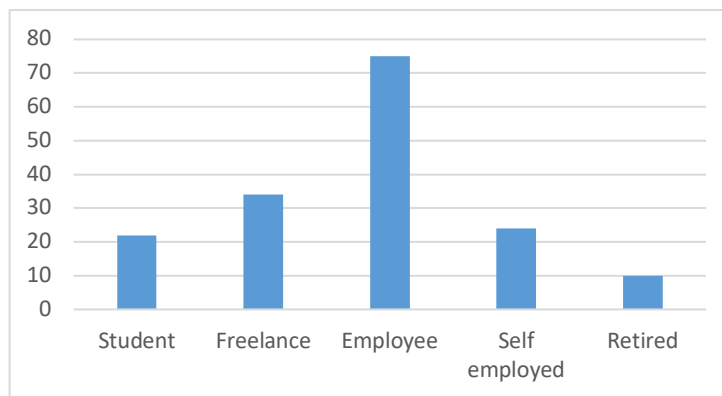


The graph above shows the distribution concerning the community of the random sample analyzed. The population has been divided into four categories (18-25, 26-35, 36-50, and above 50) for an overall amount of respondents equal to 165. On the X-axis are displayed the four categories while the Y-axis shows the number of the people sampled. As the graph demonstrates, the higher percentage (43.6%) of the people tested is represented by respondents whose age is above 50 years old. This data is not surprising because people in this range of age usually earn a higher level of income, which positively affects credit card usage. Moreover, the relationship between the age and the credit card usage is positively correlated, especially for middle-aged customers ranked at the second place of the study, with a 36.4% share and the youth population, which is in third place representing the 16.4% of the sample. The community whose age is between 26 and 35 years old is represented only by six people, which accounts for 3.6% of the total.

To find in which category lies the mean age of the respondents to the group 18-25 years old has been given value one, to the class 26-35 value two, to the category 36-50 value three, and the section above 50 has taken value four. The mean for this sample of the population is 3.073. This data demonstrates that the average age corresponds to category three, which represents the range of age from 36 to 50 years old.

3.1.2. Activity of the Respondents

Activity	Frequency	Percentage
Student	22	13.3%
Freelance	34	20.6%
Self employed	24	14.5%
Employee	75	45.5%
Retired	10	6.1%
Balance	165 Respondents	100%

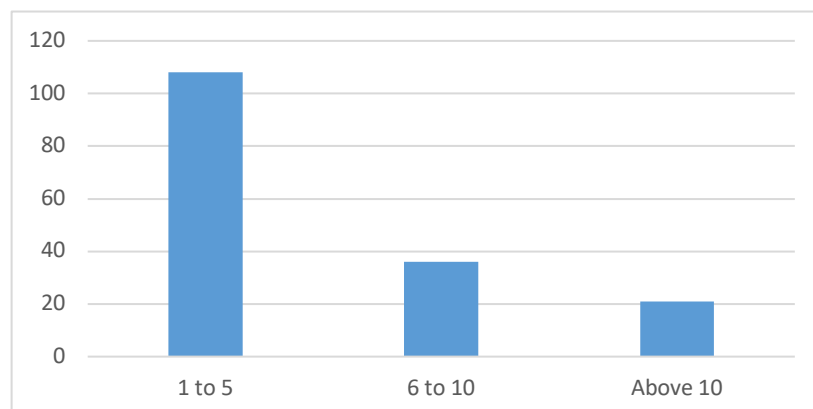


The chart and the respective graph show the distribution of the respondents based on their working activities. Displayed on the X-axis, there are the five categories of working activities (student, freelance, self- employed, employee, and retired) that have been identified to gather to the best the information. The data of this analysis can be strictly linked to the previous one. Since based on the age, the majority of the respondents are above fifty years old; not surprisingly, the investigation concerning the working activities of the respondents shows a substantial contribution (45.5%) made by employed respondents; 20.6% of the population sampled works as a freelance, and the 14.5% is self-employed. The overall contribution of the working class to the survey is 80.6%.

This data perfectly reflects the data in the previous graph, where 80% of the sampled population age lied between 36 years old and above fifty. Twenty-two out of 165 respondents are students, and they account for 13.3%; instead, only 6.1% lies in the retired category.

3.1.3. How many credit card transactions each respondent makes weekly

Number of transactions	Frequency	Percentage
1 to 5	108	65.5%
6 to 10	36	21.8%
Above 10	21	12.7%
Balance	165 Respondents	100%



The Italian economy, which according to the European statistics for the implementation of electronic payments, is located in the last places, is far from becoming cashless; indeed, cash remains the most widely used method of payment and accounts for almost 86% of the overall transactions. This data is far from the 76% European average. These circumstances are also reflected in the annual cashless transactions per person; in Italy, each person, on average, makes 37 cashless transactions per year while the European average is 104 transactions. Denmark outperforms all the other European nations with 300 cashless transactions per person⁴³.

The respondents have been asked to state how many cashless transactions they make weekly. They could choose between three different categories (1 to 5, 6 to 10, and above 10). The classes are

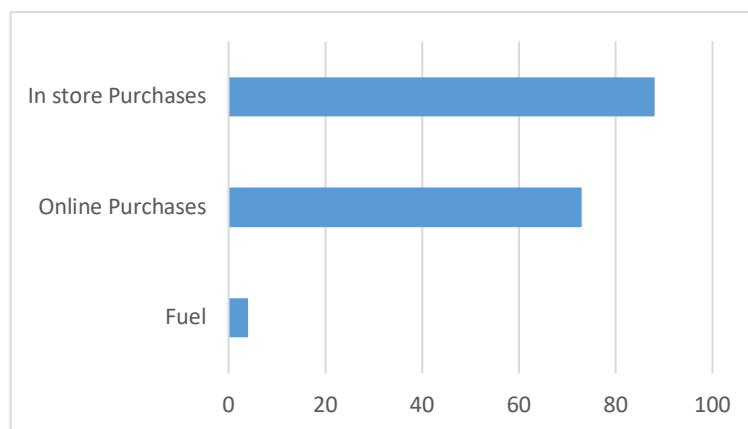
⁴³ Pwc.com

represented on the X-axis of the graph. The analysis confirms the trend stated by PWC; indeed, the majority (65.5%) of the respondents make cashless transactions between one and five times a week. This data means that a bulk amount of respondents still prefer cash to perform daily purchases instead of using more innovative payment methods.

Thirty-six out of 165 sampled people utilize cashless payments at least six times a week but less than ten times. Only 12.7% of the sampled population has fully embraced the benefits of using a cashless means of payment. This segment comprehends people who make more than ten credit card transactions per week. According to the study pursued by Ipsos, Sinottica, in 2018, which analyzed the monthly amount of credit card payments per person. It states that: 27% of the Italian population utilized cashless payments more than five times a month, 20% between three and four times monthly, 13% two times per month, 12% only one time a month, 16% less than one time per month, and 12% own a credit card but do not use it.

3.1.4. For which types of operations each respondent uses the credit card

Types of operations	Frequency	Percentage
Fuel	4	2.4%
Online purchases	73	44.2%
In store purchases	88	53.3%
Balance	165 Respondents	100%



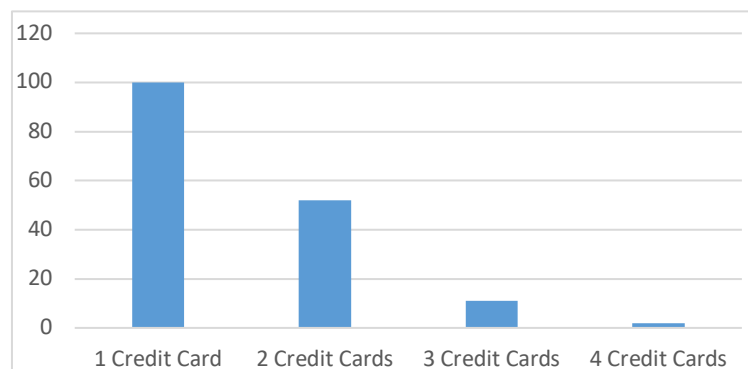
For this question, three diverse categories are available to the sampled population. Each respondent had to choose for which purpose uses the most the credit card. The choices are to refuel

vehicles, to make online purchases, and to make in-store transactions. 2.4% of the respondents mainly uses the credit card at the gas station to refuel their vehicles. After having taken apart this 2.4%, the remaining 97.6% is almost evenly split between in-store purchases (53.3%) and online transactions (44.2%). Italy is transitioning at a swift pace towards a more evolved e-commerce market. However, nowadays, the Italian's online sales only account for four percent of the overall European e-commerce. This circumstance is due to the lower internet penetration rate (73%) compared to any other nation included in the statistics elaborated by JP Morgan. Italian e-commerce is expected to experience a compound annual growth rate of about 14% to 2021.

Credit card payment is the most common method for online purchases in 2019 in Italy, accounting for 33.8% of the whole online transactions. This data is followed by the standing out of digital wallets follows, which represents 32.3% of the entire online purchases⁴⁴.

3.1.5. How many credit cards each respondent owns

Number of credit card owned	Frequency	Percentage
1 Credit Card	100	60.6%
2 Credit Cards	52	31.5%
3 Credit Cards	11	6.7%
4 Credit Cards	2	1.2%
Balance	165 Respondents	100%



⁴⁴ jpmorgan.com

For this stage of the analysis, the respondents have been required to state how many credit cards they use daily. The question has been proposed as a continuous type so that they could clearly express the number. The range of answers is between one credit card and four credit cards per individual. The distribution of the response shows that 92.1% of the participants to the survey utilize either one or two credit cards, leaving the remaining 7.9% to the users of three and four credit cards. The actual breakdown demonstrates that 60.6% of the sampled population uses one credit card, 31.5% utilize two credit cards, 6.7% use three credit cards, and only 1.2% utilize four credit cards. The data gathered through the survey are reflected by the research developed by Sinottica Ipsos in 2019 aimed at monitoring the number of credit cards owned by each individual whose range of age was between 18 and 74 years old from 2014 to 2019. Indeed, in 2019, 87% of the Italians owned just one credit card, and the statistic confirms that this percentage was consistent throughout the analyzed years with a pick of 91% in 2015. 11% of the population owns two credit cards; this data has been higher in all the other studied years except for 2015. Only 2% of the population holds three or more credit cards; this information has remained stable throughout the years.

	2019	2018	2017	2016	2015	2014
Una sola carta	87%	86%	87%	86%	91%	86%
Due carte	11%	13%	12%	12%	8%	13%
Tre o più carte	2%	1%	1%	2%	1%	1%
N° medio di carte possedute	1.2	1.2	1.1	1.1	1.1	1.1

Source: Multifinanziaria Retail Market Ipsos, ed. 2019/1

The mean value of credit cards per person, according to the information gathered through this survey, accounts for 1.5. Since the majority of the sampled population is clustered around the mean value, the analysis presents a low standard deviation (0,7028082199). The mean value found is consistent with the analysis carried by PWC, which estimates an average of 1.2 credit cards per person in Italy. This average value is considered low compared to other countries such as Russia (2 Credit Cards per person) and the UK (2.7 Credit Cards per individual)⁴⁵. Americans on average own and use 3.1 credit cards.

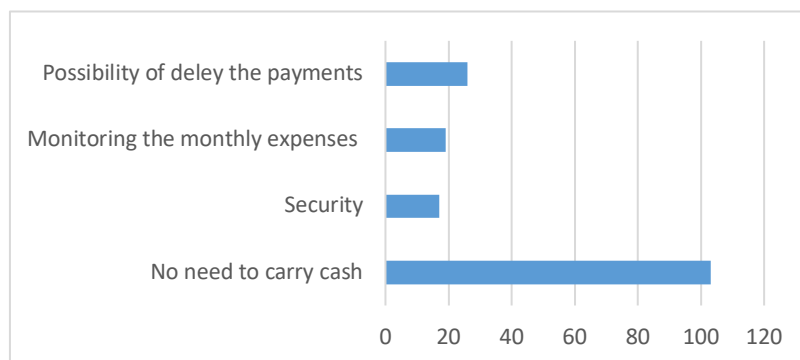
The number of credit cards used by every consumer ideally should be at least two from different networks so that each of them offers distinct rewards. Although experts do not set a limit on the number of credit cards owned by each individual since the number of credit cards held varies

⁴⁵ Pwc.com

according to the circumstances of every person. A critical recommendation is to use as many cards as each consumer can handle⁴⁶.

3.1.6. Reasons for the usage of credit cards

Reasons	Frequency	Percentage
No need to carry cash	103	62.4%
Security	17	10.3%
Monitoring the monthly expenses	19	11.5%
Possibility to delay the payment of the purchases	26	15.8%
Balance	165 Respondents	100%

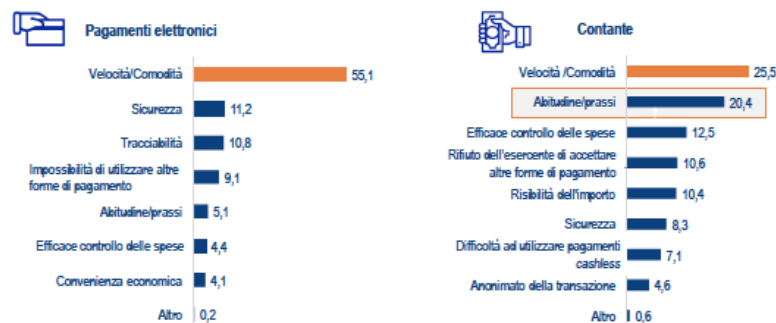


This section of the analysis aims at analyzing the significant reasons for which Italians use credit cards. The survey has proposed to the respondents four of the essential reasons that demonstrate the benefits of the credit card usage. The four available answers comprehend the possibility to avoid carrying cash, the security that e-payments guarantee both for the merchants and the costumers, the opportunity to better monitor the monthly expenses, and the chance to delay the actual detracton of money on the costumer's bank account for the completed purchases. According to the responses obtained through the survey, the majority of the respondents (62.4%) believe that the most crucial benefit linked to the usage of e-payments is the unnecessary need to carry cash. The remaining 37.6% is almost evenly split between the other three possible responses.

⁴⁶ Constance Sommer, (2019)

The accurate breakdown of the percentages shows that 15.8% of the sampled population believes that the service which enables credit card users to delay the payments is what drives them to utilize this means of payment. 11.5% of the respondents consider the credit card as a suitable means of payment because it allows the users to track the monthly expenses, and the remaining 10.3% utilize electronic means of payment to process secured payments. This last data can be linked to the fact that the majority of the sampled population is not aware of services such as Paypal or Satispay that allow the users to proceed with the payments through a third-party so that the consumer's personal information is hidden while purchasing.

According to a survey conducted by the Cashless Community Society concerning the reasons that push the Italian citizens to utilize a specific means of payment compared to another. For what concerns the use of credit cards, what prevails is the velocity/convenience of this payment instrument. This perk has been recognized by 55.1% of the Italian population. Surprisingly, the velocity is indicated as the first reason also for cash, although with a percentage less polarized compared to the cashless payments (25.5%). Among the reasons for choosing cash, immediately after the velocity appears the habit and the routine (20.4% of the respondents). This data highlights the strong cultural rooting "pro-cash" of the Italians⁴⁷.

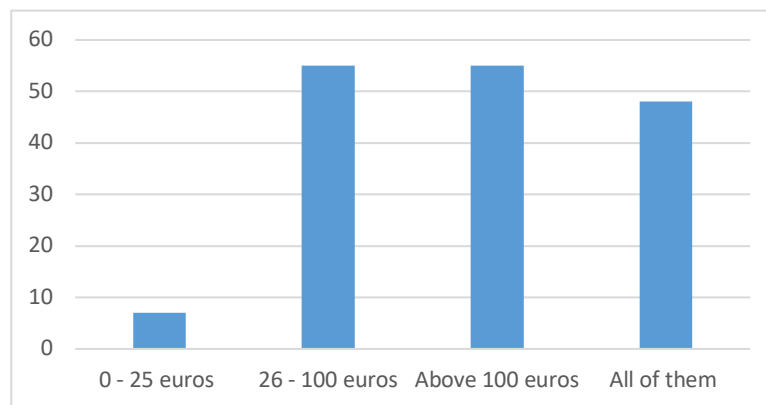


Source: The European House - Ambrosetti, 2020

⁴⁷ Rapporto Community Cashless Society, (2020)

3.1.7. The amount of money for which each respondent uses the credit card the most

Amounts of money	Frequency	Percentage
0 - 25 euros	7	4.3%
26 - 100 euros	55	33.3%
Above 100 euros	55	33.3%
All of them	48	29.1%
Balance	165 Respondents	100%



At this stage, the survey has asked the respondents to state for what type of purchases based on the amount of the payment they use credit cards as means of payment. The questionnaire provided four different answers (0 - 25, 26-100, above 100, and all of them), and each respondent had to choose the category that best fits the credit card usage. As the chart shows, 66.6% of the sampled population is evenly divided between respondents who use the credit card exclusively for purchases which value lies between 26 and 100 euros and people who use it for payments of amounts above 100 euros. 29.1% consider the credit card as a suitable means of payment for all types of payments, regardless of the value of the purchases. 4.3% of the sampled population the majority of the times uses credit cards for purchases, which amount is under 25 euros but prefers cash for the remaining of the payments.

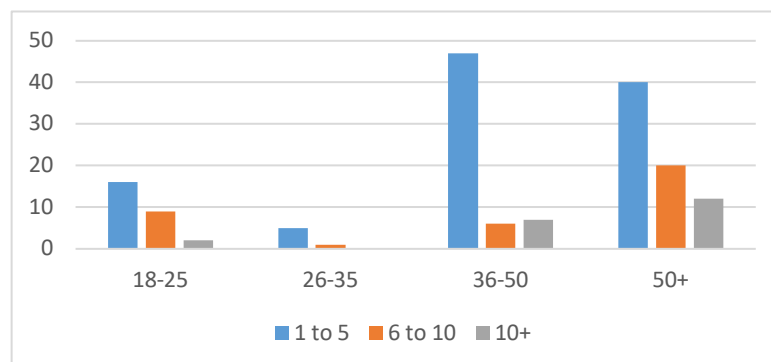
To evaluate the mean to each of the possible responses has been assigned a value from one to four. The calculations lead to a mean equal to 2.87. This data lies between category 2 (26-100) and category 3 (above 100). Still, it is substantially closer to class 3 so that it can be stated that the

average amount for which this sample of respondents use credit cards concerns purchases which value is above 100 euros.

3.2. Cross-tabulation between age and average credit card payments per week

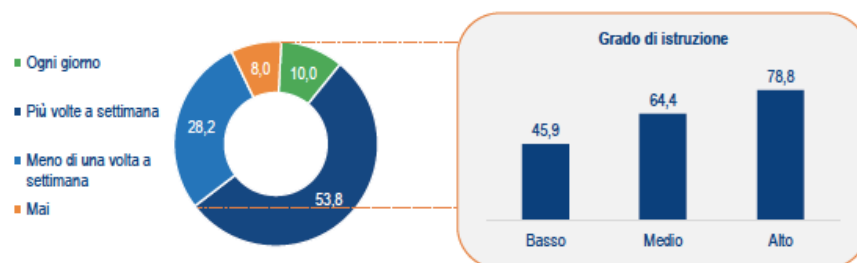
The cross-tabulation is a tool that allows the quantitative analysis of the relationship between multiple variables. In this case, it is used to analyze closer the relationship between the age of the respondents and their weekly credit card usage.

	1 to 5	6 to 10	10+
18-25	16	9	2
26-35	5	1	0
36-50	47	6	7
50+	40	20	12



In analyzing the relationship between the two variables, the probability has been set at 0.1. The chi-square test has resulted in being 0.060. Thus, since $p < 0.1$ the two variables can be considered dependent. The information gathered by the survey and displayed in the graph shows that only 0.07% of the 18-25 category uses the credit card for more than ten transactions per week and that there are zero respondents whose ages are between 26 and 35 years old utilize cashless payments for more than ten purchases weekly. Only 0.17% of them use credit cards for five to ten transactions per week. Instead, 0.12% of the 36-50 segment of the sampled population use cashless means of payment multiple times a day, and of the 50+ community, 0.17% of them utilize the credit card more than ten times a week. The same trend is described by the survey pursued by the Community Cashless Society. The younger population believes that cash is the most secure means of payment. On the other hand, the mature segment of the Italian population considers the use of

e-payments as the most secure form of payment. This analysis can be emphasized by the fact that the percentage of citizens that judges cash as the most reliable instrument decreases with the increased level of education and thus in the frequency of credit card usage. Indeed, 61.3% of the citizens that infrequently or never utilize the credit card believe that cash is the most secure means of payment compared to 14% of the population that uses the credit card daily. The results of the survey highlight that more than three out of five Italian citizens utilize cashless payments at least several times a week or every day (63.8%). At the same time, only one out of ten Italians never uses cashless payments. Since as stated before, the frequency of usage of credit cards is directly correlated with the level of education. Among the highly educated people, the majority of them (78.8%) use cashless instruments regularly⁴⁸.



Source: The European House - Ambrosetti, 2020

⁴⁸ Rapporto Community Cashless Society, (2020)

3.3. Cross-tabulation between number of transactions and occupation

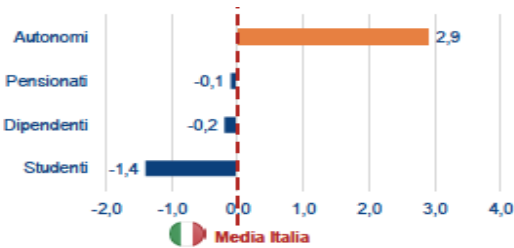
	1 to 5	6 to 10	10+
Student	13	7	2
Employee	50	16	9
Freelance	25	5	4
Self Employed	16	3	5
Retired	4	6	0



In this cross-tabulation has been described the relationship between the number of transactions per week and the occupation of each respondent. Thus, to understand if the two variables are dependent, a chi-square test has been assessed. The probability has been set at 0.1, and the result of the chi-square test has ended to be 0.09. Hence, since $p < 0.1$, the two variables are considered to be dependent.

From this analysis emerges that the self-employed workers are the ones that generally use the credit cards the most with 0.21% of them using cashless payments more than ten times a week. Employed workers and freelances follow with 0.12% of them using credit cards multiples times daily. Only 0.09% of the sampled students use credit cards more than times a week, and of the sampled population, zero retired people use cashless payments 10+ times a week. This information is confirmed by the study pursued by the Community Cashless Society. The study explains that the incomplete integration of the elderly population into the cashless society is due to their cultural heritage being less oriented to new technological instruments. The younger generation's inclination to prefer cash can be because most of them are not economically independent. For instance, according to the Community Cashless Society, the self-employed workers are the ones that use the

most cashless means of payment. At the same time, students, employees, and retirees are the categories that tend to prefer cash⁴⁹.



Source: The European House Ambrosetti, 2020

⁴⁹ Rapporto Community Cashless Society, (2020)

Conclusion

The transition towards a cashless society is not straightforward, especially in a country like Italy, where the population is culturally linked to cash-based transactions. As has been discussed throughout the dissertation, all the countries are moving at a swift pace towards cashless economies. This process aims to reduce the shadow economy and increase government revenues, which will lead to economic growth. The Italian cultural and historical framework does not allow the country to turn cashless at the same pace as the other nations. Indeed, as it has been explained, Italy is far behind the other nations leading this transition. The Community Cashless Society has pointed out that it aims to turn the country cashless by 2025. However, according to the speedometer, Italy is maintaining a constant velocity, which will prevent the State from reaching the established goal. It has been estimated that if the other European countries would remain stationary, then Italy would turn cashless by 2028. Instead, if the other countries will move at the current velocity, the Italian transition to cashless will have to wait until 2042.

The comparison of the two surveys has depicted the Italian population's inclination to be reluctant to a fast transition. Indeed, according to the studies' results, credit card usage is closely linked to the level of education of the population. That is, as people are more educated, the more they will trust and thus use the credit card as the principal means of payment. From both of the surveys' results, the self-employed workers are the class that uses cashless payments the most and that students, employees, and retired are the categories that tend to prefer cash transactions. The matter that reflects the inadequacy of the Italian population to turn cashless is indicated by the average number of cashless operations per year. In Italy, they account for 37 compared to a European average of 104 and to the countries leading this sector in which around 300 cashless transactions per person are performed annually.

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